BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1252

In the Matter of Application by Duke Energy Progress, 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	)	TESTIMONY OF DAVID M. WILLIAMSON PUBLIC STAFF – NORTH CAROLINA UTILITIES COMMISSION

August 26, 2020

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Testimony of David M. Williamson

On Behalf of the Public Staff

North Carolina Utilities Commission

August 26, 2020

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 Energy Division[1] 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 June 9, 2020 application and August 17, 2020 supplemental

[1] On August 1, 2020, the Public Staff merged the Electric Division and the Natural Gas Division to form the Public Staff Energy Division.

testimony and exhibit of Duke Energy Progress, LLC (DEP or the Company), for approval of its demand-side management (DSM) and energy efficiency (EE) cost recovery rider for 2021 (2021 Rider).

This testimony discusses: (1) the portfolio of DSM/EE programs included in the proposed 2021 Rider, including modifications of those programs made pursuant to the Flexibility Guidelines;[2] (2) the ongoing cost-effectiveness of each DSM/EE program; (3) the concerns of the Public Staff with various DSM/EE programs going forward, with regard to regulatory and grid-related activities; and (4) the evaluation, measurement, and verification (EM&V) studies filed as Exhibits A through C to the testimony of Company witness Robert P. Evans, and the additional EM&V study filed as Evans Supplemental Exhibit D to the supplemental testimony of Company witness Robert P. Evans.

Q. WHAT DOCUMENTS HAVE YOU REVIEWED IN YOUR INVESTIGATION OF DEP'S PROPOSED 2021 RIDER?

A. I reviewed the application and supporting testimony and exhibits, the Company's supplemental testimony and exhibits, and DEP's

[2] The "Flexibility Guidelines" were included as Attachment A to the Cost Recovery and Incentive Mechanism approved by the Commission by Order dated January 20, 2015 in Docket No. E-2, Sub 931.

responses to Public Staff data requests. In addition, I reviewed previous Commission orders related to DEP's DSM and EE programs and cost recovery rider proceedings, including the Commission's Order Approving DSM/EE Rider, Revising DSM/EE Mechanism, and Requiring Filing of Proposed Customer Notice issued November 27, 2017, in Docket No. E-2, Sub 1145, which revised the Cost Recovery and Incentive Mechanism originally approved in Docket No. E-2, Sub 931 (Revised Mechanism).

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

A. The Public Staff makes the following recommendations to the Commission:

1. That, beginning in 2021, only specialty light emitting diode (LED) lighting be considered for recognition as an EE measure eligible for cost recovery;

2. That the Company, in the next rider proceeding, assess the costs and benefits of continuing to offer the MyHER program while also providing customers with their usage data through the Company's new smart meter and customer billing systems, specifically assessing the value of offering energy consumption and EE tips in the MyHER program versus providing the same comparison and tips through the customer bill;

3. That the Company perform an analysis of its Grid Improvement Plan (GIP) to explain how GIP will affect the ability of DSM/EE programs to produce peak demand and energy savings;

4. That the Company, in the next rider proceeding, explain how it will distinguish peak demand and energy savings resulting from the GIP from those resulting from the DSM and EE portfolio; and

5. That the Company provide in its next rider filing a list of GIP projects that have been implemented and how those projects have affected the performance[3] of the Company's DSM/EE portfolio, if at all. The Company should be prepared to discuss any impacts the GIP projects have had on day-to-day system operations, as well as customer expectations for utility service in general, DSM/EE program performance, and the availability of customer data.

Q. ARE YOU PROVIDING ANY EXHIBITS WITH YOUR TESTIMONY?

A. Yes. I have three exhibits, described below:

- Exhibit 1: Three year cost benefit analysis (CBA) projections

[3] The Public Staff considers the "performance" of a DSM/EE program to include energy savings as well as attributes such as the program design, delivery, implementation, and administration, which can be conducted in a manner that improves overall program participation.

- Exhibit 2: Three year CBA actuals
- Exhibit 3: DEP General Rate Case - Public Staff Data Request No.178-2
- Exhibit 4: Net effects on Cost-Effectiveness tests applying Public Staff's position regarding avoided capacity issues

DSM/EE Programs in the 2021 Rider

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

A. In its proposed 2021 Rider, DEP included the costs and incentives associated with the following programs:

- Residential
  - Appliance Recycling Program (Sub 970)
  - EE Education Program (Sub 1060)
  - Multi-Family EE Program (Sub 1059)
  - My Home Energy Report (MyHER) Program (formerly the EE Benchmarking Program) (Sub 989)
  - Neighborhood Energy Saver (Low-Income) Program (Sub 952)
  - Residential Smart $aver EE Program (formerly HEIP) (Sub 936)
  - New Construction Program (Sub 1021)
  - Load Control Program (EnergyWise Home) (Sub 927)

- Save Energy and Water Kit Program (Sub 1085)
- Energy Assessment Program (Sub 1094)
- Low-Income Weatherization Pay for Performance Program (Sub 1187)

- Non-Residential
  - Non-Residential Smart $aver Energy Efficient Products and Assessment Program (formerly Energy Efficiency for Business Program) (Sub 938)
  - Non-Residential Smart $aver Performance Incentive Program (Sub 1126)
  - Small Business Energy Saver Program (Sub 1022)
  - CIG Demand Response Automation (CIG DRA) Program (Sub 953)
  - EnergyWise for Business (Sub 1086)

- Combined Residential and Non-Residential
  - Energy Efficient Lighting Program (EE Lighting) (Sub 970)
  - Distribution System Demand Response (DSDR) Program (Sub 926)

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 N.C. Gen. Stat. § 62-133.9, subject to certain program-specific conditions imposed by the Commission.

Since initial program approval, DEP 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, DEP either sought Commission approval or provided notice of those modifications in compliance with those guidelines.

I also note that since the last rider proceeding, DEP has received Commission approval to modify the Residential Energy Assessment and Residential Neighborhood Energy Saver programs.

Changes to the DSM/EE Rider since last Rider Proceeding

Q. PLEASE DISCUSS THE CHANGES THAT HAVE OCCURRED SINCE THE LAST RIDER PROCEEDING, IN DOCKET NO. E-2, SUB 1206 (SUB 1206).

A. In the Sub 1206 proceeding, the Company utilized the avoided cost rates approved in the Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities - 2016, Docket No. E-100, Sub 148, to determine the avoided benefits that would be

generated for each of the Company's DSM/EE programs within its portfolio.

On October 7, 2019, and supplemented on October 17, 2019, the Commission issued a Notice of Decision in Docket No. E-100, Sub 158, regarding the Biennial Determination of Avoided Cost Rates for Electric Utility Purchases from Qualifying Facilities – 2018 (Sub 158 proceeding).

Pursuant to the Mechanism, the Company has updated its underlying input source for both avoided capacity and avoided energy in this proceeding to reflect the methodology used in the Sub 158 proceeding.

The Public Staff agrees with the Company's decision to update its underlying inputs to reflect those approved in the Sub 158 proceeding, pursuant to the Mechanism. However, as discussed later in my testimony and in more detail in Public Staff witness Hinton's testimony, the Public Staff has two concerns with the Company's application of the inputs from the Sub 158 proceeding.

Additionally, the Company, various other parties to this proceeding, and the Public Staff, have jointly filed proposed modifications to the

Revised Mechanism.[4] These proposed modifications are still pending before the Commission.

Cost Effectiveness

Q. HOW IS THE COST EFFECTIVENESS OF DEP'S DSM/EE PROGRAMS EVALUATED?

A. The Public Staff reviews the cost-effectiveness of the individual DSM/EE programs when they are proposed for approval and then annually in the rider proceedings. 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.

A program may be above 1.0 on one or more tests, and below 1.0 on other tests. The Public Staff, as well as the Revised Mechanism, places greater weight on the UC and TRC tests.

The TRC test represents the combined utility and participant benefits that will result from implementation of the program; a result greater

[4] The proposed modifications to the Revised Mechanism were filed in Docket No. E-2, Sub 931.

than 1.0 indicates that the 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[5] to the utility (the overall system benefits are greater than the utility's costs, including incentives paid to participants). The Participant test is used to evaluate the benefits against the costs specific to those ratepayers who participate in a program. 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, DEP files the projected cost-effectiveness of each program and for the portfolio as a whole for the upcoming rate period (Evans Exhibit 7). Subsequently, when new DSM/EE programs are approved under Commission Rule R8-68, potential cost-effectiveness is evaluated 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

[5] "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.

performance of a typical measure, providing an indication of what to expect over the next year. Each year's rider filing is updated with the most current EM&V data and other program performance data.

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

A. The Public Staff compares the cost-effectiveness test predictions in previous DSM/EE proceedings to the current filing, and develops a trend of potential cost-effectiveness that serves as the basis for the Public Staff's recommendation on whether a program should: (1) continue as currently implemented, (2) be watched for signs of continued decreasing cost-effectiveness combined with Company efforts to improve cost-effectiveness, or (3) be terminated.

Q. HOW DO THE FORWARD-LOOKING COST-EFFECTIVENESS TEST SCORES FILED IN THIS RIDER COMPARE TO SCORES IDENTIFIED IN PREVIOUS RIDERS?

A. While many programs continue to be cost effective, the TRC and UC scores as filed by the Company for all programs have a natural ebb and flow over the years of DSM/EE rider proceedings, meaning that the value of the inputs used in determining their scores change over time. Such changes are mainly driven by updates to the avoided cost rate determinations. In addition, changes to cost-effectiveness are

also attributable to updates in the unit savings from the original estimates of savings as determined through EM&V of the program. 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, some programs have experienced greater than expected participation, which usually results in greater savings per unit cost, generally increasing cost-effectiveness.

These changes are shown for Vintage years 2019, 2020, and 2021 in Williamson Exhibit No. 1.

In addition to the forward looking cost-effectiveness test results, as most of the EM&V reports for the Company's portfolio of programs are completed, the Company has been able to provide the Public Staff with updated, actual cost-effectiveness test results for each program, and program year, over the Vintage years 2017, 2018, and 2019.

Q. HOW DO THE ACTUAL COST-EFFECTIVENESS TEST SCORES COMPARE TO THE FORWARD-LOOKING SCORES IDENTIFIED IN PREVIOUS RIDERS?

A. Understanding that the incorporation period of EM&V within the portfolio may be different from one program to another, having a

rolling record of actual cost-effectiveness results provides the Public Staff with confirmation that the activities within the portfolio have been and continue to be worthwhile. On the other hand, actual test results highlight programs that ultimately do not perform at or above the original projection. The actual cost-effectiveness results for DEP's portfolio of programs are shown in Williamson Exhibit No. 2. These test results are a reflection of the annual updates in cost-effectiveness due to completed EM&V and finalized participation numbers.

Program Performance

Q. PLEASE DISCUSS THE PERFORMANCE OF THE PORTFOLIO.

A. The Company's DSM/EE portfolio offers a wide variety of measures to support everyday activities of its customers. Our review of program performance involves: (1) reviewing cost-effectiveness trends; and (2) reviewing Evans Exhibit 6, which provides specific information on each program's marketing strategy, potential areas of concern, and an overall qualitative analysis.

The Public Staff also uses its involvement in the Company's bi-monthly EE collaborative meetings to determine how a program is performing. During these meetings, the Collaborative discusses program performance (participation, customer engagement, and

potential barriers regarding continuation and entry to the program), recently completed EM&V and market potential study activities, and potential new program offerings.

Relying on all of the resources mentioned above, the Public Staff believes that the historical performance of the Company's programs, as previously described, is reasonable. However, I have a number of concerns with the portfolio that I wish to bring to the Commission's attention for consideration in future rider proceedings.

Public Staff's Concerns

Q. PLEASE DISCUSS THE PUBLIC STAFF'S CONCERNS REGARDING THE PORTFOLIO.

A. I have the following areas of concern regarding DEP's DSM/EE portfolio:

a. The federal guidelines relevant to the production of lighting-related measures, and the North Carolina market in which these measures are offered;

b. The potential impacts of the Company's proposed GIP on the performance of current and future DSM/EE programs;

c. The Company's incorrect application of the Sub 158 avoided cost rates in the DSM/EE Rider calculations; and

d. Changes to the Company's Referral Channel for its Residential Smart Saver EE program to incorporate referrals to services unrelated to DSM/EE.

Lighting

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

A. Over the years and in various dockets before the Commission,[6] and extensively in the Public Staff's testimony regarding Evans Exhibit C in the Docket No. E-7, Sub 1192 proceeding, we have highlighted several trends surrounding the adoption of EE lighting measures, specifically, that the EE lighting market for North Carolina 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 any EE program that continues to include general service bulb technologies.

On January 19, 2017, the U.S. Department of Energy (DOE) published final rules for its second phase of the 2007 Energy

[6] See Comments of the Public Staff filed February 6, 2019, in Docket No. E-100, Sub 159; Testimony of Jack L. Floyd filed May 23, 2017, in Docket No. E-7, Sub 1130; Testimony of David M. Williamson filed May 22, 2018, in Docket No. E-7, Sub 1164, May 20, 2019, in Docket No. E-7, Sub 1192, September 5, 2017, in Docket No. E-2, Sub 1145, September 4, 2018, in Docket No. E-2, Sub 1174, and August 9, 2019, in Docket No. E-2, Sub 1206.

Independence and Security Act (EISA). The rules, otherwise known as EISA 2020, adopted revised definitions for the general service lamp (GSL) and the general service incandescent lamp (GSIL), which were to become effective January 1, 2020.[7]

However, on February 11, 2019, DOE issued a notice of proposed rulemaking and request for comment to withdraw the current definitions of GSL and GSIL.[8]

On September 5, 2019, the DOE published a notice of proposed determination in which it initially determined that energy conservation standards for GSILs do not need to be amended.

On December 27, 2019, the DOE published a final determination in which it responded to comments received in September of 2019 and determined that amending the energy conservation standards for GSILs would not be economically justified.[9]

The Public Staff continues to believe that the EE lighting market in North Carolina has transformed at a faster rate than was initially

[7] Energy Conservation Program: Energy Conservation Standards for General Service Lamps, 82 Fed. Reg. 7276 (Jan. 19, 2017).

[8] Energy Conservation Program: Energy Conservation Standards for General Service Lamps, 84 Fed. Reg. 3120 (Feb. 2, 2019).

[9] Energy Conservation Program: Energy Conservation Standards for General Service Incandescent Lamps, 84 Fed. Reg. 71626 (Dec. 27, 2019).

recognized. This transformation has been a result of changes to federal lighting standards since 2007 resulting from the EISA, and customer preference for LEDs. Both of these factors have substantially transformed the lighting market to the point that non-specialty LED lighting should be considered the baseline standard for general service bulb technologies.

One of the goals of utility-sponsored EE programs is to build customer awareness of, and confidence in, EE technologies, and to encourage consumers to adopt EE measures on their own. As technologies become more energy efficient, costs decrease, and consumer acceptance increases, adoption of EE measures should become routine, at which point "market transformation" results, as has been seen in the lighting markets.

Q. PLEASE DESCRIBE THE ACTIONS THAT THE COMPANY IS TAKING WITH REGARD TO TRANSFORMATION OF LIGHTING IN NORTH CAROLINA.

A. The Company, in last year's rider proceeding, acknowledged the changes and impacts proposed by the EISA 2020 rules and began making strides to minimize those impacts. The Company has been updating all of its programs that incorporate lighting-related products to offer specialty LED bulb technologies as the only lighting offering.

Based on the Public Staff's review in this case, we can confirm that the Company's portfolio is focusing on specialty LED bulb technologies.

The Public Staff agrees with this approach.

Q. DO YOU HAVE ANY RECOMMENDATIONS FOR THE COMMISSION WITH REGARD TO LIGHTING TRANSFORMATION IN NORTH CAROLINA?

A. Yes. Based on the Public Staff's review of lighting-related EM&V reports over the last three years, and the Company's acknowledgement of upcoming lighting standard changes as they alter their program offerings, I recommend that the Commission require that, beginning in 2021, only specialty LED lighting be considered for recognition as energy efficiency.

DEP's GIP Impacts

Q. PLEASE DESCRIBE THE PUBLIC STAFF'S CONCERNS WITH THE IMPACT OF THE COMPANY'S GIP PROPOSAL ON DSM/EE PROGRAMS.

A. Since the last rider proceeding, the Company has filed a general rate case in Docket No. E-2, Sub 1219 (Sub 1219 proceeding), in which, among other things, it has proposed a GIP, along with a request for

deferral of associated investments, which is still pending before the Commission at this time. The GIP, as proposed, would drive enhancements to capacity, data analytics/collection, and power flow capabilities on almost all of the circuits within its service territory. The Public Staff believes that the GIP proposal will have an impact on the savings achieved through the DSM/EE portfolio due to improvements in the areas of utility operation listed above.

Q. WHY IS IT IMPORTANT TO DISCUSS THE GIP IN THE CONTEXT OF THE DSM/EE RIDER?

A. As discussed in the Sub 1219 proceeding, the Company is planning to make improvements to its ability to provide customer-specific information and reliability through data analytics, all designed to help bring the grid up to a new level of operation. The Company has also acknowledged that its customers' needs and expectations are evolving.

As more data analytics and technology enhancements are made to the Company's day-to-day operations, the base level impacts and offerings of DSM/EE programs will be impacted.

Q. WHAT CONCERNS DO YOU HAVE WITH THE COMPANY'S GIP PROPOSAL AS IT RELATES TO THE DSM/EE PORTFOLIO?

A. I have two specific concerns and one overarching concern with the Company's GIP proposal and its potential impact on the DSM/EE portfolio.

My first concern is that I believe the MyHER program will be significantly impacted by the GIP proposal. This program relies heavily on data analytics that are currently being updated in various ways outside of this program. I will discuss this in greater detail later in my testimony. Ultimately, as the Company deploys GIP, the MyHER program will need to be re-evaluated (both internally by the Company and through EM&V) in order to: (1) ensure that it continues to provide unique information from that available through GIP investments; (2) ensure that it remains a cost-effective offering; and (3) determine whether or not it is better suited as part of the Company's standard operating procedures (i.e., part of the Company's day-to-day operations).

My second concern is with the Company's proposed conversion of DSDR to a Conservation Voltage Control (CVR) program, and how that conversion will impact the current DSM and EE portfolio. The CVR program is being proposed under the Company's GIP proposal.

This conversion is not set to be implemented until 2021, but during discovery, the Company acknowledged that it is currently unsure of the potential impacts to the portfolio that would result from CVR's activation and that further testing would need to be performed to determine those impacts. I will discuss this in greater detail later in my testimony.

The Public Staff also has concerns with the direction the Company is taking with its grid enhancements. Specifically, the Public Staff is concerned that the DSDR program will no longer fit within the Company's DSM/EE portfolio. This program relies heavily on base level system capacity and switching technology on the Transmission and Distribution (T&D) grid, along with certain technology enhancements that were once considered incremental to the Company's everyday work on the T&D grid. This may not be the case going forward as this level of grid enhancements, for the purpose of improving operational efficiency, becomes the standard operating procedure for an electric utility.

Q. PLEASE EXPLAIN WHY YOU BELIEVE THE MYHER PROGRAM WILL BE IMPACTED BY THE COMPANY'S GIP PROPOSAL.

A. The success of the MyHER program relies on the Company's collection of individual customers' data, and then analyzing this data

in relation to similar nearby customers.

The deployment of Advanced Metering Infrastructure (AMI) is expected to be used to provide new opportunities for better rate design and to provide customers with interval usage data. AMI is a crucial component of the Company's GIP data collection infrastructure.

In Exhibit 6, page 28, DEP witness Evans discusses the impact AMI meters have on the MyHER program:

> In 2019, the [MyHER] program launched into the Duke Energy Mobile App. Participants in the MyHER program are now able to see their usage comparison and disaggregation in the mobile app. With the deployment of AMI meters throughout DEP, the program began sending AMI data to Tendril. Customers with AMI meters can see their interval energy usage on the MyHER interactive experience. In 2019, the program also launched new AMI usage charts on the eHERs which show customers the difference in average weekly usage by hour from one month to the next.

Additionally, the Company's investment in its AMI meters provides its customers with more direct access to their customer data than previously available. Two examples of this are (1) the Company's Smart Meter Usage App, and (2) allowing third parties to analyze a

particular customer's usage data.[10]

In response to a Public Staff data request, the Company acknowledged that it has very recently made available to customers functionality similar to the functionality provided by Green Button Download, enabling customers to download their usage data in a standard format. The Company further stated that between February 26 and July 14, 2020, the Company observed 1,766 unique instances of DEP customers using "Download My Data."

The Public Staff believes that with these services and access to data, the MyHER program will simply be a duplicate provision of the same data to the customer in one form or another. The only incremental difference would be the EE tips that would be offered through the MyHER report. If offering EE tips is the only additional item offered by a MyHER report that is not already provided by other potentially less costly channels (e.g., the Company's website, bill inserts, or information printed on the monthly bill that a customer receives), then the Public Staff is skeptical that the cost and utility incentives associated with the MyHER program are justified. The Public Staff believes it would be appropriate for the Commission to require the

[10] See September 5, 2019 Order Approving Pilot Programs in Docket No. E-2, Sub 1213 (approving Smart Meter Usage App pilot program).

Company to assess the costs and benefits of continuing to offer the MyHER program, which is a comparison of energy consumption and EE tips, versus providing the same comparison and tips through another channel such as those identified above.

Q. PLEASE EXPLAIN YOUR CONCERNS ABOUT THE CVR CONVERSION AS IT RELATES TO THE DSDR PROGRAM.

A. The implementation of the CVR conversion component of the Company's GIP proposal, as it is currently proposed, is set to begin during 2021. This conversion will allow the current assets of DSDR to be used in a new manner, so that a constant and consistent voltage reduction will occur on the electric grid across all circuits designed to operate under CVR. The goal of CVR mode on the system will be to reduce the voltage on all lines by approximately two percent. The Company is projecting that CVR mode will be active approximately 90% of the time.

The enablement of CVR is fully dependent on the current DSDR buildout, as the Company says it will not require any additional assets to be placed on the system in order to activate the CVR operational mode. The changes necessary to implement the CVR conversion component of the Company's GIP proposal are software in nature.

During the discovery process, the Company informed the Public Staff that DSDR equipment is installed on approximately 98 percent of DEP's North Carolina distribution retail substations and circuits (feeders). In other words, when CVR is activated, it should be able to provide two percent voltage reduction to all 98% of the DSDR circuits across the Company's North Carolina system.

The Company has not assessed the potential impacts of reduced energy or demand savings that will result from this CVR initiative, however, they do note that these impacts will be reflected in future cost-effectiveness evaluations. If the CVR conversion does result in impacts to energy and demand savings, then energy and demand savings for all DSM and EE programs, including DSDR, will be reduced to some degree.

Q. PLEASE EXPLAIN YOUR CONCERNS ABOUT THE DIRECTION THE COMPANY IS TAKING WITH ITS GRID ENHANCEMENTS AS IT RELATES TO THE DSDR PROGRAM.

A. Over the course of the last few years, through smart grid plans, the Power Forward proposal, and now GIP, DEP and Duke Energy Carolinas, LLC (DEC), have been planning to modernize their grids to achieve new functionalities that they had not been able previously to operationally perform. My concern is not with these

enhancements, but with what these advancements mean to DSM/EE programs and how they are treated for rate recovery, specifically in the DSM/EE rider.

My greatest concern is with the DSDR program and its similarities to where the grid is moving with its operational planning. Unlike the Company's other DSM/EE programs, DSDR is intertwined with the Company's day-to-day grid activities in order to produce certain efficiencies for customers. When DSDR was initially proposed by the Company in 2008, it was a new type of operational mode that the Company had not previously had at its disposal. The deployment of DSDR resulted in significant circuit conditioning, including: the installation of substation and distribution voltage regulating devices and capacitors; telecommunications and IT infrastructure; and some balancing of load on distribution circuits. This work allowed DEP to achieve peak shaving voltage reduction of approximately three percent throughout the DEP distribution system during its activation periods.

The grid's need for operational evolution has continued since the original deployment of DSDR began nearly a decade ago. During the discovery process in the Company's current general rate case, Docket No. E-2, Sub 1219, the Company detailed how the new CVR

capabilities are critical now to enable greater application of Distributed Energy Resources on the grid. The Company's discovery response is provided as Williamson Exhibit 3. As explained above, the capabilities of CVR mode are completely dependent on the infrastructure of the DSDR program.

The Company has an obligation to serve all users of the grid, and its explanation as shown in Williamson Exhibit 3 provides a more in-depth view of all beneficiaries of the Company's GIP proposal, in the form of energy savings and increased opportunity for renewables.

Additionally, the Company during the rate case discovery process also acknowledged that the type of grid enhancements being deployed under the GIP's three-year plan are devices approved for use on the Duke Energy system and generally will become a standard practice. Essentially, the Company is saying that all work being undertaken for the GIP will generally become the standard by which the distribution system will be designed and built going forward. This is no different for DSDR. The Company acknowledged in discovery that "nearly all DSDR equipment is the same type of equipment used for normal/routine T&D work. Exceptions include the installation of standalone sensors installed during the original DSDR deployment. In other words, DSDR utilizes standard

equipment."

These responses from the Company lead me to believe that the standard design needs of the grid going forward have now adopted the standards that once were considered incremental (i.e., DSDR).

The Public Staff has concerns that DSDR is treated differently than normal operational efficiency improvements being made by electric utilities, and that this separate treatment is due to the differences in the cost recovery mechanism applied to DSDR, and the cost recovery of the GIP. Thus, the need to differentiate the grid support work of DSDR from the grid support work of GIP may no longer be needed.

The electric industry is showing a greater desire to operationally improve systems in an effort to improve operational efficiency, minimize outage, and reduce costs, where applicable. The industry is also making strides to modernize the electric grid so that outage mitigation and power quality is more manageable for all users of the grid. These enhancements are being driven by the natural effects of an evolving user base. The Company is obligated to serve its customers and other users of the grid, and to do so at least-cost.

Q. YOU EXPRESSED CONCERN THAT DSDR IS NOW BEING TREATED DIFFERENTLY THAN NORMAL OPERATIONAL EFFICIENCY IMPROVEMENTS BEING MADE BY ELECTRIC UTILITIES. CAN YOU EXPLAIN WHAT YOU MEAN?

A. Yes. When DSDR was originally proposed, it provided an innovative technology that allowed the Company to achieve peak shaving capabilities that previously had not been possible. However, as noted above, the grid and its needs have been evolving, and DSDR is now quite similar to the work that is currently categorized as normal and routine. In other words, DSDR has become the standard design for electric distribution systems.

DSDR is also, however, being provided special rate making treatment in the form of DEP's DSM/EE rider,[11] pursuant to which the Company is allowed recovery of all program costs on an annual basis.[12] This recovery treatment is different from how normal and routine grid work is treated in a general rate case scenario, where costs are depreciated and appropriately allocated across all customer classes. Under the current DSM/EE rider construct, there

[11] DSDR was originally approved as an EE program by Commission order dated, November 25, 2009, in Docket No. E-2, Sub 926.

[12] DEP was also allowed to recoup lost revenues for DSDR for three years, beginning in 2014. This is consistent with the Mechanism and is how all programs in the DSM/EE portfolio are handled.

is an avenue for certain parties to avoid the costs of DSDR entirely, even though they may receive some level of benefits from the program.

Q. IN THE LAST DEP RIDER PROCEEDING, YOU HIGHLIGHTED THE POTENTIAL FOR OVERLAP BETWEEN THE COMPANY'S GIP AND ITS DSDR PROGRAM. DO YOU HAVE AN UPDATE ON THAT MATTER?

A. Yes. Through discovery in this case, I was able to identify the overlapping technologies that exist in both DSDR and GIP. These items are as follows: Capacitor Bank Controls, 2G/3G modem replacements to support 4G/5G, and GridWAN Core routers.

Additionally, a portion of the sensor equipment is being retired from the original deployment of DSDR and is being replaced as part of the Self-Optimizing Grid (SOG) program. The costs associated with SOG are not being charged to DSDR.

The total dollar amount on a system basis for the overlapping technologies mentioned above is approximately $5.7 million for Vintage year 2019.

Q. IS THE PUBLIC STAFF SUPPORTIVE OF GRID IMPROVEMENT ACTIVITIES PERFORMED BY ELECTRIC UTILITIES?

A. Yes, we are. The Public Staff is supportive of certain activities that will improve the customer experience through increased access to data and reliability enhancements, as evidenced by the recent settlement agreement between the Company and the Public Staff as it pertains to its GIP initiative. We also understand that electric industry technologies and capabilities are much more advanced, than they were 30 years ago.

Q. PLEASE SUMMARIZE YOUR CONCERNS WITH THE COMPANY'S PORTFOLIO OF PROGRAMS GOING FORWARD.

A. As the Company continues to implement its GIP, and as the Company's grid capabilities and services continue to evolve, the Company's continuation of savings and offerings for DSM/EE programs will need to be reviewed to ensure that peak demand and energy savings are not being double-counted or offered in other rate base related channels as a form of standard service.

Q. DO YOU HAVE A RECOMMENDATION REGARDING THE COMPANY'S GIP AND ITS INFLUENCE ON THE DSM/EE RIDER?

A. Yes. With regard to the Company's pending GIP proposal, the Public Staff recommends that the Commission require the Company to:

1. Perform an analysis of GIP to explain how GIP will affect the performance of DSM/EE programs with respect to their ability to produce peak demand and energy savings. In other words, if a GIP project will reduce T&D losses or impact the operational capability of a DSM or EE program to produce savings, the Company should seek to quantify those impacts so that it can appropriately forecast energy and demand reductions going forward. The results of this analysis should be filed as soon as it is available, or filed with the Company's next DSM/EE rider proceeding;
2. In the next rider proceeding, explain how the Company will distinguish peak demand and energy savings resulting from GIP from those resulting from DSM and EE programs; and,
3. Provide in its next rider filing a list of GIP projects that have been implemented and how those projects have affected the performance of the Company's DSM/EE portfolio, if at all. The Company should be prepared to discuss any impacts GIP projects have had on day-to-day system operations, as well as customer expectations for utility service in general, DSM/EE program performance, and the availability of customer data.

Avoided Cost

Q. PLEASE DESCRIBE YOUR CONCERNS REGARDING THE COMPANY'S USE OF AVOIDED COST RATES.

A. The Company, as noted above, has updated its underlying avoided cost inputs for both capacity and energy to be derived from the Sub 158 avoided cost proceeding, in Docket No. E-100, Sub 158 (Sub 158), pursuant to the Revised Mechanism. While the Public Staff agrees with this update, we have two concerns with the Company's application of avoided capacity derived from the Sub 158 rates. Public Staff witness John R. Hinton goes into further discussion on these two concerns in his testimony, but I summarize his concerns as the following:

1. That the Company's incorporation of a 17% reserve margin adder to all avoided capacity benefits associated with its EE programs, beginning in Vintage year 2021, is inappropriate; and,

2. That the Company's allocation of 100% of avoided capacity benefits to summer capacity for DEP's legacy[13] DSM programs is inappropriate.

Q. WHAT IS THE IMPACT OF IMPLEMENTING PUBLIC STAFF WITNESS HINTON'S POSITION ON THE FIRST CONCERN?

A. The impact associated with this issue on the cost effectiveness of the portfolio is seen in Williamson Exhibit 3, under the column labeled "Removing 17% Reserve Margin Adder." The impacts expressed in this column are only associated with this adjustment because only the EE programs are impacted by this adjustment.

The impacts with regard to the NPV of system avoided cost benefits that are included in Evans Exhibit 1 and used in the calculation of the revenue requirement for the prospective rate for Vintage year 2021 amount to a decrease in the amount of approximately $4.9 million for both residential and non-residential programs combined.

Q. WHAT IS THE IMPACT OF IMPLEMENTING PUBLIC STAFF WITNESS HINTON'S POSITION ON THE SECOND CONCERN?

A. The impact on the cost effectiveness of the portfolio is seen in

[13] "Legacy," as understood by the Public Staff and based on the Company's responses to data requests, is the level of DSM activation capability that was originally projected for the year 2021 in the 2018 IRP.

Williamson Exhibit 4, under the column labeled "Applying 100%W/0%S Seasonal Allocation." The impacts expressed in this column are only associated with this adjustment because only the DSM programs are impacted by this adjustment.

The impacts with regard to the NPV of system avoided cost benefits that are included in Evans Exhibit 1 and used in the calculation of the revenue requirement for the prospective rate for Vintage year 2021 amounts to a decrease in amount of approximately $1.5 million for both residential and non-residential programs combined.

Q. WHAT ARE THE NET IMPACTS OF THE PUBLIC STAFF'S POSITION ON BOTH CONCERNS ON THE PROJECTED COST-EFFECTIVENESS SCORES FOR THE PORTFOLIO?

A. The impact on the cost effectiveness of the portfolio of both of these adjustments is seen in Williamson Exhibit 4, under the column labeled "Total Net Impacts."

In addition to the net impacts to cost-effectiveness, I have calculated the percent change to both the TRC and UC tests from the originally filed scores to the "Total Net Impacts" scores. As seen in Williamson Exhibit 4, the greatest impacts to cost-effectiveness occur with the DSM programs. This is because the Company does not currently have activations of its DSM programs during the winter time, where

the majority of potential avoided benefits reside.

The total net impacts with regard to the NPV of system avoided cost benefits that are included in Evans Exhibit 1 and used in the calculation of the revenue requirement for the prospective rate for Vintage year 2021 amount to a decrease in the amount of approximately $6.4 million for both residential and non-residential programs combined.

These impacts have been provided to Public Staff witness Maness for his incorporation in the appropriate revenue requirement for this proceeding.

Residential Smart Saver EE Program – Referral Channel

Q. WHAT IS THE PURPOSE OF THE RESIDENTIAL SMART SAVER PROGRAM?

A. The Company's Residential Smart Saver (SmartSaver) program, which was originally known as the Home Energy Improvement program (HEIP), is designed to offer rebate options to customers for a variety of EE measures related to home heating and cooling[14] to encourage greater energy efficiency.

[14] For example, HVAC equipment (heat pumps and central air conditioning), attic insulation, duct sealing, etc.

On February 9, 2016, in Docket No. E-2, Sub 936, the Commission approved the Company's request to implement a referral channel to offset some of the costs associated with the program. The Company expected that this modification would bolster the cost-effectiveness of HEIP.

On September 11, 2017, in the same docket, the Commission approved the conversion of HEIP into what is now known as the SmartSaver program. This program modification expanded the program to include additional household-related measures, as well as an online store option. These changes were intended to make the DEP SmartSaver program match the SmartSaver program of DEC.

Q. DID THE RESIDENTIAL HVAC EE REFERRAL CHANNEL CONTINUE AFTER THE PROGRAM CHANGES APPROVED ON SEPTEMBER 11, 2017?

A. Yes. The Company's referral channel continues to be a part of the SmartSaver program. However, the Company has expanded the original scope of the referral channel to include a variety of items and services beyond its original focus on HVAC equipment-related contractor referrals. The referral channel now also provides customers with contractor referrals related to rooftop solar systems, plumbing, and tree removal services.

For marketing purposes, the Company uses the name "FindItDuke" to provide the contractor referral information.[15] This portal is accessible to the general public, and is accessible without having to log into the Company's customer account system. The Company includes a disclaimer on its portal to explain this accessibility. It reads that "[w]hile non-Duke Energy customers are eligible to use the referral service and receive special contractor discounts and financing, only Duke Energy customers are eligible to receive Duke Energy rebates."

The referral services currently available from the "FindItDuke" portal include:

- Heating and Air Conditioning;
- Insulation;
- Plumbing;
- Electrical;
- Pool;
- Solar; and
- Tree Removal.

[15] https://www.duke-energy.com/find-it-duke

Q. WHERE ARE THE REVENUES RECEIVED FROM CONTRACTORS PARTICIPATING IN THE REFERRAL CHANNEL BOOKED?

A. All funds that DEP receives from contractors participating in the referral channel are used to offset the program costs for the SmartSaver program. This includes funds associated with rooftop solar and tree service contractors, which at this time represent only a very small portion of the overall revenues received.

Q. WITH RESPECT TO THE EXPANSION OF THE REFERRAL CHANNEL AND THE "FINDITDUKE" WEB PORTAL, DOES THE PUBLIC STAFF HAVE ANY CONCERNS WITH THE COMPANY MAKING THIS TYPE OF PROGRAM MODIFICATION?

A. The Public Staff does not believe that the Company has violated any Commission rules or the Flexibility Guidelines that address how program modifications are to be handled. While the Flexibility Guidelines have generally worked well to provide the appropriate notice to the Commission and parties of upcoming or past changes to the programs, the expansion of the referral channel into areas not specifically related to DSM and EE programs, or that may be otherwise recovered through base revenues, does seem to be the type of program change that should be brought to the Commission's attention for approval in advance of the change. This would be

particularly applicable to any change that would give the appearance of impacting the performance or cost recovery of a particular DSM or EE program. The Public Staff will continue to discuss this matter with the Company, and such discussions could include the potential for revisions to the Flexibility Guidelines to specifically address this type of program modification.

EM&V

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

A. Yes. The Public Staff contracted the services of GDS Associates, Inc. (GDS), to assist 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 C. Additionally, I have reviewed the EM&V report filed by the Company on August 17, 2020, as Evans Supplemental Exhibit D.

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

Q. DO YOU HAVE ANY CONCERNS REGARDING THE EM&V REPORTS YOU REVIEWED?

A. I have reviewed the testimony and exhibits of DEP witness Evans concerning the EM&V of DEP's DSM/EE programs. Based upon my review and upon the analysis performed by GDS, I have recommendations regarding both the EM&V report for the Residential Income-Qualified EE (Neighborhood Energy Saver or NES) Program (Evans Exhibit B) and the Save Energy and Water Kit (SEWK) Program (Evans Exhibit C).

Q. PLEASE EXPLAIN YOUR RECOMMENDATION FOR THE NES PROGRAM.

A. Evans Exhibit B evaluated the performance of the NES program over the period from June 1, 2017, through June 30, 2018, and included approximately 4,500 customers in the DEP portion of the study. As discussed by the evaluator of the NES program, a billing analysis was not used in this case to determine program savings. Rather, the evaluator used an engineering analysis that relied on information from other sources (namely technical reference manuals from other states). The evaluator states that a billing analysis was not appropriate in this evaluation because of differences in usage patterns between the treatment group and control group, and the

differences in weather patterns between pre- and post-treatment periods.[16]

The use of an engineering analysis is an acceptable analytical approach for the NES program. However, a billing analysis is preferable because it provides a more accurate representation of actual program performance.[17] The Public Staff has recommended in past DSM/EE rider proceedings,[18] and the Company and Commission have agreed, that billing analyses of EE programs are preferable. The engineering analysis in this case produces per participant savings that are double the savings from the previous evaluation.[19]

A second issue relates to the evaluation of the net-to-gross ratio (NTGR). The engineering analysis assumes a NTGR of 1.0, which is standard practice for income-qualified programs. While the Public Staff recognizes this to be a standard practice, we also note that lighting accounts for 37% of the program's gross savings and that

[16] See Section 4.3 of Evans Exhibit B.

[17] A billing analysis provides net program savings. An engineering analysis does not include a net-to-gross analysis and therefore must rely on numerous measure assumptions, and less on empirical customer consumption data.

[18] Docket Nos. E-7, Subs 1105 and 1130, and E-2, Subs 1145 and 1174.

[19] The previous evaluation reported 430 kWh saved per participant (Table 1-2 of Evans Exhibit B in Docket No. E-2, Sub 1145). The current evaluation reports 779 kWh saved per participant (Table 1-3 of Evans Exhibit B).

there have been significant changes in the lighting market in recent years. The evaluation indicates that many bulbs could not be installed because efficient bulbs were already present, which suggests a NTGR of less than 1.0 for lighting measures. The issue is further complicated by the fact that the engineering analysis assumes the baseline wattage is equal to the federal standard (equivalent to a halogen bulb) when at the time of the evaluation, halogen bulbs likely only represented a small fraction of shelf space at stores selling bulbs to prospective lighting purchasers. During 2017-2018, LEDs and CFLs were already occupying much of the available shelf-space at big box retailers like Home Depot and Lowes. This suggests that the NTGR assumption as well as the presumed baseline wattage in the engineering analysis may over-estimate the LED bulb savings component of the program. The concern we have over the NTGR for the lighting component of the program adds emphasis to my recommendation that the next evaluation rely on a billing analysis for assessing the savings attributable to the program.

Consistent with the EM&V agreement contained in the Mechanism, the results in Evans Exhibit B would apply to participation from June 30, 2018, through the end of the sampling period associated with the next evaluation. Based on past scheduling of evaluations, this could

be two to three years, which likely puts the next evaluation in 2021. Evans Exhibit B is acceptable for purposes of verifying the NES program savings. However, the Public Staff also believes it would be appropriate to perform the next evaluation of the NES program as soon as possible, and to incorporate a billing analysis in that evaluation. The Company has represented to the Public Staff that it will initiate the next evaluation very soon.

Q. PLEASE EXPLAIN YOUR RECOMMENDATION FOR THE SEWK PROGRAM.

A. The savings and impacts of the SEWK program were evaluated by Nexant (Evans Exhibit C) for the period spanning September 2018 to August 2019. During the course of our review, we discovered a discrepancy between the savings resulting from the engineering analysis that was applied to these measures and a billing analysis. We have thus far been unable to conclude our review of the overall findings and savings estimates put forth in the evaluation report in this rider proceeding, and will continue to evaluate Evans Exhibit C and coordinate with DEP to conduct additional review of the data used in the evaluation. The Public Staff will continue to review this report and offer further recommendations before the close of this proceeding.

Q. DO YOU HAVE ANY OTHER EM&V CONCERNS?

A. Yes. There are some cases in which a similar or identical measure is offered across multiple programs. For example, the low-flow showerhead is offered through the Neighborhood Energy Saver program as well as the Energy Efficiency Education in Schools program. DEP used different contractors in the evaluations of these two programs. The evaluators made different assumptions with respect to the assumed baseline flow of an existing showerhead in the calculation of the low-flow showerhead measure savings. The assumptions and sources cited by both evaluators are reasonable. However, unless there is a compelling reason to have different assumptions for the same measure (other than the use of different contractors to evaluate different programs), the Public Staff recommends that DEP work to ensure that these measures be evaluated consistently. When such recommendations are not consistent across the programs, the Company should explain the differences justifying each case.[20]

[20] This is similar to the Public Staff's recommendations in Docket No. E-2, Sub 1145 regarding different methodologies that were used to evaluate different programs offering the same measures.

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

A. Yes. The reports filed in this proceeding, labeled as Evans Exhibits A through C, and Evans Supplemental Exhibit D, should be considered complete, with the exception of the SEWK report (Evans Exhibit C). As discussed above, the Public Staff will continue to review this report and offer further recommendations before the close of this proceeding.

Q. HAVE YOU CONFIRMED THAT THE COMPANY'S CALCULATIONS INCORPORATE THE VERIFIED SAVINGS OF THE VARIOUS EM&V REPORTS?

A. Yes. As in previous cost recovery proceedings, I was able, through sampling, to verify that the changes to program impacts and participation were appropriately incorporated into the rider calculations for each DSM/EE program, as well as the actual participation and impacts calculated with EM&V data. I reviewed: (1) workpapers provided in response to data requests; (2) a sampling of the EE programs; and (3) Evans Exhibit 1, which incorporates data from various EM&V studies. I also met with DEP personnel to review the calculations, EM&V, DSMore, and other data related to the program/measure participation and impacts. Based on my ongoing review of this data, I believe DEP has appropriately incorporated the

findings from EM&V studies and annual participation into its rider calculations consistent with Commission orders and the Revised Mechanism. I will continue to review this information and, if necessary, file further information with the Commission should my review reveal any relevant issues that would cause me to alter my recommendations or conclusions.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

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. In August of 2020, the Electric Division merged with the Natural Gas Division to form the Energy Division, where I am a part of the Electric Section - Rates and Energy Services. My current responsibilities within the Energy 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. Additionally, I am currently serving as a co-chairman on the National Association of State Utility and Consumer Advocates' (NASUCA) DER and EE Committee.

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 have filed testimony in various DEC, DEP, and DENC Demand Side Management/Energy Efficiency rider proceedings, as well as recent general rate case proceedings.

Duke Energy Progress, LLC
Comparison of "As-Filed" Cost-Effectiveness Scores to Previous DSM/EE Riders
Docket Number E-2, Sub 1252

Public Staff
Williamson Exhibit #1
E-2, Sub 1252

	Evans Exhibit 7 in Sub 1174 Vintage 2019				Evans Exhibit 7 in Sub 1206 Vintage 2020				Evans Exhibit 7 in Sub 1252 Vintage 2021				Percent Change from previous V2020 to V2021	
Program	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**
Residential Programs														
Energy Education Program for Schools	1.62	2.24	0.76	-	1.35	1.38	0.51	10.30	1.37	1.39	0.56	9.10	2%	1%
Energy Efficient Appliances & Devices	-	-	-	-	14.59	15.40	0.88	34.77	8.44	10.13	0.84	31.03	-42%	-34%
Energy Efficient Lighting	1.79	2.58	0.57	6.36	2.01	2.70	0.71	6.42	1.99	2.96	0.63	7.09	-1%	10%
Residential Smart $aver (Home Energy Improvement)	0.91	0.57	0.48	1.36	1.60	0.97	0.69	1.66	0.57	0.40	0.33	1.39	-64%	-59%
Multi-Family	3.00	5.58	0.64	-	2.65	2.65	0.54	24.31	2.64	2.65	0.58	20.70	0%	0%
Neighborhood Energy Saver	0.46	1.55	0.31	-	0.49	0.49	0.31	2.23	0.87	0.90	0.49	2.51	76%	81%
Residential Energy Assessments	1.54	1.71	0.60	-	2.15	2.19	0.56	49.13	2.03	1.96	0.54	30.63	-6%	-10%
Residential New Construction	1.96	1.03	0.86	1.85	1.55	4.93	1.30	6.84	1.31	1.38	0.58	3.40	-15%	-72%
My Home Energy Report	0.96	0.96	0.48	-	1.01	1.01	0.43	-	1.61	1.61	0.65	-	60%	60%
EnergyWise Home	9.28	58.30	9.28	-	5.27	15.93	5.27	-	1.96	5.83	1.96	-	-63%	-63%
Residential Total	**2.79**	**2.70**	**1.03**	**5.28**	**2.56**	**3.68**	**1.11**	**7.90**	**1.76**	**1.95**	**0.68**	**5.95**	-31%	-47%
Non-Residential Programs														
Energy Efficient Lighting	4.63	7.98	1.21	12.09	4.03	2.03	0.86	4.04	3.93	1.92	0.88	3.69	-2%	-5%
Smart $aver Performance (Custom)[1]	2.45	1.07	0.77	1.99	2.61	1.17	0.94	2.19	3.16	1.52	0.89	-	21%	30%
Smart $aver Performance (Prescriptive)[1]														
Smart $aver Performance Incentive	3.75	0.92	0.95	1.64	4.05	0.99	1.09	1.54	2.83	1.09	1.00	1.79	-30%	10%
Small Business Energy Saver	2.57	1.60	0.87	2.87	2.51	1.55	0.86	2.85	2.01	1.24	0.76	2.50	-20%	-20%
EnergyWise ® for Business	0.72	1.07	0.62	-	0.27	0.46	0.27	-	0.27	0.52	0.27	-	1%	15%
Commercial Industrial Governmental Demand Response	2.06	33.28	2.06	-	1.84	28.03	1.84	-	1.77	29.70	1.77	-	-4%	6%
Non-Residential Total	**2.41**	**1.56**	**1.01**	**2.37**	**2.59**	**1.77**	**0.92**	**3.21**	**2.41**	**1.49**	**0.86**	**2.72**	-7%	-16%
Overall Portfolio total	**2.63**	**2.12**	**1.03**	**3.67**	**2.57**	**2.51**	**1.02**	**4.52**	**2.01**	**1.71**	**0.75**	**3.90**	-22%	-32%

[1] **Similar to what DEC has done, DEP is combining the Performance Custom and Performance Prescriptive programs due to their similarities in participants and renaming them Non-Residential Smart Saver (formerly known as EE for Business)**

Duke Energy Progress, LLC
Comparison of Actual Cost-Effectiveness Scores to Previous DSM/EE Riders
Docket Number E-2, Sub 1252

Public Staff
Williamson Exhibit #2
E-2, Sub 1252

	Evans Exhibit 7 in Sub 1108 Vintage 2017				Evans Exhibit 7 in Sub 1145 Vintage 2018				Evans Exhibit 7 in Sub 1174 Vintage 2019			
Program	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**	**RIM**	**PCT**
Residential Programs												
Energy Education Program for Schools	1.65	2.22	0.76	-	2.02	2.81	0.82	-	1.39	1.37	0.48	11.58
Energy Efficient Appliances & Devices	19.34	64.63	1.19	-	12.35	24.47	1.11	-	5.01	4.45	0.75	12.84
Energy Efficient Lighting	3.23	4.15	0.91	-	3.43	17.04	0.91	-	2.63	3.78	0.70	8.52
Residential Smart $aver (Home Energy Improvement)	0.91	0.47	0.50	1.01	0.88	0.59	0.48	1.40	0.84	0.63	0.44	1.74
Multi-Family	4.04	6.54	0.76	-	3.40	4.99	0.67	-	2.84	2.75	0.56	21.72
Neighborhood Energy Saver	0.63	1.85	0.42	-	0.99	3.16	0.69	-	0.86	0.82	0.47	2.68
Residential Energy Assessments	2.96	3.32	0.75	380.29	2.90	3.31	0.71	473.05	2.06	2.03	0.54	38.16
Residential New Construction	1.84	1.20	0.81	2.05	1.72	1.92	0.74	3.88	1.28	1.42	0.54	3.96
My Home Energy Report	1.03	1.03	0.49	-	1.28	1.28	0.56	-	1.85	1.85	0.66	-
EnergyWise Home	9.60	153.14	13.05	-	9.63	87.87	9.63	-	9.17	281.08	9.17	-
Residential Total	**3.31**	**3.26**	**1.48**	**6.64**	**3.03**	**4.14**	**1.32**	**10.64**	**2.66**	**3.14**	**1.11**	**7.90**
Non-Residential Programs												
Smart $aver Performance (Custom)[1]	-	-	-	-	4.09	1.46	1.22	2.19	3.22	1.58	0.97	2.85
Smart $aver Performance (Prescriptive)[1]	-	-	-	-	5.56	2.57	1.19	3.54	4.49	2.40	0.91	1.19
Smart $aver Performance Incentive	2.28	1.08	0.92	2.10	4.01	1.14	1.05	1.82	2.27	0.98	0.75	2.37
Small Business Energy Saver	3.07	1.97	1.08	2.86	2.52	1.72	0.99	2.75	2.20	1.44	0.82	2.78
EnergyWise ® for Business	0.62	0.71	0.39	-	-0.24	-0.34	-0.24	-	0.22	0.38	0.22	-
Commercial Industrial Governmental Demand Response	2.55	28.54	-	-	1.84	-63.97	1.84	-	2.43	7.73	2.43	-
Non-Residential Total	**3.27**	**1.56**	**1.15**	**2.97**	**3.80**	**2.12**	**1.11**	**3.19**	**2.94**	**1.93**	**0.91**	**3.67**
Overall Portfolio total	**3.30**	**2.29**	**1.40**	**4.96**	**3.29**	**3.03**	**1.22**	**4.47**	**2.74**	**2.63**	**1.02**	**5.00**

[1] **Similar to what DEC has done, DEP is combining the Performance Custom and Performance Prescriptive programs due to their similarities in participants and renaming them Non-Residential Smart Saver (formerly known as EE for Business)**

North Carolina Public Staff
Data Request No. 178
DEP Docket No. E-2, Sub 1219
Item No. 178-2

Request:

2. On page 8 of witness Oliver's rebuttal testimony, he states that "advancing the current DSDR capabilities beyond its current state to CVR operational mode is critical now to enable the greater application of Distributed Energy Resources on the grid..." Please explain what is meant by the phrase "critical now." This response should explain the Company's position that DSDR and the proposed CVR operational mode became critical to the operations of the grid, and why it was not considered critical prior to that time.

Response:

When the legacy DEP DSDR project was implemented several years ago, the primary objective was to reduce peak demand. Since the implementation of DSDR the cost of solar has continually fallen. North Carolina has seen rapid growth in the adoption rate of solar as prices decrease and ownership options expand, and this is expected to continue. As of the 4th quarter of 2019, North Carolina now ranks 2nd in the United States for the highest solar generation capacity. Distributed energy resources are typically connected to the utility distribution network, potentially impacting Volt Var Control on a daily basis. As the penetration of distributed energy resources (i.e. solar) increases on the electric grid, local overvoltage and intermittency issues seen at the distribution level will impact voltage quality at the customer-level and increase the risk to system stability both at the distribution and substation level. For example, the intermittent nature of solar production can create variability of voltage due to cloudiness and can have a significant impact on local feeders. The deployment of CVR capability will help provide the capability to manage and mitigate the impacts of distribution-connection generation by monitoring and optimizing the system voltage in near real time, and thereby assist with operating the grid more efficiently and reliably. DSDR (i.e. peak shaving) will remain a critical operation to the grid to provide peak reduction capacity and reliability benefit as the distribution system approaches peak loads and generation limits.

Program/Portfolio Cost Effectiveness - Program Year 2021

	ORIGINAL				Removing 17% Reserve Margin Adder				Applying 100%W/0%S Seasonal Allocation				Total Net Impacts				Percent Change of "Total Net Impacts" from "Original"	
Program	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**	**RIM**	**PCT**	**UCT**	**TRC**
Residential Programs																		
· **Energy Education Program for Schools**	1.37	1.39	0.56	9.10	1.32	1.34	0.54	9.10	1.37	1.39	0.56	9.10	1.32	1.34	0.54	9.10	-4%	-4%
· **Energy Efficient Appliances & Devices**	8.44	10.13	0.84	31.03	8.06	9.67	0.80	31.03	8.44	10.13	0.84	31.03	8.06	9.67	0.80		-5%	-5%
· **Energy Efficient Lighting**	1.99	2.96	0.63	7.09	1.96	2.91	0.62	7.09	1.99	2.96	0.63	7.09	1.96	2.91	0.62		-2%	-2%
· **EnergyWise Home**	1.96	5.83	1.96		1.96	5.83	1.96		1.96	5.83	1.96		1.96	5.83	1.96		0%	0%
· **Multi-Family EE Products & Services**	2.64	2.65	0.58	20.70	2.54	2.55	0.56	20.70	2.64	2.65	0.58	20.70	2.54	2.55	0.56		-4%	-4%
· **My Home Energy Report**	1.61	1.61	0.65		1.53	1.53	0.62		1.61	1.61	0.65		1.53	1.53	0.62		-5%	-5%
· **Neighborhood Energy Saver**	0.87	0.90	0.49	2.51	0.84	0.86	0.47	2.51	0.87	0.90	0.49	2.51	0.84	0.86	0.47		-4%	-4%
· **Residential Energy Assessments**	2.03	1.96	0.54	30.63	1.99	1.92	0.53	30.63	2.03	1.96	0.54	30.63	1.99	1.92	0.53		-2%	-2%
· **Residential New Construction**	1.31	1.38	0.58	3.40	1.25	1.32	0.55	3.40	1.31	1.38	0.58	3.40	1.25	1.32	0.55		-5%	-5%
· **Residential Smart $aver**	0.57	0.40	0.33	1.39	**0.56**	0.39	0.32	1.39	0.57	0.40	0.33	1.39	0.56	0.39	0.32		-2%	-2%
Residential Total	**1.76**	**1.95**	**0.68**	**5.95**	**1.70**	**1.89**	**0.65**	**5.95**	**1.76**	**1.95**	**0.68**	**5.95**	**1.70**	**1.89**	**0.65**		-3%	-3%
Non-Residential Programs																		
· **Non-Residential Smart $aver**	3.16	1.52	0.89		3.06	1.47	0.86		3.16	1.52	0.89		3.06	1.47	0.86		-3%	-3%
· **Non-Residential Smart $aver Performance Incentive**	2.83	1.09	1.00	1.79	2.75	1.06	0.97	1.79	2.83	1.09	1.00	1.79	2.75	1.06	0.97	1.79	-3%	-3%
· **Small Business Energy Saver**	2.01	1.24	0.76	2.50	1.95	1.21	0.74	2.50	2.01	1.24	0.76	2.50	1.95	1.21	0.74	2.50	-3%	-3%
· **EnergyWise ® for Business**	0.27	0.52	0.27		0.27	0.52	0.27		0.10	0.19	0.10		0.10	0.19	0.10		-64%	-64%
· **Commercial Industrial Governmental Demand Response**	1.77	29.70	1.77		1.77	29.70	1.77		1.43	23.91	1.43		1.43	23.91	1.43		-19%	-19%
Non-Residential Total	**2.41**	**1.49**	**0.86**	**2.72**	**2.34**	**1.45**	**0.84**	**2.72**	**2.36**	**1.46**	**0.85**	**2.72**	**2.29**	**1.41**	**0.82**		-5%	-5%
Overall Portfolio total	**2.01**	**1.71**	**0.75**	**3.90**	**1.94**	**1.66**	**0.73**	**3.90**	**1.99**	**1.69**	**0.74**	**3.90**	**1.93**	**1.64**	**0.72**		-4%	-4%