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September 5, 2017

Via Federal Express

Ms. Martha Lynn Jarvis
Chief Clerk
North Carolina Utilities Commission
430 North Salisbury Street
Dobbs Building
Raleigh, NC 27603-5918

RE: In the Matter of: Application of Duke Energy Progress, Inc. for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to G.S. 62-133.9 and Commission Rule R8-69 ***Docket No. E-2, Sub 1145***

Dear Ms. Jarvis:

Southern Environmental Law Center electronically filed *Testimony of James Grevatt on Behalf of North Carolina Justice Center and Southern Alliance for Clean Energy* on September 5, 2017. Pursuant to Commission Rule R1-28(e), we are also submitting fifteen (15) paper copies of the testimony and accompanying exhibit, one of which is a single-sided copy for the benefit of the Court Reporter.

By copy of this letter, I am serving all parties of record on the service list. Please let me know if you have any questions about this filing.

Sincerely,

s/ Robin G. Dunn

Administrative Legal Assistant

RGD
Enclosures
cc: Parties of Record

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. E-2, SUB 1145

In the Matter of: Application of 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 JAMES GREVATT ON BEHALF OF NORTH CAROLINA JUSTICE CENTER and SOUTHERN ALLIANCE FOR CLEAN ENERGY**

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

A. My name is James Grevatt. I am a Managing Consultant at Energy Futures Group, located at 18 Mechanicsville Rd., Hinesburg, VT 05461.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of the Southern Alliance for Clean Energy ("SACE") and the North Carolina Justice Center ("NC Justice Center").

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL AND EDUCATIONAL EXPERIENCE.

A. I have worked in the energy efficiency industry since 1991 in a wide variety of roles, including extensive hands-on experience conducting hundreds of energy audits for Vermont's low-income Weatherization Assistance Program and Vermont Gas Systems' Demand-Side Management programs. I was the Energy Services Manager at Vermont Gas, managing award-winning residential and commercial energy efficiency programs for five years, and the Director of Residential Energy Services at Efficiency Vermont and then the District of Columbia Sustainable Energy Utility for a total of seven years, both while I was employed by Vermont Energy Investment Corporation.

Since 2013 I have been employed by Energy Futures Group (EFG), which is an energy efficiency consulting firm established in 2010 by Chris Neme, Richard Faesy and Glenn Reed. EFG specializes in the design, implementation and evaluation of programs and policies to promote investments in efficiency, with particular emphasis on cutting edge strategies to cost-effectively achieve both broad participation and deep levels of savings. EFG has worked on behalf of

program administrators, government and regulatory agencies, and advocacy organizations in more than 20 states and provinces, as well as several countries in Europe. EFG staff have critically reviewed hundreds of efficiency programs and played key roles in developing a number that have won national awards for excellence. Recent work includes serving as advisors on the development of efficiency program portfolios and policies in four of the six highest ranking states in the American Council for an Energy Efficient Economy's ("ACEEE") 2016 State Energy Efficiency Scorecard. In addition, EFG played key roles in the development of a report summarizing lessons learned from leading residential retrofit programs in North America and Europe, an analysis and presentation on the key pitfalls that can be encountered in performing potential studies, a study of emerging practices in the use of energy efficiency to defer or entirely avoid electric Transmission and Distribution upgrades, the development and updating of a regional residential lighting strategy for the Northeast, and an assessment of the effectiveness of leading efficiency financing initiatives.

At Energy Futures Group, I have advised regulators, program implementers, and advocates in Missouri, Mississippi, Maryland, Pennsylvania, Delaware, Virginia, New Jersey, Illinois, California, Vermont, Maine, New Hampshire, and British Columbia. I focus on using my in-depth knowledge of program operations and a clear understanding of strategic thinking and planning to ensure that programs achieve their desired market impacts.

My resume, attached as Grevatt Exhibit 1, presents a summary of my professional and educational experience.

Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE NORTH CAROLINA UTILITIES COMMISSION (THE "COMMISSION")?

A. This is my first appearance before this Commission, however, I have provided direct testimony in proceedings before public utility commissions in Illinois, Vermont, and British Columbia, authored formal comments in public utility commission proceedings in Pennsylvania and Maryland, and made frequent appearances in hearings before the Maryland Public Service Commission.

INTRODUCTION

Q. WHAT IS DUKE ENERGY PROGRESS REQUESTING THAT THE COMMISSION APPROVE IN THIS PROCEEDING?

A Duke Energy Progress ("DEP" or the "Company") has filed an application ("Application") pursuant to N.C. Gen. Stat. § 62-133.9 and Commission Rule R8-69 seeking Commission approval of the Company's proposed rider to recover demand-side management ("DSM") and energy efficiency ("EE") costs, net lost revenues, and a Program Performance Incentive ("PPI") for 2018 ("Rider 9").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to describe my assessment of the reported performance of DEP's DSM and EE programs as described in its Application and to provide recommendations, based on industry best practice and the experience of other jurisdictions, for steps that DEP can take to improve the services and programs that it offers. Specifically, I will discuss the following topics:

- DEP's 2016 energy savings achievements and projections for the near term;
- Opportunities for DEP to increase cost-effective energy savings;
- Recommendations for improving DEP's low and moderate-income programs;
- The prevalence of opt-outs among eligible non-residential customers and recommendations for increasing participation in this sector;
- The benefits of Advanced Metering Infrastructure ("AMI") and recommendations for DEP to consider should it pursue wide deployment of AMI technology.

Q. PLEASE SUMMARIZE YOUR OVERALL IMPRESSION OF DEP'S DSM/EE PERFORMANCE.

A. DEP continues to implement cost-effective DSM/EE programs for its customers that result in significant energy savings. The performance of DEP's DSM/EE portfolio remained relatively flat in 2016, achieving savings of 0.85% of prior-year retail sales. Despite its consistent performance, however, DEP is foregoing valuable opportunities to strengthen its DSM/EE portfolio and to increase energy savings, which means that its customers are not receiving the benefits that should be available to them. In fact, DEP is projecting that its energy savings will remain flat in 2017 and then fall in 2018, indicating a need for DEP to closely examine and implement program improvements, increase the savings that participants achieve, and consider new programs. My primary conclusions and recommendations, upon which I will elaborate in my testimony, are as follows:

1. The bulk of DEP's residential savings result from lighting measures and its behavior program. DEP should increase its focus on programs that provide more comprehensive and long-lasting savings, such as HVAC upgrades and comprehensive home retrofits;

2. DEP's failure to procure an alternate vendor for its Appliance Recycling program resulted in the loss of energy savings opportunities for its customers that could have been averted. DEP should immediately procure an alternate vendor for its Appliance Recycling Program;

3. DEP should maximize the cross-program marketing that occurs in behavior, audit, and kit programs to drive deeper, comprehensive, and persistent savings in the form of home retrofits, HVAC upgrades, and other measures;

4. DEP should address opportunities to save more energy in multifamily housing, including in common areas and for commonly-metered systems;

5. DEP should significantly increase its focus and level of investment in low income energy efficiency programs, recognizing that DEP's current low-income energy savings lag well behind those of leading utilities;

6. The Company should continue with steps to promote adoption of a greater range of measures through the Small Business Energy Saver program;

7. DEP can and should take aggressive steps to encourage the participation of non-residential customers who are eligible to opt out of the DSM/EE programs and

rider, both by making sure that the available programs meet these customers' needs and by providing personalized outreach and engagement;

8. As DEP contemplates the possibility of broadly deploying AMI in its distribution system, it should fully explore the use of the technology to drive greater efficiency for its customers.

DEP'S ENERGY SAVINGS ACHIEVEMENTS AND PROJECTIONS

Q. WHAT ARE YOUR OVERALL OBSERVATIONS ABOUT DEP'S 2016 REPORTED ENERGY EFFICIENCY SAVINGS?

A. DEP reported that their 2016 portfolio of energy efficiency and demand side management programs achieved approximately 399 GWh of energy savings, equal to roughly 0.85% of 2015 retail sales. The trajectory of DEP's MWh savings achievements from 2010 to the present, including DEP's projections for 2017 and 2018, is shown in Figure 1. It is particularly worth noting that DEP's energy savings achievement has leveled off in 2016 after a period of sustained growth, is expected to remain flat for 2017, and is forecast to decline by nearly 7% to 374 GWh in 2018.

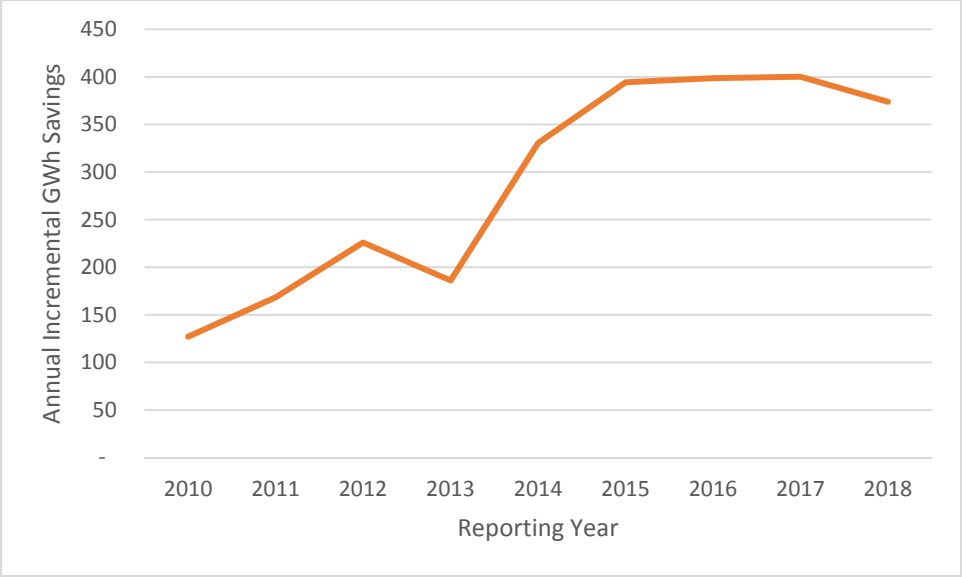

Figure 1: Annual Incremental MWh Savings by Year [1]

While DEP has reported higher energy savings in recent years than a number of other utilities in the Southeast have achieved, it is capturing far less than leading North American utilities.[2] Furthermore, DEP's energy savings are dramatically less than what is needed to achieve the system-wide energy efficiency savings targets that the Company agreed to in a settlement agreement with SACE, as well as the South Carolina Coastal Conservation League and the Environmental Defense Fund, in connection with the then-proposed merger of Duke Energy and Progress Energy ("Merger Settlement").[3] The Merger

[1] Savings values for 2010-2012 from Testimony of Taylor Allred on behalf of Southern Alliance for Clean Energy in Docket No. E-2, Sub 1044 at 5; savings values for 2013 and savings projection for 2017 from Evans Exhibit 1 in Docket No. E-2, Sub 1108; savings values for 2014-2016 and savings projection for 2018 from Evans Exhibit 1 in Docket No. E-2, Sub 1145.
[2] Relf, Grace, et. al., ACEEE, 2017 Utility Energy Efficiency Scorecard at 17, Table 6 (2017), *available at* http://aceee.org/research-report/u1707.
[3] The Merger Settlement was approved by the Public Service Commission of South Carolina in Docket No. 2011-158-E.

Settlement established an annual savings target of at least 1% of prior-year retail sales beginning in 2015, with cumulative savings of at least 7% over the period from 2014-2018. The calculated historical savings as a percentage of prior-year retail sales is illustrated in Figure 2, along with projected values for 2017 and 2018 and the savings trajectory that would be required to meet the 7% cumulative savings target. Unfortunately, DEP's reported and forecasted energy savings fall far short of the trajectory that would meet the agreed-upon target. The gap is daunting, and it is increasing with every year that DEP fails to achieve the energy savings targets.

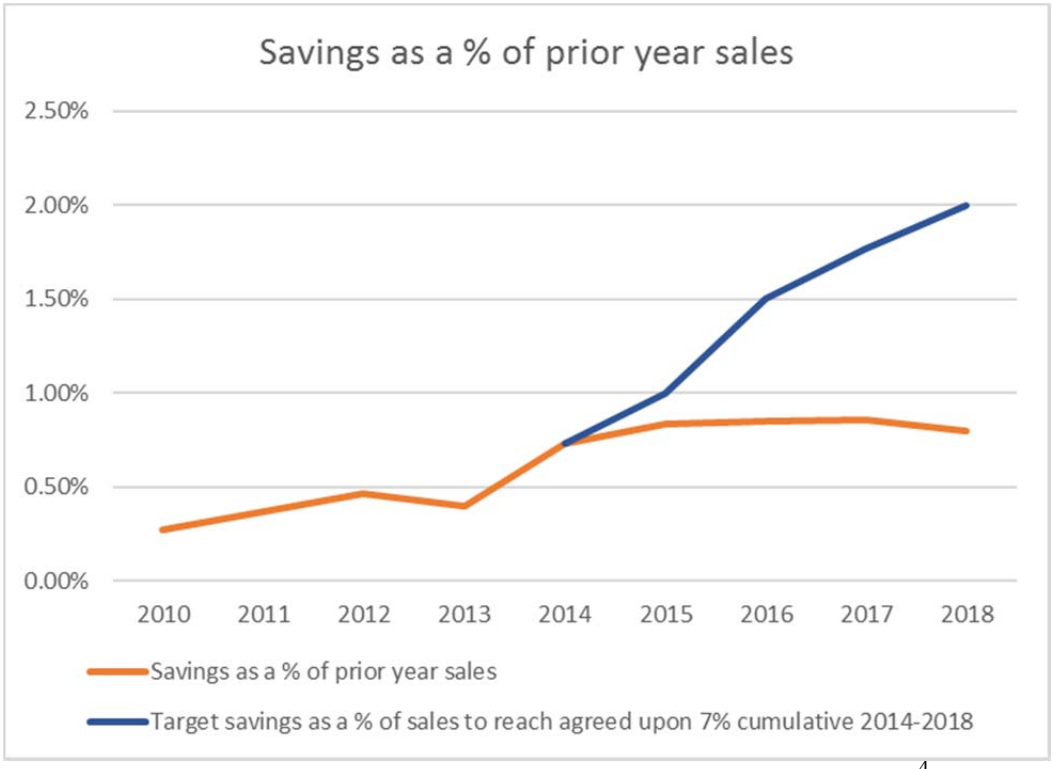

Figure 2: Duke Energy Progress Savings as a Percent of Prior-Year Retail Sales [4]

[4] *See* note 1. Annual sales for 2009-2016 and 2018 sales projection from DEP 2017 Integrated Resource

In order to meet the 7% cumulative savings target, it is clear that DEP will need to dramatically scale up its energy efficiency efforts in several areas, including increasing the comprehensiveness of savings in all sectors and increasing efforts to engage non-residential customers. I will elaborate on these points in subsequent sections of my testimony.

Q. WHY IS IT IMPORTANT FOR THE COMPANY TO ACHIEVE AND MAINTAIN THE AGREED UPON 1% ANNUAL AND 7% CUMULATIVE SAVINGS TARGETS?

A. According to the data provided in the 2016 Energy Efficiency Potential Study, ". . . DEP electricity use is forecasted to increase by 35% from 2017-2041 . . . ."[5] The potential costs to customers in terms of transmission and distribution infrastructure and increased energy and demand procurement could be significant. Maximizing the use of cost-effective energy efficiency and demand side management will ensure that customers are not unreasonably burdened by the costs of meeting increasing system needs:

> Many states have instituted energy efficiency programs funded by the public or ratepayers to achieve a variety of benefits. A core, compelling reason for this is because energy efficiency represents a least-cost option for supplying energy services compared to other prevailing options, providing both consumers and society with cost savings.[6]

Plan Update and 2017 REPS Compliance Plan, Docket No. E-100, Sub 147 at Table 5B, 5E; 2017 sales projection is the average of 2016 and 2018 for lack of a DEP projection.

[5] Nexant, Duke Energy North Carolina DSM Market Potential Study at 27 (Dec. 2016) ("Market Potential Study").

[6] A. Goldberg, R. P. Taylor, and B. Hedman, State and Local Energy Efficiency Action Network, Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector at ES-1 (2014).

This, of course, is in addition to the opportunities for significant and immediate bill savings that energy efficiency provides to customers who participate in DEP's programs, which are especially important for low and moderate income residential customers and to commercial and industrial customers whose high energy bills threaten their ability to be competitive.

Q. HOW DO DEP'S ENERGY EFFICIENCY SAVINGS RESULTS COMPARE WITH OTHER UTILITIES IN NORTH AMERICA AND IN THE REGION?

A. ACEEE recently produced its first scorecard ranking the energy efficiency programs of the 51 largest utilities in the United States.[7] In terms of energy efficiency program performance, DEP was ranked only 33rd out of the 51 utilities that ACEEE examined. To determine its rankings, ACEEE awarded points in the following categories: Incremental Savings, Spending, Peak Demand Reduction, Lifetime Energy Savings, and Progress toward 2015 Goal. Incremental savings received the highest weighting. Of the 25 total possible points for energy efficiency program performance, the Company only earned six, or 24% of the possible points, compared with 26% for DEC and 40% for Entergy Arkansas. This ranking supports the view that there is room for the Company to improve its energy efficiency efforts and achieve greater savings for its customers.

[7] 2017 Utility Energy Efficiency Scorecard, *supra* note 2.

Q. DOES THE COMPANY'S 2016 POTENTIAL STUDY SHED ANY LIGHT ON DEP'S ABILITY TO ACHIEVE GREATER ENERGY EFFICIENCY SAVINGS?

A. DEP's 2016 market potential study addresses the 25-year period ending in 2041, so it does not provide insight into past performance. However, it does provide support for DEP's ability to achieve the agreed-upon 1% annual savings in the residential sector. The study estimates a residential program potential of 5.0% savings of the residential load under a 5-year base scenario, and an enhanced scenario of 6.3% savings.[8] The vast majority of these savings would be obtained through measures that reduce the energy needed for residential space cooling and heating and for domestic hot water. This highlights the need that I describe later in my testimony for DEP to greatly increase its emphasis on programs that comprehensively deliver these savings.

The study suggests much lower potential savings for the non-residential sector, at only 1.8% of non-residential load for the first five years of the study period in the base scenario, and 3.1% in the enhanced scenario. However, there are at least two simplifying assumptions regarding customer opt-outs that could cause significant under-estimation of non-residential savings potential. The first is the assumption that the opt-out level remains steady throughout the five-year period. In other words, the study assumes that DEP will not succeed in increasing the number of customers who choose to opt in to the Company's DSM/EE programs and rider. Given the success that other program administrators have had

[8] Market Potential Study, *supra* note 5 at 105.

in engaging opt-out eligible customers, which I describe later in my testimony, I believe that DEP can bring more non-residential customers into the fold.

The second assumption the study seems to make regarding opt outs is that the remaining opted-in customers will not participate in programs at higher rates than the general population of eligible customers would. This is clearly flawed logic, and I believe that it results in underestimation of the savings that can be achieved in the large commercial and industrial sector. Given the ease with which these customers can opt out, it only makes sense for them to remain opted-in if they intend to participate in DEP's DSM/EE programs. Therefore, the potential study should assume much higher participation rates for opted-in customers.

Q. DOES THE 2016 POTENTIAL STUDY PROVIDE AN EXPLANATION FOR WHY DEP WOULD NOT BE ABLE TO SAVE ENERGY AT THE LEVELS OF OTHER LEADING UTILITIES?

A. I do not believe that the 2016 market potential study does provide such an explanation. When the study determines "program potential," which it has defined as "the realistic quantity of energy savings the utility can realize," it makes many assumptions about program performance. Regarding the accuracy of the industry's projections of achievable potential, the Regulatory Assistance Project states that "[o]ther factors, such as effective program design and the strength of motivation on the part of the utility, can significantly influence what level of

savings will ultimately be realized."[9] High-performing programs can outperform program potential, and I see no explanation for why DEP could not improve its performance and achieve cost-effective savings at the agreed-upon 1% of prior-year retail sales level.

Q. WHAT DOES THE 2016 POTENTIAL STUDY SAY ABOUT THE COST-EFFECTIVENESS OF THE DEP PROGRAM PORTFOLIO UPON WHICH IT BASES ITS CONCLUSIONS?

A. The "achievable potential" and "program potential" scenarios are subsets of the "economic potential" scenario, which is defined as "…the amount of energy and capacity that could be reduced by efficiency measures that pass a cost-effectiveness test."[10] By extension, all of the measures in the program potential must be cost-effective. However, program administration and delivery costs also impact cost-effectiveness. In the study, potential base and enhanced scenarios for several of the residential programs have benefit cost ratios under the Total Resource Cost (TRC) test that are slightly less than 1.0.[11] All of the non-residential programs have TRC results greater than 1.0 in both the base case and enhanced scenarios.[12]

When program TRC results are less than 1.0, it can be worthwhile to review assumptions, program design, and program administration to identify

[9] Kramer, Chris and Reed, Glenn, The Regulatory Assistance Project, *Ten Pitfalls of Potential Studies* at 5 (2012), *available at* http://www.raponline.org/wp-content/uploads/2016/05/energyfutures-kramerreed-tenpitfallsesdraft2-2012-oct-24.pdf.
[10] Market Potential Study, *supra* note 5 at 9.
[11] *Id.* at 108.
[12] *Id.* at 112.

opportunities for improvement. In some cases, increased participation can lead to better results. For example, the Income Qualified program in the base scenario has a TRC of 1.03, but in the enhanced scenario the TRC is 1.27.

RESIDENTIAL PROGRAMS

Q. DO YOU HAVE OBSERVATIONS AND SPECIFIC RECOMMENDATIONS FOR THE COMPANY REGARDING ITS RESIDENTIAL PROGRAMS?

A. Yes. First, I recommend that the Company increase its focus on promoting projects that are more comprehensive, meaning that they provide higher levels of savings for individual customers. In order to do this, the Company should increase its emphasis on more comprehensive program approaches that promote building shell and HVAC system improvements. The Company should also take steps to re-open its Appliance Recycling Program, as its failure to do so thus far has deprived customers of energy savings opportunities. Lastly, the Company should address the cost-effective energy efficiency opportunities that it is currently disregarding in its multifamily program by not addressing energy use that is provided through commercial accounts.

Q. WHAT IS YOUR VIEW OF THE LEVEL OF PROGRAM COMPREHENSIVENESS AND MEASURE DIVERSITY IN THE COMPANY'S RESIDENTAL PROGRAM PORTFOLIO?

A. Based on program level savings reports, it appears that the Company is currently acquiring the majority of its residential savings through promotion of efficient lighting and through the behavioral program My Home Energy ("MyHER")

Report. The relative savings level of DEP's residential programs is illustrated in Figure 3 below:

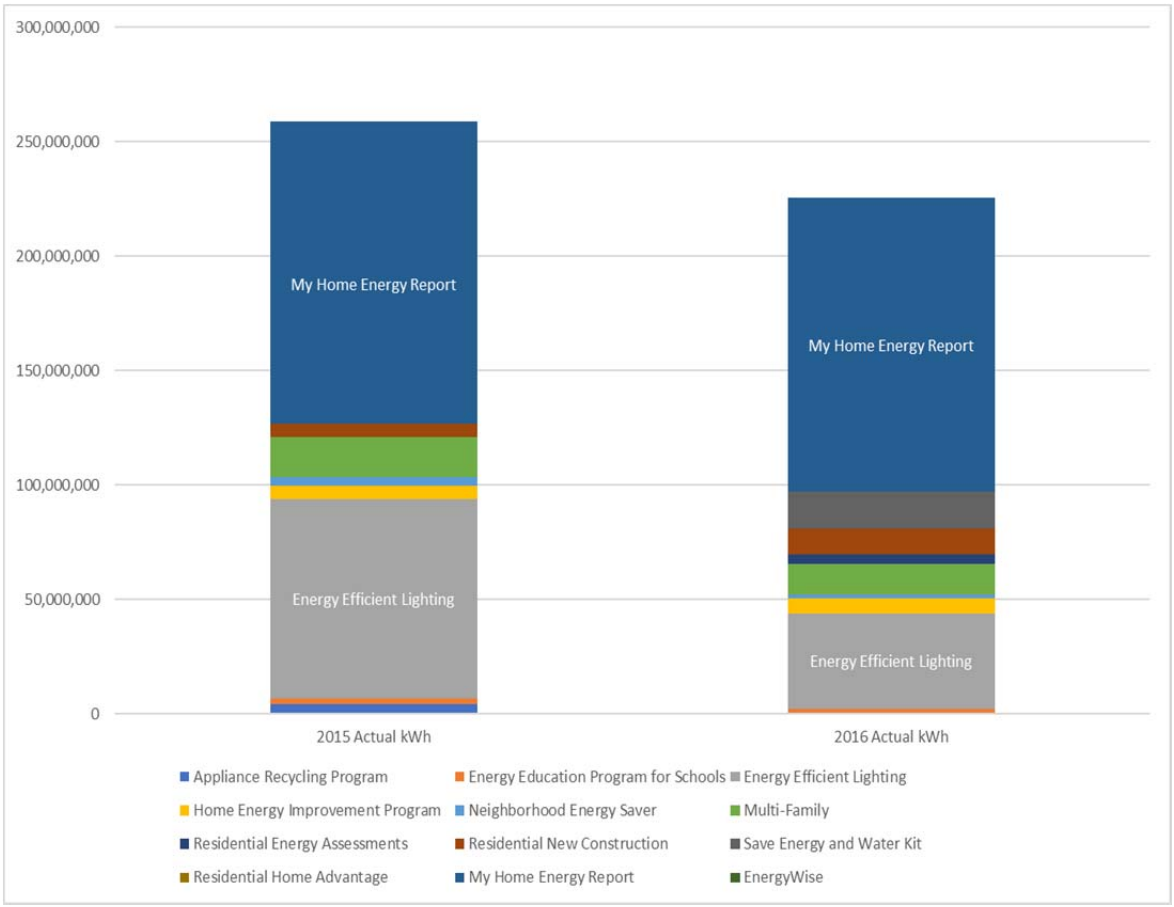

Figure 3: Residential Program Savings[13]

Clearly, the vast majority of residential savings come from the two programs mentioned above. DEP's failure to capture longer-lived measures and promote greater participation in more comprehensive programs becomes even more noteworthy when one recognizes that a significant fraction of the savings in several of DEP's other programs is likely to also come from efficient lighting.

[13] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-1, DEP v2015 Exhibit 8 and DEP v2016 Exhibit 8.

This conclusion is based on the measures that are included in the energy saving kits in the Energy Efficiency Education program and the measures that are installed in the Residential Energy Assessments Program[14] and the Multifamily Energy Efficiency Program,[15] among others.

Q. WHY DO YOU SUGGEST THAT THE COMPANY SHOULD INCREASE ITS FOCUS ON COMPREHENSIVE PROJECTS THAT SAVE MORE ENERGY FOR CUSTOMERS?

A. Customers have increasingly limited amounts of time to devote to discretionary activities, such as home energy upgrades. Given this reality, program administrators are well-advised to take advantage of each customer interaction to promote as much efficiency as possible before the customer moves on to face other demands. If a program only succeeds in procuring modest savings from a customer interaction and does not engage the customer in "next steps" at that time, it may lose the opportunity to re-engage that customer for months, or even years.

Program administrators often think of the "transaction costs" involved in engaging a customer, and those costs are borne on all sides. Time is a valuable commodity for customers and for the program administrator, and all parties benefit when the greatest return is provided for that valuable investment. Maximizing the amount of energy savings that result from each transaction will provide the greatest reduction in customer bills and the greatest benefit in

[14] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-6-a, 1-6-b for Energy Efficiency Education Program; 1-11-b, 1-11-c for Residential Energy Assessments Program.
[15] Docket No. E-2, Sub 1145, Evans Exhibit E at 5.

reducing demands on the grid. This, in turn, will maximize benefits associated with reduced infrastructure investments related to growth, as discussed earlier in my testimony.

Q. WHY DO YOU SUGGEST THAT THE COMPANY SHOULD INCREASE ITS FOCUS ON LONGER-LIVED MEASURES?

A. Simply put, measures with long lives will continue to provide savings for many years to come, where short-lived measures will expire. While longer-lived measures such as HVAC upgrades and building shell improvements may have higher initial costs, it is often true that they provide better returns on investment due to the fact that the savings persist for so much longer. Programs that focus on short duration measures with a low initial cost, such as lighting programs, are pursuing savings that are sometimes referred to as "low-hanging fruit." When the opportunity to pursue these "easy" savings has been exploited, it is often harder to engage customers in savings opportunities that require more effort or a higher level of investment. This can make it more difficult and costly for program administrators to continue to pursue energy efficiency programs effectively for a sustained period of time. Continued savings are more likely to occur with a balanced portfolio that captures a mix of the "easy" savings to engage customers who are less inclined to pursue energy efficiency with more comprehensive options for customers who are willing and able to pursue deeper savings opportunities.

Q. WILL INCREASING THE USE OF PROGRAM CROSS-PROMOTION LEAD TO MORE SAVINGS FOR CUSTOMERS?

A. Yes. Program cross-promotion is an essential element of a well-developed, balanced portfolio. A balanced portfolio should have opportunities for customers to participate at the level at which they are ready or able to participate, but it should also provide ongoing customer engagement so that they know how, when, and where they can take additional steps to increase their energy efficiency. Providing that engagement at the time that a customer is participating in an energy efficiency program through cross-promotion of additional program opportunities takes advantage of the timing of the customer's current interest, and demands less effort and cost for both the customer and the program than trying to engage that customer when their interest is "cold." Increasing total household savings is especially important for low and moderate income customers who may be least able to invest in energy efficiency projects without program support.

Q. WHICH OF DEP'S RESIDENTIAL PROGRAMS DO YOU VIEW AS HAVING OPORTUNITUES FOR CROSS-PROMOTION?

A. There is no reason why cross-program promotion can't occur in all programs; however, it makes sense to focus on the programs that target "low-hanging fruit." Viewed through this lens, significant efforts at cross-promotion could and should be made in programs such as the Energy Efficiency Education Program, the My Home Energy Report Program, the Save Energy and Water Kit Program, and the Residential Energy Assessments Program.

Q. DOES DEP CURRENTLY LEVERAGE CUSTOMER PARTICIPATION IN THESE PROGRAMS TO PROMOTE PARTICIPATION IN OTHER PROGRAMS?

A. It appears that DEP does make some efforts to cross-promote its programs, but it is not at all clear that these efforts are sufficient. In response to a data request regarding the Energy Efficiency Education Program, DEP reports that it "does promote other programs on occasion and plans to do so in the future."[16] Regarding the MyHER Program DEP says that "MyHER promotes Smart Saver lighting programs and rebate programs, Home Energy House Call, Energy Wise Home, Contract Referrals and payment programs." [17] However, the sample MyHER report provided by DEP in Discovery only contains a reference to retail lighting discounts and a link to duke-energy.com/SavingTips.[18] Clearly this is only one sample report, but the lack of cross program marketing in this example suggests that DEP's cross-promotion of programs is insufficient and must be improved.

DEP also reports that the Residential Energy Assessment Program "…cross promotes HEIP as well as Energy Efficiency Lighting during the assessment."[19] Because the program is in effect an audit program that provides energy savings kits and direct installation of low-cost measures, it is critical that the program is aggressive in promoting participation in other programs. This is particularly true for the HEIP program, which provides the opportunity for

[16] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-6-h.
[17] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-9-b.
[18] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-9-d.
[19] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-11-h.

customers to save very significant amounts of energy through building and equipment improvements. In fact, in my view, industry best-practice is to favor programs that are specifically intended to incentivize customers to install significant energy saving improvements over those that provide stand-alone energy audits, even when accompanied by direct installation of some low-cost measures. My recommendation is for DEP to sharpen the focus of the Residential Energy Assessment Program such that its success is measured according to how many participants subsequently participate in the HEIP Program, and how much savings those customers achieve through non-lighting home improvements such as air sealing, insulation upgrades, and HVAC improvements.

Q. WHY DO YOU RECOMMEND THAT THE COMPANY RE-OPEN ITS APPLIANCE RECYCLING PROGRAM?

A. DEP previously implemented an appliance recycling program that offered an incentive to customers who agreed to retire old, inefficient refrigerators. The appliances were dismantled and recycled, ensuring that they would not be resold and returned to use by other customers. This effectively guaranteed that the load was forever off the grid. The program was disrupted when Jaco, the program vendor, very suddenly ceased operations. It is completely understandable that DEP was unable to provide this program on a continuous basis given this disruption. However, it is not clear why DEP did not procure an alternate vendor for the program so that its customers could continue to garner the benefits it provides. Jaco ceased operations in late November of 2015, nearly two full years ago, which seemingly would have provided DEP with sufficient time to procure

an alternate vendor. For comparison, the New Jersey Clean Energy Program suspended its appliance recycling program in the late Fall of 2015 in response to Jaco's suspension of operations, and re-opened its recycling program with an alternate vendor in March of 2016.[20] This is illustrated in Figure 4, below.

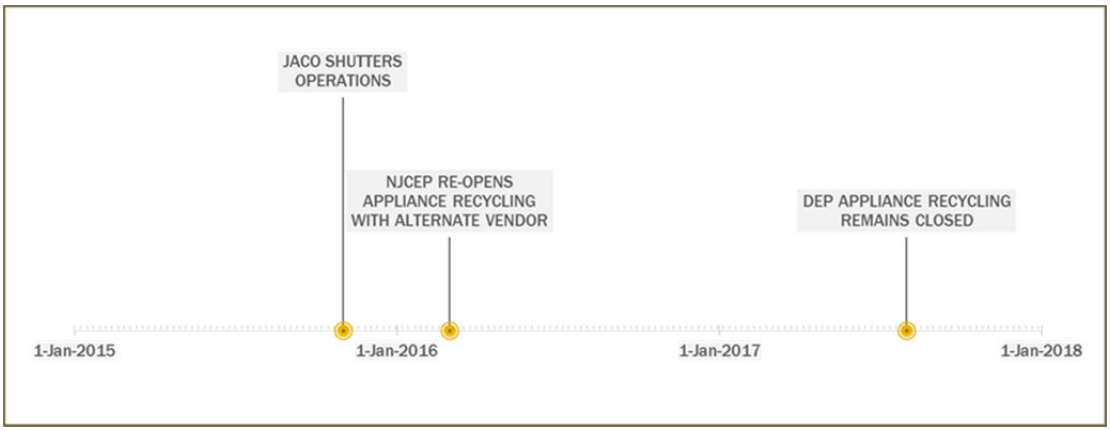

Figure 4: Comparative Timeline of Appliance Recycling Programs

In response to a data request, DEP indicated that "[t]here are several companies that can operate the program for Duke Energy in the Carolinas, but the costs are substantially higher than the previous program structure."[21] DEP did not indicate the precise value of "substantially" but it is worth noting that utilities in numerous other jurisdictions that faced the same program interruption have continued their appliance recycling programs with alternate vendors, including utilities in New Jersey, Maryland, Pennsylvania, Michigan, Georgia, Massachusetts, and Rhode Island.[22] This suggests that it is highly likely that DEP

[20] Personal communications with NJCEP program administrator.
[21] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-5.
[22] Personal communications with MA and RI consultant teams and ICF, International, Inc.

could also procure a cost-effective alternate vendor in order to re-open this program and increase it savings achievements.

Q. WHAT IS YOUR RECOMMENDATION REGARDING DEP'S MULTIFAMILY PROGRAM?

A. First, I am pleased to see that DEP is offering a multifamily program, as utilities in many jurisdictions do not provide sufficient opportunities for residential customers who live in multifamily housing. Many low and moderate-income families reside in multifamily housing, and multifamily efficiency programs can contribute to the long-term affordability of housing for these vulnerable families. However, I am concerned that the program is only aimed at the residential units in multifamily buildings.[23] Lighting in common areas, including hallways, lobbies, and the exterior, may be on commercial rather than residential meters, but savings are available and they should be pursued. Increasingly, energy efficiency programs are recognizing that metering configurations are not relevant in how customers think about energy efficiency—in other words, from a customer's perspective it makes no sense to install an efficient lighting product in an apartment while the program ignores the opportunity to improve building shell and HVAC efficiency, and inefficient lighting in the lobby and parking lot.

I acknowledge that pursing savings for two different rates in a single project would require careful attention to reporting and cost accounting on DEP's part, but it is done successfully in other jurisdictions. For example, PPL says in its

[23] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-8.

recent plan update that "[i]ndividually metered low-income multifamily residences are eligible for the same measures as individually metered single family low-income residences . . . ."[24] It goes on to say that master-metered living units will be eligible to receive the same measures at no cost to the tenants, and that master-metered common area measures will be offered incentives that are consistent with PPL's nonresidential programs. In other words, PPL will provide incentives for all eligible measures in a multifamily property regardless of the metering configuration.

There is no reason to think that DEP is not also capable of providing such a service. Indeed, coordinated program delivery to multifamily housing regardless of metering configuration is regarded as a best-practice for overcoming the unique barriers that this market faces. An ACEEE study of multifamily energy efficiency programs found that best practices "include integrating programs across commercial and residential portfolios . . . and encouraging owners to undertake projects with deep savings."[25]

There are also benefits to reducing the transaction costs for property managers that are associated with having to deal with multiple utility programs, requirements, and staff representatives or program vendors. For example, according to the ACEEE, "[i]nterviews with building owners and property

[24] PPL Electric Utilities Corporation, Energy Efficiency and Conservation Plan, Act 129 Phase III at 71 (revised June 6, 2017) *available at* https://www.pplelectric.com/-/media/PPLElectric/Save-Energy-and-Money/Docs/Act129_Phase3/PPLPhase3PlanBlackline060517.pdf?la=en.
[25] Johnson, Kate, ACEEE, Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings at iii (Dec. 2013), *available at* http://aceee.org/research-report/e13n.

managers in California have shown that a one-stop shop or single point of contact . . . helps owners navigate the often overlapping utility programs (commercial and residential, low-income or market-rate) . . . ."[26]

Q. ARE THERE OTHER BEST PRACTICES FOR MULTIFAMILY ENERGY EFFICIENCY PROGRAMS THAT DEP SHOULD PURSUE?

A. In addition to providing an integrated program that addresses savings opportunities for both residentially and commercially-metered areas in multifamily housing, I recommend that DEP take advantage of its engagement with multifamily property managers to identify and encourage the installation of additional, more comprehensive energy saving measures. I have recommended that DEP cross-promote in its residential programs to achieve greater savings, and the concept applies here as well. For example, Puget Sound Energy (PSE) includes efforts to leverage the installation of follow-on measures in its Multi-Family Retrofit Program:

> Treating its direct installation services as a gateway to property owners, the PSE program has penetrated a significant share of the multifamily market in its territory (49% or approximately 120,000 units) and encouraged 34% of the sites receiving services to complete additional energy efficiency projects (Forde 2013).[27]

Clearly, there are opportunities for the Company to pursue these practices to greatly increase its effectiveness in the multifamily market.

[26] *Id.* at 8.
[27] *Id.* at 13.

Q. YOU REFER TO THE INSUFFICIENCY OF DEP'S LOW-INCOME ENERGY EFFICIENCY PROGRAMS. WHY DO YOU FOCUS PARTICULAR ATTENTION ON THIS AREA?

A. While all energy efficiency programs that are cost-effective provide value to both ratepayers in general and to individual participants, low income ratepayers in particular stand to benefit greatly from participating in energy efficiency programs. Low income households face much higher energy burdens (the percentage of income that is required to pay energy bills) than do average households. A fact sheet on North Carolina produced by The Home Energy Affordability Gap documents that in 2016 there were over 286,000 North Carolina households with incomes below 50% of the federal poverty level (FPL) whose energy bills on average consumed a staggering 29% of their annual household income. There were an additional 371,000 households with incomes between 50%-100% of FPL whose average energy burden was 16% of annual household income.[28] Effective low income energy efficiency programs will help to reduce the energy burden of low income households, leading to improved ability to pay utility bills and freeing up scarce resources for other critical needs, such as food and medicine. In addition to the straightforward economic benefits and related quality of life improvements they provide, effective low income energy efficiency programs can also improve the health and safety of low income

[28] Fisher, Sheehan & Colton, The Home Energy Affordability Gap: North Carolina (2017), *available at* http://www.homeenergyaffordabilitygap.com/03a_affordabilityData.html.

families by making buildings more weather-resistant, improving indoor temperatures, and improving indoor air quality.[29]

Q. WHAT IS THE BASIS OF YOUR CHARACTERIZATION OF DEP'S LOW INCOME ENERGY EFICIENCY PROGRAMS AS INSUFFICIENT?

A. The only program that DEP offers that is specifically targeted to low income customers is the Neighborhood Energy Savers Program. There are several things about this program that are worth appreciating, including its focus on determining eligibility by neighborhood rather than on a case by case basis. I find this to be a practical and expedient method of addressing eligibility questions, which might otherwise become onerous for programs and participants alike. However, this program does not reach enough customers, and it does not save enough energy.

A comparison of the low income savings that are achieved by leading portfolios is illustrative of the insufficiency of DEP's low income program efforts. In a proceeding before the Maryland Public Service Commission, the Maryland Energy Efficiency Advocates submitted data comparing the percentage of total portfolio savings that were attributed to low income programs for several leading energy efficiency portfolios. These data are reproduced in rows 1-5 in the table below, labeled Figure 5.[30] The Company's reported low-income energy savings

[29] For more information regarding the non-energy benefits associated with low income energy efficiency programs, *see* Skumatz, Lisa, Non-Energy Benefits /Non-Energy Impacts (NEBs/NEIs) and Their Role & Values in Cost-Effectiveness Tests: State of Maryland (Mar. 2014), *available at* http://energyefficiencyforall.org/sites/default/files/2014_%20NEBs%20report%20for%20Maryland.pdf.
[30] Comments of Maryland Energy Efficiency Advocates on the EmPOWER Maryland Limited Income Work Group Summary Report (Apr. 15, 2016), Maryland Public Service Commission Maillog No. 188604.

for 2015 and 2016, in rows 6-7,[31] show results that are startlingly less than the leading portfolios shown in rows 1-5.

	Company	Program Year	Portfolio Savings (MWh)	LI Program Savings (MWh)	LI Savings as a % of Portfolio Savings
1	National Grid RI	2013	157,121	6,305	4.0%
2	National Grid MA	2009	189,004	7,238	3.8%
3	Eversource	2012	520,760	19,728	3.8%
4	Otter Tail	2007	9,533	356	3.7%
5	National Grid MA	2014	611,064	21,600	3.5%
6	DEP	2015	442,466	3,610	0.8%
7	DEP	2016	398,643	1,992	0.5%

Figure 5: LI Savings as a Percentage of Overall Portfolio Savings

Q. WHAT ARE YOUR RECOMMENDATIONS FOR ACTIONS THAT DEP COULD TAKE TO PROVIDE ROBUST ENERGY EFFICIENCY PROGRAMS FOR ITS LOW INCOME CUSTOMERS?

A. SACE Witness Weiss spoke to the insufficiency of DEP's low income energy efficiency efforts in Docket E-2, Sub 1108, where she recommended "that DEP implement a Single-Family Residential Low-Income Add-On Program and a Multifamily Low-Income Add-On Program to complement current Weatherization Assistance Programs." [32]

I agree with Weiss' recommendations and can speak to the effectiveness of such an approach from direct experience. As the Manager of Energy Services

[31] Docket No. E-2, Sub 1145, DEP response to SACE Data Request No.1, Item No. 1-1, DEP v2015 Exhibit 8 and DEP v2016 Exhibit 8.
[32] Testimony of Jennifer Weiss, Southern Alliance for Clean Energy, Docket No. E-2, Sub 1108 at 28.

at Vermont Gas, I supervised that company's low income add-on program, as I did subsequently as the Director of Residential Energy Services at Efficiency Vermont. In both cases the utility program provided additional funding to extend the reach of Vermont's low income Weatherization Assistance Program, both increasing the depth of savings achieved at each residence by expanding the scale and scope of eligible measures, and also increasing the number of households served by allowing the program to stretch its non-utility funding across more households. These were award-winning, highly successful programs that were also operationally efficient due to the elimination of redundant delivery mechanisms. Based on my experience, I would strongly concur with Weiss' previous recommendations and urge the Commission to direct DEP to initiate low income add-on programs. I would also encourage the Commission and DEP to establish a target for low-income savings to ensure that sufficient future attention is paid to obtaining savings for low-income customers.

NON-RESIDENTIAL PROGRAMS

Q. DO YOU HAVE OBSERVATIONS AND SPECIFIC RECOMMENDATIONS FOR THE COMPANY REGARDING ITS NON-RESIDENTIAL PROGRAMS?

A. Yes. First, I want to recognize the steps that DEP reports it is taking to increase the availability of HVAC measures in its Small Business Energy Saver program. It is often challenging for small business customers to pursue energy efficiency given the lack of staff resources and in-house expertise, yet they are often the customers who stand to benefit the most from reduced energy costs. Any steps the

program can take to make it easier and more affordable for these customers to obtain greater levels of energy efficiency will help businesses to remain economically viable and protect local jobs. Indeed, this approach of capturing more savings through each customer engagement is consistent with my recommendations for DEP's residential portfolio, and I encourage the Company to continue to identify and implement enhancements to its non-residential portfolio that will result in more comprehensive, more persistent savings for its customers.

Q. DO YOU HAVE ADDITIONAL OBSERVATIONS OR RECOMMENDATIONS REGARDING THE COMPANY'S NON-RESIDENTIAL PROGRAMS?

A. Yes. I am concerned about the prevalence and implications of opt-outs among DEP's non-residential customers. The prevalence of opt-outs is high and increasing. DEP reports that:

> For Vintage 2016, DEP had 3,869 eligible customer accounts opt out of participating in DEP's nonresidential portfolio of EE programs and had 3,919 eligible customer accounts opt out of participating in DEP's non-residential portfolio of DSM programs. This is an increase from the 3,602 opted-out accounts reported for 2015. [33]

[33] Direct Testimony of Robert P. Evans, Docket No. E-2, Sub 1145 at 22. Note that for 2015, customers could only opt out of EE and DSM, rather than electing to opt out of the DSM and/or EE riders separately as they could starting in 2016.

Opted out customers represent 52% of the forecasted 2016 eligible non-residential load for both DSM and EE.[34] This is an increase compared with the 50% of overall non-residential load sales that were opted out in 2015.[35]

The requirements that customers must meet in order to opt out are minimal. Customers are not required to provide documentation regarding energy efficiency projects that they have done or intend to do as a condition of opting-out, so little is known by DEP or the Commission regarding the amount of energy efficiency that these customers are investing in. Recognizing the barriers that customers typically face when they are interested in pursuing energy efficiency, it is reasonable to assume that the amount of energy efficiency that occurs on the DEP system by opted-out customers is less than would occur if these customers were to participate in successful energy efficiency programs. This is borne out by research:

> "States have found that a larger amount of energy savings potential in industry can be gained from energy efficiency programs than can likely be achieved if industrial energy users pursue energy efficiency individually, with limited program assistance. Industrial companies are often aware of energy savings projects in their facilities and many companies have a solid record of developing these projects to save money; however, energy efficiency often cannot compete with other capital demands, even with similar or better paybacks. Moreover, industrial staff members often report that it is difficult to effectively navigate corporate project decision-making systems to get management endorsement for even quick payback energy efficiency projects. In addition, small- or medium-sized energy savings projects often do not compete well with other projects in garnering

[34] Miller Exhibit 6, Docket No. E-2, Sub 1145.
[35] Miller Exhibit 6, Docket No. E-2, Sub 1108.

> management attention and enthusiasm. Finally, limitations on staff resources and knowhow can further hinder implementation of cost effective energy efficiency measures." [36]

The prevalence of opt outs is unfortunate for several reasons. First, customers who opt out but do not have the resources to pursue energy efficiency on their own are not able to benefit from the expertise and support that experienced program professionals can provide, meaning that their operations are likely to remain less efficient. Thus, their operating costs remain higher than needed, and their economic viability may be less secure. It is also unfortunate because DEP's customers as a whole could benefit from a more efficient system, in that it reduces the need for T & D investments that are growth related.

Industrial energy efficiency is a critically important component in providing least-cost utility service to all customers.

> The industrial sector is a significant consumer of energy, accounting for about one-third of total U.S. energy consumption (EIA 2013). Implementation of cost-effective industrial energy efficiency (IEE) measures can help defer the need to build more power generation, transmission, and distribution capacity while also enhancing energy security and mitigating risk considerations.[37]

Because system maintenance and improvement costs are typically shared across all customers, any rate impacts related to higher capacity or energy needs on the part of customers who opt-out are likely to be shared across the entire customer base.

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[36] Designing Effective State Programs for the Industrial Sector, *supra* note 6 at ES-1, ES-2.
[37] *Id.* at 3.

When customers opt-out, the costs of reducing demands on the grid through funding energy efficiency programs are shared by residential customers and those non-residential customers who do not opt-out. Because these customers also pay for costs of improving the grid through Transmission and Distribution charges (as do all customers), it could be argued that they pay twice while opted-out customers only pay once.

Q. DO YOU HAVE ANY OBSERVATIONS AND SPECIFIC RECOMMENDATIONS FOR THE COMPANY REGARDING STEPS IT CAN TAKE TO REDUCE THE PREVALENCE OF NON-RESIDENTIAL OPT-OUTS AMONG ITS CUSTOMERS?

A. DEP reports that it is taking steps now to engage its opt-out eligible customers, and I believe that the Company is on the right track in making efforts to engage its non-residential customers, but it must do more. E Source recently conducted research on the needs and priorities of large utility customers regarding energy efficiency programs and concluded that it is critically important for program administrators to make strong efforts to understand these customers' specific needs and design programs that meet them. As stated by E Source, "[p]roviding quality energy efficiency program offerings, technical expertise, and strategic account management are essential to keep large customers engaged in utility energy efficiency programs." [38]

[38] Andrews, Kevin and Doutre, Dan, ACEEE Summer Study on Energy Efficiency in Industry, Cracking the Code: Understanding Customer Perceptions and Utility Strategies for Large Customer Energy Efficiency Programs at 3-13 (2017) (available upon request, and will be available at http://aceee.org/proceedings when posted by ACEEE).

E Source's research profiles AEP Ohio's success in using an aggressive account management approach coupled with highly tailored and effective energy efficiency programs to keep large customers from opting out:

> The utility worked strategically in the 18-24 months leading up to the legislation's implementation to engage with . . . large business customers that had not previously participated in its energy efficiency programs [and] saw approximately 43 percent of historic large-customer non-participants enroll in utility energy efficiency programs.[39]

Clearly, AEP Ohio's aggressive outreach and engagement strategy was successful in countering large customer opt outs, but strong account management was only one part of a comprehensive approach with these customers. In addition, program designs for these large, opt-out eligible customers had to evolve to reflect the specific needs of the customers:

> . . . as the utility continued to recognize the unique energy efficiency and business needs of its largest business customers, its program mix evolved to include programs designed specifically for this customer class, such as retro-commissioning and Continuous Energy Improvement. These program offerings . . . helped to improve overall large customer satisfaction with the utility.[40]

AEP is not the only utility that E Source identified for its successful approach to large customer engagement. Regarding MidAmerican Energy in Iowa, E Source found that the utility:

> . . . has seen increased levels of engagement and satisfaction among its largest customers by developing a targeted and relevant set of efficiency

[39] *Id.* at 3-17.
[40] *Id.*

> options, incorporating specialized energy managers as a resource for large customers, and driving engagement with its key account managers.[41]

This research indicates that many large utility customers will choose to participate in utility energy efficiency programs when programs are well-designed to meet the customers' unique needs and when the utilities invest in building strong, ongoing relationships.

Perhaps the most effective tool at DEP's disposal for countering opt outs is to make its programs as attractive as possible to opted in customers. Achieving very high participation and satisfaction rates among these customers will help DEP tailor its program offerings to meet customer needs, which should make them more attractive to customers who have previously opted out. With effective use of case studies and account management of opted out customers, these successes may also help to pull some opted out customers back into the fold.

Q. CAN YOU PROVIDE ANY EXAMPLES OF STRATEGIES THAT OTHER UTILITIES HAVE USED TO ENGAGE LARGE CUSTOMERS?

A. Yes. I would suggest that DEP consider a model such as Efficiency Nova Scotia's (ENS) experience using compressed air leak surveys as a tool for engaging industrial energy efficiency. ENS offers a no-cost air leak survey to eligible customers, and uses it both to obtain low cost savings, and perhaps more importantly, as a door opener to engage these customers in energy efficiency and build relationships with the ENS program, through which it can then cross

[41] *Id.* at 3-18, 3-19.

promote its other programs that can lead to more comprehensive and longer-lived efficiency projects. According to ACEEE:

> Leak repairs are inexpensive . . . allowing customers to reduce operating costs without making capital investments. Customers can then use the "free" savings to invest in energy audits or capital upgrades funded in part by ENS.[42]

This model is based on providing customers with something that they will perceive as having value, and on then using that engagement to foster ongoing relationships that will support future, more comprehensive energy efficiency projects.

Q. HOW ARE OPT OUTS HANDLED IN OTHER JURISDICTIONS?

A. According to ACEEE, there are twelve jurisdictions in the U.S. where certain industrial, and in some cases commercial, customers are eligible to opt out of utility energy efficiency programs.[43]

In addition to the jurisdictions where opting out of utility programs is available, there are sixteen jurisdictions that offer a "self-direct" option instead of an opt out.[44] Self-direct options in general are similar to opt outs but require a much higher level of activity and reporting on the part of customers who choose to self-direct rather than stay in to a utility program offering. From the perspective of ensuring that utilities and regulators have sufficient information regarding the

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[42] Mitchell, Sarah, ACEEE Summer Study on Energy Efficiency in Industry, Compressed Air Leak Surveys: Gateway to Industrial Efficiency at 1-82 (2017) (available upon request, and will be available at http://aceee.org/proceedings when posted by ACEEE).
[43] ACEEE, Overview of Large-Customer Self-Direct Options for Energy Efficiency Programs (2016), *available at* http://aceee.org/fact-sheet/self-direct.
[44] *Id.*

efficiency projects that large customers undertake, self-direct options are generally thought to be more successful than opt outs.

Effective self-direct programs require some amount of reporting regarding efficiency projects that these customers undertake, and in some cases evaluation, measurement, and verification (EM&V) is also required to ensure that projects will produce the expected energy savings. This matters both for utilities and regulators so that they can understand the implications of any customer-initiated efficiency activities on loads and infrastructure needs. It further matters to regulators so that they can be assured that the utilities they regulate are able to provide energy to customers at the least cost by minimizing infrastructure investments and peak power purchases related to growing system loads.

Q. ARE THERE ACTIONS THE COMMISSION COULD TAKE TO, AT LEAST IN PART, MITIGATE THE CONSEQUENCES OF THE HIGH LEVEL OF OPT OUTS AMONG DEP'S NON-RESIDENTIAL CUSTOMERS?

A. In my view the most important action for the Commission to take is to provide the Company with clear guidance for increasing and strengthening its engagement with opt out eligible customers. Making every effort to provide energy efficiency programs that will be attractive to these customers, and making sure that they are not only aware of them, but are provided with focused information showing how they can benefit from the programs, is critical.

ADVANCED METERING INFRASTRUCTURE

Q. WHAT IS YOUR UNDERSTANDING OF DEP'S AMI DEPLOYMENT?

A. Based on the filing containing *DEC and DEP's Supplemental Information for 2016 Smart Grid Technology Plans*,[45] my understanding is that DEP is currently assessing the opportunity for deploying AMI technology across its service territory. In that filing, DEP indicated that it "initially deployed AMI meters to nearly eliminate manually-read meters, primarily for Commercial and Industrial customers and residential customers on time-of-use rates."[46] As of September 2016, DEP had installed just under 57,000 AMI meters.[47]

Q. ARE THERE OPPORTUNITIES TO ENHANCE ENERGY EFFICIENCY AND DEMAND SIDE MANAGEMENT THAT ARE ASSOCIATED WITH AMI?

A. AMI technology is still new enough that the EE and DSM benefits associated with it are still being studied. However, there are indications that certain approaches to the use of AMI can help customers reduce energy use. For example, "smart" thermostats are available that utilities can use for direct load control during peak demand periods. These thermostats can also subtly modify temperature settings to reduce energy use and demand. In addition, AMI can be used in conjunction with web-based interfaces to provide customers with near real-time views into their energy use.

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[45] Supplemental Information, 2016 Smart Grid Technology Plans of Duke Energy Carolinas, LLC and DEP, Docket No. E-100, Sub 147 at cover letter.
[46] *Id.* at 10.
[47] Docket No. E-100, Sub 147, Order Approving Smart Grid Technology Plans (Mar. 29, 2017).

When this information is accompanied by messaging from the utility it can help customers moderate their energy usage. For example, Baltimore Gas and Electric Company's ("BGE") Smart Energy Manager® (SEM) Program:

> "…uses a variety of channels (web, email, text, automated phone dialer, and paper reports) to help customers understand their energy usage and thereby encourage energy efficiency and conservation. Customers became eligible as their smart meters were installed and ready for billing." [48]

Should DEP decide to launch a large-scale deployment of AMI, I would urge it to use the capabilities AMI provides to drive energy efficiency and demand side management decisions for its customers. Some of the opportunities AMI provides— including those provided through the use of smart thermostats—could be appropriate for a new energy efficiency program offering. Several utilities are now offering incentives for such thermostats, either through a specified brand or on a "bring your own" basis where multiple brands of thermostats are eligible for incentives so long as they meet certain criteria. Examples of utility programs that are now promoting smart thermostats include Santee Cooper, Georgia Power, Kansas City Power and Light, and others.[49]

[48] BGE, Semi-Annual Report for Third and Fourth Quarters, July 1 through December 31, 2016 in Case No. 9154 at 49 (Jan. 31, 2017).
[49] *See, e.g.*, Nest, Partners in Energy, https://nest.com/blog/2016/04/22/partners-in-energy/ (last accessed Sept. 5, 2017).

CONCLUSIONS

Q. IN SUMMARY, WHAT ARE YOUR RECOMMENDATIONS FOR THE COMMISSION REGARDING DEP'S ENERGY EFFICIENCY AND DEMAND SIDE MANAGEMENT PROGRAMS IN THIS PROCEEDING?

A. My recommendations are as follows:

1. DEP should increase its focus in areas that provide more comprehensive and long-lived savings, such as HVAC upgrades and comprehensive home retrofits;

2. DEP should immediately procure an alternate vendor for its Appliance Recycling program to ensure these savings are available;

3. DEP must maximize the cross-program marketing that occurs in behavior, audit, and kit programs;

4. DEP should address opportunities to save more energy in multifamily housing, including in common areas and for commonly-metered systems;

5. DEP should significantly increase its focus and level of investment in low income energy efficiency;

6. DEP should continue to promote adoption of a greater range of measures through its Small Business Energy Saver program;

7. DEP can and should take aggressive steps to encourage the participation of non-residential customers who are eligible to opt out, both by making sure that the available programs meet these customers' needs and by providing personalized outreach to engage them; and

8. DEP should fully explore the use of the technology to drive greater efficiency for its customers as it contemplates a broad AMI deployment.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

JAMES GREVATT, MANAGING CONSULTANT

EDUCATION

B.F.A., University Honors, University of Illinois, 1982

EXPERIENCE

2013-present: Managing Consultant, Energy Futures Group, Hinesburg, VT
2012-2013: Director, Targeted Implementation, Vermont Energy Investment Corp., Burlington, VT
2011-2012: Director, Residential Energy Services, District of Columbia Sustainable Energy Utility for Vermont Energy Investment Corp., Washington, D.C. and Burlington, VT
2010-2012: Managing Consultant, Vermont Energy Investment Corporation, Burlington, VT
2005-2010: Director, Residential Services, Vermont Energy Investment Corp., Burlington, VT
2001-2005: Manager, Energy Services, Vermont Gas Systems, S. Burlington, VT
1998-2001: Manager, Residential Energy Services, Vermont Gas Systems, S. Burlington, VT
1996-1998: Manager, HomeBase Retrofit Program, Vermont Gas Systems, S. Burlington, VT
1994-1996: Technical Specialist, Vermont Gas Systems, S. Burlington, VT
1991-1994: Associate Director and Technical Specialist, Champlain Valley Weatherization Program, Burlington, VT

PROFESSIONAL SUMMARY

James Grevatt brings 25 years' experience as a leadership professional in energy efficiency program operations to his consulting practice. Mr. Grevatt uses an in-depth knowledge of the nuts and bolts of running programs and a clear understanding of strategic thinking and planning to assess the effectiveness of program designs and identify improvement areas that will ensure achievement of desired outcomes. Throughout his career, Mr. Grevatt has focused on building strong relationships with staff, peers, trade allies, regulators, and clients as the best way to understand the needs and challenges that each sector faces. As Director of Residential Services for Efficiency Vermont for over five years, and then in the same role for the District of Columbia Sustainable Energy Utility for its startup operation, Mr. Grevatt has hands-on experience with industry-leading markets-based approaches to managing energy efficiency programs, including multi-family, low income, residential retrofit, new construction, HVAC, and efficient products programs. In his leadership roles he was responsible for finding successful consensus approaches among diverse groups of partners and stakeholders, and for policy interactions with regulators, assuring that program processes were efficient and effective. Prior to his roles with Vermont Energy Investment Corporation, Mr. Grevatt managed Vermont Gas' residential and commercial energy efficiency programs. In each of these roles he had overall responsibility both for program design and operations.

SELECTED PROJECTS

- ***Coalition of Maryland Energy Efficiency Advocates*** Prepared written comments and multiple appearances before the Commission to present evidence regarding Maryland utilities' 2015-2017 EmPOWER Maryland energy efficiency plans, and in subsequent proceedings related to utility goal-setting, cost-effectiveness testing, and energy efficiency financing (2014-2017)
- ***New Jersey Clean Energy Program: Planning Team Lead for F2018-F2022 Strategic Plan*** Facilitated focus groups, worked with Board of Public Utilities Staff, program administrators,

utility companies, and other stakeholders to identify opportunities to improve NJCEP strategic direction and increase benefits for ratepayers. Lead author drafting strategic plan (2015-2017)

- ***Energy Efficiency for All: Expert technical support for affordable multifamily energy efficiency advocacy in Pennsylvania and Virginia*** Worked with a coalition of energy efficiency and affordable housing advocates to shape advocacy efforts with utilities and regulators (2015-2017)
- ***Sierra Club of British Columbia and British Columbia Sustainable Energy Association:*** Provided expert witness testimony in DSM proceedings with Fortis BC and BC Hydro. (2017)
- ***Southern Environmental Law Center:*** Provided technical support for SELC staff regarding pre-pay programs and other policy issues. (2015-2017)
- ***Regulatory Assistance Project: Researched and co-authored with Chris Neme:*** *The Next Quantum Leap in Efficiency: 30 Percent Electric Savings in Ten Years,* addressing program and policy questions related to doubling the best efficiency program results (2016)
- ***Natural Resources Defense Council:*** Provided expert witness testimony in support of NRDC's intervention in Ameren Illinois' 2014-2016 energy efficiency plan. Testimony demonstrated that Ameren would be capable of capturing significantly greater efficiency savings than it had proposed (2013)
- ***Regulatory Assistance Project: Expert technical support for DSM in China*** Worked with various government agencies and grid companies, as well as advocacy organizations to provide technical support related to advancing DSM and energy efficiency in China (2015)
- ***Vermont Public Service Department: Evaluation of Clean Energy Development Fund*** Conducted interviews of staff and key stakeholders under contract to NMR and prepared memo outlining process findings and recommendations (2014-2015)
- ***Evaluation of Efficiency Maine Low-Income Multi-Family Weatherization Program-*** Responsible for program staff and building owner interviews and process evaluation under contract to NMR and Efficiency Maine (2014-2015)
- ***Northeast Energy Efficiency Partnerships-*** Researched and co-authored meta-study of the use of energy efficiency to defer T&D investments (2014)
- ***Northeast Energy Efficiency Partnerships-*** Researched and co-authored meta-study of ductless heat pump performance and market acceptance (2014)
- ***New Hampshire Electric Co-op-*** Conducted assessment of the co-op's environmental and social responsibility programs' promotion of whole building efficiency retrofits, cold climate heat pumps and renewable energy systems. Presented recommendations to the co-op Board. (2014)
- ***High Meadows Fund-*** Co-authored a study assessing the market viability of "High Performance Homes" in Vermont (2014)

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- ***Energy Savings Potential Study, Delaware Department of Natural Resources-*** led narrative development for the residential programs for a study of the energy efficiency savings potential in Delaware (2013-2014)
- ***Regulatory Assistance Project-*** Provide technical support to energy efficiency advocates in proceedings in Maryland, Mississippi, and Missouri (2013-2017)
- ***Better Buildings Solutions Center, U. S. Department of Energy-*** Energy Futures Group's lead author in drafting and reviewing web content for ten how-to "handbooks" detailing proven approaches to designing and implementing residential retrofit efficiency programs (2013-2014)
- ***Utility Program Benchmarking-*** led research on behalf of a large IOU to compare the cost of saved energy across ~10 leading utility portfolios. The research sought to determine if there are discernable differences in the cost of saved energy related to utility spending in specific non-incentive categories, including administration, marketing, and EM&V (2013)
- ***Research on trends in multi-family, HVAC, and new construction programs-*** developed an analysis of emerging program trends on behalf of a leading energy efficiency industry firm (2013-2014)
- ***Efficiency Power Plant, Regulatory Assistance Project-*** Partnered with RAP to develop a demonstration tool to show how energy efficiency measures can be used to mitigate air quality impacts related to power production (2013)
- ***Natural Gas Energy Efficiency Analysis, the Green Energy Coalition-*** Provided analytical support to demonstrate in testimony that Enbridge Gas could reduce the scale of its proposed pipeline expansion by implementing aggressive energy efficiency programs (2013)
- ***Targeted Implementation, VEIC-*** Responsible for market analysis and strategic planning for a new division expanding VEIC's energy efficiency program implementation projects (2012-2013)
- ***DC Sustainable Energy Utility-*** Led the planning and startup implementation of Residential programs for the DC SEU, including single and multi-family and retail market programs. Led the development of the initial portfolio-level Annual Plan. Led client and partner interactions around planning and policy development. Member of DC SEU Senior Management Team (2011-2012)
- ***EmPOWER Maryland Critical Program Review-*** Expert consultant to the Maryland Office of Peoples' Counsel in EmPOWER Maryland hearings regarding utility energy efficiency planning and reporting. Represented the OPC in stakeholder meetings that informed the current 2012-2014 EmPOWER plans. Multiple appearances before the Maryland Public Service Commission. (2010-2012)
- ***Efficiency Vermont 20 year Forecast of Efficiency Potential-*** Senior Advisor in developing the forecast scenarios that led to significantly increased efficiency investment in Vermont (2010-2011)

JAMES GREVATT, MANAGING CONSULTANT

- ***Efficiency Vermont Residential Programs-*** Directed 100% growth in program budgets to nearly $10M annually. Responsible for strategic direction, leadership, and results for Efficiency Vermont's award-winning residential retrofit, new construction, retail, and low income programs. Supported excellence in a staff of 30 (2005-2010).
- ***Vermont Gas Systems Efficiency Program Leader-*** Directed strategic planning and program operations that led to six programs and portfolio as a whole being recognized as exemplary in Responding to the Natural Gas Crisis: America's Best Natural Gas Energy Efficiency Programs (ACEEE, 2003). Built contractor infrastructure and internal support to consistently meet program objectives. Led development of Annual Reports, planning and budgeting. Collaborated with Efficiency Vermont staff to develop a fuel-blind, state-wide, jointly offered residential new construction program (2001-2005)
- ***Residential Retrofit Program Development-*** Enhanced design and performance of VGS' residential retrofit offerings by streamlining delivery and building strong relationships with contractors, homeowners, and property managers (1994-2005)
- ***Demonstrated Technical Excellence in Approaches to Residential Retrofits*** Conducted hundreds of residential energy audits and quality assurance inspections for natural gas and alternative-fueled homes. Trained and coached installers to obtain desired quality. Worked to satisfy homeowners through explanation, education, sound listening to concerns, and ultimately assuring that concerns were addressed. Trained new staff in auditing techniques. (1991-1998)

SELECTED PRESENTATIONS

Keys to the House: Unlocking Residential Savings with Program Models for Home Energy Upgrades-ACEEE 2016 Summer Study on Energy Efficiency in Buildings, August, 2016

Home Upgrade Program Design & Implementation Models for Acquiring Savings in Multiple Climate Zones- 2016 National Home Performance Conference, April, 2016

EERS Advancements in Maryland: EmPOWER After 2015- Presentation at ACEEE Energy Efficiency as a Resource Conference, September, 2015

Leveling the Playing Field for Distributed Energy Resources- Panelist discussing the use of energy efficiency to defer T&D investments, Acadia Center forum on Envisioning Our Energy Future, February, 2015

Residential Retrofit Programs: What's Working? Perspectives from National Program Leaders- Panelist at AESP National Conference 2012

Elements of Retrofit Program Incentive Design- DOE Technical Assistance Program Publication, April, 2011

Designing Effective Incentives to Drive Residential Retrofit Participation- DOE Technical Assistance Program Webinar, October, 2010

Quality Assurance for Residential Retrofit Programs- DOE Technical Assistance Program Webinar, October, 2010

Home Performance with ENERGY STAR, Quality Assurance in Vermont- Panelist at the ACI Home Energy Retrofit Summit, April 2010

Delivering on the Promise-Engaging Communities and the Public- Panelist at 2010 NEEP Summit, March, 2010

Home Performance with Energy Star in Vermont - Presentation at CEE Member meeting, June 2009

Leading by Example: Exemplary Low Income Energy Efficiency Programs –Presented on Efficiency Vermont's Residential low income services at California's Low Income Energy Efficiency Symposium, June 2006

"Natural Gas Efficiency Policies, Responding to the Natural Gas Crisis One Therm at a Time" - Co-presented with Dan York and Anna Monis Shipley of American Council for an Energy-Efficient Economy (ACEEE) -ACEEE/CEE Market Transformation Symposium, 2004

CERTIFICATE OF SERVICE

I certify that the parties of record on the service list have been served with the foregoing Testimony of James Grevatt on Behalf of North Carolina Justice Center and Southern Alliance for Clean Energy either by electronic mail or by deposit in the U.S. Mail, postage prepaid.

This the 5th day of September, 2017.

s/ Robin G. Dunn
Robin G. Dunn