PLACE: Dobbs Building, Raleigh, North Carolina

DATE: Tuesday, June 5, 2018

TIME: 10:22 a.m. - 12:18 p.m.

DOCKET NO: E-7, Sub 1164

BEFORE: Commissioner ToNola D. Brown-Bland, Presiding
Chairman Edward S. Finley, Jr.
Commissioner Jerry C. Dockham
Commissioner James G. Patterson
Commissioner Lyons Gray

IN THE MATTER OF:

Application of Duke Energy Carolinas, LLC, for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to G.S. 62-133.9 and Commission Rule R8-69.

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

2 COMMISSIONER BROWN-BLAND: Good morning.
3 Let's come to order and go on the record. I am
4 Commissioner ToNola D. Brown-Bland with the North
5 Carolina Utilities Commission, Presiding Commissioner
6 for this hearing. With me this morning are Chairman
7 Edward S. Finley, Jr.; and Commissioners Jerry C.
8 Dockham, James G. Patterson, and Lyons Gray.
9 I now call for hearing Docket Number E-7,
10 Sub 1164, In the Matter of Application of Duke Energy
11 Carolinas, LLC, for Approval of Demand-Side Management
12 and Energy Cost Recovery Rider Pursuant to G.S.
13 62-133.9 and Commission Rule R8-69.
14 G.S. 62-133.9 establishes the procedure for
15 cost recovery of Demand-Side Management and Energy
16 Efficiency expenditures, respectively hereafter DSM
17 and EE. G.S. 62-133.9(d) provides for an annual
18 DSM/EE Rider for electric public utilities to recover
19 all reasonable and prudent costs incurred and
20 appropriate incentives for adoption and implementation
21 of new DSM and EE measures.
22 On March 7, 2018, Duke Energy Carolinas,
23 LLC, hereafter DEC or Applicant, filed its Application
24 for approval of the DSM and Energy Efficiency Cost

Recovery Rider pursuant to G.S. 62-133.9 and Commission Rule R8-69, along with the direct testimony and exhibits of Carolyn T. Miller and Robert P. Evans in support of the Application.

On March 29, 2018, the Commission issued an Order Scheduling Hearing and Requiring Filing of Testimony, Establishing Discovery Guidelines and Requiring Public Notice. The Order scheduled the hearing in this docket for today, Tuesday, June 5, 2018 at 9:30 a.m., following DEC's annual Fuel and Fuel-Related Charge Adjustment proceeding.

Based on their timely Petitions to Intervene in this docket, the following parties were allowed to intervene by Order of the Commission. North Carolina Sustainable Energy Association (NCSEA), Carolina Utility Customers Association, Inc., (CUCA), Southern Alliance for Clean Energy (S-A-C-E or SACE), North Carolina Justice Center, Carolina Industrial Group for Fair Utility Rates III (CIGFUR III), and the Natural Resources Defense Council (NRDC).

The intervention and participation of the Public Staff is recognized pursuant to G.S. 62-15(d) and Commission Rule R1-19(e).

On May 22, 2018, the Public Staff filed the

1 testimony and exhibits of David M. Williamson, Eric
2 Williams and Michael C. Maness.
3 Also on May 22nd, the co-intervenors, the
4 North Carolina Justice Center (NRDC) and SACE filed
5 the testimony and exhibits of Christopher Neme.
6 On June 1, 2018, DEC filed the joint
7 rebuttal testimony of Timothy J. Duff and Richard G.
8 Stevie, Ph.D., the rebuttal testimony and exhibits of
9 Robert P. Evans, and the rebuttal testimony and
10 exhibits of Carolyn T. Miller.
11 On June 1, 2018, DEC filed a motion to
12 excuse Witness Carolyn T. Miller from appearance at
13 this hearing. And co-intervenors, the North Carolina
14 Justice Center (NRDC) and SACE, moved that their
15 witness Christopher Neme also be excused from
16 appearing today. Both motions excusing the witnesses
17 were granted by Commission Order dated June 4, 2018.
18 On June 4th, DEC filed the required
19 Affidavit of Publication of notice.
20 In compliance with the requirement of
21 Chapter 138A of the State Government Ethics Act, I
22 remind the members of the Commission of our
23 responsibility to avoid conflicts of interest, and I
24 inquire at this time whether any member has any known

1 conflict of interest with respect to the matter before
2 us this morning?
3 (No response)
4 The record will reflect that no conflicts
5 were identified.
6 I now call for appearances of counsel,
7 beginning with the Applicant.
8 MS. FENTRESS: Good morning. I'm Kendrick
9 Fentress appearing on behalf of Duke Energy Carolinas.
10 MS. JAGANNATHAN: Good morning. I'm Molly
11 Jagannathan also appearing on behalf of Duke Energy
12 Carolinas.
13 COMMISSIONER BROWN-BLAND: Good morning.
14 MR. NEAL: Good morning. I'm David Neal,
15 Southern Environmental Law Center, appearing on behalf
16 of the North Carolina Justice Center, Southern
17 Alliance for Clean Energy and Natural Resources
18 Defense Council.
19 MR. PAGE: I'm Bob Page appearing on behalf
20 of Carolina Utility Customers Association, Inc.
21 COMMISSIONER BROWN-BLAND: Good morning.
22 MS. HICKS: Good morning. Warren Hicks,
23 Bailey & Dixon, appearing on behalf of Carolina
24 Industrial Group for Fair Utility Rates III.

1 COMMISSIONER BROWN-BLAND: All right.
2 MR. SMITH: Good morning. Ben Smith and
3 Peter Ledford for NCSEA.
4 COMMISSIONER BROWN-BLAND: Good morning.
5 MS. EDMONDSON: Good morning. Lucy
6 Edmondson with the Public Staff appearing on behalf of
7 the Using and Consuming Public.
8 COMMISSIONER BROWN-BLAND: Good morning,
9 Ms. Edmondson. Have you identified any public
10 witnesses who wish to come forward this morning?
11 MS. EDMONDSON: I have not.
12 COMMISSIONER BROWN-BLAND: Out of an
13 abundance of caution are there any public witnesses
14 who wish to be heard regarding this matter today?
15 (No response)
16 The record will reflect that no one came
17 forward.
18 Any other preliminary matters before we
19 begin?
20 (Counsel shakes heads no)
21 Well then, the case is with the Applicant.
22 MS. JAGANNATHAN: Thank you, Madam Chair.
23 At this time the Company would like to call witness
24 Bob Evans to the stand to present his direct

1 testimony.

2 ROBERT P. EVANS;

3 having been duly sworn,

4 testified as follows:

5 COMMISSIONER BROWN-BLAND: You may be

6 seated.

7 DIRECT EXAMINATION BY MS. JAGANNATHAN:

8 Q Mr. Evans, would you please state your name and

9 address for the record?

10 A My name is Robert P. Evans. I'm employed by Duke

11 Energy Carolinas in the terms of this particular

12 case. My address is 150 Fayetteville Street,

13 Raleigh, North Carolina 27602. I'm employed

14 again by Duke Energy Corporation as Senior

15 Manager of Strategy and Collaboration for

16 Carolinas in the Market Solutions and Regulatory

17 Strategy and Evaluations Group.

18 Q And, Mr. Evans, did you cause to be prefiled in

19 this docket direct testimony consisting of 36

20 pages?

21 A Yes, I did.

22 Q And did you also cause to be filed Exhibits 1

23 through 12 and A through L to your direct

24 testimony?

A Yes, I did.

Q Do you have any changes or corrections to your prefiled direct testimony or exhibits?

A I have four changes. On page 20 of my direct testimony, line 11, the word "capacity" in the first -- it's the second word should be replaced by energy. The second to last word "energy" should be modified and changed to capacity. On line 12, the DSM annotation should be changed to EE. And the second to last word again on line 12 should be -- EE should be replaced by DSM. I have no further changes.

Q And aside from those changes, if I asked you the same questions here today, would your answers be the same?

A Yes, they would be.

MS. JAGANNATHAN: I would move that Mr. Evans' prefiled direct testimony as corrected be entered into the record as if given orally from the stand, and that his Exhibits 1 through 12 and A through L to his direct testimony be marked for identification.

COMMISSIONER BROWN-BLAND: There being no objection, that motion will be allowed and his

1 testimony will be received as if given orally from the
2 stand and the exhibits will be marked as identified
3 when prefiled.
4 MS. JAGANNATHAN: Thank you, Madam Chair.
5 (WHEREUPON, Evans Exhibits 1 - 12,
6 including 9A and 9B, and Evans
7 Exhibits A through L are marked
8 for identification as prefiled.)
9 (WHEREUPON, the prefiled direct
10 testimony of ROBERT P. EVANS is
11 copied into the record as if given
12 orally from the stand.)
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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-69	))))))	**DIRECT TESTIMONY OF ROBERT P. EVANS FOR DUKE ENERGY CAROLINAS, LLC**

I. INTRODUCTION AND PURPOSE

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

A. My name is Robert P. Evans, and my business address is 150 Fayetteville Street, Raleigh, North Carolina 27602. I am employed by Duke Energy Corporation ("Duke Energy") as Senior Manager-Strategy and Collaboration for the Carolinas in the Market Solutions Regulatory Strategy and Evaluation group.

Q. PLEASE BRIEFLY STATE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. I graduated from Iowa State University ("ISU") in 1978 with a Bachelor of Science Degree in Industrial Administration and a minor in Industrial Engineering. As a part of my undergraduate work, I participated in both the graduate level Regulatory Studies Programs sponsored by American Telephone and Telegraph Corporation, and graduate level study programs in Engineering Economics. Subsequent to my graduation from ISU, I received additional Engineering Economics training at the Colorado School of Mines, completed the National Association of Regulatory Utility Commissioners Regulatory Studies program at Michigan State, and completed the Advanced American Gas Association Ratemaking program at the University of Maryland. Upon graduation from ISU, I joined the Iowa State Commerce Commission (now known as the Iowa Utility Board ("IUB") in the Rates and Tariffs Section of the Utilities Division. During my tenure with the IUB, I

1 held several positions, including Senior Rate Analyst in charge of Utility
2 Rates and Tariffs, and Assistant Director of the Utility Division. In those
3 positions, I provided testimony in gas, electric, water, and telecommunications
4 proceedings as an expert witness in the areas of rate design, service rules, and
5 tariff applications. In 1982, I accepted employment with City Utilities of
6 Springfield, Missouri, as an Operations Analyst. In that capacity, I provided
7 support for rate-related matters associated with the municipal utility's gas,
8 electric, water, and sewer operations. In addition, I worked closely with its
9 load management and energy conservation programs. In 1983, I joined the
10 Rate Services staff of the Iowa Power and Light Company, now known as
11 MidAmerican Energy, as a Rate Engineer. In this position, I was responsible
12 for the preparation of rate-related filings and presented testimony on rate
13 design, service rules, and accounting issues before the IUB. In 1986, I
14 accepted employment with Tennessee-Virginia Energy Corporation (now
15 known as the United Cities Division of Atmos Energy) as Director of Rates
16 and Regulatory Affairs. While in this position, I was responsible for
17 regulatory filings, regulatory relations, and customer billing. In 1987, I went
18 to work for the Virginia State Corporation Commission in the Division of
19 Energy Regulation as a Utilities Specialist. In this capacity, I worked on
20 electric and natural gas issues and provided testimony on cost of service and
21 rate design matters brought before that regulatory body. In 1988, I joined
22 North Carolina Natural Gas Corporation ("NCNG") as its Manager of Rates
23 and Budgets. Subsequently, I was promoted to Director-Statistical Services in

NCNG's Planning and Regulatory Compliance Department. In that position, I performed a variety of work associated with financial, regulatory, and statistical analysis and presented testimony on several issues brought before the North Carolina Utilities Commission ("Commission"). I held that position until the closing of NCNG's merger with Carolina Power and Light Company, the predecessor of Progress Energy, Inc. ("Progress"), on July 15, 1999.

From July 1999 through January 2008, I was employed in Principal and Senior Analyst roles by the Progress Energy Service Company, LLC. In these roles, I provided NCNG, Progress Energy Carolinas, Inc. (now Duke Energy Progress, LLC or "DEP"), and Progress Energy Florida, Inc. with rate and regulatory support in their state and federal venues. From 2008 through the merger of Duke Energy and Progress, I provided regulatory support for demand-side management ("DSM") and energy efficiency ("EE") programs. Subsequent to the Progress merger with Duke Energy, I obtained my current position.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN MATTERS BROUGHT BEFORE THIS COMMISSION?

A. Yes. I have provided testimony to this Commission in matters concerning revenue requirements, avoided costs, cost of service, rate design, and the recovery of costs associated with DSM/EE programs and related accounting matters.

Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES?

A. I am responsible for the regulatory support of DSM/EE programs in North Carolina for both Duke Energy Carolinas, LLC ("DEC" or the "Company") and DEP.

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

A. My testimony supports DEC's Application for approval of its DSM/EE Cost Recovery Rider, Rider EE, for 2019 ("Rider 10"), which encompasses the Company's currently effective cost recovery and incentive mechanism ("Mechanism") and portfolio of programs approved in the Commission's *Order Approving DSM/EE Programs and Stipulation of Settlement* issued October 29, 2013, in Docket No. E-7, Sub 1032 ("Sub 1032 Order"). My testimony provides (1) a discussion of items the Commission specifically directed the Company to address in this proceeding; (2) an overview of the Commission's Rule R8-69 filing requirements; (3) a synopsis of the DSM/EE programs included in this filing; (4) a discussion of program results; (5) an explanation of how these results have affected the Rider 10 calculations; (6) information on DEC's Evaluation Measurement & Verification ("EM&V") activities; (7) an overview of the calculation of the Portfolio Performance Incentive ("PPI"); and (8) review of the Mechanism approved in the Sub 1032 Order.

Q. PLEASE DESCRIBE THE EXHIBITS ATTACHED TO YOUR TESTIMONY.

A. Evans Exhibit 1 supplies, for each program, load impacts and avoided cost revenue requirements by vintage. Evans Exhibit 2 contains a summary of net lost revenues for the period January 1, 2014 through December 31, 2019. Evans Exhibit 3 contains the actual program costs for North Carolina for the period January 1, 2014 through December 31, 2017. Evans Exhibit 4 contains the found revenues used in the net lost revenues calculations. Evans Exhibit 5 supplies evaluations of event-based programs. Evans Exhibit 6 contains information about and the results of DEC's programs and a comparison of actual impacts to previous estimates. Evans Exhibit 7 contains the projected program and portfolio cost-effectiveness results for the Company's current portfolio of programs. Evans Exhibit 8 contains a summary of 2017 program performance and an explanation of the variances between the forecasted program results and the actual results. Evans Exhibit 9 is a list of DEC's industrial and large commercial customers that have opted out of participation in its DSM or EE programs and a listing of those customers that have elected to opt in to DEC's DSM or EE programs after having initially notified the Company that they declined to participate, as required by Commission Rule R8-69(d)(2). Evans Exhibit 10 contains the projected shared savings incentive (PPI) associated with Vintage 2019. Evans Exhibit 11 provides a summary of the estimated activities and timeframe for completion of EM&V by program. Evans Exhibit 12 provides the actual and expected dates when the EM&V for each program or measure will become effective. Evans Exhibits A through L provide the detailed completed EM&V reports or

updates for the following programs: PowerShare® Program 2016 (Evans Exhibit A); Non-Residential Smart $aver® Energy Efficient Products and Assessment – Custom 2014-2015 (Evans Exhibit B); My Home Energy Report Program ("MyHER") 2015-2016 (Evans Exhibit C); Power Manager Load Control Service 2016 (Evans Exhibit D); Small Business Energy Saver 2014-2016 (Evans Exhibit E); Non-Residential Smart $aver® Energy Efficient Products and Assessment – Assessment 2014-2016 (Evans Exhibit F); EnergyWise for Business 2016 (Evans Exhibit G); Multi-Family EE 2014-2016 (Evans Exhibit H); Non-Residential Smart $aver® Energy Efficient Products and Assessment – Prescriptive 2013-2015 (Evans Exhibit I); Residential Energy Efficient Appliances and Devices – Save Energy and Water Kit: 2016 (Evans Exhibit J); Energy Efficient Appliances and Devices – Free LED 2016-2017 (Evans Exhibit K); and Smart Energy in Offices 2014-2016 (Evans Exhibit L).

Q. WERE EVANS EXHIBITS 1-12 PREPARED BY YOU OR AT YOUR DIRECTION AND SUPERVISION?

A. Yes, they were.

II. ACTIONS ORDERED BY THE COMMISSION

Q. PLEASE DESCRIBE THE ACTIONS THE COMMISSION DIRECTED DEC TO TAKE IN THE COMMISSION'S ORDER IN DOCKET NO. E-7, SUB 1130.

A. In its August 23, 2017 *Order Approving DSM/EE Rider, Revising Mechanism, and Requiring Filing of Proposed Customer Notice* in Docket No. E-7, Sub

1130 ("Sub 1130") Order, the Commission ordered: (1) that DEC's Appliance Recycling and PowerShare® Call Option programs be canceled and that DEC not incur further expenses for either program unless DEC were to provide sufficient justification for their continuance; (2) address the continuing cost-effectiveness of the Non-Residential Smart $aver® Performance Incentive Program and the Residential HVAC EE Program, and if either is not cost-effective provide details of plans to modify or close the program; and (3) that the Company shall incorporate the recommendations made by Public Staff witness Jack Floyd into future EM&V reports filed with the Commission in subsequent DSM/EE rider proceedings. The Commission also directed DEC to leverage its Collaborative to: (a) continue collaborative working group discussions for low-income, multi-family, manufactured housing and industrial programs, and include a narrative of these discussions in its next rider filing; (b) discuss how DEC's behavioral and lighting programs can be used to encourage and improve cross-participation with other programs; (c) discuss the potential inclusion in DEC's portfolio of any new programs based on best practices from around the country, including strategic energy management for industrial customers, comprehensive whole house retrofit programs, an enhanced multi-family affordable housing program, a multi-family new construction program, a manufactured housing program, and additional low-income residential EE programs, with parties proposing these programs providing sufficient and applicable information for DEC to evaluate the cost-effectiveness of the programs; and (d) continue to discuss how to

1 increase program participation and impacts with an emphasis on increasing
2 the participation of opt-out eligible customers as discussed in the testimony of
3 North Carolina Justice Center ("NCJC") and Southern Alliance for Clean
4 Energy ("SACE") witness Jennifer Weiss.

5 **Q. HAVE THE COMPANY'S APPLIANCE RECYCLING AND**
6 **POWERSHARE CALL OPTION PROGRAMS BEEN TERMINATED?**

7 A. Yes. The Appliance Recycling Program was terminated effective December
8 31, 2017, and the PowerShare® Call Option Program was discontinued
9 effective January 31, 2018.

10 **Q. HAS THE COMPANY INCURRED FURTHER EXPENSES FOR**
11 **THESE PROGRAMS SUBSEQUENT TO THEIR CLOSURE?**

12 A. No. The Company has not incurred additional expenses for these programs
13 after their closure.

14 **Q. PLEASE ADDRESS THE COST-EFFECTIVENESS OF THE**
15 **COMPANY'S NON-RESIDENTIAL SMART $AVER PERFORMANCE**
16 **INCENTIVE PROGRAM.**

17 A. DEC's Non-Residential Smart $aver® Performance Incentive Program is not
18 expected to have a Total Resource Cost ("TRC") cost-effectiveness score
19 exceeding 1.0 in 2019. The forecasted 2019 TRC score is 0.81 and the Utility
20 Cost Test score is 2.70. While the TRC score may be viewed as less than
21 optimal in isolation, it is important to note that this program is largely an
22 extension of the custom portion of the Non-Residential Smart $aver®
23 Program. In particular, the Performance Incentive Program encompasses

energy saving measures related to new technologies, unknown building conditions and system constraints, as well as uncertain operating circumstances, occupancy, or production schedules. In these cases, energy savings are difficult, if not impossible, to project with any level of accuracy. Due to the scope of projects envisioned, the Company also believes that the program could impact a customer's decision to opt into the EE portion of Rider EE; in other words, if this program were no longer offered as part of the Company's EE portfolio, additional customers may choose to opt out as a result. Another important element of this program is that it limits the prospects of overcompensating participants, at the expense of other customers, or undercompensating participants for their EE improvements. The Company believes that this program is an essential element of its EE portfolio and that its cost-effectiveness results will improve.

Q. PLEASE ADDRESS THE COST EFFECTIVENESS OF THE COMPANY'S RESIDENTIAL HVAC EE PROGRAM.

A. DEC's Residential HVAC EE Program has been renamed "Residential Smart $aver® EE Program," and modified in several ways. However, this program continues to struggle to maintain cost-effectiveness. During 2016 and 2017, the Company made a number of changes to the program to address the erosion in the program's cost-effectiveness caused by advancement in efficiency standards and the associated lower incremental savings associated with exceeding the new standards. These program changes, which were highlighted by the redesign of the program to include a referral channel that

reduced program costs, proved successful in returning the program to cost-effectiveness in 2017 and 2018. Unfortunately, with the application of the new lower avoided costs in 2019, the program is again projecting to no longer be cost effective. For this reason, the Company is actively working to evaluate additional programmatic changes, such as the Public Staff's recommendation to eliminate all non-referral channel measures, that would offset the decline in avoided costs and make this critical residential program cost-effective in 2019 and beyond.

III. PUBLIC STAFF'S EM&V RECOMMENDATIONS

Q. PLEASE DESCRIBE PUBLIC STAFF WITNESS FLOYD'S RECOMMENDATIONS THAT THE COMMISSION ORDERED DEC TO INCORPORATE INTO FUTURE EM&V REPORTS.

A. In the Sub 1130 proceeding, Public Staff witness Floyd recommended that the Company implement certain recommendations in its future EM&V studies, subject to the consideration of whether the cost would outweigh the benefit. These recommendations were as follows:

(1) That future evaluations of the Residential Multi-Family EE program include a billing analysis and more specific data on bulbs being replaced. If it is not feasible to provide this analysis or data, the evaluator should explain why it is not feasible.

(2) If the evaluator continues to rely on an engineering analysis to calculate measure impacts for the Save Energy and Water Kits, the evaluator should address the technological limits of water heaters when assessing

the length of showers used to calculate impacts. Future engineering analyses should either discard outliers or incorporate an assessment of the limitations of water heaters to produce savings.

(3) Future evaluations of the Small Business Energy Saver program should:

(a) incorporate HVAC interactive effects and update the coincidence factors for lighting measures, and

(b) begin tracking the heating and cooling types of participants to improve estimates of the HVAC interaction factors.

(4) Future evaluations of the Non-Residential Smart $aver® Energy Efficient Products and Assessments – Prescriptive program should rely on metering studies in determining the hours-of-use for lighting measures installed in commercial buildings consistent with the Uniform Methods Project.

(5) The EM&V reports for the Multi-Family EE Program, the Smart $aver® Prescriptive Incentive Program, and the Small Business Energy Saver Program should be revised as discussed by Public Staff witness Floyd and refiled in the next rider proceeding.

Q. HAS DEC HAD THE OPPORTUNITY TO ADDRESS WITNESS FLOYD'S EM&V RECOMMENDATIONS?

A. Yes. The Company has communicated witness Floyd's recommendations to its independent third-party evaluators. His recommendations have been and are being adopted to the extent that the additional costs associated with his recommendations are outweighed by the benefits.

1 **Q. WILL FUTURE EVALUATIONS OF THE RESIDENTIAL MULTI-**
2 **FAMILY EE PROGRAM INCLUDE A BILLING ANALYSIS AND**
3 **MORE SPECIFIC DATA ON BULBS BEING REPLACED?**
4 A. The Company has not yet developed the evaluation plan for the next
5 evaluation cycle of the Residential Multi-Family EE Program; however, future
6 evaluations will include a billing analysis, if feasible. If the evaluator
7 determines that a billing analysis is not feasible, the evaluator will explain its
8 rationale as to why a billing analysis is not the appropriate methodology to
9 measure impacts. With respect to providing more data on bulbs being
10 replaced, the Company is currently tracking the overall wattage of these bulbs
11 and has started to track specific bulb wattages.
12 **Q. WITH RESPECT TO WITNESS FLOYD'S RECOMMENDATION**
13 **REGARDING THE ANALYSIS OF THE SAVE ENERGY AND**
14 **WATER KITS, WILL OUTLIERS OR WATER HEATER**
15 **LIMITATIONS BE RECOGNIZED IN THE DETERMINATION OF**
16 **SAVINGS?**
17 A. Yes. The outliers are recognized and removed by the evaluator in its
18 engineering analyses of the Save Energy and Water Kits. Upon review, the
19 evaluator discards those cases that are considered outliers in the course of its
20 analysis. As to the technological limitations of water heaters, the evaluator
21 has indicated that there is a correlation between these limitations and outlying
22 data points. As a result of discarding the outlying data points, there are no
23 impacts relating to technological limitations of water heaters used in the

determination of savings. In future evaluation reports, the evaluator will specifically call out cases for which they removed outlying information.

Q. HAS DEC ADDRESSED WITNESS FLOYD'S RECOMMENDATIONS REGARDING ITS SMALL BUSINESS ENERGY SAVER PROGRAM?

A. Yes. The evaluator incorporates HVAC interaction factors into the verified numbers and revises the coincidence factors for each Small Business Energy Saver evaluation. In addition, Program Management has initiated the tracking of heating and cooling types for Small Business Energy Saver participants. It is important to know that the simulation modeling required to estimate HVAC interaction factors incorporating heating and cooling data adds approximately 10-20% to the typical Small Business Energy Saver evaluation budget. The addition of the simulation modeling would have required a change order to the agreed-upon Statement of Work ("SOW") between Duke Energy and the evaluator for the program year 2016 Small Business Energy Saver evaluation, as the SOW was agreed between each party on a date prior to the date of the EM&V recommendations. With the heating and cooling types now being tracked, the next Small Business Energy Saver evaluation will include simulation modeling to improve future estimates of HVAC interaction factors.

Q. HAS DEC ADDRESSED WITNESS FLOYD'S RECOMMENDATIONS REGARDING LIGHTING MEASURES OFFERED AS A PART OF ITS NON-RESIDENTIAL SMART SAVER ENERGY EFFICIENT PRODUCTS AND ASSESSMENTS – PRESCRIPTIVE PROGRAM?

A. Evaluation activities had commenced in Spring 2016 for the 2015/2016 DEC Non-Residential Smart $aver® Prescriptive program; therefore, the evaluator was not able to incorporate metering studies into the program evaluation currently underway due to the timing of the EM&V program recommendations. Metering studies to determine the hours-of-use for lighting measure will be included in future Non-Residential Smart $aver® Prescriptive evaluations.

Q. DID THE COMPANY SUBMIT CORRECTED EM&V REPORTS FOR THE MULTI-FAMILY EE PROGRAM, THE SMART $AVER PRESCRIPTIVE INCENTIVE PROGRAM, AND THE SMALL BUSINESS ENERGY SAVER PROGRAM?

A. Yes. The revised evaluation studies have been provided in the filed Evans exhibits. The revised Multi-Family EE Program evaluation is identified as Evans Exhibit H, the revised Smart $aver® Prescriptive Incentive Program evaluation is identified as Evans Exhibit I, and the revised the Small Business Energy Saver Program evaluation is identified as Evans Exhibit E.

IV. NCJC/SACE RECOMMENDATIONS

Q. HAS THE COLLABORATIVE MET AFTER THE ISSUANCE OF COMMISSION'S SUB 1130 ORDER?

A. Yes. Subsequent to the Commission's August 23, 2017 Sub 1130 Order, the Company scheduled two meetings of the Collaborative. The third quarter meeting was canceled due to events surrounding Hurricane Irma; however, the Collaborative did meet in December for its fourth quarter session.

Q. HAS THE COLLABORATIVE CONTINUED ITS WORKING GROUP DISCUSSIONS?

A. Yes. While the fourth quarter Collaborative meeting is dedicated primarily to EM&V report reviews, reports were provided by the Residential Low-Income and Residential Multi-Family subcommittees/working groups. These groups will continue to meet, both within and outside the formal Collaborative, through and likely beyond 2018.

Q. WERE NCJC/SACE WITNESS WEISS' OTHER RECOMMENDATIONS DISCUSSED BY THE COLLABORATIVE?

A. Yes. While all issues were touched on during the fourth quarter 2017 meeting, these issues will be discussed in greater depth starting with the first quarter 2018 meeting scheduled for March 27.

V. RULE R8-69 FILING REQUIREMENTS

Q. WHAT INFORMATION DOES DEC PROVIDE IN RESPONSE TO THE COMMISSION'S FILING REQUIREMENTS?

A. The information for Rider 10 is provided in response to the Commission's filing requirements contained in R8-69(f)(1) and can be found in the testimony and exhibits of Company witnesses Evans and Miller as follows:

R8-69(f)(1)		Items	Location in Testimony
(i)		Projected NC retail sales for the rate period	Miller Exhibit 6
(ii)		For each measure for which cost recovery is requested through Rider 10:	
(ii)	a.	Total expenses expected to be incurred during the rate period	Evans Exhibit 1
(ii)	b.	Total costs savings directly attributable to measures	Evans Exhibit 1
(ii)	c.	EM&V activities for the rate period	Evans Exhibit 11
(ii)	d.	Expected peak demand reductions	Evans Exhibit 1
(ii)	e.	Expected energy reductions	Evans Exhibit 1

(iii)		Filing requirements for DSM/EE EMF rider, including:	
(iii)	a.	Total expenses for the test period in the aggregate and broken down by type of expenditure, unit, and jurisdiction	Evans Exhibit 3
(iii)	b.	Total avoided costs for the test period in the aggregate and broken down by type of expenditure, unit, and jurisdiction	Evans Exhibit 1
(iii)	c.	Description of results from EM&V activities	Testimony of Robert Evans and Evans Exhibits A-L
(iii)	d.	Total peak demand reductions in the aggregate and broken down per program	Evans Exhibit 1
(iii)	e.	Total energy reduction in the aggregate and broken down per program	Evans Exhibit 1
(iii)	f.	Discussion of findings and results of programs	Testimony of Robert Evans and Evans Exhibit 6
(iii)	g.	Evaluations of event-based programs	Evans Exhibit 5
(iii)	h.	Comparison of impact estimates from previous year and explanation of significant differences	Testimony of Robert Evans and Evans Exhibits 6 and 8
(iv)		Determination of utility incentives	Testimony of Robert Evans and Evans Exhibit 10
(v)		Actual revenues from DSM/EE and DSM/EE EMF riders	Miller Exhibit 4
(vi)		Proposed Rider 10	Testimony of Carolyn Miller and Miller Exhibit 1
(vii)		Projected NC sales for customers opting out of measures	Miller Exhibit 6
(viii)		Supporting work papers	Flash drive accompanying filing

VI. PORTFOLIO OVERVIEW

Q. WHAT ARE DEC'S CURRENT DSM AND EE PROGRAMS?

A. The Company has two interruptible programs for non-residential customers, Interruptible Service ("IS") and Standby Generation ("SG"), which are accounted for outside of the Mechanism approved by the Commission in the Sub 1032 Order. Aside from IS and SG, the following DSM/EE programs have been implemented by DEC in its North Carolina service territory:

RESIDENTIAL CUSTOMER PROGRAMS

- Energy Assessments Program
- EE Education Program
- Energy Efficient Appliances and Devices
- Residential Smart $aver® EE Program (formerly, the HVAC EE Program)
- Multi-Family EE Program
- My Home Energy Report (MyHER)
- Income-Qualified EE and Weatherization Program
- Power Manager

NON-RESIDENTIAL CUSTOMER PROGRAMS

- Non-Residential Smart $aver® Energy Efficient Food Service Products Program
- Non-Residential Smart $aver® Energy Efficient HVAC Products Program
- Non-Residential Smart $aver® Energy Efficient IT Products Program
- Non-Residential Smart $aver® Energy Efficient Lighting Products Program
- Non-Residential Smart $aver® Energy Efficient Process Equipment Products Program
- Non-Residential Smart $aver® Energy Efficient Pumps and Drives Products Program
- Non-Residential Smart $aver® Custom Program

- Non-Residential Smart $aver® Custom Energy Assessments Program
- PowerShare®
- PowerShare® CallOption (program canceled effective January 31, 2018)
- Small Business Energy Saver
- Smart Energy in Offices (program to be canceled effective June 30, 2018)
- EnergyWise for Business
- Non-Residential Smart $aver® Performance Incentive

Q. ARE THESE SUBSTANTIVELY THE SAME PROGRAMS DEC RECEIVED APPROVAL FOR IN DOCKET NO. E-7, SUB 1032?

A. Yes. The programs contained in the current portfolio are the same as those approved by the Commission in the Sub 1032 Order, with the exception of: (1) the additions of the Non-Residential Smart $aver® Performance Incentive Program and Small Business Energy Saver Program; and (2) the discontinuation of the Business Energy Report Program, the Energy Management Information Services Pilot Program, the Residential Appliance Recycling Program, PowerShare® CallOption, and the Smart Energy in Healthcare Program, as well as the impending discontinuation of the Smart Energy in Offices Program.

Q. PLEASE DESCRIBE ANY UPDATES MADE TO THE UNDERLYING ASSUMPTIONS FOR DEC'S PORTFOLIO OF

PROGRAMS THAT HAVE ALTERED PROJECTIONS FOR VINTAGE 2019.

A. Updates to two key elements of the underlying assumptions materially impact DEC's 2019 portfolio projection: reductions in DEC's avoided costs and updates to EM&V-related impacts.

Q. PLEASE DESCRIBE THE IMPACT OF REDUCED AVOIDED COSTS.

A. The avoided cost rates used in the 2019 portfolio projection were significantly lower than those employed in the Sub 1130 proceeding. Both avoided capacity and energy rates were reduced; however, the reduction in the ~~capacity~~ energy rates was more pronounced than reduction in the ~~energy~~ capacity rates. As a result, ~~DSM~~ EE programs were impacted more than ~~EE~~ DSM programs. Irrespective of the program type, the reductions in avoided costs, lowered cost-effectiveness scores of all of the Company's DSM and EE programs as well as DEC's portfolio as a whole.

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Q. PLEASE DESCRIBE THE EM&V IMPACT OF REDUCED AVOIDED COSTS TO DEC'S ESTIMATED 2019 PROGRAM PORTFOLIO.

A. Changes in the EM&V results were updated to reflect the savings impacts for those programs for which DEC received EM&V results after it prepared its application in Sub 1130. Updating programs for EM&V, as with the aforementioned reduction in avoided cost rates, results in changes to the projected avoided cost benefits associated with the projected participation

and hence will impact the calculation of the specific program and overall portfolio cost-effectiveness, as well as impact the calculation of DEC's projected shared savings incentive.

Q. AFTER FACTORING THESE UPDATES INTO THE VINTAGE 2019 PORTFOLIO, DO THE RESULTS OF DEC'S PROSPECTIVE COST-EFFECTIVENESS TESTS INDICATE THAT IT SHOULD DISCONTINUE OR MODIFY ANY OF ITS PROGRAMS?

A. DEC performed a prospective analysis of each of its programs and the aggregate portfolio for the Vintage 2019 period. The cost-effectiveness results for the entire portfolio for Vintage 2019 are contained in Evans Exhibit 7. This exhibit shows that, with the exception of the Income-Qualified EE Products and Services Program, which was not cost-effective at the time of Commission approval, as well as the Non-Residential Smart $aver® Performance Incentive and the Residential Smart $aver® EE programs, discussed earlier in my testimony, the aggregate portfolio continues to project cost-effectiveness.

Q. DID DEC MAKE ANY MODIFICATIONS TO ITS PORTFOLIO OF PROGRAMS DURING VINTAGE 2017?

A. Yes. The Company has made several modifications to its portfolio of programs during Vintage 2017. These modifications were made in compliance with the Flexibility Guidelines approved by the Commission in its Sub 1032 Order. Three of DEC's programs, Residential HVAC-EE Program Air Conditioning, Residential HVAC-EE Program Tune and Seal,

Residential EE Appliances and Devices Program were consolidated into two programs. The modifications associated with this consolidation are as follows: (1) renaming the Residential HVAC-EE Program Air Conditioning to the Residential Smart $aver® EE Program; (2) elimination of the Residential HVAC-EE Program Tune and Seal by shifting all measures into the Residential Smart $aver® EE Program (except for the HVAC tune up and duct insulation measures, which were discontinued); (3) relocation of the high efficiency heat pump water heater and pool pump measures from the Residential EE Appliances and Devices Program into the Residential Smart $aver® EE Program; (4) elimination of the existing tier structure for HVAC incentives; and (5) removal of incentives for HVAC devices with a SEER of less than 15.

Other program changes include the elimination of CFL measures, incentive changes, the addition of new measures in the Non-Residential Smart $aver® EE Program, and making the MyHER Program available to customers living in multi-family residences.

VII. DSM/EE PROGRAM RESULTS TO DATE

Q. HOW MUCH ENERGY, CAPACITY AND AVOIDED COST SAVINGS DID DEC DELIVER AS A RESULT OF ITS DSM/EE PROGRAMS DURING VINTAGE 2017?

A. During Vintage 2017, DEC's DSM/EE programs delivered over 907 million kilowatt-hours ("kWh") of energy savings and over 1,022 megawatts ("MW") of capacity savings, which produced net present value of avoided

cost savings of over $586 million. The 2017 performance results for individual programs are provided in Evans Exhibits 6 and 8.

Q. DID ANY PROGRAMS SIGNIFICANTLY OUT-PERFORM RELATIVE TO THEIR ORIGINAL ESTIMATES FOR VINTAGE 2017?

A. Yes. During Vintage 2017, DEC's portfolio of programs was able to deliver energy and capacity savings that yielded avoided costs that were 162 percent of the target, and it did so while expending 147 percent of targeted program costs. While the Company's entire portfolio of programs performed well, programs in the portfolio that feature lighting measures continued to contribute the largest portion of the avoided cost impacts. In the residential market, the three highest ranked programs in terms of percentage increases in avoided costs from those forecasted for 2017 were the Energy Efficient Appliances and Devices Program, the Multi-Family EE Program, and the MyHER Program. These impacts were achieved largely due to elevated participation of customers adopting measures at a higher rate than originally forecasted. The avoided cost savings impacts for these three programs, compared to those originally filed for Vintage 2017, exceeded the projections by 128 percent, 45 percent, and 26 percent, respectively. The energy savings impacts for the three programs, compared to those originally filed for Vintage 2017, exceeded the projections by 122 percent, 50 percent, and 48 percent, respectively.

The non-residential program with the largest percentage increase in avoided cost savings impacts from those forecasted for 2017 is the Non-Residential Smart $aver® Prescriptive Program. This program produced 257 percent of expected avoided costs and 174 percent of expected energy savings.

Q. HAVE ANY PROGRAMS SIGNIFICANTLY UNDERPERFORMED RELATIVE TO THEIR ORIGINAL ESTIMATES IN VINTAGE 2017?

A. Yes. In the residential market, the two lowest ranked programs, in terms of percentage variations in avoided costs from those forecasted for 2017, are the Income-Qualified EE and Weatherization Program and the Residential Energy Assessments Program. It is important to note that the Residential Smart $aver® EE program was not included in the 2017 estimates.

During 2017, the Income-Qualified EE and Weatherization Program produced 77 percent of forecasted avoided costs, 93 percent of forecasted energy savings, and 75 percent of forecasted capacity savings. The underperformance of this program is primarily due to less than forecasted program participation.

The Residential Energy Assessments Program produced 83 percent of forecasted avoided costs, 103 percent of forecasted energy savings, and 130 percent of forecasted capacity savings. The primary drivers for the underperformance of DEC's Residential Energy Assessments Program were reductions in realized avoided costs and an increase in program costs.

VIII. PROJECTED RESULTS

Q. PLEASE PROVIDE A PROJECTION OF THE RESULTS THAT DEC EXPECTS TO SEE FROM IMPLEMENTATION OF ITS PORTFOLIO OF PROGRAMS.

A. Consistent with its practices during the save-a-watt pilot, DEC will update the actual and projected EE achievement levels in its annual Rider EE filing to account for any program or measure additions based on the performance of programs, market conditions, economics and consumer demand. The actual results for Vintage 2017 and projection of the results for Vintages 2018 and 2019, as well as the associated projected program expense for DEC's portfolio of programs, are summarized in the following table:

DEC System (NC & SC) DSM/EE Portfolio 2017 Actual Results and 2018-2019 Projected Results			
	2017	2018	2019
Annual System MW	1,022	1,059	1,040
Annual System Net GWh	907	817	781
Annual Program Costs (Millions)	$192	$142	$145

The Vintage 2018 projections are similar to those provided by DEC and reported to the Commission in Sub 1130. The projected impacts and cost for Vintage 2019 are different as a result of updated participation estimates as well as the EM&V results that have been applied to the following programs: PowerShare®; Non-Residential Smart $aver® Energy Efficient Products and Assessment – Custom; MyHER; Power Manager Load

Control; Small Business Energy Saver; Non-Residential Smart $aver® Energy Efficient Products and Assessment – Assessment; EnergyWise for Business; Multi-Family EE; Non-Residential Smart $aver® Energy Efficient Products and Assessment – Prescriptive; Residential Energy Efficient Appliances and Devices – Save Energy and Water Kit; Energy Efficient Appliances and Devices – Free LED; and Smart Energy in Offices.

IX. EM&V ACTIVITIES

Q. CAN YOU PROVIDE INFORMATION ON THE COMPANY'S EM&V ACTIVITIES?

A. Yes. Evans Exhibit 11 provides a summary of the estimated activities and timeframe for completion of EM&V by program. Evans Exhibit 12 provides the actual and expected dates when the EM&V for each program or measure will become effective. Evans Exhibits A through L provide the detailed completed EM&V reports or updates for the following programs:

Evans Exhibit	EM&V Reports	Report Finalization Date	Evaluation Type
A	PowerShare® Program: 2016	1/27/2017	Impact
B	Non-Residential Smart $aver® Energy Efficient Products and Assessment – Custom: 2014-2015	2/13/2017	Impact
C	My Home Energy Report Program (MyHER): 2015-2016	2/16/2017	Process and Impact
D	Power Manager Load Control Service: 2016	4/11/2017	Process and Impact
E	Small Business Energy Saver Program: 2014-2016	6/6/2017	Process and Impact
F	Non-Residential Smart $aver® Energy Efficient Products and Assessment – Assessment: 2014-2016	6/8/2017	Process and Impact
G	EnergyWise for Business: 2016	6/12/2017	Impact
H	Multi-Family EE: 2014-2016	6/27/2017	Process and Impact

I	Non-Residential Smart $aver® Energy Efficient Products and Assessment – Prescriptive: 2013-2015	8/4/2017	Process and Impact
J	Residential Energy Efficient Appliances and Devices – Save Energy and Water Kit: 2016	11/29/2017	Process and Impact
K	Energy Efficient Appliances and Devices – Free LED: 2016-2017	12/8/2017	Process and Impact
L	Smart Energy in Offices: 2014-2016	12/15/2017	Process and Impact

Q. HOW WERE EM&V RESULTS UTILIZED IN DEVELOPING THE PROPOSED RIDER 10?

A. The Company has applied EM&V in accordance with the process as agreed upon by DEC, SACE, and the Public Staff and approved by the Commission in its *Order Approving DSM/EE Rider and Requiring Filing of Proposed Customer Notice* issued on November 8, 2011, in Docket No. E-7, Sub 979 ("EM&V Agreement"). In accordance with the Sub 1032 Order, DEC continues to apply EM&V in accordance with the EM&V Agreement.

Actual participation and evaluated load impacts are used prospectively to update net lost revenues estimated for 2017. In addition, the EM&V Agreement provides that initial EM&V results shall be applied retrospectively to program impacts that were based upon estimated impact assumptions derived from industry standards (rather than EM&V results for the program in the Carolinas), in particular the DSM/EE programs initially approved by the Commission in Docket No. E-7, Sub 831 ("Sub 831") programs, with the exception of the Non-Residential Smart $aver® Custom Rebate Program and the Low-Income EE and Weatherization Assistance Program.

For purposes of the vintage true-ups and forecast, initial EM&V results are considered actual results for a program and continue to apply until superseded by new EM&V results, if any. For all new programs and pilots approved after the Sub 831 programs, DEC will use the initial estimates of impacts until it has EM&V results, which will then be applied retrospectively back to the beginning of the offering and will be considered actual results until a second EM&V is performed.

All program impacts from EM&V apply only to the programs for which the analysis was directly performed, though DEC's new product development may utilize actual impacts and research about EE and conservation behavior directly attributed to existing DEC program offerings.

Since program impacts from EM&V in this Application apply only to the programs for which the analysis was directly performed, there are no costs associated with performing additional EM&V for other measures, other than the original cost for EM&V for these programs. As indicated in previous proceedings, DEC estimates that 5 percent of total portfolio program costs will be required to adequately and efficiently perform EM&V on the portfolio.

The level of EM&V required varies by program and depends on that program's contribution to total portfolio, the duration the program has been in the portfolio without material change, and whether the program and administration is new and different in the energy industry. DEC estimates,

however, that no additional costs above 5 percent of total program costs will be associated with performing EM&V for all measures in the portfolio.

Q. WHICH PROGRAMS CONTAIN IMPACT RESULTS BASED ON CAROLINAS-BASED EM&V?

A. The following programs have Carolinas-based EM&V applied and have been provided as Evans Exhibits A through L: PowerShare® Program 2016 (Evans Exhibit A); Non-Residential Smart $aver® Energy Efficient Products and Assessment – Custom 2014-2015 (Evans Exhibit B); MyHER 2015-2016 (Evans Exhibit C); Power Manager Load Control Service 2016 (Evans Exhibit D); Small Business Energy Saver 2014-2016 (Evans Exhibit E); Non-Residential Smart $aver® Energy Efficient Products and Assessment – Assessment 2014-2016 (Evans Exhibit F); EnergyWise for Business 2016 (Evans Exhibit G); Multi-Family EE 2014-2016 (Evans Exhibit H) (Evans Exhibit H); Non-Residential Smart $aver® Energy Efficient Products and Assessment – Prescriptive 2013-2015 (Evans Exhibit I); Residential Energy Efficient Appliances and Devices – Save Energy and Water Kit: 2016 (Evans Exhibit J); Energy Efficient Appliances and Devices – Free LED 2016-2017 (Evans Exhibit K); and Smart Energy in Offices 2014-2016 (Evans Exhibit L).

X. RIDER IMPACTS

Q. HAVE THE PARTICIPATION RESULTS AFFECTED THE VINTAGE 2017 EXPERIENCE MODIFICATION FACTOR?

A. Yes. The EMF in Rider 10 accounts for changes to actual participation relative to the forecasted participation levels utilized in DEC's Vintage 2016 Rider EE. As DEC receives actual participation information, it is then able to update participation-driven actual avoided cost benefits from its DSM/EE programs and the net lost revenues derived from its EE programs. For example, as previously mentioned, the Residential Energy Assessments Program and Income-Qualified EE and Weatherization Program underperformed relative to their original participation targets. As a result, the EMF will be reduced to reflect the lower costs, net lost revenues, and shared savings incentive (PPI) associated with these programs. On the other hand, higher-than-expected participation in programs, such as the Multi-Family EE, Energy Efficient Appliances and Devices, and MyHER programs, cause the EMF to reflect higher program costs, net lost revenues, and PPI. In addition to the above, the EMF is impacted by the application of EM&V results.

Q. HOW WILL EM&V BE INCORPORATED INTO THE VINTAGE 2016 TRUE-UP COMPONENT OF RIDER 10?

A. All of the final EM&V results that have been received by DEC as of December 31, 2017 have been applied prospectively from the first day of the month immediately following the month in which the study participation sample for the EM&V was completed in accordance with the EM&V Agreement. Accordingly, for any program for which DEC has received EM&V results, the per participant impact applied to the projected program

1 participation in Vintage 2017 is based upon the actual EM&V results that
2 have been received.

3 **Q. PLEASE DESCRIBE HOW DEC CALCULATED FOUND**
4 **REVENUES.**

5 A. Consistent with the Sub 1032 Order and with the "Decision Tree" found in
6 Appendix A of the Commission's February 8, 2011 order in Docket No. E-
7 7, Sub 831, and approved for the new portfolio in the Sub 1032 Order,
8 possible found revenue activities were identified, categorized, and netted
9 against the net lost revenues created by DEC's EE programs. Found
10 revenues may result from activities that directly or indirectly result in an
11 increase in customer demand or energy consumption within DEC's service
12 territory. Load-building activities such as these, however, would not be
13 considered found revenues if they (1) would have occurred regardless of
14 DEC's activity, (2) were a result of a Commission-approved economic
15 development activity not determined to produce found revenues, or (3) were
16 part of an unsolicited request for DEC to engage in an activity that supports
17 efforts to grow the economy. On the other hand, found revenues would
18 occur for load growth that did not fall into the previous categories but was
19 directly or indirectly a result of DEC's activities. Based on the results of
20 this work, all potential found revenue-related activities are identified and
21 categorized in Evans Exhibit 4. Additionally, consistent with the
22 methodology employed and approved in Docket No. E-7, Sub 1073, as
23 discussed in detail in the testimony of Company witness Timothy J. Duff in

Docket No. E-7, Sub 1050, DEC also proposes to adjust calculation of found revenues to account for the impacts of activities outside of its EE programs that it undertakes that reduce customer consumption – i.e., "negative found revenues."

Q. PLEASE DISCUSS THE ADJUSTMENT THAT DEC PROPOSES TO MAKE TO ITS FOUND REVENUE CALCULATION TO ACCOUNT FOR NEGATIVE FOUND REVENUES.

A. DEC continues to aggressively pursue, with its outdoor lighting customers, the replacement of aging Mercury Vapor lights with Light Emitting Diode ("LED") fixtures. By moving customers past the standard High Pressure Sodium ("HPS") fixture to an LED fixture in this replacement process, DEC is generating significant energy savings. These energy savings, since they come outside of DEC's EE programs, are not captured in DEC's calculation of lost revenues. Since one of the activities that DEC includes in the calculation of found revenues is the increase in consumption from new outdoor lighting fixtures added by DEC, it is logical and symmetrical to count the energy consumption reduction realized in outdoor lighting efficiency upgrades. The Company does not take credit for the entire efficiency gain from replacing Mercury Vapor lights, but rather only the efficiency gain from replacing HPS with LED fixtures. In addition, DEC has not recognized any negative found revenues in excess of the found revenues calculated; in other words, the net found revenues number will never be negative and have the effect of increasing net lost revenue

calculations. In Docket No. E-7, Sub 1073, the Commission found inclusion of negative found revenues associated with the Company's initiative to replace Mercury Vapor lighting with LED fixtures in the calculation of net found revenues to be reasonable, and the Company proposes to continue to this practice in Rider 10.

Q. HAS THE OPT-OUT OF NON-RESIDENTIAL CUSTOMERS AFFECTED THE RESULTS FROM THE PORTFOLIO OF APPROVED PROGRAMS?

A. Yes, the opt-out of qualifying non-residential customers has had a negative effect on DEC's overall non-residential impacts. For Vintage 2017, DEC had 4,075 eligible customer accounts opt out of participating in DEC's non-residential portfolio of EE programs. In addition, DEC had 4,863 eligible customer accounts opt out of participating in DEC's non-residential DSM programs. While the total number of opted-out accounts increased from Vintage 2016 to Vintage 2017, it is worth noting that there was a positive increase in the number of accounts that opted into the Vintage 2017 DSM/EE Rider. For comparison, only 78 eligible customer accounts that were opted-out of the Vintage 2015 EE Rider then opted into the Vintage 2016 Rider. The number of eligible customer accounts that were opted-out of the Vintage 2016 EE portion of the Rider and then opted into the Vintage 2017 EE Rider was 199.

Q. PLEASE EXPLAIN THE INCREASE IN THE OPT-OUT IN 2017 COMPARED TO 2016.

A. Because the Company does not take part in the customers' economic benefit analysis or the customers' decision-making process, it is difficult to provide a concrete explanation as to the reason for the increase in opt-outs. As non-residential customers become better equipped at determining the economic benefit of participating in the Company's DSM/EE programs versus the costs associated with opting into the DSM/EE Rider, they are more knowledgeable on the best allocation of their resources. The Company believes this knowledge, coupled with increases to the Rider EE rates, is leading to the increase in eligible customer opt-outs.

Q. IS THE COMPANY CONTINUING ITS EFFORTS TO ATTRACT THE PROGRAM PARTICIPATION OF OPT-OUT ELIGIBLE CUSTOMERS?

A. Yes. Increasing the participation of opt-out eligible customers in DSM and EE programs is very important to the Company. As discussed earlier, DEC continues to evaluate and revise its non-residential portfolio of programs to accommodate new technologies, eliminate product gaps, remove barriers to participation, and make its programs more attractive. It also continues to leverage its Large Account Management Team to make sure customers are informed about product offerings and the March Opt-in Window.

XI. PPI CALCULATION

Q. PLEASE PROVIDE AN OVERVIEW OF THE COST RECOVERY AND INCENTIVE MECHANISM APPROVED IN DOCKET NO. E-7, SUB 1032.

A. Pursuant to the Sub 1032 Order, the Mechanism allows DEC to (1) recover the reasonable and prudent costs incurred for adopting and implementing DSM and EE measures in accordance with N.C. Gen. Stat. § 62-133.9 and Commission Rules R8-68 and R8-69; (2) recover net lost revenues incurred for up to 36 months of a measure's life for EE programs; and (3) earn a PPI based upon the sharing of 11.5% of the net savings achieved through DEC's DSM/EE programs on an annual basis.

Q. PLEASE EXPLAIN HOW DEC DETERMINES THE PPI.

A. First, DEC determines the net savings eligible for incentive by subtracting the present value of the annual lifetime DSM/EE program costs (excluding approved low-income programs as described below) from the net present value of the annual lifetime avoided costs achieved through the Company's programs (again, excluding approved low-income programs). The Company then multiplies the net savings eligible for incentive by the 11.5% shared savings percentage to determine its pretax incentive.

Q. PLEASE EXPLAIN IF DEC EXCLUDES ANY PROGRAMS FROM THE DETERMINATION OF ITS PPI CALCULATION.

A. Consistent with the Sub 1032 Order, DEC has excluded the impacts and costs associated with the Income-Qualified EE and Weatherization Program from its calculation of the PPI. At the time the program was approved, it was not cost-effective, but was approved based on its societal benefit. As such, although DEC is eligible to recover the program costs and 36 months of the net lost revenues associated with the impacts of the program, it does

not earn an incentive, and the negative net savings associated with these types of programs is not factored into the calculation of the annual shared savings PPI.

XII. CONCLUSION

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

A. Yes.

BY MS. JAGANNATHAN:

Q Mr. Evans, do you have a summary of your direct testimony?

A Yes, I do.

(WHEREUPON, the summary of ROBERT P. EVANS is copied into the record.)

SUMMARY OF DIRECT TESTIMONY OF ROBERT P. EVANS

My direct testimony supports DEC's Application for approval of its DSM/EE Cost Recovery Rider for 2019 ("Rider 10"), which encompasses the Company's currently effective cost recovery and incentive mechanism and portfolio of programs approved by the Commission. In particular, my testimony includes an overview of the Commission's Rule R8-69 filing requirements, a synopsis of the DSM/EE programs included in this filing, a discussion of program results and an explanation of how these results have affected the Rider 10 calculations, information on DEC's Evaluation Measurement & Verification, or "EM&V" activities, and an overview of the calculation of the Company's Portfolio Performance Incentive, or "PPI."

DEC's cost recovery mechanism allows it to (1) recover the reasonable and prudent costs incurred for adopting and implementing DSM and EE measures; (2) recover net lost revenues incurred for up to 36 months of a measure's life for EE programs; and (3) earn a PPI based upon the sharing of 11.5% of the net savings achieved through DEC's DSM/EE programs on an annual basis. The Experience Modification Factor, or "EMF," in Rider 10 accounts for changes to actual participation relative to the forecasted participation levels utilized in prior DSM/EE riders and also reflects the application of EM&V results.

In my testimony, I include a comprehensive list of all of the DSM and EE programs included the Company's current portfolio. I also describe several modifications DEC has made to its portfolio of programs during

Vintage 2017 in accordance with its Commission-approved Flexibility Guidelines.

During Vintage 2017, DEC's DSM/EE programs delivered over 907 million kilowatt hours of energy savings and over 1,022 megawatts of capacity savings, which produced net present value of avoided cost savings of over $586 million. While the Company's entire portfolio of programs performed well, programs in the portfolio that feature lighting measures continued to contribute the largest portion of the avoided cost impacts.

EM&V results were updated to reflect the savings impacts for those programs for which DEC received EM&V reports after it prepared its application in last year's DSM/EE proceeding. These reports are included as Exhibits A through L to my testimony. After factoring in these EM&V updates, DEC performed a prospective analysis of each of its programs and the aggregate portfolio for the Vintage 2019 period. The avoided cost rates used in the 2019 portfolio projection were significantly lower than those employed in the Company's last DSM/EE cost recovery proceeding. These reductions in avoided costs lowered the cost-effectiveness scores of all of the Company's DSM/EE programs as well as DEC's portfolio as a whole. Nevertheless, with the exception of the Income-Qualified EE Products and Services Program, the Non-Residential Smart $aver Performance Incentive Program, and the Residential Smart $aver EE Program, the aggregate portfolio continues to project cost-effectiveness.

This concludes the summary of my pre-filed direct testimony.

1 MS. JAGANNATHAN: Mr. Evans is now available
2 for cross examination on his direct testimony.
3 COMMISSIONER BROWN-BLAND: Is there cross
4 examination? I see Mr. Neal moving to the mic.
5 MR. NEAL: Yes. Thank you, Chair
6 Brown-Bland. At this time, if I could just hand up an
7 exhibit?
8 COMMISSIONER BROWN-BLAND: Yes, go ahead.
9 MR. NEAL: Chair Brown-Bland, while I finish
10 handing this out, if I could, it's exhibits -- well,
11 asked that it be marked as NC Justice Center et al
12 Evans Cross Examination Exhibit 1, the Duke Energy
13 Carolinas Data Response 2-12.
14 COMMISSIONER BROWN-BLAND: It will be so
15 marked as NC Justice Center et al Evans Cross
16 Examination Exhibit 1.
17 MR. NEAL: Thank you.
18 (WHEREUPON, NC Justice Center et
19 al Evans Cross Examination Exhibit
20 1 is marked for identification.)
21 CROSS EXAMINATION BY MR. NEAL:
22 Q Good morning, Mr. Evans.
23 A Good morning.
24 Q Again, sorry I think I always look behind -- at

1 the back of someone's head. So I have just a few
2 questions about the Residential Power Manager
3 Program.
4 A Uh-huh (yes).
5 Q Could you just briefly describe that program?
6 A The Residential Power Manager Program is a load
7 control program. When the Company requires
8 resources, the Power Manager Program, in fact, a
9 switch is activated which cycles the air
10 conditioning compressor on and off. They are
11 done overlapping one another so customers do not
12 have power to their air conditioner discontinued
13 for over an hour; maybe they're discontinued for
14 15 minutes at a time. That is the program in a
15 nutshell.
16 Q Great. And you would agree that it's been a
17 successful program?
18 A Very successful, yes.
19 Q Turning your attention to Evans Cross Exhibit 1,
20 you see that we asked DEC why it doesn't make its
21 Residential Power Manager Program available to
22 customers on various tariffs, including time of
23 use, net metering, and small customer generator.
24 A Yes.

Q And are you familiar with this data response?
A I reviewed it as it was supplied.
Q And so putting aside the response as it relates to time of use rates, but just considering response as it relates to net metering and small customer generation customers, you would agree that this response says that those customers in theory have taken or will take actions to reduce their air conditioning load or review it from the grid entirely during on-peak periods?
A That's correct.
Q And just given that qualifier, in theory, and then as you read further down, the word "likely", is it fair to conclude that DEC has not analyzed specifically whether those customers have, in fact, taken their air conditioners off the grid?
A In the absence of demand-based meters there's also registered capacity. I am not aware of any studies or the basis from which those studies could be made. Intuitively, it is a factual statement; however, as to quantifying them based on research and measuring devices I could not for a fact indicate that.
Q Okay.

1 COMMISSIONER GRAY: Mr. Evans, would you
2 pull that microphone up?
3 THE WITNESS: I'm sorry.
4 COMMISSIONER GRAY: No, I'm just a little
5 hard of hearing.
6 THE WITNESS: That makes two of us,
7 Commissioner.
8 BY MR. NEAL:
9 Q So again, DEC hasn't studied the cost
10 effectiveness of allowing Power Manager to be
11 used by a net metering customer or a small
12 customer, generator customer?
13 A Not to my knowledge.
14 Q And so even if some or all of those customers'
15 air conditioning loads was being met by self
16 generation, wouldn't it -- wouldn't participation
17 in the Power Manager Program be an inducement to
18 use less air conditioning during on-peak periods
19 and thus provide benefits to the grid during
20 those on-peak periods?
21 A There's no argument there would be an inducement.
22 However, would the benefits accrue to the same
23 extent that they would be in a non-net metering
24 or small generator environment; would be again

1 comparable to what we say is the stereotypical
2 Power Manager participant.
3 Q Well, put another way, in those moments of peak
4 demand, if a net metering customer, for example,
5 was on Power Manager and that allowed some of
6 that self generation to go onto the grid during a
7 period of peak demand, wouldn't that be at least
8 worth studying whether that provided some
9 additional benefits to the grid during those
10 periods?
11 A A study would -- I can't say would it be
12 warranted, but intuitively I can indicate that
13 there may be some benefits if the net metering
14 customer was supplying energy into the grid at
15 those times of peak.
16 MR. NEAL: I have no further questions.
17 Thank you, Mr. Evans.
18 COMMISSIONER BROWN-BLAND: Ms. Edmondson.
19 MS. EDMONDSON: No questions on direct.
20 COMMISSIONER BROWN-BLAND: Any redirect?
21 MS. JAGANNATHAN: No redirect.
22 COMMISSIONER BROWN-BLAND: Questions from
23 the Commission? Chairman Finley.
24 EXAMINATION BY CHAIRMAN FINLEY:

Q Is the Company working to do some more time of use and dynamic pricing rates?

A We're always looking at dynamic pricing rates possibly with the ability to control or register customer consumption. For example, that's a benefit of AMI which we've all heard about because it's the ability to look at 15-minute intervals or whatever the case might be. We are looking at it. In fact, I looked at a coincident peak pricing rate let's say 10 years ago so I know research has been underway, and I have talked to folks in the rate department and they are looking at that. As to the specifics, Commissioner Finley, I am certainly not aware of them at this time.

Q This is just this Commissioner's opinion, if you're going to ask for recovery of the cost of AMI meters you better be working on some time of use and dynamic pricing rates, sooner rather than later.

A Noted, Chairman Finley.

COMMISSIONER BROWN-BLAND: Questions on the Commission's questions?

(No response)

1 Let's do the housekeeping.
2 MS. JAGANNATHAN: All right. Commissioner
3 Brown-Bland, I would move that Exhibits 1 through 12
4 and A through L to Mr. Evans' prefiled direct
5 testimony be admitted into evidence.
6 COMMISSIONER BROWN-BLAND: There being no
7 objection, that motion will be granted and the
8 prefiled exhibits filed along with Witness Evans'
9 direct testimony will be received into evidence. And
10 I note that there are 12 exhibits marked numerically
11 but they include Exhibits 9A and 9B.
12 MS. JAGANNATHAN: That's correct.
13 COMMISSIONER BROWN-BLAND: And also we'll
14 receive the Exhibits A through L.
15 (WHEREUPON, Evans Exhibit 1
16 through 12, including 9A and 9B,
17 and A through L are admitted into
18 evidence as prefiled.)
19 MS. JAGANNATHAN: And if it's appropriate at
20 this time - I know she was excused - but I would move
21 that Carolyn Miller's direct testimony consisting of
22 23 pages be entered into the record as if given orally
23 from the stand and that the eight exhibits to her
24 direct testimony be admitted as evidence. And I would

also move that the Company's Application filed on March 7th in this docket be admitted as evidence.

COMMISSIONER BROWN-BLAND: Okay. There being no objection, the direct testimony of Carolyn T. Miller which consists of 23 pages filed on March 7th with eight exhibits, the testimony will be received into evidence as if given orally from the witness stand and the exhibits will be received into evidence. Also, the Company's Application will be received into evidence at this time.

(WHEREUPON, Miller Exhibits 1 through 8 are marked for identification as prefiled and received into evidence.)

(WHEREUPON, the prefiled direct testimony of CAROLYN T. MILLER is copied into the record as if given orally from the stand.)

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-69	))))))	**DIRECT TESTIMONY OF CAROLYN T. MILLER FOR DUKE ENERGY CAROLINAS, LLC**

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Carolyn T. Miller, and my business address is 550 South Tryon Street, Charlotte, North Carolina, 28202.

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

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

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I graduated from the College of New Jersey in Trenton, New Jersey with a Bachelor of Science in Accountancy. I am a certified public accountant licensed in the State of North Carolina. I began my career in 1994 with Ernst & Young as a staff auditor. In 1997, I began working with Duke Energy as a Senior Business Analyst and have held a variety of positions in the Finance organization. I joined the Rates Department in 2014 as Manager, Rates and Regulatory Strategy.

Q. WHAT ARE YOUR PRESENT RESPONSIBILITIES FOR DEC?

A. I am responsible for providing regulatory support and guidance on DEC's demand-side management ("DSM") and energy efficiency ("EE") cost recovery process.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I have provided testimony in support of DEC's previous applications for approval of its DSM/EE cost recovery riders as well as DEP's applications for approval of its DSM/EE cost recovery riders.

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

A. The purpose of my testimony is to explain and support DEC's proposed DSM/EE cost recovery rider (Rider 10), including prospective and Experience Modification Factor ("EMF") components, and provide information required by Commission Rule R8-69.

Q. PLEASE DESCRIBE THE EXHIBITS ATTACHED TO YOUR TESTIMONY.

A. Miller Exhibit 1 summarizes the individual rider components for which DEC requests approval in this filing. Miller Exhibit 2 shows the calculation of revenue requirements for each vintage, with separate calculations for non-residential DSM and EE programs within each vintage. Miller Exhibit 3 presents the return calculations for Vintages 2014, 2015, 2016 and 2017. Miller Exhibit 4 shows the actual and estimated prospective amounts collected from customers via Riders 5-9 pertaining to Vintages 2014 through 2018. Miller Exhibit 5 provides the calculation of the allocation factors used to allocate system DSM and EE costs to DEC's North Carolina retail jurisdiction. Miller Exhibit 6 presents the forecasted sales for the rate period (2019), and the estimated sales related to customers that have opted out of various vintages. These amounts are used to determine the forecasted sales to

which the Rider 10 amounts will apply. Miller Exhibit 7 shows the revised forecasted revenue to be collected as part of Rider 9 in accordance with the Commission's *Order Approving DSM/EE Rider, Revising DSM/EE Mechanism, and Requiring Filing of Proposed Customer Notice* issued on August 23, 2017 in Docket No. E-7, Sub 1130 ("Sub 1130 Order"). Consistent with this Order, this revision will be incorporated into Rider 10. Miller Exhibit 8 is the proposed tariff sheet for Rider 10.

Q. WERE MILLER EXHIBITS 1-8 PREPARED BY YOU OR AT YOUR DIRECTION AND SUPERVISION?

A. Yes.

II. GENERAL STRUCTURE OF RIDERS

Q. PLEASE DESCRIBE THE STRUCTURE OF RIDER 10.

A. Rider 10 was calculated in accordance with the Company's cost recovery mechanism described in the Agreement and Stipulation of Settlement DEC reached with the Public Staff, the North Carolina Sustainable Energy Association, Environmental Defense Fund, Southern Alliance for Clean Energy ("SACE"), the South Carolina Coastal Conservation League, Natural Resources Defense Council, and the Sierra Club, which was filed with the Commission on August 19, 2013 (the "Stipulation"), and approved in the Commission's *Order Approving DSM/EE Programs and Stipulation of Settlement* issued on October 29, 2013 ("Sub 1032 Order").

The approved cost recovery mechanism is designed to allow DEC to

1 collect revenue equal to its incurred program costs[1] for a rate period plus a
2 Portfolio Performance Incentive ("PPI") based on shared savings achieved by
3 DEC's DSM/EE programs, and to recover net lost revenues for EE programs
4 only.

5 The Company is allowed to recover net lost revenues associated with a
6 particular vintage of an EE measure for the lesser of 36 months or the life of
7 the measure, and provided that the recovery of net lost revenues shall cease
8 upon the implementation of new rates in a general rate case to the extent that
9 the new rates are set to recover net lost revenues.

10 The Company's cost recovery mechanism employs a vintage year
11 concept based on the calendar year.[2] In each of its annual rider filings, DEC
12 performs an annual true-up process for the prior calendar year vintages. The
13 true-up will reflect actual participation and verified Evaluation, Measurement
14 and Verification ("EM&V") results for completed vintages, applied in the
15 same manner as agreed upon by DEC, SACE, and the Public Staff, and
16 approved by the Commission in its *Order Approving DSM/EE Rider and*
17 *Requiring Filing of Proposed Customer Notice* issued on November 8, 2011,
18 in Docket No. E-7, Sub 979 ("EM&V Agreement").

19 The Company has implemented deferral accounting for over- and
20 under-recoveries of costs that are eligible for recovery through the annual
21 DSM/EE rider. Under the Stipulation, the balance in the deferral account(s),

[1] Program costs are defined under Rule R8-68(b)(1) as all reasonable and prudent expenses expected to be incurred by the electric public utility, during a rate period, for the purpose of adopting and implementing new DSM and EE measures previously approved pursuant to Rule R8-68.

[2] Each vintage is referred to by the calendar year of its respective rate period (*e.g.*, Vintage 2019).

1 net of deferred income taxes, may accrue a return at the net-of-tax rate of
2 return rate approved in DEC's then most recent general rate case. The
3 methodology used for the calculation of interest shall be the same as that
4 typically utilized for DEC's Existing DSM Program rider proceedings.
5 Pursuant to Commission Rule R8-69(c)(3), DEC will not accrue a return on
6 net lost revenues or the PPI. Miller Exhibit 3, pages 1 through 16, shows the
7 calculation performed as part of the true-up of Vintage 2014, Vintage 2015,
8 Vintage 2016 and Vintage 2017.

9 The Company expects that most EM&V will be available in the time
10 frame needed to true-up each vintage in the following calendar year. If any
11 EM&V results for a vintage are not available in time for inclusion in DEC's
12 annual rider filing, however, then the Company will make an appropriate
13 adjustment in the next annual filing.

14 DEC calculates one integrated (prospective) DSM/EE rider and one
15 integrated DSM/EE EMF rider for the residential class, to be effective each
16 rate period. The integrated residential DSM/EE EMF rider includes all true-
17 ups for each applicable vintage year. Given that qualifying non-residential
18 customers can opt out of DSM and/or EE programs, DEC calculates separate
19 DSM and EE billing factors for the non-residential class. Additionally, the
20 non-residential DSM and EE EMF billing factors are determined separately
21 for each applicable vintage year, so that the factors can be appropriately
22 charged to non-residential customers based on their opt-in/out status and
23 participation for each vintage year.

Finally, the following revisions to the cost recovery mechanism were approved effective January 1, 2018 per the Sub 1130 Order:

1. For the purposes of calculating PPI for Vintage Years 2019 and afterwards, the program-specific per kW avoided capacity benefits and per kWh avoided energy benefits used for the initial estimate of the PPI and any PPI true-up will be derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing. However, for the calculation of the underlying avoided energy credits to be used to derive the program-specific avoided energy benefits, the calculation will be based on the projected EE portfolio hourly shape, rather than the assumed 24x7 MW reduction typically used to represent a qualifying facility.

2. For purposes of calculating prospective cost-effectiveness in each DSM/EE rider proceeding to be used to determine whether a program should remain in the portfolio, the Company shall assess each program by:

a. Using projected avoided capacity and energy benefits specifically calculated for each program, as derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for

Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing. However, for the calculation of the underlying avoided energy credits to be used to derive the program-specific avoided energy benefits, the calculation will be based on the projected EE portfolio hourly shape, rather than the assumed 24x7 100 MW reduction typically used to represent a qualifying facility; and

b. Evaluating each cost-effectiveness test using a projection of participation, savings, costs and benefits for the upcoming vintage year.

c. For any program that initially demonstrates a Total Resource Cost ("TRC") calculated as described above of less than 1.00, the Company shall include a discussion in its annual DSM/EE rider proceeding of the actions being taken to maintain or improve cost-effectiveness, or alternatively, its plan to terminate the program.

d. For programs that demonstrate a prospective TRC calculated as described above, of less than 1.00 in a second DSM/EE rider proceeding, the Company shall include a discussion of what action it has taken to improve cost-effectiveness.

e. For programs that demonstrate a prospective TRC of less than 1.00 in a third DSM/EE rider proceeding, the Company shall terminate the program effective at the end of the year following the DSM/EE rider order, unless otherwise ordered by the Commission.

Q. WHAT ARE THE COMPONENTS OF RIDER 10?

A. The prospective components of Rider 10 include: (1) a prospective Vintage 2019 component designed to collect program costs and the PPI for DEC's 2019 vintage of DSM programs; (2) a prospective Vintage 2019 component to collect program costs, PPI, and the first year of net lost revenues for DEC's 2019 vintage of EE programs; (3) a prospective Vintage 2018 component designed to collect the second year of estimated net lost revenues for DEC's 2018 vintage of EE programs; and (4) a prospective Vintage 2017 component designed to collect the third year of estimated net lost revenues for DEC's 2017 vintage of EE programs. The EMF components of Rider 10 include: (1) a true-up of Vintage 2014 PPI and participation for DSM/EE programs based on additional EM&V results received; (2) a true-up of Vintage 2015 PPI and participation for DSM/EE programs based on additional EM&V results received; (3) a true-up of Vintage 2016 PPI and participation for DSM/EE programs based on additional EM&V results received; (4) a true-up of Vintage 2017 program costs, PPI and participation for DSM/EE programs.

Q. HOW DOES DEC CALCULATE THE PROPOSED BILLING FACTORS?

A. The billing factor for residential customers is computed by dividing the combined revenue requirements for DSM and EE programs by the forecasted sales for the rate period. For non-residential rates, the billing factors are computed by dividing the revenue requirements for DSM and EE programs separately by forecasted sales for the rate period. The forecasted sales exclude the estimated sales to customers who have elected to opt out of Rider

EE. Because non-residential customers are allowed to opt out of DSM and/or EE programs separately in an annual election, non-residential billing factors are computed separately for each vintage.

III. COST ALLOCATION METHODOLOGY

Q. HOW DOES DEC ALLOCATE REVENUE REQUIREMENTS TO THE NORTH CAROLINA RETAIL JURISDICTION AND TO THE RESIDENTIAL AND NON-RESIDENTIAL RATE CLASSES?

A. The Company allocates the revenue requirements related to program costs and incentives for EE programs targeted at retail residential customers across North Carolina and South Carolina to its North Carolina retail jurisdiction based on the ratio of North Carolina retail kWh sales (grossed up for line losses) to total retail kWh sales (grossed up for line losses), and then recovers them only from North Carolina residential customers. The revenue requirements related to EE programs targeted at retail non-residential customers across North Carolina and South Carolina are allocated to the North Carolina retail jurisdiction based on the ratio of North Carolina retail kWh sales (grossed up for line losses) to total retail kWh sales (grossed up for line losses), and then recovered from only North Carolina retail non-residential customers. The portion of revenue requirements related to net lost revenues for EE programs is not allocated to the North Carolina retail jurisdiction, but rather is specifically computed based on the kW and kWh savings of North Carolina retail customers.

For DSM programs, because residential and non-residential programs are similar in nature, the aggregated revenue requirement for all retail DSM programs targeted at both residential and non-residential customers across North Carolina and South Carolina are allocated to the North Carolina retail jurisdiction based on North Carolina's contribution to total retail peak demand. Both residential and non-residential customer classes are allocated a share of total system DSM revenue requirements based on each group's contribution to total retail peak demand.

The allocation factors used in DSM/EE EMF true-up calculations for each vintage are based on DEC's most recently filed Cost of Service studies at the time that the Rider EE filing incorporating the initial true-up for each vintage is made. If there are subsequent true-ups for a vintage, DEC will use the same allocation factors as those used in the original DSM/EE EMF true-up calculations.

IV. UTILITY INCENTIVES AND NET LOST REVENUES

Q. HOW DOES DEC CALCULATE THE PPI?

A. Pursuant to the Stipulation, DEC calculates the dollar amount of PPI by multiplying the shared savings achieved by the system portfolio of DSM/EE programs by 11.5%. Company witness Evans further describes the specifics of the PPI calculation in his testimony. In addition, Evans Exhibit 1, pages 1 through 4, show the revised PPI for Vintage 2014, Vintage 2015, Vintage 2016 and Vintage 2017, respectively, based on updated EM&V results, and Evans Exhibit 1, page 5, shows the estimated PPI by program type and

customer class for Vintage 2019. The system amount of PPI is then allocated to North Carolina retail customer classes in order to derive customer rates.

Q. HOW DOES DEC CALCULATE THE NET LOST REVENUES FOR THE PROSPECTIVE COMPONENTS OF RIDER EE?

A. For the prospective components of Rider EE, net lost revenues are estimated by multiplying the portion of DEC's tariff rates that represent the recovery of fixed costs by the estimated North Carolina retail kW and kWh reductions applicable to EE programs by rate schedule, and reducing this amount by estimated found revenues. The Company calculates the portion of North Carolina retail tariff rates (including certain riders) representing the recovery of fixed costs by deducting the recovery of fuel and variable operation and maintenance ("O&M") costs from its tariff rates. The lost revenues totals for residential and non-residential customers are then reduced by North Carolina retail found revenues computed using the weighted average lost revenue rates for each customer class. The testimony and exhibits of Company witness Evans provide information on the actual and estimated found revenues which offset lost revenues.

Lost revenues associated with vintages through the test period of the Company's current general rate case proceeding in Docket No. E-7, Sub 1146, have been removed from the prospective period as of May 1, 2018, assuming new base rates recover the net lost revenues associated with those kWh sales reductions. All amounts will be trued up during the next EMF period pending resolution of the DEC rate case in Docket No. E-7, Sub 1146.

Q. HOW DOES DEC CALCULATE THE NET LOST REVENUES FOR THE EMF COMPONENTS OF RIDER EE?

A. For the EMF components of Rider EE, DEC calculates the net lost revenues by multiplying the portion of its tariff rates that represent the recovery of fixed costs by the actual and verified North Carolina retail kW and kWh reductions applicable to EE programs by rate schedule, then reducing this amount by actual found revenues.

V. OPT-OUT PROVISIONS

Q. PLEASE EXPLAIN THE OPT-OUT PROCESS FOR NON-RESIDENTIAL CUSTOMERS.

A. Pursuant to the Commission's *Order Granting Waiver, in Part, and Denying Waiver, in Part* ("Waiver Order") issued April 6, 2010, in Docket No. E-7, Sub 938 and the Sub 1032 Order, the Company is allowed to permit qualifying non-residential customers[3] to opt out of the DSM and/or EE portion of Rider EE during annual election periods. If a customer opts into a DSM program (or never opted out), the customer is required to participate for three years in the approved DSM programs and rider. If a customer chooses to participate in an EE program (or never opted out), that customer is required to pay the EE-related program costs, shared savings incentive and the net lost revenues for the corresponding vintage of the programs in which it participated. Customers that opt out of DEC's DSM and/or EE programs remain opted-out unless they choose to opt back in during any of the

[3] Individual commercial customer accounts with annual energy usage of not less than 1,000,000 kWh and any industrial customer account.

succeeding annual election periods, which occur from November 1 to December 31 each year, or any of the succeeding annual opt-in periods in March as described below. If a customer participates in any vintage of programs, the customer is subject to all true-up provisions of the approved Rider EE for any vintage in which the customer participates.

DEC provides an additional opportunity for qualifying customers to opt in to DEC's DSM and/or EE programs during the first five business days of March. Customers who choose to begin participating in DEC's EE and DSM programs during the special "opt-in period" during March of each year will be retroactively billed the applicable Rider EE amounts back to January 1 of the vintage year, such that they will pay the appropriate Rider EE amounts for the full rate period.

Q. DOES DEC ADJUST THE RATE FOR NON-RESIDENTIAL CUSTOMERS TO ACCOUNT FOR THE IMPACT OF "OPT-OUT" CUSTOMERS?

A. Yes. The impact of opt-out results is considered in the development of the Rider EE billing rates for non-residential customers. Since the revenue requirements will not be recovered from non-residential customers that opt out of DEC's programs, the forecasted sales used to compute the rate per kWh for non-residential rates exclude sales to customers that have opted out of the vintage to which the rate applies. This adjustment is shown on Miller Exhibit 6.

VI. PROSPECTIVE COMPONENTS

Q. WHAT IS THE RATE PERIOD FOR THE PROSPECTIVE COMPONENTS OF RIDER 10?

A. In accordance with the Commission's *Order on Motions for Reconsideration* issued on June 3, 2010, in Docket No. E-7, Sub 938 ("Second Waiver Order") and the Sub 1032 Order, DEC has calculated the prospective components of Rider 10 using the rate period January 1, 2019 through December 31, 2019.

Q. PLEASE EXPLAIN WHY THERE IS NO PROSPECTIVE COMPONENT FOR REVENUE REQUIREMENTS RELATING TO VINTAGE 2016.

A. Net lost revenues associated with eligible kWh sales reductions shall cease being eligible for use in calculating net lost revenues as of the effective date of the implementation of new rates approved by the Commission in a general rate case or comparable proceeding. The test year for the Company's pending rate case in Docket No. E-7, Sub 1146 is the calendar year January 1, 2016 through December 31, 2016. At this time, the Company is projecting that new rates will go into effect May 1, 2018. Therefore, lost revenues associated with Vintage Year 2016 and prior would not earn lost revenues after May 1, 2018. Vintage Year 2016 would normally have one last ½ year of lost revenues to collect in calendar year 2019; however, these lost revenues have not been included based on the assumption new rates will go into effect May 1, 2018. Any differences between the Company's actual experience and projected experience will be trued up in an upcoming EMF period.

Q. PLEASE DESCRIBE THE BASIS FOR THE RATE PERIOD REVENUE REQUIREMENTS RELATING TO VINTAGE 2017.

A. The Company determines the estimated revenue requirements for Vintage 2017 separately for residential and non-residential customer classes and bases them on the third year of net lost revenues for its Vintage 2017 EE programs. The amount of lost revenue earned is based on estimated North Carolina retail kW and kWh reductions and DEC's rates approved in its most recent general rate case, which became effective September 25, 2013, adjusted as described above to recover only the fixed cost component. These rates will be trued up during the EMF period to reflect the rates approved in Docket No. E-7, Sub 1146.

Q. PLEASE DESCRIBE THE BASIS FOR THE RATE PERIOD REVENUE REQUIREMENTS RELATING TO VINTAGE 2018.

A. The Company determines the estimated revenue requirements for Vintage 2018 separately for residential and non-residential customer classes and bases them on the second year of net lost revenues for its Vintage 2018 EE programs. The amounts are based on estimated North Carolina retail kW and kWh reductions and DEC's rates approved in its most recent general rate case, which became effective September 25, 2013, adjusted as described above to only recover the fixed cost component. These rates will be trued up during the EMF period to reflect the rates approved in Docket No. E-7, Sub 1146.

Q. PLEASE DESCRIBE THE BASIS FOR THE RATE PERIOD REVENUE REQUIREMENTS RELATING TO VINTAGE 2019.

A. The estimated revenue requirements for Vintage 2019 EE programs include program costs, PPI, and the first year of net lost revenues determined separately for residential and non-residential customer classes. The estimated revenue requirements for Vintage 2019 DSM programs include program costs and PPI. The program costs and shared savings incentive are computed at the system level and allocated to North Carolina based on the allocation methodologies discussed earlier in my testimony. The net lost revenues for EE programs are based on estimated North Carolina retail kW and kWh reductions and the rates approved in DEC's most recent general rate case, which became effective September 25, 2013. These rates will be trued up during the EMF period to reflect the rates approved in Docket No. E-7, Sub 1146.

VII. EMF

Q. WHAT IS THE TEST PERIOD FOR THE EMF COMPONENT?

A. Pursuant to the Second Waiver Order and Sub 1032 Order, the test period for the EMF component is defined as the most recently completed vintage year at the time of DEC's Rider EE cost recovery application filing date, which in this case is Vintage 2017 (January 1, 2017 through December 31, 2017). In addition, the Second Waiver Order allows the EMF component to cover multiple test periods, so the EMF component for 2019 includes Vintage 2014 (January 2014 through December 2014), Vintage 2015 (January 2015 through December 2015), and Vintage 2016 (January 2016 through December 2016) as well.

1 **Q. WHAT IS BEING TRUED UP FOR VINTAGE 2017?**

2 A. The chart below demonstrates which components of the Vintage 2017
3 estimate filed in 2016 are being trued up in the Vintage 2017 EMF component
4 of Rider 10. Miller Exhibit 2, page 4 contains the calculation of the true-up
5 for Vintage 2017. The second year of net lost revenues for Vintage 2017,
6 which are a component of Rider 9 billings during 2018, will be trued-up to
7 actual amounts during the next rider filing.

	Vintage 2017 Estimate (2017) As Filed (Filed 2016)	**Vintage 2017 True-Up (2017) (Filed March 2018)**
	Rider 8	**Rider 10 EMF**
Participation	Estimated participation assuming January 1, 2017 sign-up date	Update for actual participation for January – December 2017
EM&V	Initial assumptions of load impacts	Updated according to Commission-approved EM&V Agreement
Lost Revenues	Estimated 2017 participation using half-year convention	Update for actual participation for January – December 2017 and actual 2017 lost revenue rates
Found Revenues	Estimated according to Commission-approved guidelines	Update for actual according to Commission-approved guidelines
New Programs	Only includes programs approved prior to estimated filing	Update for any new programs and pilots approved and implemented since estimated filing

8 In addition, DEC has implemented deferral accounting for the
9 under/over collection of program costs and calculated a return at the net-of-tax
10 rate of return rate approved in DEC's most recent general rate case. The
11 methodology used for the calculation of return is the same as that typically
12 utilized for DEC's Existing DSM Program rider proceedings. Pursuant to

1 Commission Rule R8-69(c)(3), DEC is not accruing a return on net lost
2 revenues or the PPI. Please see Miller Exhibit 3, pages 1 through 16 for the
3 calculation performed as part of the true-up of Vintage 2014, Vintage 2015
4 Vintage 2016 and Vintage 2017.

5 **Q. HOW WERE THE LOAD IMPACTS UPDATED?**

6 A. For DSM programs, the contracted amounts of kW reduction capability from
7 participants are considered to be components of actual participation. As a
8 result, the Vintage 2017 true-up reflects the actual quantity of demand
9 reduction capability for the Vintage 2017 period. The load impacts for EE
10 programs were updated in accordance with the Commission-approved EM&V
11 Agreement.

12 **Q. HOW WERE ACTUAL NET LOST REVENUES COMPUTED FOR**
13 **THE VINTAGE 2017 TRUE-UP?**

14 A. Net lost revenues for year one (2017) of Vintage 2017 were calculated using
15 actual kW and kWh savings by North Carolina retail participants by customer
16 class based on actual participation and load impacts reflecting EM&V results
17 applied according to the EM&V Agreement. The actual kW and kWh savings
18 were as experienced during the period January 1, 2017 through December 31,
19 2017. The rates applied to the kW and kWh savings are the retail rates that
20 were in effect for the period January 1, 2017 through December 31, 2017,
21 reduced by fuel and other variable costs. The lost revenues were then offset
22 by actual found revenues for year one of Vintage 2017 as explained by

Company witness Evans. The calculation of net lost revenues was performed by rate schedule within the residential and non-residential customer classes.

Q. WHAT IS BEING TRUED UP FOR VINTAGE 2016?

A. Avoided costs for Vintage 2016 DSM programs are being trued up to update EM&V participation results. Avoided costs for Vintage 2016 EE programs are also being trued up based on updated EM&V results and projected impacts of Docket No. E-7, Sub 1146. Net lost revenues for all years were trued up for updated EM&V participation results. The actual kW and kWh savings were as experienced during the period January 1, 2016 through December 31, 2016. The rates applied to the kW and kWh savings are the retail rates that were in effect during each period the lost revenues were earned, reduced by fuel and other variable costs.

Q. WHAT IS BEING TRUED UP FOR VINTAGE 2015?

A. Avoided costs for Vintage 2015 EE programs are being trued up based on updated EM&V results. Net lost revenues for all years were trued up for updated EM&V results and projected impacts of Docket No. E-7, Sub 1146. The actual kW and kWh savings were as experienced during the period January 1, 2015 through December 31, 2015. The rates applied to the kW and kWh savings are the retail rates that were in effect during each period the lost revenues were earned, reduced by fuel and other variable costs.

Q. WHAT IS BEING TRUED UP FOR VINTAGE 2014?

A. Avoided costs for Vintage 2014 EE programs are being trued up based on updated EM&V results. Net lost revenues for all years were trued up for

updated EM&V results. The actual kW and kWh savings were as experienced during the period January 1, 2014 through December 31, 2014. The rates applied to the kW and kWh savings are the retail rates that were in effect during each period the lost revenues were earned, reduced by fuel and other variable costs.

VIII. PROPOSED RATES

Q. WHAT ARE DEC'S PROPOSED INITIAL BILLING FACTORS APPLICABLE TO NORTH CAROLINA ELECTRIC CUSTOMERS FOR THE PROSPECTIVE COMPONENTS OF RIDER 10?

A. The Company's proposed initial billing factor for the Rider 10 prospective components is 0.4229 cents per kWh for DEC's North Carolina retail residential customers. For non-residential customers, the amounts differ depending upon customer elections of participation. The following chart depicts the options and rider amounts:

Non-Residential Billing Factors for Rider 10 Prospective Components	¢/kWh
Vintage 2017 EE participant	0.0831
Vintage 2018 EE participant	0.0723
Vintage 2018 DSM participant	0.0031
Vintage 2019 EE participant	0.3283
Vintage 2019 DSM participant	0.0910

Q. WHAT ARE DEC'S PROPOSED EMF BILLING FACTORS APPLICABLE TO NORTH CAROLINA ELECTRIC CUSTOMERS FOR THE TRUE-UP COMPONENTS OF RIDER 10?

A. The Company's proposed EMF billing factor for the true-up components of Rider 10 is 0.1091 cents per kWh for DEC's North Carolina retail residential customers. For non-residential customers, the amounts differ depending upon customer elections of participation. The following chart depicts the options and rider amounts:

Non-Residential Billing Factors for Rider 10 EMF Components	¢/kWh
Vintage 2017 EE Participant	0.3032
Vintage 2017 DSM Participant	0.0005
Vintage 2016 EE participant	(0.0131)
Vintage 2016 DSM participant	(0.0015)
Vintage 2015 EE participant	0.0025
Vintage 2015 DSM participant	(0.0025)
Vintage 2014 EE participant	(0.0063)
Vintage 2014 DSM participant	(0.0002)

IX. CONCLUSION

Q. PLEASE SUMMARIZE THE SPECIFIC RATE MAKING APPROVAL REQUESTED BY DEC.

A. DEC seeks approval of the Rider 10 billing factors to be effective for 2019. As discussed above, Rider 10 contains (1) a prospective component, which includes the third year of net lost revenues for Vintage 2017, the second year of net lost revenues for Vintage 2018, and the revenue requirements for Vintage 2019; and (2) an EMF component which represents a true-up of

Vintage 2014, Vintage 2015, Vintage 2016, and Vintage 2017. Consistent with the Stipulation, for DEC's North Carolina residential customers, the Company calculated one integrated prospective billing factor and one integrated EMF billing factor for Rider 10. Also in accordance with the Stipulation, the non-residential DSM and EE billing factors have been determined separately for each vintage year and will be charged to non-residential customers based on their opt-in/out status and participation for each vintage year.

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

A. Yes.

1 (WHEREUPON, Duke Energy Carolinas,
2 LLC, Application is admitted into
3 evidence.)
4 MS. JAGANNATHAN: Thank you, Commissioner
5 Brown-Bland. And I think that concludes the Company's
6 direct case.
7 COMMISSIONER BROWN-BLAND: Thank you.
8 MR. NEAL: And at this time, if it's
9 appropriate, Chair Brown-Bland, I would also move to
10 admit the testimony of Chris Neme consisting of 45
11 pages and two exhibits, and ask that it be admitted
12 into evidence as if given orally from the stand.
13 COMMISSIONER BROWN-BLAND: Is there any
14 objection?
15 (No response)
16 There being no objection, the direct
17 testimony of Witness Christopher Neme will be received
18 into evidence at this time. And do we have exhibits?
19 MR. NEAL: Yes, Chair Brown-Bland, two
20 exhibits.
21 COMMISSIONER BROWN-BLAND: Two exhibits is
22 what I have. All right. And the two exhibits will be
23 received at this time as well.
24 (WHEREUPON, Neme Exhibits CN-1 and

CN-2 are marked for identification as prefiled and received into evidence.)

(WHEREUPON, the prefiled direct testimony of CHRISTOPHER NEME is copied into the record as if given orally from the stand.)

I. Introduction and Qualifications

Q: PLEASE STATE YOUR NAME, EMPLOYER, AND BUSINESS ADDRESS.

A: My name is Chris Neme. I am a co-founder and Principal of Energy Futures Group, a consulting firm that provides specialized expertise on energy efficiency and renewable-energy markets, programs, and policies. My business address is P.O. Box 587, Hinesburg, VT 05461.

Q: PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A: I received a Master of Public Policy degree from the University of Michigan (Ann Arbor) in 1986. That is a two-year, multi-disciplinary degree focused on applied economics, statistics, and policy development. I also received a Bachelor's degree in Political Science from the University of Michigan (Ann Arbor) in 1985. My first year of graduate school counted towards both my Master's and Bachelor's degrees.

Q: PLEASE SUMMARIZE YOUR BUSINESS AND PROFESSIONAL EXPERIENCE.

A: As a Principal of Energy Futures Group, I play lead roles in a variety of energy-efficiency consulting projects. Recent examples include:

- Representing the Natural Resources Defense Council (NRDC) in Illinois, Michigan, and Ohio consultations with utilities (including Duke Energy Ohio) and other parties on efficiency-program and portfolio design, cost-effectiveness screening, evaluation, shareholder incentive structures, and other related topics;

- Helping the National Association of Regulatory Utility Commissioners and the Michigan Public Service Commission staff assess the relative merits of alternative approaches to defining savings goals for utility efficiency programs (focusing on lifetime rather than just first-year savings);
- Serving as an appointed expert representative on the Ontario Energy Board's Evaluation and Audit Committee for natural gas demand-side management, as well as on related committees to provide expertise on the conduct of gas and electric efficiency-potential studies;
- Serving on the Management Committee and leading strategic planning and program design for a team of firms, led by Applied Energy Group, that was hired by the New Jersey Board of Public Utilities to deliver the electric and gas utility-funded New Jersey Clean Energy Programs;
- Serving on a five-person national drafting committee for development of a new National Standard Practice Manual for cost-effectiveness screening of energy-efficiency measures, programs, and portfolios, which was published in May 2017;
- Providing technical support to the Arkansas energy-efficiency collaborative (commonly known as the "Parties Working Collaboratively") in assessing (at the Arkansas Commission's direction) how well the State's current practices in assessing cost-effectiveness aligns with national best practices; and
- Drafting policy reports for the Regulatory Assistance Project on a variety of energy-efficiency and related regulatory policy issues, such as whether 30 percent electric savings is achievable in 10 years, the history of efforts across

the United States to use geographically targeted efficiency programs to cost-effectively defer transmission and distribution system investments, and the history of bidding of efficiency resources into the PJM and New England capacity markets.

Prior to co-founding Energy Futures Group in 2010, I worked for 17 years for the Vermont Energy Investment Corporation ("VEIC"), the last 10 as Director of its Consulting Division managing a group of 30 professionals with offices in three states. Most of our consulting work involved critically reviewing, developing, and/or supporting the implementation of electric, gas, and multi-fuel energy-efficiency programs for clients across North America and beyond. During my more than 25 years in the in the energy-efficiency industry, I have worked in numerous jurisdictions to develop or review energy-efficiency potential studies; develop or review Technical Reference Manuals ("TRM") of deemed savings assumptions; support utility-stakeholder collaboratives; negotiate or support development of efficiency-program performance incentive mechanisms; review or develop efficiency programs; and/or review or develop energy-efficiency evaluation frameworks and related studies. All told, I have worked on these and/or other policy and program issues for clients in more than 30 states, half a dozen Canadian provinces, and several European countries. I have also led courses on efficiency program design, published widely on a range of efficiency topics, and served on numerous national and regional efficiency committees, working groups, and forums. A copy of my curriculum vitae is attached as Exhibit CN-1.

Q: HAVE YOU PREVIOUSLY FILED EXPERT WITNESS TESTIMONY IN OTHER PROCEEDINGS BEFORE THE NORTH CAROLINA COMMISSION?

A: No. I have not.

Q: HAVE YOU BEEN AN EXPERT WITNESS ON ENERGY-EFFICIENCY MATTERS BEFORE OTHER REGULATORY COMMISSIONS?

A: Yes, I have filed expert witness testimony on approximately 50 occasions before similar regulatory bodies in 10 other states and provinces, including most recently in Michigan, Ohio, Illinois, and Ontario.

Q: ARE YOU SPONSORING ANY EXHIBITS?

A: Yes.

- CN-1 Christopher Neme CV
- CN-2 Advanced Energy, Duke Energy, Lockheed Martin, and North Carolina Community Action Association, *Evaluation of Duke Energy's Helping Home Fund*, p. 2 (October 2017) (hereinafter "Helping Home Fund Evaluation")

II. Testimony Overview

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A: My testimony addresses the reasonableness of both Duke Energy Carolinas' (DEC's) energy-efficiency savings estimates and the composition of its energy-efficiency program portfolio.

Q: WHAT MATERIAL HAVE YOU REVIEWED TO INFORM YOUR TESTIMONY ON THESE ISSUES?

A: I have reviewed DEC's application, as well as its related responses to discovery questions. Generally speaking, my review is a high-level one, focusing on bigger-picture issues. I have selectively investigated details of the Company's programs when my review raised questions that merited a more thorough review.

Q: WHAT ARE YOUR SUMMARY FINDINGS WITH REGARD TO DEC'S ENERGY-EFFICIENCY SAVINGS ESTIMATES?

A: The evaluation measurement and verification ("EM&V") framework under which DEC has developed and annually adjusted estimates of its program savings is well-conceived. While I have not reviewed every detail of each of the program-evaluation studies filed by DEC in this proceeding, my high-level review suggests that they have been conducted professionally.

That said, I have a few potential concerns:

- **No published Technical Reference Manual ("TRM").** Most jurisdictions have a TRM to document publicly all current assumptions regarding efficiency-measure energysavings, peak-demand savings, savings life, and incremental costs – as well as references for the sources of those assumptions. When evaluation studies suggest that an assumption needs to be updated, the TRM is also updated. The absence of such a single reference document makes it more difficult to review the reasonableness of DEC's savings and net benefits claims properly.
- **Potential for overstating of My Home Energy Report savings.** DEC is apparently assuming that My Home Energy Report program savings last only as long as a residential customer is enrolled in the program. As a result, DEC

effectively assumes that those savings are reacquired by re-running the program each year for the same participants. However, there is evidence that a significant portion of the savings produced from any set of customers participating in year one would continue to persist in subsequent years even if program delivery were ended for those customers. Thus, DEC may be significantly over-estimating the *new* savings this program produces each year. The persistence of savings and implications for annual savings claims and future program design and delivery strategy are issues that should be evaluated.

- **Potential for overstating lifetime savings (and economic net benefits) of residential lighting measures.** DEC is assuming that the annual savings produced by a residential LED light bulb installed as a result of its efficiency programs will be realized every year—at the same level experienced in the first year—for each of the next 12 years. These projections do not take into account new federal efficiency standards imposed by the Energy Independence and Security Act (EISA) for most residential light bulbs. Those standards will essentially mean roughly 80 percent of the savings realized from most LED light bulbs installed before 2020 will not be attributable to utility programs after 2020.

I discuss each of these issues in greater detail in Section III of my testimony.

Q: DID DEC MEET ITS ONE PERCENT ANNUAL ENERGY SAVINGS TARGET IN 2017?

A: Yes, DEC delivered its highest DSM/EE portfolio savings in 2017, saving 854 gigawatt-hours (GWh) at its customers' meters.[1] This level of savings corresponds to 1.07 percent of prior-year sales,[2] exceeding the one percent annual energy savings target to which the Company agreed in a settlement in the then-proposed merger of Duke Energy and Progress Energy ("Merger Settlement").[3]

Q: PLEASE SUMMARIZE YOUR ASSESSMENT OF DEC'S PROPOSED 2019 EFFICIENCY PROGRAM PORTFOLIO.

A: There are a number of admirable elements in DEC's 2019 planned portfolio. To begin with, DEC's forecast of the amount of new annual savings its programs will produce in 2019 are equal to about 0.95 percent of total forecast sales and 1.38 percent of sales to non-opt-out customers – both significant milestones. Second, the program portfolio is very cost-effective, producing $2.46 in supply-cost savings for every dollar DEC has spent. Since 2014, DEC's efficiency programs have saved enough energy at the time of system peak to eliminate the need for the equivalent of more than four natural gas "peaker" power plants. Third, the portfolio includes a wide range of efficiency measures and programs. Fourth, there are some national state-of-the-art program design features,

[1] DEC reported 906.9 GWh of annual savings at the generator in 2017. That is a value for savings across both its North Carolina and South Carolina service territories. Adjusting for an average line loss rate of 6.2187 percent (DEC response to SACE 2-6) produces 853.8 GWh savings at customers' meters.
[2] Total DEC retail sales in both North Carolina and South Carolina were 79,643 GWh in 2016 [U.S. Energy Information Administration Form 861 Data, Table 10 (https://www.eia.gov/electricity/sales_revenue_price/index.php)].
[3] The Merger Settlement with SACE, South Carolina Coastal Conservation League, and Environmental Defense Fund calls for annual energy savings of at least 1% of prior-year retail sales beginning in 2015 and cumulative savings of at least 7% over the period from 2014 through 2018. The Merger Settlement was approved by the Public Service Commission of South Carolina ("PSCSC") in Docket No. 2011-158-E.

1 particularly the Company's recent launch of a midstream channel for promoting
2 non-residential HVAC, lighting, food service, and IT measures.
3 That said, I also have some over-arching concerns about the portfolio:
4 • **Too much emphasis on short-lived savings**. About 70 percent of residential
5 annual savings and 40 percent of the total portfolio savings in 2019 are
6 forecast to come from DEC's My Home Energy Report program. Savings
7 from such behavioral programs are very short-lived, though longer than the
8 one year DEC is currently assuming.

9 • **Inadequate promotion of longer-lived major measures or comprehensive**
10 **treatment of buildings**. The Residential Smart$aver Energy-Efficiency
11 Program, through which DEC promotes major measures such as heat pumps,
12 central air conditioners, heat pump water heaters, attic insulation, and duct
13 sealing, is forecast to produce only about one percent of its total residential
14 sector savings.
15 • **Insufficient planning to offset what will be a significant loss of**
16 **residential-lighting savings potential once the 2020 federal EISA**
17 **efficiency standards go into effect.** DEC's filing does not demonstrate how
18 the Company will make up for the loss of lighting savings following full
19 implementation of the federal efficiency standards for lightbulbs. DEC's
20 over-emphasis on short-term savings and under-emphasis on longer-lived
21 major measures is a structural problem with the Company's portfolio.
22 Greater promotion of longer-lived measures will diversify DEC's program
23 portfolio, which will be an acute need following the loss of lighting savings.

- **Need for increased investment in lower-income communities and in programs that reach rental units.**

Q: HOW COULD DEC MODIFY ITS 2019 PORTFOLIO OF PROGRAMS TO ADDRESS THESE SHORTCOMINGS?

A: I have four recommendations for improvement:

- First, DEC should endeavor to improve participation in its Residential Smart$aver program significantly through establishment of a midstream channel for promoting some of the measures through equipment distributors (and possibly retailers and/or other parts of the supply chain), increasing incentives, enhancing marketing, and/or other means to reach more customers.
- Second, DEC should consider greater promotion of whole-building retrofits, including support for both (A) improvements to building envelopes (e.g. insulation and air leakage reduction); and (B) retrofitting single-family and multi-family buildings that currently have electric-resistance heating with high-efficiency heat pumps. Such efforts could initially be targeted to lower-income communities, but should ultimately aim to address all such cost-effective opportunities within the residential sector. One option would be to emulate an Energy Arkansas program that is weatherizing manufactured homes. Another would be to consider a new pilot-program in Illinois that is promoting heat-pump retrofits in electric-resistance-heated multi-family buildings.

- Third, DEC should build on recent success and progress in promoting efficiency measures for business customers through the midstream channel of its non-residential Smart$aver prescriptive rebate program. DEC's current forecast that lighting savings will be reduced to half in 2019 of what they were in 2017 raises questions about whether the Company is planning to make some unfortunate changes to one of its best-performing programs. It should instead be endeavoring to increase these savings.
- Fourth, DEC should assess the potential to reduce the number of customers who opt out of its programs by improving business customers' understanding of its programs and/or improving the designs of its programs to make them more attractive to such customers.

Q: HOW DO YOU RECOMMEND THAT THE UTILITIES COMMISSION ADDRESS YOUR RECOMMENDATIONS?

A: Both the EM&V issues and the efficiency-portfolio design issues that I raise are complicated and would probably best be addressed, at least initially, through in-depth discussions between the utilities and other parties, with solutions ultimately brought back to the Utilities Commission. Thus, I recommend that the Utilities Commission refer the issues to the DEC Collaborative, with a requirement that DEC report back on decisions in their 2019 Rider proceeding. Note that this may require more intensive engagement between DEC and other parties than has historically been the case, or than is even possible through quarterly Collaborative meetings alone. However, my experience with collaboratives in other jurisdictions suggests that this can be accomplished by establishing

subcommittees or working groups that meet as often as required to reach resolution on specific issues and to identify any points of disagreement that cannot be bridged.

III. DEC's Energy-Efficiency Savings Estimates

Q: WHAT IS YOUR UNDERSTANDING OF HOW DEC ESTIMATED SAVINGS FOR ITS EFFICIENCY PROGRAMS IN THIS PROCEEDING?

A: DEC witness Evans explains that the Company applied the EM&V Agreement developed by DEC, SACE, and Public Staff, and approved by the Commission in November 2011, in Docket No. E-7, Sub 979. As I understand it, that agreement essentially states that:

- The Company uses "initial estimates" of savings – i.e. estimates developed from sources other than direct impact of evaluation of its programs in the Carolinas – until such impact-evaluation results are available;
- Once the first set of impact-evaluation results are available, the Company uses those results both retrospectively – to adjust past savings estimates based on "initial estimates" – and prospectively; and
- When any subsequent impact-evaluation results become available (i.e., from the second or third or subsequent evaluation of a program), such subsequent evaluation results are only applied prospectively.

These principles apply to all programs except for the Non-Residential Smart$aver Custom Rebate Program and the Low-Income Energy-Efficiency and Weatherization Assistance Program.

Q: IS THIS A REASONABLE FRAMEWORK FOR ESTIMATING SAVINGS?

A: Yes. This is a well-conceived framework, particularly in the context of policies that compensate the utility for lost revenues and provide shareholder incentives based on estimates of economic net benefits. As long as the program impact evaluations follow industry standards and are sufficiently rigorous, it ensures that all lost revenue and shareholder incentive payments are ultimately based on local evaluation of efficiency-program impacts.

There are trade-offs inherent in policy choices between EM&V requirements, particularly regarding retrospective application (or not) of EM&V results. At one extreme, retrospective application of all EM&V results minimizes risk to ratepayers of paying for results that did not occur, though they can also end up paying more than expected if results are better than expected. At another extreme, only applying EM&V results prospectively rewards utilities for performance relative to plans. Since they cannot control how some efficiency measures perform in the field (other than in limited cases such as custom business measures), limiting application of EM&V results to future programs ensures that shareholder incentives are based on performance utilities can control. The approach developed for DEC is a defensible middle ground between these two ends of the spectrum. It seems particularly reasonable given that shareholder incentives are based on estimated net economic benefits to the system rather than to achievement of specific savings targets which were established under a fixed set of planning assumptions.

Q: HAVE YOU FOUND THE IMPACT-EVALUATION STUDIES SPONSORED BY DEC TO FOLLOW INDUSTRY STANDARDS AND BE SUFFICIENTLY RIGOROUS?

A: While I have not reviewed every detail of each of the program-evaluation studies filed by DEC in this proceeding, my high-level review suggests that they have generally been conducted professionally, using appropriate methodologies and with sufficient rigor.

Q: BASED ON YOUR REVIEW, ARE YOU IN A POSITION TO ENDORSE THE SAVINGS ESTIMATES PUT FORWARD BY DEC IN THIS PROCEEDING?

A: No, but not because I have reason to think that there are widespread problems. Such a thorough review is beyond the scope of my engagement with NC Justice Center, et al., and would take more time and resources than I could devote to this case. It would be a less burdensome task to undertake such a review, however, if DEC or the State as whole made use of a Technical Reference Manual ("TRM").[4]

1. Value of Technical Reference Manual (TRM)

Q: WHAT IS A TRM?

A A TRM publicly documents all current estimates of efficiency-measure energy-savings, peak-demand savings, other fuel savings, savings life, incremental costs and, other related assumptions – as well as references for the sources of each assumption. When evaluation studies suggest that an assumption needs to be updated, the TRM is also updated. This typically takes place annually. TRMs also sometimes document protocols and/or EM&V methods that should be used

[4] Note that in some jurisdictions, this is called a Technical *Resources* Manual instead of Technical *Reference* Manual.

to estimate savings from custom projects for which prescriptive assumptions are not appropriate.

Q: WHAT IS THE VALUE OF A TRM?

A: TRMs provide a single reference that regulators and other parties can use to ensure that utility savings estimates are based on the correct assumptions. They also provide transparency for regulators and other parties regarding the basis for all utility-savings estimates, as well as other key inputs to cost-effectiveness calculations. That makes it easier for all parties to identify quickly when key assumptions may be outdated and/or when targeted evaluation activity may be needed to update assumptions. That includes assumptions, such as savings life and incremental cost, that are often not addressed by impact evaluations. Such assumptions are important inputs to cost-effectiveness calculations and shareholder-incentive calculations.

Q: DO MOST STATES HAVE A TRM?

A: Yes. In my experience, the vast majority of states – especially those with fairly robust efficiency-program offerings – have TRMs. For example, in the South there are TRMs currently in use in Arkansas (currently on their seventh iteration),[5] New Orleans (currently on its first iteration),[6] Texas (currently on its fifth iteration),[7] and by TVA (currently on its seventh iteration).[8] TRMs have also been developed and used by utilities in Illinois, Indiana, Michigan, Ohio, Pennsylvania, Missouri, New Jersey, other mid-Atlantic states, New York, the

[5] http://www.apscservices.info/EEInfo/TRMv7.0.pdf.
[6] No on-line link is available.
[7] http://www.texasefficiency.com/index.php/emv.
[8] https://www.tva.gov/Energy/EnergyRightSolutions.

1 New England states, the Pacific Northwest states, California, and at least half a
2 dozen other states.[9]

3 **2. My Home Energy Report Program Savings Life**

4 **Q: WHAT IS YOUR UNDERSTANDING OF DEC'S ASSUMPTION**
5 **REGARDING THE LIFE OF SAVINGS FROM ITS MY HOME ENERGY**
6 **REPORT PROGRAM?**

7 A: DEC is assuming that the savings from this program last one year.[10]

8 **Q: WHAT ARE THE IMPLICATIONS OF THAT ASSUMPTION?**

9 A: DEC assumes that in each year, in addition to sometimes reaching new
10 participants, it needs to "re-reach" the previous year's participants in order to
11 reacquire savings procured the previous year, which are assumed to have
12 "expired." Thus, each year, DEC counts the savings from all program
13 participants, regardless of the year in which they started participating, as part of
14 its estimates of the new annual savings it is producing each year.

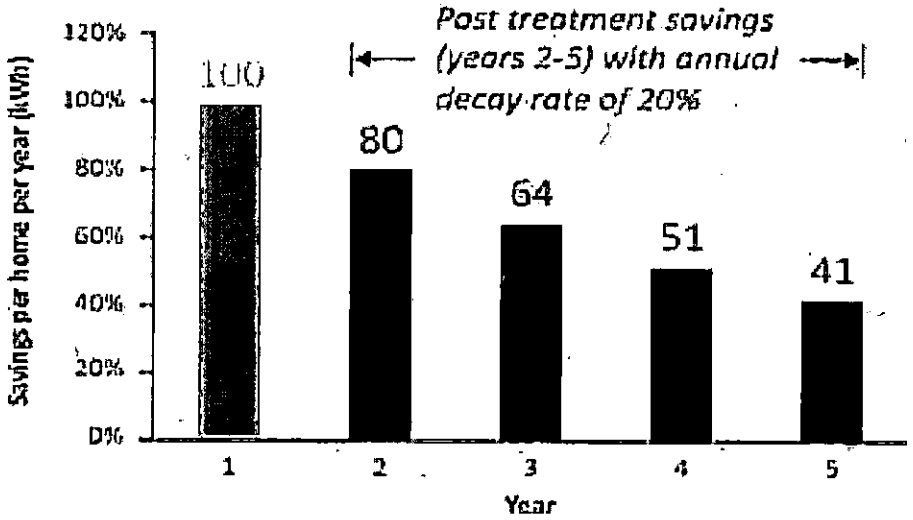
15 **Q: IS THAT A REASONABLE ASSUMPTION?**

16 A: Probably not. A number of studies of residential behavior programs have shown
17 that savings produced from a given year of program delivery do not expire after
18 one year if the program is stopped. Instead, a significant portion of the savings
19 will persist into the years following program termination, though the amount that
20 persists declines over the course of several years. One commonly referenced
21 study suggests that, on average, savings achieved during a program year decay

[9] For a list of jurisdictions with TRMs as of a year ago see U.S. Department of Energy, *SEE Action Guide for States: Guidance on Establishing and Maintaining Technical Reference Manuals for Energy Efficiency Measures*, Evaluation, Measurement and Verification Working Group, June 2017 (https://www4.eere.energy.gov/seeaction/system/files/documents/TRM%20Guide_Final_6.21.17.pdf).
[10] Evans Exhibit C, p. 70 of 138.

(or decline) by about 20 percent every year following program termination.[11] As Figure 1 illustrates, that would mean that 80 percent of the program-year savings persist into the first year following program termination, 64 percent persist into the second year following program termination, 51 percent persist into the third year following program termination, etc.

Figure 1: Home Energy Report Savings Persistence 20 Percent Annual Decay Rate[12]



Q: DO ANY OTHER JURISDICTIONS ADJUST SAVING ASSUMPTIONS TO ACCOUNT FOR THIS UNDERSTANDING OF SAVINGS PERSISTENCE FROM RESIDENTIAL BEHAVIOR PROGRAMS?

A: Some states have adjusted the way that they estimate savings from such programs. For example, the Illinois TRM now requires electric utilities in the state to assume that 80 percent of savings achieved in a program-participation year persist into the first year following program termination, 54 percent into the

[11] Khawaja, Sami and James Stewart, Long-Run Savings and Cost-Effectiveness of Home Energy Report Programs, published by The Cadmus Group, Inc., Winter 2014/2015 (http://www.cadmusgroup.com/wp-content/uploads/2014/11/Cadmus_Home_Energy_Reports_Winter2014.pdf).
[12] This is a copy of Figure 3 from the Cadmus paper.

second year, 31 percent into the third year and 15 percent into the fourth year.[13] Thus, if a utility measures annual savings of 100 kWh per participating customer each year, it can only claim 20 kWh of new incremental annual savings in the second consecutive year of delivery to the same set of customers.[14]

Q: CAN THAT APPROACH TO ACCOUNTING FOR THE PERSISTENCE OF SAVINGS FROM RESIDENTIAL BEHAVIOR PROGRAMS AFFECT PROGRAM-DELIVERY STRATEGY?

A: Yes, it can, for a couple of related reasons. First, it significantly reduces the amount of *new* annual savings a utility can count from repeat participants towards any annual savings goals. And because the cost of the program per participant does not change, the cost per unit of new annual savings from repeat participants goes up considerably. That, in turn, at least has the potential to make program delivery to repeat participants comparatively more expensive per new annual kWh saved than other programs to which efficiency portfolio budgets can be allocated. Second, it can even render it not cost-effective to deliver the program to repeat participants.

As a result, it may make sense to adjust program design and delivery strategy. One option is to rotate delivery of residential behavior programs to different sets of customers each year, and not return to a group of customers until at least three or four years have passed since they were last treated. That is the strategy that

[13] Illinois TRM Version 6.0, Volume 4, p. 9 (http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_6/Final/IL-TRM_Effective_010118_v6.0_Vol_4_X-Cutting_Measures_and_Attach_020817_Final.pdf).

[14] Unless savings per customer increase, which they sometimes do after more than one year of participation. For example, if average savings per customer were 100 kWh in the first year and grew to 120 kWh in the second year, the utility could claim 40 kWh of new incremental annual savings per repeat participant, or the difference between the 120 kWh measured in the second year and the 80 kWh that would have persisted into the second year had the program not been offered again to the same customers.

Ameren Illinois has adopted for its 2018-2021 plan. There are undoubtedly other options that merit consideration as well.

Q: ARE YOU SUGGESTING THAT DEC NEEDS TO CHANGE ITS ASSUMPTION OF A ONE-YEAR LIFE FOR SAVINGS FROM ITS MY HOME ENERGY REPORT PROGRAM, WITH ATTENDANT CHANGES IN THE AMOUNT OF NEW SAVINGS IT COUNTS EACH YEAR?

A: I think it likely that it will be appropriate to change that assumption. However, I would recommend that more analysis be done, considering the applicability of the results of other studies' estimates of savings decay/persistence to DEC's program, before making any specific changes. It may also be appropriate to stop delivering the program for a set of participants and to perform an evaluation of savings persistence over time for those participants to refine any assumption changes. Finally, it will be important to consider whether and the extent to which any change in assumption regarding measure life – as well as other concerns I discuss further below – supports changes to program emphasis and delivery strategy. This is an issue that the Utilities Commission may wish to refer to the DEC Collaborative for discussion, analysis, and ultimately recommendations on how to proceed.

3. EISA Impact on Residential Light Bulb Savings Life

Q: WHAT MEASURE-LIFE ASSUMPTION IS DEC USING FOR RESIDENTIAL LED LIGHT BULBS ITS PROGRAMS ARE CURRENTLY PROMOTING?

A: Based on the evaluation report for DEC's Free LED program, it appears as if DEC is assuming that most LED light bulbs have an average life of about 12 years.[15]

Q: IS 12 YEARS A REASONABLE ASSUMPTION FOR THE MEASURE LIFE OF AN LED LIGHT BULB?

A: Depending on the specific LED products DEC is promoting, 12 years could be a reasonable assumption for the equipment life of the bulbs, or how long the LED light bulbs will physically last. However, at least for most LEDs, it is not a reasonable assumption regarding the average life of the first year savings – i.e., the *savings life*. Put another way, multiplying the first-year savings of a standard LED by its assumed 12-year measure life will be produce an unrealistically high estimate of lifetime savings for the measure.

Q: WHY IS THE SAVINGS LIFE SHORTER THAN THE EQUIPMENT LIFE?

A: For most measures they are the same. But they can be different in cases in which the equipment life of the efficiency measure and the equipment life of the baseline measure being replaced or displaced are different. That is the case with LED light bulbs.

An LED light bulb that is purchased today – or next year – is assumed to be purchased instead of a halogen light bulb. The electricity savings produced by an LED in its first year of operation will therefore be equal to the difference between

[15] A 12-year life is the assumption for between 85% and 90% of the light bulbs DEC is forecasting for its 2019 Residential Energy Efficient Appliances and Devices program in North Carolina. The remaining bulbs have an assumed measure life of 15 years (DEC confidential response to SACE et al Data Request 2-3b). Though the underlying data source for this analysis was from a spreadsheet marked "confidential" by DEC, counsel for the Company has confirmed that no confidential material is included in my summary of the average useful life of lighting measures.

its electricity consumption and that of the halogen that would have otherwise been purchased and installed. In addition to consuming less energy, LEDs last a lot longer than halogens. Depending on the product and other factors, it can be reasonable to assume that LEDs last an average of 12 years. In contrast, halogens that are replaced by LEDs typically last only a year or two.[16] Thus, in the baseline scenario, the customer would be buying a new light bulb roughly every year or every other year, for as long as the baseline product remains a halogen bulb. If it were reasonable to assume that the baseline product would remain a halogen bulb for the next 12 years, the savings in each of the next 12 years of the LED equipment life would be the same as in the first year. In that case, the LED savings life would be equal to the LED equipment life. But that is not a reasonable assumption for standard LEDs because federal efficiency standards under the Energy Independence and Security Act (EISA) that will go into effect in 2020 will effectively require all new general service, screw-based lamps – i.e., those that "standard LEDs" would replace – to be as efficient as compact fluorescent light bulbs (CFLs). Thus, the annual savings estimated for standard LEDs will decline significantly starting in 2020. Put another way, rather than assuming that the current annual savings of an LED will last 12 years, the annual savings for an LED installed in 2017 should only have been assumed to continue at the 2017 level for three or four years, followed by eight or nine years of much lower levels of savings.[17] Similarly, for a standard LED light bulb installed in

[16] Based on review of a variety of screw based halogen light bulbs for sale from Home Depot (https://www.homedepot.com/s/halogen%2520light%2520bulb?NCNI-5).

[17] Similarly, for a standard LED installed in 2019, the current annual savings estimate would be appropriate for only one or two years, followed by 10 or 11 years of much lower levels of savings. And

2019, the current annual savings estimate may be appropriate for only the first year or two of the LED bulb's physical life, with lower savings assumed for the remaining 10 or 11 years.

Q: IS THAT KIND OF ADJUSTMENT APPROPRIATE FOR ALL LED LIGHT BULBS?

A: No, this kind of adjustment is only appropriate for the kinds of light bulbs that are governed by the EISA product-efficiency standards. That means all of what are commonly known in the industry as "standard LEDs," particularly "A-Line LEDs," but also likely directional and decorative lamps that are included in a recently expanded definition of "general service lamp" adopted by the U.S. Department of Energy. DEC's programs may include savings from both LEDs that are covered by EISA and LEDs that are not. The savings from the LEDs not covered by EISA would be unaffected by the shifting baseline efficiency associated with EISA. I do not know what fraction of the LED light bulbs promoted by all of DEC's programs fall into each category, though at first blush it appears as if all of the bulbs proposed to be promoted in 2019 through its Residential Energy Efficient Appliances and Devices program will be affected by EISA.[18]

Q: IS THE KIND OF ADJUSTMENT TO STANDARD LED SAVINGS LIVES THAT YOU ARE SUGGESTING CONSISTENT WITH NATIONAL BEST PRACTICE?

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the savings for any standard LED installed in 2020 or later will be much smaller in every year of its operation (i.e. requiring a lower first year savings value as well as lower savings in subsequent years).

[18] Based on my review of product types listed in DEC's Excel attachment to its confidential response to SACE 2-3b.

A: Yes. This is kind of savings adjustment was recommended a couple of years ago by the national "Uniform Methods Project," a national effort designed to bring best practice consistency to energy-savings estimation and evaluation:

> *Bulbs expected to be in use in 2020 and beyond will be affected by the EISA backstop provision mentioned in Section 1. The life cycle savings of CFLs, therefore, should either terminate for any remaining years in the expected life beginning in mid-2020, or be substantially reduced after 2020 to account for the backstop provision. Similarly, the life cycle savings for LEDs should incorporate this upcoming baseline change.*[19]

Q: ARE THERE OTHER STATES THAT MAKE SUCH SAVINGS ADJUSTMENTS FOR STANDARD LEDS STARTING IN OR AROUND 2020?

A: Yes. Illinois is an example of a state that makes this adjustment. The Illinois TRM explains the LED "mid-life baseline adjustment" as follows:

> *During the lifetime of a standard Omnidirectional LED, the baseline incandescent/halogen bulb would need to be replaced multiple times. Since the baseline bulb changes over time (except for <300 and >2600+ lumen lamps) the annual savings claim must be reduced within the life of the measure to account for this baseline shift.*

[19] Dimetrosky, Scott, Katie Parkinson and Noah Lieb, "Chapter 21: Residential Lighting Evaluation Protocol;" The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures, published by the National Renewable Energy Laboratory, February 2015, http://energy.gov/sites/prod/files/2015/02/f19/UMPChapter21-residential-lighting-evaluation-protocol.pdf.

For example, for 60W equivalent bulbs installed in 2014, the full savings...should be claimed for the first six years, but a reduced annual savings (...[initial first year energy savings]...multiplied by the adjustment factor in the table below) claimed for the remainder of the measure life.[20]

Minimum Lumens	Maximum Lumens	LED Wattage (WattsEE)	Delta Watts 2014-2019 (WattsEE)	Delta Watts Post 2020 (WattsEE)	Mid Life adjustment (made from June 2020) to first year savings
1490	2600	37.2	34.8	8.3	23.8%
1050	1489	23.1	29.9	5.1	17.1%
750	1049	16.4	26.6	3.6	13.5%
310	749	9.6	19.4	2.1	10.8%

As one can see from the table, the portion of initial LED savings that no longer apply after 2020 varies by lamp light output level. The average remaining savings across the four categories shown is 16 percent, representing an 84-percent reduction from pre-2020 annual savings levels.

The Arkansas TRM uses the same conceptual approach, but with slightly different assumptions. Specifically, it assumes that the baseline shift for standard LEDs does not change until 2022 instead of after 2020, so it assumes that there are a couple more years of the higher levels of savings and a couple fewer years

[20] Illinois Statewide Technical Reference Manual for Energy Efficiency, Version 5.0, Volume 3: Residential Measures, Final; February 11th, 2016; effective June 1st, 2016; p. 261, http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Effective_060116_v5.0_Vol_3_Res_021116_Final.pdf.f

of lower levels of savings.[21] That difference is a function of different assumptions regarding the average life of a current baseline halogen lamp.

Q: WHAT ARE THE IMPLICATIONS OF ACCOUNTING FOR THIS EISA-DRIVEN BASELINE SHIFT WHEN ESTIMATING SAVINGS FROM LED LIGHT BULBS?

A: The EISA-driven baseline shift, by definition, does not affect estimated first year savings from LEDs, at least not until 2020 when the prohibition on sale of products not meeting EISA standards goes into effect. However, because it affects estimated savings for a significant portion of the assumed physical life of the average LED governed by such standards, it will reduce estimates of the net economic benefits of such light bulbs.

Q: ARE YOU SUGGESTING THAT ANY PART OF DEC'S APPLICATION IN THIS PROCEEDING BE ADJUSTED TO ACCOUNT FOR SUCH IMPACTS?

A: No. There are several issues that would need to be worked out in detail before making adjustments to DEC's economic net benefit calculations, including the nature of the specific baseline shifts to be made, assumptions regarding the products for which they should be made,[22] assumptions regarding the assumed life of the average halogen baseline lamp being displaced today (the longer the halogen life, the longer the average period before the baseline shift occurs), etc.

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[21] Arkansas Public Service Commission, Arkansas Technical Reference Manual, Version 7.0, Approved in Docket 10-100-R, filed 8/31/2017 (http://www.apscservices.info/EEInfo/TRMv7.0.pdf).

[22] The U.S. Department of Energy's expanded definition of general service lamp is being challenged by some parties. While it appears likely to withstand such challenges, it may be appropriate to assess that likelihood thoroughly before making definitive decisions regarding the products for which adjustments should be made.

1 That said, this is an important issue for a measure that accounts for a significant
2 portion of DEC's estimated annual savings. Thus, as with the issue of the My
3 Home Energy Report program savings decay/persistence, the Utilities
4 Commission should consider referring this issue to the DEC Collaborative for
5 discussion, analysis, and ultimately recommendations on how to proceed.

6 **IV. DEC's Efficiency Program Mix**

7 **1. Overview**

8 **Q: WHAT IS YOUR VIEW OF DEC'S PLANNED ENERGY-EFFICIENCY**
9 **PROGRAM PORTFOLIO FOR 2019?**

10 A: There are some admirable elements to the portfolio:

11 • First, it appears as if DEC is planning to achieve annual savings of 0.95
12 percent of total annual sales and an even higher percentage of annual sales to
13 non-opt-out customers – 1.38 percent – in 2019.[23] Though it is possible to
14 acquire greater levels of cost-effective savings than that, 0.95 percent of total
15 sales and 1.38 percent of sales to non-opt-out customers still represent
16 significant milestones.

17 • Second, the efficiency-program portfolio is very cost-effective, demonstrating
18 that efficiency programs are a least-cost resource for meeting consumers'
19 electricity needs. For every dollar that DEC spends on its programs, it is

[23] The Company is forecasting that it will achieve 451.9 GWh of residential efficiency program savings and 327.0 GWh of non-residential efficiency program savings for a total efficiency program savings of 778.9 GWh at the generator in 2019 (Evans Exhibit 1, p. 5). Approximately 72.81 percent of those savings – or 567 GWh – is allocated to North Carolina (Evans Exhibit 5, p. 1). Adjusted for 6.2187 percent line losses (Duke response to SACE 2-6), the North Carolina savings are about 534 GWh at customers' meters. DEC's forecast 2019 sales are 56,057 GWh (Miller Exhibit 6). DEC is forecasting that business customers with annual sales of 17,253 GWh will opt out of its programs, so sales to non-opt-out customers will be 38,804 GWh in 2019.

eliminating the need to spend $2.46 on new power plants, the fuel to run those power plants, new power lines, and other investments otherwise needed to supply electricity to inefficient homes and businesses. This calculation is based on DEC's estimated UCT benefit-cost ratio as reported in Evans Exhibit 7. DEC's analysis also suggests that the programs are very cost-effective under the TRC test (benefit-cost ratio of roughly 2 to 1).[24] It is notable that in just the four years from 2014 through 2017 DEC's efficiency programs provided enough peak demand savings to eliminate the need for more than four average-sized natural gas "peaker" power plants.[25]

- Third, DEC's efficiency program portfolio is fairly broad. That is, it promotes a fairly wide range of efficiency measures through a range of programs that at least theoretically could be accessed a by wide range of residential and non-residential customers.
- Fourth, I am impressed by the sophistication and advanced nature of some of the DEC programs or program elements. In particular, the Company deserves

[24] And this is a very conservative estimate of TRC cost-effectiveness because, as I understand it, DEC's application of the TRC test excludes many benefits – including natural gas and other fuel savings, water savings, and various participant non-energy benefits – that a TRC test should include if it is to assess properly the cost-effectiveness of the impacts on the utility system plus program participants, which is the conceptual construct of the TRC (see Woolf, Tim, et al., *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Edition 1, Spring 2017 (https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf).

[25] The sum of the incremental annual peak savings for each year for all DEC's efficiency programs other than the My Home Energy Report program is 298 MW. Since virtually all of the savings from those programs had a life of at least four years, that is a reasonable estimate of the persisting peak savings after four years. On top of that, the My Home Energy Report program had a peak savings of 79 MW in 2017 (since this is a program that is estimated to have just a one-year life, I only include the peak savings from 2017), bringing the total for the efficiency program portfolio to 377 MW by the end of 2017. (DEC confidential response to SACE et al Data Request 2-3b). Though the underlying data source for this analysis was from a spreadsheet marked "confidential" by DEC, counsel for the Company has confirmed that no confidential material is included in my summary of annual peak savings. Note that this analysis is for efficiency programs only; the peak savings from DEC's demand-response programs are additional to that amount. According to U.S. Energy Information Administration data, in 2016 DEC had 32 natural-gas-fired combustion turbines, with summer capacities ranging between 42 MW and 160 MW and an average summer capacity of 86 MW.

great credit for initiating a new midstream channel to its Non-Residential Smart$aver Prescriptive program for promoting a range of efficient products (HVAC, lighting, food service, and IT measures) to business customers. This is a national state-of-the-art practice.

That said, I do have several concerns regarding the composition of the portfolio of programs and, perhaps even more importantly, the relative contributions of different programs to the Company's estimated savings.

Q: WHAT ARE THOSE CONCERNS?

A: I have several inter-related concerns:

- Too much relative emphasis on programs that deliver only very short-lived savings.
- Insufficient promotion of long-lived major measures and comprehensive treatment of buildings. This is a corollary to the point above.
- Insufficient planning to offset what will be a significant loss of residential-lighting savings potential once the 2020 federal EISA efficiency standards go into effect.
- Need for expanded focus on delivering energy-saving programs in lower-income communities.

Though I express these concerns at the portfolio level, they are most pronounced for the residential sector.

2. Short-Lived Savings vs. Longer-Lived Savings

Q: WHAT DO YOU CONSIDER TO BE "SHORT-LIVED" SAVINGS?

1 A: If I had to draw a line, it would be savings from measures with a life of less than
2 7 to 10 years. However, I think it is more appropriate to take a more nuanced
3 view by looking at the mix of savings lives.[26]

4 **Q: WHAT IS THE BASIS FOR YOUR CONCERN REGARDING DEC'S**
5 **LEVEL OF EMPHASIS ON SHORT-LIVED SAVINGS?**

6 A: To begin with, nearly 70 percent of DEC's residential annual savings and roughly
7 40 percent of the DEC's *total* forecast 2019 incremental annual savings are
8 forecast to come from just its Residential My Home Energy Report behavioral
9 program. Those are extremely high percentages.
10 Second, it appears as if the vast majority of other savings DEC is forecasting to
11 acquire from the residential sector is lighting savings.[27] As I discussed in the
12 previous section to this testimony, most residential lighting savings will not
13 persist past 2020 (or maybe 2021) because of the baseline shift resulting from the
14 2020 federal EISA efficiency standards.
15 Finally, data from the American Council for an Energy Efficient Economy's
16 (ACEEE's) 2017 Utility Energy Efficiency Scorecard, which rated the efficiency
17 performance of 51 utilities across the country, also suggest that the average
18 savings life of DEC's efficiency programs is much lower than average.
19 Specifically, though DEC's average *annual* savings was only just below average

[26] For example, if 60 percent of savings are from measures that have a life of less than seven years, but most of those have lives of six years, that would be much better than if 50 percent of savings are from measures that have a life of less than seven years, but most of those have a life of one year.
[27] Most of the balance of DEC's forecast 2019 residential savings are from its Energy Efficient Appliances and Devices program. Light bulbs likely dominate savings from that program, with roughly 1.6 million free LED light bulbs and 2.1 million lighting measures – mostly light bulbs – rebated through the "retail lighting" program component in 2017 (Evans Exhibit 6, pp. 8-9 of 126). Energy-efficient lighting is also a key focus of almost all of the other residential programs targeted to the residential sector in 2019. For example, 67 percent of the measures installed in the Multi-Family program were lighting measures (Evans Exhibit 6, p. 53 of 126).

for the 51 utilities analyzed, its average *lifetime* savings was only about half of the average lifetime savings achieved by the same utilities.[28]

Q: HOW DOES THE 40 PERCENT OF TOTAL PORTFOLIO SAVINGS THAT DEC IS FORECASTING TO ACHIEVE THROUGH ITS RESIDENTIAL BEHAVIOR (MY HOME ENERGY REPORTS) PROGRAM COMPARE TO OTHER UTILITIES?

A: I am unaware of any other investor-owned electric utility (other than DEC's affiliated company, Duke Ohio) that is planning to get that much of its total savings from a residential behavior program. To illustrate that point, I have compiled estimates of the percentage of both residential and total savings that residential-behavior programs provide for 19 electric utilities in the eastern half of the United States, including nine Southern utilities. Though this is not an exhaustive review, I have endeavored to collect data for the largest utilities in most Southern, mid-Atlantic and Midwestern states. Those estimates are provided in Table 1 below. Where possible, I have provided planned numbers to compare to DEC's plan for 2019; otherwise I have provided actual performance numbers for a recent year (mostly 2017). None of these utilities come close to achieving as large a portion of total electric portfolio savings from their Residential Behavior programs as does DEC, which projects that 40 percent of its overall savings in 2019 will come from My Home Energy Report. In fact, the average non-DEC utility is getting only 9 percent of total portfolio electric savings from its residential behavior programs – less than one-quarter as much as DEC – and the average of the other southern utilities for which I obtained data is

[28] Relf, Grace et al., 2017 Utility Energy Efficiency Scorecard, ACEEE Report U1707, June 2017.

even less. Only one utility – Baltimore Gas & Electric – is planning to get even half as much of its savings from its Residential Behavior program as DEC.[29]

Table 1: Percentage of Total Savings from Residential Behavior Programs[30]

Utility	State	Plan or Actual	Year	MWh Savings: Res. Behavior Program	MWh Savings: All Res. Sector Programs	MWh Savings: All Programs, All Sectors	Behavior Savings %: % of Res. Sector Savings	Behavior Savings %: % of Total Savings (All Sectors)
Duke Energy Carolinas	NC/SC	Plan	2019	312,934	451,520	778,508	69%	40%
Entergy New Orleans	LA	Plan	2019	8,000	19,416	53,894	41%	15%
Entergy Gulf States	LA	Actual	2017	0	10,419	17,057	0%	0%
Entergy Louisiana	LA	Actual	2017	0	18,101	28,456	0%	0%
Entergy Mississippi	MS	Actual	2017	0	13,227	26,294	0%	0%
Mississippi Power	MS	Actual	2017	3,421	7,611	18,333	45%	19%
Entergy Arkansas	AR	Actual	2017	7,901	104,051	264,992	8%	3%
SWEPCO	AR	Actual	2017	0	12,617	33,667	0%	0%
Georgia Power	GA	Actual	2017	12,366	94,119	375,375	13%	3%
Florida Power and Light	FL	Actual	2017	0	23,600	71,400	0%	0%
PEPCO	MD	Plan	2019	48,710	130,189	262,357	37%	19%
Baltimore Gas & Electric	MD	Plan	2019	138,200	335,267	500,267	41%	28%
PECO	PA	Plan	2016-20	304,999	844,412	2,091,301	36%	15%
All MA Utilities	MA	Actual	2016	140,547	723,392	1,569,661	19%	9%
Commonwealth Edison	IL	Plan	2018	275,502	575,606	1,619,028	48%	17%
Ameren Illinois	IL	Plan	2018	6,290	92,971	347,176	7%	2%
First Energy	OH	Plan	2017-19	125,788	632,302	1,781,833	20%	7%
American Electric Power	OH	Plan	2019	75,000	212,600	611,500	35%	12%
DTE	MI	Plan	2019	73,668	291,013	702,850	25%	10%
Consumers Energy	MI	Plan	2019	31,442	157,846	479,471	20%	7%
Avg of Southern Utilities	Various	Mix	Mix				**12%**	**4%**
Avg of All Utilities	Various	Mix	Mix				**21%**	**9%**

Q: YOU TESTIFIED THAT THE AMOUNT OF NEW INCREMENTAL ANNUAL SAVINGS PRODUCED BY DEC'S MY HOME ENERGY REPORT PROGRAM MAY BE OVER-STATED. IF THAT PROVES TO TRUE, AND PERSISTENT SAVINGS WERE INSTEAD ACCOUNTED

[29] The 28 percent provided in the table for BG&E includes only efficiency programs designed to promote efficiency actions by customers. BG&E also gets significant customer savings from conservation voltage regulation, which I did not include in the total savings into which I divided their residential-behavior program savings. If CVR savings were included, the BG&E average would drop to 21 percent.

[30] All values are from publicly available sources, either filed utility plans or utility annual reports. Specific references are available upon request.

FOR, WOULD THAT ELIMINATE YOUR CONCERN ABOUT TOO MUCH OF THE COMPANY'S SAVINGS BEING SHORT-LIVED SAVINGS?

A: No. Though it is true that such an adjustment would reduce the percentage of annual portfolio savings coming from the My Home Energy Report program, this isn't just an accounting issue. As I note above, I have a corollary concern that DEC is not acquiring enough longer-lived savings. Moreover, if the My Home Energy Report *annual* savings declined because it was determined to be more appropriate to account for persistence of savings from participants over multiple years, DEC would need to acquire additional savings from other measures and programs in order to get back up to (or exceed) the 1.0 percent of prior-year sales target. Those additional savings should ideally come from longer-lived measures because they provide more lasting benefits both to consumers and to the utility system.

Q: CAN YOU GIVE EXAMPLES OF THE KINDS OF ADDITIONAL LONGER-LIVED SAVINGS DEC COULD ACQUIRE IN THE RESIDENTIAL SECTOR?

A: I would begin by suggesting efforts to increase significantly the number of customers participating in rebate offers for high-efficiency heat pumps, central air conditioners, heat-pump water heaters, pool pumps, attic insulation, air sealing, and duct sealing. There should be significant savings potential from these measures as they address the largest electricity end-uses in homes. However, DEC's Residential Smart$aver Energy Efficiency Program – the program through which all of these measures are promoted – is forecast to produce only about one

1 percent of the Company's annual residential savings in 2019. Participation rates
2 for these measures could potentially be increased in a variety of ways. In short,
3 though DEC includes many of the major residential measures with big savings
4 potential in its program, it is not getting nearly enough uptake or participation
5 with those measures. Perhaps most notably, they could be dramatically increased
6 by moving some of the measure incentives (e.g., those for heat pumps, central air
7 conditioners, and heat pump water heaters) upstream to distributors, as the
8 Company has recently done for a number of non-residential prescriptive
9 incentives. Utilities that have made such transitions have achieved dramatic
10 increases in participation. For example, United Illuminating in Connecticut saw a
11 more than six-fold increase in participation in its heat pump water heater rebates
12 when it moved rebates upstream to distributors.[31] Changes in rebate levels,
13 marketing strategies, paperwork requirements, options for financing investments
14 (for example, through on-bill financing), and/or other program elements may also
15 enable increases in participation.
16 In addition, the Company could increase longer-lived savings through greater
17 promotion of whole-building retrofits, for residential and potentially small
18 business customers too. Such whole-building retrofits should include both (A)
19 improvements to building envelopes (e.g. insulation and air leakage reduction),
20 and (B) retrofitting efficient heat pumps in single-family and multi-family homes

[31] Jennifer Parsons (UI, SCG and CNG), "Energize Connecticut Upstream Residential HVAC Program," presented at the 2015 ACEEE National Conference on Energy Efficiency as a Resource in Little Rock, Arkansas, September 2015 (http://aceee.org/sites/default/files/pdf/conferences/eer/2015/Jennifer_Parsons_Session4A_EER15_9.22.15.pdf).

currently using inefficient electric-resistance heat. There may be quite a large number of such inefficiently electrically heated housing units.[32]

Q: CAN YOU GIVE EXAMPLES OF THE KINDS OF ADDITIONAL LONGER-LIVED SAVINGS DEC COULD ACQUIRE IN THE NON-RESIDENTIAL SECTOR?

DEC reports that in 2017, incentive payments in its prescriptive rebate program increased (relative to 2016 levels) by 69 percent for lighting, 24 percent for pumps and motors, 71 percent for process equipment, and five percent for HVAC equipment.[33] One key reason for the growth is the increased interest in LED lighting, which is likely tied to both fast improving product quality and declining costs. Another key to the increase was improvements to the midstream channel through which 56 percent of program savings were processed in 2017. Absent any changes to the program to dampen participation, I would expect participation and savings to increase further in the future as LED lighting products become even more attractive and as distributors' comfort with the midstream channel continues to increase. However, it appears as if DEC is actually forecasting a nearly 50 percent decline in lighting savings from this program – from 230 GWh in 2017 to just 123 GWh in 2019.

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[32] I do not have statistics specific to DEC's North Carolina service territory. However, 62 percent of North Carolina homes use electricity as their primary heating fuel [U.S. Census, Selected Housing Characteristics, 2012-2016 American Community Survey 5-Year Estimates (https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk)]. Census data also suggest that more than half of electrically heated homes in the South Atlantic region rely upon some form of electric-resistance heating system, whether a furnace, electric baseboard, or portable electric heaters (U.S. Energy Information Administration, Residential Energy Consumption Survey, Table HC6.8: "Space heating in homes in the South and West Regions, 2015" (https://www.eia.gov/consumption/residential/data/2015/#sh)).

[33] Evans Exhibit 6, p. 77.

1 In addition, customers responsible for approximately half of DEC's forecast
2 commercial and industrial sales have opted out and/or are forecast to opt out of
3 its efficiency programs for 2019. In my experience, business customers opt out
4 of efficiency-program offerings (when they have the option) for a variety of
5 reasons. Some of those reasons are outside the control of the utility. Others are
6 not. For example, some business customers opt out because they do not feel that
7 the utility's efficiency-program offerings adequately address their needs.
8 Sometimes this feeling is a function of the business customer not fully
9 understanding the efficiency programs that the utility offers. Other times,
10 business customers have legitimate concerns about the structure and nature of
11 available program designs. I cannot speak to the extent to which either of those
12 issues exists with respect to DEC's programs. However, if DEC could improve
13 awareness of how its programs can help business customers while also improving
14 its offerings to better serve customers that are otherwise inclined to opt out, the
15 Company could tap into another source of substantial energy savings. Many of
16 these savings would likely be long-lived and very cost-effective and would
17 further reduce the amount of more expensive supply-side resources the Company
18 would need to procure.
19 I understand that last year the Utilities Commission instructed DEC to explore
20 how it could reduce opt-outs. DEC witness Evans very briefly discusses this
21 issue in his testimony, simply stating that the Company continues to assess ways
22 to improve is non-residential programs and to use its Large Account Management

Team to ensure customers are aware of product offerings and opt-in windows.[34] However, a more extensive and structured approach to assessing options for decreasing opt-outs – perhaps including a formal study involving solicitation of feedback from those customers who have opted out (to the extent that has not yet been undertaken) – may be appropriate.

3. Preparing for the Impact of the 2020 EISA Federal Lighting Efficiency Standards

Q: WOULD THESE KINDS OF CHANGES TO THE COMPANY'S PROGRAM PORTFOLIO THAT YOU HAVE IDENTIFIED ADDRESS YOUR CONCERN REGARDING THE COMING 2020 EISA STANDARDS AND THE NEED TO REPLACE RESIDENTIAL LIGHTING AS A SIGNIFICANT SOURCE OF ENERGY SAVINGS?

A: Yes. The kinds of program additions, changes, and enhancements I have suggested should not only lead to longer-lasting savings and benefits, but also help diversify the sources of DEC's energy savings.

Q: WHY IS SUCH DIVERSIFICATION IMPORTANT?

A: As I noted earlier, the 2020 EISA standards are going to eliminate much of the residential energy savings that appears to currently make up a large majority of DEC's non-behavior program savings in the residential sector. There is unlikely to be a single measure or even a single program that, by itself, could fill the "savings gap" that EISA will create – at least not in the residential sector. Thus, it is important that DEC consider several different new programs and/or changes to existing programs that may collectively fill the gap.

[34] Evans testimony, p. 34, lines 13-19.

1 **Q: IS IT IMPORTANT THAT SUCH DIVERSIFICATION EFFORTS BEGIN**
2 **SOON?**

3 A: Yes, it is very important. 2020, when the new lightbulb standards go into effect,
4 is only two years away. Depending on the program and market, it can take a year
5 or two to launch new initiatives and then begin to gain significant traction in the
6 market with them. Thus, the Company should be ramping up efforts now to
7 acquire other important sources of savings.

8 **4. Equitably Serving Lower Income Communities**

9 **Q: WHY IS IT IMPORTANT FOR DEC'S ENERGY-EFFICIENCY**
10 **PROGRAM PORTFOLIO TO INCLUDE AN EXPANDED FOCUS ON**
11 **LOW-INCOME COMMUNITIES?**

12 A: There are at least three related reasons. The first is equity. Low-income
13 customers are generally less likely to participate in programs marketed to the
14 residential sector as a whole because such programs usually offer financial
15 incentives to defray, but not totally eliminate, the incremental cost of efficiency
16 measures. Low-income customers rarely have the financial means to make any
17 contribution to efficiency-measure costs. They can also be more likely to be
18 renters, who face greater barriers to efficiency program participation than home
19 owners. Second, low-income customers need energy-efficiency improvements
20 more than other customers. This is because the portion of their income devoted
21 to paying for energy tends to be much higher than for non-low-income customers.
22 In addition, because of their limited means, paying their energy bills can force
23 trade-offs with other necessities of life like food and health care. Finally, because
24 of their financial constraints, low-income households are generally more likely to

have problems paying their bills. DEC, like all utilities, incurs costs managing relationships with customers with bill-payment problems. To the extent that low-income efficiency programs can lower such costs, there are added utility-system benefits that do not accrue to other programs (at least not to the same level).

Q: WHY DO RENTERS FACE GREATER BARRIERS TO EFFICIENCY PROGRAM PARTICIPATION THAN HOME OWNERS?

A: In rental properties (including in multi-family buildings) in which tenants pay the energy bills, there is what is commonly known as a split-incentive problem. Specifically, the party who incurs the costs of making any major investments in building envelop, HVAC, and appliance-efficiency measures – the landlord – is different than the party who will see the resulting savings on their energy bills – the tenant.

Q: COULD ANY OF THE IDEAS YOU PUT FORWARD IN YOUR TESTIMONY FOR INCREASING LONGER-LIVED SAVINGS ALSO BE TAILORED TO ADDRESS THE NEEDS OF LOWER INCOME CUSTOMERS?

A: Yes. For example, a new residential, whole-building retrofit program could be targeted first to electrically heated low-income neighborhoods[35] and/or offered with a tiered incentive structure, with income-eligible customers receiving the retrofit services for free when necessary to enable them to participate.[36] Depending on capabilities, relationships, and other factors, such a program could

[35] Although for equity reasons, there would be value to initially targeting such a program offering to electrically heated low-income customers, such a program should ultimately aim (over time) to address all cost-effective opportunities for all customers, regardless of income.

[36] There can be situations, particularly in the case of multi-family buildings, where it may not be necessary to offer efficiency upgrades for free (e.g., where building owners are paying the energy bills and/or when building owners see enough value in lowering energy costs, reducing turnover rates, etc., that they are willing to bear a portion of the cost).

1 even be delivered on DEC's behalf by community action agencies (CAAs) that
2 already perform low-income home retrofits using federal and/or state dollars.
3 DEC has experience with this kind of partnership following its investment in the
4 Helping Home Fund.[37] I recommend that the Commission direct the
5 Collaborative to analyze the Helping Home Fund for cost-effectiveness and
6 determine whether any aspects of the program could serve as a model for an
7 additional DSM/EE program offering.
8 There are a variety of other options that could also be considered. Later this year,
9 Commonwealth Edison will launch a pilot program promoting heat-pump
10 retrofits exclusively in electric-resistance-heated, low-income, multi-family
11 buildings in the Chicago area.[38] Entergy Arkansas is currently running a
12 program weatherizing manufactured homes, 37 percent of which were occupied
13 by low-income households and another 29 percent either "likely" to be or
14 "potentially" low-income.[39] That program had a remarkable 8.56-to-1 TRC
15 benefit-to-cost ratio in 2017. These programs could be models for similar future
16 DEC initiatives.

17 **5. Process for Consideration of New Program Ideas**

18 **Q: ARE YOU SUGGESTING THAT THE UTILITIES COMMISSION**
19 **REQUIRE DEC TO LAUNCH SPECIFIC NEW EFFICIENCY**
20 **PROGRAMS IN THE AREAS YOU HAVE IDENTIFIED?**

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[37] CN Ex. 2, Helping Home Fund Report.
[38] Illinois Commerce Commission, Order, Docket 17-0312, September 11, 2017 (https://www.icc.illinois.gov/docket/files.aspx?no=17-0312&docId=256554).
[39] Energy Arkansas, Arkansas Energy Efficiency Program Portfolio Annual Report, Docket No. 07-085-TF, 2017 Program Year, May 1, 2018 (http://www.apscservices.info/EEInfo/EEReports/Entergy%202017.pdf).

A: No. Before a commitment to new program design or even a significant change to an existing program design is made, one would need to: flesh out the details of the proposed approach; assess the market; estimate likely participation and savings; develop a specific budget; and conduct a cost-effectiveness analysis.[40]

Q: WHAT DO YOU SUGGEST THE UTILITIES COMMISSION DO WITH RESPECT TO THE NEED FOR CHANGES TO DEC'S EFFICIENCY-PROGRAM PORTFOLIO?

A: As with the potential concerns I have raised regarding DEC's current savings assumptions, I suggest that the Utilities Commission direct DEC to explore program options for decreasing emphasis on short-lived savings, increasing investment in longer-lived measures, filling the "savings gap" that will be created by the elimination of most residential-lighting savings potential in 2020, and increasing program offerings to low-income communities. This direction should include, but not be limited to, a requirement to consider the program ideas I have put forward. Analysis and consideration of all such program ideas should be pursued through the DEC Collaborative in order to involve stakeholders. Note that this will require more than a quarterly meeting; it will likely require significant subcommittee or "working group" discussions in between such meetings.

Q: HAVE YOU PARTICIPATED IN UTILITY-STAKEHOLDER COLLABORATIVE PROCESSES?

[40] The program concepts that I have proposed have been shown to be quite cost-effective in other jurisdictions, including jurisdictions in the South. That is a good indicator that they could be cost-effective in DEC's North Carolina service territory. However, a DEC-specific analysis should ultimately be required.

A: Yes. I have participated as a technical advisor in numerous utility-stakeholder collaborative processes in a wide range of jurisdictions. For example, since 2010, I have actively participated in virtually every collaborative meeting of Illinois's Stakeholder Advisory Group (SAG), which typically meets monthly, as well as in much more numerous and more regular SAG subcommittee or working-group discussions. In recent years, I have also participated in a number of similar regular collaborative discussions in Michigan, the Canadian province of Ontario, and, to a lesser degree, in Ohio. I am also currently working with the Arkansas collaborative, called the "Parties Working Collaboratively" ("PWC"), to support an effort that the Arkansas Commission directed to assess how its current cost-effectiveness test aligns with the best practice principles of the *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*.

Q: IN YOUR EXPERIENCE, CAN SUCH COLLABORATIVE DISCUSSIONS BETWEEN UTILITIES AND STAKEHOLDERS EFFECTIVELY ADDRESS COMPLEX PROGRAM DESIGN AND EM&V ISSUES?

A: Yes. In fact, they are often much more effective venues for addressing such issues than regulatory proceedings.

Q: WHY IS THAT?

A: Because the complex and often arcane nature of the issues demands both specialized expertise and significant "back-and-forth" dialogue to fully explore concerns and options for addressing them. In jurisdictions where well-functioning collaborative processes have become institutionalized, regulators

often choose to focus their efforts on higher-level policy issues, such as savings targets and budgets, and direct the collaboratives to work out EM&V, program design, and other operational issues.

Q: CAN YOU ELABORATE ON THE KINDS OF ISSUES THAT COMMISSIONS HAVE DEFERRED TO COLLABORATIVES TO RESOLVE?

A: Because I am most familiar with Illinois, I will use it as an example. The Illinois Commerce Commission ("ICC") has directed the Illinois SAG to address the following issues, among others:

- **Statewide TRM.** Development of a statewide TRM that documents all savings, cost, measure life, and other relevant assumptions for estimating savings from the two electric utilities' and three gas utilities' efficiency programs. The SAG developed the first such statewide TRM in 2012. It also developed a process for annually updating and filing the TRM with the ICC.[41] To date, every TRM filed has been a consensus document. However, the SAG also has a process for filing any updates when there is disagreement.
- **Net-to-gross (NTG) program assumptions.** The SAG has a similar annual process for engaging with all parties, including the utilities' independent evaluators, to develop NTG assumptions for every program the utilities are operating.
- **Energy-Efficiency Policy Manual.** A couple of years ago, the SAG developed a policy manual which it now also updates annually and files with

[41] For the current version (6.0), which is in four volumes, see (http://www.ilsag.info/il_trm_version_6.html).

1 the ICC. The policy manual explains how the SAG works as well as the
2 TRM and NTG processes discussed above. The manual also spells out how
3 TRC cost-effectiveness calculations are to be performed; sets forth schedules
4 and processes for developing EM&V plans and reviewing and finalizing
5 EM&V reports; dictates consistent statewide utility quarterly and annual
6 reporting requirements; and covers related issues.

7 • **Cost-effectiveness testing parameters**. In the past, when there were
8 disagreements between parties over the parameters of cost-effectiveness
9 analyses, the ICC directed the SAG to flesh out the issues and attempt to
10 resolve them. There was partial resolution with a couple of remaining
11 disagreements that the ICC was going to address (but subsequent legislation
12 addressed them first).

13 • **Large industrial self-direct program design**. Several years ago there was
14 disagreement in a contested proceeding over the effectiveness of a utility's
15 program offerings for large industrial customers. Following a directive from
16 the ICC, the SAG worked by consensus to develop a self-direct program for
17 large industrial customers.

18 • **Low-income program design and delivery**. The ICC has directed the SAG
19 to work to identify ways to increase the effectiveness (particularly savings) of
20 low-income efficiency programs.

21 • **Calculation of weighted average measure life (WAML)**. Illinois's electric
22 utilities now amortize the cost of their efficiency programs over the weighted
23 average life of the efficiency measures installed. Interestingly, three different

parties initially put forward three different ways of calculating WAML. The ICC directed the SAG to attempt to reach consensus on the most appropriate way to calculate WAML.

- **Program budget reallocations**. The ICC has required that whenever a utility plans to change an approved program budget by more than 20 percent, it must report and discuss that proposed change to the SAG, with the goal that consensus on such changes (and the rationale for them) be reached without requiring Commission involvement.

The SAG has also taken upon itself efforts to negotiate details of the utilities' multi-year plans prior to their filing with the ICC. In the vast majority of cases in the last two multi-year planning cycles, consensus plan filings have been achieved.

Q: IN YOUR EXPERIENCE, WHAT FACTORS ALLOW THE ILLINOIS SAG, AND OTHER WELL-FUNCTIONING COLLABORATIVES, TO SUCCEED?

A: In my experience, there are several key factors that allow collaboratives to function well:

- **A genuine willingness on the part of all parties to work together**. That does not mean that there will be no disagreement. There will be. But in my experience, the number and importance of such disagreements decline over time as parties work together, begin to appreciate the others' perspectives, and look to find compromises that work for everyone.
- **A commitment to meet often enough to effectively work through complex issues**. In my experience, this means eight to 10 times a year, almost

monthly, for larger group discussions, as well as more numerous sub-group working sessions focused on specific topics (for example, examination and analysis of a particular program design, or updating the TRM).

- **All parties having a voice in establishing priorities for discussion,** including specific meetings agendas.
- **Independent facilitation of Collaborative meetings.** In Illinois, an independent facilitator has been hired to manage the SAG process. In Arkansas, an individual hired by the Commission to serve as an Independent Evaluation Monitor facilitates the Collaborative meetings. In Michigan, a Commission staff person manages the monthly Collaborative meetings and related subcommittee or working-group meetings. An independent facilitator ensures that all voices are heard, including in the setting of agendas for meetings, and enables participants in the Collaborative to focus on the topic at hand rather than the actual running of meetings.
- **Institutionalization of working processes.** This starts with simple things like establishing a schedule for meetings and what those meetings will cover; distributing agendas; and distributing meeting notes, summaries of agreements/ disagreements, and lists of next steps. All of these steps must be taken with enough advance notice for parties to be able to meaningfully prepare and participate in the meetings. Over time, more formal processes should be developed (e.g., annual processes for reviewing and updating and documenting savings assumptions – ideally in a TRM). The institutionalization evolves over time as the collaborative parties get used to

working together and develop an increasing list of work products that require periodic updating.

- **Accountability**. Well-functioning collaboratives are expected to produce results and to report back to regulators, increasingly in the form of consensus filings, on progress made on key issue

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

COMMISSIONER BROWN-BLAND: Cross exhibit?

MR. NEAL: Oh! And yes, thank you, Chair Brown-Bland. We would move to admit NC Justice Center et al Evans Cross Exam Exhibit 1 into evidence.

COMMISSIONER BROWN-BLAND: There being any objection, that motion will be allowed and NC Justice Center et al Evans Cross Examination Exhibit 1 will be received into evidence.

(WHEREUPON, NC Justice Center et al Evans Cross Examination Exhibit 1 is admitted into evidence.)

COMMISSIONER BROWN-BLAND: And Witness Evans has disappeared but I'll say he was excused for the moment and I believe he'll be back.

(Laughter)

(The witness is excused.)

MS. JAGANNATHAN: Yes, I hope he didn't go too far.

COMMISSIONER BROWN-BLAND: The Company has rested. The case is with the Public Staff, I believe.

MS. EDMONDSON: The Public Staff calls Mike Maness, David Williamson and Eric Williams. I believe we've already passed out the summaries during the break.

PANEL OF MICHAEL C. MANESS,
DAVID M. WILLIAMSON AND ERIC WILLIAMS;
having been duly sworn,
testified as follows:

MS. EDMONDSON: We'll start with you, Mr. Maness.

DIRECT EXAMINATION BY MS. EDMONDSON:

Q Mr. Maness, please state your name and position for the record.

A My name is Michael C. Maness. I am Director of the Accounting Division for the Public Staff.

Q Mr. Maness, on May 22, 2018, did you prepare and cause to be filed testimony consisting of 23 pages and an appendix and two exhibits?

A Yes, I did.

Q Do you have any changes or corrections to your testimony, appendix or exhibits?

A Yes, I have two corrections, both on page 20 of my testimony. On line 7 near the beginning between the words "estimated" and "kWh", the word "opt-out", opt hyphen out should be entered there. And then on line 10 at the end of the sentence ending in 2018, there needs to be a closing parenthesis added there before the

period.

Q And with those corrections, if you averred to the same facts today, would your statements be the same?

A Yes.

MS. EDMONDSON: We request that Mr. Maness' testimony and appendix be admitted into evidence as if given orally from the witness stand, and his exhibits be marked?

COMMISSIONER BROWN-BLAND: That motion will be allowed and Witness Michael C. Maness' direct testimony will be received into evidence as if given orally from the witness stand along with Appendix A. And his exhibits will be identified as they were prefiled.

MS. EDMONDSON: Thank you.

(WHEREUPON, Maness Exhibits I and II are marked for identification as prefiled.)

(WHEREUPON, the prefiled direct testimony and Appendix A of MICHAEL C. MANESS is copied into the record as if given orally from the stand.)

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC, for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to G.S. 62-133.9 and Commission Rule R8-69	)))))	TESTIMONY OF MICHAEL C. MANESS PUBLIC STAFF – NORTH CAROLINA UTILITIES COMMISSION

May 22, 2018

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

3 A. My name is Michael C. Maness. My business address is 430 North
4 Salisbury Street, Dobbs Building, Raleigh, North Carolina.
5 I am the Director of the Accounting Division of the Public Staff – North
6 Carolina Utilities Commission (Public Staff).

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

8 A. A summary of my qualifications and duties is set forth in
9 Appendix A of this testimony.

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

11 A. The purpose of my testimony is to present my recommendations
12 regarding the overall Demand-Side Management/Energy Efficiency
13 (DSM/EE) rider (Rider 10) proposed by Duke Energy Carolinas, LLC
14 (DEC or the Company), in its Application filed in this docket on
15 March 7, 2018, pursuant to G.S. 62-133.9 and Commission Rule
16 R8-69.

17 **Q. HOW IS YOUR TESTIMONY ORGANIZED?**

18 A. My testimony begins with a review of the statutory framework for
19 DSM/EE cost recovery by electric utilities and the historical
20 background of DEC's Application in this docket. I then discuss the
21 Company's proposed billing factors and other aspects of its filing.
22 Following a summary of my investigation, I present my findings,

conclusions, and recommendations regarding approval of proposed Rider 10.

THE RATE-SETTING PROCESS FOR DEC'S DSM/EE REVENUE REQUIREMENTS

Q. PLEASE DESCRIBE THE BASIS FOR THE COMPANY'S FILING.

A. G.S. 62-133.9(d) allows a utility to petition the Commission for approval of an annual rider to recover (1) the reasonable and prudent costs of new DSM and EE measures and (2) other incentives to the utility for adopting and implementing new DSM and EE measures. However, G.S. 62-133.9(f) allows industrial and certain large commercial customers to opt out of participating in the power supplier's DSM/EE programs or paying the DSM/EE rider, if each such customer notifies its electric power supplier that it has implemented or will implement, at its own expense, alternative DSM and EE measures. Commission Rule R8-69, which was adopted by the Commission pursuant to G.S. 62-133.9(h), sets forth the general parameters and procedures governing approval of the annual rider, including but not limited to, (1) provisions for both (a) a DSM/EE rider to recover the estimated costs and utility incentives applicable to the "rate period" in which that DSM/EE rider will be in effect, and (b) a DSM/EE experience modification factor (EMF) rider to recover the difference between the DSM/EE rider in effect for a given test period

(plus a possible extension) and the actual recoverable amounts incurred during that test period; and (2) provisions for interest or return on amounts deferred and on refunds to customers.

The costs and utility incentives to be recovered via Rider 10 are all related to DSM and EE measures actually or expected to be installed or implemented during calendar years 2014-2019 (Vintage Years 2014 through 2019). Therefore, DEC has calculated each proposed Rider 10 billing factor by use of the Cost Recovery and Incentive Mechanism (Mechanism) for Demand-Side Management and Energy Efficiency Programs approved on October 29, 2013, in Docket No. E-7, Sub 1032 (the Sub 1032 Order). Revisions to the Mechanism were approved by the Commission in the 2017 DSM/EE rider proceeding, Docket No. E-7, Sub 1130 (Revised Mechanism). The Revised Mechanism is the successor to the Modified Save-A-Watt Mechanism approved on February 9, 2010, in Docket No. E-7, Sub 831, which was in effect for Vintage Years 2009 through 2013 (referred to as Vintage Years 1 through 4 in prior proceedings. In the following paragraphs, I will describe the essential characteristics of the Revised Mechanism; however, the Revised Mechanism includes and is subject to many additional and more detailed criteria than are set forth in this testimony.

1 **Q. PLEASE DESCRIBE THE DEVELOPMENT OF THE REVISED**
2 **MECHANISM AND ITS MAJOR COMPONENTS.**

3 A. In the Sub 1032 Order, the Commission approved an Agreement and
4 Stipulation of Settlement, filed on August 19, 2013, and amended on
5 September 23, 2013, by and between DEC, the Public Staff, and
6 certain other intervenors[1] (Sub 1032 Settlement), which incorporated
7 the Mechanism at that time. However, as the result of discussions
8 that took place during the Company's 2017 Sub 1130 proceeding,
9 the Company and the Public Staff recommended certain changes to
10 Paragraphs 19, 23, and 69 of the Mechanism, and the addition of
11 new Paragraphs 23A through 23D. These revisions were set forth in
12 Public Staff witness Maness Exhibit II filed in Sub 1130, and were
13 approved as set forth therein by the Commission in its *Order*
14 *Approving DSM/EE Rider, Revising DSM/EE Mechanism,*
15 *and Requiring Filing of Proposed Customer Notice*, issued
16 August 23, 2017 (Sub 1130 Order). For purposes of clarity and
17 convenience, a copy of the entire Revised Mechanism is attached to
18 my testimony in this docket as Maness Exhibit II.

19 The overall purpose of the Revised Mechanism is to (1) allow DEC
20 to recover all reasonable and prudent costs incurred for adopting and

[1] The parties to the Sub 1032 Settlement were DEC; the North Carolina Sustainable Energy Association; the Environmental Defense Fund; the Southern Alliance for Clean Energy; the South Carolina Coastal Conservation League; the Natural Resources Defense Council; the Sierra Club; and the Public Staff.

implementing new DSM and new EE measures; (2) establish certain requirements, in addition to those of Commission Rule R8-68, for requests by DEC for approval, monitoring, and management of DSM and EE programs; (3) establish the terms and conditions for the recovery of certain utility incentives - net lost revenues (NLR) and a Portfolio Performance Incentive (PPI) to reward DEC for adopting and implementing new DSM and EE measures and programs; and (4) provide for an additional incentive to further encourage kilowatt-hour (kWh) savings achievements. The Revised Mechanism includes provisions addressing mechanism continuity and review, program modification flexibility, and the treatment of opted-out and opted-in customers, as well as provisions directly affecting the calculation of the DSM/EE and DSM/EE EMF riders. Among these provisions are the following:

1. With the exception of Low-Income Programs or certain other societally beneficial non-cost-effective programs approved by the Commission, all programs submitted for approval will have an estimated TRC and UCT test result greater than 1.00. For purposes of calculating cost-effectiveness for program approval, the Company shall use projected avoided capacity and energy benefits specifically calculated for the program, as derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates as of the date of the program approval filing, but using, for program-specific avoided energy benefits, the projected EE portfolio hourly shape rather than an assumed 24x7 100 MW reduction.

2. In each annual DSM/EE cost recovery filing, DEC shall perform and file (a) prospective cost-effective test evaluations for each of its approved DSM and EE programs, and (b) prospective aggregated portfolio-level cost-effectiveness test evaluations for its approved DSM/EE programs, using the same methodology for determining avoided capacity and energy benefits as set forth in the Revised Mechanism for program approval, except that the reference Commission-approved avoided cost credits shall be derived from those approved as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing. For any program that initially demonstrates a TRC, determined pursuant to paragraph 23A above of less than 1.00, the Company shall either terminate the program or undertake a process over the next two years to improve program cost-effectiveness. For programs that demonstrate a prospective TRC of less than 1.00 in a third DSM/EE rider proceeding after the initial non-cost-effective result, the Company shall terminate the program effective at the end of the year following the DSM/EE rider order, unless otherwise ordered by the Commission.

3. Industrial and large commercial customers have the flexibility to opt out of either or both of the DSM and EE categories of programs for one or more vintage years, as well as the ability to opt back into either or both the categories for a later vintage year. If a customer opts back into the DSM category, it cannot opt out again for three years; however, a customer has the freedom to opt in or out of the EE category for each vintage year. Additionally, if a customer opts out of paying the rider for a vintage year after one or more years in which the customer was "opted in," DEC may charge the customer subsequent DSM/EE and DSM/EE EMF riders only for those vintage years in which the customer actually participated in a DSM/EE program.

4. DSM/EE and DSM/EE EMF riders will be calculated on a vintage year basis, with separate riders being calculated for the Residential customer class and for those rate schedules within the Non-Residential customer class that have DEC DSM/EE program options in which they can participate.

5. Incurred DSM and EE program costs will be directly recovered as part of the annual riders. Deferral accounting for over- and underrecoveries of costs is allowed, and the balance in the deferral account(s), net of deferred income taxes, may accrue a return at the net-of-tax rate of return approved in DEC's then most recent general rate case.

6. DEC will be allowed to recover NLR as an incentive (with the exception of those amounts related to research and development or the promotion of general awareness and education of EE and DSM activities), but will be limited for each measurement unit installed in a given vintage year to those dollar amounts resulting from kWh sales reductions experienced during the first 36 months after the installation of the measurement unit. NLR related to pilot programs are subject to additional qualifying criteria.

7. The eligibility of kWh sales reductions to generate recoverable NLR during the applicable 36-month period will cease upon the implementation of a Commission-approved alternative recovery mechanism that accounts for NLR, or new rates approved by the Commission in a general rate case or comparable proceeding.

8. NLR will be reduced by net found revenues, as defined in the Revised Mechanism, that occur in the same 36-month period. Net found revenues will continue to be determined according to the "Decision Tree" process approved by the Commission on February 8, 2011, in Docket No. E-7, Sub 831.[2]

9. DEC will be allowed to recover a PPI for its DSM and EE portfolio based on a sharing of actually achieved and verified energy and peak demand savings (excluding those related to general programs and measures and research and development activities). Any PPI related to pilot programs is subject to additional qualifying criteria. Unless the Commission determines otherwise in an annual DSM/EE rider proceeding, the amount of the pre-income-tax PPI initially to be recovered for the entire DSM/EE portfolio for a vintage year will be equal to 11.5% multiplied by the present value of the estimated net dollar savings associated with the DSM/EE portfolio installed in that vintage year. Low-income programs

[2] Additionally, in its Order issued on August 21, 2015, in Docket No. E-7, Sub 1073, the Commission found that "it is reasonable, for purposes of this proceeding, for DEC to include negative found revenues associated with its current initiative to replace mercury vapor (MV) lighting with light emitting diode (LED) fixtures in the calculation of net found revenues used in the Company's calculation of NLR."

with expected Utility Cost Test (UCT) results less than 1.00 and other non-cost-effective programs with similar societal benefits as approved by the Commission will not be included in the portfolio for purposes of the PPI calculation. The PPI for each vintage year will ultimately be trued up based on net dollar savings as verified by the evaluation, measurement, and verification (EM&V) process and approved by the Commission. For Vintage Years 2019 and afterwards, the program-specific per kilowatt (kW) avoided capacity benefits and per kWh avoided energy benefits used for the initial estimate of the PPI and any PPI true-up will be derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing, but using, for program-specific avoided energy benefits, the projected EE portfolio hourly shape rather than an assumed 24x7 100 MW reduction.

10. If the Company achieves incremental energy savings of 1% of its prior year's system retail electricity sales in any year during the five-year 2014-2018 period, the Company will receive a bonus incentive of $400,000 for that year.

The Revised Mechanism adopted and continued certain requirements from several prior Commission orders.

THE COMPANY'S PROPOSED BILLING FACTORS AND OTHER ASPECTS OF ITS FILING

Q. PLEASE DESCRIBE THE BILLING FACTORS AND VINTAGE YEARS BEING CONSIDERED IN THIS PROCEEDING.

A. In its Application and the supporting testimony and exhibits, DEC requested approval of 14 billing factors [including the North Carolina Regulatory Fee (NCRF)] comprising Rider 10, which is to be charged for service rendered during the rate period

January 1, 2019, through December 31, 2019. These proposed billing factors are set forth on Miller Exhibit 1, Pages 1 and 2.

For purposes of the Company's filing, the following vintage year time periods apply[3]:

Vintage Year 2014:	The year ended December 31, 2014.
Vintage Year 2015:	The year ended December 31, 2015.
Vintage Year 2016:	The year ended December 31, 2016.
Vintage Year 2017:	The year ended December 31, 2017.
Vintage Year 2018:	The year ended December 31, 2018.
Vintage Year 2019:	The year ended December 31, 2019.

Q. WHAT ARE THE GENERAL CHARACTERISTICS OF DEC'S PROPOSED DSM/EE BILLING FACTORS?

A. DEC's proposed billing factors have the following general characteristics:

1. For Vintage Year 2019, proposed Rider 10 includes billing factors intended to recover estimated program costs and a PPI, as well as estimated calendar year 2019 NLR, applicable to DSM and EE measures projected to be installed or implemented during Vintage Year 2019, all subject to future true-up.

[3] In addition to the applicable mechanism noted above, particular billing factors may also be subject to Commission rulings in Subs 831, 938, 979, and 1032, as well as the various annual DSM/EE cost and incentive recovery proceedings and individual program approval proceedings.

2. For Vintage Year 2018, the proposed Rider includes billing factors (or components of billing factors) intended to prospectively recover estimated calendar year 2019 NLR associated with Vintage Year 2018 installations, subject to future true-up.

3. For Vintage Year 2017, the proposed Rider includes billing factors (or components of billing factors) intended to (a) prospectively recover estimated calendar year 2019 NLR associated with Vintage Year 2017 installations, subject to future true-up, and (b) true up 2017 program cost and, to the extent EM&V of these results has been completed, Vintage Year 2017 participation and per-participant avoided cost savings and calendar years 2017 and 2018 NLR.

4. For Vintage Year 2016, the proposed Rider includes billing factors (or components of billing factors) intended to, to the extent EM&V of these results has been completed, true up Vintage Year 2016 participation and per-participant avoided cost savings and calendar years 2016, 2017, and 2018 NLR.

5. For Vintage Year 2015, the proposed Rider includes billing factors intended to, to the extent EM&V of these results has been completed, true up Vintage Year 2015 participation and per-participant avoided cost savings and calendar years 2015, 2016, 2017, and 2018 NLR.

6. For Vintage Year 2014, the proposed Rider includes billing factors intended to, to the extent EM&V of these results has been completed, true up Vintage Year 2014 participation and per-participant avoided cost savings and calendar years 2014, 2015, 2016, and 2017 NLR.

As described in the testimony of DEC witness Carolyn Miller (as well as my testimony in last year's DEC DSM/EE rider proceeding and the Sub 1130 Order), the billing factors for Vintage Years 2014-2018 also include the effect of corrected estimates of revenues to be recovered through the DSM/EE rider approved in last year's DSM/EE rider proceeding (Rider 9).

Q. COULD THERE BE FUTURE TRUE-UPS OF THE DSM/EE REVENUE REQUIREMENTS?

A. Certain components of the revenue requirements related to prior years (Vintage Years 2014 through 2018) will remain subject to prospective update adjustments and/or retrospective true-ups in the future. The various types of other expected or possible adjustments to the revenue requirements for these vintage years include prospective recovery of NLR requirements; true-ups of program cost; and true-ups of the PPI and NLR requirements to reflect the results of and possible adjustments to participation and EM&V analyses.

1 **INVESTIGATION AND CONCLUSIONS**

2 **Q. PLEASE DESCRIBE YOUR INVESTIGATION OF DEC'S FILING.**

3 A. My investigation of DEC's filing in this proceeding focused on
4 whether the Company's proposed DSM/EE billing factors (a) were
5 calculated in accordance with the Sub 1032 Settlement,
6 the Sub 1130 Order, and the Revised Mechanism, and (b) otherwise
7 adhered to sound ratemaking concepts and principles. The
8 procedures I and other members of the Public Staff's Accounting
9 Division utilized included a review of the Company's filing, relevant
10 Commission proceedings and orders, and workpapers and source
11 documentation used by the Company to develop the proposed billing
12 factors. Performing the investigation required the review of
13 responses to written and verbal data requests, as well as discussions
14 with Company personnel. As part of its investigation, the Public Staff
15 performed a review of the DSM/EE program costs incurred by DEC
16 during the 12-month period ended December 31, 2017.
17 To accomplish this, the Public Staff selected and reviewed samples
18 of source documentation for test year costs included by the Company
19 for recovery through the DSM/EE riders. Review of this sample,
20 which is still underway as of the date of this testimony, is intended to
21 test whether the costs included by the Company in the DSM/EE
22 riders are valid costs of approved DSM and EE programs.

1 **Q. WHAT ARE YOUR FINDINGS AND CONCLUSIONS?**

2 A. With the exception of items specifically described later in this
3 testimony, as well as subject to the outcome of the Public Staff's
4 program cost review described above, I am of the opinion that the
5 Company has calculated the Rider 10 billing factors in a manner
6 consistent with G.S. 62-133.9, Commission Rule R8-69,
7 the Sub 1032 Settlement, the Sub 1130 Order, the Revised
8 Mechanism, and other relevant Commission Orders. However, this
9 conclusion is subject to the caveat that the Public Staff is still in the
10 process of reviewing certain data responses received from the
11 Company, including documentation of costs selected for review in
12 the Public Staff's sample; should this review result in any further
13 issues, the Public Staff will file additional information with the
14 Commission.

15 I would like to note the following regarding the Public Staff's
16 investigation:

17 (1) Review of Vintage Year 2017 Program Costs – As noted
18 previously, the Public Staff's review of samples of Vintage Year 2017
19 program costs is underway, but not yet completed. If any concerns,
20 issues, or necessary adjustments are found during the completion of
21 this process, the Public Staff will file supplemental information in this
22 proceeding related to such.

(2) Avoided Costs to be Used in the Determination of the PPI – In his testimony in this proceeding, Public Staff witness Williams recommends that the avoided capacity cost benefits used to determine the PPI should be consistent with the avoided cost rates for capacity set by the Commission for Qualifying Facilities (QFs) under PURPA[4], as provided for in the Revised Mechanism. Per Mr. Williams, maintaining this consistency requires that avoided capacity cost benefits for purposes of the PPI be calculated under the assumption that generation kW (capacity) avoided prior to year 2023 be assigned a zero dollar value. Mr. Williams testifies that instead of assigning a zero dollar value to such avoided generation kW, the Company has assigned full capacity value to them.

I concur with Mr. Williams' recommendation. Paragraph 69 of the Revised Mechanism reads as follows:

> 69. For the PPI for Vintage Years 2019 and afterwards, the program-specific per kW avoided capacity benefits and per kWh avoided energy benefits used for the initial estimate of the PPI and any PPI true-up will be derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing. However, for the calculation of the underlying avoided energy credits to be used to derive the program-specific avoided

[4] The Public Utility Regulatory Policy Act of 1978.

> energy benefits, the calculation will be based on the projected EE portfolio hourly shape, rather than the assumed 24x7 100 MW reduction typically used to represent a qualifying facility.

Pursuant to Paragraph 69, for purposes of this proceeding, the treatment recommended by Mr. Williams should be applied to calculate the estimated (and, therefore, the eventually trued-up) PPI for Vintage Year 2019. Since the Company did not do so, it is appropriate and necessary to make an adjustment to the estimated Vintage Year 2019 PPI proposed in this case by DEC to bring it into compliance with the Commission-approved Revised Mechanism.

In the course of its investigation, the Public Staff asked the Company to provide a calculation of estimated avoided cost benefits related to Vintage Year 2019 under the assumption that avoided capacity kW occurring prior to year 2023 is assigned a zero dollar value.[5] According to the Company's calculation, making this assumption reduces the estimated Vintage Year 2019 system-level PPI from $25,050,064 to $16,055,813, a decrease of $8,994,251. This reduction is incorporated into the billing factors set forth on Maness Exhibit I. I also recommend that the $8,994,251 reduction in the system PPI be included in all future true-ups of the Vintage

[5] Certain DSM/EE measures installed or implemented in Vintage Year 2019 have lives extending into and beyond 2023, meaning that assigning an avoided capacity cost benefit of $0 to kW savings achieved before 2023 does not reduce the avoided capacity cost benefit for the entire Vintage Year to $0.

2019 DSM/EE revenue requirement and billing factors. Furthermore, I recommend that for as long as the Docket No. E-100, Sub 148 avoided cost rates remain in effect, the Company continue to assign a capacity cost value of zero to all kW savings occurring before year 2023 that are related to Vintage Years 2019 and afterwards, consistent with Paragraph 69 of the Revised Mechanism.

(3) kWh Sales used to Calculate Billing Factors – As in past years' DSM/EE rider proceedings, the Company has performed a calculation of estimated 2019 kWh sales to be used to derive the various billing factors proposed for approval in the proceeding. The revenue requirement for each applicable billing group (Residential or Non-Residential, Prospective or EMF factor, DSM or EE) and applicable Vintage Year has been divided by the calculated kWh sales applicable to that revenue requirement to determine the proposed cents per kWh (cents/kWh) billing factor for that particular group/vintage combination. More specifically, for the single residential billing factor, the Company has used its most recent forecast (as of the time of filing) of N.C. retail Residential kWh sales for the 2019 rate period to determine the denominator of the Residential cents/kWh billing factor calculation. For each Non-Residential DSM, EE, DSM EMF, and EE EMF billing factor, for each Vintage Year, two steps were involved in the process. The first was to determine the most recent forecast of N.C. retail

1 Non-Residential kWh sales for the 2019 rate period. The second
2 step was to subtract from that total the amount of estimated 2019
3 kWh sales applicable to Non-Residential customers who have
4 effectively opted out for each Vintage Year. The difference between
5 the total 2019 Non-Residential kWh sales forecast and the estimated
6 2019 opt-out kWh sales for each group/vintage combination is the
7 participating kWh sales total for that combination, which is used as
8 the denominator for that group/vintage billing factor. Thus, as
9 presented on Company witness Miller's Exhibit 6, there are 13
10 separate calculations of estimated participating kWh sales: one for
11 Residential, six for Non-Residential EE (Vintage Years 2014 through
12 2019), and six for Non-Residential DSM.

13 In the course of my review of the rate calculations, I noted that for
14 each Non-Residential vintage/factor combination for Vintage Years
15 2014-2018, there has been a significant decrease in the level of 2019
16 participating kWh sales from that which was estimated in last year's
17 proceeding for 2018, amounting to, on average, a decrease of
18 approximately 12%. This decrease is the result of two things: first,
19 the overall Non-Residential kWh sales forecast has decreased by
20 approximately 3.90% from 2018 to 2019; and second, the
21 Company's estimate of opt-out sales for the vintage/factor groups
22 has increased by an average of 6.92% Since an increase in
23 estimated opt-out sales translates into a decrease in participating

sales, the combination of these two changes results in a "double whammy" to the estimate of participating 2019 sales, and a substantial increase to the resulting DSM/EE billing factors.

It appears somewhat incongruous that while fewer Non-Residential sales overall are expected in 2019 from what was expected last year for 2018, estimated opt-out sales are estimated to be higher in 2019 than they were expected to be in 2018. One of the reasons for this incongruity, as explained by Company personnel during my review, is that as customers newly choose to opt out, their sales as applicable to past Vintage Years are also treated as "opt-out sales," to the extent each customer did not actually participate in a DSM or EE program in those past years. However, another reason may be that the Company uses as its estimate of opt-out sales for the coming rate period the actual opt-out sales from the most recent calendar year. Thus, the estimate of 2019 opt-out kWh sales for each vintage/factor combination is the actual level of 2017 opt-out sales for that combination. Therefore, the estimate does not reflect the overall Non-Residential kWh sales decrease forecasted for 2019 as compared to what was forecasted for 2018.

I am concerned that in the specific circumstances of this case, the result of this time lag may cause the 2019 Non-Residential billing factors to be overstated. Although most of this over-statement would

be corrected in future periods as the billing factors are trued up to reflect actual revenue requirements and amounts collected, I do not believe that it would be reasonable to expose customers who are charged the Rider 10 billing factors to a possible "rate spike" due to an understatement of participating Rider 10 kWh sales. Therefore, I am recommending that the Company's proposed level of 2019 estimated kWh sales for each Non-Residential vintage/factor combination be reduced by 3.90% (the average difference between the overall Non-Residential kWh sales currently forecasted for 2019 and the same as forecasted last year for 2018. Because of this change in the typical method used to calculate the billing factors, I also recommend that the true-up process for Rider 10 be held open until the total actual amount of Rider 10 revenues collected can be reflected in the rate calculation process, and that the Company be allowed to recover carrying costs on any understatements of Rider 10 billing factors caused by use of the Public Staff's recommended levels of participating Rider 10 kWh sales versus the actual levels of such kWh sales, but with the understatement eligible for carrying charges limited to the difference between the Public Staff's recommended levels of participating Rider 10 kWh sales and the Company's initially proposed levels of such sales in this proceeding. This adjustment reduces the estimated factors in a manner that would tend to reduce the overall Non-Residential DSM/EE revenue

1 collected by approximately $5.7 million. The results of my
2 recommendation are incorporated into the billing factors set forth on
3 Maness Exhibit I.

4 (4) Return on Deferred Program Costs and Interest on
5 Overrecoveries – As stated in past proceedings, the Public Staff
6 reserves the right to raise the issue of the appropriate interest rate
7 on overrecoveries of utility incentives.

8 **Q. WHAT IS THE IMPACT OF PUBLIC STAFF WITNESS**
9 **WILLIAMSON'S TESTIMONY ON YOUR CONCLUSIONS**
10 **REGARDING THE DSM/EE REVENUE REQUIREMENTS IN THIS**
11 **PROCEEDING?**

12 A. Public Staff witness Williamson has filed testimony in this proceeding
13 discussing several topics and issues related to the Company's filing.
14 None of these topics and issues necessitates an adjustment in this
15 particular proceeding to the Company's billing factor calculations,
16 although some of the recommendations made by Mr. Williamson may
17 affect the revenue requirements in future proceedings.

18 **Q. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING THE**
19 **RIDER 10 BILLING FACTORS.**

20 A. In summary, I have identified two issues that necessitate adjustment
21 to the DSM/EE billing factors proposed by the Company: first, the
22 valuation of avoided capacity benefits produced by DSM/EE

measures estimated to be installed/ implemented in Vintage Year 2019; and second, the potential understatement of calendar year 2019 kWh sales. Other than these issues, the Public Staff has found no errors or other issues necessitating an adjustment to the Rider 10 billing factors.

RECOMMENDATION

Q. WHAT IS YOUR RECOMMENDATION IN THIS PROCEEDING?

A. Based on the results of the Public Staff's investigation (subject to completion of its review of 2017 program costs), I recommend approval of the DSM/EE billing factors set forth on Maness Exhibit I. These factors incorporate both my kWh sales recommendation and the recommendations of Public Staff Williams. These factors should be approved subject to any true-ups in future cost recovery proceedings consistent with the Sub 1032 Settlement, the Sub 1130 Order, and the Revised Mechanism, as well as other relevant orders of the Commission, including the Commission's final order in this proceeding. In making this recommendation, the Public Staff notes that reviewing the calculation of the DSM/EE rider is a process that involves reviewing numerous assumptions, inputs, and calculations, and its recommendation with regard to this proposed rider is not intended to indicate that the Public Staff will not raise

questions in future proceedings regarding the same or similar assumptions, inputs, and calculations.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

Appendix A

MICHAEL C. MANESS

I am a graduate of the University of North Carolina at Chapel Hill with a Bachelor of Science degree in Business Administration with Accounting. I am a Certified Public Accountant and a member of both the North Carolina Association of Certified Public Accountants and the American Institute of Certified Public Accountants.

As Director of the Accounting Division of the Public Staff, I am responsible for the performance, supervision, and management of the following activities: (1) the examination and analysis of testimony, exhibits, books and records, and other data presented by utilities and other parties under the jurisdiction of the Commission or involved in Commission proceedings; and (2) the preparation and presentation to the Commission of testimony, exhibits, and other documents in those proceedings. I have been employed by the Public Staff since July 12, 1982.

Since joining the Public Staff, I have filed testimony or affidavits in a number of general, fuel, and demand-side management/energy efficiency rate cases of the utilities currently organized as Duke Energy Carolinas, LLC, Duke Energy Progress, LLC., and Virginia Electric and Power Company (Dominion Energy North Carolina) 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, applications for approval of self-generation deferral rates, applications for approval of cost and incentive recovery mechanisms for electric utility demand-side management and energy efficiency (DSM/EE) efforts, and applications for approval of cost and incentive recovery pursuant to those mechanisms.

I have also been involved in several other matters that have come before this Commission, including the investigation undertaken by the Public Staff into the operations of the Brunswick Nuclear Plant as part of the 1993 Carolina Power & Light Company fuel rate case (Docket No. E-2, Sub 644), the Public Staff's investigation of Duke Power's relationship with its affiliates (Docket No. E-7, Sub 557), and several applications for business combinations involving electric utilities regulated by this Commission. Additionally, I was responsible for performing an examination of Carolina Power & Light Company's accounting for the cost of Harris Unit 1 in conjunction with the prudence audit performed by the Public Staff and its consultants in 1986 and 1987.

I have had supervisory or management responsibility over the Electric Section of the Accounting Division since 1986, and also was assigned management duties over the Water Section of the Accounting Division during the 2009-2012 time frame. I was promoted to Director of the Accounting Division in late December 2016.

BY MS. EDMONDSON:

Q Mr. Maness, would you please give your summary?

A Yes.

(WHEREUPON, the summary of MICHAEL C. MANESS is copied into he record.)

Summary of Testimony of Michael C. Maness
Docket No. E-7, Sub 1164

The purpose of my testimony is to present my recommendations regarding the overall Demand-Side Management/Energy Efficiency (DSM/EE) rider (Rider 10) proposed by Duke Energy Carolinas, LLC (DEC or the Company), in its Application in this proceeding. With the exception of items specifically described herein, I am of the opinion that the Company has calculated the Rider 10 billing factors in a manner consistent with G.S. 62-133.9, Rule R8-69, and the Revised Mechanism approved in Docket No. E-7, Sub 1130, subject to the completion of the Public Staff's review of a sample of source documentation for year 2017 program costs. Should this review result in any issues, the Public Staff will file additional information with the Commission.

Avoided Costs to be Used in the Determination of the Portfolio Performance Incentive (PPI):

In his testimony in this proceeding, Public Staff witness Williams recommends that the avoided capacity cost benefits used to determine the PPI should be consistent with the avoided cost rates for capacity set by the Commission for Qualifying Facilities (QFs) under PURPA, as is provided for in the Revised Mechanism. Per Mr. Williams, maintaining this consistency requires that avoided capacity cost benefits for purposes of the PPI be calculated under the assumption that generation kW (capacity) avoided prior to year 2023 be assigned a zero dollar value, the same treatment that was approved by the Commission for QFs in Docket No. E-100, Sub 148. I concur with Mr. Williams' recommendation.

This treatment reduces the estimated Vintage Year 2019 system-level PPI from $25,050,064 to $16,055,813. I also recommend that this reduction be included in all future true-ups of Vintage 2019 billing factors, and that for as long as the Sub 148 avoided cost rates remain in effect, the Company continue to assign a capacity cost value of zero to all kW savings occurring before year 2023 that are related to Vintage Years 2019 and afterwards.

Kilowatt-Hour (kWh) Sales used to Calculate Billing Factors:

As in past years' DSM/EE rider proceedings, the Company has performed a calculation of estimated 2019 kWh sales to be used as the denominator in the calculation of the various billing factors proposed for approval in this proceeding. For each Non-Residential billing factor, for each Vintage Year, two steps were involved in the process. The first was to determine the most recent forecast of N.C. retail Non-Residential kWh sales for the 2019 rate period. The second step was to subtract from that total the amount of estimated 2019 kWh sales applicable to Non-Residential customers who have effectively opted out for each Vintage Year. The resulting amount of sales is the participating kWh sales total for that Vintage Year – billing factor combination.

In the course of my review, I noted that for each Non-Residential vintage/factor combination for Vintage Years 2014-2018, there has been a significant decrease of approximately 12% in the level of 2019 participating kWh sales from that which was estimated in last year's proceeding for 2018. This decrease is the result of two things: first, the overall Non-Residential kWh sales forecast has decreased by approximately 3.90%; and second, the

Company's estimate of opt-out sales for the vintage/factor groups has increased by an average of 6.92%.

It appears somewhat incongruous that while fewer Non-Residential sales overall are expected in 2019 from what was expected last year for 2018, estimated opt-out sales are estimated to be higher in 2019 than they were expected to be in 2018. I am concerned that in the specific circumstances of this case, the result of this time lag may cause the 2019 Non-Residential billing factors to be overstated, leading to a possible rate spike. Therefore, I am recommending that the Company's proposed level of 2019 estimated opt-out kWh sales for each Non-Residential vintage/factor combination be reduced by 3.90% (the average difference between the overall 2019 versus 2018 proceeding Non-Residential kWh sales forecasts). I also recommend that the true-up process for Rider 10 be held open until the total actual amount of Rider 10 revenues collected can be reflected in the rate calculation process, and that the Company be allowed to recover carrying costs on any understatements of Rider 10 billing factors caused by the Public Staff's adjustment, but with the understatement eligible for carrying charges limited to the difference between the Public Staff's and the Company's recommended levels of participating Rider 10 kWh sales.

The results of both my recommendations are incorporated into the billing factors set forth on Maness Exhibit I.

This completes my summary.

1 MS. EDMONDSON: Thank you, Mr. Maness.
2 BY MS. EDMONDSON:
3 Q Now, Mr. Williamson, would you please state your
4 name and business position for the record?
5 A My name is David M. Williamson and I'm an
6 Engineer with the Electric Division of the Public
7 Staff.
8 Q Mr. Williamson, on May 22, 2018, did you prepare
9 and cause to be filed testimony consisting of 36
10 pages, an appendix and three exhibits?
11 A That's correct.
12 Q Do you have any changes or corrections to your
13 testimony, appendix or exhibits?
14 A I do not.
15 Q If you were asked the same questions today, would
16 your answers be the same?
17 A They would.
18 MS. EDMONDSON: We request that
19 Mr. Williamson's testimony and appendix be admitted
20 into evidence as if given orally from the witness
21 stand, and his exhibits be marked.
22 COMMISSIONER BROWN-BLAND: That request is
23 granted, and the direct testimony of David M.
24 Williamson consisting of 36 pages will be received

1 into evidence as if given orally from the witness
2 stand, along with Appendix A, and his three exhibits
3 will be identified as they were when filed.
4 MS. EDMONDSON: Thank you.
5 (WHEREUPON, Williamson Exhibits 1,
6 2 and 3 are marked for
7 identification as prefiled.)
8 (WHEREUPON, the prefiled direct
9 testimony and Appendix A of DAVID
10 M. WILLIAMSON is copied into the
11 record as if given orally from the
12 stand.)
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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC, for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to G.S. 62-133.9 and Commission Rule R8-69	)))))	TESTIMONY OF DAVID M. WILLIAMSON PUBLIC STAFF – NORTH CAROLINA UTILITIES COMMISSION

May 22, 2018

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

A. My name is David M. Williamson. My business address is 430 North Salisbury Street, Dobbs Building, Raleigh, North Carolina. I am a Utilities Engineer with the Electric Division of the Public Staff, North Carolina Utilities Commission.

Q. BRIEFLY STATE YOUR QUALIFICATIONS AND DUTIES.

A. My qualifications and duties are included in Appendix A.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present the Public Staff's analysis and recommendations with respect to the following aspects of the March 7, 2018 application of Duke Energy Carolinas, LLC (DEC), for approval of its demand-side management (DSM) and energy efficiency (EE) cost recovery rider for 2019 (Rider 10): (1) the portfolio of DSM and EE programs included in the proposed Rider 10, including modifications of those programs made pursuant to the joint motion regarding program modifications approved on July 16, 2012, in Docket No. E-7, Sub 831 (Flexibility Guidelines); (2) the ongoing cost-effectiveness of each DSM and EE program; and (3) the evaluation, measurement, and evaluation (EM&V) studies filed

as Exhibits A through L to the testimony of Company witness Robert P. Evans.

Q. WHAT DOCUMENTS HAVE YOU REVIEWED IN YOUR INVESTIGATION OF DEC'S PROPOSED RIDER 10?

A. I reviewed the application and supporting testimony and exhibits, as well as DEC's responses to Public Staff data requests. In addition, I reviewed previous Commission orders related to DEC's DSM and EE programs and cost recovery rider proceedings, including the following documents:

1. The Agreement and Joint Stipulation of Settlement (Sub 831 Agreement) approved on February 9, 2010, in Docket No. E-7, Sub 831;
2. The agreement regarding EM&V approved on November 8, 2011, in Docket No. E-7, Sub 979 (EM&V Agreement),
3. The Flexibility Guidelines;
4. The Agreement and Stipulation of Settlement (Sub 1032 Agreement) approved on October 29, 2013, in Docket No. E-7, Sub 1032 (Sub 1032 Order), which approved a new DSM/EE Cost Recovery Mechanism that incorporated the EM&V Agreement and the Flexibility Guidelines (Sub 1032 Mechanism); and

5. The Commission's *Order Approving DSM/EE Rider, Revising DSM/EE Mechanism, and Requiring Filing of Proposed Customer Notice* issued August 23, 2017, in Docket No. E-7, Sub 1130 (Sub 1130 Order) that approved revisions to the Sub 1032 Mechanism (Revised Mechanism).

Q. DO YOU HAVE ANY EXHIBITS?

A. Yes. I have included three exhibits with my testimony. Williamson Exhibit No. 1 shows the changes in the cost-effectiveness of the Company's programs as calculated by the Company in its 2016, 2017, and current DSM/EE rider proceedings. Williamson Exhibit No. 2 shows the difference in the cost-effectiveness calculations of each program using the Company's methodology of determining avoided capacity benefits as opposed to the methodology that the Public Staff believes is required by the Revised Mechanism. Williamson Exhibit No. 3 provides a historical look at the cost-effectiveness of the Company's Residential Smart $aver EE Program.

DSM and EE Programs in Rider 10

Q. PLEASE IDENTIFY THE DSM AND EE PROGRAMS FOR WHICH DEC IS SEEKING COST RECOVERY THROUGH THE DSM/EE RIDER IN THIS PROCEEDING.

A. In its proposed Rider 10, DEC included the costs and incentives associated with the following programs:

- Energy Assessments;
- EE Education;
- Residential Smart $aver® Energy Efficient Appliances and Devices;
- Residential Smart $aver® EE (formerly the HVAC EE Program);
- Multi-Family EE;
- My Home Energy Report (MyHER);
- Income-Qualified (formerly Low Income) Energy Efficiency and Weatherization Assistance;
- Power Manager;
- Nonresidential Smart $aver® Energy Efficiency Food Service Products;
- Nonresidential Smart $aver® Energy Efficiency HVAC Products;
- Nonresidential Smart $aver® Energy Efficiency IT Products;

- Nonresidential Smart $aver® Energy Efficiency Lighting Products;
- Nonresidential Smart $aver® Energy Efficiency Process Equipment Products;
- Nonresidential Smart $aver® Energy Efficiency Pumps and Drives;
- Nonresidential Smart $aver® Energy Efficiency Custom;
- Nonresidential Smart $aver® Custom Energy Assessments;
- PowerShare®;
- Power Share® Nonresidential Call Option[1];
- Small Business Energy Saver;
- Smart Energy in Offices[2];
- EnergyWise for Business; and,
- Nonresidential Smart $aver® Performance Incentive.

Each of these programs has received Commission approval as a new DSM or EE program and is eligible for cost recovery in this proceeding under G.S. 62-133.9, subject to certain program-specific conditions imposed by the Commission.

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[1] Commission Order in Sub 1130 dated August 23, 2017, approving program cancellation effective January 31, 2018.

[2] Commission Order dated February 7, 2018, approving program cancellation effective June 30, 2018.

Since program approval, DEC has modified several of these programs to add or remove measures, consistent with the Flexibility Guidelines, to enhance the programs' cost-effectiveness and address changing market conditions and technologies. In each case, DEC either sought Commission approval or provided notice of those modifications in compliance with those guidelines.

Program Performance

Q. PLEASE DISCUSS THE PERFORMANCE OF THE PORTFOLIO.

A. While the testimony and exhibits of DEC witness Evans provide information regarding the performance of each program in DEC's portfolio, I want to bring certain information to the Commission's attention regarding the performance of particular programs, as well as the performance of DEC's overall portfolio. While the portfolio of programs seems generally to be performing satisfactorily, the level of savings obtained from non-specialty light-emitting diode (LED) lighting-related measures and the My Home Energy Report (MyHER) program merit further discussion. I also discuss the performance of other programs that are struggling to remain cost-effective.

Q. PLEASE DISCUSS YOUR OBSERVATIONS CONCERNING LIGHTING-RELATED MEASURES.

A. As mentioned by Company witness Evans, savings from lighting-related measures continue to provide a significant portion of the savings in the portfolio. A review of the workpapers supporting page 4 of Evans Exhibit 1 suggests that in 2017, over 25% of the residential kWh savings and over 75% of the non-residential kWh savings came from lighting-related measures. These two lighting profiles, residential and non-residential, are comprised of both specialty and non-specialty bulbs. I have serious concerns about the future of the non-specialty bulbs incorporated in the Company's portfolio, which I discuss below.

In the Sub 1130 proceeding, the Public Staff highlighted several trends with the adoption of EE lighting measures, i.e., that the EE lighting market is being transformed and that non-specialty LED lighting will likely become the baseline standard for general service bulb technologies by January 2020, thereby decreasing savings from EE lighting programs. Those trends continue. Furthermore, I have not observed any new information that would suggest that federal proposals to revise lighting standards[3] are being delayed or modified.

[3] https://www.federalregister.gov/documents/2017/01/19/2016-32012/energy-conservation-program-energy-conservation-standards-for-general-service-lamps

DEC's market potential study (MPS) of EE programs, which was finalized last year, includes several lighting-related measures that only recognize savings through 2021.

Market transformation is difficult to determine because the metrics associated with market transformation are subjective. However, one of the purposes of utility EE programs is to encourage consumers to adopt EE on their own. As technologies become more energy efficient, costs decrease, consumer acceptance improves, adoption of EE should become more routine. For example, the free ridership calculation in the Energy Efficient Appliances and Devices Program Final Evaluation Report, Evans Exhibit K,[4] which covers calendar year 2016 through March of 2017, shows that the free ridership of the Free LED program is 50%, suggesting that one-half of the gross program savings would have been achieved even if the program did not exist.

I have also learned that the Company has commissioned a "shelving study"[5] for lighting measures. The results from this study should be finalized later this year and should provide some very

[4] Free ridership is any action a participant would have taken anyway, regardless of the program or incentive to encourage the action.

[5] A shelving study determines what types of bulbs are present in the North Carolina marketplace and the bulb types that are dominating retail shelf space.

useful data to assess future lighting technology baselines and the degree to which North Carolina's market has been transformed.

Regardless of the new standard and barring any new technology for lighting, it appears that the lighting market may be close to adopting EE lighting technologies as a baseline and that further incentives for certain EE lighting measures for certain customers may not be necessary after January 1, 2020.[6] In DEC's 2019 rider proceeding, the Company will file for rates to be effective for the 2020 rate period. I recommend that the Company include in its 2019 DSM/EE rider filing its plans to incorporate the impacts identified in the lighting shelving study, including any baseline changes for non-specialty LED bulb lighting technology in its EE programs.

Q. PLEASE DISCUSS YOUR OBSERVATIONS CONCERNING THE MYHER PROGRAM.

A. The MyHER program provides periodic reports to customers that compare their household energy consumption patterns to those of other similarly situated, nearby households. The reports provide a summary of energy use compared to the customer's neighbors, and also provide energy savings tips to encourage customers to reduce

[6] http://www.nmrgroupinc.com/wp-content/uploads/2017/09/Davids-poster-description.pdf

energy consumption. As illustrated on page 4 of Evans Exhibit 1, for Vintage year 2017, approximately two-thirds of the energy savings and three-quarters of the peak demand savings of the residential portfolio were derived from the MyHER program.

As indicated in its recent general rate case (Docket No. E-7, Sub 1146), the Company has started modernizing its grid, in part by updating its metering technology and billing software that will allow its customers to access their energy consumption data in a more manageable format. The Company is currently replacing its existing meters with Advanced Metering Infrastructure (AMI) meters, as well as replacing and updating its customer information system. Between 2013 and the end of 2017, DEC replaced approximately 35% of its total base of meters across its North Carolina service territory with AMI meters. The Company also plans to completely update and replace its billing software and customer information system over the next three to four years.

As the Company moves closer to being able to provide daily information through the use of AMI and its customer information systems, there may be some redundancy in the information available through these new systems and the information provided through the MyHER program. The EM&V for the MyHER program will need to

clearly isolate any savings associated with enhanced access to customer data provided through AMI and customer information systems from the impacts solely attributable to the customized suggestions for the home provided by the MyHER program.

The current MyHER EM&V report filed in this proceeding as Evans Exhibit C contains a list of key findings, two of which I note: (1) 94% of respondents recalled receiving at least one MyHER, with 96% of those that recalled receiving a MyHER indicating that they "always" or "sometimes" read the reports; (2) Respondents reported that the most useful feature of the reports was the graphs illustrating the home's energy usage over time, and the least useful feature was the customized suggestions for the home. Thus, while respondents appear to generally read the MyHER, much of the energy usage information that they find most useful will be, or at least should be, available through AMI and new billing functionalities.

The Public Staff will continue to work with DEC to evaluate the MyHER program to ensure that it produces verifiable and cost effective energy savings as the Company develops its technology base and provides customers with new functionalities.

Revisions to the Mechanism Approved in Sub 1130

Q. PLEASE DISCUSS THE REVISIONS TO THE SUB 1032 MECHANISM APPROVED IN THE SUB 1130 ORDER.

A. As proposed by DEC and the Public Staff, and approved by the Commission in Sub 1130, revisions to the DEC DSM/EE Mechanism were made to better align the avoided cost rates used for DSM/EE Portfolio Performance Incentive (PPI) calculations, PPI true-up, and program cost-effectiveness evaluations with the current avoided cost rates being implemented by the Company.[7] Details of this change are discussed more fully in the testimony of Public Staff witnesses Eric L. Williams and Michael C. Maness.

Impact on Portfolio Cost-Effectiveness of the Mechanism Revisions

Q. PLEASE DISCUSS THE IMPACTS TO THE PORTFOLIO AS A RESULT OF THE REVISIONS TO THE MECHANISM APPROVED IN THE SUB 1130 ORDER.

A. In the last rider proceeding, the underlying avoided costs utilized for calculation of avoided energy and avoided capacity values were

[7] Similar changes were made to the evaluation process for new programs in the Revised Mechanism but are not in issue in this proceeding. However, the Commission's decision in this proceeding should apply to the evaluation of avoided capacity values for new programs.

derived from the 2012 IRP[8] and the 2012 Avoided Cost Proceeding,[9] respectively. Public Staff witness Eric Williams discusses the reasons that the Public Staff and Company chose to propose revisions to the Sub 1032 Mechanism regarding the source of the avoided energy and capacity values. Under the Revised Mechanism, the underlying avoided costs utilized for calculation of avoided energy and capacity values in this proceeding are derived from the Avoided Cost Proceeding approved as of December 31, 2017, in Docket No. E-100, Sub 148 (Sub 148).

While the changes in program cost effectiveness from last year's to the current year's rider filing are not solely attributable to the avoided cost changes to the Mechanism, the impact of the change in avoided cost rates is significant. This change in avoided costs updated the underlying assumptions for the inputs of both avoided energy and avoided capacity. As proposed by the Company, this decreased the impacts on a net present value dollar amount by 40-50% for avoided energy rates and approximately 10% for avoided capacity rates.[10]

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[8] Docket No. E-100, Sub 137

[9] Docket No. E-100, Sub 136

[10] These decreases in avoided cost were provided to the Public Staff in the Sub 1130 proceeding. These percentages were Company projections of avoided energy and avoided capacity values that could result from the Sub 148 avoided cost proceeding, since an Order by the Commission had not been issued at the time of that rider proceeding.

Williamson Exhibit No. 1[11] shows the aggregate impact on program cost-effectiveness which includes updates to avoided cost sources, EM&V, and program participation.

Cost Effectiveness

Q. HOW IS THE COST EFFECTIVENESS OF DEC'S DSM AND EE PROGRAMS EVALUATED?

A. The Public Staff reviews the cost-effectiveness of the individual DSM/EE programs to determine if their benefits outweigh the costs when they are proposed for approval and then annually in the rider proceedings on an ongoing basis. Pursuant to the Revised Mechanism, cost-effectiveness is evaluated at both the program and portfolio levels. The Public Staff reviews cost-effectiveness using the Utility Cost (UC), Total Resource Cost (TRC), Participant, and Ratepayer Impact Measure (RIM) tests. Under each of these four tests, a result above 1.0 indicates that a program is cost-effective.

The TRC test represents the overall net system and participant benefits that will result from implementation of the program; a result

[11] The Non-Residential Smart $aver Custom and Custom Energy Assessment programs are listed separately in this Exhibit, but have recently been treated as part of the same program, with a combined TRC value of 1.04.

greater than 1.0 indicates that the overall system benefits outweigh the costs of a program to both the utility and the program's participants. A UC test result greater than 1.0 means that the program is cost beneficial[12] to the utility system (the overall system benefits are greater than the utility's costs, including incentives paid to participants). The RIM test is used to understand how ratepayers who do not participate in a program will be impacted by the program.

Q. HOW IS COST-EFFECTIVENESS EVALUATED IN DSM/EE RIDER PROCEEDINGS?

A. In each DSM/EE rider proceeding, DEC files the expected cost-effectiveness of each program and the portfolio as a whole for the upcoming rate period (Evans Exhibit 7). New DSM/EE programs are approved under Commission Rule R8-68, which evaluates cost-effectiveness over a three-to five year period using estimates of participation and measure attributes that can be reasonably expected over that period. The evaluations in DSM/EE rider proceedings look more specifically at the actual performance of a typical measure, providing an indication of what to expect in the next

[12] "Cost beneficial" in this sense represents the net benefit achieved by avoiding the need to construct additional generation, transmission, and distribution facilities related to providing electric utility service, and/or avoiding energy generation from existing or new facilities or purchased power.

1 year. Each year's rider filing is updated with the most current EM&V
2 data and other program performance data.

3 **Q. HOW DOES THE PUBLIC STAFF ASSESS COST-**
4 **EFFECTIVENESS IN EACH RIDER?**

5 A. The Public Staff compares the cost-effectiveness test results in
6 previous DSM/EE proceedings to the current filing, and develops a
7 trend of cost-effectiveness that serves as the basis for the Public
8 Staff's recommendation on whether a program should be terminated.

9 **Q. HOW DO THE COST-EFFECTIVENESS TEST SCORES FILED IN**
10 **THIS RIDER COMPARE TO SCORES IDENTIFIED IN PREVIOUS**
11 **RIDERS?**

12 A. While many programs continue to be cost effective, the TRC scores
13 as filed by the Company for all programs have decreased since the
14 2017 DSM/EE rider proceeding, mainly due to the changes in
15 avoided cost rate determinations, as mentioned earlier. These
16 changes are shown in Williamson Exhibit No. 1.

17 **Q. ARE THERE OTHER REASONS FOR THESE DIFFERENCES?**

18 A. The decreasing cost-effectiveness is also partially attributable to
19 anticipated unit savings being lower than expected as determined
20 through EM&V of the program. Also, as programs mature, baseline

standards increase, or avoided cost rates decrease, it becomes more difficult for a program to produce cost-effective savings. On the other hand, greater than expected participation usually results in greater savings per unit cost.

Q. DOES THE PUBLIC STAFF AGREE WITH DEC'S CALCULATIONS OF COST-EFFECTIVENESS FILED IN THIS PROCEEDING?

A. No. Based on the information provided in response to the Public Staff's data requests and in conversations with the Company representatives who perform the DSMore modeling, the Public Staff believes that determinations of cost-effectiveness were not based on the avoided capacity rates approved by the Commission in Sub 148. These avoided capacity rates should reflect zero avoided capacity values in years prior to the identified need for new capacity in the underlying IRP (in this case the 2016 IRP) that serves as the basis for the avoided capacity rate calculations.

Q. UNDER DEC'S CALCULATIONS OF COST-EFFECTIVENESS, ARE THERE ANY PROGRAMS THAT ARE NOT COST-EFFECTIVE FOR VINTAGE 2019?

A. Yes. Evans Exhibit 7 indicates that the Residential Smart $aver EE Program (formerly, HVAC EE) (TRC of 0.59 and a UC of 0.94),

the Income-Qualified EE and Weatherization program (low-income) (TRC of 0.83 and a UC of 0.19), the EnergyWise for Business program (TRC of 1.21 and a UC of 0.83), and the Non-Residential Smart $aver Performance Incentive (TRC of 0.81 and a UC of 2.70), are not cost-effective under either the TRC or UC test, or both.

Q. WHAT ARE THE IMPACTS ON THE COST-EFFECTIVENESS OF THE PORTFOLIO WHEN APPLYING ZERO CAPACITY VALUE FOR YEARS PRIOR TO 2023?

A. Williamson Exhibit 2 shows the change in cost-effectiveness scores for each program when no capacity value is given for years that DEC's 2016 IRP does not show a capacity need. I note that programs with measures having measure lives extending to 2023 and beyond do include a capacity payment for those periods when the IRP shows a capacity need. Besides the four programs, mentioned above, shown to be not cost-effective under DEC's calculations, use of the Public Staff's methodology shows that the Non-Residential Smart $aver Custom/Assessments program[13] would also not be cost-effective for vintage 2019.

[13] While Williamson Exhibit 2 may represent these two programs separately, the Company has combined these two programs for purposes of cost-effectiveness because of their similar nature and participation. The combined TRC value for the Smart $aver Custom/Assessments program is 0.97.

1 **Q. WHAT ACTIONS DO YOU RECOMMEND THAT THE**
2 **COMMISSION TAKE REGARDING THE NON-COST EFFECTIVE**
3 **PROGRAMS PURSUANT TO THE REVISED MECHANISM?**
4 A. As part of the Revised Mechanism, the Company and the Public Staff
5 agreed on a procedure for programs that are not cost effective.
6 Under Paragraph 23 and Paragraphs 23A-D of the Revised
7 Mechanism, for any program that initially demonstrates a TRC of less
8 than 1.00, the Company will include in its annual DSM/EE rider
9 filing a discussion of the actions being taken to maintain or
10 improve cost-effectiveness, or alternatively, its plans to terminate the
11 program. If a program demonstrates a prospective TRC of less
12 than 1.00 in a second DSM/EE rider proceeding, the Company will
13 include a discussion of what actions it has taken to improve
14 cost-effectiveness. If a program demonstrates a prospective TRC of
15 less than 1.00 in a third DSM/EE rider proceeding, the Company will
16 terminate the program effective at the end of the year following the
17 DSM/EE rider order, unless otherwise ordered by the Commission.
18 This approach provides ample time for program modifications to
19 improve cost-effectiveness. I discuss below my recommendations
20 regarding the programs in this rider proceeding that have an ongoing
21 TRC of less than 1.0:

- The Income-Qualified EE and Weatherization program (low-income) was hit with a major decrease in cost-effectiveness due largely to the update of the avoided cost sources, as illustrated in Williamson Exhibit No. 1. However, as a matter of policy,[14] low-income programs are not required to meet the cost effectiveness test thresholds that other programs must meet in order to be considered for continuation.
- The EnergyWise for Business program is a demand-side management program that draws the majority of its avoided benefits from capacity and transmission and distribution (T&D) reductions. Using the Company's application of avoided capacity costs, this program is cost effective under the TRC test; however, when using the Public Staff's methodology, this program is no longer cost effective, as illustrated in Williamson Exhibit No. 2. Pursuant to Paragraph 23B, the Company should provide a discussion of the actions being taken to maintain or improve cost-effectiveness, or alternatively, its plans to terminate the program. Pursuant to Paragraph 23C of the Revised

[14] Low income programs are intended to provide EE measures to a sector of customers who would not otherwise participate in an EE program on their own.

Mechanism, if this program shows a prospective TRC of less than 1.00 in next year's DSM/EE rider proceeding, the Company should include a discussion of what actions it has taken to improve cost-effectiveness.

- The Non-residential Smart $aver Performance Incentive program was approved in the fall of 2016 and launched in January 2017. In the Sub 1130 proceeding, this program was not cost-effective, but was still too new to assess its full potential. This year it is again not cost-effective, but because of its status last year, I consider this program to fall under paragraph 23B of the Revised Mechanism. Thus, I recommend that in its rebuttal or supplemental testimony in this proceeding, the Company provide a discussion of the actions being taken to maintain or improve cost-effectiveness, or alternatively, its plans to terminate the program. Further, if this program is again not cost-effective at the time of the next rider filing, the Company should include a discussion in that proceeding of the actions taken to improve cost-effectiveness pursuant to Paragraph 23C of the Revised Mechanism.
- Non-Residential Smart Saver Customer Energy Assessments and Non-Residential Smart Saver Custom programs were

filed separately in the last proceeding, but since then, the Company has decided to combine these two programs for purposes of program performance due to their similarities, including target participants. Under the combined efforts, the cost effectiveness of these two programs shows a TRC greater than 1.00; however, when applying the Public Staff's methodology, the combined program is no longer cost effective. Pursuant to Paragraph 23B, the Company should provide a discussion of the actions being taken to maintain or improve cost-effectiveness, or alternatively, its plans to terminate the program. Pursuant to Paragraph 23C of the Revised Mechanism, if the combined program show a prospective TRC of less than 1.00 in next year's DSM/EE rider proceeding, the Company should include a discussion of the actions taken to improve cost-effectiveness.

- With respect to the Residential Smart $aver EE program (formerly, HVAC EE program), as explained below, I believe this program should be terminated or suspended effective at the end of the year.

1 **Q. WHY ARE YOU RECOMMENDING SUSPENSION OR**
2 **TERMINATION OF THE RESIDENTIAL SMART $AVER EE**
3 **PROGRAM?**
4 A. The Residential Smart $aver EE program has struggled to achieve
5 cost-effectiveness for several years because of (1) higher efficiency
6 standards mandated by the federal government, which has
7 increased baselines against which savings impacts have been
8 measured, and (2) the need for large participant incentives to
9 overcome the upfront out-of-pocket costs to participants. Williamson
10 Exhibit No. 3 provides the history of TRC test performances for this
11 program as filed by the Company. As illustrated by Evans Exhibit 7,
12 the program continues to fail the TRC test for vintage 2019.

13 DEC has expressed a strong desire to the Public Staff to continue
14 offering a residential HVAC replacement program. With HVAC being
15 one of the largest energy-consuming appliances in the home, I agree
16 that an EE program that encourages adoption of high efficiency
17 HVAC equipment is a fundamental EE program for a utility EE
18 portfolio. I also understand that is it critical to maintain a good vendor
19 network that provides customers with accurate, reliable information
20 on HVAC energy consumption and other assistance.

In the Sub 1130 proceeding, Public Staff witness Floyd recommended that the Company either terminate the program or modify it to transition away from non-referral channel measures that are not cost-effective under the TRC, and instead focus more on referred measures. His recommendations were based upon the same cost-effectiveness and equipment cost trends that I have highlighted here. Witness Floyd recommended that the Company eliminate the non-referral channel from the portfolio because it was not cost-effective, and maintain the referral channel which was cost-effective. While the Company agreed with this recommendation, it has not removed the non-referral channel.

In the Sub 1130 proceeding, witness Floyd stated that approximately 99% of the participation in the HVAC replacement measures of the program was through the non-referral channel. New data provided by the Company in this proceeding suggest that participation is shifting from the non-referral to the referral channel, with approximately 70% of the current participation coming through the referral channel. Nevertheless, documents provided to the Public Staff in this proceeding show that the referral channel is also not projected to be cost-effective for the calendar year 2019. While the data show that participation in this area of the program is growing, the amount of participation required to make it cost effective, along

with the updated avoided cost rates,[15] make it challenging for the referral channel to stay a viable option.

Williamson Exhibit No. 3 provides the calculated TRC scores that have been filed with the Commission since the program was approved in October 2013 (Sub 1032). The exhibit illustrates the ongoing struggle of the program to remain cost-effective. Since 2015, the Commission has approved two requests by the Company to modify the program[16] in an attempt to improve its cost-effectiveness. Unfortunately, these modifications have only made marginal improvements to cost-effectiveness. The main drivers decreasing cost-effectiveness continue to be the tighter efficiency standards and decreases in the avoided cost benefits.

Q. DO YOU HAVE A PREFERENCE BETWEEN SUSPENSION AND TERMINATION OF THE RESIDENTIAL SMART $AVER EE PROGRAM?

A. While this program has continually struggled to attain and maintain cost-effectiveness, a residential HVAC program is a cornerstone

[15] The program is not cost effective, regardless of the impact of updated avoided cost rates. However, the updated avoided cost rates make the program even less cost-effective.

[16] Modifications have included a new incentive structure and adoption of the referral channel.

program for any electric utility. Though termination may be warranted, I think it is preferable that the Company suspend this program until it can determine what is necessary for this program to attain and maintain cost-effectiveness. Based on the history of cost-effectiveness, the Company's lack of success at improving the cost-effectiveness of the program, and the projected TRC test cost-effectiveness score of only 0.59,[17] I recommend that the program be suspended effective December 31, 2018. Ratepayers should not be forced to pay for this program in its current form in light of its continued non-cost effectiveness and poor prospects for viability. The purpose of the review of program cost effectiveness is to allow struggling programs to recover, not to allow struggling programs to remain in the portfolio indefinitely.

Q. WHAT IS THE STATUS OF PROGRAMS THAT WERE DETERMINED NOT TO BE COST EFFECTIVE IN THE SUB 1130 PROCEEDING?

A. Last year, the Business Energy Report pilot, the Non-Residential Smart $aver Performance Incentive, and the Residential HVAC EE (now known as the Residential Smart $aver EE) programs were determined not to be cost effective and the Company was instructed

[17] This TRC score includes both the referral and non-referral channels.

to either improve cost-effectiveness or terminate these programs. The Company terminated the Business Energy Report pilot program[18] due to its poor cost-effectiveness. I have discussed the Non-Residential Smart $aver Performance Incentive and Residential Smart Saver EE programs above.

EM&V

Q. HAVE YOU REVIEWED THE EM&V REPORTS FILED BY DEC?

A. The Public Staff contracted the services of GDS Associates, Inc., to assist it with review of EM&V. With GDS's assistance, I have reviewed the EM&V reports filed in this proceeding as Evans Exhibits A through L.

I also reviewed previous Commission orders to determine if DEC complied with provisions regarding EM&V contained in those orders. In the Sub 1130 DSM/EE rider proceeding for DEC, the Commission approved Public Staff witness Floyd's recommendations concerning:

1. Including a billing analysis and bulb replacement information in future evaluations of the Residential Multi-Family Energy Efficiency;

[18] Commission Order terminating pilot was granted in Docket No. E-7, Sub 1081 on July 25, 2017, to be effective July 30, 2017.

2. Reviewing the technological limits of water heaters and the appropriateness of outlier data used in an engineering analysis when evaluating the limitations of water heater to produce savings in the Save Energy and Water Kits measure;

3. Reviewing HVAC interactive effects, updating coincidence factors for lighting measures, and tracking the type of heating and cooling equipment used to estimate HVAC interaction factors; and,

4. Reviewing the use of metering studies to determine the hours-of-use for lighting measures installed in commercial buildings in the Non-Residential Smart $aver Energy Efficient Products and Assessments – Prescriptive.

Q. DID DEC ADOPT THE PUBLIC STAFF'S RECOMMENDATIONS IN ITS EM&V REPORTS?

A. Yes. To the extent these recommendations are applicable to the EM&V reports filed in this proceeding, the reports incorporated Mr. Floyd's recommendations. I understand that the Company's EM&V evaluator intends to incorporate these recommendations in future EM&V reports as well.

1 **Q. DO YOU HAVE ANY RECOMMENDATIONS CONCERNING THE**
2 **EM&V REPORTS YOU REVIEWED?**
3 A. Yes. I have reviewed the testimony and exhibits of DEC witness
4 Evans concerning the EM&V of DEC's DSM and EE programs.
5 Based upon my review, I have two recommendations that will impact
6 the current and future analyses for the Non-Residential Smart Saver
7 Custom program (Evans Exhibit B) and the MyHER program
8 (Evans Exhibit C).

9 **Q. PLEASE EXPLAIN YOUR EM&V-RELATED RECOMMENDATION**
10 **REGARDING THE NON-RESIDENTIAL CUSTOM PROGRAM.**
11 A. The savings and impacts of the Non-Residential Smart Saver
12 Custom program (Evans Exhibit B) were evaluated by Cadmus
13 for the 2013 to 2015 timeframe. The evaluation was conducted in
14 three phases, the first by TecMarket Works[19] (TMW), and the latter
15 two by Cadmus, after Cadmus acquired the assets of TMW in 2015.
16 The evaluation included an assessment of free ridership which was
17 used to develop a net-to-gross (NTG) ratio.

[19] "Process and Impact Evaluation of the Non-Residential Smart Saver Prescriptive Program in the Carolina System: Lighting and Occupancy Sensors," dated April 5, 2013. Filed as Ham Exhibit F in Docket No. E-7, Sub 1050.

The methodology used to estimate free ridership involved a series of survey questions designed to determine the savings that are directly attributable to the program, and how much of those savings would have occurred even in the absence of the program. The key questions in this survey questionnaire included asking respondents to provide an incentive influence rating on a scale of 0-10 (how much the program incentive influenced their decision to participate in the program). Through the discovery process, the Public Staff learned that the scoring of the survey responses was not weighted in a linear, or symmetrical fashion. The Public Staff has previously recommended to the Commission[20] that if self-reporting survey responses are used to inform free ridership, that the evaluation should use a symmetrical scoring scale, unless an explanation is provided justifying the use of an asymmetrical scale in a particular instance.

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[20] *"If self-reporting responses are used to inform free-ridership, the evaluator should use a symmetrical scoring scale to calculate free-ridership. If the evaluator determines that a symmetrical scoring scale is not appropriate for a particular question, the evaluator will provide an explanation indicating why an asymmetrical scoring scale is appropriate in a particular instance. Any such explanation should be substantiated by a reference to supporting research or documentation citing a currently accepted industry practice."* Affidavit of Public Staff witness Jack Floyd, filed June 7, 2012 in Docket No. E-7, Sub 1101. http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=c1b5e2d8-007a-4b1a-b867-acfa22bc1b79.

The effect of using the asymmetrical scoring scale for this program is that the net savings increased by approximately 3%, or approximately 4,000,000 annual kWh. Based on the magnitude of the impact on net energy savings for the program, and the Public Staff's previous recommendation to the Commission on the matter, I recommend that DEC submit a revised report in the next DSM/EE rider proceeding in which the NTG scoring scale is adjusted so that it is symmetrical, giving equal weight to survey responses that favor the Company as well as those that do not favor the Company.

Q. PLEASE EXPLAIN YOUR EM&V-RELATED RECOMMENDATION REGARDING THE MYHER PROGRAM.

A. The savings and impacts of the MyHER program were evaluated by Nexant, (Evans Exhibit C) for the period of program participation spanning May 2015 to April 2016. Nexant relied upon a randomized control trial (RCT) to determine the savings of program participants. An RCT compares observed differences in energy consumption between the treatment group (program participants) and a control group (non-participants). A benefit of the use of an RCT is that it can isolate the observed differences between the treatment and control group to those which must be attributable to the program. In other words, the only difference in the change in consumption patterns

between the treatment and control groups over time is that one group is exposed to the home energy reports and the other is not. The Public Staff recognizes this approach to be a standard and best practice for the evaluation of residential behavioral programs that are similar or identical in nature to the MyHER program.

Nexant evaluated the program savings based on the timing of participation of different groups of customers called "cohorts." As the report describes, a cohort is a group of accounts that are added to the program at a given time. For this evaluation, there were three cohorts: the first included customers who began participating in 2010, the second included those who began participating between 2012 and 2013, and the third included those who began participating between 2014 and 2015.

The annual kWh savings were found to vary by cohort as follows:

Cohort 1 (2010)	153 kWh
Cohort 2 (2012-2013)	135 kWh
Cohort 3 ((2014-2015)	319 kWh

Source: Table 3-11 of Evans Exhibit C shows point estimates for each cohort for the period May 2015 to April 2016.

The evaluation was unable to explain why the savings were so much higher among Cohort 3, when compared to the first two cohorts,

1 or identify any known differences between the three cohorts that
2 would explain the difference. While the Public Staff has confidence
3 in the methodology applied to complete this evaluation and believes
4 that the overall savings appear to be reasonable and in line with the
5 findings of other similar evaluations of residential behavioral savings
6 in the United States, the Public Staff is unable to conclude its review
7 of the overall findings and savings estimates put forth in the
8 evaluation report. The Public Staff will continue to evaluate Evans
9 Exhibit C and will coordinate with DEC to conduct additional review
10 of the data used in the evaluation. Therefore, the Public Staff is not
11 able to make a definitive recommendation on Evans Exhibit C
12 and bring its review to a conclusion. Therefore, it is my
13 recommendation that the results of the MyHER program evaluation
14 be accepted conditionally for the purposes of this EE Rider
15 proceeding. However, the Public Staff will continue to review this
16 report and offer further recommendations in the next DSM/EE rider
17 proceeding.

18 **Q. SHOULD THE EM&V REPORTS FILED IN THIS PROCEEDING BE**
19 **ACCEPTED AS COMPLETE?**

20 A. With the exception of Evans Exhibits B and C as discussed above,
21 the program vintages for which the remaining EM&V reports were

filed in this proceeding should be considered complete and do not require any adjustment to the impacts at this time. With respect to Evans Exhibits B and C, I believe it is appropriate to postpone accepting Evans Exhibit B as complete until a revised report is filed in the next rider proceeding, and also postpone accepting Evans Exhibit C until the Public Staff can conclude its review, which would be addressed in DEC's 2019 DSM/EE rider proceeding.

Q. WERE THERE ANY EM&V REPORTS THAT WERE CARRIED OVER FROM LAST YEAR'S RIDER PROCEEDING AND LEFT OPEN FOR REVISION?

A. Yes. In the Sub 1130 proceeding, Public Staff witness Floyd recommended that the EM&V reports for the Multifamily EE, Non-Residential Smart Saver Prescriptive Incentive, and Small Business Energy Saver programs (Evans Exhibits B, F, and J, respectively, filed in the Sub 1130 proceeding) be revised before accepting them as complete. These reports have been revised and submitted as Evans Exhibits H, I, and E, respectively, in this proceeding. The Public Staff's review indicates that the Company appropriately incorporated the Public Staff's previous recommendations into these EM&V reports. Therefore, I recommend that Evans Exhibits H, I, and E be considered complete for purposes of calculating program impacts in this proceeding.

1 **Q. HAVE YOU CONFIRMED THAT THE COMPANY'S**
2 **CALCULATIONS INCORPORATE THE VERIFIED SAVINGS OF**
3 **THE VARIOUS EM&V REPORTS?**
4 A. Yes. As in previous cost recovery proceedings, I was able, through
5 sampling, to verify that the changes to program impacts and
6 participation were appropriately incorporated into the rider
7 calculations for each DSM and EE program, as well as the actual
8 participation and impacts calculated with EM&V data. I reviewed:
9 (1) workpapers provided in response to data requests; (2) a sampling
10 of the EE programs; and (3) Evans Exhibit 1, which incorporates data
11 from various EM&V studies. I also met with DEC personnel to review
12 the calculations, EM&V, DSMore, and other data related to the
13 program/measure participation and impacts. Based on my ongoing
14 review of this data, I believe DEC has appropriately incorporated the
15 findings from EM&V studies and annual participation into its rider
16 calculations consistent with Commission orders and the Mechanism.
17 I will continue to review this information and, if necessary, file further
18 information with the Commission should my review reveal any
19 relevant issues that would cause me to alter my recommendations
20 or conclusions.

21 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**
22 A. Yes.

APPENDIX A

DAVID M. WILLIAMSON

I am a 2014 graduate of North Carolina State University with a Bachelor of Science Degree in Electrical Engineering. I began my employment with the Public Staff's Electric Division in March of 2015. My current responsibilities within the Electric Division include reviewing applications and making recommendations for certificates of public convenience and necessity of small power producers, master meters, and resale of electric service; reviewing applications and making recommendations on transmission proposals for certificates of environmental compatibility and public convenience and necessity; and also interpreting and applying utility service rules and regulations.

My primary responsibility within the Public Staff is reviewing and making recommendations on DSM/EE filings for initial program approval, program modifications, EM&V evaluations, and on-going program performance of DEC, DEP, and DENC's portfolio of programs. I filed an affidavit in DEP's 2016 DSM/EE rider proceeding in Docket No. E-2, Sub 1108, and testimony in DEP's 2017 DSM/EE rider proceeding in Docket No. E-2, Sub 1145.

BY MS. EDMONDSON:

Q Would you please give your summary?

(WHEREUPON, the summary of DAVID M. WILLIAMSON is copied into the record.)

Summary of Testimony
David M. Williamson
Docket No. E-7, Sub 1164

My testimony addresses a number of topics, including a review of the performance and cost-effectiveness of Duke Energy Carolinas' portfolio of DSM and EE programs, EE lighting trends and their impact on the Company's lighting programs, the impact of AMI meters and the Company's new Customer Information System on the MyHER program, the impact of zero capacity values on cost-effectiveness, and a review of the Company's EM&V reports filed in this proceeding.

PERFORMANCE AND COST-EFFECTIVENESS OF DUKE ENERGY CAROLINAS' PORTFOLIO OF DSM AND EE PROGRAMS

I reviewed Duke Energy Carolinas' portfolio of 22 approved DSM and EE programs. Each of these approved programs is eligible for cost recovery pursuant to the Commission's rules and the cost recovery mechanism approved in Docket No. E-7, Sub 1032 and revised in Sub 1130. The Company's overall portfolio performed well in 2017. My testimony highlights the perspectives used to evaluate cost-effectiveness in the annual rider proceedings. I review trends of cost-effectiveness to develop an expectation of the program's performance, costs, and measure life benefits in the upcoming rate period, as well as its ongoing cost-effectiveness. I rely on this trend, as illustrated in my exhibit, to develop my recommendations concerning whether a program should be continued, modified, or terminated. Several factors such as changes in participation, standards, or avoided costs also impact cost-effectiveness. Because of its

continued struggle to be cost-effective, and its projected cost-effectiveness, I recommend that the Residential Smart $aver EE (formerly, HVAC EE) program be suspended by December 31, 2018.

EE LIGHTING TRENDS AND THEIR IMPACT ON THE COMPANY'S LIGHTING PROGRAMS

It does not appear that the federal proposals to revise lighting standards are being delayed or modified. General Service Lighting technology continues to be leaning toward the standards of EISA 2020 that should make LED the standard lighting technology and baseline. Lighting measures, technology, and standards will continue to impact the Company's portfolio in the near future. The lighting market has adopted EE lighting to the extent that further incentives for certain EE lighting measures may not be necessary after January 1, 2020. I recommend that the Company include in its 2019 DSM/EE rider filing its plans to incorporate the impacts identified in the current lighting shelving study, including any baseline changes for non-specialty LED bulb lighting technology in its EE programs.

THE IMPACT OF AMI METERS AND THE COMPANY'S NEW CUSTOMER INFORMATION SYSTEM ON THE MYHER PROGRAM

The Company is currently replacing its existing meters with Advanced Metering Infrastructure (AMI) meters, as well as replacing and updating its customer information system. As the Company moves closer to being able to provide daily energy consumption data through the use of AMI and its customer information systems, there may be some redundancy in the information available through these new systems and the information provided through the MyHER program. The Public Staff will continue to work with DEC to evaluate the MyHER program to ensure that it produces verifiable and cost effective energy savings as the

Company develops its technology base and provides customers with new functionalities.

THE IMPACT OF ZERO CAPACITY VALUES ON COST-EFFECTIVENESS

In the last DSM/EE proceeding, the Company and Public Staff made revisions to the Mechanism that stated the avoided energy and avoided capacity rates would be derived from the PURPA Avoided Cost Proceeding that is approved and in effect as of the December 31st prior to the filing of the rider. The Public Staff believes that the Company did not update the avoided capacity cost rates used in the calculations of cost-effectiveness to reflect the procedure and calculation of avoided capacity rates approved by the Commission in the 2016 Sub 148 PURPA proceeding. Specifically, DEC did not treat its DSM/EE measures in a manner that is consistent with its treatment of QFs. DEC's calculations overvalue avoided capacity benefits by not assigning a "zero" value to that capacity to recognize that the underlying IRP does not require new capacity in years prior to 2023.

Under the Public Staff's approach to cost-effectiveness and illustrated in my exhibits, I determined that two additional programs did not have total resource cost test results above 1.0, EnergyWise for Business and the Non-Residential Smart $aver Custom/Assessment programs. I recommend that these programs continue, but that their performance be closely monitored and that the Company discuss its actions to improve the cost-effectiveness of these programs in the next rider proceeding.

REVIEW OF THE COMPANY'S EM&V REPORTS FILED IN THIS PROCEEDING

In regard to the EM&V reports filed by DEC in previous DSM/EE rider proceedings, I believe the Company has complied with the Public Staff's earlier recommendations concerning EM&V, as ordered by the Commission. The Public Staff generally agrees with the findings of the EM&V reports filed in this proceeding, except Evans Exhibits B and C, EM&V reports for the Non-Residential Smart $aver Custom and the Residential MyHER programs, respectively. I believe it is necessary to revise the Non-Residential Smart $aver Custom report and submit the revised report in the next DSM/EE rider proceeding. With respect to Evans Exhibit C, I recommend that the Commission conditionally accept Evans Exhibit C until the Public Staff can finish its review and offer further recommendations in the next DSM/EE rider proceeding. With the exception of Evans Exhibits B and C, the EM&V reports filed in this proceeding should be considered to be complete for purposes of this proceeding.

In the Sub 1130 proceeding, reports for the Multifamily EE, Non-Residential Smart Saver Prescriptive Incentive, and Small Business Energy Saver programs were left open to be revised before accepting them as complete. Revised reports, submitted as Evans Exhibits H, I, and E, respectively, in this proceeding, appropriately incorporate the Public Staff's previous recommendations and should be considered complete for purposes of calculating program impacts in this proceeding.

This concludes my summary.

1 MS. EDMONDSON: Thank you, Mr. Williamson.
2 Q Mr. Williams, would you please state your name
3 and business position for the record?
4 A My name is Eric Williams and I'm a Financial
5 Analyst in the Economic Research Division with
6 the Public Staff.
7 Q And, Mr. Williams, on May 22, 2018, did you
8 prepare and cause to be filed testimony
9 consisting of 19 pages and an appendix?
10 A Yes, I did.
11 Q Do you have any changes or corrections to your
12 testimony or appendix?
13 A No.
14 Q If you were asked the same questions today, would
15 your answers be the same?
16 A Yes.
17 MS. EDMONDSON: We request that Mr. Williams
18 testimony and appendix be admitted into evidence as if
19 given orally from the witness stand.
20 COMMISSIONER BROWN-BLAND: That motion will
21 be allowed and Mr. Williams' direct testimony
22 consisting of 19 pages along with what is now an
23 unmarked appendix will be received into evidence. And
24 we will identify that unmarked as Appendix A.

MS. EDMONDSON: Thank you.

COMMISSIONER BROWN-BLAND: And so that will be -- the testimony will be received as if given orally from the witness stand.

(WHEREUPON, the prefiled direct testimony and Appendix A of ERIC WILLIAMS is copied into the record as if given orally from the stand.)

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC, for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to G.S. 62-133.9 and Commission Rule R8-69	)))))	TESTIMONY OF ERIC WILLIAMS PUBLIC STAFF – NORTH CAROLINA UTILITIES COMMISSION

May 22, 2018

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**
2 **PRESENT POSITION.**
3 A. My name is Eric Williams. My business address is 430 North
4 Salisbury Street, Raleigh, North Carolina. I am a Financial Analyst in
5 the Economic Research Division of the Public Staff - North Carolina
6 Utilities Commission. My qualifications are included in Appendix A
7 to this testimony.
8 **Q. WHAT ARE YOUR DUTIES AT THE PUBLIC STAFF?**
9 A. My duties with the Public Staff include conducting studies on the
10 weather normalization of energy sales, electric utility meter sampling
11 plans, electric utilities' long-range peak demand and energy
12 forecasts, and the integration aspect of electric utilities' integrated
13 resource plans (IRPs). I also review electric utilities' avoided cost
14 biennial filings, as well as avoided cost issues for annual rider
15 proceedings involving fuel, renewable energy, and demand-side
16 management and energy efficiency (DSM/EE).
17 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
18 **PROCEEDING?**
19 A. The purpose of my testimony is to discuss the appropriate avoided
20 capacity cost, avoided energy cost, and avoided transmission and
21 distribution (T&D) cost that should be used to evaluate the ongoing
22 cost-effectiveness of the DSM/EE programs of Duke Energy
23 Carolinas, LLC (DEC), as well as to calculate DEC's portfolio

performance incentive (PPI) pursuant to the Cost Recovery and Incentive Mechanism for Demand-Side Management and Energy Efficiency Programs (Sub 1032 Mechanism) attached to the Agreement and Stipulation of Settlement approved on October 29, 2013, in Docket No. E-7, Sub 1032. Revisions to the Sub 1032 Mechanism (after incorporation of the revisions, the Revised Mechanism) were approved in the Commission's *Order Approving DSM/EE Rider, Revising DSM/EE Mechanism, and Requiring Filing of Proposed Customer Notice* issued August 23, 2017, in Docket No. E-7, Sub 1130 (Sub 1130).

Q. IN SUB 1130, WHAT REVISIONS TO THE MECHANISM WERE PROPOSED BY THE PUBLIC STAFF AND THE COMPANY AND APPROVED BY THE COMMISSION REGARDING AVOIDED CAPACITY COSTS?

A. The Public Staff and DEC proposed and the Commission approved revisions to Paragraphs 19, 23 and 69 of the Sub 1032 Mechanism, said revisions providing that the avoided energy and capacity benefits used for program approval and the initial estimate of the PPI and any PPI true-up, as well as for review of ongoing cost-effectiveness, would use:

> projected avoided capacity and energy benefits specifically calculated for each program, as derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial

Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider filing.

Q. WHAT IS "THE MOST RECENT COMMISSION-APPROVED BIENNIAL DETERMINATION OF AVOIDED COST RATES FOR ELECTRIC UTILITY PURCHASES FROM QUALIFYING FACILITIES" FOR PURPOSES OF THIS DSM/EE RIDER PROCEEDING?

A. The applicable avoided cost proceeding is Docket No. E-100, Sub 148 (Sub 148), in which the Commission issued an order establishing rates on October 11, 2017.

Q. IS THE AVOIDED ENERGY COST THAT DEC USED TO EVALUATE THE ONGOING COST-EFFECTIVENESS OF ITS DSM/EE PROGRAMS REASONABLE?

A. Yes. The avoided energy cost that DEC used to evaluate the ongoing cost-effectiveness of its DSM/EE programs is based on the approved 2016 Sub 148 proceeding and the agreed methodology of the Revised Mechanism.

Q. WHAT DID THE COMMISSION ORDER IN DOCKET NO. E-100, SUB 148 REGARDING AVOIDED CAPACITY COSTS AND RESULTING RATES?

A. In Sub 148, the Commission concluded that "G.S. 62-156(b)(3) requires that, when calculating avoided capacity rates using the peaker method, a utility's standard offer to purchase should include

a capacity credit for those years when the utility's most recent IRP demonstrates a need for capacity."[1] G.S. 62-156(b)(3) was amended in 2017 by the General Assembly in Part I of Session Law 2017-192 (House Bill 589) to require that with regard to power sales by small power producers to public utilities, "a future capacity need shall only be avoided in a year where the utility's most recent biennial integrated resource plan filed with the Commission pursuant to G.S. 62-110.1(c) has identified a projected capacity need to serve system load and the identified need can be met by the type of small power producer resource based upon its availability and reliability of power, other than swine or poultry waste for which a need is established consistent with G.S. 62-133.8(e) and (f)." The Commission's Sub 148 Order noted that the witnesses for DEC, Duke Energy Progress, LLC, Dominion Energy North Carolina, and the Public Staff all supported the use of zero capacity values for certain years. The Commission also concluded that "PURPA[2] was not intended to force a utility and its customers to pay for capacity that it otherwise does not need."[3]

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[1] *Order Establishing Standard Rates and Contract Terms for Qualifying Facilities*, Docket No. E-100, Sub 148, October 11, 2017 (Sub 148 Order), p. 48.

[2] Section 210 of the Public Utility Regulatory Policies Act of 1978 (PURPA).

[3] Sub 148 Order, pp. 48-49.

Q. WHAT WAS THE IMPACT OF THE COMMISSION'S CONCLUSIONS ON QUALIFYING FACILITY (QF) CAPACITY RATES?

A. The result is that for at least as long as the Sub 148 order is in effect, "new" QFs seeking to sell their energy and capacity to DEC will not be paid capacity payments until new capacity is needed in 2023, as identified in the Company's 2016 IRP.[4] The zero avoided capacity costs for the years through 2022 are combined with positive capacity payments beyond 2023 and levelized such that the avoided capacity cost rates are reduced to reflect the use of zero capacity values.

Q. IN THE SUB 148 ORDER, DID THE COMMISSION NOTE THE LINK BETWEEN PURPA-BASED AVOIDED COSTS AND THE COMPANY'S DSM/EE PROGRAMS?

A. Yes. The Commission noted that "... in addition to providing the basis for electric power purchases from QFs by a utility, the Commission-determined avoided costs are utilized in, among other applications, the determination of the cost-effectiveness of DSM/EE programs and the calculation of the performance incentives for such programs...."[5]

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[4] "New" QFs would consist of those facilities that had not previously established a legally enforceable obligation with DEC to sell their energy and capacity to the utility under a prior avoided cost rate structure.

[5] Sub 148 Order, p. 69.

1 **Q. WHAT IS THE PUBLIC STAFF'S POSITION ON HOW DSM/EE**
2 **CAPACITY COSTS SHOULD BE TREATED UNDER THE**
3 **REVISED MECHANISM?**
4 A. The Public Staff's position is that the avoided cost rates for capacity
5 that are used in the calculation of ongoing cost-effectiveness and
6 utility incentives for DSM/EE programs should be consistent with the
7 avoided cost rates for capacity for PURPA-based QFs, as provided
8 in the Revised Mechanism and noted above in the Sub 148 Order.
9 As such, DSM/EE ongoing cost-effectiveness and utility incentives
10 should be based on consistent assumptions from the approved
11 2016 Biennial Avoided Cost rates which include an avoided capacity
12 value of zero prior to 2023.[6]
13 **Q. PURSUANT TO PARAGRAPHS 23 AND 69 OF THE REVISED**
14 **MECHANISM, SHOULD ONGOING COST-EFFECTIVENESS**
15 **AND UTILITY INCENTIVES FOR DSM/EE PROGRAMS BE**
16 **DETERMINED BASED ON AVOIDED CAPACITY VALUES**
17 **GREATER THAN ZERO IN THE YEARS PRIOR TO AN**
18 **IDENTIFIED NEED FOR NEW CAPACITY IN THE COMPANY'S**
19 **IRP?**
20 A. No. In order to be consistent with the Sub 148 Order and the Revised
21 Mechanism, determinations of ongoing cost-effectiveness and utility

[6] Actual DSM/EE avoided capacity rates would be levelized across the life of a given measure, with the levelized calculation including zeros for years prior to 2023. For measure lives that end before 2023, the avoided capacity rate would be zero.

incentives of both new DSM/EE programs and new vintages of existing DSM/EE programs starting in vintage 2019 should be based on avoided capacity rates that reflect zero avoided capacity value in years prior to the identified need for new capacity in the Company's IRP (2023).

Q. DID THE COMPANY USE AVOIDED COST CAPACITY RATES THAT WERE BASED ON CONSISTENT ASSUMPTIONS AS APPROVED IN THE LAST BIENNIAL AVOIDED COST PROCEEDING?

A. No. In assessing the ongoing cost-effectiveness of its DSM/EE programs and the appropriate level of utility incentives, the Company used avoided cost rates that reflected a full capacity value, based on the peaker method, beginning in year one. Public Staff witness Williamson discusses the Public Staff's review of ongoing cost-effectiveness in more detail, and Public Staff witness Maness discusses the determination of the PPI utility incentive.

Q. DID THE PUBLIC STAFF EXPECT THE COMPANY TO USE FULL AVOIDED COST CAPACITY VALUES IN ITS CALCULATIONS OF ONGOING COST-EFFECTIVENESS AND UTILITY INCENTIVES FOR ITS DSM/EE PROGRAMS?

A. No. Given the Public Staff's understanding of the Revised Mechanism and the Commission's conclusions in Sub 148 referenced earlier in my testimony, the Public Staff did not expect the

Company to use full avoided cost values for capacity in the years in which capacity is not needed and that QF contracts receive zero avoided cost value for capacity.

In the Company's 2017 DSM/EE rider proceeding in Docket No. E-7, Sub 1130, Public Staff witness Hinton's testimony explicitly linked the PURPA-based avoided capacity and avoided energy costs to the savings and financial incentives of the Company's DSM/EE programs, which was not challenged or rebutted in the proceeding. Furthermore, Company witness Timothy J. Duff stated in his Sub 1130 supplemental and rebuttal testimony that "another benefit of the agreement is that it eliminates the potential for avoided energy and avoided capacity costs to be based upon inconsistent assumptions."[7] Mr. Duff further testified that "the proposed revisions eliminate this potential problem by aligning the assumptions for both avoided energy and avoided capacity rates, as a result of using the most recently approved avoided energy and capacity costs from the same proceeding.[8]

Q. HAS THE COMPANY EXPLAINED WHY IT INCLUDED FULL AVOIDED COST CAPACITY VALUE FOR DSM/EE PROGRAMS BEGINNING IN YEAR 1?

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[7] T., p. 65.
[8] T., p. 75.

A. Yes. In Data Request 3-1, the Public Staff asked the Company whether it had included avoided capacity cost benefits in every year during the life of each measure. The Company indicated that it had done so. The Public Staff then asked how this approach was consistent with the Sub 148 Order. The Company quoted the applicable language of the Revised Mechanism referenced above and then responded:

> The Company has followed the agreed upon mechanism by establishing avoided capacity and energy cost benefits "...derived from the underlying resource plan, production cost model, and cost inputs" used in the most recent Commission-approved Avoided Cost Proceeding. Due to fundamental differences between a QF and a DSM/EE measure, the avoided cost benefits for EE and DSM programs should not be, and were not intended to be, exactly the same as those used to establish QF payments. For example, the currently approved DEC DSM/EE mechanism specifically allows avoided energy rates to be modeled differently for DSM/EE programs (which uses the projected hourly EE portfolio) than for QF's (which uses a flat 100 MW power purchase). In this case, the resulting avoided energy rates for DSM/EE are different than for QF purchases, while being "derived from" the same underlying data and models. The mechanism, however, does not address the specifics required to properly determine the avoided capacity costs of DSM/EE programs. DSM/EE measures are different and must be evaluated differently than Qualifying Facilities. The Public Staff questions appear to contend that because avoided capacity credits for a QF are calculated based upon the projected in-service date for the next avoidable generating unit, then that same assumption should also be applied to the calculation of avoided capacity costs for DSM/EE measures. If indeed the case, that contention fails to recognize that the capacity credits for a QF were derived after inclusion of the DSM/EE portfolio in the resource plan. The very fact that the

DSM/EE portfolio has been included in the resource plan is why the QF capacity credit is zero for the period 2018-22. The valuation of QF capacity credits is incremental to a resource plan which already includes the DSM/EE portfolio. If the DSM/EE portfolio had not been included in the resource plan, then the QF capacity credits would have been the same as those used in the DSM/EE valuation of cost effectiveness because the removal of the DSM/EE portfolio would have resulted in an immediate resource need.

Q. DO YOU AGREE WITH THE COMPANY'S BASIS FOR INCLUDING FULL AVOIDED COST CAPACITY VALUE FOR DSM/EE PROGRAMS BEGINNING IN YEAR 1?

A. No. My position is consistent with the testimony in the Sub 1130 proceeding of Public Staff witness John Robert Hinton, Director of the Economic Research Division, who testified that "the use of PURPA-based avoided costs appropriately links the Company's DSM/EE savings and financial incentives with the avoided cost rates it *pays qualified facilities*, will lead to better estimates of the costs avoided by the Company's DSM/EE programs, and will provide a more accurate view of the *value* of DSM and EE."[9] (emphasis added) Mr. Hinton further testified that "... the use of PURPA-based avoided costs *links* the savings and financial incentives afforded the Company for its DSM/EE programs with the *rates it pays QFs* for avoided energy and *avoided capacity.* Therefore, I believe that the *use of PURPA-based avoided energy and capacity costs will lead to*

[9] T. p. 257.

1 *better estimates of the costs avoided by the Company's DSM/EE*
2 *programs* thereby providing a more accurate view of the value of
3 DSM and EE."[10]
4 The Company, based on the particular way it determines its IRP,
5 assumes that DSM/EE is included *a priori* and that the supply-side
6 resource plan follows from it. However, an *Integrated* Resource Plan
7 is meant to treat demand- and supply-side resources on an even
8 playing field by identifying the combination of demand- and supply-
9 side resources that lead to the lowest system cost.
10 **Q. IS THE COMPANY CORRECT IN SAYING THAT REMOVING THE**
11 **BLOCK OF DSM/EE PROGRAMS FROM THE IRP WOULD**
12 **RESULT IN A MORE IMMEDIATE NEED FOR NEW CAPACITY?**
13 A. The Company is correct in its contention that removing the block
14 of DSM/EE programs from the IRP would result in a more
15 immediate need for new capacity; however, the very same argument
16 holds with respect to projected QFs in the IRP. Removing projected
17 QFs would also result in a more immediate need for capacity. In fact,
18 DEC concludes in DR 14-4 that "if all anticipated future QF contracts
19 were removed from the DECarolinas 2016 Resource Plan, the need
20 for new capacity would advance one year, from December 2022 to
21 December 2021."

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[10] T. pp. 250-51.

DEC's argument that the capacity value of DSM/EE is derived from the fact that its removal would result in changes to the resource plan applies equally to QF capacity; thus, QF capacity would also have value prior to 2023.

Nevertheless, the General Assembly and Commission have determined that customers should not have to pay for capacity that the Company does not need and that new QFs should receive the equivalent of zero avoided capacity cost payments until capacity is needed. As the Commission noted, "... the Commission-determined avoided costs are utilized in, among other applications, the determination of the ongoing cost-effectiveness of DSM/EE programs and the calculation of the performance incentives for such programs...."[11] Those Commission-determined avoided costs for avoided capacity for DEC are zero until 2023. Therefore, DSM/EE programs should be evaluated and given incentives according to the Commission-determined avoided costs, and those avoided costs include zero value for capacity prior to 2023.

Q. DOES THE COMPANY ACKNOWLEDGE THAT INCREMENTAL DSM/EE SHOULD BE TREATED IN THE SAME WAY AS QFS WITH RESPECT TO AVOIDED CAPACITY?

[11] Sub 148 Order, p. 69.

In its response to Data Request 14-3, the Company stated in part, "It is wholly consistent to treat avoided capacity value for existing EE the same way existing QFs are treated with respect to capacity valuation, while treating incremental EE capacity value in the same manner incremental solar QF capacity value is being treated."

Thus, it is the Public Staff's understanding that if DEC proposed a new DSM/EE program that is incremental to the block of DSM/EE in the IRP, DEC would agree that this incremental DSM/EE would be treated the same as new QFs, thereby receiving the equivalent of no avoided capacity cost payment prior to 2023.

Q. TO YOUR KNOWLEDGE, DOES DEC HAVE A DEFINITIVE LIST OF PROGRAMS INCLUDED IN THE DSM/EE BLOCK IN THE IRP?

A. No. My understanding is that DEC's projection of the programs composing the DSM/EE block is rather fluid. DEC's DSM/EE block is based on projections of participation and savings associated with the Company's approved DSM/EE portfolio, as well as the Company's market potential study for DSM/EE in effect at the time the IRP is developed. This process also assumes that where possible, cost-effective programs will continue and that as other cost-ineffective programs are phased out, new, but not necessarily identified, programs will take their place.

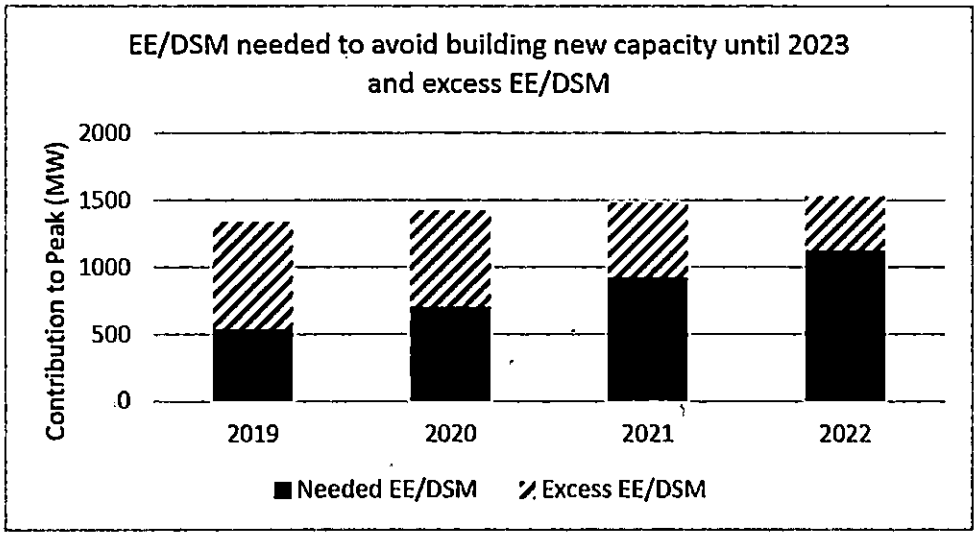
Q. HOW CAN A NEW DSM/EE PROGRAM BE DETERMINED AS INCREMENTAL TO THE BLOCK OF DSM/EE PROGRAMS INCLUDED IN THE IRP AND THEREFORE NOT BE ENTITLED TO RECEIVING CAPACITY CREDIT UNTIL 2023?

A. It appears that under DEC's approach, this determination would be made by the Company. With the constant modifications to DSM/EE programs, application of evaluation, measurement, and verification (EM&V) results, and beginning and ending of programs and measures, it would be difficult, if not impossible, to verify the Company's determination.

Q. SETTING ASIDE YOUR ASSERTION THAT DEC'S DSM/EE PROGRAMS SHOULD BE TREATED THE SAME AS QFS WITH RESPECT TO AVOIDED CAPACITY VALUE, PLEASE DISCUSS THE IMPLICATIONS OF DEC'S CONTENTION THAT ALL DSM/EE PROGRAMS WITHIN THE IRP BLOCK SHOULD HAVE FULL CAPACITY VALUE PRIOR TO 2023.

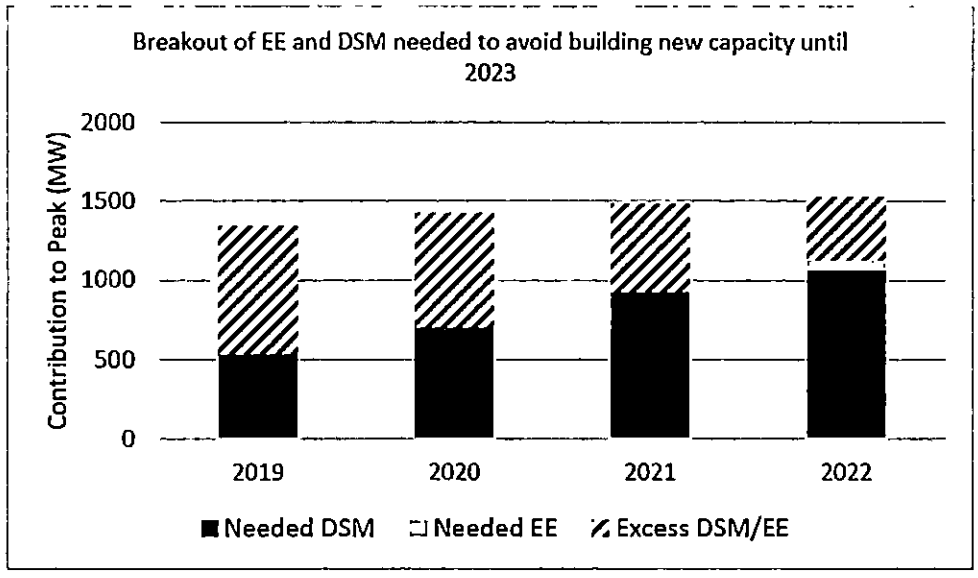
A. I evaluated DEC's Table 8-C "Summer Projections of Load, Capacity, and Reserves" in its 2016 IRP, filed in Docket No. E-100, Sub 147, to determine how much capacity from DSM/EE really is needed to avoid building new capacity until 2023. I removed enough DSM and EE capacity (as they contribute to peak) to maintain a 17% reserve margin from 2019 through 2022, so that the new capacity need remains in 2023. My evaluation indicates that beginning in 2019,

only about 40% of the DSM/EE block from the IRP is needed to maintain a 17% reserve margin. By 2022, about 74% of the DSM/EE block is needed.



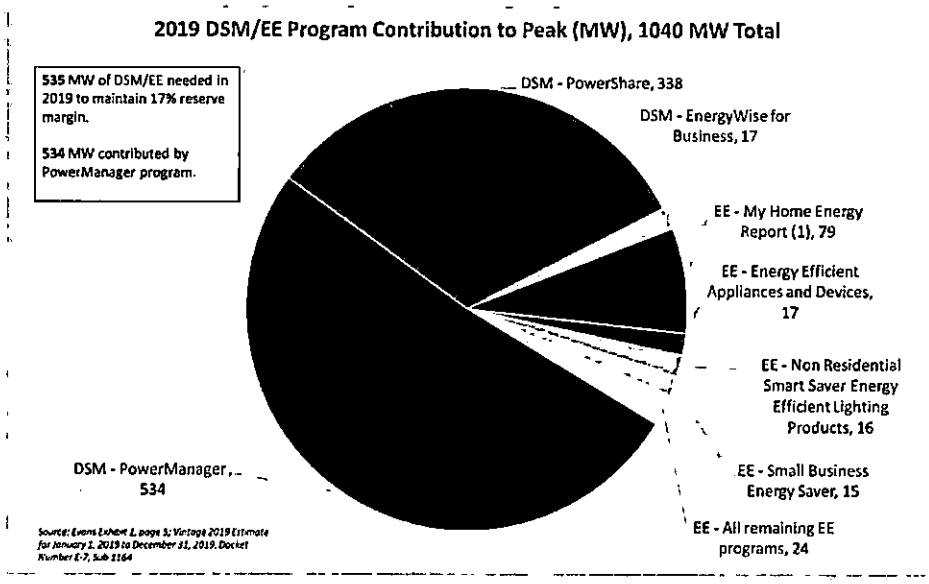
Q. WHAT IS THE ACTUAL CONTRIBUTION OF INDIVIDUAL DSM/EE PROGRAMS TO MAINTENANCE OF THE CURRENT CAPACITY EXPANSION PLAN?

A. My review indicates that DSM programs could comprise 100% of the needed DSM/EE resources from 2019 through 2021 and 95% in 2022 in order to maintain a 17% reserve margin (and delay the need for new capacity until 2023).



Not only can DSM programs contribute all the DSM/EE resources needed (535 MW) to maintain a 17% reserve margin in 2019, one DSM program – Power Manager – can contribute nearly the whole required amount by itself (534 MW). The following figure provides a detailed breakout of 2019 DSM programs in variations of blue and EE programs in variations of green. A detailed breakout of DSM/EE programs was not generated by DEC and is not available for the years 2020 – 2022 to show how the breakout may change over time.

The capacity provided through DSM programs means that, in effect, all new EE programs and all new vintages of existing EE programs are incremental to the needed DSM/EE block in the IRP and therefore do not provide any needed capacity to the system.



Residential lighting and most other EE programs – which appear to be the types of programs that the Company is continually replacing in the IRP block – have little, if any, impact on the need for new capacity. It is my understanding from Public Staff witness David M. Williamson that the DSM programs in the DSM/EE IRP block, on the other hand, are stable and expected to continue for the foreseeable future. Therefore, even under the Company's argument (i.e., any DSM/EE that avoids building capacity until 2023 should receive full capacity payments), only a small fraction of *all* EE programs likely contribute any capacity value, and any new EE program or EE vintage would contribute effectively no capacity value and would, thus, be ineligible to receive the full value of capacity payments.

1 I want to reiterate that the Public Staff disagrees with the Company's
2 argument on the grounds that it is inconsistent with the Revised
3 Mechanism and it contradicts the Commission Order in Sub 148 that
4 clearly states that 1) ratepayers should only pay for capacity in years
5 it is needed and 2) the Commission-determined avoided costs (i.e.
6 zeros for capacity before 2023) be used in determining the ongoing
7 cost-effectiveness of all DSM/EE programs and in calculating the
8 performance incentives for such programs. Public Staff witnesses
9 Michael C. Maness and David M. Williamson will address the issues
10 of DSM/EE ongoing cost-effectiveness and utility incentives in more
11 detail in their testimony.

12 **Q. ARE THERE ANY OTHER MATTERS THAT YOU WOULD LIKE**
13 **TO DISCUSS?**

14 A. Yes. In the last proceeding, the Public Staff and the Company
15 agreed to review and update the T&D avoided cost rates.
16 This methodology to calculate the avoided T&D rate was established
17 in 2014, following the Sub 1032 proceeding. The Company has
18 updated its studies using the same methodology that was previously
19 found to be reasonable. I believe the updated avoided T&D rate
20 used to determine continuing cost-effectiveness and the PPI is
21 appropriate for use in this rider.

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

23 A. Yes, it does.

Appendix A

QUALIFICATIONS AND EXPERIENCE

ERIC LEE WILLIAMS

I received a Bachelor of Arts in Economics and Political Science, with a minor in History, from the University of Kentucky in 1994. I also received a Master of Arts in Law and Diplomacy with concentrations in Development Economics and International Environmental Policy from the Fletcher School of Law and Diplomacy at Tufts University in 1997. I have 18 years of experience in energy economics and energy systems analysis. In 1998, I joined Tellus Institute, where I worked in the Electricity program and did analysis and wrote testimony on behalf of my supervisor on the issue of electricity restructuring. In late 1999, I was an Economist at the Energy Information Administration working on international energy forecasting and climate change policy analysis.

In 2000, I joined the Center for Clean Air Policy, a small NGO / think tank, as a Senior Policy Analyst. I programmed an electricity dispatch model that integrated a distributed generation (DG) diffusion model to understand the cost and environmental dynamic between DG and the existing system when providing owners of back-up diesel generators an economic incentive to generate.

In 2005, I joined a team of independent consultants assisting Arizona and New Mexico develop climate change state action plans. I led the electricity working groups in each state, evaluating greenhouse gas (GHG) reduction measures proposed by stakeholders.

Later in 2005, I joined the Nicholas Institute at Duke University as a Senior Research Economist to Co-Direct the Climate Change Policy Partnership.

I led research in the partnership, which focused on identifying barriers and developing solutions for the adoption of low-carbon energy infrastructure. I brought the National Energy Modeling System (NEMS) to the Institute and used it for a variety of energy and climate policy analyses. I also directed research on many other topics, including on barriers to utility energy efficiency programs.

In 2010, I started work as an Energy/Environmental Economist at the International Atomic Energy Agency in Vienna, Austria. I assisted developing countries assess their energy plans. I developed a capacity expansion model for Sub-Saharan Africa. I also conducted research on the impacts of climate change and extreme weather on energy infrastructure. I was a Contributing Author to the Intergovernmental Panel on Climate Change Assessment Report 5 Working Group II.

In 2014, I entered into a PhD program at Duke University to study energy systems modeling. I left the program early to join the Public Staff at the beginning of 2016. While at the Public Staff, I developed an IRP model that is integrated with a unit commitment model (UCM) with the purpose of identifying if the capacity expansion projected in the IRP is flexible enough to accommodate the increase on PV capacity in North Carolina.

In 2017, I left the Public Staff for a short-term opportunity to work in Paris at the Organization for Economic Cooperation and Development (OECD). I returned to the Public Staff in November 2017 and resumed my current duties. I have since re-written my IRP-UCM model that I plan to use in review of the 2018 IRP.

BY MS. EDMONDSON:

Q Would you please give your summary?

(WHEREUPON, the summary of ERIC WILLIAMS is copied into the record.)

Summary of Testimony

Eric Williams

Docket No. E-7, Sub 1164

My testimony discusses the appropriate avoided capacity, energy, and transmission and distribution (T&D) costs that should be used to evaluate the ongoing cost-effectiveness of the DSM/EE programs of Duke Energy Carolinas, LLC (DEC), as well as to calculate DEC's portfolio performance incentive (PPI) pursuant to the Sub 1032 Mechanism as revised in the 2017 DEC DSM/EE rider proceeding. The Revised Mechanism provides that the avoided energy and capacity benefits used for program approval, PPI, and review of ongoing cost-effectiveness would use, "projected avoided capacity and energy benefits specifically calculated for each program, as derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost rates." In this case, the applicable avoided cost proceeding is Docket No. E-100, Sub 148.

The avoided energy and T&D costs that DEC used to evaluate ongoing cost-effectiveness of its DSM/EE programs are reasonable and are based on the approved Sub 148 proceeding and the agreed methodology of the Revised Mechanism. However, the Company was not consistent with Sub 148 and the Revised Mechanism in how it applied avoided capacity value with respect to its DSM/EE programs. House Bill 589 required that "a future capacity need shall only be avoided in a year where the utility's most recent biennial integrated resource plan filed with the Commission pursuant to G.S. 62-110.1(c) has identified a projected capacity need to serve system load." The Commission's Sub

148 Order noted that the witnesses for DEC, Duke Energy Progress, LLC, Dominion Energy North Carolina, and the Public Staff all supported the use of zero capacity values for certain years. The Commission also concluded that "PURPA[1] was not intended to force a utility and its customers to pay for capacity that it otherwise does not need." The result was that the cost input into determining avoided capacity rates in Sub 148 included zero capacity values in years through 2022.

The Commission noted in Sub 148 that "... in addition to providing the basis for electric power purchases from QFs by a utility, the Commission-determined avoided costs are utilized in, among other applications, the determination of the cost-effectiveness of DSM/EE programs and the calculation of the performance incentives for such programs....". In the Company's 2017 DSM/EE rider proceeding, Public Staff witness Hinton's testimony explicitly linked the PURPA-based avoided capacity and energy costs to the savings and financial incentives of the Company's DSM/EE programs. Mr. Hinton testified that "the use of PURPA-based avoided costs appropriately links the Company's DSM/EE savings and financial incentives with the avoided cost rates it pays qualified facilities, will lead to better estimates of the costs avoided by the Company's DSM/EE programs, and will provide a more accurate view of the value of DSM and EE."

The Public Staff's position is that the avoided capacity benefits used for program approval, PPI, and review of on-going cost-effectiveness of the Company's DSM/EE programs should also be "derived from the same underlying resource plan, production

[1] Section 210 of the Public Utility Regulatory Policies Act of 1978 (PURPA).

cost model, and cost inputs" as agreed to in the Revised Mechanism. In this case, the cost inputs relevant for DMS/EE include zeros for capacity value in years prior to 2023.

In data responses, the Company contended that DSM/EE should be treated differently than QFs for two reasons. The Company pointed to the fact that the Revised Mechanism provides for a different treatment for avoided energy benefits for DSM/EE than for QFs. This is true for avoided energy benefits. The issue at hand, however, is avoided capacity benefits, and the Revised Mechanism makes no such distinction for avoided capacity benefits. The Company also argues that DSM/EE is distinct from QFs in that without DSM/EE in the IRP, there would be a more immediate need for new capacity. Therefore, the Company's position is that the DSM/EE within the IRP has capacity value and should receive full avoided capacity benefits in all years. At the same time, the Company accepts that any DSM/EE that is incremental to what is in the IRP should have zeros for capacity value for years before 2023, just as is the case for QFs. There are several flaws in the Company's position.

First, in the context of the IRP, on a MW to MW basis, the contribution to peak provided by DSM/EE is functionally equivalent to the contribution to peak provided by QF contracts. The Company acknowledges in a data response that if all future QF contracts were removed from the IRP, there would be a more immediate need for new capacity. Therefore, DSM/EE capacity is not distinct from QF capacity in this context and should not be treated differently. Any argument that DSM/EE capacity has value prior to 2023 should apply equally to QF contracts.

Second, based on the Company's argument that DSM/EE value is derived from its usefulness in delaying new capacity need until 2023, only the DSM/EE actually needed to delay new capacity need would have any value. It is important to note that only a fraction of the MWs provided by DSM/EE programs is needed to maintain a 17% reserve margin through 2022 and thus needed to preserve the expansion plan. From 2019 through 2022, only 40%, 49%, 63%, and 74% of the DSM/EE capacity is needed to maintain a 17% reserve margin. DSM programs alone can meet this need through 2021 and can meet 95% of the need in 2022. Even under the Company's argument that any DSM/EE that avoids building capacity until 2023 should receive full capacity payments, only a small fraction of all EE programs likely contribute any capacity value, and any new EE program or EE vintage would contribute effectively no capacity value and should, thus, be ineligible to receive the full value of capacity payments.

This concludes my summary.

MS. EDMONDSON: The witnesses are available for cross examination.

COMMISSIONER BROWN-BLAND: Any cross?

MS. JAGANNATHAN: I have no cross examination.

COMMISSIONER BROWN-BLAND: Are there any questions from the Commission?

CHAIRMAN FINLEY: You're getting off easy.

COMMISSIONER BROWN-BLAND: If there are no questions for these witnesses.

MS. EDMONDSON: We would enter the exhibits into evidence.

COMMISSIONER BROWN-BLAND: The exhibits of each the witnesses exhibits filed with direct testimony of Witness Maness and Witness Williamson will be received into evidence and identified as they were marked with when prefiled.

MS. EDMONDSON: Thank you.

(WHEREUPON, Maness Exhibits I and II, and Williamson Exhibits 1, 2 and 3 are admitted into evidence.)

COMMISSIONER BROWN-BLAND: Gentlemen, you're getting off light, you are excused. I must say to Witness Williams welcome back.

1 MR. WILLIAMS: Thank you.
2 (The witnesses are excused.)
3 MS. JAGANNATHAN: At this time the Company
4 would like to recall Witness Bob Evans to the stand
5 for his rebuttal testimony.
6 COMMISSIONER BROWN-BLAND: You may take a
7 seat and you will remain under oath.
8 ROBERT P. EVANS;
9 Having been previously sworn,
10 testifies as follows:
11 DIRECT EXAMINATION BY MS. JAGANNATHAN:
12 Q Mr. Evans, did you cause to be prefiled in this
13 docket rebuttal testimony consisting of 10 pages?
14 A Yes, I did.
15 Q Did you also cause to be filed Exhibits 1 and 2
16 to your rebuttal testimony?
17 A Yes, I did.
18 Q Do you have any changes or corrections to your
19 prefiled rebuttal testimony or exhibits?
20 A No, I do not.
21 Q If I asked the same questions here today, would
22 your answers be the same?
23 A Yes.
24 MS. JAGANNATHAN: I would move that

1 Mr. Evans' prefiled rebuttal testimony be entered into
2 the record as if given orally from the stand and that
3 Evans Rebuttal Exhibits 1 and 2 be marked for
4 identification.
5 COMMISSIONER BROWN-BLAND: Without
6 objection, that motion is granted.
7 MS. JAGANNATHAN: Thank you.
8 (WHEREUPON, Evans Rebuttal
9 Exhibits 1 and 2 are marked for
10 identification as prefiled.)
11 (WHEREUPON, the prefiled rebuttal
12 testimony of ROBERT P. EVANS is
13 copied into the record as if given
14 orally from the stand.)
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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-69	))))))	**REBUTTAL TESTIMONY OF ROBERT P. EVANS FOR DUKE ENERGY CAROLINAS, LLC**

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

2 A. My name is Robert P. Evans. My business address is 150 Fayetteville Street,
3 Raleigh, North Carolina 27602.

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

5 A. I am employed by Duke Energy Corporation ("Duke Energy") as Senior
6 Manager-Strategy and Collaboration for the Carolinas in the Market Solutions
7 Regulatory Strategy Evaluation group, supporting both Duke Energy
8 Carolinas, LLC ("DEC" or the "Company") and Duke Energy Progress, LLC
9 ("DEP").

10 **Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN SUPPORT**
11 **OF DEC'S APPLICATION IN THIS DOCKET?**

12 A. Yes.

13 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

14 A. The purpose of my rebuttal testimony is to respond to the testimony of Public
15 Staff witness David M. Williamson and witness Chris Neme testifying on
16 behalf of the North Carolina Justice Center, Natural Resources Defense
17 Council, and Southern Alliance for Clean Energy.

18 **Q. DO YOU HAVE COMMENTS RELATED TO PUBLIC STAFF**
19 **WITNESS WILLIAMSON'S TESTIMONY?**

20 A. Yes. These comments cover the portions of his testimony relating to: (1) his
21 recommendations that the Company include in its 2019 Demand-Side
22 Management ("DSM")/Energy Efficiency ("EE") rider filing its plans to
23

incorporate the impacts identified in the lighting shelving study, including any baseline changes for non-specialty LED bulb lighting technology in its EE programs; (2) his observations concerning the Company's My Home Energy Report ("MyHER") program; and (3) his observations and recommendations related to the cost-effectiveness of the Company's DSM/EE programs.

Q. DOES THE COMPANY INTEND TO INCORPORATE IMPACTS IDENTIFIED IN ITS LIGHTING SHELVING STUDY AND ANY BASELINE CHANGES FOR NON-SPECIALTY LED BULB LIGHTING TECHNOLOGIES IN ITS 2019 DSM/EE RIDER FILING?

A. Yes. The results of the lighting shelving study will be made available to the Public Staff this summer when DEP files the Retail Lighting evaluation, which includes this study as a component, as part of its DSM/EE rider application. In addition, baselines for non-specialty bulbs will have changed to concur with applicable Energy Independence and Security Act ("EISA") standards. The impacts of the lighting shelving study and the change in baselines for non-specialty bulbs will be reflected in DEC's 2019 DSM/EE rider filing.

Q. DO YOU HAVE ANY CONCERNS REGARDING WITNESS WILLIAMSON'S OBSERVATIONS ON THE COMPANY'S MYHER PROGRAM?

A. Yes. Given that the updated customer information system and billing system will not be in service for several years, I believe that Witness Williamson's observations are premature. Nevertheless, I do feel it is necessary to express

my concerns.

Witness Williamson indicated that

> As the Company moves closer to being able to provide daily information through the use of AMI and its customer information systems, there may be some redundancy in the information available through these new systems and the information provided through the MyHER program. The [Evaluation, Measurement, and Verification ("EM&V")] for the MyHER program will need to clearly isolate any savings associated with enhanced access to customer data provided through AMI and customer information systems from the impacts solely attributable to the customized suggestions for the home provided by the MyHER program.

Witness Williamson also noted that the MyHER EM&V report indicated that survey respondents reported that the most useful feature of the reports was the graphs illustrating the home's energy usage over time, and the least useful feature was the customized suggestions for the home. He concluded that the energy usage information that customers find most useful will be, or should be, available through AMI and new billing functionalities.

It appears that Witness Williamson is implying that the "least useful feature," the customized suggestions for the home to become more efficient, would be the only remaining MyHER-related source of energy savings once AMI is implemented. In doing so, he ignores the significant energy savings generated by the engagement and motivating effect created by the normative usage comparisons between the customer, peer group, and efficient home, which would not likely be available outside of the MyHER reports. While we cannot predict what an AMI-based paper billing will look like several years

from now, initially I believe that it probably would be similar to the copy of my DEP bill provided as Evans Rebuttal Exhibit 1. Unlike the DEC bill, which provides a customer-specific energy comparison between the bill for the current billing month and the same billing month from the prior year, the DEP bill provides a graphic with a thirteen-month energy comparison. It is important to note that while both bills contain information illustrating the home's energy usage over time, it is only the monthly data for that specific home. In comparing my bill with a sample MyHER report, which I have included as Evans Rebuttal Exhibit 2, it is clear that the information provided is significantly different. MyHER allows a customer to compare his home's energy use with similar homes in the community based on age, square footage, and fuel type.

Witness Williamson fails to acknowledge that it is the normative psychology behind the reports that drives customers to adopt the actionable tips and take on the energy efficient behavior underlying MyHER savings. With behavioral energy reports, consumers generally adjust their attitudes and behaviors to what they comprehend as overall normal attitudes and behaviors, since few want to be considered out of the norm or an outlier. By seeing how their energy use stacks up against comparable homes, customers tend to adjust their behavior. For many, it might even be subliminal actions they might not be aware they are taking.

While it is possible to isolate savings resulting from MyHER from any impacts resulting from subsequent measures or programs that arise through

1 the use of AMI, there is no reason to assume that AMI data will take the place
2 of MyHER, which delivers comparative usage information through an
3 engaging medium with information that is relevant and actionable.

4 **Q. DO YOU HAVE ANY COMMENTS RELATING TO THE COST-**
5 **EFFECTIVENESS OF THE COMPANY'S NON-RESIDENTIAL**
6 **SMART SAVER CUSTOM/ASSESSMENTS, RESIDENTIAL SMART**
7 **$AVER EE, ENERGYWISE FOR BUSINESS, AND NON-**
8 **RESIDENTIAL SMART SAVER PERFORMANCE INCENTIVE**
9 **PROGRAMS DISCUSSED IN WITNESS WILLIAMSON'S**
10 **TESTIMONY?**

11 A. Yes. Initially, I would like to indicate that the Company does not agree with
12 the application of zero avoided capacity cost values proposed by the Public
13 Staff for the determination of program cost-effectiveness. The impropriety of
14 employing zero avoided capacity cost values is discussed in the testimony of
15 Company witnesses Timothy J. Duff and Richard G. Stevie, Ph.D.

16 While the use of the Public Staff's proposed zero avoided capacity cost
17 values would render the Non-Residential Smart $aver Custom/Assessments and
18 EnergyWise for Business programs non-cost-effective, these programs are
19 considered to be cost-effective under the avoided cost rates applied by the
20 Company. Because these programs are cost-effective, paragraph 23B of the
21 Company's revised cost recovery mechanism – which, for programs that are
22 no longer cost-effective, requires the Company to provide a discussion of

1 actions being taken to maintain or improve cost-effectiveness or, alternatively,
2 its plans to terminate the program – does not apply.

3 The Company agrees with Witness Williamson that the Residential
4 Smart $aver Energy Efficiency Program is not cost-effective at this time.
5 However, the Company believes that suspending the only program that offers
6 assistance for making the largest single energy user in the home, a customer's
7 HVAC system, more energy efficient does not seem reasonable, especially
8 when the decision to make said investment only comes around once every
9 fifteen years. Furthermore, the recommended suspension of the program does
10 not take into consideration the Company's relationships with HVAC
11 contractors. This proposed suspension will likely erode trust and engagement,
12 making it more like a termination than a suspension and also making it
13 difficult to offer similar types of programs that would require trade ally
14 support in the future.

15 In the past, when the program's cost-effectiveness has struggled due to
16 efficiency standard changes, the Company has demonstrated the ability to
17 effectively modify the program to restore cost-effectiveness and should have
18 the opportunity to attempt restore to the cost-effectiveness of the program that
19 was eroded by reduction in avoided costs. The Company is currently
20 investigating several opportunities to increase the cost-effectiveness of the
21 program, including the following:

22 1. While the Company does have some concerns with respect to the
23 Public Staff's recommendation to move the program to an all referral

structure, the Company is not opposed to adopting this proposal so long as the Commission deems it appropriate. Irrespective of its concerns, the Company believes this structural change would result in the program passing the cost-effectiveness tests referenced in Witness Williamson's testimony;

2. Updating studies and performing cost studies of the incremental costs actually being paid by customers to adopt higher efficiency equipment, in order to ensure these costs are reflective of the current market. Such information could lead to greater TRC scores; and

3. Updating the measure mix, measure designs, and requirements that may be able to be removed/altered thus, lowering product cost to customers and increasing the TRC score.

The Company is confident that there is a solution available that will lead to a cost-effective program and that shutting down the current operations without an appropriate time frame for planning and adjustment is not the best answer for its customers.

The Non-Residential Smart $aver Performance Incentive Program has been in place since January 1, 2017. The program was intended to encompass large EE-related projects with uncertainty relative to their performance, for example, projects that employ new technologies. Related program incentives are provided in installments based on actual savings. In this manner, participants are properly incentivized for their EE-related investments and other customers are shielded from the impacts of overstated performance.

1 That said, very few projects are appropriate for participation in the program.
2 The 0.81 TRC test score reflected in Evans Exhibit 7 to my Direct Testimony
3 was based upon participation forecasts and costs used in the Company's 2016
4 program filing. During 2017, only two projects were involved. Currently,
5 there are twelve projects underway in the Company's North Carolina service
6 territory. The Company's estimated TRC score for this program, based on
7 these and other projects under review will exceed 1.75. In short, we do not
8 believe that this program requires additional scrutiny at this time, due to both
9 the short time it has been in place and anticipated cost-effectiveness results.

10 **Q. DO YOU HAVE ANY COMMENTS REGARDING WITNESS NEME'S**
11 **TESTIMONY?**

12 A. Yes. Witness Neme has brought up several issues and ideas relating to current
13 and potential EE programs. In addition, Witness Neme discussed the
14 employment of a Technical Resource Manual ("TRM").

15 Consistent with Witness Neme's suggestions, discussions relating to
16 current and potential EE programs should be examined within the
17 Collaborative and findings should be provided to the Commission. However,
18 I believe that given the commonality between DEC's and DEP's programs, a
19 combined DEC/DEP Collaborative would be preferable to a DEC-only
20 Collaborative. Furthermore, as Witness Neme indicated, given the
21 consideration needed to evaluate his program ideas, more than quarterly
22 meetings will be required. I recommend that the Collaborative meetings be
23 expanded from meeting quarterly to meeting every two months. Also, as to

1 Witness Neme's suggestions regarding working groups, I recommend that
2 they should be employed when deemed beneficial by the Collaborative.
3 As to the employment of a TRM, a North Carolina-specific TRM
4 working group met on several occasions during 2012, 2013, and 2014. The
5 working group did not go forward with the establishment of a TRM. That
6 said, given the time elapsed since the last examination of a TRM, the
7 Company does not object to a related working group.
8 It is important to note that such a working group would, at a minimum,
9 require representation by the Public Staff, Electric Membership Cooperatives,
10 impacted municipalities, and investor owned utilities. Since part of the
11 rationale for using a TRM is economic, such an effort should also encompass
12 South Carolina as well.
13 **Q. DOES THIS CONCLUDE YOUR PRE-FILED REBUTTAL**
14 **TESTIMONY?**
15 A. Yes.

BY MS. JAGANNATHAN:

Q Mr. Evans, do you have a summary of your rebuttal testimony?

A Yes, I do.

(WHEREUPON, the summary of ROBERT P. EVANS rebuttal testimony is copied into the record.)

SUMMARY OF REBUTTAL TESTIMONY OF ROBERT P. EVANS

The purpose of my rebuttal testimony is to respond to the testimony of Public Staff witness David Williamson and witness Chris Neme testifying on behalf of the North Carolina Justice Center, Natural Resources Defense Council, and Southern Alliance for Clean Energy.

First, I explain that the Company plans to incorporate the impacts identified in the lighting shelving study, including any baseline changes for non-specialty LED bulb in DEC's 2019 DSM/EE rider filing, as recommended by Witness Williamson.

Second, I express my concerns regarding Witness Williamson's observations relating to the Company's My Home Energy Report, or "MyHER," program. While energy usage information for a specific customer may be available through AMI, the significant energy savings generated by the motivating effect of normative usage comparisons between the customer, peer group, and efficient home, would not likely be available outside of the MyHER reports.

Third, I address the cost-effectiveness recommendations of Witness Williamson, noting that under the Company's interpretation of the appropriate avoided capacity costs, the Non-Residential Smart $aver Custom/Assessments and EnergyWise for Business programs are, in fact, cost-effective. While the Residential Smart $aver Energy Efficiency Program is not cost-effective at this time, the Company believes that suspending the only program that offers assistance for making the largest

single energy user in the home, a customer's HVAC system, more energy efficient is not the answer. I also offer several ideas for improving cost-effectiveness of this program. In addition, I explain that the Non-Residential Smart $aver Performance Incentive Program, based on projects currently underway and other projects under review, is projected to be cost-effective.

Finally, Witness Neme has brought up several issues and ideas relating to current and potential EE programs, all of which should be examined within the Collaborative.

This concludes the summary of my pre-filed rebuttal testimony.

1 MS. JAGANNATHAN: Mr. Evans is now available
2 for cross examination.
3 COMMISSIONER BROWN-BLAND: Is there any
4 cross for this witness?
5 MR. NEAL: Yes, Chair Brown-Bland.
6 COMMISSIONER BROWN-BLAND: Mr. Neal.
7 CROSS EXAMINATION BY MR. NEAL:
8 Q Good morning again, Mr. Evans.
9 A Good morning.
10 Q This will be very brief. On page 7 of your
11 rebuttal testimony you address this issue of
12 the -- related to the Residential Smart $aver
13 Program, and I just wanted to direct your
14 attention to this point you made that if the
15 program was eliminated that it would, quote,
16 *erode trust and engagement* with the, I guess,
17 HVAC trade allies and making it more difficult to
18 offer similar types of programs. And so why --
19 my question is why might you need the support of
20 these trade allies in the future?
21 A Our trade allies provide advice to customers'
22 baseline all the way up to more energy efficient
23 equipment. We find this very important in this
24 group versus non-trade allies which will maybe

1 anecdotally provide a less emphasis on high
2 energy efficiency equipment.
3 We also, from a trade ally
4 standpoint, we are very concerned about customer
5 satisfaction and quality. You can put in energy
6 efficient HVAC systems, however, they may not be
7 tuned as necessary. Our trade allies go through
8 a certification. We get feedback on them to make
9 certain that they are in fact, as would imply our
10 trade allies are representing what Duke -- it
11 doesn't make the Company look bad. We want to
12 make sure we have a high quality group of folks
13 making those installations and again be assured
14 that they are at least providing customers with
15 information related to higher efficiency options.
16 Q So, for example, if in the future the measure
17 costs went down or the avoided costs went up,
18 you'd want to maintain trust with those
19 contractors so that they would be available to do
20 those sorts of upgrades in the future; isn't that
21 right?
22 A That's correct, because if you were to drop our
23 Trade Ally Network and then try to reestablish it
24 a year later, I think it would be very difficult.

1 And that's one of the reasons why I believe it
2 necessary to maintain the HVAC/EE element of this
3 program.
4 Q And do you know, Mr. Evans, when the most recent
5 cost-effectiveness analysis was done on this
6 Residential Power $aver Program?
7 A I don't have my notes. It's been supplied in my
8 direct testimony.
9 Q And but maybe a more -- would you agree that
10 maybe a more updated detailed cost-effectiveness
11 analysis might point to additional
12 cost-effectiveness going forward?
13 A That's correct. We are looking at the
14 incremental price of higher efficiency equipment
15 in the marketplace. So that would be one element
16 to increase our TRC. As we know, as higher
17 efficiency equipment is more -- the availability
18 has increased in the marketplace and as such you
19 have additional competition, prices go down. We
20 are in the process of beginning a new analysis of
21 that. Of course, with the avoided cost situation
22 that made it all that more difficult.
23 MR. NEAL: Thank you. I have no other
24 questions.

1 COMMISSIONER BROWN-BLAND: Any additional
2 cross?
3 MS. EDMONDSON: Yes.
4 COMMISSIONER BROWN-BLAND: Ms. Edmondson.
5 MS. EDMONDSON: I have some exhibits to pass
6 out.
7 COMMISSIONER BROWN-BLAND: All right.
8 MS. EDMONDSON: Mr. Floyd -- And I've got
9 one that's confidential.
10 (Mr. Floyd assisted with the distribution of exhibits)
11 COMMISSIONER BROWN-BLAND: Ms. Edmondson,
12 how do we want to mark?
13 MS. EDMONDSON: So, if you would, as I go
14 through these I will ask you to mark them. I think
15 we'll mark them as Public Staff Evans Cross Exhibit 1
16 through, as we go through.
17 CROSS EXAMINATION BY MS. EDMONDSON:
18 Q Good morning, Mr. Evans, how are you?
19 A Good morning.
20 Q So, Mr. Evans, talking about the MyHER Program --
21 A Yes.
22 Q You would agree with me that the MyHER Program
23 provides a customer with information about his or
24 her usage in comparison with similar residences

in the same geographical area?

A Yes.

Q And the MyHER Program suggests energy efficiency improvements and makes energy saving recommendations --

A That's correct.

Q -- to customers. And an interactive online portal has been developed to enhance the MyHER Program that allows customers to learn more about their energy usage and provides them with more targeted tips?

A Yes.

Q If we could look at the first document, it's entitled -- it's the Data Request 38-4 from the recent rate case.

MS. EDMONDSON: We could mark that as Public Staff Evans Cross Exhibit 1.

MS. JAGANNATHAN: And, Mr. Evans, if you don't mind just moving your microphone - I think it got moved back again - just a little closer. Thanks.

THE WITNESS: Thank you.

COMMISSIONER BROWN-BLAND: Ms. Edmondson, this is Data Request NCPS 38-4?

MS. EDMONDSON: Yes.

1 COMMISSIONER BROWN-BLAND: It will be
2 identified as requested, Public Staff Evans Cross
3 Examination Exhibit 1?
4 (WHEREUPON, Public Staff Evans
5 Cross Examination Exhibit 1 is
6 marked for identification.)
7 BY MS. EDMONDSON:
8 Q Mr. Evans, I will represent to you this is data
9 response from Duke Energy Carolinas that was
10 provided to us in the recent rate case, and it is
11 comparing -- the part we're going to talk about
12 is where it compares the capabilities of the
13 current billing system with those of the new
14 customer billing system the Company is
15 implementing, and it's referred to in this
16 document as Customer Connect. Are you familiar
17 with that program to some extent?
18 A No to -- not -- that is outside my purview nor --
19 I have heard the term and that is the most that I
20 know.
21 Q Are you -- you're aware that they are
22 implementing a new billing system?
23 A Absolutely, yes.
24 Q And, if you would look at the attachment, the

first two pages of this document are the Data Request itself and then I have printed out the attachment and it starts -- it has the color on it. And if you could turn to the second page of the attachment, at the top it says *Additional Feature Comparison*, and if you could look in the box in the bottom left-hand corner that is titled, let's see, *Giving Customers More Options*. Do you see that box?

A Yes.

Q And in the first row -- do you see the very first row where it says that Customer Connect will provide personalized recommendations for products and services?

A Yes, I do.

Q Okay. And the CBIS is I believe the current billing system, and under this chart it has no capabilities for personalized recommendations; do you recognize that?

A Yes, I see that.

Q And do you see where the Customer Connect down below the 10 means that it would fully meet future state capability expectations?

A I see that it's -- yes, looking at the foot mark,

1 excuse me, the footnote, yes, I do.
2 Q Okay. And then the third line from the bottom
3 where it talks about online rate analysis and
4 comparison tools will also be provided.
5 A Yes, I see that.
6 Q And again this is a similar situation where the
7 current billing system has no such capabilities
8 and the customer connect it appears would
9 provide -- fully meet the expectations here.
10 A Yes, it would. I'm not -- I do see that online
11 rate analysis and comparison tools is -- I wish
12 we had additional footnotes.
13 Q Sure. I understand you're not familiar with the
14 ins and outs of the Customer Connect, but the
15 document says what it says, right?
16 A Right.
17 MS. EDMONDSON: Now, if we could -- I handed
18 out a document separately that is marked as
19 confidential and I am going to discuss it, portions
20 that counsel for Duke have said that are not
21 confidential. We believe that the cost information,
22 the financial analysis on the fifth page is what would
23 be confidential and I will not be discussing that. I
24 want to talk about page 4.

1 And this document, if I could have that
2 marked as Public Staff Evans Cross Exhibit 2? And
3 this is -- it starts out at the top *Finance and Risk*
4 *Management Committee February 24, 2016.*
5 COMMISSIONER BROWN-BLAND: It will be so
6 identified as Public Staff Evans Cross Examination
7 Exhibit 2. And, Madam Court Reporter, it will remain
8 in the record as confidential.
9 (WHEREUPON, Confidential Public
10 Staff Evans Cross Examination
11 Exhibit 2 is marked for
12 identification and filed under
13 seal.)
14 MS. EDMONDSON: Thank you.
15 BY MS. EDMONDSON:
16 Q And, Mr. Evans, looking to page 4 of this
17 document, I believe it says at the top *AMI -*
18 *Enabler for Transforming the Customer Experience.*
19 A Yes, I see that.
20 Q And if you would look at the row of boxes that
21 are at the bottom of the page.
22 A Yes.
23 Q The third box where it says *Bill Estimator and*
24 *Usage Alerts*, could you read those four

capabilities that are listed below?

A Yes. *Know spend & trends* at a, excuse me, *at any point in time; provide tips (customer* service, excuse me, *customer advocate); set and track electricity usage goal; 5 to 10 percent reduction in usage, Energy Efficiency*.

Q And then --

COMMISSIONER BROWN-BLAND: Mr. Evans, you've got that lovely baritone near base, be sure you speak in the mic and speak up.

THE WITNESS: Thank you. I need a lapel mic maybe but I'll do better.

BY MS. EDMONDSON:

Q And, Mr. Evans, if we could look at the last box at the very end under *Smart Meter Usage App*.

A Yes.

Q And if you could you read those two capabilities in that box.

A Yes. *Track your electrical usage on a minute-to-minute basis for greater clarity into current consumption; understand Energy Consumption better*.

Q Thank you. And would you agree that the current MyHER interactive portal provides customers with

1 information about their energy usage?
2 A I am only generally aware of the interactive
3 opportunities and/or the portal, and I honestly
4 cannot provide any more information on that.
5 Q Isn't it true that MyHER provides customers with
6 tips and recommendations on ways to reduce usage?
7 A Oh, that's correct.
8 Q Are you aware that the Commission approves the
9 customers, I mean, excuse me, the Company's
10 request in the DEC rate case that AMI and the
11 billing system will be recovered by the Company
12 through base rates?
13 A I would expect that to be the motive; collection,
14 yes.
15 Q And you would not advocate that ratepayers pay
16 for the same thing twice, would you?
17 A No, I would not. If we construe what we -- where
18 we're going as being the same thing in terms
19 of -- and well as twice, yes.
20 Q So to the extent that there may be some overlap
21 between AMI and the new billing system and the
22 MyHER, isn't it important to parse out what is
23 already being paid for through base rates?
24 A Redundancies would not seem to make sense where

they are truly redundant. To have a customer pay twice, as a customer myself I would find that to be counterintuitive.

Q Thank you. Now, if we could turn to the Residential Smart $aver HVAC Program you talked to Mr. Neal. Do you have Mr. Williamson's Exhibit 3 where he had the, kind of a history of the cost-effectiveness scores of the Smart $aver HVAC?

A I do back at my chair. If you'd like me to get those or better yet if you have it in front of you I could look at that would be wonderful.

Q I have my -- well, let me ask you if you just -- do you have any dispute with his numbers in that?

A Historically no.

Q Okay. And would you agree that the exhibit shows that since 2015 the program has been struggling to be cost-effective?

A That is correct.

Q So if you could turn, the next document I have in the bundle I handed out is the Commission's Order entitled "Order on Application for Approval of Program Modifications" and it's dated February 9, 2016.

A I have that in front of me.

MS. EDMONDSON: Did I have the AMI document -- I did have that one marked as 2 so we would be to number 3?

COMMISSIONER BROWN-BLAND: It will so marked Public Staff Evans Cross Examination Exhibit 3.

(WHEREUPON, Public Staff Evans Cross Examination Exhibit 3 is marked for identification.)

BY MS. EDMONDSON:

Q And, Mr. Evans, are you familiar with this Order?

A Yes, I am.

Q And would you agree this Order was -- the Commission ruled on the Company's 2015 application to modify what I'm calling the Smart $aver HVAC Program to make it more cost-effective?

A Yes.

Q And, if you would look at page 3 of the Order and the first full paragraph there, would you read the second sentence there, please?

A The first full paragraph. Are you talking about a bullet item two?

Q No, the paragraph beginning with *On December 2nd*.

A Yes. *On December 2, 2015, the Public Staff filed comments on the proposed modifications to the Program. A major concern raised by the Public Staff is the failure of the Program as a whole, and some of the individual measures even with the proposed modifications, to achieve cost-effectiveness under the Total Resource Cost test.*

Q Okay. Thank you. Now, the Company and the Public Staff worked out an agreement that was approved by the Commission where the Company would terminate the Program if it did not have a projected TRC of 1.0 by March 1, 2017, or an actual TRC of 1.0 for Vintage year 2016; isn't that correct?

A That is correct. I believe that was also subject to the Commission would make the final decision if we brought that before them, but yes, in essence, you're correct.

Q And didn't the Company agree to refund any associated net loss revenues or PPI if the Program did not achieve the TRC of 1.0 as I discussed just a second ago?

A Yes.

1 Q Now, in the 2017 Rider in Docket Number E-7, Sub
2 1130 filed last year, the Program had a 0.99 TRC
3 cost-effectiveness result; isn't that correct?
4 A That is correct.
5 Q And it was your testimony in last year's case
6 that because the 0.99 was so close to 1.0 and the
7 Company planned additional modifications, the
8 Program should not be canceled?
9 A That's correct, I did.
10 MS. EDMONDSON: All right. And, if I could
11 turn to the next document, and this would be an
12 excerpt of Public Staff Witness Floyd's testimony in
13 that Rider proceeding, if I could have that marked as
14 Public Staff Evans Cross Exhibit 4.
15 COMMISSIONER BROWN-BLAND: That will be so
16 identified.
17 (WHEREUPON, Public Staff Evans
18 Cross Exhibit 4 is marked for
19 identification.)
20 BY MS. EDMONDSON:
21 Q And, Mr. Evans, could you please turn to page 22
22 of that testimony?
23 A I'm with you.
24 Q And on line 8 could you read the sentence

1 beginning with *Therefore*?
2 A *Therefore, I recommend that DEC either terminate*
3 *the program effective March 31, 2018, or modify*
4 *the program due to transition from a non-referral*
5 *channel due that -- not cost-effective under the*
6 *TRC -- more heavily focused on referred measures,*
7 *as calculated for the purpose of preparing Evans*
8 *Exhibit 7.*
9 MS. EDMONDSON: And if I could look -- if we
10 could look at the next document that I have, and this
11 is an excerpt of Mr. Duff's testimony in that same
12 proceeding. If I could have that marked as Public
13 Staff Evans Cross Exhibit 5?
14 COMMISSIONER BROWN-BLAND: It will be so
15 identified. And if I'm correct this is a single page
16 which is a portion --
17 MS. EDMONDSON: Yes. Thank you. This is
18 just page 9.
19 (WHEREUPON, Public Staff Evans
20 Cross Exhibit 5 is marked for
21 identification.)
22 BY MS. EDMONDSON:
23 Q If I could direct your attention, Mr. Evans, to
24 line 12.

A Yes.

Q Could you read that sentence beginning with the word *Finally*?

A *Finally, with respect to Witness Floyd's recommendation regarding the Residential HVAC EE Program, the Company is in the process of preparing a filing requesting to make a number of modifications to the program to enhance its cost effectiveness, including a modified (sic) designed to improve the ratio of customers participating in the more cost effective referral measures.*

Q Thank you. Mr. Evans, did the Company transition from the non-referral channel measures that are not cost-effective under the TRC to meet -- to be more heavily focused on referred measures as recommended by Mr. Floyd?

A We are concentrating on referred measures with trade allies; however, with respect to the testimony of Mr. Duff, we have not completely gone on that road as of yet. That was carried or brought up in my rebuttal testimony as well.

Q So, in other words, you -- the Company chose not to follow Mr. Floyd's recommendation?

A We are -- we do not object to Witness Floyd's recommendation; however, we did not go to complete referral.

Q And he made this recommendation back in May of 2017?

A That's correct.

Q Now, in this year's proceeding the Public Staff sent the Company a data request asking why it had not made the -- followed the recommendation of Mr. Floyd; is that correct?

A That's correct.

MS. EDMONDSON: And, if I could turn your attention to the next document. And I'd ask that to be marked as Public Staff Evans Cross Exhibit 6.

Q Do you recognize --

COMMISSIONER BROWN-BLAND: So marked.

(WHEREUPON, Public Staff Evans Cross Exhibit 6 is marked for identification.)

BY MS. EDMONDSON:

Q Do you recognize this document, Mr. Evans?

A Referring to Public Staff Data Request Number 12.

Q Twelve dash -- Item 12-12.

A Thank you. Yes, I am familiar with the document.

Q Okay. And could you read the Company's response? And this is the Company's response basically to why they did not follow the recommendation of Mr. Floyd.

A Would you like me to read the entire response?

Q If you would, please.

A Certainly. *While the Company does not disagree with the changes proposed by the Public Staff in the last case, Docket Number E-7, Sub 1130, regarding the elimination of the non-referral channel provided in the Residential Smart $aver EE program, the Company did have concerns regarding the broader trade ally network response to such a drastic programmatic change. As the Program's cost-effectiveness is not, excuse me, is of an ongoing concern for both the Public Staff and the Company, the Company is not adverse to adopting the Public Staff's recommendation to eliminate the non-referral channel. The Company would prefer that the Public Staff, in the context of the current proceeding, request that the Commission order the Company to make the Program change. If the Commission approves the Public Staff's request, which the Company does*

1 *not plan to object to, the Company will file*
2 *changes, in the form of a compliance filing*
3 *(sic), within 60 days of the Commission's Order.*
4 Q And so assuming the Commission's Order comes out
5 in August or September then that -- the
6 compliance tariff would be toward the -- probably
7 in the fourth quarter of this year?
8 A Yes.
9 Q In fact, didn't the Company make modifications to
10 the Program to improve cost-effectiveness that
11 were approved September 11, 2017?
12 A That's correct.
13 Q And if I could ask you to turn to the next
14 document, which is an Order approving those
15 modifications.
16 MS. EDMONDSON: If I could have that marked
17 as Public Staff Evans Cross Exhibit -- sorry I lost
18 count.
19 COMMISSIONER BROWN-BLAND: Seven.
20 MS. EDMONDSON: Yes, thank you.
21 COMMISSIONER BROWN-BLAND: It will be so
22 marked.
23 MS. EDMONDSON: Thank you.
24 (WHEREUPON, Public Staff Evans

1 Cross Exhibit 7 is marked for
2 identification.)
3 BY MS. EDMONDSON:
4 Q And, Mr. Evans, if you could turn to page 8 of
5 that order, please.
6 A Now which order is --
7 Q I'm sorry. I am looking at the -- hold on -- let
8 me -- I am looking at the wrong thing. Let's
9 see. It's not page 8.
10 COMMISSIONER BROWN-BLAND: You have a 5-page
11 Order?
12 MS. EDMONDSON: I know. That's really -- I
13 have the wrong --
14 COMMISSIONER BROWN-BLAND: Just to be sure
15 I've identified the correct one.
16 MS. EDMONDSON: Sure. Sorry.
17 BY MS. EDMONDSON:
18 Q Actually it's on page 4, the first full paragraph
19 starting with *The Public Staff.*
20 A Yes.
21 Q And in this Order this Smart $aver Program is --
22 I think we're -- the acronym here is RSSS,
23 Residential Smart $aver. And do you see where
24 the Public Staff again expressed concern that

1 measures through the non-referral channel were
2 not cost-effective?
3 A If you'll give me a second I will read this.
4 Q Sure.
5 A Thank you. (Reading the document) Yes. I've
6 read it.
7 Q And you would agree with me the Public Staff
8 again expressed concerns that the measures
9 through the non-referral channel were not
10 cost-effective?
11 A Yes, certain measures would not be; that's
12 correct.
13 Q And turning back to page 3 of that Order, looking
14 at number 6, you'd agree the Company projected a
15 TRC with the modifications of a 1.08; is that
16 correct?
17 A That's correct.
18 Q But in this year's proceeding, the Company has
19 projected a cost-effectiveness for 2019 of only
20 .59, correct?
21 A That's correct.
22 Q And that's only a little, a little more than half
23 of the projection that y'all made back in --
24 let's see, you filed that application in

1 July 2017?
2 A I would -- correct -- I would indicate that's
3 correct with a qualification. If I might
4 indicate that the avoided costs have changed
5 considerably in the current filing when compared
6 to the basis for the analysis that was performed
7 at that point in time, and that we were looking
8 at a recast of 2018.
9 Q Right.
10 A Using two thousand -- excuse me, using 2017 as
11 the base year.
12 Q Right. So when you applied the new avoided costs
13 the projected cost-effectiveness went down
14 significantly?
15 A That's correct, it did.
16 Q And that is -- that's not using the Public
17 Staff's recommendation of no capacity costs, that
18 is using Duke's methodology, correct?
19 A Yes, it is using Duke's methodology. We were
20 unaware of the extent of the reduction of the
21 avoided costs associated with our programs at
22 that point in time. And so, if all things had
23 remained equal so to speak, we believe that the
24 TRC score would have been higher than 1.0.

Q But we're not projecting avoided costs to go up? The next avoided costs aren't going to be filed until November of this year, correct?

A That's correct.

Q And we won't have new approved rates for some time thereafter?

A Your guess is probably better than mine.

Q So you think it's likely this program is going to stay -- continue to struggle with these avoided, current avoided costs?

A With the avoided costs of and by itself it will continue to struggle. However, with program modifications I think we can alleviate some of that deficiency, and that is our intention.

Q Besides low income programs, are you aware of any Duke Energy energy efficiency program that has this low a TRC and the Company has not proposed closure?

A None of our programs have scores lower than that other than the low income related programs.

(WHEREUPON, the Court Reporter requested clarification.

THE WITNESS: The low income related programs.

BY MS. EDMONDSON:

Q Are you aware of any programs for which the Company has approved so many modifications that required Commission approval?

A In the short term, no.

Q The Company has really tried to make modifications to keep this cost-effective?

A Yes, we have and we would continue to attempt to make more.

Q Under the statutes in the mechanism ratepayers have to pick up all the program costs whether a program is cost-effective or not, correct?

A That is correct.

Q And under the mechanism the Company gets net loss revenues whether or not the program is cost-effective, correct?

A A ongoing program, that is correct.

Q Now, where the Company would be affected by a lack of cost-effectiveness is its impact on the overall portfolio performance incentive, correct?

A That is correct. If we were looking at Company incentives in isolation, motivation would be to say maybe we should remove it; however, we have faith in the program in the long run and such is

1 our point, and our proposal, and our desire.
2 Q The Company gets annual recovery of its DSM/EE
3 costs; that's what we're doing here, right?
4 A That's correct.
5 Q So we don't have the regulatory lag problem,
6 correct?
7 A It's limit regulatory lag, that's correct.
8 Q And does the Company have any capital costs
9 associated with the Residential Smart $aver HVAC
10 Program?
11 A DEC has no capital costs associated with any of
12 its programs.
13 Q Would you agree with me that ratepayers are
14 bearing almost all the risk if the Smart $aver
15 HVAC Program is not cost-effective?
16 A Ratepayers are taking a risk as well as the
17 Company in this situation. As you'd indicated it
18 does adversely impact the PPI. You indicated
19 that as a non -- going forward that net loss
20 revenues possibly would be a risk, so it is a
21 shared risk. I won't say that ratepayers take
22 most of the risk in this.
23 Q But without that special agreement the Public
24 Staff had with Duke back in 2015, generally net

loss revenues are not at risk, are they? The Company gets them regardless of whether the program is cost-effective.

A Unless the Commission orders otherwise; that is correct.

Q When do you project the Residential HVAC EE program will be cost-effective?

A We are trying to be resilient with making modifications. However, it would be dependent in large part, I guess, the primary factor is, in fact, avoided costs at this point in time. Now, let's not lose sight that the avoided cost differential does create a situation with a TRC. Now, I'm not going to say that the risk the ratepayers are taking if we had a zero TRC, we have a TRC that is above 50 percent granted. So ratepayers are receiving net benefits but not benefits relative to the cost or the prices in which they are bearing. But again, the Company is taking a risk on this as well.

Q So what does a .59 TRC mean?

A A point, 1.0 means a year neutral. Greater benefits are achieved when the score is greater than 1.0. Lesser benefits, benefits not -- as

implied not cost-effective, those benefits will say customers are bearing costs greater than they are bearing or receiving benefits.

Q And the program is just -- before it's been marginal whether it was cost-effective wouldn't you say?

A That's correct.

Q Would you call it marginal now with this point, 0.59?

A In the current -- the program's current form, yes, I would agree with you. But just to further qualify we have been resilient with attempts to make changes to keep that program viable. We have had one thing after another and that's just the nature of things with the avoided cost, et cetera, prices, incremental prices associated with the enhanced energy efficient equipment, so it's been difficult as we have indicated in the past, unfortunately over and over again, but we continue to try.

Q What circumstances would you envision that the Company would close the program?

A When it was deemed by the Commission that it was no longer appropriate to offer because it would

be brought before the Commission. At this point in time the Company's opinion would not to be propose closure.

Q Now, you understand the Public Staff recommended suspending the program to give the Company time to figure out how to make it more cost-effective?

A Absolutely and it would work under most situations. Unfortunately with Trade Ally Network which I brought up that makes it difficult. You just can't disband it for six months, for example. I guess it's possible but you are going to lose continuity and that was our concern that we expressed. I guess --

Q But we've --

A Please continue.

Q But we've been here year 2015 on where almost every time ratepayers have been bearing greater costs than they're receiving benefits.

A That is an unfortunate fact, but again, we're trying to eliminate that disparity.

Q Instead of suspending the program as requested by the Public Staff, would the Company show the faith that it has in the future of this program by agreeing to pick up a portion of the program

1 cost and the net loss revenues to the extent the
2 program is not cost-effective?
3 A I cannot answer that question as to what the
4 Company would do. I'd like to say that's above
5 my pay grade.
6 COMMISSIONER BROWN-BLAND: Stay --
7 A But it is something to consider.
8 COMMISSIONER BROWN-BLAND: -- stay in the
9 mic, please.
10 THE WITNESS: I'm sorry.
11 A It is something that we obviously would consider.
12 As to give you a definitive answer, I cannot do
13 that at this time.
14 BY MS. EDMONDSON:
15 Q Is that something the Company could address in a
16 proposed order?
17 A It is something -- let me just say it is
18 something that we could --
19 Q Sure.
20 A -- present in a proposed order. As to would it,
21 again I cannot make that decision.
22 MS. EDMONDSON: Okay. That's all I have.
23 Thank you.
24 THE WITNESS: Thank you.

COMMISSIONER BROWN-BLAND: Redirect?

MS. JAGANNATHAN: Yes. I have a few questions for you, Mr. Evans.

REDIRECT EXAMINATION BY MS. JAGANNATHAN:

Q If you can find it, can you please turn back to Public Staff Cross Exhibit 7? It's the Order Approving Program Modifications.

A Yes. The September 11th Order. Okay.

Q Exactly. And if you can turn to page 3 of that Order, please, and read aloud the paragraph number 3.

A Yes.

Q If you don't mind just reading that into the record.

A Certainly. *DEC indicated to the Public Staff that the Company will continue to provide incentives for measures installed outside of the referral channel because of concerns that converting to an RSSS to a "referral only" program would create a "pay for play" environment. DEP further indicated that it believes that the proposed modifications to the RSSS will increase participation in the referral-based channel -- delivery channel.*

1 Q And the concern that you read about in that
2 paragraph number 3, is that the same as the
3 concerns that were expressed in the data request
4 marked Public Staff Cross Exhibit 6?
5 A That is correct, they are the same. Although
6 phrased somewhat differently they are the same
7 concerns.
8 Q And is it fair to say that this is why the
9 Company itself has not proposed to switch to a
10 referral-only network?
11 A That is correct.
12 Q And can you tell me how long the Company receives
13 net loss revenues for its EE Programs?
14 A For each vintage it would be a 36-month period --
15 Q Okay.
16 A -- from the date of installation of the measure
17 unless a rate case comes up and base rates are
18 changed, with that qualifier.
19 Q And then just generally can you explain why the
20 Company thinks it's important for the Company to
21 offer a residential HVAC program?
22 A Again, it's the largest energy user in a
23 domicile. It lasts 15 years. A customer can
24 make a decision today to go baseline or to go to

a higher efficiency unit. We're talking about long life benefits and this is the opportunity to do it now. And when -- in fact, 15 years from now I'd like to think the avoided costs are going to be somewhat different than they are now from the standpoint of evaluating energy efficiency programs. But it is the Company's wish and the -- we feel very important -- it is very important, like many of the utilities around the country - not that that makes any difference - to offer HVAC EE programs. In fact, I'm not aware of any other than what Duke would be, but again, it's very important because it impacts so many homes and we have an opportunity here to provide long lasting energy efficiency benefits, thus, our desire to maintain the program.

Q Thank you. And now I think I'm going to turn to the MyHER Program.

A Yes.

Q And is the Company contending that the customer pay twice for the same thing available through AMI and MyHER?

A Absolutely not.

Q And I know you're contending that there's no

1 overlap, but to the extent that there was any
2 overlap would the Company's EM&V be able to parse
3 out overlap between AMI and MyHER such that
4 customers would not pay for any AMI's through the
5 DSM/EE Rider?
6 A Absolutely.
7 Q Can you describe the comparative usage data
8 provided by the MyHER Program?
9 A Take a look at Exhibit 2 of my rebuttal
10 testimony. If I could -- can I refer to that?
11 Q Yes.
12 A It's easier to look at the graph as opposed to
13 describing it. It's actually the last page of my
14 rebuttal testimony. You can see we have three
15 lines there - we have what your home is doing, we
16 have what a typical home in your peer group would
17 be using, and then we have the energy efficient
18 homes - and it provides a gauge of what a
19 customer performance is relative to their peers.
20 It's a psychological-prone program. Just to
21 diverge a little bit, on my home report -- this
22 is not mine; it is my bill mind you on Exhibit
23 1 -- my graph shows me at the very top
24 unfortunately that is not good, that is very bad.

1 And I'm guilt tripping myself as well as the rest
2 of my family not to a great deal of avail, but
3 anyway that is the nature of it. I'm sorry I
4 went on but I had to express my guilt and provide
5 some confession here before the Commission.
6 Q So is it fair to say that MyHER provides just
7 more than just tips and product recommendations
8 along with single-home usage but it also provides
9 kind of a normative comparison?
10 A That's correct it does, and that is one of the
11 major benefits. Of course, even we have said
12 that with regard to EM&V --
13 Q And --
14 A -- the normative statistics.
15 Q -- do any of the exhibits that you were shown
16 today as Public Staff cross exhibits relating to
17 the new billing system or AMI change, change your
18 mind that MyHER -- or that the AMI and billing
19 system would provide the same benefits as MyHER?
20 A Nothing I saw in the exhibits. Of course, the
21 exhibits were not finite or descriptive enough.
22 All -- with that being fair, but no, I do not see
23 any overlap that I can discern at this point in
24 time.

1 MS. JAGANNATHAN: Okay. Thank you. I don't
2 have nothing further.
3 COMMISSIONER BROWN-BLAND: Are there
4 questions by the Commission?
5 EXAMINATION BY COMMISSIONER BROWN-BLAND:
6 Q Mr. Evans, I have just a couple of questions.
7 One, on the MyHER Report where you speak to, as
8 you said in your summary, the motivating effect
9 of the normative usage comparisons. Does the
10 Company actually see what those benefits are? Do
11 you have good measures for that?
12 A Yes, Madam Chairman, we do. That is a part of
13 the EM&V analysis that I referred to in my direct
14 testimony, and Witness Williamson in his direct,
15 and also in my rebuttal testimony.
16 Q Could you just share a little light, if you have
17 that information, that knowledge, on how that
18 determination is made that it is beneficial?
19 A I can provide that as a post-hearing exhibit. I
20 am unable to -- I do not have the materials to
21 provide that information at this point in time
22 accurately.
23 Q Okay. And then my last question was,
24 Ms. Edmondson asked you whether this TRC of .59,

1 whether you consider that to be marginal, and I'm
2 not sure I understood your answer to the
3 question. Did you consider it marginal or not?
4 A It is not even marginal, it is disappointing.
5 Although I realize that is somewhat vague,
6 marginal would be 1.001, which I would be happy
7 with at this point in time. But that is what
8 one, I guess, would deduce as being marginal.
9 COMMISSIONER BROWN-BLAND: All right. Are
10 there questions on the Commission's questions?
11 (No response)
12 All right.
13 MS. JAGANNATHAN: Madam Chair, I'd move that
14 Evans Rebuttal Exhibits 1 and 2 be admitted into
15 evidence.
16 COMMISSIONER BROWN-BLAND: Without
17 objection, those exhibits will be received into
18 evidence, rebuttal exhibits.
19 MS. JAGANNATHAN: Thank you.
20 (WHEREUPON, Evans Rebuttal
21 Exhibits 1 and 2 are admitted into
22 evidence.)
23 MS. EDMONDSON: If I could have Evans Cross
24 Exhibits 1 through 7, sorry I can't count, admitted.

COMMISSIONER BROWN-BLAND: Without objection, the Public Staff Cross Exhibits will be admitted into evidence, 1 through 7.

MS. EDMONDSON: Thank you.

(WHEREUPON, Public Staff Evans Cross Exhibits 1 through 7 are admitted into evidence. Public Staff Evans Cross Exhibit 2 is confidential and filed under seal.)

COMMISSIONER BROWN-BLAND: Mr. Evans, I think this time you may be excused.

THE WITNESS: Thank you very much.

(The witness is excused.)

COMMISSIONER BROWN-BLAND: We have two witnesses left as I understand.

MS. JAGANNATHAN: That's right. And if it's okay we'll present them together since they filed their testimony together.

COMMISSIONER BROWN-BLAND: And I think I'm going to take a quick break before we do that. But before we do that did you want to address Witness Miller's --

MS. JAGANNATHAN: Oh, that would be great.

1 If now is the time, I would also move that
2 Ms. Miller's rebuttal testimony consisting of seven
3 pages be entered into the record as if given orally
4 from the stand and that Miller Rebuttal Exhibits 1, 2,
5 6 and 8 be admitted as evidence.
6 COMMISSIONER BROWN-BLAND: Without
7 objection, that motion will be allowed and the
8 testimony -- the rebuttal testimony of Witness Miller
9 will be received into evidence as if given orally from
10 the stand, and the exhibits will be received, 1, 2, 6
11 and 8.
12 MS. JAGANNATHAN: Thank you.
13 (WHEREUPON, Rebuttal Miller
14 Exhibits 1, 2, 6 and 8 are marked
15 for identification as prefiled and
16 received into evidence.)
17 (WHEREUPON, the prefiled rebuttal
18 testimony of CAROLYN T. MILLER is
19 copied into the record as if given
20 orally from the stand.)
21
22
23
24

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-69	))))))	**REBUTTAL TESTIMONY OF CAROLYN T. MILLER FOR DUKE ENERGY CAROLINAS, LLC**

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

2 A. My name is Carolyn T. Miller. My business address is 550 South Tryon
3 Street, Charlotte, North Carolina.

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

5 A. I am a Rates Manager for Duke Energy Carolinas, LLC ("DEC" or the
6 "Company").

7 **Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN SUPPORT**
8 **OF DEC'S APPLICATION IN THIS DOCKET?**

9 A. Yes.

10 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

11 A. The purpose of my rebuttal testimony is to support the filing of Rebuttal
12 Exhibits which reflect revisions to Miller Exhibits 1, 2, 6 and 8 filed March 7,
13 2018 in this proceeding. These revisions are due to the adjustment of the opt-
14 out forecast as recommended by Public Staff witness Michael C. Maness.

15 **Q. WHY IS THE COMPANY REVISING THE OPT-OUT FORECAST?**

16 A. In his testimony, Witness Maness indicated that he is concerned that the use of
17 the 2017 actual opt-out usage experience combined with a lower projected
18 2019 forecast results in an understatement of participating usage for non-
19 residential customers, resulting in a possible "rate spike." Witness Maness
20 has proposed a 3.9% decrease to the actual 2017 opt-out usage, which
21 corresponds to the decrease from the overall 2018 non-residential kWh
22 forecast to the overall 2019 non-residential kWh forecast. He also proposes
23 that the Company be allowed to recover carrying costs on any

1 understatements of Rider 10 billing factors caused by use of the Public Staff's
2 recommended levels of participating Rider 10 kWh sales versus the actual
3 levels of such kWh sales, but with the understatement eligible for carrying
4 charges limited to the difference between the Public Staff's recommended
5 levels of participating Rider 10 kWh sales and the Company's initially
6 proposed levels of such sales in this proceeding.

7 The Company disagrees with the premise that the non-residential
8 participating sales used to calculate EE/DSM rates that the Company has
9 proposed for Rider 10 are too low. The Company has seen an increase in the
10 number of customers that have opted out each year, so it seems improbable
11 that opt-out usage would decline in future periods. Using actual opt-out sales
12 from the test period as a basis for determining projected opt-out sales has
13 resulted in undercollection of revenue for each prior Vintage Year on a
14 consistent basis. Further, there is no direct correlation between overall non-
15 residential kWh sales and the level of sales associated with those customers
16 that have opted out of EE and DSM programs.

17 Nevertheless, DEC is willing to make this concession in this case and
18 agree to Witness Maness's adjustment to the opt-out sales as the Company
19 would be made whole with the collection of any underrecovery of the non-
20 residential revenue requirement and carrying charges on the eligible
21 undercollected amount as described above. The Company notes that this
22 adjustment is unique for Rider 10 and should not be used as precedent any
23 future EE/DSM Rider filings.

Q. ARE THERE ANY OTHER ADJUSTMENTS MADE IN YOUR REBUTTAL EXHIBITS?

A. No. As discussed in DEC witnesses Timothy J. Duff and Richard G. Stevie, Ph.D.'s rebuttal testimony, the Company has not incorporated the adjustments to avoided costs as recommended by the Public Staff.

Q. HOW DO THESE CHANGES IMPACT DEC'S REQUESTED RATES?

A. The changes impact the following rates included in the initial DSM/EE filing:

Description	Filed Rate	Revised Rate
Vintage 2014 Non-Residential EMF EE Rate	(0.0063)	(0.0061)
Vintage 2014 Non-Residential EMF DSM Rate	(0.0002)	(0.0002)
Vintage 2015 Non-Residential EMF EE Rate	0.0025	0.0024
Vintage 2015 Non-Residential EMF DSM Rate	(0.0025)	(0.0024)
Vintage 2016 Non-Residential EMF EE Rate	(0.0131)	(0.0126)
Vintage 2016 Non-Residential EMF DSM Rate	(0.0015)	(0.0015)
Vintage 2017 Non-Residential EMF EE Rate	0.3032	0.2924
Vintage 2017 Non-Residential EMF DSM Rate	0.0005	0.0005
Vintage 2017 Non-Residential Prospective EE Rate	0.0831	0.0801
Vintage 2018 Non-Residential Prospective EE Rate	0.0723	0.0695
Vintage 2018 Non-Residential Prospective DSM Rate	0.0031	0.0030
Vintage 2019 Non-Residential Prospective EE Rate	0.3283	0.3158
Vintage 2019 Non-Residential Prospective DSM Rate	0.0910	0.0877

1 **Q. WHAT REBUTTAL EXHIBITS WILL BE FILED IN CONJUNCTION**
2 **WITH YOUR REBUTTAL TESTIMONY?**

3 A. Only the exhibits impacted as a result of the changes outlined above will be
4 filed as Rebuttal Exhibits. A description of the specific pages and contents
5 that have been revised is provided below:

6 • Rebuttal Miller Exhibit 1: Summary of Rider EE Exhibits and
7 Factors
8 • Rebuttal Miller Exhibit 2, page 1: True-up of Years 1 through
9 4 for Vintage Year 2014
10 • Rebuttal Miller Exhibit 2, page 2: True-up of Year 1, 2 and 3
11 for Vintage Year 2015
12 • Rebuttal Miller Exhibit 2, page 3: True-up of Year 1 and 2 for
13 Vintage year 2016
14 • Rebuttal Miller Exhibit 2, page 4: Estimated Year 3 lost
15 Revenue and True-up of Year 1 for Vintage Year 2017
16 • Rebuttal Miller Exhibit 2, page 5: Estimated Year 2 Lost
17 Revenue for Vintage Year 2018
18 • Rebuttal Miller Exhibit 2, page 6: Estimated Program Costs,
19 Earned Incentives and Lost Revenues for Vintage 2019
20 • Rebuttal Miller Exhibit 6: Revised Forecast 2019 kWh Sales
21 for the Rate Period for Vintage Years 2014-2019
22 • Rebuttal Miller Exhibit 8: Revised Tariff Sheet

23 **Q. WHAT ARE THE FINAL RATES REQUESTED IN THE**

APPLICATION OF DEC FOR APPROVAL OF ITS DSM/EE RIDER FOR 2019 AS A RESULT OF THESE REVISIONS?

A. Pursuant to the provisions of N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-69, the Company requests Commission approval of the following annual billing adjustments (all shown on a cents per kWh basis, including gross receipts tax and regulatory fee):

Residential Billing Factors[1]	**¢/kWh**
Residential Billing Factor for Rider 10 Prospective Components	0.4229
Residential Billing Factor for Rider 10 EMF Components	0.1091

Non-Residential Billing Factors for Rider 10 Prospective Components	**¢/kWh**
Vintage 2017 EE Participant	0.0801
Vintage 2018 EE Participant	0.0695
Vintage 2018 DSM Participant	0.0030
Vintage 2019 EE Participant	0.3158
Vintage 2019 DSM Participant	0.0877

[1] The Residential Billing Factors were not impacted by the adjustment to non-residential opt-out sales discussed herein, and are the same as those included in the Company's Application.

Non-Residential Billing Factors EMF Component	¢/kWh
Vintage 2017 EE Participant	0.2924
Vintage 2017 DSM Participant	0.0005
Vintage 2016 EE Participant	(0.0126)
Vintage 2016 DSM Participant	(0.0015)
Vintage 2015 EE Participant	0.0024
Vintage 2015 DSM Participant	(0.0024)
Vintage 2014 EE Participant	(0.0061)
Vintage 2014 DSM Participant	(0.0002)

Q. DOES THIS CONCLUDE YOUR PRE-FILED REBUTTAL TESTIMONY?

A. Yes.

1 COMMISSIONER BROWN-BLAND: We're going to
2 take a 10 -- let's -- a break where everybody comes
3 back at ten after twelve. And just before we do that,
4 off the record can I see counsel?
5 (Recess at 12:00 p.m., until 12:10 p.m.)
6 COMMISSIONER BROWN-BLAND: Let's come back
7 to order. I believe we're still in rebuttal.
8 MS. JAGANNATHAN: Yes, it's my understanding
9 that in lieu of putting Witnesses Stevie and Duff on
10 the stand that the Public Staff is going to stipulate
11 some exhibits into the record, and to the extent that
12 I would just move that Dr. Stevie and Tim Duff's
13 testimony, I'm sorry, rebuttal testimony consisting of
14 25 pages be entered into the record as if given orally
15 to the stand.
16 COMMISSIONER BROWN-BLAND: Just give me a
17 second and let me ask, any Commissioners have
18 questions for these two witnesses for the record?
19 (No response)
20 There being no questions from the Commission
21 and no objections, the rebuttal testimony of Witnesses
22 Duff and Stevie which consists of 25 pages filed on
23 June 1, 2018, will be received into evidence as if
24 given orally from the witness stand.

MS. JAGANNATHAN: Thank you.

(WHEREUPON, the prefiled rebuttal testimony of TIMOTHY J. DUFF and RICHARD G. STEVIE, PH.D. is copied into the record as if given orally from the stand.)

0300

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1164

In the Matter of Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-69	))))))	**REBUTTAL TESTIMONY OF TIMOTHY J. DUFF AND RICHARD G. STEVIE, PH.D. FOR DUKE ENERGY CAROLINAS, LLC**

1 **Q. MR. DUFF, PLEASE STATE YOUR NAME AND BUSINESS**
2 **ADDRESS.**
3 A. My name is Timothy J. Duff. My business address is 400 South Tryon Street,
4 Charlotte, North Carolina 28202.
5 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**
6 A. I am employed by Duke Energy Business Services LLC as General Manager,
7 Customer Regulatory Strategy and Evaluation.
8 **Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL**
9 **QUALIFICATIONS.**
10 A. I graduated from Michigan State University with a Bachelor of Arts in
11 Political Economics and a Bachelor of Arts in Business Administration, and
12 received a Master of Business Administration degree from the Stephen M.
13 Ross School of Business at the University of Michigan. I started my career
14 with Ford Motor Company and worked in a variety of roles within the
15 company's financial organization, including Operations Financial Analyst and
16 Budget Rent-A-Car Account Controller. After five years at Ford Motor
17 Company, I started working with Cinergy in 2001, providing business and
18 financial support to plant operating staff. Eighteen months later I joined
19 Cinergy's Rates Department, where I provided revenue requirement analytics
20 and general rate support for the company's transfer of three generating plants.
21 After my time in the Rates Department, I spent a short period of time in the
22 Environmental Strategy Department, and then I joined Cinergy's Regulatory
23 and Legislative Strategy Department. After Cinergy merged with Duke

Energy Corporation ("Duke Energy") in 2006, I was employed as Managing Director, Federal Regulatory Policy. In this role, I was primarily responsible for developing and advocating Duke Energy's policy positions with the Federal Energy Regulatory Commission. I became General Manager, Energy Efficiency & Smart Grid Policy and Collaboration in 2010, was named General Manager, Retail Customer and Regulatory Strategy in 2011, and assumed my current position of General Manager, Customer Regulatory Strategy and Evaluation in 2013.

Q. PLEASE DESCRIBE YOUR DUTIES AS GENERAL MANAGER, CUSTOMER REGULATORY STRATEGY AND EVALUATION.

A. I am responsible for the development of strategies and policies related to energy efficiency and other retail products and services. I also oversee the analytics functions associated with evaluating and tracking the performance of Duke Energy's retail products and services.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION OR ANY OTHER REGULATORY BODIES?

A. Yes. I testified in Duke Energy Carolinas, LLC's ("DEC" or the "Company") applications to update its demand-side management ("DSM") and energy efficiency ("EE") cost recovery rider, Rider EE, in Docket Nos. E-7, Subs 941, 979, 1001, 1031, 1050, and 1130, as well as the Company's application for approval of its new portfolio of DSM and EE program and new cost recovery mechanism in Docket No. E-7, Sub 1032. I also provided Supplemental Testimony in Duke Energy Progress, LLC's ("DEP") DSM/EE

rider proceeding in Docket No. E-2, Sub 1145. In addition, I provided Rebuttal Testimony in DEP's Renewable Energy Portfolio Standard Compliance Report in Docket No. E-2, Sub 1109. In addition to testifying on behalf of DEC and DEP in North Carolina, I also testified in South Carolina in Docket 2013-298-E in support of the Company's application for approval of its new portfolio of DSM and EE programs and new cost recovery mechanism. Beyond providing testimony in the Carolinas, I also have testified in matters pertaining to DSM and EE before the state regulatory commissions in the other four states in which Duke Energy subsidiaries provide utility service: Florida, Indiana, Kentucky and Ohio.

Q. DR. STEVIE, PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard G. Stevie and my business address is 123 East Fourth Street, Suite 300, Cincinnati, Ohio 45202.

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

A. I am employed as Vice President, Forecasting, by Integral Analytics, Inc. Integral Analytics is an analytical software and consulting firm focused on operational, planning, and market research solutions for the energy industry. In addition, I have been retained by Duke Energy Business Services to provide consulting support on EE issues.

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I received a Bachelor's degree in Economics from Thomas More College in May 1971. In June 1973, I was awarded a Master of Arts degree in Economics from the University of Cincinnati. In August 1977, I received a Ph.D. in Economics from the University of Cincinnati. In 2012, I was named a Research Fellow for the Economics Center at the University of Cincinnati. Prior to joining Integral Analytics, I was Chief Economist for Duke Energy. During my tenure with Duke Energy, I managed several key analytical functions including economic forecasts, projections of energy sales and peak load demands, customer research on energy usage, market research, product development analytics, evaluation of EE and DSM program cost-effectiveness, and measurement and verification of EE and DSM impacts. I have been involved in many regulatory proceedings and provided expert witness testimony on numerous utility economic issues in Ohio, Kentucky, Indiana, North Carolina, and South Carolina. The principle areas of testimony involved load forecasting, cost-effectiveness analysis of EE and DSM programs, measurement and verification plans for EE and DSM programs, market pricing for energy, regulatory recovery mechanisms for EE, weather normalization of energy sales, and assessment of economic conditions.

Before the merger with Duke Energy, I was General Manager of Market Analytics for Cinergy Corp. and prior to that Senior Economist with the Cincinnati Gas & Electric Company. In addition, I was a past Director of Economic Research for the Public Staff of the North Carolina Utilities Commission. While working at the Public Staff, I provided expert testimony

on numerous issues including cost of capital, capital structure, operating ratio, and rate design.

For over twenty years, I chaired the Regional Economic Advisory Committee for the Greater Cincinnati Chamber of Commerce. As chair of the committee, I led the development and presentation of the Chamber's Annual Economic Outlook. In addition, I have appeared in numerous local forums to provide views on the economy.

Q. ARE YOU A MEMBER OF ANY PROFESSIONAL ORGANIZATIONS?

A. Yes, I am a member of the American Economic Association, the National Association of Business Economists, the International Association for Energy Economics, and the Association of Energy Services Professionals.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes, when I was a member of the Public Staff I testified before this Commission on numerous occasions. I also testified on behalf of DEC in the Company's original Save-a-Watt proceeding (Docket No. E-7, Sub 831), the Company's DSM/EE cost recovery mechanism review (Docket No. E-7, Sub 1032), and in several IRP proceedings (2005 IRP Docket No. E-100, Sub 103; 2007 IRP Docket E-100, Sub 114; 2008 IRP Docket E-100, Sub 118; and 2009 IRP Docket E-100, Sub 124).

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

A. The purpose of our testimony is to address the Public Staff's recommendation, as described in the testimony of Public Staff witness Eric L. Williams, that the avoided capacity cost benefits for purposes of the Portfolio Performance Incentive ("PPI") and cost-effectiveness of the Company's DSM/EE programs be calculated under the assumption that capacity avoided prior to year 2023 be assigned a zero dollar value. The Public Staff also recommends that for as long as the Docket No. E-100, Sub 148 avoided cost rates remain in effect, the Company should assign a capacity cost of zero to all kilowatt ("kW") savings occurring before year 2023 that are related to Vintage Years 2019 and afterward. As detailed in our testimony below, the Company strongly disagrees with these recommendations. Witness Duff describes the Company's agreement with the Public Staff to revise the Company's cost recovery mechanism in Docket No. E-7, Sub 1130 ("Sub 1130"), as approved by the Commission in its August 23, 2017 order in that docket ("Sub 1130 Order"), and how the agreement does not support the Public Staff's position. Dr. Stevie discusses Witness Williams' testimony with respect to his analytical process that led to the Public Staff's conclusion that all of the DSM/EE programs in the Company's resource plan should receive zero capacity value for the years 2019 through 2022. Dr. Stevie points out why this approach is inappropriate and seriously underestimates the value of the Company's DSM/EE programs.

Q. MR. DUFF, WILL YOU PLEASE SUMMARIZE THE AGREEMENT DEC REACHED WITH THE PUBLIC STAFF IN SUB 1130?

A. In pertinent part, the agreement establishes, beginning with Vintage 2019 and for all future Vintages, a uniform method for determining cost-effectiveness for DSM/EE programs and calculating the Company's PPI for the purposes of both the projection and true-up of programs offered in a given Vintage Year. Under this method, the Company uses the projected avoided capacity and energy benefits specifically calculated for the program, as derived from the underlying resource plan, production cost model, and cost inputs used to determine the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of December 31 of the year immediately preceding the date of the annual DSM/EE rider in which the Vintage was projected. The agreement specifies that the PURPA based avoided energy costs are derived by taking the difference between one production cost run that includes an assumed 24x7, 100 megawatts ("MW") of no-cost qualified facility ("QF") energy and one without the 100 MW of QF energy. The avoided energy costs used in the revised cost recovery mechanism are derived by taking a similar differencing approach except the projected hourly load shapes and load reductions associated with the proposed bundle of DSM/EE programs with the 100 MW of no-cost energy would be substituted. In order to ensure that new program requests and existing programs are being evaluated with up-to-date avoided costs, the agreement also establishes that the Company shall use projected avoided capacity and energy benefits specifically calculated for the program, as derived from the

underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits reflected in the most recent Commission-approved Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities as of the date of the filing for the new program approval. The Commission approved this agreement and the resulting revisions to the Company's cost recovery mechanism in the Sub 1130 Order.

Q. WHY DID THE COMPANY AND PUBLIC STAFF PROPOSE THESE CHANGES TO THE MECHANISM?

A. One of the primary purposes for the revisions to the mechanism was to eliminate the previous "trigger" approach for updating avoided costs. Prior to the changes approved in Sub 1130, the previous version of DEC's DSM/EE cost recovery mechanism provided that the per kW avoided capacity costs used to calculate the avoided cost savings were those reflected in the filing by DEC in Docket No. E-100, Sub 136 (the 2012 Biennial Avoided Cost Proceeding). The per kilowatt-hour ("kWh") avoided energy costs were those reflected in the Company's most recent integrated resource plan ("IRP") at the time that version of the mechanism was approved (the 2012 IRP). These avoided costs were only updated if certain triggers were hit – if avoided energy costs calculated for purposes of the IRP increased or decreased by 20% or more, or if avoided capacity costs reflected in the rates approved in the biennial avoided cost proceedings increased or decreased by 15% or more.

Under the old trigger approach, if the trigger thresholds were not hit, avoided cost rates could potentially remain unchanged for years. Under the agreement and approved modifications to the mechanism, these triggers are eliminated and instead, DSM and EE programs are evaluated for cost effectiveness utilizing Commission-approved avoided cost rates that are updated every two years as part of the biennial avoided cost proceeding.

The second primary purpose of the agreement is that it changed the source and methodology for calculating avoided energy costs, which previously had been based on the IRP, so that like avoided capacity costs, they would now be derived from the biennial avoided cost proceeding. Absent the revision, the existing language in the mechanism could have resulted in DSM and EE programs being evaluated using avoided energy rates from the Company's IRP that were not based on the same fundamental assumptions used in the determination of the avoided capacity rates, which are those approved in the Company's biennial avoided cost proceeding. This potential mismatch could have undermined the validity of the cost effectiveness evaluation. The new language eliminates this potential problem by aligning the assumptions approved for both avoided energy and avoided capacity rates, as the proposed revisions to the mechanism call for using the most recently approved avoided energy cost and most recently approved avoided capacity cost from the same proceeding – i.e., the Company's biennial avoided cost proceeding.

Q. DID THE REVISIONS TO THE MECHANISM APPROVED IN SUB 1130 CHANGE THE METHODOLOGY BY WHICH THE COMPANY WAS TO CALCULATE AVOIDED CAPACITY COSTS?

A. No, aside from eliminating the trigger approach, there were no changes to the source or methodology underlying the avoided capacity calculation.

Q. WHAT WAS THE DATA SOURCE FROM WHICH THE AVOIDED CAPACITY RATE AND AVOIDED ENERGY RATE USED IN THE COMPANY'S APPLICATION IN THIS PROCEEDING WERE DERIVED?

A. Consistent with the revisions to DEC's DSM/EE cost recovery mechanism that the Commission approved in the Sub 1130 Order, the Company derived both the avoided energy and avoided capacity using the rates approved in the Company's most recent biennial avoided cost proceeding, which in this case is Docket No. E-100, Sub 148.

Q. DO YOU AGREE WITH WITNESS WILLIAMS' CONTENTION THAT THE COMPANY DID NOT USE AVOIDED CAPACITY RATES THAT WERE BASED ON ASSUMPTIONS APPROVED IN THE LAST BIENNIAL AVOIDED COST PROCEEDING?

A. No, I do not agree. The Company updated the avoided capacity rate used for estimating program cost effectiveness and the Company's projected PPI in a manner consistent with how it has always updated avoided capacity based on the biennial avoided cost proceedings. It utilized the avoided capacity value calculated using the Peaker Method consistent with the Company's

understanding of the Sub 1130 settlement, which, in the Company's view, did not modify the approach used in past DSM/EE proceedings.

Q. DID THE COMPANY EXPECT THAT THE PUBLIC STAFF WOULD ADOPT THE POSITION THAT THE REVISIONS TO THE COMPANY'S DSM/EE COST RECOVERY MECHANISM APPROVED IN THE SUB 1130 ORDER WOULD ALTER THE WAY AVOIDED CAPACITY WAS TO BE UPDATED?

A. No, the Company did not believe the agreed-upon revisions to the mechanism would change how the Company should calculate the avoided capacity costs used to evaluate programs that have already been approved by the Commission and are part of the Company's existing portfolio of programs.

Q. IN SUB 1130, WHAT REVISIONS WERE PROPOSED BY THE PUBLIC STAFF AND THE COMPANY AND APPROVED BY THE COMMISSION REGARDING AVOIDED CAPACITY COSTS?

A. I am not aware of any changes contained in the revisions that pertained to avoided capacity costs. Avoided capacity costs are calculated in the same manner as they were prior to the revisions approved in Sub 1130. The revisions to paragraphs 19, 23 and 69 of the Company's cost recovery mechanism accomplished two things. First, they eliminated the trigger methodology for updating avoided energy and avoided capacity costs. Second, they changed the data source and methodology used to update the avoided *energy* rates used in the calculation of program cost-effectiveness.

Q. WITNESS WILLIAMS CITES EXCERPTS FROM YOUR SUPPLEMENTAL AND REBUTTAL TESTIMONY IN SUB 1130 AS SUPPORT FOR THE PUBLIC STAFF'S BELIEF THAT THE COMPANY WAS GOING TO UPDATE THE AVOIDED CAPACITY RATES IN A MANNER CONSISTENT WITH THE PUBLIC STAFF'S PROPOSAL IN THIS PROCEEDING. DO YOU AGREE WITH WITNESS WILLIAMS' CHARACTERIZATION OF YOUR PRIOR TESTIMONY IN SUB 1130?

A. No, I do not agree. I believe Witness Williams has selectively utilized excerpts of my prior testimony out of context to justify his contention. The statement he references from my Sub 1130 testimony was actually taken from the summary of my testimony; when reviewed in context of the entire paragraph from which they were excerpted, it is clear that I am referring to the "inconsistent assumptions" that would exist between using avoided energy rates from an IRP filing that could be based on a different resource plan than the avoided capacity rates simply due to the timing of the approval of rates in the biennial avoided cost proceeding (the source for the avoided capacity rates) and the acceptance of an IRP (previously, the source for the avoided energy rates). The language below is the entire paragraph from which Witness Williams's selectively excerpted:

> This agreement improves upon the methodology used to determine the avoided costs to be used under the Company's existing cost recovery mechanism in a number of ways. In particular, this agreement will reduce the potential for the avoided costs used to assess program cost effectiveness and establish DEC's PPI

from becoming dated or stale, while still allowing DEC enough certainty to effectively plan its portfolio of programs. Under the old trigger approach spelled out in Paragraph 69 of the mechanism, if the trigger thresholds were not hit, avoided cost rates could potentially remain unchanged for years. Under the agreement and proposed modifications to the mechanism, DSM and EE programs will be evaluated for cost effectiveness utilizing fully-vetted and Commission-approved avoided cost rates that are essentially updated every two years as part of the biennial avoided cost proceeding. Another benefit of the agreement is that it eliminates the potential for avoided energy and avoided capacity costs to be based upon inconsistent assumptions. Absent the proposed revisions to the mechanism, DSM and EE programs could potentially be evaluated using avoided energy rates from the Company's Integrated Resource Plan that were not based on the same fundamental assumptions used in the determination of the avoided capacity rates approved in the Company's biennial avoided cost proceeding. The proposed revisions eliminate this potential problem by aligning the assumptions for both avoided energy and avoided capacity rates, as a result of using the most recently approved avoided energy and capacity costs from the same proceeding.

Q. MR. WILLIAMS' TESTIMONY FREQUENTLY REFERS TO THE TESTIMONY OF PUBLIC STAFF WITNESS JOHN R. HINTON IN SUB 1130 TO SUPPORT HIS POSITION. HAVE YOU REVIEWED WITNESS HINTON'S TESTIMONY IN THAT PROCEEDING?

A. Yes, the Company has reviewed Mr. Hinton's testimony in Sub 1130 and believes that DEC's application of avoided capacity costs in this case is entirely consistent with Mr. Hinton's testimony. Nowhere in Mr. Hinton's testimony does he indicate that the specific manner in which avoided capacity rates are to be derived from the Biennial Determination of Avoided Costs has changed as a result of the revisions to the mechanism approved in the Sub

1130 Order. In addition, Mr. Hinton does not indicate in his testimony that the avoided capacity rates to be used for existing DSM programs should be *the same* as those that would be paid to QF facilities. Instead, it should be clear from Mr. Hinton's testimony that the intent was to align the determination of both avoided energy and avoided capacity such that the resource plan used for those calculations would be based on the same plan as was used in the avoided cost filing. The key focus of the discussion was avoided energy. The process used to establish avoided capacity was not changing from what it had always been, or in Mr. Hinton's words that it was "generally" based on or "linked" to the rates paid to QFs for avoided energy and avoided capacity.

Q. AT THE TIME OF REACHING THE AGREEMENT WITH THE PUBLIC STAFF IN SUB 1130, DID THE COMPANY PROVIDE THE PUBLIC STAFF WITH ANY INFORMATION THAT WOULD HAVE DEMONSTRATED ITS INTENT TO APPLY CAPACITY VALUES BEGINNING IN YEAR 1 (VINTAGE 2019)?

A. Yes. As referenced on page 13 of Witness Maness affidavit in Sub 1130, as well as his live testimony beginning on page 267 of the transcript in Sub 1130, the Company provided the Public Staff with calculations showing that the projected PPI for 2018 would be reduced by approximately $9.5 Million if the Public Staff's interpretation of Paragraph 69 had been applied in the calculation of the Vintage 2018 PPI. In this analysis, the Company also provided a projection of what the change in Vintage 2019 PPI would be under

the revisions to the mechanism if the proposed avoided costs rates pending before the Commission in Docket No. E-100, Sub 148 were approved. Specifically, the Company provided a projected stream of avoided capacity costs that reflected capacity values beginning in year one (2019). In other words, the analysis provided clearly reflected avoided capacity values in the years 2019-2022, rather than the zero value advocated by Witness Williams.

Q. DO YOU AGREE WITH WITNESS WILLIAMS' CONTENTION THAT THE COMMISSION'S ORDER IN DOCKET NO. E-100, SUB 148 JUSTIFIES THE PUBLIC STAFF'S POSITION REGARDING HOW AVOIDED CAPACITY COST SHOULD BE TREATED IN THE COMPANY'S DSM/EE APPLICATION?

A. No, I do not agree. The language that was cited from page 69 of the Commission Order in the E-100 Sub 148 case again appears to have been taken somewhat out of context. The full paragraph that was referenced by Witness Williams reads as follows:

> The Commission notes that in addition to providing the basis for electric power purchases from QFs by a utility, the Commission-determined avoided costs are utilized in, among other applications, the determination of the cost effectiveness of DSM/EE programs and the calculation of the performance incentives for such programs, the determination of the incremental costs of compliance with REPS for cost recovery purposes; and in some ratemaking, such as determination of stand-by rates. In these contexts, it is appropriate for the rates to be reflective of the utilities' actual forecasted rates over a longer term, not based on a short-term forecast that is fixed for the duration of a longer term."

While the paragraph does reference that Commission-determined avoided costs are utilized in "the determination of the cost effectiveness of

1 DSM/EE programs and the calculation of the performance incentives," it in no
2 way indicates that they are to be utilized in a manner consistent with the
3 Public Staff's position. An even more important context to note is that the
4 portion of the Order that contains this paragraph is specifically dealing with
5 the Evidence and Conclusions Supporting Findings of Fact No 10, which does
6 not deal with avoided capacity rates, but rather with the Commission's denial
7 of DEC and DEP's request to reset energy rates utilized in a standard contract
8 every two years. So while the language referenced clearly indicates the
9 Commission believes that since the avoided energy rates are utilized in
10 calculations associated with cost-effectiveness and performance incentives
11 related to DSM/EE programs that they should not be updated every two years,
12 it is a far cry from supporting the Public Staff's contention related the
13 application of avoided capacity rates.

14 **Q. DO YOU BELIEVE THAT A COMMISSION DECISION TO ADOPT**
15 **THE PUBLIC STAFF'S RECOMMENDATION IS CONSISTENT**
16 **WITH NORTH CAROLINA POLICY?**

17 A. No, I do not.

18 **Q. PLEASE EXPLAIN.**

19 A. Witness Williams' testimony appears to imply that EE is the first capacity
20 resource that could be cut out of the Company's resource plan, in that he
21 states that the Company would still be able to meet its load requirement and
22 maintain a 17% reserve margin without the projected new EE included in the
23 plan. He then uses this logic to support his position that the Company should

not recognize avoided capacity costs until a resource need exists in 2023. Unfortunately, his logic appears to ignore the fact that new EE should be viewed as a priority resource, not the first resource to be eliminated, as he fails to recognize the key role EE plays in the Company meeting its Renewable Energy Portfolio Standard. In fact, his position seems to fly directly in the face of Senate Bill 3, when one appropriately considers that the stated purpose of Senate Bill 3 was to "promote the development of renewable energy and energy efficiency in the state through the implementation of a Renewable Energy and Energy Efficiency Portfolio Standard."

Q. DR. STEVIE, WHAT IS YOUR UNDERSTANDING OF THE PUBLIC STAFF'S POSITION ON THE TREATMENT OF DSM/EE AVOIDED CAPACITY COSTS?

A. Based upon my review of Public Staff witness Williams' testimony, it is my understanding that the Public Staff's position is that:

> "DSM/EE ongoing cost-effectiveness and utility incentives should be based on consistent assumptions from the approved 2016 Biennial Avoided Cost rates which include an avoided capacity value of zero prior to 2023."
> (Witness Williams' testimony: page 7, lines 9-12).

Further, Public Staff Witness Williams states that:

> "In order to be consistent with the Sub 148 Order and the Revised Mechanism, determinations of ongoing cost-effectiveness and utility incentives of both **new** DSM/EE programs and new vintages of existing DSM/EE programs starting in vintage 2019 should be based on avoided capacity rates that reflect zero avoided capacity value in years prior to the identified need for new capacity in the Company's IRP (2023)."
> (Emphasis added).
> (Witness Williams' testimony page 7, line 20 through page 8, line 5).

Q. WHAT IS THE IMPACT OF THIS POSITION?

A. It is my understanding that based upon this position, the Public Staff recommends that all of the DSM/EE kW impacts in the years 2019 to 2022 would have a zero capacity value for purposes of evaluating cost-effectiveness and evaluating utility incentives. To that end, the Public Staff's testimony removes the avoided capacity value for that time period for all kW impacts. Based upon the referenced DEC IRP, in 2019 this represents the removal of the capacity value for 1,119 MW of DSM impacts and 220 MW of EE impacts of summer capability from the Company's existing portfolio of approved DSM/EE programs.

Q. DO YOU AGREE WITH PUBLIC STAFF WITNESS WILLIAMS' TESTIMONY?

A. No, I do not. I have several reasons why this is not a reasonable approach.

Q. PLEASE EXPLAIN.

A. To begin, we need to parse apart the DSM/EE impacts into two components, DSM and EE. With respect to the DSM portion, the Public Staff has totally ignored the legacy aspect of the DSM programs. The DSM programs are not incremental programs. They are not new,[1] which is in direct conflict with Witness Williams' statement quoted above that his recommendation applies to **new** programs and **new** vintages of existing DSM/EE programs. The Company first initiated DSM programs at least forty years ago when I was a

[1] While of course, the Company's DSM programs qualify as "New demand-side management or energy efficiency measures" as that term is defined in Commission Rule R8-68 ("a demand-side management or energy efficiency measure that is adopted and implemented on or after January 1, 2007, including subsequent changes and modifications to any such measure."), they certainly are not "new" as the term is used by Witness Williams.

1 member of the Public Staff and has implemented the current set of DSM
2 programs pursuant to Senate Bill 3. Again, these are not incremental or new
3 programs. They are established programs that have grown over time to be a
4 useful resource. If a power plant were designated used and useful and placed
5 into service, but subsequently there is an unanticipated recession that caused a
6 reduction in the projected loads, would it be reasonable to then penalize the
7 Company for a past decision that was deemed reasonable at the time? That is
8 similar to what the Public Staff is trying to do here and is not reasonable.

9 As for the usefulness of the Company's DSM programs, Public Staff
10 witness Williams' own testimony (*see* page 16, lines 8 to 11) points out that
11 by the year 2022, 95% of the DSM programs would be needed to defer the
12 need for capacity to the year 2023. This should have raised an obvious
13 question for the Public Staff. How can a resource such as the legacy DSM
14 programs, that are in part responsible for the deferral of the need for new
15 capacity, not receive a capacity valuation? If the Company's legacy DSM
16 programs were closed tomorrow, there would be an immediate need for new
17 capacity.

18 The Company believes it is appropriate to recognize the similarity
19 between the continuing capacity value for these legacy DSM programs and
20 QFs that had established legally enforceable obligations ("LEOs") or had
21 signed power purchase agreements with the Company prior to November 15,
22 2016. While I am not an attorney, in order to respond to Witness Williams'
23 testimony about the Commission's avoided cost order, I have familiarized

myself at a high level with the Commission's avoided cost proceedings. It is my understanding that these legacy QFs are now receiving long-term fixed rates (up to 15 years) that included capacity values in every year based on the Commission's policies and avoided cost orders in effect prior to House Bill 589's enactment. No party has recommended a retroactive revision of existing purchase power agreements (some of which may continue until 2030 or longer under Section I.(c) of House Bill 589) entered into by the Company and these legacy QFs that contracted to sell prior to November 15, 2016 to modify the capacity payments to reflect the Commission's Sub 148 Order. Accordingly, the Company's legacy DSM programs, which are, in fact, providing capacity value in the near-term to avoid future capacity needs clearly deserve to be assigned an avoided capacity value similar to the legacy QFs, and not to have the zero value position of the Public Staff retroactively imposed upon them.

Q. DO YOU HAVE ANY OTHER COMMENTS ON THE DSM PORTION OF THE PUBLIC STAFF'S ANALYSIS?

A. Yes. In response to the Company's discovery request 1-5, Public Staff Witness Williams responded that he used Excel's solver functionality to determine the minimum DSM and EE capacity needed to maintain a 17% reserve margin for the period 2019 – 2022. This appears to be how he evaluated the capacity need for the Company. There are two things to note about his analysis. First, he ignored the fact that his own analysis demonstrated that the existing DSM resources provide real value in terms of

capacity during the 2019 to 2022 time frame. Even though his own analysis showed tremendous value, the Public Staff went ahead and deleted all the value for capacity for that time period. Second, while using Excel's solver mechanism may provide the correct answer, it is impossible to know what may be overlooked by not using an IRP planning model that captures significantly more factors than just the amount of capacity. Basing capacity decisions on the use of Excel's solver software does not seem like a proper resource planning process.

Q. YOU HAVE REVIEWED THE PUBLIC STAFF'S POSITION ON THE COMPANY'S DSM PROGRAMS. WHAT COMMENTS DO YOU HAVE ABOUT THE STAFF'S POSITION ON THE EE PROGRAMS?

A. The Company's EE programs are, in some respects, different than the DSM programs in that most represent incremental new impacts in the resource plan. One could look at the EE programs and conclude that the capacity from those approved EE programs is not needed and hence should not receive a capacity value until the year 2023.

However, this overlooks the fact that one program, My Home Energy Report ("MyHER"), is effectively in the same position as the legacy DSM programs. The MW capability provided by the MyHER EE program was created in the past, prior to the establishment of the new avoided cost rates. All that is required is the expenditure of funds to maintain the impacts, just like the Company must do to maintain the availability of the impacts from the legacy DSM programs. In this case, the MyHER program impacts are also

not incremental or new after November 2016. They are embedded in the resource plan, and like legacy QFs with LEOs existing prior to November 15, 2016, should receive a capacity value in the 2019 to 2022 time period. The MW impacts of the MyHER program were not included in the EE impacts shown in the Company's IRP.

With respect to the other EE programs, there is a summer capacity need of 425 MW (379 MW for the winter) from the EE programs in the year 2023. Now, anyone who has been around the implementation of EE programs for any length of time will recognize that one does not create 425 MW of EE overnight. It takes time. It takes time to build customer awareness. It takes time for equipment to wear out and be replaced or for customers to recognize that it is time to change out equipment. In addition, the Company is subject to the decisions of customers to participate in the programs. There is no control over customer decision-making when it comes to participation in EE programs. In addition, in the Company's IRP, the EE impacts are subtracted from the load forecast. As a result, there is no reserve margin for the EE impacts. The Company can only make offers that it hopes customers will embrace. But, there are no guarantees.

Looking further at the Company's IRP, Witness Williams points out in reference to the Commission approved revisions to DEC's cost recovery mechanism:

"said revisions providing that the avoided energy and capacity benefits used for program approval and the initial estimate of the PPI and any PPI true-up, as well as for the review of on-going cost-effectiveness, would use:

> 'projected avoided capacity and energy benefits specifically calculated for each program, as derived from the underlying resource plan, production cost model, and cost inputs that generated the avoided capacity and avoided energy credits…'"

(Witness Williams' testimony: page 3, lines 15 to 25).

It is important to note the fact that the Company's inputs to the IRP for the cost of the DSM and EE programs include not just the implementation cost, but also the estimate of the utility's PPI, which contains a capacity value for the years 2019 through 2022. As a result, one could conclude that to be consistent with the underlying resource plan, including the cost inputs, one should be including the avoided capacity cost for DSM/EE for the years 2019 to 2022. I think when one looks at the resource planning process from this perspective, it makes good sense to recognize the capacity value of the EE programs during the 2019 to 2022 period. While the Public Staff would likely not advocate for the Company to shut down its EE programs during "gap years" until a capacity need arrives, from a financial perspective, it is effectively telling them to do just that.

Q. DO YOU HAVE ANY OTHER COMMENTS ABOUT THE PUBLIC STAFF'S POSITION ON THE DSM/EE PROGRAMS?

A. Yes. It should be very clear that the legacy DSM programs and the MyHER program deserve a full capacity value for the years 2019 to 2022 and beyond. The legacy DSM programs are not incremental and are treated as a dispatchable resource in the IRP. In addition, even the Public Staff's own analysis concluded that the legacy DSM programs provide a capacity value during the 2019 to 2022 time period.

With respect to the MyHER EE program, because its load impacts are also not incremental and existed prior to the establishment of the new avoided cost rates, I believe they also deserve a full capacity value.

For the other EE programs, while the Company believes it valued them appropriately with an avoided capacity value for all years; should the Commission agree with the Public Staff's position, then the Company would recognize that the incremental impacts from those programs could be treated the same as the incremental QF resources in the IRP. This means that, consistent with how "new" QFs with LEOs after November 15, 2016 are treated, the Company would ascribe a zero value of capacity for the years 2019 to 2022 for these other EE programs.

Q. DOES THIS CONCLUDE YOUR PRE-FILED REBUTTAL TESTIMONY?

A. Yes.

1 MS. JAGANNATHAN: And, to the extent the
2 Commission would want their summaries, we could
3 stipulate that into the record as well. But if -- I
4 don't think there's any need to if their testimony is
5 already in the record.
6 COMMISSIONER BROWN-BLAND: I'm sorry, you're
7 saying summaries are being waived? Is that what
8 you're --
9 MS. JAGANNATHAN: Yes, summaries are being
10 waived.
11 COMMISSIONER BROWN-BLAND: And that's fine
12 with the Commission. All right.
13 MS. EDMONDSON: And we would -- I handed out
14 some documents at the break that Duke and the Public
15 Staff had agreed to stipulate to enter into the
16 record, and if I could just identify these.
17 COMMISSIONER BROWN-BLAND: All right.
18 MS. EDMONDSON: And these -- so I think
19 first I handed you a folder, a second folder, the
20 first document in there is, it's Docket Number E-7,
21 Sub 1164, NC Public Staff Data Request Number 3. If
22 that can be Stipulated Stevie/Duff Cross Exhibit 1 or
23 Stipulated Exhibit 1.
24 MS. JAGANNATHAN: Yes, that's fine.

1 MS. EDMONDSON: And then the next document
2 is --
3 COMMISSIONER BROWN-BLAND: Hold on.
4 MS. EDMONDSON: I'm sorry.
5 COMMISSIONER BROWN-BLAND: That will be
6 marked and identified as Stevie/Duff Stipulated
7 Exhibit 1.
8 MS. EDMONDSON: Thank you.
9 (WHEREUPON, Stevie/Duff Stipulated
10 Exhibit 1 is marked for
11 identification.)
12 MS. EDMONDSON: And Stipulated Exhibit 2
13 would be the next document which is Data Request
14 Number 14.
15 COMMISSIONER BROWN-BLAND: This is still
16 Stevie/Duff, correct?
17 MS. EDMONDSON: Yes.
18 COMMISSIONER BROWN-BLAND: So this will be
19 Stipulated Exhibit 2.
20 (WHEREUPON, Stevie/Duff Stipulated
21 Exhibit 2 is marked for
22 identification.)
23 MS. EDMONDSON: And the next document is
24 Data Request Number 16 and that would be Stevie/Duff

Stipulated Exhibit 3.

COMMISSIONER BROWN-BLAND: So identified.

(WHEREUPON, Stevie/Duff Stipulated Exhibit 3 is marked for identification.)

MS. EDMONDSON: And the next document is a data request from the Public Staff, it's Data Request 4. It is for the Prepaid Advantage Program dated February 5th, and that would be Stevie/Duff Stipulated Exhibit 4.

COMMISSIONER BROWN-BLAND: So identified.

(WHEREUPON, Stevie/Duff Stipulated Exhibit 4 is marked for identification.)

MS. EDMONDSON: And the Stevie/Duff Stipulated Exhibit 5 would be what is entitled *Public Staff Data Request Number 5*. That's also for Prepaid Advantage Pilot. And --

COMMISSIONER BROWN-BLAND: Wait a minute.

MS. EDMONDSON: Sorry. It's just a one page.

COMMISSIONER BROWN-BLAND: I was looking at the wrong one. It will be so marked as Stipulated Exhibit 5.

1 (WHEREUPON, Stevie/Duff Stipulated
2 Exhibit 5 is marked for
3 identification.)
4 MS. EDMONDSON: The sixth Stevie/Duff
5 Stipulated Exhibit is a -- it's a different font -- it
6 is a -- it's got a confidential portion. It's
7 Response of the Public Staff to Duke Energy Carolinas,
8 consists of five pages, and I would note that on page
9 3 there is confidential information. I also have not
10 included the spreadsheets that are confidential, but
11 the response to 1-7 includes confidential information.
12 COMMISSIONER BROWN-BLAND: So you're not --
13 the exhibit is not to include the spreadsheets?
14 MS. EDMONDSON: Right, but 1-7, the text
15 does include a couple of confidential numbers.
16 COMMISSIONER BROWN-BLAND: So this will be
17 Stevie/Duff Stipulated Exhibit 6 --
18 MS. EDMONDSON: Yes.
19 COMMISSIONER BROWN-BLAND: -- with the
20 confidential portion remaining confidential, Madam
21 Court Reporter.
22 MS. EDMONDSON: Yes.
23 (WHEREUPON, Confidential
24 Stevie/Duff Stipulated Exhibit 6

is marked for identification and filed under seal.)

MS. EDMONDSON: And I do not have these to pass out, we will submit these post-hearing, but what we -- we would ask that, and I can give -- I've got one copy of each of these to be marked as Stevie/Duff Stipulated Exhibit 7, would be a response to Public Staff Data Request Number 21, and I will file those. I don't have copies. I have one for the court reporter.

COMMISSIONER BROWN-BLAND: All right.

MS. EDMONDSON: And then what we would ask that would be Number 8 is a response to Data Request Number 22.

COMMISSIONER BROWN-BLAND: Responses to Data Requests 21 and 22 --

MS. EDMONDSON: Which we would --

COMMISSIONER BROWN-BLAND: -- will be Stevie/Duff Stipulated Exhibits 7 and 8, respectively.

MS. EDMONDSON: Right.

COMMISSIONER BROWN-BLAND: So marked.

(WHEREUPON, Stevie/Duff Stipulated Exhibits 7 and 8 are marked for identification.)

MS. EDMONDSON: And we will file those with the Commission.

COMMISSIONER BROWN-BLAND: Post haste.

MS. EDMONDSON: Yes, and that is all. Thank you.

COMMISSIONER BROWN-BLAND: Ms. Jagannathan.

MS. JAGANNATHAN: And, finally, I think the Public Staff and the Company would ask the Commission to take judicial notice of a certain number of dockets - Docket Number E-7, Sub 831; E-7, Sub 1032; E-7, Sub 1130; and E-100, Sub 148.

COMMISSIONER BROWN-BLAND: Those documents (sic) will be judicially noticed for the record.

MS. JAGANNATHAN: Thank you.

COMMISSIONER BROWN-BLAND: Does that include --

MS. JAGANNATHAN: Including all filings and orders in those dockets.

COMMISSIONER BROWN-BLAND: Okay. All right. Is there anything else in this case to come before?

MS. JAGANNATHAN: Not from the Company.

MR. NEAL: (Shakes head no).

MR. SMITH: (Shakes head no).

MS. EDMONDSON: (Shakes head no).

COMMISSIONER BROWN-BLAND: Witnesses Stevie and Duff got out even lighter than the other three.

(Laughter)

There being nothing else to come before the Commission on this, what we'll turn our attention to the post-hearing briefs and orders. Is everybody comfortable with 30 days after the availability of the transcript?

MS. JAGANNATHAN: That works for the Company.

MS. EDMONDSON: Yes.

COMMISSIONER BROWN-BLAND: So ordered. That being the case, we will close this DSM docket, and thank you for your participation.

MS. JAGANNATHAN: Thank you.

MS. EDMONDSON: Thank you.

MR. NEAL: Thank you.

COMMISSIONER BROWN-BLAND: We will take just a brief minute to reorganize for the REPS proceeding.

(WHEREUPON, the proceedings were adjourned.)

C E R T I F I C A T E

I, KIM T. MITCHELL, DO HEREBY CERTIFY that the Proceedings in the above-captioned matter were taken before me, that I did report in stenographic shorthand the Proceedings set forth herein, and the foregoing pages are a true and correct transcription to the best of my ability.

Kim T. Mitchell
Court Reporter II