



**NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION**

May 9, 2023

Ms. A. Shonta Dunston, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

Re: Docket No. E-7, Sub 1285 – Application of Duke Energy Carolinas, LLC, for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C.G.S § 62-133.9 and Commission Rule R8-69

Dear Ms. Dunston:

Attached for filing on behalf of the Public Staff in the above-referenced docket, please find the Testimony of David M. Williamson, Engineer, Energy Division.

By copy of this letter, we are forwarding a copy to all parties of record by electronic delivery.

Sincerely,

Electronically submitted
/s/ Anne M. Keyworth
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/s/ Nadia L. Luhr
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Attachments

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CERTIFICATE OF SERVICE

I certify that a copy of this Testimony has been served on all parties of record or their attorneys, or both, in accordance with Commission Rule R1-39, by United States Mail, first class or better; by hand delivery; or by means of facsimile or electronic delivery upon agreement of the receiving party.

This the 9th day May, 2023.

Electronically submitted
/s/ Anne M. Keyworth
Staff Attorney

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1285

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

May 9, 2023

1 **Q. Please state your name, business address, and present**
2 **position.**

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

7 **Q. Briefly state your qualifications and duties.**

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

9 **Q. What is the purpose of your testimony?**

10 A. The purpose of my testimony is to present the Public Staff's analysis
11 and recommendations with respect to Duke Energy Carolinas, LLC's
12 (DEC or the Company) application for approval of its demand-side
13 management (DSM) and energy efficiency (EE) cost recovery rider
14 for Vintage Year 2024 (Rider 15), as well as the testimony and
15 exhibits of DEC witnesses Casey Q. Fields and Shannon R.
16 Listebarger filed on February 28, 2023; the corrected exhibits of
17 Casey Q. Fields filed on March 7, 2023; and the supplemental
18 testimony and exhibits of Casey Q. Fields and Carolyn T. Miller filed
19 on April 28, 2023.

20 My testimony discusses: (1) the portfolio of DSM/EE programs
21 included in the proposed Rider 15, including modifications to those
22 programs; (2) the ongoing cost-effectiveness and performance of

1 each DSM/EE program; and (3) the evaluation, measurement, and
2 verification (EM&V) studies filed as Exhibits A through I to the
3 testimony of Company witness Fields.¹

4 **Q. What documents have you reviewed in your investigation of**
5 **DEC's proposed Rider 15?**

6 A. I reviewed the application, supporting testimony and exhibits, and
7 DEC's responses to Public Staff data requests. In addition, I
8 reviewed the following documents, which are pertinent to Rider 15:

- 9 1. The Cost Recovery and Incentive Mechanism for Demand-Side
10 Management and Energy Efficiency Programs approved on
11 August 23, 2017, in the Commission's Order Approving DSM/EE
12 Rider, Revising DSM/EE Mechanism, and Requiring Filing of
13 Proposed Customer Notice, in Docket No. E-7, Sub 1032 (2017
14 Mechanism);
- 15 2. The Cost Recovery and Incentive Mechanism for Demand-Side
16 Management and Energy Efficiency Programs approved on
17 October 20, 2020, in the Commission's Order Approving
18 Revisions to Demand-Side Management and Energy Efficiency
19 Cost Recovery Mechanisms, in Docket Nos. E-2, Sub 931, and
20 E-7, Sub 1032 (2020 Mechanism); and

¹ The Company filed Fields Exhibit J as an EM&V report, but Fields Exhibit J is an informational report to study low- and moderate-income penetration within the Company's DSM/EE portfolio. Fields Exhibit J does not propose changes to the savings that will be incorporated in the Company's filing.

1 3. The modification to subsection 20 of the 2020 Mechanism to
2 include language on the Reserve Margin Adjustment Factor,
3 approved by the Commission in Docket No. E-7, Sub 1265, on
4 December 12, 2022.

5 **Q. Please summarize your recommendations.**

6 A. The Public Staff makes the following recommendations:

- 7 1. That, with the exception of Fields Exhibit F, the EM&V reports
8 filed by DEC as Fields Exhibits A through I be accepted; and
9 2. That the EM&V report filed as Fields Exhibit F be held open
10 until the next rider proceeding.

11 **Q. Are you providing any exhibits with your testimony?**

12 A. Yes, I am. Williamson Exhibit 1 is an updated Fields Exhibit 7 to
13 reflect the corrected cost-effectiveness scores for each program
14 within the portfolio.

15 **Q. For which programs is DEC seeking cost recovery through the**
16 **DSM/EE rider in this proceeding?**

17 A. In its proposed Rider 15, DEC is seeking recovery of the costs and
18 incentives associated with the following programs:

- 19 • Energy Assessment;
20 • EE Education;
21 • Residential Smart \$aver® Energy Efficient Appliances and
22 Devices;

- 1 • Residential Smart \$aver® EE (formerly the HVAC EE
- 2 Program);
- 3 • Multi-Family EE;
- 4 • My Home Energy Report (MyHER);
- 5 • Residential Neighborhood Energy Saver (formerly Income-
- 6 Qualified Energy Efficiency and Weatherization Assistance);
- 7 • Residential New Construction;
- 8 • Power Manager;
- 9 • Nonresidential Smart \$aver® Energy Efficient Products and
- 10 Assessments Program:
- 11 ○ Energy Efficiency Food Service Products;
- 12 ○ Energy Efficiency HVAC Products;
- 13 ○ Energy Efficiency IT Products;
- 14 ○ Energy Efficiency Lighting Products;
- 15 ○ Energy Efficiency Process Equipment Products;
- 16 ○ Energy Efficiency Pumps and Drives;
- 17 ○ Custom Incentive and Energy Assessments;
- 18 • PowerShare®;
- 19 • Small Business Energy Saver;
- 20 • EnergyWise for Business; and
- 21 • Nonresidential Smart \$aver® Performance Incentive.

Cost Effectiveness

1
2 **Q. How is the cost-effectiveness of DEC's DSM/EE programs**
3 **evaluated?**

4 A. The cost-effectiveness of a program is determined by determining a
5 ratio of the benefits versus the costs of the program. The cost-
6 effectiveness of each DSM/EE program is reviewed when it is
7 proposed for approval and then annually in the rider proceedings.
8 Pursuant to the 2020 Mechanism, cost-effectiveness is evaluated at
9 both the program and portfolio levels. Cost-effectiveness is reviewed
10 using the Utility Cost (UC), Total Resource Cost (TRC), Participant,
11 and Ratepayer Impact Measure (RIM) tests. Under each of these
12 four tests, a result above 1.0 indicates that the benefits of the
13 program outweigh the costs² so that the program is cost effective. It
14 is possible for a program's score to exceed 1.0 on one or more tests,
15 while still falling below 1.0 on other tests. While the 2017 Mechanism
16 used the TRC and UC tests to evaluate initial and ongoing cost-
17 effectiveness, the 2020 Mechanism uses the UC test only.
18 The TRC test represents the combined utility and participant benefits
19 that will result from implementation of the program, with a result
20 greater than 1.0 indicating that the benefits outweigh the costs of a

² Each test uses different costs and benefits in calculating the cost-effectiveness score.

1 program to both the utility and the program's participants. A UC test
2 result greater than 1.0 means that the program is cost beneficial³ to
3 the utility (the overall system benefits are greater than the utility's
4 costs incurred to offer the program, including incentives paid to
5 participants). The Participant test is used to evaluate the benefits
6 against the costs specific to those ratepayers who participate in a
7 program. The RIM test is used to understand how the rates of
8 customers who do not participate in a program will be impacted by
9 the program (but without consideration of what future rates would
10 have been otherwise).

11 **Q. How is cost-effectiveness evaluated in DSM/EE rider**
12 **proceedings?**

13 A. In each DSM/EE rider proceeding, DEC files the projected cost-
14 effectiveness of each program and for the portfolio as a whole for the
15 upcoming rate period (Fields Exhibit 7). These projections are an
16 evaluation of the costs and benefits associated with each test. The
17 evaluations in DSM/EE rider proceedings look at the actual
18 performance of a typical measure, providing an indication of what to

³ "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, or avoiding energy generation from existing or new facilities or purchased power.

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

3 **Q. How does the Public Staff review cost-effectiveness in each**
4 **rider?**

5 A. The Public Staff compares the cost-effectiveness test projections
6 from previous DSM/EE proceedings to the current filing and
7 develops a trend of cost-effectiveness projections that serves as the
8 basis for the Public Staff's recommendation on whether a program
9 should: (1) continue as currently implemented; (2) be monitored for
10 further decreases in cost-effectiveness along with any Company
11 efforts to improve cost-effectiveness; or (3) be terminated. While
12 each DSM/EE rider proceeding provides a snapshot of the cost-
13 effectiveness and performance of the programs and portfolio, the
14 Public Staff does not rely on one specific calculation to evaluate
15 program performance. The trends provide a clearer understanding
16 of how changes in participation, avoided cost inputs, marketing and
17 education about DSM/EE matters, and customer behaviors and
18 preferences impact overall program performance.

19 Program design and delivery may need to be modified to address
20 changes in cost-effectiveness. For example, incentive levels may
21 need to be increased or decreased to maintain overall cost-
22 effectiveness. Changes in the avoided cost inputs may increase or

1 decrease cost-effectiveness because of the changes to the value of
2 energy savings benefits realized from the portfolio. In either case, the
3 trends in cost-effectiveness over time are more telling of overall
4 performance. As long as programs are reasonably forecasted to
5 produce cost-effective savings, the Public Staff generally supports
6 their approval and inclusion in the DSM/EE rider.

7 **Q. How are the benefits determined in a cost-effectiveness**
8 **evaluation?**

9 A. The benefits associated with a program's cost-effectiveness are
10 generated by applying the applicable avoided cost rates to the
11 savings generated by the program during a specified vintage year.
12 Additionally, the avoided costs that are used in a proceeding for the
13 upcoming rate period determine how the cost-effectiveness, Portfolio
14 Performance Incentive (PPI), and Program Return Incentive (PRI)
15 will be calculated.

16 **Q. What avoided costs should be used as the basis for determining**
17 **cost-effectiveness for Vintage Year 2024?**

18 A. For purposes of determining cost-effectiveness in Vintage Year 2024,
19 the applicable avoided cost sourcing that complies with paragraph
20 77 of the 2020 Mechanism is the rates approved in the Biennial
21 Determination of Avoided Cost Rates for Electric Utility Purchases

1 from Qualifying Facilities issued on November 22, 2022, in Docket
2 No. E-100, Sub 175 (Sub 175).

3 **Q. Did the Company apply the correct avoided cost determination**
4 **for Vintage Year 2024 in its initial filing in this proceeding?**

5 A. No. In response to discovery, the Company explained that it did not
6 apply the correct avoided cost methodology to the supporting files
7 that would determine projected cost-effectiveness and the
8 associated PPI and PRI.

9 However, the Company and Public Staff have worked together to
10 assess what the impacts would be if the correct avoided cost sources
11 were applied, and the results showed that the impacts were minimal
12 because of the nearly-offsetting effects of decreasing avoided
13 capacity rates and increasing avoided energy rates.

14 **Q. Has the Company provided an update to its cost-effectiveness**
15 **projections as a result of this error?**

16 A. Yes, it has. Williamson Exhibit 1 is an updated Fields Exhibit 7, which
17 illustrates what the cost-effectiveness projections are forecasted to
18 be under the Sub 175 avoided costs.

1 **Q. Do you believe the Company's updated assessment of cost-**
2 **effectiveness for Vintage Year 2024 is reasonable?**

3 A. Yes, I do. I have reviewed its updated information and believe it to
4 be reasonable.

5 Program Performance

6 **Q. Please discuss the performance of DEC's DSM/EE portfolio.**

7 A. The Company's DSM/EE portfolio offers a wide variety of measures
8 to support the everyday activities of its customers in an energy-
9 efficient manner. The Public Staff's review of program performance
10 involved: (1) reviewing cost-effectiveness trends; (2) reviewing
11 Fields Exhibit 6, which provides specific information on each
12 program's marketing strategy and potential areas of concern; and (3)
13 performing an overall qualitative analysis.

14 The Public Staff also uses its involvement in the Company's bi-
15 monthly EE Collaborative meetings to keep abreast of how the
16 portfolio of programs is performing. During these meetings, the
17 Collaborative discusses program performance (participation,
18 customer engagement, and potential barriers to entry and
19 continuation of the program), recently completed EM&V and market
20 potential study activities, and potential new program offerings.

1 Based on the review discussed above, the Public Staff believes that
2 the historical performance of the Company's programs is
3 reasonable.

4 EM&V

5 **Q. Have you reviewed the EM&V reports filed by DEC?**

6 A. Yes. The Public Staff contracted the services of GDS Associates,
7 Inc. (GDS) to assist with review of EM&V. With GDS's assistance, I
8 have reviewed the EM&V reports filed in this proceeding as Fields
9 Exhibits A through J.

10 I also reviewed previous Commission orders to determine if DEC
11 complied with provisions regarding EM&V contained in those orders.
12 My review leads me to conclude that the Company is complying with
13 the various Commission orders regarding EM&V of its DSM/EE
14 portfolio.

15 **Q. Please elaborate on how much time is required for a program**
16 **vintage year to have EM&V conducted and incorporated into the**
17 **DSM/EE rider proceeding.**

18 A. Depending on where in the cycle of EM&V reports, a vintage year
19 will need to remain open for accounting adjustments for anywhere
20 between three to five years. This is to allow for the vintage year to be

1 trued-up to incorporate the updated energy and capacity savings that
2 are determined in the various EM&V reports.

3 **Q. Are there any vintages in this proceeding that are being dealt**
4 **with that are in excess of five years?**

5 A. Yes, there are. For the residential class, there are true-up
6 components in the EMF that date back to vintage years 2016 and
7 2017. For the non-residential class, there are true-ups being applied
8 to vintage year 2018.

9 **Q. Are there any concerns regarding how long vintages are held**
10 **open so that they may be trued up?**

11 A. While the Public Staff believes that all programs should have enough
12 time to have EM&V performed, allowing vintages to remain open in
13 excess of five years might make certain non-residential class
14 customers, who have the potential to opt-out, less likely to opt-in if
15 there is a potential for a rate to be charged to them for longer than
16 five years. As part of the upcoming mechanism review that was
17 initiated by the Company on April 27, 2023, in Docket No. E-7, Sub
18 1032, the Public Staff intends to discuss with interested parties the
19 appropriate length of time for making corrections to previous vintage
20 years, as well as how corrections for a given vintage year will be
21 handled. The Public Staff does not propose any recommendations
22 on these matters in this proceeding.

1 **Q. With respect to the findings presented in the EM&V reports in**
2 **this proceeding, do you have any recommendations regarding**
3 **the EM&V reports you reviewed?**

4 A. Yes, I do. Based on my review and discussions with the Company,
5 additional time is needed for the Public Staff to complete a review of
6 Fields Exhibit F, an EM&V report on the Non-Residential Smart
7 Saver Custom program. The Public Staff is still in the process of
8 reviewing the spillover percentage associated with the non-
9 participants. The Company has informed the Public Staff that it does
10 not object to the Public Staff continuing its review and the
11 Commission holding this report open until the Company's next rider
12 proceeding.

13 With respect to Fields Exhibit J, this report was filed as an
14 assessment of the penetration levels of low- to moderate-income
15 customers in the Company's DSM/EE portfolio. This study does not
16 contain recommended changes in the savings of programs that are
17 being trued-up in this proceeding, as it was for informational
18 purposes only.

1 **Q. Should the remaining EM&V reports filed in this proceeding be**
2 **accepted as complete?**

3 A. Yes, the remaining EM&V reports filed in this proceeding – Fields
4 Exhibits A through E, and G through I – should be considered
5 complete.

6 **Q. Have you confirmed that the Company's calculations**
7 **incorporate the verified savings of the various EM&V reports?**

8 A. Yes. As in previous cost recovery proceedings, I was able, through
9 sampling, to verify that the changes to program impacts and
10 participation were appropriately incorporated into the rider
11 calculations for each DSM/EE program, as well as the actual
12 participation and impacts calculated with EM&V data. I reviewed: (1)
13 workpapers provided in response to data requests; (2) a sampling of
14 the EE programs; and (3) Fields Exhibit 1, which incorporates data
15 from various EM&V studies. I also met with DEC personnel to review
16 the calculations, EM&V, DSMore modeling inputs, and other data
17 related to the program/measure participation and impacts. Based on
18 my ongoing review of this data, I believe DEC has appropriately
19 incorporated the findings from EM&V studies and annual
20 participation into its rider calculations consistent with Commission
21 orders and the Mechanisms.

- 1 Q. Does this conclude your testimony?
- 2 A. Yes.

APPENDIX A**QUALIFICATIONS AND EXPERIENCE****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. In August of 2020, the Electric Division merged with the Natural Gas Division to form the Energy Division, where I am a Utilities Engineer in the Electric Section – Rates and Energy Services. My current responsibilities include reviewing applications and making recommendations for certificates of public convenience and necessity of small power producers, master meters, and resale of electric service. Moreover, my responsibilities include 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 related to Electric and Natural Gas Investor-Owned Utilities. I have filed testimony in various Duke Energy Carolinas, Duke Energy Progress, and Dominion Energy North Carolina DSM/EE rider proceedings. I have also filed testimony in recent general rate case proceedings for Piedmont and Public Service Natural Gas companies related to the approval and tracking of their portfolio of EE programs.

Estimate - January 1, 2024 - December 31, 2024
Docket Number E-7, Sub 1285
Projected Program/Portfolio Cost Effectiveness - Vintage 2024
Updated To Reflect E-100, Sub 175 Avoided Cost Assumptions

Program	UCT	TRC	RIM	PCT
Residential Programs				
• Energy Efficiency Education Program	1.32	1.33	0.37	13.34
• Energy Efficient Appliances & Devices	4.86	3.41	0.89	5.42
• Smart Saver Energy Efficiency Program	1.31	2.04	0.71	2.08
• Income-Qualified EE Products & Services	0.70	0.70	0.49	1.81
• Multi-Family EE Products & Services	4.52	4.62	0.85	36.08
• My Home Energy Report	3.24	2.01	0.74	7.61
• Power Manager	4.40	8.81	4.40	0.00
• Residential Energy Assessments	1.32	1.29	0.49	19.02
• Residential New Construction	2.12	1.47	0.81	2.27
Residential Total	2.86	2.94	1.21	4.15
Non-Residential Programs				
• Custom Energy Assessment & Incentive	3.42	1.29	1.02	1.89
• EnergyWise for Business	1.25	2.25	1.12	79.51
• Smart Saver Energy Efficient Food Service Products	2.27	0.71	0.61	1.64
• Smart Saver Energy Efficient HVAC Products	4.10	2.66	0.90	3.93
• Smart Saver Energy Efficient Lighting Products	4.11	2.10	1.00	3.15
• Smart Saver Energy Efficient Pumps & Drives	3.92	2.68	0.90	4.61
• Smart Saver Energy Efficient Information Technology	0.51	0.55	0.30	5.03
• Smart Saver Energy Efficient Process Equipment	2.35	1.67	0.93	2.47
• Smart Saver Energy Efficient Performance Incentive	5.11	1.33	1.04	1.85
• Business Energy Saver	2.95	1.82	0.94	2.83
• PowerShare	4.42	260.40	4.42	0.00
Non-Residential Total	3.84	2.39	1.20	2.87
Overall Portfolio Total	3.37	2.59	1.21	3.20

Percent Change Compared to Initial Filing	
UCT	TRC
12%	12%
0%	0%
-2%	84%
-3%	-3%
0%	0%
9%	9%
-7%	-7%
0%	0%
-4%	-4%
-3%	1%
-1%	-1%
-6%	-6%
2%	1%
-2%	-2%
-1%	-1%
0%	0%
9%	10%
0%	0%
0%	0%
-1%	-1%
-7%	-7%
-3%	-3%
-3%	-1%