

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1305

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 20, 2024

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 (Application) for approval of its
13 demand-side management (DSM) and energy efficiency (EE) cost
14 recovery rider for Vintage Year 2025 (Rider 16), as well as the
15 testimony and exhibits of DEC witnesses Casey Q. Fields and
16 Carolyn T. Miller filed on February 27, 2024; and the supplemental
17 testimony and exhibits of Casey Q. Fields and Carolyn T. Miller filed
18 on May 8, 2024 (supplemental filing).

19 My testimony discusses (1) the portfolio of DSM/EE programs
20 included in the proposed Rider 16, including modifications to those
21 programs; (2) the ongoing cost-effectiveness and performance of
22 each DSM/EE program; and (3) the evaluation, measurement, and

1 verification (EM&V) studies filed as Exhibits A through J to the
2 testimony of Company witness Fields.

3 **Q. What documents have you reviewed in your investigation of**
4 **DEC's proposed Rider 16?**

5 A. I have reviewed the Application, supporting testimony and exhibits,
6 the supplemental filing, and DEC's responses to Public Staff data
7 requests. In addition, I have reviewed the following documents,
8 which are pertinent to Rider 16:

- 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
- 21 3. The modification to subsection 20 of the 2020 Mechanism to
22 include language on the Reserve Margin Adjustment Factor,

1 approved by the Commission in Docket No. E-7, Sub 1265, on
2 December 12, 2022.

3 **Q. Please summarize your recommendations.**

4 A. The Public Staff makes the following recommendations:

- 5 1. That future EM&V reports on water saving measures include
6 more robust surveying of large occupancy homes in the data
7 set in order to assess the reasonableness of the data; and
- 8 2. That the EM&V reports filed by DEC as Fields Exhibits A
9 through J be accepted.

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

12 A. Pages 12 and 13 of Company witness Fields' direct testimony lists
13 all programs that are eligible for inclusion in the Company's proposed
14 Rider 16. Each of these programs has been approved by the
15 Commission prior to the filing of the Company's Application. New
16 programs and modifications to existing programs approved and
17 initiated during Vintage Year 2025 – the proposed prospective period
18 in this proceeding – will be addressed during the Experience
19 Modification Factor review for Vintage Year 2025.

1

COST-EFFECTIVENESS

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

4 A. The cost-effectiveness of a program is determined by calculating 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 using the Utility Cost (UC),
10 Total Resource Cost (TRC), Participant, and Ratepayer Impact
11 Measure (RIM) tests. Under each of these four tests, a result above
12 1.0 indicates that the benefits of the program outweigh the costs¹
13 such that the program is cost-effective. It is possible for a program's
14 score to exceed 1.0 on one or more tests, while still falling below 1.0
15 on other tests. While the 2017 Mechanism used the TRC and UC
16 tests to evaluate initial and ongoing cost-effectiveness, the 2020
17 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

¹ Each test evaluates costs and benefits from different perspectives 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 beneficial² 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 result from
16 an evaluation of the costs and benefits associated with each test.
17 The evaluations in DSM/EE rider proceedings look at the actual
18 performance of a typical measure, providing an indication of what to

² "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. Trends provide a clearer understanding of
16 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. So 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 2025?**

18 A. While an existing DSM/EE Cost Recovery Mechanism is in place that
19 depicts how avoided costs should be derived in each DSM/EE cost
20 recovery proceeding, as part of the currently pending DSM/EE Cost
21 Recovery Mechanism review, if approved by the Commission, the
22 Company will true-up Vintage Year 2025 and provide an updated

1 underlying avoided cost assumption as well as updated program
2 costs related to changes in customer rebates.

3 However, as part of this proceeding, for purposes of determining
4 cost-effectiveness for Vintage Year 2025 using the currently
5 approved DSM/EE Cost Recovery Mechanism, the applicable
6 avoided cost rates that comply with paragraph 77 of the 2020
7 Mechanism are the rates approved in the order issued on November
8 22, 2022, in the Biennial Determination of Avoided Cost Rates for
9 Electric Utility Purchases from Qualifying Facilities in Docket No. E-
10 100, Sub 175.

11 PROGRAM PERFORMANCE

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

13 A. The Company's DSM/EE portfolio offers a wide variety of measures
14 to support the needs of its customers. The Public Staff's review of
15 program performance involved (1) reviewing cost-effectiveness
16 trends; (2) reviewing Fields Exhibit 6, which provides specific
17 information on each program's marketing strategy and potential
18 areas of concern; and (3) performing an overall qualitative analysis.

19 The Public Staff also relies upon knowledge gathered from its
20 involvement in the Company's bi-monthly EE Collaborative meetings
21 to keep abreast of how the portfolio of programs is performing.

22 During these meetings, the Collaborative discusses program

1 performance (participation, customer engagement, and potential
2 barriers to entry and continuation of the program), recently
3 completed EM&V and market potential study activities, and potential
4 new program offerings.

5 Based on the review discussed above, the Public Staff believes that
6 the historical performance of the Company's programs is
7 reasonable.

8 **EM&V**

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

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

14 I have also reviewed previous Commission orders to determine if
15 DEC complied with provisions regarding EM&V contained in those
16 orders. The Company is complying with the various Commission
17 orders regarding EM&V of its DSM/EE portfolio.

18 **Q. With respect to the findings presented in the EM&V reports in
19 this proceeding, do you recommend any adjustments?**

20 A. No, I do not have any recommendations that would impact the rates
21 in this proceeding.

1 **Q. Do you have any observations or recommendations regarding**
2 **EM&V for nonparticipant spillover in future proceedings?**

3 A. Yes. The Public Staff raised issues with respect to the topic of
4 nonparticipant spillover (NPSO) during Duke Energy Progress,
5 LLC's (DEP) most recent annual DSM/EE rider proceeding in Docket
6 No. E-2, Sub 1322 (DEP Proceeding), where the Public Staff
7 articulated numerous concerns involving the NPSO component of
8 the net-to-gross (NTG) calculation within the Nonresidential Custom
9 Report, which encompassed data collected during the 2018-2019
10 timeframe. Public Staff witness Warren Hirons outlined those
11 concerns in his testimony filed on August 29, 2023, in the DEP
12 Proceeding. As part of the current proceeding, the Company filed a
13 new program evaluation report using data collected during the 2020-
14 2021 timeframe.

15 In the current proceeding, the Public Staff is not raising any issues
16 related to the NPSO methodology but will continue to monitor the
17 methodology of the NPSO component of the NTG calculation within
18 the Companies' Nonresidential Custom Reports.

1 **Q. Do you have any observations or recommendations regarding**
2 **the water-related measures evaluated in the Companies' EM&V**
3 **reports?**

4 A. Yes. The EE in Schools Program Report, filed as Fields Exhibit H,
5 included large occupancy homes in the data used to complete the
6 report and no further surveying data was collected to ensure that
7 energy savings were still being experienced as a result of the
8 measures' performance. In this instance, a survey respondent
9 reported several thousand kilowatt hours (kWhs) of savings
10 attributable to showerhead measures. More specifically, a participant
11 reported at least seven showers per day at the residence lasting
12 roughly 30 minutes each, which resulted in savings of approximately
13 8,400 kWhs.³

14 The Public Staff views this data point as an improbable amount of
15 savings from water-related measures and inquired further. The
16 Public Staff learned from the Company that the practice for
17 determining reasonableness of water-related measures is based on
18 a standard deviation determined by the number of showers per
19 person per day and by the number of minutes per shower
20 assessment. For this instance, the data fell within the prescribed

³ The survey data showed that this household had seven residents living in the home.

1 band of reasonableness, which is why DEC did not exclude the
2 survey response from the data set used in the EM&V report.

3 While this data point meets DEC's criteria for purposes of inclusion
4 in this EM&V report, the data does not indicate, through more
5 detailed surveying, if there are instances where some showers occur
6 simultaneously or consecutively within a home that could result in the
7 water heater running out of hot water, thus not producing any
8 additional savings for the program. The Public Staff believes that
9 water heating capability is essential for evaluating high occupancy
10 homes as a reasonableness check for the savings DEC claimed in
11 the report. Therefore, I recommend that future reports that
12 encompass water savings measures include more robust surveying
13 of large occupancy homes in the data set in order to assess the
14 reasonableness of the data.

15 **Q. Should the EM&V reports filed in this proceeding be accepted**
16 **as complete?**

17 A. Yes, the EM&V reports filed in this proceeding – Fields Exhibits A
18 through J – should be considered complete.

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

21 A. Yes. As in previous cost recovery proceedings, I was able, through
22 sampling, to verify that the changes to program impacts and

1 participation were appropriately incorporated into the rider
2 calculations for each DSM/EE program, as well as the actual
3 participation and impacts calculated with EM&V data. I reviewed (1)
4 workpapers provided in response to data requests; (2) a sampling of
5 the EE programs; and (3) Fields Exhibit 1, which incorporates data
6 from various EM&V studies. I also met with DEC personnel to review
7 the calculations, EM&V, DSMore modeling inputs, and other data
8 related to the program/measure participation and impacts. Based on
9 my ongoing review of this data, I believe DEC has appropriately
10 incorporated the findings from EM&V studies and annual
11 participation into its rider calculations consistent with Commission
12 orders and the Mechanisms.

13 **Q. Does this conclude your testimony?**

14 A. Yes.

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.

CERTIFICATE OF SERVICE

I certify that a copy of the foregoing 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 20th day May, 2024.

Electronically submitted
/s/ Anne M. Keyworth
Staff Attorney