

September 9, 2021

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

**RE: 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
Docket No. E-2, Sub 1273**

Dear Ms. Dunston:

Enclosed for filing is the Direct Testimony and Exhibits of Forest Bradley-Wright on behalf of the North Carolina Justice Center, the North Carolina Housing Coalition, and the Southern Alliance for Clean Energy.

Pursuant to Commission Rule R1-28(e)(1), we plan to deliver via overnight mail fifteen (15) three-hole punched paper copies, one of which shall be single-sided, of the entire filing to the Commission on or before September 10, 2021.

If you have any questions, please let me know.

Sincerely,



Tirrill Moore

Enclosures
cc: Parties of Record

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

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)

Docket No. E-2, Sub 1273

DIRECT TESTIMONY AND EXHIBITS OF

FOREST BRADLEY-WRIGHT

ON BEHALF OF

**THE NORTH CAROLINA JUSTICE CENTER,
NORTH CAROLINA HOUSING COALITION, AND
SOUTHERN ALLIANCE FOR CLEAN ENERGY**

September 9, 2021

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EXHIBITS

Exhibit FBW-1: Resume of Forest Bradley-Wright

Exhibit FBW-2: DEP Response to SACE et al. Data Request 1-20

Exhibit FBW-3: DEP Response to SACE et al. Data Request 1-4

Exhibit FBW-4: DEP Response to SACE et al. Data Request 1-21

Exhibit FBW-5: DEP Response to SACE et al. Data Request 1-18

Exhibit FBW-6: DEP Response to SACE et al. Data Request 1-36

Exhibit FBW-7: Liz Bourguet & Jim Grevatt, *Pathways for Energy Efficiency in Virginia*, Energy Futures Group (June 3, 2021)

Exhibit FBW-8: DEP Response to SACE et al. Data Request 1-40

Exhibit FBW-9: July 14, 2021 Presentation to the Collaborative: Duke Energy's Income Qualified Weatherization Pilot

Exhibit FBW-10: DEP Response to SACE et al. Data Request 1-30

Exhibit FBW-11: July 14, 2021 Presentation to the Collaborative on Income Qualified Budgeting

1 **I. Introduction and Qualifications**

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

3 A. My name is Forest Bradley-Wright. I am the Energy Efficiency Director for
4 Southern Alliance for Clean Energy (“SACE”), and my business address is 3804
5 Middlebrook Pike, Knoxville, Tennessee.

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

7 A. I am testifying on behalf of SACE, the North Carolina Justice Center (“Justice
8 Center”), and the North Carolina Housing Coalition (“Housing Coalition”)
9 (collectively, “Public Interest Intervenors”).

10 **Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS AND WORK**
11 **EXPERIENCE.**

12 A. I graduated from Tulane University in 2001 and in 2013 received my Master of
13 Arts degree from Tulane in Latin America Studies with an emphasis on
14 international development, sustainability, and natural resource planning.

15 My work experience in the energy sector began in 2001 at Shell International
16 Exploration and Production Company, where I served as Sustainable Development
17 Team Facilitator.

18 From 2005 to 2018, I worked for the Alliance for Affordable Energy. As the Senior
19 Policy Director, I represented the organization through formal intervenor filings
20 and before regulators at both the Louisiana Public Service Commission and the
21 New Orleans City Council on issues such as integrated resource planning, energy-
22 efficiency rulemaking and program design, rate cases, utility acquisition, power
23 plant certifications, net metering, and utility scale renewables. As a consultant, I

1 also prepared and filed intervenor comments on renewable energy dockets before
2 the Mississippi and Alabama Public Service Commissions.

3 Since 2018, I have been the Energy Efficiency Director for SACE. In this role, I
4 am responsible for leading dialogue with utilities and regulatory officials on issues
5 related to energy efficiency in resource planning, program design, budgets, and
6 cost recovery. This takes the form of formal testimony, comments, presentations,
7 and/or informal meetings in the states of Georgia, Florida, North Carolina, South
8 Carolina, Mississippi and in jurisdictions under the Tennessee Valley Authority. A
9 copy of my resume is included as Exhibit FBW-1.

10 **Q. HAVE YOU BEEN AN EXPERT WITNESS ON ENERGY-EFFICIENCY**
11 **MATTERS BEFORE THE NORTH CAROLINA UTILITIES**
12 **COMMISSION?**

13 A. Yes, I filed expert witness testimony in response to Duke Energy Carolina's
14 ("DEC") DSM/EE Recovery Riders in Docket Nos. E-7, Sub 1192, E-7, Sub 1230,
15 and E-7, Sub 1249 and Duke Energy Progress' ("DEP" or "the Company")
16 DSM/EE Recovery Riders in Docket Nos. E-2, Sub 1206, and E-2, Sub 1252.

17 **Q. HAVE YOU BEEN AN EXPERT WITNESS ON ENERGY-EFFICIENCY**
18 **MATTERS BEFORE OTHER REGULATORY COMMISSIONS?**

19 A. Yes, I have filed expert witness testimony in Georgia related to Georgia Power
20 Company's 2019 Demand Side Management application and in the five-year
21 energy efficiency goal setting proceeding before the Florida Public Service
22 Commission in 2019 for Florida Power & Light, Gulf Power, Duke Energy Florida,
23 Tampa Electric Company, Jacksonville Electric Authority and Orlando Utilities
24 Commission.

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II. Summary of Recommendations

Q. WHAT RECOMMENDATIONS DO YOU HAVE FOR DEP?

A. I have two main recommendations for DEP:

- (1) Expeditiously finalize the evaluation and development of program recommendations proposed by Collaborative members for direct implementation or submission of program applications to the Commission for approval.
- (2) Track efficiency savings associated with Collaborative-sponsored program recommendations and report them to both the Collaborative and in future DEP DSM/EE Recovery Rider filings.

Q. WHAT RECOMMENDATIONS DO YOU HAVE FOR THE COMMISSION?

A. I have three key recommendations for the Commission:

- (1) Direct DEP to work in good faith with members of the Collaborative to produce a plan for how best to exceed 1% annual savings in each of the next six years, to be periodically updated and presented to the Commission as an appendix to future DEP DSM/EE Rider applications.
- (2) Direct DEP to increase its low-income efficiency program budgets to at least match those of DEC on a per-residential customer basis, which would result in a floor of \$5.4 million annually.
- (3) Direct DEP to quantify and analyze the carbon savings associated with DEP's DSM/EE portfolio to both inform the work of the Collaborative and enable the Commission and other interested parties to track the impact of DSM/EE

1 resources towards achieving North Carolina's and Duke Energy's respective
2 carbon reduction goals.

3 **III. DEP's 2020 Energy Savings Achievements**

4 **Q. HOW DID DEP'S EFFICIENCY PERFORMANCE IN 2020 COMPARE TO**
5 **PREVIOUS YEARS?**

6 A. DEP's reported energy efficiency savings were lower in 2020 than in each of the
7 previous three years. However, DEP is to be commended for proactively adjusting
8 its approach in the face of unprecedented challenges brought on by the COVID-19
9 pandemic.

10 In 2020, DEP delivered 307.2 gigawatt-hours ("GWh") of efficiency savings at the
11 meter, equal to 0.70% of the previous year's retail sales¹. This reflects a 12.2%
12 decline in total savings from the previous year when the Company reported 350
13 GWh in annual efficiency savings. However, DEP still has not reached the 1%
14 annual savings target agreed to in the Duke Energy-Progress Energy merger and
15 continues to lag considerably behind DEC.²

¹DEP reports energy savings and projections as "Net at Plant" or at the generator level. A line loss factor of (1+0.051) obtained from DEP Response to SACE et al. Data Request 1-20 in Duke Energy Progress DSM/EE Rider Docket (E-2, Sub 1273), attached as Exhibit FBW-2, is used to convert total savings from Evans Exhibit 1 Total All Programs (no DSDR) to "at the meter." Previous year retail sales obtained from EIA Form 861 2019, Sales to Ultimate Customers.

²The Merger Settlement with SACE, South Carolina Coastal Conservation League, and Environmental Defense Fund calls for annual energy savings of at least 1% of prior-year retail sales beginning in 2015 and cumulative savings of at least 7% over the period from 2014 through 2018. The Merger Settlement was approved by the Public Service Commission of South Carolina in Docket No. 2011-158-E. The 1% savings target has also been memorialized in the mechanism governing North Carolina programs, which provides an opportunity for the Company to earn a bonus incentive for achieving savings of 1% or more of prior year retail sales. *Order Approving DSM/EE Programs and Stipulation of Settlement*, Docket No. E-7, Sub 1032 (Oct. 29, 2013).

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Table 1. Duke Energy Progress DSM/EE Performance 2017-2020

Vintage Year	2017	2018	2019	2020
At Meter Savings (GWh) ³	359.9	380.2	350.0	307.2
Previous Year Variance (%)	-	5.6%	-7.9%	-12.2%

2 **Q. HOW DID DEP'S DSM/EE PERFORMANCE COMPARE TO ITS**
3 **PROJECTIONS FOR 2020?**

4 A. In Docket E-2, Sub 1206, the Company projected annual energy savings for its
5 entire portfolio equal to 315.1 GWh at the meter, or 0.72% of the prior-year's
6 retails sales.⁴ Because those projections preceded the COVID-19 pandemic and the
7 lockdowns it precipitated, they understandably did not take those unanticipated
8 circumstances into account. Ultimately, DEP's portfolio of programs achieved
9 97% of its projections for 2020, only slightly lower than forecasted in 2019.
10 Historically, DEP's projections have nearly always underestimated its actual
11 energy savings. The comparison highlights that, in 2020, the Company's
12 projections were conservative enough that they were nearly achievable even during
13 a global pandemic. The difference between the Company's DSM/EE performance
14 and the Company's own projections is shown below in Table 2.

³ Generator savings 2018-2020 obtained from Evans Exhibit 1, Pages 1-5 filed in NCUC Docket No. E-2, Sub 1273; 2017 savings obtained Evans Exhibit 1, Page 7 filed in NCUC Docket No. E-2, Sub 1206. Converted to at the meter using line loss factor from Footnote 1.

⁴DEP reports energy savings and projections as "Net at Plant" or at the generator level. A line loss factor of (1+0.051) obtained from DEP Response to SACE et al. Data Request 1-20 in Duke Energy Progress DSM/EE Rider Docket (E-7, Sub 1273), attached as Exhibit FBW-2, is used to convert savings total savings from Evans Exhibit 1 including DSDR to "at the meter." Previous year retail sales obtained from EIA Form 861 2019, Sales to Ultimate Customers.

1

Table 2. DEP Projected vs. Actual Savings at the Meter⁵

Year	Projected Savings (GWh)	Actual Savings (GWh)	Actual to Projected Variance (%)
2017	333.8 ⁶	359.9 ⁷	7.8%
2018	308.6 ⁸	380.2 ⁹	23.2%
2019	324.5 ¹⁰	350.0 ¹¹	7.9%
2020	315.1 ¹²	307.2 ¹³	(2.5%)
2021	378.7 ¹⁴		
2022	397.7 ¹⁵		

2 **Q. WAS THE COMPANY'S EE PORTFOLIO COST-EFFECTIVE IN 2020?**

3 A. Yes. The value of DSM/EE programs continued to be cost-effective and delivered
4 considerable financial value to customers. In 2020, DEP's DSM/EE portfolio had
5 a Utility Cost Test ("UCT") score of 2.04 and a Total Resource Cost ("TRC") score
6 of 1.82, though both of which were significantly lower than in 2019.¹⁶ The total
7 net present value ("NPV") of avoided costs in 2020 was also substantially lower
8 than in previous years, but still amounted to approximately \$136.6 million of
9 financial benefit for customers.¹⁷

⁵Docket numbers referenced below report actual energy savings and projections as "Net at Plant" or at the generator level, but table summarizes at the meter for the sake of consistency of previous sections.

⁶ Evans Exhibit 1, Page 9 filed in NCUC Docket No. E-2, Sub 1108.

⁷ Evans Exhibit 1, Page 7 filed in NCUC Docket No. E-2, Sub 1206.

⁸ Evans Exhibit 1, Page 7 filed in NCUC Docket No. E-2, Sub 1145.

⁹ Evans Exhibit 1, Page 1 filed in NCUC Docket No. E-2, Sub 1273.

¹⁰ Evans Exhibit 1, Page 7 filed in NCUC Docket No. E-2, Sub 1174.

¹¹ Evans Exhibit 1, Page 3 filed in NCUC Docket No. E-2, Sub 1273.

¹² Evans Exhibit 1, Page 7 filed in NCUC Docket No. E-2, Sub 1206.

¹³ Evans Exhibit 1, Page 5 filed in NCUC Docket No. E-2, Sub 1273.

¹⁴ Evans Exhibit 1, Page 5 filed in NCUC Docket No. E-2, Sub 1252.

¹⁵ Evans Exhibit 1, Page 5 filed in NCUC Docket No. E-2, Sub 1273.

¹⁶ DEP Response to SACE et al. Data Request 1-4 in Duke Energy Progress DSM/EE Rider Docket (E-2, Sub 1273), attached as Exhibit FBW-3.

¹⁷ *Id.*

1 **Table 3. Duke Energy Progress DSM/EE Cost Effectiveness 2017-2020¹⁸**

Vintage Year	2017	2018	2019	2020
Utility Cost Test (UCT)	3.43	3.29	2.72	2.04
Total Resource Cost (TRC)	2.35	3.03	2.60	1.82
Net Present Value (NPV) (Million)	\$281.7	\$254.7	\$212.9	\$136.6

- 2 **Q. HOW DID RESIDENTIAL SAVINGS RELATE TO TOTAL SAVINGS IN**
3 **2020?**
- 4 A. Residential programs have made up the majority of savings in DEP's portfolio for
5 the past several years and 2020 was no exception. Residential programs
6 represented 72% of all savings in 2020.¹⁹ One residential program, My Home
7 Energy Report (MyHER), made up nearly half of DEP's total savings in 2020 at
8 48% of reported system energy reductions. As noted numerous times in previous
9 years, I am concerned that the bulk of DEP's DSM/EE portfolio savings are from
10 a behavioral program with such limited measure life persistence. This concern was
11 further heightened by the Market Potential Study DEP presented to the
12 Commission in its most recent integrated resource plan (IRP), which attributed 72-
13 78% of its 5-year cumulative efficiency savings potential to behavioral programs.²⁰
14 We urge the Company to focus on implementing additional measures that achieve
15 deeper and longer-lived savings in order to maintain a more balanced and robust
16 program portfolio going forward.²¹ These measures should include adding to or

¹⁸ *Id.*

¹⁹ Evans Exhibit 1, Page 5 filed in NCUC Docket No. E-2, Sub 1273.

²⁰ Nexant (submitted to Duke Energy), "Duke Energy North Carolina EE and DSM Market Potential Study" June 2020, p. 106.

²¹ *Testimony of Forest Bradley-Wright on Behalf of the North Carolina Justice Center and Southern Alliance for Clean Energy*, Docket No. E-7, Sub 1192 (May 20, 2019).

1 modifying programs that target the largest residential end uses of electricity – such
2 as space heating & cooling and water heating.

3 **Q. HOW DID NON-RESIDENTIAL SAVINGS RELATE TO TOTAL**
4 **SAVINGS IN 2020?**

5 A. In 2020, DEP’s non-residential programs made up just 28% of total energy
6 efficiency savings.²² DEP’s non-residential efficiency program savings declined
7 17% from just the previous year, nearly double the level of decline seen for
8 residential programs, most likely resulting from the economic decline brought on
9 by the COVID-19 pandemic. However, even pre-pandemic, DEP demonstrated a
10 troubling trend of being unable to meet projections for non-residential programs
11 and falling savings among commercial and industrial customers. This broader trend
12 has resulted in a 37% decrease in non-residential energy savings from 2018-2020.²³

13 **Q. WHAT EFFECT DO COMMERCIAL AND INDUSTRIAL OPT OUTS**
14 **HAVE ON PERCENT OF ENERGY SAVINGS?**

15 A. Commercial and industrial opt outs continue to negatively impact DEP’s ability to
16 reach higher savings benchmarks due to this group’s large share of energy
17 consumption. In a departure from previous years, DEP did not provide a calculation
18 of the percentage of its commercial and industrial customers that opted out of the
19 DSM/EE riders as requested in discovery. The data it referenced in its data
20 response was for North Carolina only, where in 2020 approximately 47.9% of
21 DEP’s commercial and industrial energy consumption opted out of the utility’s

²² Duke Energy Progress Response to SACE et al. Data Request 1-21 in Duke Energy Progress DSM/EE Rider Docket (E-2, Sub 1273), attached as Exhibit FBW-4.

²³ *Id.*

1 energy efficiency offerings (11,747 GWh²⁴ out of 24,509 GWh²⁵ of DEP's North
2 Carolina non-residential retail sales).

3 Because commercial and industrial efficiency savings can be among the most
4 economic, greater savings among these customers would likely translate into even
5 higher utility-system cost reductions.

6 **Q. IS IT REASONABLE TO INCLUDE OPT-OUT CUSTOMERS IN A**
7 **PERCENTAGE OF RETAIL SALES CALCULATION?**

8 A. Yes. By calculating energy savings compared to all retail sales, the Commission
9 can observe the effect of the efficiency portfolio against actual customer energy
10 consumption in a year. It is also important for the Commission to be able to readily
11 review the impact that the opt-out provisions have on overall savings. Because
12 DEP did not provide system level opt out figures, it is not possible to compare its
13 2020 efficiency performance as a percentage of retail sales with and without opt
14 out customers as I have done in past proceedings. It is clear, however, that opt outs
15 continue to drag down DEP's total efficiency savings, which could otherwise be
16 much higher.

17 **Q. HOW DID DEP'S LOW-INCOME EFFICIENCY IMPACTS COMPARE**
18 **TO PREVIOUS YEARS?**

19 A. DEP's low-income efficiency programs were negatively impacted to a
20 considerable degree by the COVID-19 pandemic. In 2020, energy saved in the DEP
21 Neighborhood Energy Saver program decreased by 84%,²⁶ making it the hardest-
22 hit program in the entire portfolio. Unfortunately, this reduction in energy saving

²⁴ *Duke Energy Progress Direct Testimony of Shannon Listebarger*, Docket No. E-2, Sub 1273, p. 15.

²⁵ U.S. Energy Information Administration, Form EIA-861, Sales to Ultimate Customers, Early Release Data 2020.

²⁶ *Duke Energy Progress Direct Testimony of Robert Evans*, Docket No. E-2, Sub 1273, Evans Exhibit 1, p. 5.

1 services came at a time when low-income customers were facing the hardest
 2 economic circumstances in recent history. Likewise, the Multi-Family Energy
 3 Efficiency program, which benefits significant numbers of low-income customers,
 4 was similarly impacted with an 76% savings reduction in 2020. Both of these
 5 programs experienced declines that vastly exceeded the negative impact to total
 6 residential programs.

7 **Table 4. DEP Savings by Residential Customer / Program Type²⁷**

Customer/Program Type	Energy Savings (GWh)			% Change
	2018	2019	2020	2019-2020
Income-Qualified	3.5	3.8	0.6	-84%
Multi-Family	13.8	11.9	2.8	-76%
All Residential Programs	254.1	257.4	231.6	-10%

8 Continued growth of efficiency savings for low-income customers has been a
 9 consistent focus at the Collaborative and Duke has shown a willingness to engage
 10 on this issue. However, as noted in my testimony last year in Docket E-2, Sub 1252,
 11 the budgets and impact of DEP's programs that aim specifically to serve low-
 12 income customers lag far behind what DEC has been delivering, which raises
 13 significant concerns. The time has come for DEP to match the recent performance
 14 of its sister company, as set forth in more detail below in Section VII of my
 15 testimony.

²⁷ *Id.*

1 needed to calculate DEP's annual percent savings for 2022, it is clear that unless
2 DEP increases savings beyond its current forecast, the Company will continue to
3 fall short of the 1% threshold and the higher performance of its sister company.
4 DEP could still exceed its forecast and achieve savings greater than 1%, but given
5 past performance it is unlikely to do so without a defined plan or direction from the
6 Commission.

7 **Q. SHOULD DEP CONTINUE PURSUING HIGHER LEVELS OF SAVINGS**
8 **IN 2022?**

9 A. DEP is forecasting savings for 2022 that are higher than it projected in its Docket
10 No. E-2, Sub 1252 for 2021 (397.7 GWh of retail sales vs. 378.7 GWh,
11 respectively). This is directionally appropriate, but still short of the longstanding
12 goal of 1% annual efficiency savings that continues to be a long sought and highly
13 emphasized priority for many Collaborative participants.

14 **Q. IF DEP IS PRESENTING CONSERVATIVE FORECASTS IN ITS**
15 **ANNUAL RIDER FILINGS, IS THERE STILL VALUE IN SHOWING**
16 **HOW IT WOULD ACHIEVE HIGHER SAVINGS LEVELS?**

17 A. Yes. Even if DEP has presented a conservative estimate of forecasted savings for
18 2022 for the purposes of establishing the rider, it should acknowledge in its
19 DSM/EE Rider filings that the Commission, Public Interest Intervenors, and
20 members of the Collaborative will be comparing the Company's 2022 savings
21 forecast with the 1% annual savings target. DEP could additionally state its intent
22 to strive for these higher levels, while indicating what course of action it believes
23 would enable to successfully achieve those more ambitious goals.

1 **Q. HAS DEP RESPONDED DIFFERENTLY TO REQUESTS FOR**
2 **INFORMATION COMPARING ITS PERFORMANCE TO THE 1%**
3 **TARGET IN THIS DOCKET COMPARED TO PAST PROCEEDINGS?**

4 A. Yes. In a departure from previous years, DEP objected to our discovery request
5 seeking a calculation of its annual savings as a percentage of previous year's sales
6 – by which a comparison to the 1% savings target can be made.³² DEP's decision
7 to object to the question this year is made more notable by the fact that the
8 calculation itself is comparatively simple to produce, and that DEP is now eligible
9 for a \$500,000 performance bonus for reaching the 1% annual savings threshold.³³
10 In its objection, DEP states that it has not made this calculation, raising the question
11 of whether the company intends to pursue the performance incentive bonus or of
12 working in good faith with Collaborative members to develop plans for reaching
13 1% annual savings in future years. Furthermore, by failing to provide a response
14 to our discovery request, DEP also withheld its projected 2021 retail sales forecast,
15 thereby preventing the Public Interest Intervenors from having the data necessary
16 to make the calculation of percent annual efficiency savings in spite DEP's
17 objection.

18 **Q. SHOULD THE COMMISSION ASSESS DEP'S PERFORMANCE IN**
19 **COMPARISON TO A 1% ANNUAL SAVINGS TARGET?**

20 A. Yes. The 1% annual savings target continues to be relevant for public policy
21 purposes for several reasons. Notably, research suggests that energy efficiency
22 savings trend higher in jurisdictions that have enacted savings targets.³⁴ The

³² DEP Response to SACE et al. Discovery Request 1-18, attached as Exhibit FBW-5.

³³ *Order Approving Revisions to Demand-Side Management and Energy Efficiency Cost Recovery Mechanisms*, NCUC Docket No. E-2, Sub 931 (Oct. 20, 2020).

³⁴ See Gold, *et.al.*, *Next-Generation Energy Efficiency Resource Standards*, American Council for an Energy-Efficient Economy (August 2019), available at: <https://www.aceee.org/sites/default/files/publications/researchreports/u1905.pdf>.

1 Commission has also indicated its desire that Duke and stakeholders at the
2 Collaborative work towards reaching higher levels of savings. To this end, a large
3 number of clean energy and public interest advocates have contributed
4 considerable amounts of time to this work at the Collaborative, while making clear
5 that the 1% threshold is important to their participation in these efforts.

6 All of these factors speak to the continued relevance of the 1% annual savings
7 threshold.

8 **Q. DID THE COMMISSION'S 2020 ORDER CONCERNING DUKE'S**
9 **DSM/EE COST RECOVERY MECHANISM IN DOCKET NO. E-2, SUB 931**
10 **CHANGE THE PRIMARY COST EFFECTIVENESS TEST TO SUPPORT**
11 **INCREASED ENERGY EFFICIENCY SAVINGS?**

12 A. Yes. In addition to the \$500,000 performance incentive, the Commission changed
13 the primary cost effectiveness test used in screening program offerings from the
14 Total Resource Cost (TRC) test to the Utility Cost Test (UCT). In discussions at
15 the Collaborative, Duke promoted the notion that this change will help to better
16 value efficiency benefits for inclusion in DEP's DSM/EE portfolio and should help
17 the Company expand its overall efficiency savings. I agree with this, especially
18 given that the TRC, as previously applied, was asymmetrical and did not account
19 for all benefits. Even with the switch to UCT as the new primary cost effectiveness
20 test, the TRC will continue to be evaluated for informational purposes, and DEP is
21 now working with the Collaborative to undertake a study of non-energy benefits
22 (NEBs) that could result in more complete and accurate accounting of benefits for
23 the TRC test in the future.

24 **Q. HAS CHANGING THE PRIMARY COST EFFECTIVENESS FROM TRC**
25 **TO UCT RESULTED IN DEP PROJECTING HIGHER EFFICIENCY**
26 **SAVINGS?**

1 A. No. Despite representations by the Company that changing from the TRC to the
2 UCT would increase the availability of cost-effective savings, it has not. In
3 response to discovery concerning the impact of this change on DEP's 2022
4 projections, the company stated:

5 No additional savings are projected for 2022 using the UCT compared to
6 TRC. There have been no changes to program offerings based on the shift
7 from TRC to UCT for the 2022 projection.³⁵

8 Moreover, between the time the Stipulating Parties submitted their Settlement
9 Agreement and the Commission issued its Final Order, DEP completed its Market
10 Potential Study using the now outdated TRC test, rather than the UCT. Therefore,
11 DEP's IRP significantly understated the amount of available cost-effective
12 DSM/EE.

13 Ultimately, it is important that the DSM/EE Rider and the IRP both reflect the full
14 range of available cost-effective energy efficiency and demand response resources
15 to ensure that ratepayers are not unduly burdened with costs that could be avoided
16 through cost-effective investments in DSM/EE.

17 **Q. DO DUKE'S ENERGY EFFICIENCY ASSUMPTIONS IN THE IRP**
18 **UNDERESTIMATE DSM/EE POTENTIAL??**

19 A. As I testified last year, there is an important intersection between Duke's integrated
20 resource planning in the Carolinas and the investment in DSM/EE programs that
21 are the focus of its annual DSM/EE Recovery Rider dockets. If, the DSM/EE
22 assumptions used in the IRP underestimate³⁶ future energy saving potential,

³⁵ DEP Response to SACE et al. Data Request 1-36, attached as Exhibit FBW-6.

³⁶ DEC indicated in multiple stakeholder meetings that IRP inputs will be based on internal forecasts for at least the next five years. While DEC DSM/EE Recovery Rider projections for 2018 and 2019 were far closer to actual performance, previous filings were off by a substantial degree, typically underestimating actual savings by about 40%.

1 customers could wind up paying for more expensive energy, capacity, and delivery
2 infrastructure rather than investing in less expensive strategies to eliminate energy
3 waste. IRPs form the basis for a utility's resource acquisition decisions and
4 underpin avoided cost calculations used in cost-effectiveness testing. Therefore,
5 any flaws in how DSM/EE are treated in the IRP have important implications for
6 this proceeding.

7 As detailed in testimony submitted by Jim Grevatt on behalf of SACE, Sierra Club,
8 and NRDC in Duke's South Carolina IRP proceeding, there were several key
9 deficiencies in the DSM/EE market potential study ("MPS") that Duke relies upon
10 for setting energy and capacity savings levels in the IRP. Duke's MPS omitted
11 emerging technologies and failed to consider changes to customer engagement
12 strategies or programs designs that may increase customer participation.
13 Additionally, as noted above, the MPS relied on the TRC test, which substantially
14 undercounts economic savings potential, rather than the UCT.

15 **Q. HAVE REGULATORS ADDRESSED THE ISSUES RAISED**
16 **CONCERNING DEP UNDERESTIMATING ENERGY EFFICIENCY**
17 **RESOURCE POTENTIAL?**

18 A. While Duke's IRP proceeding in North Carolina is ongoing, the South Carolina
19 Public Service Commission ("SC PSC") affirmed several of the issues raised by
20 Mr. Grevatt, resulting in the following directives, including:³⁷

21 2. Duke is required to use the UCT when developing EE/DSM scenarios and
22 savings projections in its future IRPs, IRP updates, and market potential
23 studies.

24
25 3. In future IRPs, IRP updates, and market potential studies, Duke must work
26 with the EE/DSM Collaborative to identify a set of reasonable assumptions

³⁷ South Carolina Public Service Commission, *Order Requiring Modification to Integrated Resource Plans*, Docket No. 2019-225-E (June 28, 2021), paras. 2-4.

1 surrounding 1) increased market acceptance of existing technologies and 2)
2 emerging technologies to incorporate into EE/DSM saving forecasts. Duke
3 should also work with members of the Collaborative to ensure that
4 residential saving projections are not overly dependent on behavioral
5 programs with short savings persistence. Further, Duke's next IRPs should
6 identify which of the Collaborative's recommendations relating to market
7 acceptance, emerging technologies, and types of programs were and were
8 not adopted when developing market potential studies and IRPs.
9

10 4. In future IRPs, Duke must evaluate high and low EE/DSM cases across a
11 range of fuel and CO2 assumptions to better understand what level of
12 EE/DSM should be implemented if fuel costs rise or higher CO2 costs are
13 imposed.³⁸

14 **Q. WHAT SUGGESTIONS DO YOU HAVE FOR HOW DEP CAN REACH**
15 **HIGHER OVERALL LEVELS OF SAVINGS IN THE FUTURE?**

16 A. As noted above, my principal recommendation for DEP achieving higher overall
17 savings is for it to develop a plan for reaching, exceeding, and sustaining annual
18 efficiency savings of 1% over the next six years. With input from the Collaborative,
19 this plan should consider opportunities for new, expanded, and enhanced efficiency
20 program offerings, as well as refinements to program delivery practices and
21 potential policy changes. It should also incorporate new approaches to evaluating
22 efficiency potential using the UCT, include new technologies, and pursue higher
23 levels of market participation, as directed by the South Carolina PSC. Without
24 quantifying, striving, and tracking progress towards a defined savings target, like
25 1%, it is unlikely DEP will reach higher levels of efficiency savings.

26 **Q. HOW MIGHT THE EXPERIENCE OF UTILITIES WITH HIGHER**
27 **EFFICIENCY PERFORMANCE INFORM PLANNING FOR DEP TO**
28 **REACH 1% ANNUAL SAVINGS?**

29 A. DEP's sister company in the Carolinas, DEC, has historically delivered higher
30 annual efficiency savings performance, providing a partial roadmap for DEP to

³⁸ South Carolina Public Service Commission, *Order Requiring Modification to Integrated Resource Plans*, Docket No. 2019-225-E (June 28, 2021) p. 86.

1 follow. Ample opportunities exist for identifying new savings strategies by
2 examining the experience of other utilities as well. According to analysis by the
3 American Council for an Energy Efficient Economy (“ACEEE”), 25 of the 52
4 largest utilities in the country have delivered annual savings in excess of 1%. Duke
5 should assess what it can learn from the experience of peer utilities that achieve
6 higher levels of savings and apply that to increase the savings it achieves in the
7 Carolinas.

8 **Q. ARE YOU AWARE OF SIMILAR ANALYSIS THAT HAS BEEN DONE IN**
9 **OTHER JURISDICTIONS?**

10 A. Recent work by ACEEE and Energy Futures Group (“EFG”) highlighted new
11 savings opportunities for Dominion Energy Virginia by analyzing the level of
12 savings achieved by typical EE program types at a dozen peer utilities.³⁹ For each
13 program type, EFG determined the depth of savings achieved on average by these
14 utilities, expressed as the percentage of sector sales by program. While this analysis
15 did not specifically include DEP, DEC was included and shows how the
16 comparison can be used to identify opportunities for increased savings. For
17 instance, DEC’s residential behavioral programs (MyHER) deliver a higher than
18 average percent of savings compared to total residential electric sales. But the
19 savings that DEC achieves through deep efficiency programs of the type we have
20 long recommended, like residential HVAC and residential whole house retrofit, are
21 each about 80% below the average savings achieved across the comparison

³⁹ Liz Bourguet & Jim Grevatt, *Pathways for Energy Efficiency in Virginia*, Energy Futures Group (June 3, 2021), attached as Exhibit FBW-7.

1 utilities.⁴⁰ DEC's residential new construction⁴¹ and non-residential prescriptive
2 programs also substantially underperform compared to peer utilities. Each of these
3 present an opportunity to pursue substantial new efficiency savings and provide
4 DEP with a valuable source of comparative data that it could use to pursue new
5 efficiency savings opportunities. As a general strategy for finding new savings
6 opportunities for its customers, DEP can draw from this ACEEE/EFG analysis and
7 widely available original source materials documenting the successful experiences
8 of other utility efficiency programs from which the Company can build a plan to
9 exceed 1% annual efficiency savings.

10 **Q. WHAT DO YOU RECOMMEND?**

11 A. I recommend that the Commission direct DEP to work in good faith with members
12 of the Collaborative to produce a plan for how best to exceed 1% annual savings
13 in each of the next six years, to be periodically updated and presented to the
14 Commission as an appendix to future DEP DSM/EE Rider applications.

15 **VI. Update on Efforts by the Collaborative to Support Higher**
16 **Efficiency Savings**

17 **Q. HAS THE COLLABORATIVE WORKED TO DEVELOP STRATEGIES**
18 **AND RECOMMENDATIONS FOR INCREASING FUTURE DEP DSM/EE**
19 **SAVINGS?**

20 A. Yes. Understanding constraints and developing recommendations to increase
21 future efficiency savings continues to be a central aim of discussions at the
22 Collaborative.

⁴⁰ <https://www.aceee.org/pathways-energy-efficiency-virginia>, download "Modeling Tool" and see tab "Consolidated Savings."

⁴¹ DEC does not currently offer an incentive program for residential new construction, though it has submitted a program application for Commission approval.

1 In 2019, the Collaborative prioritized exploring portfolio level opportunities and
2 challenges and produced a summary report highlighting a range of program and
3 policy opportunities to increase savings. Reflecting the perspective of many clean
4 energy and customer advocacy organizations that participate in the Collaborative,
5 the report affirmed a continued desire to see Duke sustain annual savings in excess
6 of 1% of retail sales. It also identified several other complimentary performance
7 targets.

8 In 2020, SACE, NCJC, and others efficiency advocates in the Collaborative shifted
9 focus towards development of specific program recommendations detailed below
10 that could help to prevent savings declines and achieve sustained annual savings
11 levels in excess of 1% of retail sales.

12 In 2021, SACE, NCJC, and other stakeholders at the Collaborative are seeking to
13 build on this past work, but have shifted towards development of a more specific
14 and actionable plan. The intent is that this plan will quantify the number of kWh
15 savings needed to achieve 1% savings and then be paired with program
16 recommendations and proposed changes to policies and practices sufficient to
17 reach that target. Accordingly, each of these individual opportunities should be
18 evaluated for their expected future savings contributions, then added together and
19 measured against the savings gap. The aim is for the plan to include enough new
20 savings opportunities to exceed 1% annual savings for each of the next six years,
21 with sufficient redundancy and flexibility to achieve the goal even if not every
22 individual component is implemented. Progress will be up to Duke, as Advocates

1 at the Collaborative cannot do this work without Duke's full cooperation on both
2 analysis and solutions development.

3 **Q. HAVE COLLABORATIVE STAKEHOLDERS SUBMITTED PROGRAM**
4 **RECOMMENDATIONS TO DUKE TO HELP INCREASE THE**
5 **COMPANY'S EFFICIENCY SAVINGS?**

6 A. Yes. Over the past two years, stakeholders have submitted several program
7 proposals for Duke's consideration along with supporting materials and presented
8 them to the Collaborative, including:

- 9 • Low-Income Housing Tax Credit (LIHTC) (March 2019)
- 10 • Energy Star Retail Products Platform (January 2020)
- 11 • Program Savings from Building Codes and Standards (January 2020)
- 12 • Residential Low-Income Single-Family Heat Pump Water Heater Rental
13 Program (June 2020)
- 14 • Non-Residential Multifamily Heat Pump Water Heater Rebate Program
15 (June 2020)
- 16 • Manufactured Homes Retrofit Program (August 2020)
- 17 • Manufactured Home New and Replacement Programs (August 2020)

18 **Q. HAS DUKE ACTED ON ANY OF THE PROGRAM**
19 **RECOMMENDATIONS BROUGHT FORWARD BY STAKEHOLDERS**
20 **AT THE COLLABORATIVE?**

21 A. Duke has taken the Collaborative stakeholder program recommendations for
22 internal review and consideration. But until recently, there has been little visible
23 action towards implementing these recommendations, and Duke has yet to submit
24 a program application to the Commission for approval based on any of the
25 recommendations provided by members of the Collaborative. Among the various

1 recommendations presented by Collaborative Stakeholders, Duke appears to have
2 done the most to advance projects receiving an allocation of Low-Income Housing
3 Tax Credits (LIHTC) with the Company's DSM/EE program offerings. But DEP
4 reports that there is just one LIHTC project currently in the pipeline with status
5 listed as Contract Approval, which is expected to yield 96.7 MWh of savings. This
6 is a small step in the right direction that points to even more savings potential, as
7 discussed further below. Through discovery, DEP also indicates that it expanded
8 residential midstream offerings in response to a Collaborative stakeholder
9 recommendation by working directly with manufacturers that do not use
10 distributors, though in a separate discovery response the company states: "DEP
11 does not track the incremental savings that can be attributed to Collaborative
12 contributions."⁴²

13 **Q. DID DEP PROVIDE ANY INDICATION TO THE COLLABORATIVE**
14 **THAT IT PLANNED TO PROJECT INCREASES IN EXISTING**
15 **PROGRAM SAVINGS FOR 2022?**

16 A. Not that I am aware of, which I find odd. It is common knowledge that the
17 Collaborative has a strong interest in seeing DEP achieve higher efficiency savings,
18 but to my recollection Duke representatives never mentioned that they were
19 planning significant increases (of 25%-57%) in savings for many of its existing
20 programs. Nor did it mention plans to substantially decrease multifamily program
21 savings (by 30%), which likely would have been concerning to several
22 Collaborative members. Among other implications, this means Collaborative

⁴² DEP Response to SACE et al. Data Request 1-40, attached as Exhibit FBW-8.

1 members were not provided an opportunity to comment on or contribute to DEP's
2 plans for substantially shifting savings levels for its existing programs in 2022.

3 **Q. IS IT YOUR SENSE THAT THE STAKEHOLDERS WHO PARTICIPATE**
4 **IN THE COLLABORATIVE ARE SATISFIED WITH THE PROGRESS**
5 **THAT HAS BEEN MADE?**

6 A. While I cannot speak for others, as time goes on, I have observed increasing
7 frustration among Collaborative members at the slow progress and ambiguity
8 surrounding Duke's decision-making process, including concern with Duke's
9 handling of stakeholder program recommendations that I discussed above.
10 Stakeholders are left wondering what to expect between the time of program
11 recommendation submission and the Company either implementing program
12 modifications or submitting a program application for approval at the Commission
13 (or rejecting the recommendation, if that is their decision). I continue to believe
14 that the Collaborative provides a valuable vehicle for this type of program
15 development work, but to date there has been little to show for all the effort
16 Collaborative members have contributed towards developing program concepts for
17 inclusion in DEP's DSM/EE portfolio.

18 **Q. WHAT DO YOU RECOMMEND?**

19 A. I recommend that DEP expeditiously finalize the evaluation and development of
20 program recommendations proposed by Collaborative members for direct
21 implementation or submission of program applications to the Commission for
22 approval. I also recommend that going forward DEP track the efficiency savings
23 associated with Collaborative-sponsored program recommendations and report
24 them to the Collaborative and in future DEP DSM/EE Recovery Rider filings. As

25 I have previously testified, the Collaborative would benefit from more direction

1 from the Commission, including clear timelines for producing specific deliverable
2 outcomes. Without that direction, the tendency is for the Collaborative to be a place
3 for discussion with no clear action.

4 **VII. Achieving Greater Efficiency Savings Impact for Low-Income**
5 **Customers**

6 **Q. WHAT HAS THE COMMISSION PREVIOUSLY SAID REGARDING THE**
7 **DEVELOPMENT OF LOW-INCOME ENERGY EFFICIENCY**
8 **PROGRAMS IN ITS PREVIOUS ORDERS?**

9 A. Consistent with its statements in previous years, the Commission’s Final Order in
10 the 2020 DEP Rider Docket E-2, sub 1252 stated:

11 The Collaborative should continue to emphasize developing EE programs
12 that assist low income customers in saving energy and reducing their
13 energy burdens.

14 **Q. WHAT LEVEL OF SAVINGS DOES DEP PROJECT FOR ITS LOW-**
15 **INCOME PROGRAMS IN 2022?**

16 A. Neighborhood Energy Saver accounts for 4.7 GWh of system energy reductions in
17 DEP’s estimated load impacts for 2022.⁴³ These programs are forecasted to account
18 for just 1% of total residential energy savings in 2022. Nevertheless, if achieved,
19 this would be a 27% increase in total energy savings for DEP’s low-income
20 programs compared to its 2019 pre-pandemic performance.

21 **Q. HOW DO OVERALL SAVINGS LEVELS FOR LOW-INCOME**
22 **EFFICIENCY PROGRAMS AT DEP COMPARE TO THOSE AT DEC?**

23 A. In past years, DEP’s low-income efficiency program performance has trailed far
24 behind DEC. In 2019, DEP’s 3.7 GWh of savings⁴⁴ paled in comparison to the
25 more than 9 GWh DEC saved customers through its low-income efficiency
26 programs.⁴⁵ For 2022, DEP is projecting 4.7 GWh of savings from its income

⁴³ Evans Exhibit 1, p. 5, NCUC Docket No. E-2, Sub 1273.

⁴⁴ Evans Exhibit 1, p. 3, Docket No. E-2, Sub 1252.

⁴⁵ Evans Exhibit 1, p. 3, Docket No. E-7, Sub 1230.

1 qualified efficiency programs. DEC's projected 9.8 GWh of low-income program
2 savings for 2022⁴⁶ are 208% higher than DEP's and its annual budget is 265%
3 higher, despite DEC having only 62% more residential customer accounts.⁴⁷

4 **Q. HOW DO THE LOW-INCOME PROGRAMS OFFERED BY DEP**
5 **COMPARE TO THOSE OFFERED BY DEC?**

6 A. Both DEP and DEC operate neighborhood-style low-income programs and both
7 use the same program administrator, Honeywell Building Services. But DEC also
8 operates the Income Qualified Weatherization program, administered by the North
9 Carolina Community Action Association, which delivers deeper individual savings
10 for each participating household. DEP launched a Buncombe County Pay for
11 Performance pilot program in 2019 that includes deeper saving measures, but it
12 currently contributes only a little to the Company's overall savings and has been
13 less successful at delivering deep efficiency savings than DEC's income qualified
14 weatherization program. As noted above, DEP's total low-income program savings
15 also fall far short of the levels achieved by DEC.

16 **Q. WHAT ARE SOME OF THE AVAILABLE OPTIONS FOR EXPANDING**
17 **DEEPER SAVING EFFICIENCY PROGRAMS FOR LOW-INCOME**
18 **CUSTOMERS?**

19 A. There are several options for expanding deeper efficiency savings programs for
20 DEP's low-income customers.

21 One option is to essentially replicate the regular DEC Income Qualified
22 Weatherization program model, which I have advocated for in previous DEP Rider
23 proceedings. The company could also deploy a modified version of this program,

⁴⁶ Evans Exhibit 1, p. 5, Docket No. E-7, Sub 1249.

⁴⁷ EIA 861 2020.

1 patterned off of the related Income Qualified Weatherization pilot program DEC
2 offered in Durham from late 2018 through the end of 2019. Another option would
3 be to dramatically scale up DEP's Pay for Performance Pilot, if such an expansion
4 is deemed feasible and likely to deliver comparable results.

5 Or, DEP could increase funding and deployment of the expanded set of deeper
6 efficiency saving measures for the Neighborhood Energy Saver⁴⁸ program that
7 were previously approved by the Commission but never fully implemented due to
8 the COVID-19 pandemic. If the Company pursued this route, it should also offer
9 programming for low-income customers that includes HVAC equipment
10 replacement, which is the largest source of energy use in a typical home and has
11 been a major component of the DEC Income Qualified Weatherization program
12 and the Durham Pilot. DEP could also build on recent progress by significantly
13 expanding the number of LIHTC projects it serves.

14 These examples are illustrative and not intended to be exhaustive. Additional
15 approaches could focus on particular housing types like multifamily and
16 manufactured homes, or measures like heat pump water heaters, and new program
17 marketing and delivery methods.

18 Regardless of which program designs are pursued, there will likely be trade-offs
19 between potential total savings impact, cost per kWh savings, and average savings
20 per participant. Whichever approach is ultimately taken, I recommend that these
21 three factors be carefully and transparently weighed in the decision-making process

⁴⁸ Often called NES 2.0.

1 with a strong emphasis placed on optimizing programs to deliver meaningful
2 impact for individual customers with high energy burdens.

3 **Q. WHAT IS THE BASIS OF YOUR ASSERTION THAT MORE POTENTIAL**
4 **EXISTS TO COORDINATE DSM/EE PROGRAM PARTICIPATION**
5 **WITH LIHTC?**

6 A. In 2020, the North Carolina Housing Finance Agency awarded forty-two 9%
7 LIHTC projects and an additional twenty-four tax-exempt bond projects. South
8 Carolina Housing awarded seventeen 9% LIHTC projects in 2020.⁴⁹ The LIHTC
9 program provides a reliable, annual pipeline of projects available for energy
10 efficiency investments. In the near future, I encourage Duke to work towards a
11 target that 100% of projects applying for LIHTC in its service territory are
12 reviewed to identify relevant DSM/EE program offerings, then report on an annual
13 basis the number of LIHTC applications reviewed, the conversion rate for
14 participation by these projects, and through which program. To do so, DEP should
15 work with the state housing finance agencies to ensure all LIHTC projects move
16 through its DSM/EE program offerings, without it depending on individual project
17 administrators having to become aware of and initiate the process from their end.

18 **Q. HOW MIGHT LESSONS LEARNED FROM THE DEC DURHAM PILOT**
19 **INFORM POTENTIAL CHANGES TO LOW-INCOME PROGRAM**
20 **OFFERINGS IN THE FUTURE?**

21 A. As noted above, the Durham Pilot involved a modified delivery for the DEC
22 Income-Qualified Weatherization Assistance program. This included providing a
23 larger than typical package of improvements and working with low-income

⁴⁹ Housing Tax Credit (LIHTC), South Carolina State Housing Finance and Development Authority,
available at: <https://www.schousing.com/Home/HousingTaxCredits>.

1 customers with comparatively high energy intensity. The program was also able to
2 serve customers who were unable to access the federal Weatherization Assistance
3 Program dollars due to overly long wait lists or health, safety, and incidental repair
4 needs. According to DEC:

5 For participation in the Durham Pilot, previous Neighborhood Energy
6 Saver Program neighborhoods in Durham, NC were targeted via direct
7 mail. Income eligibility for the Pilot was 200% of federal income
8 poverty guidelines and their kWh usage per home square foot was 7 kWh
9 or greater. These income-eligible customers were offered Tier 2
10 Weatherization (insulation, air sealing, and duct sealing, baseload
11 lighting and domestic hot water measures), HVAC replacement and
12 some health and safety improvements.⁵⁰

13 In total, 206⁵¹ homes were served, including 59⁵² whose participation was made
14 possible because they also received supplemental Helping Home Funds to address
15 required health, safety, and incidental repair needs prior to the efficiency
16 improvements.

17 A recently released EM&V report by Opinion Dynamics for the DEC Income
18 Qualified Weatherization Program included a process evaluation of the Durham
19 Pilot, which included the following statement:

20 Duke Energy launched the Durham Pilot in 2018, with the intent to
21 determine how and if the current DEC Weatherization Program design
22 could be improved and expanded into Duke Energy Progress (DEP)
23 service territory.⁵³

24 The EM&V reports concludes its Process Findings summary by concluding:

⁵⁰ *Testimony and Exhibits of Forest Bradley-Wright*, NCUC Docket No. E-7, Sub 1249 (May 10, 2021), Exhibit FBW-3.

⁵¹ Opinion Dynamics (for Duke Energy Carolinas), “Low Income Weatherization Program (2016-2018) Evaluation Report – Final.” April 2021, p. 5.

⁵² Duke presentation to the Collaborative on July 14, 2021 entitled “Duke Energy’s Income Qualified Weatherization Pilot,” attached as Exhibit FBW-9.

⁵³ Opinion Dynamics (for Duke Energy Carolinas), “Low Income Weatherization Program (2016-2018) Evaluation Report – Final.” April 2021, p. 41.

1 [A] program design similar to the Durham Pilot could be a good option for
2 bringing weatherization services to customers in South Carolina and/or the DEP
3 service territory.⁵⁴

4 I strongly concur with this conclusion and encourage DEP and the Commission to
5 move forward expeditiously with developing a comparable deep efficiency
6 program offering for its low-income customers.

7 **Q. ARE YOU AWARE OF ADDITIONAL HELPING HOME FUNDS BEING**
8 **ALLOCATED TO ASSIST WITH DELIVERING EFFICIENCY SAVINGS**
9 **TO LOW-INCOME CUSTOMERS?**

10 A. Yes, Public Interest Intervenors were parties to a partial Settlement Agreement
11 with DEC and DEP during their most recent rate case proceedings in which both
12 companies committed to providing a combined \$3 million to the Helping Home
13 Fund (HHF) over the next two years, for a total of \$6 million. The Commission
14 approved the settlement terms reached by the Stipulating Parties.

15 Last year, I submitted testimony in DEP's DSM/EE Rider proceeding on behalf of
16 Public Interest Intervenors that emphasized the valuable role these funds play in
17 augmenting traditional ratepayer funded low-income energy efficiency programs.
18 For instance, 59 of the 206 customers served through DEC's Durham Pilot received
19 HHF for vital repairs, without which they would typically not have been able to
20 receive energy efficiency upgrades.

21 Now that these funds have been committed, it is crucial that this money be spent
22 strategically to leverage and extend the impact of DEP and DEC's ratepayer funded
23 low-income efficiency programs to the maximum extent. One constructive
24 approach would be to use the HHF dollars almost exclusively to cover health,

⁵⁴ *Id.*

1 safety, and incidental repairs and/or fund additional improvements beyond the
2 individual house budgetary limits in the ratepayer funded low-income programs
3 for the households with the greatest need. In the near term, this could be
4 accomplished by funding health, safety, and incidental repairs for customers being
5 served by the Neighborhood Energy Saver 2.0 program, as well as providing
6 HVAC replacement to these customers when needed. Going forward, I hope DEP
7 will deploy a low-income deep efficiency program comparable to the DEC Income
8 Qualified Weatherization program or the associated Durham Pilot, then use the
9 HHF funds predominantly to supplement it with health, safety, and incidental
10 repairs, serving customers who would otherwise be excluded from the ratepayer
11 program, or providing additional measures beyond per household spending caps to
12 match improvements to customer needs. Doing so will not only extend the life of
13 these HHF dollars, it will lead to deeper savings that truly address energy burden
14 while enabling many customers to participate who otherwise would have been
15 turned away.

16 **Q. ARE YOU AWARE OF DEP'S COMMITMENT TO WORK WITH THE**
17 **COLLABORATIVE TO DEVELOP AND SEEK APPROVAL FOR NEW**
18 **LOW-INCOME ENERGY EFFICIENCY PROGRAMS?**

19 A. Yes, in the same rate case settlement, DEC and DEP agreed to work with the
20 Stipulating Parties to develop additional low-income energy efficiency programs
21 that will be presented to the Collaborative and, if supported by a majority of the
22 group, will then be submitted to the Commission for approval.

23 Not only is this an important step in the right direction for advancing ongoing
24 efforts to expand low-income efficiency program impact, it is also significant that
25 this arrangement has a timeline with specific actions leading up to a program

1 application filing to the Commission. Experience over the past two years at the
2 Collaborative has shown that without such specific deliverables and deadlines, new
3 program concepts get bogged down with no clear path to implementation. I would
4 again urge the Commission to order the Company to make the Collaborative
5 function more effectively by requiring specific deliverables to be met on a defined
6 time scale.

7 **Q. HOW DOES DEP DETERMINE BUDGETS AND SAVINGS TARGETS**
8 **FOR ITS LOW-INCOME EFFICIENCY PROGRAMS?**

9 A. Despite frequent conversations about expanding low-income efficiency programs,
10 it is still unclear how DEP determines its low-income efficiency program budgets
11 and savings targets. In response to this question during discovery, DEP stated:

12 Budget and savings targets are determined by the filed participation
13 numbers for our low-income programs. The participation numbers are
14 generated based on the potential and the workload needed to successfully
15 reach a high completion/penetration rate. Consideration is also given that
16 these programs are not cost-effective.⁵⁵

17 This July, Duke presented the Collaborative with two slides meant to explain the
18 budget differences between DEP and DEC.⁵⁶ Like the discovery answer above, the
19 Company's explanation at this meeting was also ambiguous, and raised new
20 questions, such as:

- 21 • How can it be that programs are driven by customer demand when the
22 number of customers served and budgets are predetermined and
23 constrained by the vendor contract? For this reason, historical

⁵⁵ DEP Response to SACE et al. Data Request 1-30, attached as Exhibit FBW-10.

⁵⁶ Slides presented to the Collaborative on Income Qualified Budgeting on July 14, 2021, attached as Exhibit FBW-11.

1 performance is not a meaningful indicator of customer demand, which is
2 known to be much larger.

- 3 • Are DEP's spending and savings levels (adjusted for differences in
4 relative number of residential customers) so much lower than DEC's
5 intentionally? If not, is DEP willing to bring its spending and savings
6 levels up proportionately with a corresponding timeline?

7 **Q. WOULD YOU STILL RECOMMEND INCREASING DEP'S LOW-**
8 **INCOME EFFICIENCY PROGRAM SAVINGS AND BUDGETS?**

9 A. I would. Unlike most non-income qualified efficiency programs DEP offers that
10 are driven by individual customer demand, the Neighborhood Energy Saver
11 program is delivered by third parties (such as Honeywell) with fixed budgets that
12 are set by DEP. From the answer DEP provided above regarding its low-income
13 programs, it seems that the kWh savings are based on the number of measures or
14 customers that the program administrators are contracted by DEP to serve. Thus, it
15 would appear that the key limiting factor in how many customers get served and at
16 what level of savings is DEP's internal budget setting and not the scale of customer
17 need. If DEP brought its annual budget for income qualified efficiency programs
18 up to the levels proposed by DEC for 2022 (adjusted proportionately based on
19 residential customer counts), this would equate to \$5.4 million annually.

20 **Q. WHAT DO YOU RECOMMEND?**

21 A. I recommend that the Commission direct DEP to increase its low-income
22 efficiency program budgets to at least match those of DEC on a per-residential
23 customer basis, which would result in a floor of \$5.4 million annually. DEP should
24 then work with the Collaborative on setting new savings targets for its income-

1 qualified programs, which would then be reported to the Commission in its next
2 DSM/EE Recovery Rider filing.

3 **VIII. Implications of the COVID-19 Pandemic**

4 **Q. AT A HIGH LEVEL, WHAT IMPLICATIONS DID THE COVID-19**
5 **PANDEMIC HAVE FOR DEC'S DSM/EE PERFORMANCE IN 2020?**

6 A. DEP performed better than many other major utilities in the region, as discussed in
7 greater detail below. This was in part because DEP was among the first utilities in
8 the Southeast to implement new safety protocols enabling it to resume some in-
9 home energy efficiency services. Again, DEP is to be commended for how it
10 responded to the pandemic, which indicates a level of commitment, flexibility, and
11 initiative that will serve the Company well if it accepts the challenge of pursuing
12 the savings target of 1% of prior-year retail sales.

13 **Q. HOW DID DEP'S APPROACH TO PROGRAM DELIVERY AND ITS**
14 **OVERALL ENERGY EFFICIENCY PERFORMANCE DURING THE**
15 **PANDEMIC COMPARE TO OTHER UTILITIES?**

16 A. In the early days of the pandemic, on-site efficiency services ground to a halt for
17 DEP and all utilities across the country. This led to significant declines in
18 efficiency program savings. Unfortunately, the steepest declines were often in
19 programs that serve, low-income customers – the very people who needed them
20 most. DEP was among the first utilities in the Southeast to implement new safety
21 protocols and resume in-home energy efficiency services after the pandemic. The
22 exception, however, were DEP's low-income and multi-family programs, which
23 saw steep savings declines of 84% and 76% respectively.
24 DEP's overall energy efficiency performance was relatively high in comparison to
25 several other utilities in the region, particularly those in Georgia and Florida.

1 However, DEP’s performance trailed far behind that of Entergy Arkansas, which
 2 was actually able to improve program performance in spite of the pandemic.
 3 Notably, the Arkansas Public Service Commission has established annual
 4 efficiency savings targets of 1.2%, which Entergy Arkansas was able to surpass
 5 even during the pandemic. Below is a table of selected utilities for comparison:

6 **Table 5. Energy Efficiency Performance of Selected Utilities 2019-2020**

Utility Name	2019	2020
Entergy Arkansas ⁵⁷	1.10%	1.35%
Duke Energy Progress	0.78%	0.70%
Georgia Power ⁵⁸	0.46%	0.28%

7 **Q. IN WHAT WAYS CAN ENERGY EFFICIENCY BE PART OF A**
 8 **STRATEGY TO ASSIST CUSTOMERS IMPACTED BY THE PANDEMIC**
 9 **WHILE REDUCING THE COST TO ALL CUSTOMERS FOR**
 10 **UNCOLLECTIBLE BILLS?**

11 A. For customers that struggled financially during the pandemic, energy efficiency
 12 improvements could provide extra money to help them afford current and past due
 13 electric bills that are now in repayment. DEP knows exactly which customers have
 14 overdue balances and has the opportunity to target deployment of its efficiency
 15 program services directly to those customers.

16 Programs to serve low-income customers with past due bills could come in a
 17 number of different forms, ranging from customer self-install kits combined with
 18 a personalized virtual consultation, to deeper retrofit programs potentially
 19 patterned after those offered by DEC’s Income Qualified Weatherization Program

⁵⁷ Performance calculated using net savings and total retail sales from Entergy Arkansas Standardized Annual Reporting Workbook for 2020 Program Year filed in APSC Docket No. 07-085-TF. Net savings for 2020 found in “Table 1” tab; all other figures used are found in “Prior Year Portfolio.”

⁵⁸ Calculated using EIA Form-861 for all figures except for 2020 savings, which were obtained from the 2020 Fourth Quarter DSM Report filed in Georgia PSC Docket No. 42311 (Feb. 15, 2021), available at: <https://psc.ga.gov/search/facts-document/?documentId=184364>.

1 and its Durham Pilot Program. Participation in efficiency programs could even be
2 matched with partial debt forgiveness.

3 Ultimately, these steps could make enough of a difference for customers to
4 complete their repayment plans and prevent uncollectible bills from being passed
5 on to the general body of ratepayers. Doing so could also prevent disconnections
6 and the attendant consequences that can result, like damaged credit scores,
7 additional financial challenges, health risks, and in some cases eviction.

8 **IX. The Role of DSM/EE for Achieving North Carolina's**
9 **Decarbonization Targets**

10 **Q. HAS DUKE ENERGY MADE COMMITMENTS TO REDUCE ITS**
11 **CARBON EMISSIONS?**

12 A. Yes. Duke Energy has made a commitment to its customers and shareholders to
13 reduce carbon dioxide emissions by 50% by the year 2030, and further to net zero
14 by 2050.⁵⁹

15 **Q. HOW DO DEP'S DSM/EE PROGRAMS CONTRIBUTE TO MEETING**
16 **THESE DECARBONIZATION OBJECTIVES?**

17 A. Energy saved through Duke's DSM/EE programs reduce total energy waste and
18 lessen reliance on the Company's fossil fuel generators. As such, DSM/EE is one
19 of the most effective means by which the utility can lower carbon emissions. Duke
20 has specifically highlighted the relationship between energy efficiency and
21 reaching its net zero goal, stating:

22 Some of the most effective carbon reductions we can make involve
23 helping customers avoid energy usage in the first place. Again, regulatory
24 or legislative policies related to climate change can prove to be a driver
25 for opportunities for increased deployment of energy efficiency.⁶⁰

⁵⁹ Achieving a Net Zero Carbon Future, Duke Energy 2020 Climate Report. Link: https://desitecoreprod-cd.azureedge.net/_/media/pdfs/our-company/climate-report-2020.pdf?.

⁶⁰ *Id.*

1 **Q. HOW DO ANNUAL DSM/EE RECOVERY RIDER PROCEEDINGS**
2 **INTERSECT WITH THE GOVERNOR’S EMISSION REDUCTION**
3 **COMMITMENTS?**

4 A. As detailed at greater length in testimony I filed for DEC’s DSM/EE Rider earlier
5 this year,⁶¹ in 2018, North Carolina Governor Roy Cooper committed to reducing
6 greenhouse gas emissions by 40% in all sectors by 2025.⁶² The corresponding
7 statewide Clean Energy Plan (“CEP”) went further and established an overall goal
8 of reducing *power sector* emissions by 70% from 2005 levels by 2030.⁶³ As one of
9 the largest utilities in the state, Duke Energy Progress is a substantial contributor
10 to power sector emissions in North Carolina. As noted above, efficiency not only
11 offsets the need for fossil fuel generation, it is the least cost energy resource,
12 making expansion of DEP’s DSM/EE programs an essential tool for achieving
13 North Carolina’s emission reduction commitments.

14 **Q. HAS DEP REPORTED ON THE CARBON REDUCTION IMPACT OF ITS**
15 **DSM/EE PORTFOLIOS?**

16 A. No, to my knowledge DEP has not reported the carbon reduction impact of its
17 DSM/EE portfolios, neither in its DSM/EE Rider filings nor anywhere else. While
18 general estimates can be made using per megawatt-hour emissions rates, it would
19 be instructive for the Company to conduct and provide its own analysis. Rather
20 than generalizing with an annual average, such an analysis could match efficiency
21 savings with the corresponding marginal emissions rate of the power generation it

⁶¹ *Testimony and Exhibits of Forest Bradley-Wright*, NCUC Docket No. E-7, Sub 1249 (May 10, 2021).

⁶² Executive Order No. 80, North Carolina’s Commitment to Address Climate Change and Transition to a Clean Energy Economy, Governor Roy Cooper. October, 2018, *available at*:
<https://governor.nc.gov/documents/executive-order-no-80-north-carolinas-commitment-address-climate-change-and-transition>.

⁶³ North Carolina Clean Energy Plan (CEP), North Carolina Department of Environmental Quality (NCDEQ), October 2019, *available at*:
https://files.nc.gov/governor/documents/files/NC_Clean_Energy_Plan_OCT_2019_.pdf.

1 offsets to account for key factors like time of day, time of year, and location. Such
2 an exploration could enable consideration of not only the emissions reductions
3 resulting from total energy savings, but also factor in the performance of its
4 DSM/EE portfolio during specific times of the year, including during peak vs. off-
5 peak hours.

6 **Q. DO YOU HAVE ANY RECOMMENDATIONS FOR THIS PROCEEDING**
7 **CONCERNING CARBON EMISSIONS TRACKING?**

8 A. Yes. The Commission should direct DEP to report carbon reductions from its
9 DSM/EE portfolios and discuss future strategies to decarbonize through its
10 portfolio in DSM/EE recovery rider dockets going forward. Doing so would
11 provide the Commission, and the public, with important insight into the
12 relationship between investments made in DEP's DSM/EE programs and the
13 utility's progress towards achieving the Company and the State's decarbonization
14 goals. This information could also prove useful in aiding the Company to optimize
15 program delivery to increase carbon emissions reductions. To my knowledge, there
16 is no other proceeding where DEP reports the carbon emissions reductions
17 alongside its annual DSM/EE portfolio savings results. The annual DSM/EE Rider
18 docket would appear to be the best place for regular reporting of this data.

19 **X. Conclusion**

20 **Q. DO YOU HAVE ANY CONCLUDING STATEMENT?**

21 A. Yes, I want to thank the Commission for the Orders it has issued in various
22 proceedings over the past year that facilitate improvements and expansions of
23 DEP's DSM/EE portfolio, as well as policy changes that continue to evolve the
24 underlying policy framework for DSM/EE in North Carolina, which is the

1 foundation of this work. I respectfully ask for the Commission's consideration of
2 the actionable recommendations summarized at the beginning of this testimony.
3 Even as there is much still to achieve, what has been accomplished already should
4 be a source of great pride, as it continues to keep North Carolina ahead of its peers
5 in the Southeast region. This concludes my testimony.

CERTIFICATE OF SERVICE

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

This the 9th day of September, 2021.

s/ Tirrill Moore

Tirrill Moore

PROFESSIONAL EXPERIENCE

Energy Efficiency Director: Southern Alliance for Clean Energy, Knoxville, TN **April 2018 – Present**

- Regulatory filings, testimony, strategy, and stakeholder management on integrated resource planning, energy efficiency program design, cost recovery and related matters throughout the Southeast.

Senior Policy Director: Alliance for Affordable Energy, New Orleans, LA **February 2017 – April 2018**

- Regulatory filings, strategy, and stakeholder management on integrated resource planning and energy efficiency rulemaking, power plant proposals and related matters at the city and state level.

Consultant: Utility Regulation and Energy Policy **December 2014 – February 2017**

- Technical and strategic guidance on clean energy policy and utility regulation for Opower, Gulf States Renewable Energy Industries Association, the Alliance, and Mississippi PSC candidate Brent Bailey.

Candidate: Louisiana Public Service Commission **July - December 2014**

- Won the open primary and secured 49.15% of the vote in the general election against a highly favored, well-funded incumbent.
- Raised nearly \$500,000 in campaign contributions while publicly pledging not to accept money from monopoly companies regulated by the PSC.
- Campaign focused on ethical leadership, reducing bills, energy efficiency, the rights of customers to generate solar energy, and government transparency.

Utility Policy Director: Alliance for Affordable Energy, New Orleans, LA **October 2005 – June 2014**

- Directed successful policy efforts for energy efficiency, renewable energy, and integrated resource planning at the Louisiana PSC and New Orleans City Council, spurring every major Louisiana utility investment in clean energy over the past decade.
- Reviewed and filed intervenor comments, met with commissioners, utilities, and technical consultants, assembled and managed relationships with a broad coalition of stakeholders, worked with media, and served as the organization's public face.
- Launched and managed energy efficiency and solar workforce training programs, public education campaigns, and direct service projects to improve energy performance in over 100 homes following the city's rebuild post-Katrina.

Owner and Director: EcoPark LLC (d.b.a. The Building Block), New Orleans, LA **February 2008 – Present**

Created an innovative co-location business center to serve as a catalyst for moving green commerce and social entrepreneurship to the mainstream.

- Developed the business concept and plan, brought initial funding to the project, hired staff, established brand identity, and secured tenants.

Sustainable Development Team Facilitator: Shell International, New Orleans, LA **May 2001 – June 2004**

- Worked to facilitate a paradigm shift within corporate management's core business practices toward social and environmental issue management.
- Engaged a diverse team of professionals across the company to identify energy and resource inefficiencies and methods to reduce carbon emissions from venting and flaring in oil and natural gas exploration and production.
- Analyzed ways to incorporate sustainability accounting into each stage of new venture development for major drilling projects.

EDUCATION

Tulane University

- **Master of Arts in Latin American Studies, 2011**
Concentration in environmental law, business, and international development
- **Bachelor of Arts with Honors in Latin American Studies, 2001**

EXPERT WITNESS TESTIMONY

Forest Bradley-Wright, Direct Testimony on Behalf of Southern Alliance for Clean Energy, North Carolina Justice Center, and North Carolina Housing Coalition. Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C.G.S. §62-133.9 and Commission Rule R8-69; Docket No. E-7, Sub 1249. May 10th, 2021.

Forest Bradley-Wright, Direct Testimony on Behalf of Southern Alliance for Clean Energy, North Carolina Justice Center, and North Carolina Housing Coalition. Application of Duke Energy Progress, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C.G.S. §62-133.9 and Commission Rule R8-69; Docket No. E-2, Sub 1252. August 26th, 2020.

Forest Bradley-Wright, Direct Testimony on Behalf of Southern Alliance for Clean Energy, North Carolina Justice Center, and North Carolina Housing Coalition. Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C.G.S. §62-133.9 and Commission Rule R8-69; Docket No. E-7, Sub 1230. May 22nd, 2020.

Forest Bradley-Wright, Direct Testimony on Behalf of Southern Alliance for Clean Energy, North Carolina Justice Center, and North Carolina Housing Coalition. Application of Duke Energy Progress, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C.G.S. §62-133.9 and Commission Rule R8-69; Docket No. E-2, Sub 1206. August 19th, 2019.

Forest Bradley-Wright, Direct Testimony on Behalf of Southern Alliance for Clean Energy and League of United Latin American Citizens. Docket Nos. 20190015-EG, 20190016-EG, 20190018-EG, 20190019-EG, 20190020-EG, 20190021-EG- Commission Review of Numeric Conservation Goals for Florida Power & Light, Gulf Power Company, Duke Energy Florida, Orlando Utilities Commission, Jacksonville Electric Authority, Tampa Electric Company. June 10th, 2019.

Forest Bradley-Wright, Direct Testimony on Behalf of Southern Alliance for Clean Energy and North Carolina Justice Center, Application of Duke Energy Carolinas, LLC for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C.G.S. §62-133.9 and Commission Rule R8-69; Docket No. E-7, Sub 1192. May 20th, 2019.

Forest Bradley-Wright, Direct Testimony on Behalf of Southern Alliance for Clean Energy, Georgia Power Company's Application for the Certification, Decertification, and Amended Demand Side Management Plan, Docket No. 42311. April 25th, 2019.

OTHER REGULATORY FILINGS

Forest Bradley-Wright, Comments on Behalf of Southern Alliance for Clean Energy, Re: Mississippi Power Company's Notice of IRP Cycle Pursuant to Commission Rule 29 – MPSC Docket 2019-UA-231. March 22nd, 2021

Forest Bradley-Wright, Comments on Behalf of Southern Alliance for Clean Energy, Re: Proposed amendment of Rule 25-17.0021 F.A.C., Goals for Electric Utilities – FPSC Docket No. 20200181. February 15th, 2021

Forest Bradley-Wright and George Cavros, Comments on Behalf of Southern Alliance for Clean Energy, Re: Entergy Mississippi, LLC Notice of IRP Cycle Pursuant to Commission Rule 29 – MPSC Docket 2019-UA-232. July 17th, 2020

Forest Bradley-Wright, Comments on Behalf of Southern Alliance for Clean Energy, Re: Mississippi Power Company's Notice of IRP Cycle Pursuant to Commission Rule 29 – MPSC Docket 2019-UA-231. March 24th, 2020

Forest Bradley-Wright, Comments on Behalf of Southern Alliance for Clean Energy, Order Establishing Docket to Investigate the Development and Implementation of an Integrated Resource Planning Rule – MPSC Docket 2018-AD-64. February 15th, 2019

Forest Bradley-Wright and Daniel Brookeshire, Comments on Behalf of North Carolina Sustainable Energy Association and Southern Alliance for Clean Energy, Duke Energy Progress, LLC's Proposed Non-Profit Low-Income Weatherization Pay for Performance Pilot, Docket No. E-2, Sub 1187. November 9th, 2018

Forest Bradley-Wright, Comments on Behalf of Southern Alliance for Clean Energy, Order Establishing Docket to Investigate the Development and Implementation of an Integrated Resource Planning Rule – MPSC Docket 2018-AD-64. August 1st, 2018

Forest Bradley-Wright and Logan Burke, Comments on Behalf of Alliance for Affordable Energy, Rulemaking to Study the Possible Development of Financial Incentives for the Promotion of Energy Efficiency by Jurisdictional Electric and Natural Gas Utilities, Louisiana Public Service Commission Docket R-31106. June 20th, 2017

Forest Bradley-Wright and Logan Burke, Comments on Behalf of Alliance for Affordable Energy, Rulemaking to Establish Integrated Resource Planning Components and Reporting Requirements for Entergy New Orleans, Docket No. UD-17-01. May 25th, 2017

Forest Bradley-Wright and Logan Burke, Comments on Behalf of Alliance for Affordable Energy, Rulemaking to Study the Possible Development of Financial Incentives for the Promotion of Energy Efficiency by Jurisdictional Electric and Natural Gas Utilities, Louisiana Public Service Commission Docket R-31106. March 7th, 2017

Forest Bradley-Wright and Jeff Cantin, Post Hearing Brief on Behalf of Gulf States Renewable Energy Industries Association, Petition for a Certificate of Convenience and Necessity for Alabama Power, Docket No. 32382. August 19th, 2015

PUBLICATIONS

Forest Bradley-Wright and Heather Pohnan, Third Annual Energy Efficiency in the Southeast Report, Southern Alliance for Clean Energy. January 26th, 2021

Forest Bradley-Wright and Heather Pohnan, Energy Efficiency in the Southeast 2019 Annual Report, Southern Alliance for Clean Energy. January 21st, 2020

Forest Bradley-Wright and Heather Pohnan, Energy Efficiency in the Southeast 2018 Annual Report, Southern Alliance for Clean Energy. December 12th, 2018

SACE et al.
Docket No. E-2, Sub 1273
DSM-EE Rider
SACE Data Request No. 1
Item No. 1-20
Page 1 of 1

DUKE ENERGY PROGRESS, LLC

Request:

Please provide DEP's line loss assumptions for 2020 used to convert savings on the customers' side of the meter to savings at the generator:

- a. For energy; and
- b. For peak demand.
- c. Please specify if they are based on average or marginal line loss rates.

Response:

- a. and b. DEP applied a line loss factor of $(1+0.051)$ to convert savings "at the meter" to savings "at the generator" for both energy and peak demand.
- c. The 5.1% value represents an average loss rate.

Person responding: Melissa Adams, Manager, Program Performance

SACE et al.
Docket No. E-2, Sub 1273
DSM-EE Rider
SACE Data Request No. 1
Item No. 1-4
Page 1 of 1

DUKE ENERGY PROGRESS, LLC

Request:

For each program in DEP's DSM/EE portfolio, please provide:

- a. UCT and TRC cost-effectiveness test scores with corresponding total costs and benefits for 2016, 2017, 2018, 2019, and 2020, including:
 - i. A detailed explanation of the inputs and calculation methods used for UCT and TRC
 - ii. An illustrative example showing how the calculations are done using a common efficient HVAC measure.
- b. The projected cost effectiveness scores for each program in the 2021 and 2022 forecasts;
- c. The measures and programs offered in 2018, 2019, and 2020 that were removed because there were deemed no longer cost effective for 2021 and 2022;
- d. Measures and programs that have UCT and/or TRC cost effectiveness score between 0.85 and 0.99 that were not included in DEP's 2021 and 2022 portfolios along with their respective cost effectiveness scores and projected kW and kWh savings impact that would have been expected if they had been included.

Response:

The Company objects to SACE DR 1-4(a) (ii), requesting an illustrative example showing how calculations are done using a common HVAC measure, on the ground that it is requesting the Company to perform a new and additional analysis. That objection notwithstanding, and without waiving said objection, please refer to "SACE DR 1-4 a and b.xlsx" and "SACE DR 1-4 c and d.docx."



SACE%20DR%201-4
%20a%20and%20b.xl



SACE%20DR%201-4
%20c%20and%20d.d

Person responding: Steven A. LoConte, Senior Program Performance Analyst

1-4. For each program in DEP’s DSM/EE portfolio, please provide:

a. UCT and TRC cost-effectiveness test scores with corresponding total costs and benefits for 2016, 2017, 2018, 2019, and 2020, including:

i. A detailed explanation of the inputs and calculation methods used for UCT and TRC

ii. An illustrative example showing how the calculations are done using a common efficient HVAC measure.

b. The projected cost effectiveness scores for each program in the 2021 and 2022 forecasts;

Note: Minor variances in Total Portfolio NPV of AC and Program Costs due to rounding

		2016					
a/b		NPV of AC	Program Cost	Participant Incentives	NPV Participant Costs (net)	UCT	TRC
	Appliance Recycling Program	76,177	(129,701)	(50,266)	-	-0.59	-0.96
	Appliances and Devices	-	-	-	-		
	Energy Education Program for Schools	1,693,087	783,357	213,524	-	2.16	2.97
	EnergyWise Home	70,854,171	6,887,758	5,487,905	-	10.29	50.62
	Home Energy Improvement	6,991,688	5,692,422	4,298,396	9,582,983	1.23	0.64
	Neighborhood Energy Saver	1,167,680	1,943,051	1,203,816	-	0.60	1.58
	Multi-Family Energy Efficiency Program	7,155,924	1,936,126	697,690	-	3.70	5.78
	My Home Energy Report	7,524,461	5,575,910	-	-	1.35	1.35
	Residential Energy Assessments	4,853,362	1,342,291	202,452	-	3.62	4.26
	Residential New Construction	19,280,066	8,903,911	7,975,698	12,942,488	2.17	1.39
	Energy Efficient Lighting	44,883,085	16,511,512	14,347,450	6,858,992	2.72	4.97
	Save Energy and Water Kit	13,873,513	638,558	371,460	-	21.73	51.94
	Residential Service - Smart\$aver	-	-	-	-		
	Low Income Weatherization Pilot						
	Energy Efficiency for Business	47,824,935	13,404,039	11,208,315	28,768,577	3.57	1.54
	Business Energy Report	309,365	65,808	-	-	4.70	4.70
	Non-Res SmartSaver Performance	-	24,482	-	-	0.00	0.00
	Commercial, Industrial, & Governmental Demand Response	(10,684,733)	-	-	-		
	EnergyWise for Business	164,697	1,053,456	46,835	-	0.16	0.16
	Small Business Energy Saver	32,988,897	8,838,269	8,173,844	13,318,382	3.73	2.36
	Non-Residential Smart \$aver Prescriptive	-	-				
	Non-Residential Smart \$aver Custom	-	-				
	Total Portfolio	248,956,375	73,471,249	54,177,117	71,471,423	3.39	2.74

i UCT is the sum of the net present value of avoided capacity, energy and T&D divided by total program costs

TRC is the sum of the net present value of avoided capacity, energy and T&D divided by the sum of total program costs and the participant costs less participant incentives

ii See the UCT and TRC columns for part a for the formulas used to calculate the UCT and TRC

2017						2018				
NPV of AC	Program Cost	Participant Incentives	NPV Participant Costs (net)	UCT	TRC	NPV of AC	Program Cost	Participant Incentives	NPV Participant Costs (net)	UCT
-	5,339	-	-	0.00	0.00	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
1,376,442	799,072	216,906	-	1.72	2.36	1,261,493	676,815	191,202	-	1.86
62,410,503	6,502,032	6,094,495	-	9.60	153.14	55,969,845	5,817,271	5,179,747	-	9.62
6,313,442	6,654,031	5,151,334	11,690,091	0.95	0.48	-	-	-	-	-
1,117,743	1,702,549	1,177,799	-	0.66	2.13	1,682,598	1,845,739	1,264,146	-	0.91
10,163,052	2,403,372	961,410	-	4.23	7.05	8,510,661	2,409,743	768,609	-	3.53
6,972,509	6,454,921	-	-	1.08	1.08	9,855,291	7,687,891	-	-	1.28
5,512,365	1,781,190	213,628	12,908	3.09	3.49	5,373,630	1,851,965	242,814	10,940	2.90
21,481,837	11,156,278	9,654,017	15,834,693	1.93	1.24	22,773,890	13,189,949	11,169,768	9,823,602	1.73
39,549,493	11,689,156	10,354,220	7,648,783	3.38	4.40	33,768,459	9,815,496	7,837,838	-	3.44
17,187,186	849,614	622,934	-	20.23	75.82	10,207,890	825,279	408,963	-	12.37
-	-	-	-	-	-	6,300,631	7,168,833	5,595,885	9,077,791	0.88
-	-	-	-	-	-	-	-	-	-	-
77,891,372	20,789,293	18,402,384	51,782,736	3.75	1.44	-	-	-	-	-
737	19,432	-	-	0.04	0.04	-	-	-	-	-
335,899	140,661	46,706	209,151	2.39	1.11	810,508	201,559	138,274	646,499	4.02
3,551,967	1,393,650	1,269,200	-	2.55	28.54	1,413,457	1,154,642	1,187,855	-	1.22
858,655	1,329,140	-	-	0.65	0.65	151,899	2,108,030	629,260	-	0.07
26,945,514	8,383,422	7,733,531	12,633,064	3.21	2.03	22,343,579	8,858,213	7,857,678	11,929,015	2.52
-	-	-	-	-	-	65,320,575	11,515,913	9,131,886	23,055,883	5.67
-	-	-	-	-	-	8,907,939	2,174,163	1,111,868	4,935,057	4.10
281,668,716	82,053,151	61,898,563	99,811,427	3.43	2.35	254,652,345	77,301,500	52,715,794	59,478,787	3.29

2019

TRC	NPV of AC	Program Cost	Participant Incentives	NPV Participant Costs (net)	UCT	TRC	NPV of AC	Program Cost
-	-	-	-	-	-	-	-	-
-	10,419,429	2,160,799	1,099,624	1,379,802	4.82	4.27	8,646,551	3,051,854
2.60	1,039,694	747,483	186,360	200,113	1.39	1.37	456,210	388,273
87.79	53,221,850	5,806,874	5,617,524	-	9.17	281.08	8,817,400	1,110,200
-	-	-	-	-	-	-	-	-
2.89	1,438,897	1,671,298	1,095,666	1,174,420	0.86	0.82	196,865	401,046
5.19	5,977,179	2,156,484	567,005	620,998	2.77	2.70	1,389,245	892,251
1.28	11,676,738	6,299,307	-	-	1.85	1.85	10,897,311	7,369,336
3.32	4,344,111	2,113,798	168,539	189,464	2.06	2.03	4,050,428	2,160,729
1.92	19,396,567	15,113,951	12,656,251	11,233,867	1.28	1.42	22,840,461	18,861,261
17.07	35,415,070	13,447,031	11,329,673	7,252,368	2.63	3.78	20,092,826	5,995,694
24.52	-	-	-	-	-	-	-	-
0.59	5,417,341	6,411,758	4,338,824	6,539,280	0.84	0.63	5,453,175	6,517,089
-	75,533	27,356	19,092	-	2.76	9.14	61,168	51,370
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
1.14	606,333	267,186	129,784	482,944	2.27	0.98	1,239,947	386,339
(42.56)	4,394,068	1,811,347	1,242,733	-	2.43	7.73	2,964,614	1,352,902
0.10	923,654	2,412,880	1,005,890	123,454	0.38	0.60	686,030	1,896,524
1.73	17,456,367	7,301,790	6,380,717	10,838,854	2.39	1.48	10,837,185	5,004,816
2.57	31,482,596	7,877,838	5,763,360	11,646,372	4.00	2.29	28,517,362	7,863,953
1.49	9,658,177	2,776,482	1,580,493	4,849,778	3.48	1.60	9,481,018	3,514,807
3.03	212,943,604	78,403,665	53,181,535	56,531,713	2.72	2.60	136,627,796	66,818,443

2020				2021					
Participant Incentives	NPV Participant Costs (net)	UCT	TRC	NPV of AC	Program Cost	Participant Incentives	NPV Participant Costs (net)	UCT	TRC
-	-			-	-	-	-		
1,188,978	1,379,802	2.83	2.67	13,099,464	1,552,345	946,542	687,571	8.44	10.13
83,075	200,113	1.17	0.90	1,372,059	998,933	280,177	264,916	1.37	1.39
6,592,211	-	7.94	(1.61)	13,517,088	6,906,770	4,588,239	-	1.96	5.83
-	-			-	-	-	-		
165,786	1,174,420	0.49	0.14	1,834,467	2,102,637	1,727,124	1,674,021	0.87	0.90
162,346	620,998	1.56	1.03	7,060,550	2,673,548	746,801	734,182	2.64	2.65
-	-	1.48	1.48	11,325,840	7,016,406	-	-	1.61	1.61
143,311	189,464	1.87	1.84	7,550,953	3,713,085	343,145	473,797	2.03	1.96
16,331,257	11,233,867	1.21	1.66	19,911,473	15,182,173	13,448,496	12,650,072	1.31	1.38
4,787,340	7,252,368	3.35	2.37	7,651,434	3,850,337	3,225,136	1,957,577	1.99	2.96
-	-			-	-	-	-		
4,726,175	6,539,280	0.84	0.65	2,764,092	4,842,705	2,909,158	5,023,872	0.57	0.40
16,932	-	1.19	1.78	-	-	-	-		
-	-			-	-	-	-		
-	-			-	-	-	-		
256,693	482,944	3.21	2.02	1,721,451	608,576	392,157	1,358,245	2.83	1.09
1,401,894	-	2.19	(60.51)	4,596,557	2,590,719	2,435,930	-	1.77	29.70
917,440	123,454	0.36	0.62	941,042	3,446,547	1,724,705	75,666	0.27	0.52
4,105,057	10,838,854	2.17	0.92	14,886,828	7,420,102	6,756,705	11,361,733	2.01	1.24
5,660,029	11,646,372	3.63	2.06	39,254,442	11,648,055	8,726,018	20,761,927	3.37	1.66
1,716,319	4,849,778	2.70	1.43	10,047,403	3,932,557	2,301,091	7,130,008	2.55	1.15
48,254,845	56,531,713	2.04	1.82	157,535,145	78,485,496	50,551,423	64,153,584	2.01	1.71

2022

NPV of AC	Program Cost	Participant Incentives	NPV Participant Costs (net)	UCT	TRC
-	-	-	-		
13,976,572	5,032,531	3,921,740	7,103,274	2.78	1.70
1,850,249	1,265,659	372,363	342,638	1.46	1.50
4,145,545	2,911,345	945,751	-	1.42	2.11
-	-	-	-		
2,590,613	3,063,705	2,453,001	2,279,880	0.85	0.90
4,982,779	1,924,548	1,250,294	1,075,574	2.59	2.85
10,729,556	6,543,763	-	-	1.64	1.64
7,838,136	3,422,188	344,880	476,184	2.29	2.21
20,458,026	15,144,537	13,937,691	12,814,919	1.35	1.46
12,414,397	5,700,439	4,664,172	2,340,979	2.18	3.68
-	-	-	-		
3,338,996	3,301,534	1,939,350	5,521,478	1.01	0.49
85,792	86,901	27,400	-	0.99	1.44
-	-	-	-		
-	-	-	-		
1,123,866	401,977	248,952	862,250	2.80	1.11
4,671,542	2,210,447	2,032,888	-	2.11	26.31
804,045	2,904,079	1,911,715	-	0.28	0.81
25,640,082	10,322,430	8,663,452	15,877,605	2.48	1.46
39,447,957	12,680,811	9,296,095	17,040,091	3.11	1.93
10,548,581	4,610,576	2,458,112	7,226,284	2.29	1.12
164,646,734	81,527,471	54,467,856	72,961,155	2.02	1.65

SACE et al.
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DSM-EE Rider
SACE Data Request No. 1
Item No. 1-21
Page 1 of 1

DUKE ENERGY PROGRESS, LLC

Request:

Please provide a spreadsheet of total energy savings achieved by each of the Company's DSM/EE programs, in GWh, for 2018, 2019, and 2020.

Response:

Please see attached file, "SACE - DR1-21," for total energy savings achieved by each of the Company's DSM/EE programs, in GWh, for 2018, 2019, and 2020.



SACE DR1-21.xlsx

Person responding: Steven A. LoConte, Senior Program Performance Analyst

SACE DR 1-21

1-21. Please provide a spreadsheet of total energy savings achieved by each of the Company's DSM/EE programs, in GWh, for 2018, 2019, and 2020.

	2018 System Energy Reduction (GWh)	2019 System Energy Reduction (GWh)	2020 System Energy Reduction (GWh)
Residential Programs			
EE Programs			
1 Appliance Recycling Program	-	-	-
2 Energy Efficient Appliances and Devices	15.25	19.59	18.78
3 Energy Education Program for Schools	2.56	3.28	1.46
4 Energy Efficient Lighting	25.64	33.35	18.94
5 Residential Service – Smart \$aver	7.23	6.76	6.89
6 Low Income Weatherization Pilot	-	0.13	0.11
7 Multi-Family Energy Efficiency	13.83	11.86	2.82
8 Neighborhood Energy Saver	3.54	3.70	0.51
9 Residential Energy Assessments	7.75	7.83	7.15
10 Residential New Construction	14.26	16.34	20.01
11 Save Energy and Water Kit	-	-	-
12 Total for Residential Conservation Programs	90.08	102.83	76.66
13 My Home Energy Report (1)	164.07	154.60	154.96
14 Total Residential Conservation and Behavioral Programs	254.14	257.44	231.63
15 EnergyWise	-	-	-
16 Total Residential	254.14	257.44	231.63
	2018 System Energy Reduction (GWh)	2019 System Energy Reduction (GWh)	2020 System Energy Reduction (GWh)
Non-Residential Programs			
EE Programs			
17 Business Energy Report	-	-	-
18 Energy Efficient Lighting	6.76	8.78	4.99
19 Energy Efficiency for Business	-	-	-

20 Non-Residential Smart \$aver - Prescriptive	84.98	49.68	46.35
21 Non-Residential Smart \$aver Custom	11.90	13.13	12.77
22 Non-Residential Smart \$aver Performance Incentive	1.52	1.36	3.10
23 Small Business Energy Saver	40.30	36.43	23.47
24 Total for Non-Residential Conservation Programs	<u>145.46</u>	<u>109.38</u>	<u>90.69</u>
25 EnergyWise for Business	0.04	1.06	0.55
26 Commercial, Industrial, & Governmental Demand Response	-	-	-
27 Total for Non-Residential DSM Programs	<u>0.04</u>	<u>1.06</u>	<u>0.55</u>
28 Total Non Residential	<u>145.50</u>	<u>110.44</u>	<u>91.24</u>
29 Total All Programs	<u>399.64</u>	<u>367.87</u>	<u>322.86</u>
30 DSDR	48.06	38.08	32.10
31 Total with DSDR	<u>447.70</u>	<u>405.96</u>	<u>354.96</u>

(1) My Home Energy Report impacts reflect cumulative capability as of end of vintage year

(2) Total System DSM programs allocated to Residential and Non-Residential based on contribution to retail system peak

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Docket No. E-2, Sub 1273
DSM-EE Rider
SACE Data Request No. 1
Item No. 1-18
Page 1 of 1

DUKE ENERGY PROGRESS, LLC

Request:

Please provide a calculation of DSM/EE portfolio savings with and without line loss (1) as a percentage of total annual sales; and (2) as a percentage of annual sales to non-opt-out customers:

- a. for the year 2020 (as a percentage of 2019 retail sales); and
- b. forecasted for the year 2022 (as a result of forecasted 2021 sales).

Response:

The Company objects to this data request on the ground that it requests the Company to perform new work or analysis.

Person responding: Melissa Adams, Manager, Program Performance

SACE et al.
Docket No. E-2, Sub 1273
DSM-EE Rider
SACE Data Request No. 1
Item No. 1-36
Page 1 of 1

DUKE ENERGY PROGRESS, LLC

Request:

In Docket E-2, Sub 931, the Commission authorized DEP to shift from using the Total Resource Cost test to the Utility Cost Test as the primary basis for evaluating the cost effectiveness of energy efficiency programs, beginning in 2022. Please indicate how much additional savings DEP is projecting for 2022 using the UCT compared to what would have been achieved using the TRC, both in aggregate and broken out by program.

Response:

The Company objects to this data request on the ground that it requests the Company to perform a new analysis or projection and because it seeks information that is not relevant to this annual rider proceeding. Without waiving said objection, the Company provides as follows:

No additional savings are projected for 2022 using the UCT compared to TRC. There have been no changes to program offerings based on the shift from TRC to UCT for the 2022 projection.

Person responding: Steven A. LoConte, Senior Program Performance Analyst



Pathways for Energy Efficiency in Virginia

Scenarios for Virginia Electric and Power Company to Achieve
the Virginia Clean Economy Act Energy Efficiency Savings Goals

Prepared by:

Liz Bourguet and Jim Grevatt

June 3, 2021

Energy Futures Group, Inc

PO Box 587, Hinesburg, VT 05461 – USA |  802-482-5001 |  802-329-2143 |  info@energyfuturesgroup.com

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About the Authors

Energy Futures Group (EFG) is a clean energy consulting firm based in Hinesburg, Vermont and with offices in Boston and New York. EFG specializes in the design, implementation and evaluation of programs and policies to promote investments in energy efficiency, renewable energy, other distributed resources, and strategic electrification. EFG staff have worked on these issues on behalf of energy regulators, other government agencies, utilities and advocacy organizations across the United States, Canada, Europe, and China.

Liz Bourguet is a Senior Analyst at Energy Futures Group in Hinesburg, Vermont. She joined EFG in 2020 after graduating from the Yale School of Forestry and Environmental Studies with a Master of Environmental Management, specializing in environmental policy analysis. Her capstone report, Opportunities and Challenges for Investor-Owned Utilities in a Changing Climate, prepared for the Natural Resources Defense Council, assessed grid modernization and utility financing in the face of increasing wildfires in California. Her professional experience includes work for National Wildlife Federation and Environmental Advocates of New York, where she organized environmental campaigns, drafted policy recommendations, advocated for environmental legislation through lobbying and public outreach, and conducted research on energy policy and transportation issues. Most recently she held an internship with the US Climate Alliance, where she provided research and recommendations on best practice climate policies to the coalition of states committed to the Paris Agreement.

Jim Grevatt has 30 years of experience in energy efficiency program planning and operations. At Energy Futures Group Jim has advised regulators, program implementers, and advocates in twenty-three states and provinces, and has provided expert witness testimony in fourteen of those jurisdictions. Jim has hands-on experience with industry-leading approaches to designing and managing energy efficiency programs, including multi-family, low income, residential retrofit, new construction, HVAC, and efficient products programs. His in-depth knowledge of program operations and clear understanding of strategic thinking and planning ensure that programs achieve their desired market impacts. In past leadership roles at Efficiency Vermont, the DCSEU, and Vermont Gas, Jim had overall responsibility both for program design and operations, assuring that programs were efficient and effective.

Energy Futures Group, Inc

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I. Executive Summary

Introduction and Purpose

This report was developed to explore whether, by effectively implementing a suite of energy efficiency programs similar to those currently implemented by other large utilities, Virginia Electric and Power Company (“Dominion” or “Company”) can meet and exceed the savings requirements of the Virginia Clean Economy Act (“VCEA”). The report was requested by a group of clean energy non-profits in Virginia, including the National Housing Trust (“NHT”), The Nature Conservancy (“TNC”), the Virginia chapter of the Advanced Energy Economy (“Virginia AEE”), and the American Council for an Energy Efficient Economy (“ACEEE”).¹

To support our analysis we created a model that builds off the programs that have been approved for implementation by the State Commerce Commission (“SCC” or “Commission”) prior to 2021.² The model incorporates reported costs and savings from a dozen large utility energy efficiency portfolios (“comparison utilities” or “comparison portfolios”)³ and allows comparison of the savings results of user-defined scenarios that describe different combinations of programs at varying penetration levels. We created four different sample scenarios that highlight different policy priorities while maintaining opportunities for all eligible customer sectors, in each case demonstrating compliance with VCEA savings requirements. ***Our work shows that meeting the 2022-2025 savings requirements is achievable without extraordinary or unusual efforts by simply implementing the kinds of energy efficiency programs that commonly provide the majority of energy savings for leading electric utilities.*** The Company can meet its savings requirements with longer lasting comprehensive savings for commercial and residential customers, lower cost but shorter-lived measures, or a reasonable balance of the two. In each case we find the Company can also meet the VCEA requirements for energy efficiency investments for low-income communities, however these expenditures must increase significantly as other programs ramp up if the Company is to meet this obligation. Dominion can continue to work with its stakeholders to identify program opportunities while also focusing on implementing and expanding the key programs that will drive savings results if it expects to meet its VCEA requirements.

¹ In this report, we refer to ACEEE, NHT, TNC, and Virginia AEE as the “core project team”.

² These are programs that have been approved in Phase I through Phase VIII, referred to in Dominion’s IRP as “Category 1” programs.

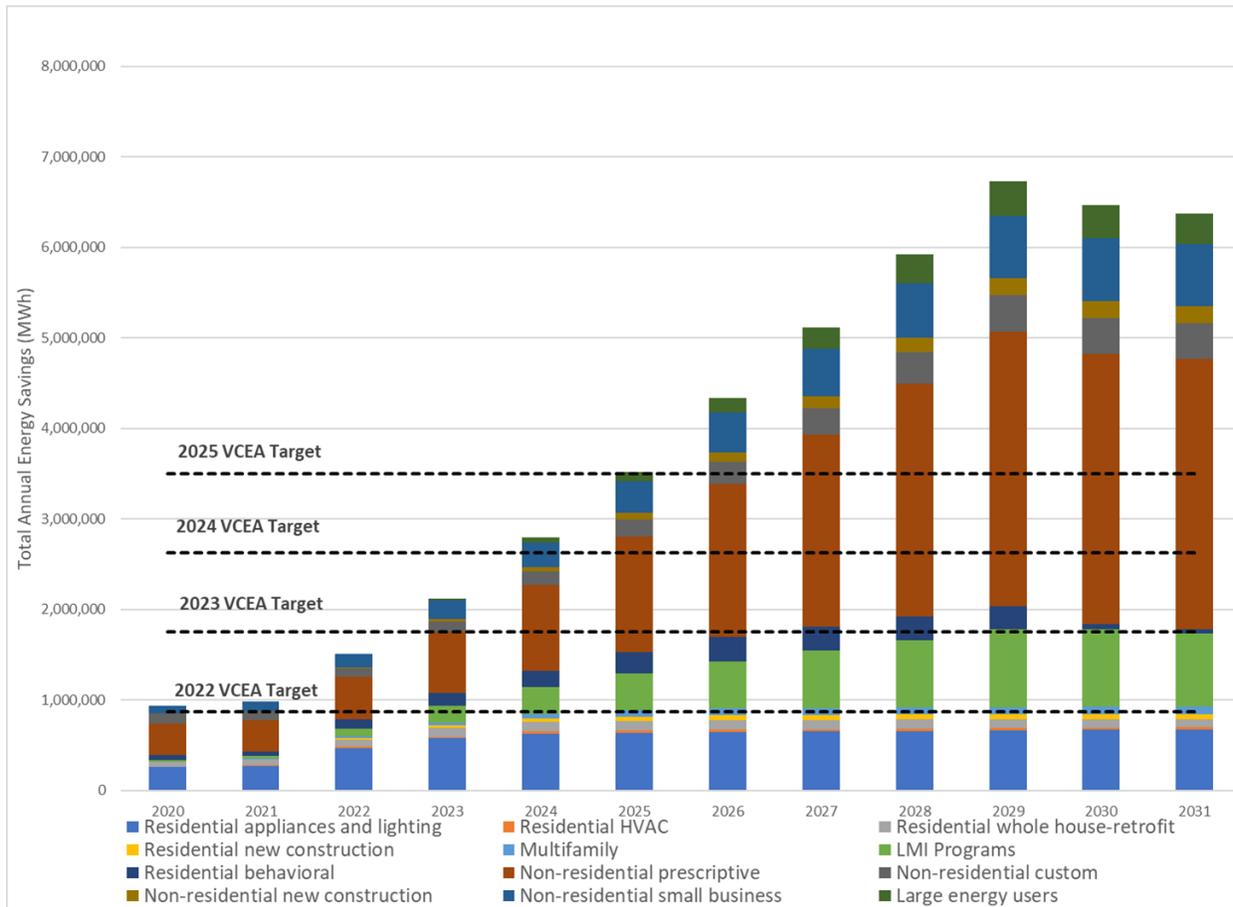
³ To learn more about how we selected and utilized comparison utilities see Appendix A.

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We further show that much of the savings achieved from programs geared towards meeting the 2022-2025 savings requirements are likely to persist through the decade – thus targets set by the Commission for 2026 and beyond should be achievable *and* should be established at considerably higher levels than the 5.0% total annual savings expected for 2025.

These points are illustrated below in Figure 1, which represents the expected results of the “Balanced Lower Cost”⁴ scenario:

Figure 1: Example Scenario that Meets 2022-2025 VCEA Savings Targets



While the evidence provided by other large utilities gives us confidence that these results are reasonable and achievable, it is also clear that Dominion must act quickly to ramp up its program savings if it is to comply with the statute. We discuss this further below.

⁴ The four scenarios are described in greater detail below.

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Energy Efficiency Savings Requirements

The VCEA, signed into law by Governor Northam in 2020, contains numerous provisions to accelerate Virginia’s transition to clean energy, including a requirement that certain utilities achieve specified energy efficiency savings beginning in 2022. The law requires that in 2022 Dominion achieve total annual energy efficiency savings equal to at least 1.25% of its 2019 annual jurisdictional retail electric sales.⁵ In 2023 the requirement doubles to 2.5%, then increases to 3.75% in 2024, and to 5.0% in 2025. Beginning in 2026, the law provides that the SCC shall establish new energy efficiency savings targets.

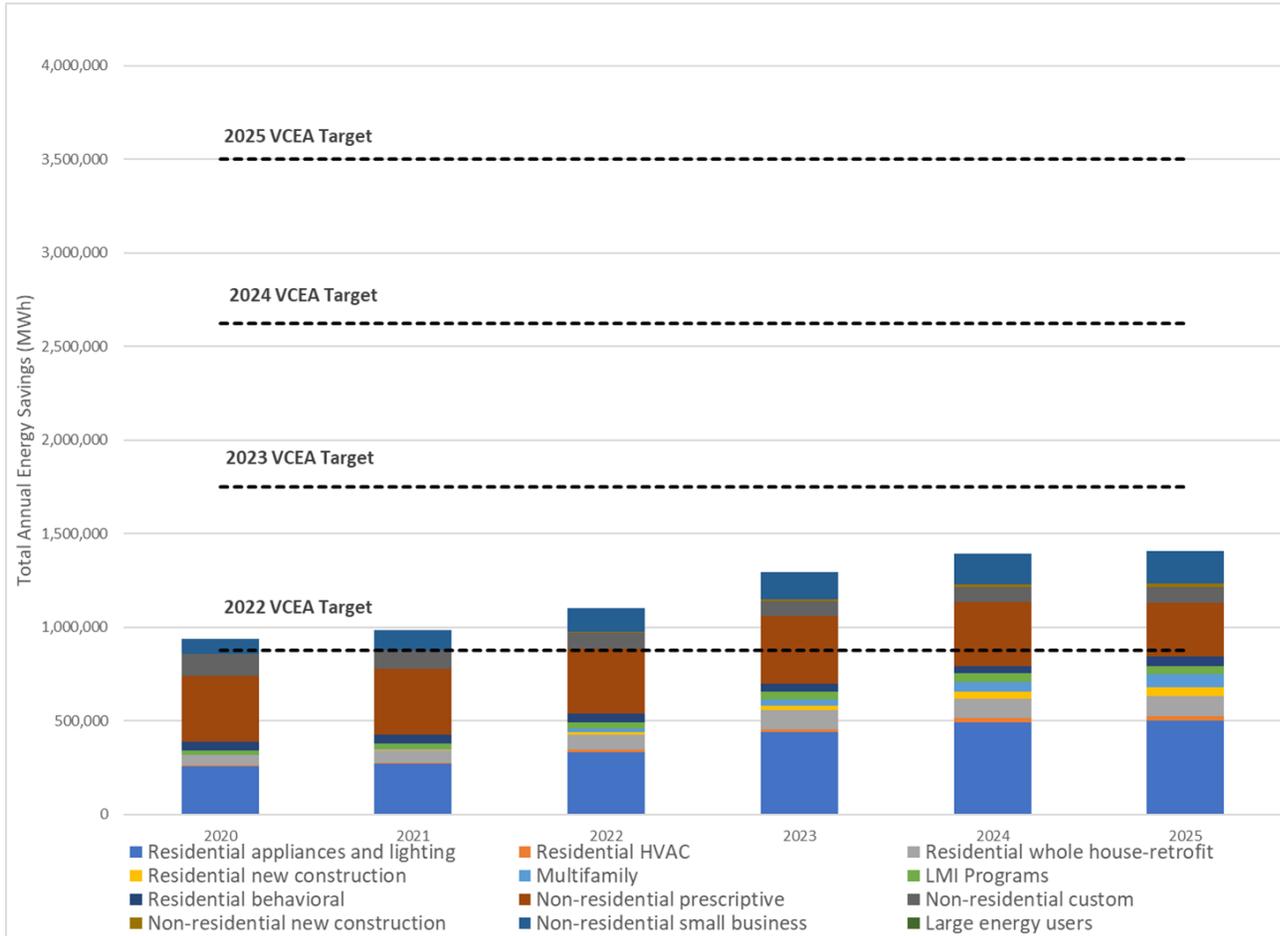
Figure 2 below is based on a scenario in which all new programs are set to “0” penetration so that only Dominion’s programs that were approved prior to 2021 are modeled. It illustrates our analysis showing that if Dominion successfully implements its programs, it should achieve its 2022 VCEA saving requirement simply through the programs that were approved prior to 2021. However, it also shows that savings must be increased rapidly for the utility to achieve the savings requirement in 2023-2025. When compared with Dominion’s modest portfolio of currently approved programs, achieving the VCEA requirements will demand significant increases in customer participation and a four-to-five-fold increase in incremental annual savings.⁶ This will only occur through focused planning and skillful program implementation. Because many other utilities are already implementing successful, large-scale programs, we conclude it is reasonable that Dominion can also do what is required to meet the VCEA requirements.

⁵ Total annual savings are the savings in a particular year from new measures installed in that year plus the savings still persisting from measures installed in prior years.

⁶ Incremental annual savings are the savings in a particular year **only** from new measures installed in that year. Incremental annual savings do not include savings from measures installed in earlier years that are still active.

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Figure 2: Savings from Dominion Programs Approved Prior to 2021

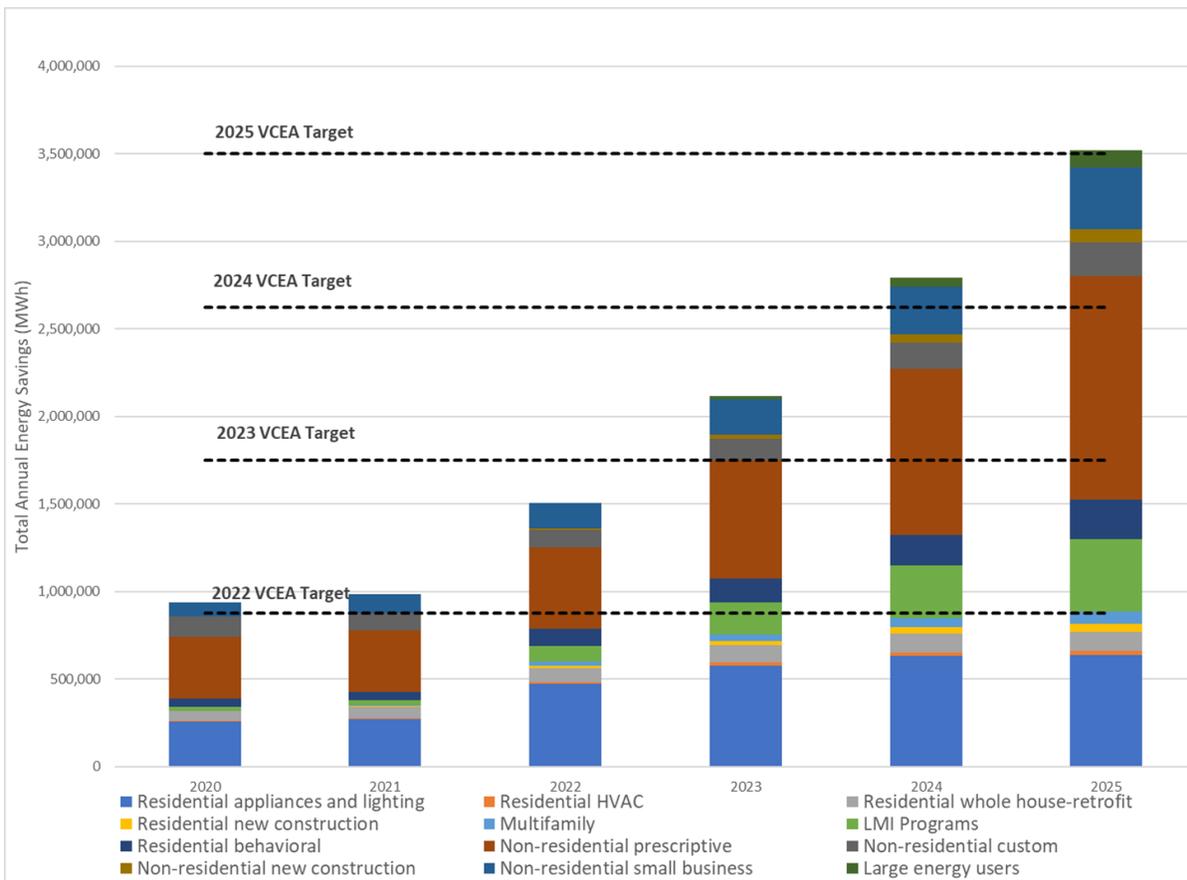


In Figure 3, we build programs up from the savings level illustrated in

Figure 2 to illustrate an example scenario in which the savings from programs approved by the SCC prior to 2021 are shown in 2020 and 2021 and then ramped up beginning in 2022 to achieve the VCEA savings requirements for 2023-2025. To ramp these programs up starting in 2022, we look to realistic program penetration rates achieved by other utilities.

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Figure 3: Example Scenario that Meets 2022-2025 VCEA Savings



VCEA Requirements for Historically Underserved Customers

The VCEA further provides that at least 15% of the proposed costs of the Company’s energy efficiency programs “shall be allocated to programs designed to benefit low-income, elderly, or disabled individuals or veterans”⁷ (“LMI”). The Company will need to rapidly and effectively ramp up not only its residential and non-residential energy efficiency programs to meet the VCEA requirements, but it will also need to increase the scale of its proposed programs for low-income, elderly, or disabled individuals or veterans. Because the LMI requirement is framed as a percentage of total proposed portfolio spending and because it is evident that Dominion must increase overall spending to meet the VCEA savings requirements, the Company clearly will also need to propose increased LMI spending. The Pathways model checks whether the proposed LMI

⁷ SB 851, lines 1866-1867.

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programs meet the 15% portfolio spending requirement, and each of the four sample scenarios we created complies.

Expected Results from Currently Approved Programs

Our analysis of Dominion’s currently approved (through Phase VIII) energy efficiency programs suggests that the Company could meet the VCEA savings requirement in 2022 if the approved programs achieve their intended results, but it will fall far short of meeting its obligations in 2023-2025 (as shown in Figure 2). It also appears that the approved program budgets will fall short of the 15% LMI requirement. In our analysis, the Company has proposed approximately \$355 million in total portfolio spending from 2020-2025, and just under \$39 million, or 11%, for total LMI programs in the same period.⁸ Looking only at the programs that were approved prior to 2021, the Company appears poised to achieve roughly 6%-8% of its portfolio spending for LMI programs in 2022 and 2023, far short of the 15% requirement. While the LMI percent of portfolio spending increases to between 13%-15% for approved programs in 2024 and 2025, it is important to recognize that the implementation, and thus the spending, of many programs that were approved in earlier phases will be completed in those years. As a result, the overall budgets from only programs that were approved prior to 2021 are much lower than will be required to achieve the energy savings requirements. In other words, overall portfolio spending must increase to meet the savings requirements, thus LMI investments must also increase to comply with the 15% of proposed spending requirement.

II. Different Scenario Approaches and Results

Leading utilities typically rely on similar types of programs to achieve the majority of their energy efficiency savings simply because, despite regional differences in the predominance of certain savings opportunities, the electric technologies that we rely on are more similar than they are different across different utility service territories. Residential and commercial lighting and controls, industrial process and operational efficiency, heating and cooling equipment efficiency and building shell improvements, motors, refrigeration, and appliances – all of these tend to provide relevant and cost-effective savings opportunities in many parts of North America, even though the specific savings levels may vary regionally. However, while there are many similarities between utility energy efficiency approaches, individual utilities may emphasize certain program

⁸ Program budgets through Phase VIII, assuming budget is allocated equally across five implementation years.

types over others based on the specific characteristics of their customer base and the policy priorities in their jurisdictions.

Dominion can meet its VCEA energy savings requirements through a variety of combinations of different program types, with each scenario reflecting differing priorities. In this report we highlight four example scenarios, but model users can explore additional scenarios in the Excel-based tool that we created. In the model, users can toggle each program between several different penetration levels and can determine ramp-up rates and start and stop years for program implementation to illustrate the multiple pathways available to Dominion to achieve its savings requirements.

The scenarios vary in emphasis and include energy efficiency portfolios focused on:

- 1) increased opportunities for historically underserved customers (“enhanced LMI”),
- 2) high residential savings (“high residential”),
- 3) small businesses (“high small business”), and
- 4) a “balanced” portfolio that seeks to provide some opportunities to all segments while minimizing program costs (“balanced lower cost”).

Each scenario adheres to the requirements that Dominion meet its 2022-2025 VCEA savings targets as well as its 15% spending requirement on programs serving LMI customers established by the VCEA. ***The four example scenarios above illustrate that Dominion can achieve its 2022-2025 VCEA targets and its spending commitment to LMI customers. Importantly, we found that if program costs for Dominion are in line with the average program costs of the comparison utilities’ portfolios, each of the four scenarios described below would also lead Dominion to comply with its Grid Transformation and Security Act (GTSA) requirement to propose at least \$870 million in energy efficiency program investments between 2018-2028.***

Below are descriptions of the four example scenarios that we modeled to illustrate how Dominion can meet its energy savings requirement while emphasizing savings for different customer segments. We illustrate the results of each of these example scenarios in Appendix B. While each scenario has a different emphasis, each includes a balanced portfolio of programs that delivers energy efficiency to multiple customer segments. In each example scenario the bulk of new programs are modeled to launch in 2022 and ramp up over several years.

1. The **enhanced LMI scenario** emphasizes programs that maximize savings for historically underserved customers and exceeds the 15% LMI spending requirement. The LMI program

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categories included are low-income multifamily, low-income single family, and low-income low cost, which includes programs such as LED or energy efficiency kits distributed through food banks and other avenues. This scenario is achieved through high levels of savings from each of the three LMI program categories. High levels of savings for this portfolio also come from non-residential prescriptive and small business programs. Moderate levels of savings come from each of the residential programs.⁹

2. The **high residential scenario** focuses on savings achieved from residential programs that provide significant savings to families and households. This includes high levels of savings from residential HVAC, whole house retrofits, new construction, market rate multifamily, and, to some extent, appliances, and lighting (reflecting changing standards and market maturity for screw-based LED lighting). This scenario also emphasizes LMI programs. This portfolio includes moderate levels of savings from non-residential prescriptive, small business, and large energy user programs.
3. The **high small business scenario** emphasizes energy savings for small business customers, while prioritizing non-residential prescriptive programs that could also benefit small businesses. In addition to its non-residential program focus, the scenario also achieves a moderate level of savings from residential LMI programs and residential appliances, near-term lighting, and behavioral programs.
4. The **balanced lower cost portfolio** is a portfolio of programs that reflect the lower end of potential program spending necessary for Dominion to meet VCEA targets through 2025 and its LMI spending requirement. It accomplishes this by balancing moderate levels of savings through residential energy efficiency programs with high-yield non-residential programs that provide the majority of the required savings. The residential programs include moderate levels of savings through residential behavioral, appliances and near-term retail lighting, and LMI programs. The non-residential programs include a high level of savings from the non-residential prescriptive program and moderate level of savings through non-residential small business and large energy users.

In

⁹ Spending and savings targets for LMI energy efficiency programs are a starting point for measuring equity across utilities' efficiency portfolios. Utilities can also consider other metrics to ensure an equitable distribution of benefits across their portfolio. For example, researchers at the University of Michigan developed the Energy Efficiency Equity baseline (E3b) to examine differences in socioeconomic characteristics and policy approaches in each utility service territory and understand how these factors change over time. See their report to learn more: poverty.umich.edu/research-publications/policy-briefs/a-multi-state-analysis-of-equity-in-utility-sponsored-energy-efficiency-investments-for-residential-electric-customers/

Figure 4 below, we provide a comparison of the costs and savings for the comparison portfolios with the four example scenarios we created in our model in implementation year 2025. The example scenario costs are higher than the comparison portfolios for two primary reasons. First, in each of the example scenarios, residential lighting savings are dramatically reduced compared with the 2018 comparison portfolios due to the likelihood of federal standards being implemented. Second, the 15% LMI spending requirement results in greater LMI expenditures than we found with many of the comparison portfolios.

Figure 4: 2025 Program Scenarios and 2018 Comparison Utilities (Nominal 2018 \$)

Portfolio totals	First year program costs	Total Incremental annual savings (MWh)	First year \$/MWh	Weighted Average Measure Life	Incremental lifetime savings (MWh)	Levelized cost (\$/MWh) in 2025
High Residential VCEA	\$ 232,395,980	944,443	\$ 246.07	10.24	9,671,806	\$ 31.29
Balanced Lower Cost VCEA	\$ 161,889,140	924,030	\$ 175.20	9.70	8,962,107	\$ 23.24
High Small Business VCEA	\$ 193,592,982	999,061	\$ 193.78	9.97	9,956,343	\$ 25.16
Enhanced LMI VCEA	\$ 227,414,935	1,055,232	\$ 215.51	10.21	10,778,819	\$ 27.45
Entergy Arkansas	\$ 50,930,300	255,930	\$ 199.00	14.74	3,772,407	\$ 19.40
MidAmerican Energy	\$ 63,804,277	322,760	\$ 197.68	13.60	4,389,538	\$ 20.38
Xcel Minnesota	\$ 107,451,885	565,220	\$ 190.11	12.80	7,234,811	\$ 20.46
Baltimore Gas and Electric	\$ 114,626,581	616,559	\$ 185.91	10.10	6,227,249	\$ 23.89
Consumers Energy	\$ 117,838,710	641,648	\$ 183.65	11.72	7,520,118	\$ 21.08
Ameren Missouri	\$ 66,483,135	364,080	\$ 182.61	11.25	4,095,898	\$ 21.61
Commonwealth Edison	\$ 352,988,361	2,064,720	\$ 170.96	9.90	20,440,728	\$ 22.31
DTE Electric	\$ 127,955,350	777,405	\$ 164.59	12.60	9,795,299	\$ 17.92
Duke Energy Carolinas	\$ 128,422,575	858,096	\$ 149.66	8.20	7,036,387	\$ 22.69
AEP Ohio	\$ 62,864,638	467,385	\$ 134.50	12.02	5,617,973	\$ 15.16
Duke Energy Ohio	\$ 32,134,301	292,107	\$ 110.01	9.31	2,719,521	\$ 15.07
First Energy Ohio	\$ 30,597,049	286,819	\$ 106.68	11.25	3,226,709	\$ 12.63

Each of the four scenarios illustrates a different approach that Dominion could use to meet its 2022-2025 energy savings targets within cost parameters that are consistent with comparison utilities.¹⁰ Beyond 2025, the scenarios show the potential for Dominion to achieve significant continued savings through 2030.

III. Savings Opportunities Beyond 2025

The VCEA calls for the Commission to assign savings requirements for the utilities after the current 2022-2025 period that is prescribed in statute. Utility programs, including those of many

¹⁰ Note that the 15% LMI spending requirement leads to higher overall portfolio costs than are representative of the comparison portfolios. The scenario modeling also reflects an end to retail efficient LED bulb promotions after 2023, based on assumed market maturity and implementation of federal lighting efficiency standards.

if not all of the comparison utilities, are operated on a multi-year basis, and energy savings opportunities will continue to exist for Dominion and its customers well beyond 2025. The model we developed allows the user to set start and end years for each base program, and we assumed that Dominion would ramp up energy efficiency programming at a rate necessary to meet the VCEA requirements – likely somewhere between 1.0%-1.5% incremental annual savings as a percent of sales on an ongoing basis. This level of savings is achievable, based on the accomplishments of the comparison utilities we used as the basis for our modeled results. Doing so would lead to significant bill savings for Virginians, improved economic conditions for customers, and would support reduced climate damage due to inefficient energy use.

By definition, maximizing the implementation of cost-effective energy efficiency reduces the Company's costs to meet its primary mandate: providing safe and reliable energy. Investments in energy efficiency can reduce the need for expensive infrastructure investments – costs which are ultimately borne by customers. When energy efficiency can make generation, transmission, and distribution investments unnecessary, or even when it can defer those investments for a period of time, it becomes a critical component of the Company's resource and investment management. For this reason, the VCEA calls for the Commission to determine future goals for Dominion. Our model suggests that there will continue to be ample opportunity for the Company to aggressively pursue energy efficiency goals, thus supporting its ability to meet its primary obligation at the lowest cost to customers.

IV. Conclusion

Our review of the program pathways used by a dozen comparably-sized utility energy efficiency providers, and the application of modeling based on their reported results, shows that Dominion can reasonably achieve the VCEA savings requirements with the timely, effective implementation of best-practice energy efficiency programs. Currently approved programs, should the Company achieve its planned savings, will only carry it towards its 2022 VCEA savings requirement. To meet savings requirements for 2023 and beyond, Dominion will need to aggressively increase its savings from energy efficiency programs. Dominion can pursue a variety of program and portfolio options, but it must act in the near term to begin ramping up such programs in order to meet its 2023-2025 savings obligations and maximize benefits for all Virginians. Dominion can continue to work with its stakeholders to identify program opportunities while also focusing on identifying and implementing expansion of the key programs that will drive savings results to meet its VCEA requirements.

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Appendix A – Methodology

In order to assess the implications of different combinations of programs and savings levels for Dominion to achieve its VCEA targets, we created an Excel-based modeling tool. The tool incorporates savings and costs from Dominion’s currently proposed and approved programs (through Phase VIII), as well as data from comparison utilities used to ground the model in realistic savings opportunities. We developed four example scenarios with varying levels of emphasis on specific program categories to illustrate how Dominion can meet its energy savings targets. Model users can develop new scenarios to further explore program emphases that align with their priorities.

The first step in the process of developing the model was to identify the common energy efficiency program types from which program administrators achieve most of their portfolio savings. Without attempting to model detailed specific program designs, we use these “base programs” to illustrate where Dominion would most reasonably focus its efforts to achieve the majority of its savings in the proposed scenarios. After receiving feedback from the core project team and from experts at EFG, we identified 12 base program categories. For residential programs, the base programs were appliances and lighting, HVAC, whole house-retrofit, new construction, multifamily (cross-cutting residential and commercial), low-income, and behavioral. We further divided the low-income category into single-family, multi-family, and low-income low cost. Non-residential base program categories included non-residential prescriptive, custom, new construction, small business, and large energy users. Note that while the model includes an appliances and lighting base program, historically the vast majority of savings in these program types have come from the promotion of efficient lightbulbs at retail locations. Given the likelihood of federal lighting standards implementation, and the inevitability of transformation in screw-based standard lighting, we recommend that any future use of the model to develop additional scenarios assume a very limited implementation time frame for retail lighting – if any at all – consistent with the approach we used.

We then mapped Dominion’s current and proposed programs to the base program categories. We consulted the core project team for this step. Dominion’s current and proposed programs served as an input for savings through 2025 in the model – the last implementation year for which the programs are currently approved.

In order to develop realistic scenarios for Dominion to achieve its VCEA targets, the model needed to include savings, costs, and average measure life data from similar utilities. We selected 12 comparison utilities achieving at least one percent incremental annual savings in relatively similar geographies, including utilities located in the Southeast or Midwest. These include AEP

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Ohio, Ameren Missouri, Baltimore Gas and Electric, Commonwealth Edison, Consumers Energy, Duke Energy Carolinas, DTE Electric, Duke Energy Ohio, Entergy Arkansas, MidAmerican Energy, First Energy Ohio, and Xcel Minnesota. Data for each utility come from their 2018 DSM annual reports.

We used the comparison portfolios to develop inputs for the model. First, we mapped each utility program to base program categories in order to easily create unified metrics. Programs that could not clearly be mapped to the base programs were not included, as our intent was not to represent all available program types, but rather to focus on the kinds of programs that large utilities have typically used to achieve high savings levels. Using reported program data available through the utilities' 2018 DSM annual reports, we determined savings, costs, and average useful measure life (when available) for each utility. We used sales data from the 2018 EIA Annual Electric Power Industry Report¹¹ to calculate savings as a percent of sector MWh sales for each base program for each utility. We used net savings where those were reported by the utilities and converted reported gross savings to net savings using the 83.1% default net to gross ratio that ACEEE calculated in its 2020 Utility Scorecard.¹² By dividing reported program costs by reported net annual MWh savings, we calculated costs per first year MWh saved. We also collected data from the comparison utilities' 2018 DSM annual reports for weighted average useful measure life ("EUL") by program for utilities that report this metric. Where EUL data were not specifically provided but lifecycle savings were reported in addition to annual savings, we used those data to calculate the EUL by program.

We then compiled the data from the comparison utilities and averaged them for each of the metrics (savings, costs, and average measure life) by base program to determine inputs for the model. We used the percentage of sectors sales for each base program as the input for penetration rates in the model scenarios. The average of percent sector sales across utilities served as the medium penetration rate for that base program. High penetration rate is the average of the three highest sector sales percentages, and the low penetration rate is the average of the three lowest. Costs for each base program are the average of all costs per MWh from the comparison utilities after we removed outliers from the calculation.¹³ We calculated the average

¹¹ U.S. Energy Information Administration, *Annual Electric Power Industry Report, Form EIA-861 detailed data files*, accessed October 28, 2020, www.eia.gov/electricity/data/eia861/.

¹² ACEEE 2020 Utility Scorecard, p.10. www.aceee.org/research-report/u2004.

¹³ Not all of the comparison utilities implemented programs that could be clearly mapped to our base program categories, and in some cases the range of program costs for the comparison utilities was large. Presumably, this

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measure life for each base program by taking the average of all comparison utilities reporting this metric.

We created an Excel-based modeling tool that projects multi-year total portfolio energy savings by summing savings from the base programs and the savings from Dominion’s approved and proposed programs. The model allows users to alter inputs for certain variables (penetration rate, ramp up period, and start/end date) that will change the level of savings achieved from the base programs (within given parameters) to calculate multi-year energy savings. We built protections into the model to limit users’ ability to develop scenarios that are not grounded in the empirical evidence provided by the comparison portfolios. For example, a user cannot create a scenario with base programs above the high penetration rate – even though it might be possible for a utility to achieve that higher level of savings. High penetration rate is not meant to represent a maximum achievable scenario; rather, it is intended to represent a savings level for which there is a high level of confidence in its achievability, based on the performance of the three highest performing utilities in our comparison for each base program. The input table from the model is illustrated below in Figure 5:

is primarily because of differences in implementation strategies. To reduce the likelihood of using costs in the model that were skewed by less representative programs, the high and low outlier costs were not included in the determination of average.

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Figure 5: Model Input Selection

Inputs - Start Here	Penetration rate	Ramp up years	Start year	End year
Residential appliances and lighting	MED	2	2022	2023
Residential HVAC	LOW	4	2022	2030
Residential whole house-retrofit	MED	4	2022	2030
Residential new construction	LOW	4	2024	2030
Multifamily	MED	4	2022	2030
Residential behavioral	MED	4	2022	2030
Non-residential prescriptive	HIGH	4	2022	2030
Non-residential custom	LOW	4	2022	2030
Non-residential new construction	LOW	4	2022	2030
Non-residential small business	MED	4	2022	2030
Large energy users	MED	4	2023	2030
LMI Programs:				
Low-income multifamily	MED	2	2022	2030
Low-income single family	MED	2	2022	2030
Low-income low-cost	MED	2	2022	2030

The modeling tool allows the user to change four variables for each base program to create new portfolio scenarios: penetration rate, ramp up period, year of program start, and end year of each program. Penetration rate is the level of uptake of a program, represented by a percent of Dominion’s sector sales. The options for input for penetration rate are zero, low, medium, and high. Each option represents a specified level of savings as a percent of sector sales and reflects the range of program achievement by comparable utilities and program administrators. The ramp up period describes the period of time a program requires to reach its full incremental annual savings level. The ramp up of savings increases linearly, and the input can be between one to five years. The start year and end year of each program define a program’s implementation life, indicating how long a new program will achieve incremental annual savings. New proposed programs will start in or after 2022 and their savings are added to those expected to occur as a result of Dominion’s programs that were approved prior to 2021. The model will project new incremental annual and total annual savings through 2031, to incorporate 10 years of savings from 2022, when the first modeled programs are implemented.

Once the model reflected the inputs of both Dominion’s Category 1 programs and the metrics from the comparison portfolios, we developed scenarios to illustrate pathways for Dominion to meet the VCEA targets. EFG consulted the core project team to create a list of scenarios most useful for Dominion and Virginia stakeholders. We developed the following scenarios: balanced

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lower cost, enhanced LMI, high residential, and high small business. These scenarios reflect varying emphasis on specific base programs. The enhanced LMI scenario, for example, places an emphasis on low-income programs and results in a spending more than the required 15 percent on LMI programs. Through each of these scenarios, Dominion could achieve its VCEA targets and LMI spending requirement.

The model indicates whether the inputs reflect a scenario in which Dominion would achieve its 2022-2025 targets and illustrates incremental annual savings and total annual savings in future years through 2031. The model also includes costs output, a determination of whether Dominion would meet the 15 percent LMI spending requirement in the scenario, and a comparison of the levelized costs in program implementation year 2025 of the user-created scenario to the levelized costs of the four example scenarios and the comparison utilities' 2018 reported portfolio results.¹⁴

¹⁴ Comparison utility data for the Cost Comparison tab were taken from ACEEE 2020 Utility Scorecard, Appendix B.

Table 1: Base Program \$/ First Year MWh Saved. Pink cells denote outliers

	AEP Ohio	Ameren Missouri	Baltimore Gas and Electric (BGE)	Commonwealth Edison (ComEd)	Consumers Energy	Duke Energy Carolinas (DEC)	DTE Electric	Duke Energy Ohio	Entergy Arkansas	MidAmerican Energy	First Energy Ohio	Xcel Minnesota	Average	Average - outliers removed
Residential appliances and lighting	\$ 136.49	\$ 202.91	\$ 146.39	\$ 165.01	\$ 148.77	\$ 222.59	\$ 124.78	\$ 112.18	\$ 215.86	\$ 201.09	\$ 106.62	\$ 58.21	\$ 153.41	\$ 151.17
Residential HVAC		\$ 233.06	\$ 945.19	\$ 735.04	\$ 322.36	\$ 1,030.96	\$ 392.09		\$ 188.08			\$ 516.17	\$ 545.37	\$ 538.28
Residential whole house-retrofit			\$ 681.35	\$ 393.34	\$ 665.94	\$ 366.40	\$ 356.60	\$ 405.80	\$ 314.29	\$ 708.19		\$ 1,901.08	\$ 643.67	\$ 511.09
Residential new construction	\$ 504.28		\$ 656.84	\$ 1,685.63	\$ 825.41		\$ 570.26			\$ 406.75		\$ 268.15	\$ 702.47	\$ 592.71
Multifamily					\$ 425.96	\$ 168.70	\$ 202.40		\$ 111.91	\$ 559.04		\$ 357.78	\$ 304.30	\$ 288.71
Low-income multifamily			\$ 2,782.80	\$ 1,313.59	\$ 474.03		\$ 2,377.95					\$ 2,878.35	\$ 1,965.34	\$ 2,189.96
Low-income single family			\$ 6,834.55	\$ 3,720.77	\$ 407.62	\$ 1,240.54	\$ 1,141.91	\$ 1,172.11				\$ 858.95	\$ 2,196.64	\$ 1,626.86
Low-income low-cost				\$ 118.42									\$ 118.42	\$ 118.42
Residential behavioral	\$ 18.64		\$ 31.97	\$ 19.04	\$ 31.32	\$ 41.24	\$ 76.80	\$ 43.37		\$ 50.76		\$ 112.81	\$ 47.33	\$ 42.07
Non-residential prescriptive	\$ 120.35	\$ 136.30	\$ 274.86	\$ 138.78		\$ 150.98	\$ 82.54	\$ 128.33	\$ 172.01	\$ 180.29	\$ 106.31	\$ 129.93	\$ 147.33	\$ 140.36
Non-residential custom	\$ 103.43	\$ 152.41	\$ 429.07	\$ 340.34	\$ 180.47	\$ 205.38	\$ 159.48	\$ 136.06	\$ 326.48	\$ 235.09		\$ 133.22	\$ 218.31	\$ 207.66
Non-residential new construction	\$ 160.33	\$ 119.96		\$ 340.26						\$ 126.56		\$ 227.55	\$ 194.93	\$ 171.48
Non-residential small business	\$ 286.34	\$ 225.51	\$ 503.25	\$ 267.72	\$ 265.32	\$ 200.22		\$ 249.54	\$ 267.11		\$ 101.00		\$ 262.89	\$ 251.68
Large energy users	\$ 128.89			\$ 208.28								\$ 121.06	\$ 152.74	\$ 152.74

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Table 2: Base Program Savings % of Sector Sales

	AEP Ohio	Ameren Missouri	Baltimore Gas and Electric (BGE)	Commonwealth Edison (ComEd)	Consumers Energy	Duke Energy Carolinas (DEC)	DTE Electric	Duke Energy Ohio	Entergy Arkansas	MidAmerican Energy	First Energy Ohio	Xcel Minnesota	Average	Average Highest 3	Average Lowest 3
Residential appliances and lighting	0.7728%	0.1046%	0.8594%	1.2952%	0.7664%	0.6773%	1.1614%	1.2657%	0.4491%	0.9451%	1.2988%	1.4526%	0.9207%	1.3489%	0.4104%
Residential HVAC		0.3459%	0.0642%	0.0357%	0.0692%	0.0228%	0.0824%		0.1425%			0.1613%	0.1155%	0.2166%	0.0409%
Residential whole house-retrofit			0.4440%	0.0857%	0.0415%	0.0261%	0.0232%	0.0357%	0.3850%	0.0678%		0.0039%	0.1237%	0.3049%	0.0177%
Residential new construction	0.0371%		0.0426%	0.0008%	0.0042%		0.0519%			0.0512%		0.0299%	0.0311%	0.0486%	0.0116%
Multifamily			0.0222%	0.0417%	0.0573%	0.0721%	0.0172%		0.0578%	0.1243%		0.0216%	0.0518%	0.0847%	0.0203%
Low-income multifamily			0.0028%	0.0314%	0.0287%		0.0072%					0.0042%	0.0149%	0.0225%	0.0048%
Low-income single family			0.0072%	0.0107%	0.0773%	0.0176%	0.0206%	0.0050%				0.0173%	0.0223%	0.0385%	0.0076%
Low-income low-cost				0.3434%									0.3434%		
Residential behavioral	0.4921%		1.4611%	0.9916%	0.3163%	1.0847%	0.3930%	1.1146%		0.5349%		0.1647%	0.7281%	1.2202%	0.2914%
Non-residential prescriptive	0.7950%	0.8773%	0.8074%	0.7887%		0.3603%	0.7618%	0.8252%	0.0933%	0.6985%	0.2979%	1.7637%	0.7336%	1.1554%	0.2505%
Non-residential custom	0.2461%	0.4372%	0.7142%	0.0757%	1.2369%	0.0655%	0.3530%	0.3165%	0.8756%	1.6953%		1.0480%	0.6422%	1.3268%	0.1291%
Non-residential new construction	0.1749%	0.0963%		0.0366%						0.7798%		0.4908%	0.3157%	0.6353%	0.0665%
Non-residential small business	0.0954%	0.0751%	0.1300%	0.3410%	0.2269%	0.1568%		0.1782%	0.1317%		0.4987%		0.2038%	0.3555%	0.1002%
Large energy users	0.1147%			0.0528%								0.3991%	0.1889%	0.3991%	0.0528%

Appendix B – Four Example Scenarios

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Figure 6: Enhanced LMI Scenario Inputs and Outputs

	Penetration rate	Ramp up years	Start year	End year		
Residential appliances and lighting	MED	2	2022	2023		
Residential HVAC	MED	4	2022	2030		
Residential whole house-retrofit	MED	4	2022	2030		
Residential new construction	MED	4	2024	2030		
Multifamily	MED	4	2022	2030		
Residential behavioral	MED	4	2022	2030		
Non-residential prescriptive	HIGH	4	2022	2030		
Non-residential custom	LOW	4	2022	2030		
Non-residential new construction	LOW	4	2022	2030		
Non-residential small business	HIGH	4	2022	2030		
Large energy users	MED	4	2023	2030		
LMI Programs:						
Low-income multifamily	HIGH	2	2022	2030		
Low-income single family	HIGH	2	2022	2030		
Low-income low-cost	HIGH	2	2022	2030		
Outputs	2020	2021	2022	2023	2024	2025
Total Incremental annual savings	0.23%	0.07%	0.80%	1.05%	1.25%	1.42%
Total annual savings as a % of 2019						
Retail Sales	1.34%	1.41%	2.21%	3.18%	4.29%	5.52%
VCEA Savings Targets	-	-	1.25%	2.50%	3.75%	5.00%
Target met?	-	-	Yes	Yes	Yes	Yes
LMI 15% cost requirement met?			Yes	Yes	Yes	Yes
LMI total annual savings as a % of total portfolio savings	2.21%	2.55%	6.03%	8.60%	10.54%	11.28%

Figure 7: Enhanced LMI Scenario Savings

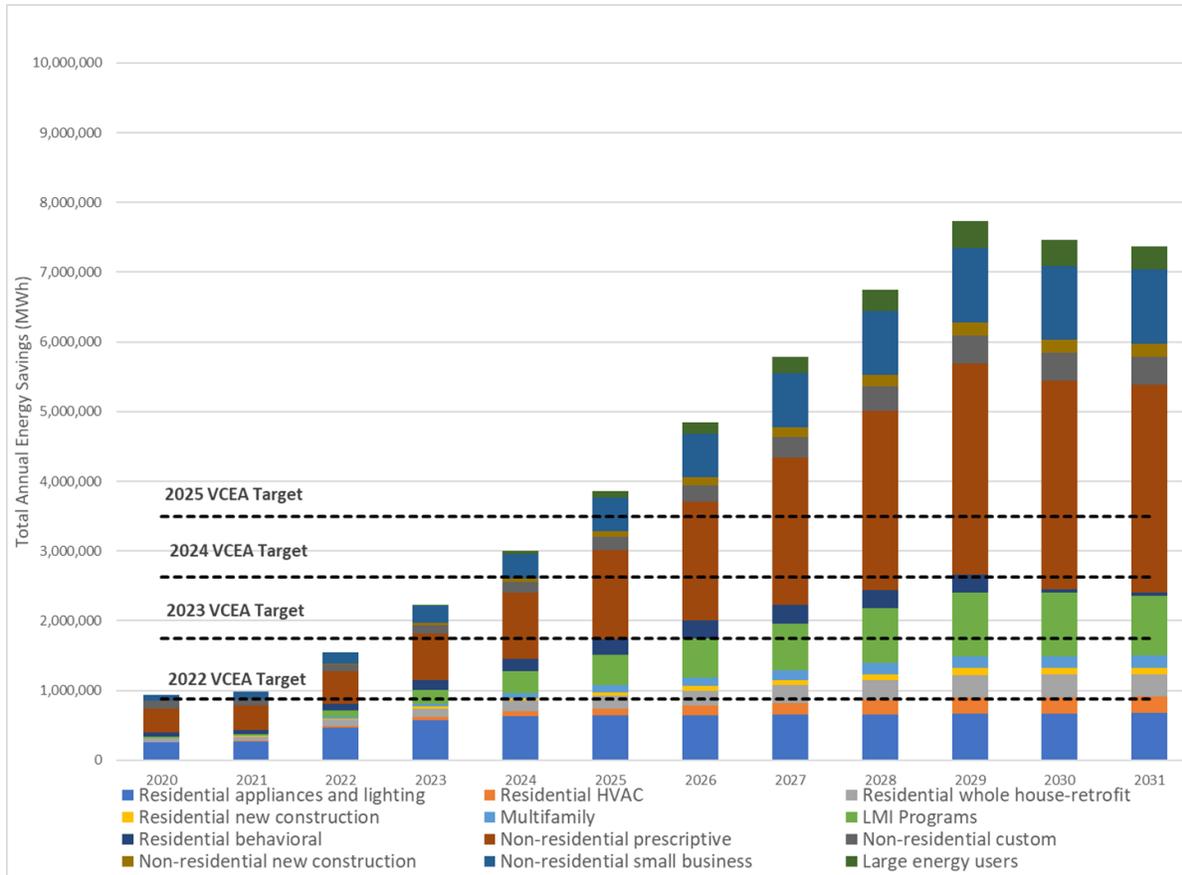


Figure 8: Enhanced LMI Scenario Costs through 2025

	2020	2021	2022	2023	2024	2025
Residential appliances and lighting	\$ 9,820,000	\$ 11,960,000	\$ 32,718,380	\$ 11,960,000	\$ 2,140,000	\$ 2,140,000
Residential HVAC	\$ 33,820,000	\$ 33,820,000	\$ 6,036,061	\$ 9,513,106	\$ 11,590,152	\$ 15,067,198
Residential whole house-retrofit	\$ 4,680,000	\$ 6,920,000	\$ 11,632,796	\$ 15,167,393	\$ 14,021,990	\$ 17,556,587
Residential new construction	\$ -	\$ 7,200,000	\$ 7,200,000	\$ 7,200,000	\$ 8,574,806	\$ 9,605,910
Multifamily	\$ -	\$ 2,920,000	\$ 5,208,501	\$ 6,924,877	\$ 8,641,253	\$ 10,357,629
LMI Programs	\$ 9,300,000	\$ 13,360,000	\$ 26,801,255	\$ 38,171,883	\$ 49,542,511	\$ 49,542,511
Residential behavioral	\$ 1,860,000	\$ 1,860,000	\$ 4,144,476	\$ 5,857,834	\$ 7,571,191	\$ 7,424,548
Non-residential prescriptive	\$ 12,040,000	\$ 14,140,000	\$ 30,427,087	\$ 35,442,403	\$ 42,817,718	\$ 55,033,033
Non-residential custom	\$ -	\$ -	\$ 2,691,745	\$ 4,710,554	\$ 6,729,363	\$ 8,748,172
Non-residential new construction	\$ -	\$ 3,020,000	\$ 4,164,931	\$ 5,023,629	\$ 5,882,328	\$ 6,741,026
Non-residential small business	\$ 7,180,000	\$ 11,240,000	\$ 15,525,664	\$ 22,264,912	\$ 26,524,160	\$ 33,263,408
Large energy users	\$ -	\$ -	\$ -	\$ 4,773,965	\$ 8,354,440	\$ 11,934,914
Total cost (\$/year)	\$ 78,700,000	\$ 106,440,000	\$ 146,550,897	\$ 167,010,557	\$ 192,389,911	\$ 227,414,935

Figure 9: High Residential Scenario Inputs and Outputs

	Penetration rate	Ramp up years	Start year	End year		
Residential appliances and lighting	MED	2	2022	2023		
Residential HVAC	HIGH	4	2022	2030		
Residential whole house-retrofit	HIGH	4	2022	2030		
Residential new construction	HIGH	4	2024	2030		
Multifamily	HIGH	4	2022	2030		
Residential behavioral	MED	4	2022	2030		
Non-residential prescriptive	MED	4	2022	2030		
Non-residential custom	LOW	4	2022	2030		
Non-residential new construction	LOW	4	2022	2030		
Non-residential small business	MED	4	2022	2030		
Large energy users	MED	4	2023	2030		
LMI Programs:						
Low-income multifamily	MED	2	2022	2030		
Low-income single family	HIGH	2	2022	2030		
Low-income low-cost	MED	2	2022	2030		
Outputs	2020	2021	2022	2023	2024	2025
Total Incremental annual savings	0.23%	0.07%	0.75%	0.96%	1.12%	1.26%
Total annual savings as a % of 2019						
Retail Sales	1.34%	1.41%	2.16%	3.05%	4.03%	5.10%
VCEA Savings Targets	-	-	1.25%	2.50%	3.75%	5.00%
Target met?	-	-	Yes	Yes	Yes	Yes
LMI 15% cost requirement met?			Yes	Yes	Yes	Yes
LMI total annual savings as a % of total portfolio savings	2.21%	2.55%	6.10%	8.86%	11.04%	12.01%

Figure 10: High Residential Scenario Savings

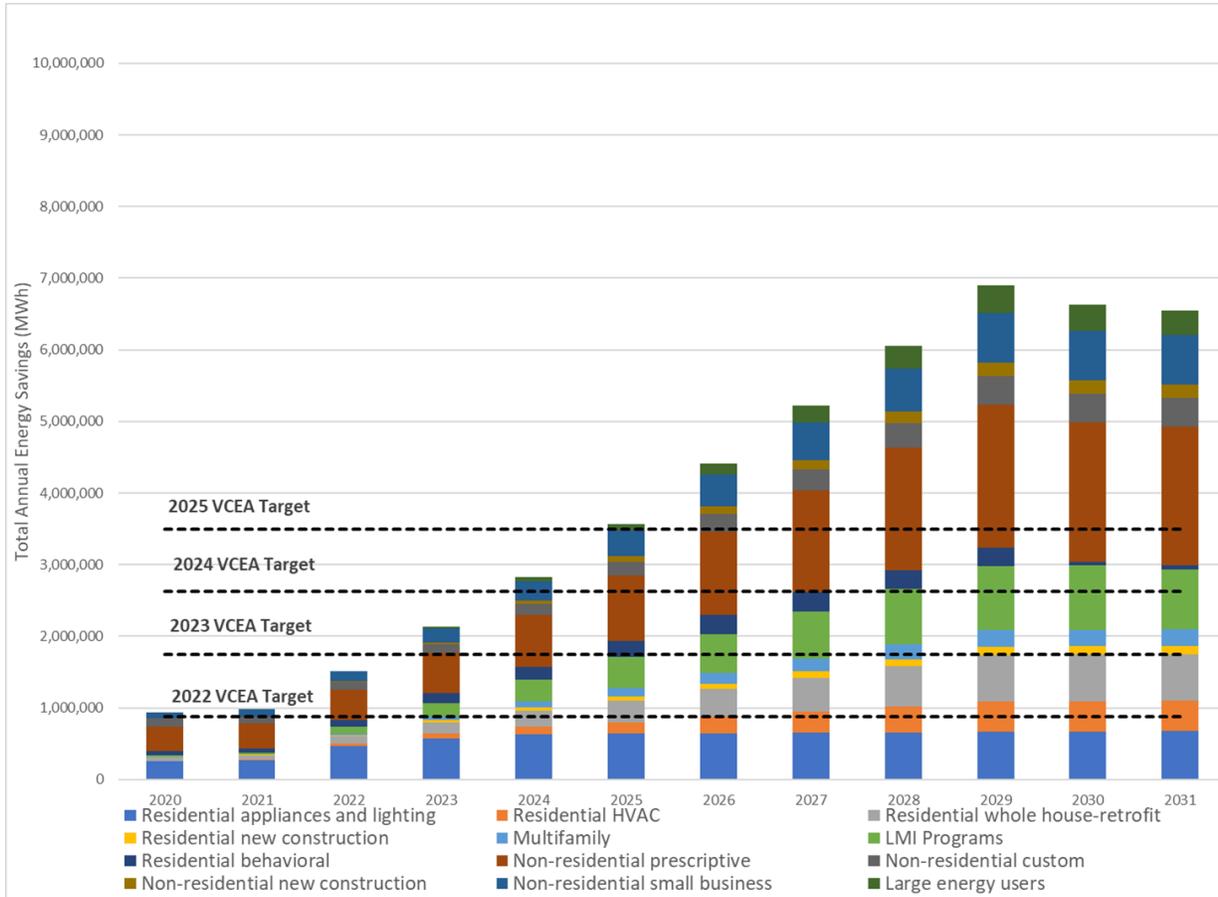


Figure 11: High Residential Scenario Costs through 2025

	2020	2021	2022	2023	2024	2025
Residential appliances and lighting	\$ 9,820,000	\$ 11,960,000	\$ 32,718,380	\$ 11,960,000	\$ 2,140,000	\$ 2,140,000
Residential HVAC	\$ 33,820,000	\$ 33,820,000	\$ 10,093,604	\$ 16,613,807	\$ 21,734,010	\$ 28,254,213
Residential whole house-retrofit	\$ 4,680,000	\$ 6,920,000	\$ 18,540,453	\$ 27,255,794	\$ 31,291,134	\$ 40,006,474
Residential new construction	\$ -	\$ 7,200,000	\$ 7,200,000	\$ 7,200,000	\$ 9,346,151	\$ 10,955,765
Multifamily	\$ -	\$ 2,920,000	\$ 6,664,752	\$ 9,473,315	\$ 12,281,879	\$ 15,090,443
LMI Programs	\$ 9,300,000	\$ 13,360,000	\$ 24,327,924	\$ 34,461,887	\$ 44,595,849	\$ 44,595,849
Residential behavioral	\$ 1,860,000	\$ 1,860,000	\$ 4,144,476	\$ 5,857,834	\$ 7,571,191	\$ 7,424,548
Non-residential prescriptive	\$ 12,040,000	\$ 14,140,000	\$ 24,480,440	\$ 25,035,769	\$ 27,951,099	\$ 35,706,429
Non-residential custom	\$ -	\$ -	\$ 2,691,745	\$ 4,710,554	\$ 6,729,363	\$ 8,748,172
Non-residential new construction	\$ -	\$ 3,020,000	\$ 4,164,931	\$ 5,023,629	\$ 5,882,328	\$ 6,741,026
Non-residential small business	\$ 7,180,000	\$ 11,240,000	\$ 11,690,200	\$ 15,552,849	\$ 16,935,499	\$ 20,798,149
Large energy users	\$ -	\$ -	\$ -	\$ 4,773,965	\$ 8,354,440	\$ 11,934,914
Total cost (\$/year)	\$ 78,700,000	\$ 106,440,000	\$ 146,716,905	\$ 167,919,404	\$ 194,812,942	\$ 232,395,980

Figure 12: High Small Business Scenario Inputs and Outputs

	Penetration rate	Ramp up years	Start year	End year		
Residential appliances and lighting	MED	2	2022	2023		
Residential HVAC	LOW	4	2022	2030		
Residential whole house-retrofit	LOW	4	2022	2030		
Residential new construction	LOW	4	2024	2030		
Multifamily	LOW	4	2022	2030		
Residential behavioral	MED	4	2022	2030		
Non-residential prescriptive	HIGH	4	2022	2030		
Non-residential custom	LOW	4	2022	2030		
Non-residential new construction	LOW	4	2022	2030		
Non-residential small business	HIGH	4	2022	2030		
Large energy users	MED	4	2023	2030		
LMI Programs:						
Low-income multifamily	MED	2	2022	2030		
Low-income single family	HIGH	2	2022	2030		
Low-income low-cost	MED	2	2022	2030		
Outputs	2020	2021	2022	2023	2024	2025
Total Incremental annual savings	0.23%	0.07%	0.78%	1.01%	1.18%	1.34%
Total annual savings as a % of 2019						
Retail Sales	1.34%	1.41%	2.19%	3.12%	4.17%	5.31%
VCEA Savings Targets	-	-	1.25%	2.50%	3.75%	5.00%
Target met?	-	-	Yes	Yes	Yes	Yes
LMI 15% cost requirement met?			Yes	Yes	Yes	Yes
LMI total annual savings as a % of total portfolio savings	2.21%	2.55%	6.03%	8.66%	10.69%	11.53%

Figure 13: High Small Business Scenario Savings

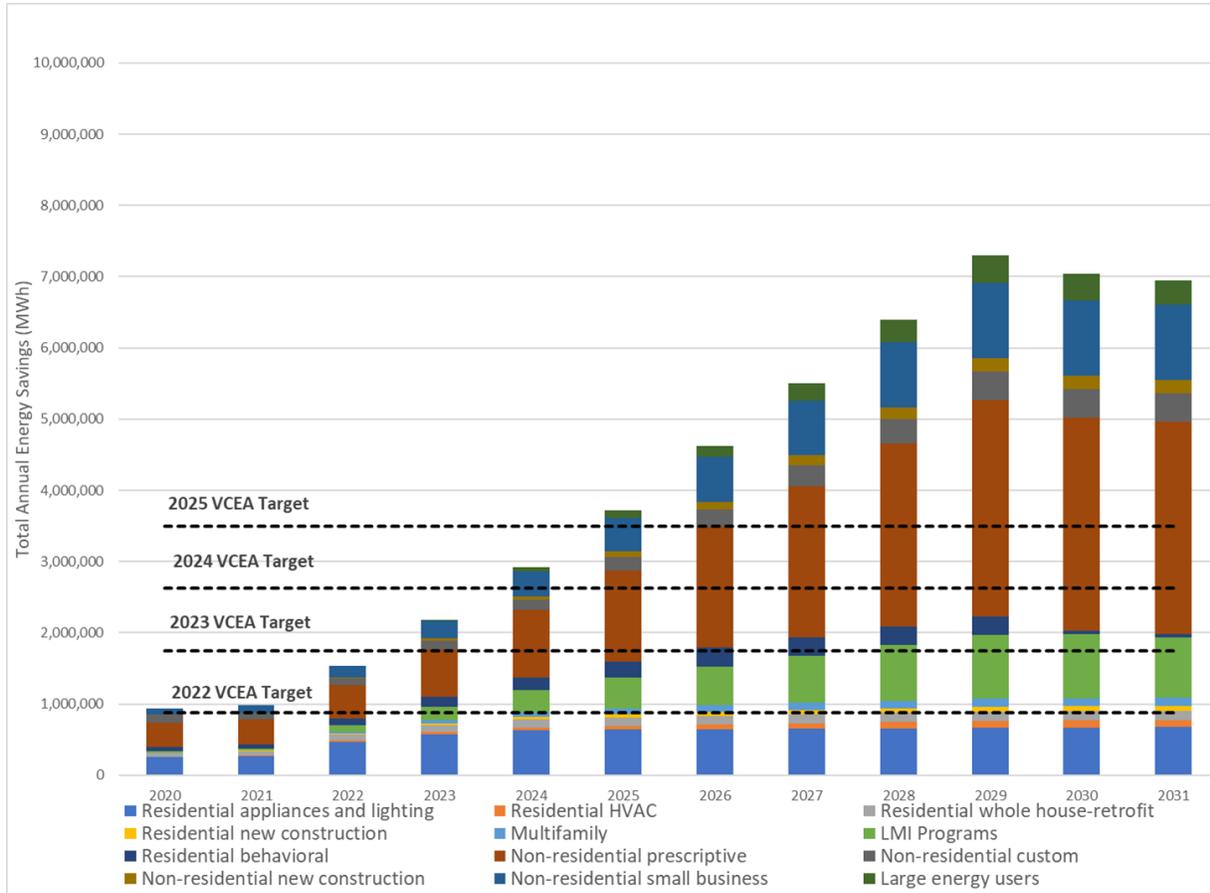


Figure 14: High Small Business Scenario Costs through 2025

	2020	2021	2022	2023	2024	2025
Residential appliances and lighting	\$ 9,820,000	\$ 11,960,000	\$ 32,718,380	\$ 11,960,000	\$ 2,140,000	\$ 2,140,000
Residential HVAC	\$ 33,820,000	\$ 33,820,000	\$ 3,041,287	\$ 4,272,252	\$ 4,103,217	\$ 5,334,182
Residential whole house-retrofit	\$ 4,680,000	\$ 6,920,000	\$ 7,595,929	\$ 8,102,876	\$ 3,929,822	\$ 4,436,769
Residential new construction	\$ -	\$ 7,200,000	\$ 7,200,000	\$ 7,200,000	\$ 7,714,829	\$ 8,100,951
Multifamily	\$ -	\$ 2,920,000	\$ 3,818,502	\$ 4,492,378	\$ 5,166,254	\$ 5,840,130
LMI Programs	\$ 9,300,000	\$ 13,360,000	\$ 24,327,924	\$ 34,461,887	\$ 44,595,849	\$ 44,595,849
Residential behavioral	\$ 1,860,000	\$ 1,860,000	\$ 4,144,476	\$ 5,857,834	\$ 7,571,191	\$ 7,424,548
Non-residential prescriptive	\$ 12,040,000	\$ 14,140,000	\$ 30,427,087	\$ 35,442,403	\$ 42,817,718	\$ 55,033,033
Non-residential custom	\$ -	\$ -	\$ 2,691,745	\$ 4,710,554	\$ 6,729,363	\$ 8,748,172
Non-residential new construction	\$ -	\$ 3,020,000	\$ 4,164,931	\$ 5,023,629	\$ 5,882,328	\$ 6,741,026
Non-residential small business	\$ 7,180,000	\$ 11,240,000	\$ 15,525,664	\$ 22,264,912	\$ 26,524,160	\$ 33,263,408
Large energy users	\$ -	\$ -	\$ -	\$ 4,773,965	\$ 8,354,440	\$ 11,934,914
Total cost (\$/year)	\$ 78,700,000	\$ 106,440,000	\$ 135,655,925	\$ 148,562,689	\$ 165,529,170	\$ 193,592,982

Figure 15: Balanced Lower Cost Scenario Inputs and Outputs

	Penetration rate	Ramp up years	Start year	End year		
Residential appliances and lighting	MED	2	2022	2023		
Residential HVAC	ZERO	4	2022	2030		
Residential whole house-retrofit	ZERO	4	2022	2030		
Residential new construction	ZERO	4	2024	2030		
Multifamily	ZERO	4	2022	2030		
Residential behavioral	MED	4	2022	2030		
Non-residential prescriptive	HIGH	4	2022	2030		
Non-residential custom	LOW	4	2022	2030		
Non-residential new construction	LOW	4	2022	2030		
Non-residential small business	MED	4	2022	2030		
Large energy users	MED	4	2023	2030		
LMI Programs:						
Low-income multifamily	MED	2	2022	2030		
Low-income single family	MED	2	2022	2030		
Low-income low-cost	MED	2	2022	2030		
Outputs	2020	2021	2022	2023	2024	2025
Total Incremental annual savings	0.23%	0.07%	0.75%	0.95%	1.10%	1.23%
Total annual savings as a % of 2019						
Retail Sales	1.34%	1.41%	2.15%	3.03%	3.99%	5.03%
VCEA Savings Targets	-	-	1.25%	2.50%	3.75%	5.00%
Target met?	-	-	Yes	Yes	Yes	Yes
LMI 15% cost requirement met?			Yes	Yes	Yes	Yes
LMI total annual savings as a % of total portfolio savings	2.21%	2.55%	5.96%	8.63%	10.77%	11.73%

Figure 16: Balanced Lower Cost Scenario Savings

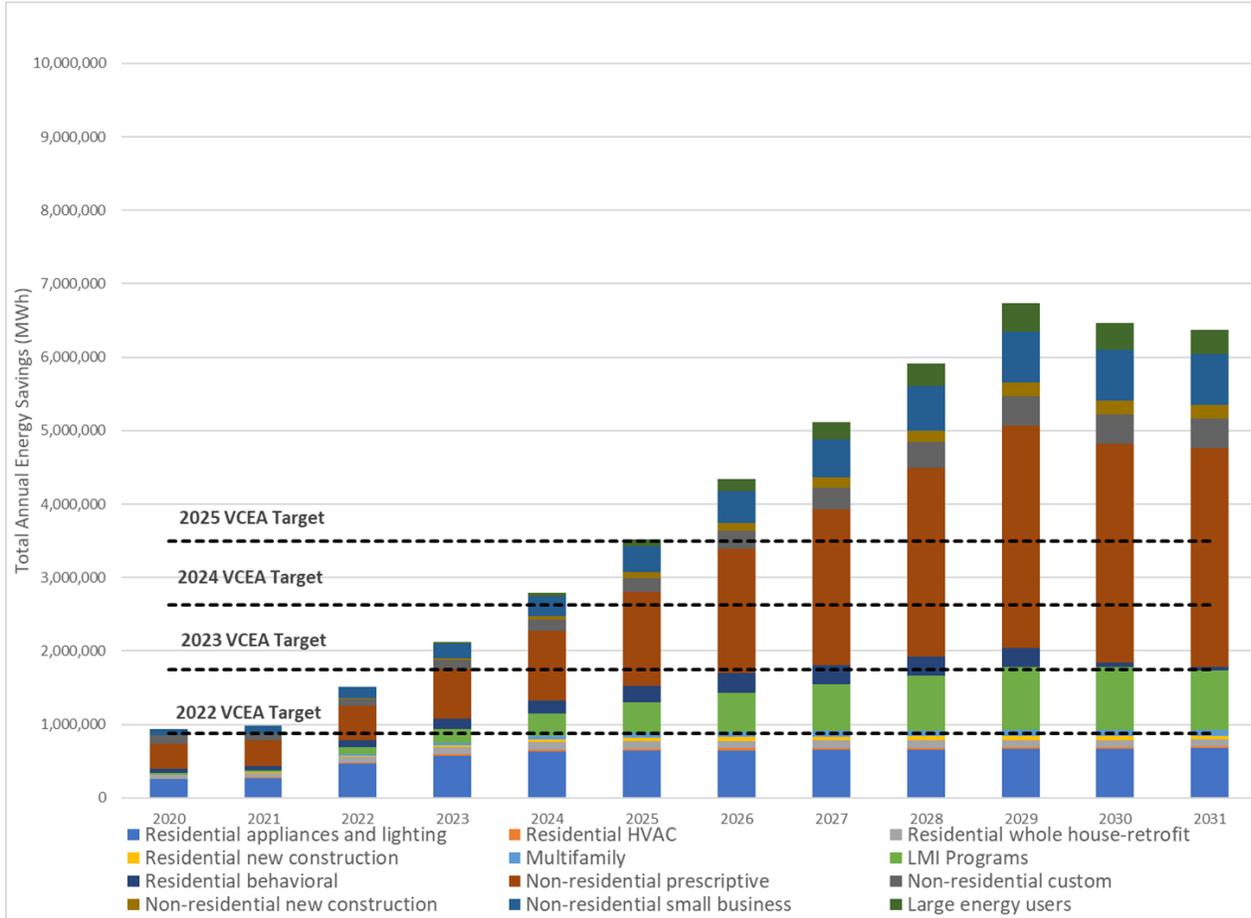


Figure 17: Balanced Lower Cost Scenario Costs through 2025

	2020	2021	2022	2023	2024	2025
Residential appliances and lighting	\$ 9,820,000	\$ 11,960,000	\$ 32,718,380	\$ 11,960,000	\$ 2,140,000	\$ 2,140,000
Residential HVAC	\$ 33,820,000	\$ 33,820,000	\$ 1,400,000	\$ 1,400,000	\$ -	\$ -
Residential whole house-retrofit	\$ 4,680,000	\$ 6,920,000	\$ 6,920,000	\$ 6,920,000	\$ 2,240,000	\$ 2,240,000
Residential new construction	\$ -	\$ 7,200,000	\$ 7,200,000	\$ 7,200,000	\$ 7,200,000	\$ 7,200,000
Multifamily	\$ -	\$ 2,920,000	\$ 2,920,000	\$ 2,920,000	\$ 2,920,000	\$ 2,920,000
LMI Programs	\$ 9,300,000	\$ 13,360,000	\$ 20,384,649	\$ 28,546,974	\$ 36,709,298	\$ 36,709,298
Residential behavioral	\$ 1,860,000	\$ 1,860,000	\$ 4,144,476	\$ 5,857,834	\$ 7,571,191	\$ 7,424,548
Non-residential prescriptive	\$ 12,040,000	\$ 14,140,000	\$ 30,427,087	\$ 35,442,403	\$ 42,817,718	\$ 55,033,033
Non-residential custom	\$ -	\$ -	\$ 2,691,745	\$ 4,710,554	\$ 6,729,363	\$ 8,748,172
Non-residential new construction	\$ -	\$ 3,020,000	\$ 4,164,931	\$ 5,023,629	\$ 5,882,328	\$ 6,741,026
Non-residential small business	\$ 7,180,000	\$ 11,240,000	\$ 11,690,200	\$ 15,552,849	\$ 16,935,499	\$ 20,798,149
Large energy users	\$ -	\$ -	\$ -	\$ 4,773,965	\$ 8,354,440	\$ 11,934,914
Total cost (\$/year)	\$ 78,700,000	\$ 106,440,000	\$ 124,661,468	\$ 130,308,208	\$ 139,499,837	\$ 161,889,140

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Appendix C – Data Sources: Dominion and Comparison Portfolios

AEP Ohio. 2019. *2018 Portfolio Status Report of the Energy Efficiency and Peak Demand Response Programs*. Case No. 19-1099-EL-EEC, May 14. Columbus: Ohio PUC (Public Utilities Commission). dis.puc.state.oh.us/TiffToPDF/A1001001A19E14B25118C02745.pdf.

Ameren Missouri. 2019. *Ameren Missouri's Demand-Side Program Annual Report for 2018*. Case No. EO-2019-0372, May 29. Missouri PSC (Public Service Commission). efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=EO-2019-0372&attach_id=2019017972.

BGE (Baltimore Gas and Electric Company). 2019. *2018 Year-End EmPOWER Maryland Report of the Baltimore Gas and Electric Company*. Case No. 9494, February 15. Baltimore: Maryland PSC (Public Service Commission). webapp.psc.state.md.us/newIntranet/Casenum/NewIndex3_VOpenFile.cfm?FilePath=//Coldfusion/Casenum/9400-9499/9494/\103.pdf.

Commonwealth Edison. 2019. *ComEd Summary Impact Evaluation Report—Energy Efficiency/Demand Response Plan: Program Year 2018 (CY2018)*. Prepared by Navigant Consulting. Springfield: Illinois Commerce Commission. s3.amazonaws.com/ilsag/ComEd_CY2018_Summary_Evaluation_Report_2018-04-30_Final.pdf.

Consumers Energy. 2019. *Supplemental Direct Testimony of Theodore A. Ykimoff on Behalf of Consumers Energy Company*. Case No. U-20365, September 16. Lansing: Michigan PSC (Public Service Commission). [mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000006VIRoAAO](https://psc.force.com/sfc/servlet.shepherd/version/download/068t0000006VIRoAAO).

DTE Energy. 2019. *DTE Electric Company's Application for Approval of the Reconciliation of Its Energy Waste Reduction Plan Expenses for the Plan Year 2018*. Case No. U-20366, May 31. Lansing: Michigan PSC (Public Service Commission). [mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000004n98cAAA](https://psc.force.com/sfc/servlet.shepherd/version/download/068t0000004n98cAAA).

Duke Energy Carolinas. 2019. *Duke Energy Carolinas, LLC's Application for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider*. Docket No. E-7, Sub 1192, February 26. Raleigh: North Carolina Utilities Commission. starw1.ncuc.net/NCUC/ViewFile.aspx?Id=7ef72466-ed10-4587-89bd-e19bf2b175cc.

Duke Energy Ohio. 2019. *In the Matter of the Annual Energy Efficiency Status Report of Duke Energy Ohio, Inc.* Case No. 19-621-EL-EEC, March 29. Columbus: PUCO (Public Utilities Commission of Ohio). dis.puc.state.oh.us/TiffToPDF/A1001001A19C29B13241104490.pdf.

Energy Futures Group, Inc

Entergy Arkansas. 2019. *Arkansas Energy Efficiency Program Portfolio Annual Report*. Docket No. 07-085-TF, May 2. Little Rock: Arkansas PSC (Public Service Commission). apscservices.info/Efilings/Docket_Search_Documents.asp?Docket=07-085-TF&DocNumVal=561.

MidAmerican Energy Company. 2019. *Energy Efficiency Plan*. Docket No. EEP-2012-0002, May 1. Des Moines: Iowa Utilities Board. efs.iowa.gov/cs/groups/external/documents/docket/mdax/odq2/~edisp/1846096.pdf.

Ohio Edison. 2019. *Energy Efficiency and Peak Demand Reduction Program Portfolio Status Report to the Public Utilities Commission of Ohio*. Docket Nos. 19-1020-EL-EEC, 19-1021-EL-EEC, 19-1022-EL-EEC, May 15. dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=19-1020-EL-EEC.

Virginia Electric and Power Company: Estimated savings for Phase I through Phase VIII from Case No. PUR-2020-00035, Appendix 6D and Appendix 6I; Program budgets from Case No. PUR-2019-00201, Direct Testimony of Michael T. Hubbard. Incremental annual savings were determined as the change from one year to the next. Five year total budgets were allocated equally by implementation year.

Xcel Minnesota. 2019. *Status Report & Associated Compliance Filings: Minnesota Electric and Natural Gas Conservation Improvement Program*. Docket No. E,G002/CIP-16-115, April 1. Minnesota Department of Commerce. edockets.state.mn.us/Efiling/edockets/searchDocuments.do?method=showPoup&documentId=%7BA066D969-0000-C119-9E6C-26A4634F87C5%7D&documentTitle=20194-151545-01.

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DUKE ENERGY PROGRESS, LLC

Request:

Please quantify the additional efficiency savings attributable to those recommendations.

Response:

DEP does not track the incremental savings that can be attributed to Collaborative contributions. The savings attributed to LIHTC participation in the NCEEDA program, which is a promotional opportunity identified by Collaborative members, can be tracked separately and can be found in the response to 1-16.

Person responding: Lynda Shafer, Senior Strategy & Collaboration Manager



Duke Energy's Income Qualified Weatherization Pilot

WX Direct



Project Types

Weatherization – Priority List of Measures

- Air Sealing
- Attic Insulation
- Duct Sealing
- Duct Insulation
- Belly Insulation (Mobile Home)
- Wall Insulation
- Tier 1 Base Load Packages
 - LED and Electric Hot Water Heater Measures



HVAC – Replacement of inefficient electric heat systems (must be operable)

- 15 SEER 8.2 HSPF Heat Pump

Applications

Number of Homes	Percentage of Total Applications	Response Rate based on 3782 Letters	Application Status
205	44%	5.4%	Completed
50	11%	1.3%	Deferred due to water, structural, housekeeping, etc. (In Home Assessment completed)
15	3%	0.4%	Owner occupied, no services needed (In Home Assessment completed)
3	1%	0.1%	Not interested after In Home Assessment
95	20%	2.5%	Over income
38	8%	1.0%	Energy usage below 7 kWh per sq. ft.
23	5%	0.6%	Never returned calls or provided income
30	6%	0.8%	No follow-up by customer (income and energy use qualified)
11	2%	0.3%	Renter occupied, rental company owns fridge or no fridge needed
470			Total Applications Submitted

- In the absence of HHF funding, the deferral rate would have been 23% of all applications submitted. (Total 109: 50 deferred above + 59 HHF homes)



Project Summary

Paid by Project Type	DEC Direct WX Projects	DEC Direct WX Total	Average Cost Per Project
Refrigerator Replacement	123	\$ 101,771.25	\$ 827.41
HVAC Replacement	52	\$ 310,903.58	\$ 5,978.92
WX Tier 2	149	\$ 485,483.76	\$ 3,258.28
Total Paid	324	\$ 898,158.59	
Admin Fees (NCCAA)		\$ 42,769.57	
Program Delivery (LM)		\$ 51,323.37	
Total Paid		\$ 992,251.53	

- 59 Homes supplemented with HHF projects to avoid deferral
- 50 Homes were deferred because of extreme conditions or costs that exceed the \$3,000 HHF Health & Safety available

HHF Projects for DEC WX Direct	Total Projects	Paid	Average Cost Per Project
H&S	49	\$ 64,056.03	\$ 1,307.27
HVAC	19	\$ 19,175.41	\$ 1,009.23
Total	68	\$ 83,231.44	

Completed Homes (205)

Number of Projects Per Home	Homes by Category
1	111
2	70
3	24

- Homes with 1 project – Refrigerators (58), Tier 2 (52), HVAC (1)
- Homes with 2 projects – Refrigerator/Tier 2 (43), Tier 2/HVAC (27)
- Homes with 3 projects – Refrigerator, Tier 2 & HVAC (24)
- 59 Homes (39%) with Tier 2/HVAC projects received HHF services (\$83K) to support WX projects including duct and HVAC repair, vapor barrier, mold/mildew remediation, CO2/smoke detector installation, debris removal, bath vent installation, floor insulation repair and attic/crawl access.

Home Characteristics

- Average Sq. Ft. per home - 1205
- Foundation - basement (9), crawl (119), slab (77)
- Primary Heating Fuel Source- electric (116), kerosene (1), natural gas (83), propane (3), wood (1), oil (1)
- Hot Water Heater Fuel Source - electric (154), natural gas (50), propane (1)
- Average Annual kWh – 13,825

Annual kWh	Number of Homes in this Range
10,000 and below	58
10,001 - 15,000	68
15,001 - 20,000	47
20,001 - 25,000	23
25,001 - 30,000	7
30,001 and above	2
	205

Occupants & Income

- Average Income - \$21,116
- Average Number of Occupants - 2

Number of Occupants	Average Income
1	\$15,167
2 - 4	\$25,232
5 & up	\$28,731

Number of Occupants	Number of Homes
1	88
2 - 4	105
5 & up	12



DEC WX Direct & HHF – Measures

DEC WX Measures	
Air Sealing	134
Attic Insulation	128
Baseload Lighting Package	83
Baseload Water Package	30
Clean and/or Replace Dryer Vent	2
Door Weatherstripping	13
Duct Sealing	94
Floor Insulation - Fiberglass, Batts - R19	23
HVAC Replacement	52
Heating System Repair	17
Heating System Tune Up	13
Knee Wall Insulation	2
Vapor Barrier	12
Refrigerator Replacement 15 cu ft	35
Refrigerator Replacement 18 cu ft	43
Refrigerator Replacement 21 cu ft	45

HHF Measures	
Attic/Crawl Access/Repair	2
Bath Vent Installation	2
CO2/Smoke Detector	1
Debris Removal/Floor Insulation Removal	9
Duct Repair/Replace	20
Electrical Repair	1
Floor	5
Hot Water Heater Replacement	2
HVAC Repair	22
Mold/Mildew Remediation	3
Plumbing	3
Range Replacement	1
Rotten Wood Repair	2
Sewage/Septic Repair	3
Vapor Barrier	7
Wall/Ceiling Replacement/Repair	2
Window Replacement/Repair	1

Lessons Learned



Challenges

- This type program requires many customer “touches”
- General concern with answering phone from unknown number – required multiple calls to schedule
- Schedules not a priority for some clients – minor problem with no-shows or last-minute cancellations
- Delivery/Quality issues with Lowe’s – changing vendors mid-program

What worked

- Clear Guidelines on Eligibility, Budgets, Processes and Expectations
- Contractors who provided both HVAC and Weatherization most cost-effective model
- Early notification to customers who don’t respond – such as “pre-qualified, last chance” letters
- Engagement and Enthusiasm of Contractor Network
- Targeted Customer Outreach – Letters from Duke Energy
- Quick response to any issues/callbacks
- Accuracy in initial SOW and estimates – very few scope changes
- Helping Home Funds to address deferral issues
- Leveraging with other programs for deferral / cost concerns
- Customer Focused Management, Program Delivery and Administrative Teams

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DUKE ENERGY PROGRESS, LLC

Request:

Please provide an explanation and analysis related to the principal factors leading to forecasted declines for DEP's 2021 and 2022 projections compared to the savings levels achieved in 2017, 2018, and 2019. Please describe the drivers and where the effects show up, including:

- i. What are the top five measure categories that account for the greatest reduction impacts?
 - ii. What internal and / or external factors led to these reductions?
 - iii. Which programs are the most affected and what are the corresponding impacts of each major factor on each program?
 - iv. Which programs are the most affected by assumed changes in customer participation and what are the corresponding impacts on each program?
- a. Please provide all relevant work papers used to provide responses to the above questions.

Response:

i. top 5 greatest kWh reductions

1. Residential Retail Lighting -52% (17,692,831 kWhs)
2. Small Business Energy Saver -5% (1,705,096 kWhs)
3. Residential Smart Saver T-stat -34% (792,164 kWhs)
4. EnergyWise for Business -96% (630,190 kWhs)
5. Multifamily Energy Efficiency -30% (506,233 kWhs)

ii. Internal and external factors that led to the reduction:

Residential Retail Lighting, reduction in A lamp LEDs because of federal standard changes. The program has focused on hard-to-reach retailers with lower sales volume, such as the Goodwill and Dollar General, which generally serve customers less likely to change lamps to LEDs.

Small Business Energy Saver - The program has fundamentally stayed the same from 2017 through 2022. Duke has updated technology included in the Program to meet customer needs. However, sales and project sizes have been on the decline. The Program completed almost the same number of projects from year to year with lower overall energy savings.

Residential Smart Saver - Smart thermostat previous projections were underestimated for 2021 and 2022. Actual participation was higher, and the current budget cycle projections have been increased to reflect actuals.

EnergyWise for Business - The major impact was a reduction in claimed savings from the EM&V completed in 2017. The allowed energy savings per installed Smart Thermostat were reduced to 13 kWh. Duke has completed a new evaluation of the energy savings in 2021 and found the smart thermostats are saving 423 kWh per installed thermostat.

Multi-family Energy Efficiency - For the Multi-family Pipe-wrap, the kWh impacts were reduced due to program EM&V beginning in 2019.

iii. Residential Retail lighting, Small Business Energy Saver, Residential Smart Saver smart t-stats, EnergyWise for business and Residential Multi-family.

iv. Residential Retail Lighting -57% (1,255,626) annual participation reduction.

a. Please see attached.



SACE DR1-27
Attachment.zip

Person responding: Rick Mifflin, Director, Products & Services

Carolinas Income Qualified Budgeting

Budgeting Considerations

- Energy Efficiency spend ratepayer funds and should be done prudently and responsibly
- The initial filing and historical program performance is used to help determine customer demand for the program
- Experience in other jurisdictions is considered, but the specific territory characteristics weigh more heavily
- In the Carolinas, the budget can be exceeded if the additional cost is driven by customer demand
- Include risks or market changes that need to be considered
- Define the capability of the resources and ability to flex
- Remaining market potential



DEC v. DEP Income Qualified Budgeting

Why does DEC have a larger budget than DEP?

- DEC is about 40% larger and has more income qualified customers
- DEC has an existing weatherization program
- No DEP weatherization program was filed initially and has been delayed in recent years to evaluate the following:
 - Learn from DEC and why there was over \$1M unspent annually
 - Consider cost effective pilot program in Asheville area
 - Consider NES 2.0 approach providing deeper measures
- DEP's Neighborhood Energy Saver was purposely constrained to \$2M budget when filed in 2008
- NES 2.0 was filed and approved, but we are just now launching after the COVID suspension. Experience will allow for "right sizing" the budget

