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May 22 2018

EXHIBITS

- CN-1 Christopher Neme CV
- CN-2 Advanced Energy, Duke Energy, Lockheed Martin, and North Carolina
Community Action Association, *Evaluation of Duke Energy's Helping
Home Fund*, p. 2 (October 2017)

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I. Introduction and Qualifications

Q: PLEASE STATE YOUR NAME, EMPLOYER, AND BUSINESS ADDRESS.

A: My name is Chris Neme. I am a co-founder and Principal of Energy Futures Group, a consulting firm that provides specialized expertise on energy efficiency and renewable-energy markets, programs, and policies. My business address is P.O. Box 587, Hinesburg, VT 05461.

Q: PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A: I received a Master of Public Policy degree from the University of Michigan (Ann Arbor) in 1986. That is a two-year, multi-disciplinary degree focused on applied economics, statistics, and policy development. I also received a Bachelor's degree in Political Science from the University of Michigan (Ann Arbor) in 1985. My first year of graduate school counted towards both my Master's and Bachelor's degrees.

Q: PLEASE SUMMARIZE YOUR BUSINESS AND PROFESSIONAL EXPERIENCE.

A: As a Principal of Energy Futures Group, I play lead roles in a variety of energy-efficiency consulting projects. Recent examples include:

- Representing the Natural Resources Defense Council (NRDC) in Illinois, Michigan, and Ohio consultations with utilities (including Duke Energy Ohio) and other parties on efficiency-program and portfolio design, cost-effectiveness screening, evaluation, shareholder incentive structures, and other related topics;

- 1 • Helping the National Association of Regulatory Utility Commissioners and
2 the Michigan Public Service Commission staff assess the relative merits of
3 alternative approaches to defining savings goals for utility efficiency
4 programs (focusing on lifetime rather than just first-year savings);
- 5 • Serving as an appointed expert representative on the Ontario Energy Board's
6 Evaluation and Audit Committee for natural gas demand-side management, as
7 well as on related committees to provide expertise on the conduct of gas and
8 electric efficiency-potential studies;
- 9 • Serving on the Management Committee and leading strategic planning and
10 program design for a team of firms, led by Applied Energy Group, that was
11 hired by the New Jersey Board of Public Utilities to deliver the electric and
12 gas utility-funded New Jersey Clean Energy Programs;
- 13 • Serving on a five-person national drafting committee for development of a
14 new National Standard Practice Manual for cost-effectiveness screening of
15 energy-efficiency measures, programs, and portfolios, which was published in
16 May 2017;
- 17 • Providing technical support to the Arkansas energy-efficiency collaborative
18 (commonly known as the "Parties Working Collaboratively") in assessing (at
19 the Arkansas Commission's direction) how well the State's current practices
20 in assessing cost-effectiveness aligns with national best practices; and
- 21 • Drafting policy reports for the Regulatory Assistance Project on a variety of
22 energy-efficiency and related regulatory policy issues, such as whether 30
23 percent electric savings is achievable in 10 years, the history of efforts across

1 the United States to use geographically targeted efficiency programs to cost-
2 effectively defer transmission and distribution system investments, and the
3 history of bidding of efficiency resources into the PJM and New England
4 capacity markets.

5 Prior to co-founding Energy Futures Group in 2010, I worked for 17 years for the
6 Vermont Energy Investment Corporation (“VEIC”), the last 10 as Director of its
7 Consulting Division managing a group of 30 professionals with offices in three
8 states. Most of our consulting work involved critically reviewing, developing,
9 and/or supporting the implementation of electric, gas, and multi-fuel energy-
10 efficiency programs for clients across North America and beyond. During my
11 more than 25 years in the in the energy-efficiency industry, I have worked in
12 numerous jurisdictions to develop or review energy-efficiency potential studies;
13 develop or review Technical Reference Manuals (“TRM”) of deemed savings
14 assumptions; support utility-stakeholder collaboratives; negotiate or support
15 development of efficiency-program performance incentive mechanisms; review
16 or develop efficiency programs; and/or review or develop energy-efficiency
17 evaluation frameworks and related studies. All told, I have worked on these
18 and/or other policy and program issues for clients in more than 30 states, half a
19 dozen Canadian provinces, and several European countries. I have also led
20 courses on efficiency program design, published widely on a range of efficiency
21 topics, and served on numerous national and regional efficiency committees,
22 working groups, and forums. A copy of my curriculum vitae is attached as
23 Exhibit CN-1.

1 **Q: HAVE YOU PREVIOUSLY FILED EXPERT WITNESS TESTIMONY IN**
2 **OTHER PROCEEDINGS BEFORE THE NORTH CAROLINA**
3 **COMMISSION?**

4 A: No. I have not.

5 **Q: HAVE YOU BEEN AN EXPERT WITNESS ON ENERGY-EFFICIENCY**
6 **MATTERS BEFORE OTHER REGULATORY COMMISSIONS?**

7 A: Yes, I have filed expert witness testimony on approximately 50 occasions before
8 similar regulatory bodies in 10 other states and provinces, including most
9 recently in Michigan, Ohio, Illinois, and Ontario.

10 **Q: ARE YOU SPONSORING ANY EXHIBITS?**

11 A: Yes.

- 12 • CN-1 Christopher Neme CV
- 13 • CN-2 Advanced Energy, Duke Energy, Lockheed Martin, and North
14 Carolina Community Action Association, *Evaluation of Duke*
15 *Energy's Helping Home Fund*, p. 2 (October 2017) (hereinafter
16 "Helping Home Fund Evaluation")

17 **II. Testimony Overview**

18 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

19 A: My testimony addresses the reasonableness of both Duke Energy Carolinas'
20 (DEC's) energy-efficiency savings estimates and the composition of its energy-
21 efficiency program portfolio.

22 **Q: WHAT MATERIAL HAVE YOU REVIEWED TO INFORM YOUR**
23 **TESTIMONY ON THESE ISSUES?**

1 A: I have reviewed DEC's application, as well as its related responses to discovery
2 questions. Generally speaking, my review is a high-level one, focusing on
3 bigger-picture issues. I have selectively investigated details of the Company's
4 programs when my review raised questions that merited a more thorough review.

5 **Q: WHAT ARE YOUR SUMMARY FINDINGS WITH REGARD TO DEC'S**
6 **ENERGY-EFFICIENCY SAVINGS ESTIMATES?**

7 A: The evaluation measurement and verification ("EM&V") framework under which
8 DEC has developed and annually adjusted estimates of its program savings is
9 well-conceived. While I have not reviewed every detail of each of the program-
10 evaluation studies filed by DEC in this proceeding, my high-level review
11 suggests that they have been conducted professionally.

12 That said, I have a few potential concerns:

- 13 • **No published Technical Reference Manual ("TRM").** Most jurisdictions
14 have a TRM to document publicly all current assumptions regarding
15 efficiency-measure energysavings, peak-demand savings, savings life, and
16 incremental costs – as well as references for the sources of those assumptions.
17 When evaluation studies suggest that an assumption needs to be updated, the
18 TRM is also updated. The absence of such a single reference document
19 makes it more difficult to review the reasonableness of DEC's savings and
20 net benefits claims properly.
- 21 • **Potential for overstating of My Home Energy Report savings.** DEC is
22 apparently assuming that My Home Energy Report program savings last only
23 as long as a residential customer is enrolled in the program. As a result, DEC

1 effectively assumes that those savings are reacquired by re-running the
2 program each year for the same participants. However, there is evidence that
3 a significant portion of the savings produced from any set of customers
4 participating in year one would continue to persist in subsequent years even if
5 program delivery were ended for those customers. Thus, DEC may be
6 significantly over-estimating the *new* savings this program produces each
7 year. The persistence of savings and implications for annual savings claims
8 and future program design and delivery strategy are issues that should be
9 evaluated.

- 10 • **Potential for overstating lifetime savings (and economic net benefits) of**
11 **residential lighting measures.** DEC is assuming that the annual savings
12 produced by a residential LED light bulb installed as a result of its efficiency
13 programs will be realized every year—at the same level experienced in the
14 first year—for each of the next 12 years. These projections do not take into
15 account new federal efficiency standards imposed by the Energy
16 Independence and Security Act (EISA) for most residential light bulbs.
17 Those standards will essentially mean roughly 80 percent of the savings
18 realized from most LED light bulbs installed before 2020 will not be
19 attributable to utility programs after 2020.

20 I discuss each of these issues in greater detail in Section III of my testimony.

21 **Q: DID DEC MEET ITS ONE PERCENT ANNUAL ENERGY SAVINGS**
22 **TARGET IN 2017?**

1 A: Yes, DEC delivered its highest DSM/EE portfolio savings in 2017, saving 854
2 gigawatt-hours (GWh) at its customers' meters.¹ This level of savings
3 corresponds to 1.07 percent of prior-year sales,² exceeding the one percent annual
4 energy savings target to which the Company agreed in a settlement in the then-
5 proposed merger of Duke Energy and Progress Energy ("Merger Settlement").³

6 **Q: PLEASE SUMMARIZE YOUR ASSESSMENT OF DEC'S PROPOSED**
7 **2019 EFFICIENCY PROGRAM PORTFOLIO.**

8 A: There are a number of admirable elements in DEC's 2019 planned portfolio. To
9 begin with, DEC's forecast of the amount of new annual savings its programs
10 will produce in 2019 are equal to about 0.95 percent of total forecast sales and
11 1.38 percent of sales to non-opt-out customers – both significant milestones.
12 Second, the program portfolio is very cost-effective, producing \$2.46 in supply-
13 cost savings for every dollar DEC has spent. Since 2014, DEC's efficiency
14 programs have saved enough energy at the time of system peak to eliminate the
15 need for the equivalent of more than four natural gas "peaker" power plants.
16 Third, the portfolio includes a wide range of efficiency measures and programs.
17 Fourth, there are some national state-of-the-art program design features,

¹ DEC reported 906.9 GWh of annual savings at the generator in 2017. That is a value for savings across both its North Carolina and South Carolina service territories. Adjusting for an average line loss rate of 6.2187 percent (DEC response to SACE 2-6) produces 853.8 GWh savings at customers' meters.

² Total DEC retail sales in both North Carolina and South Carolina were 79,643 GWh in 2016 [U.S. Energy Information Administration Form 861 Data, Table 10 (https://www.eia.gov/electricity/sales_revenue_price/index.php)].

³ The 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 ("PSCSC") in Docket No. 2011-158-E.

1 particularly the Company's recent launch of a midstream channel for promoting
2 non-residential HVAC, lighting, food service, and IT measures.

3 That said, I also have some over-arching concerns about the portfolio:

4 • **Too much emphasis on short-lived savings.** About 70 percent of residential
5 annual savings and 40 percent of the total portfolio savings in 2019 are
6 forecast to come from DEC's My Home Energy Report program. Savings
7 from such behavioral programs are very short-lived, though longer than the
8 one year DEC is currently assuming.

9 • **Inadequate promotion of longer-lived major measures or comprehensive**
10 **treatment of buildings.** The Residential SmartSaver Energy-Efficiency
11 Program, through which DEC promotes major measures such as heat pumps,
12 central air conditioners, heat pump water heaters, attic insulation, and duct
13 sealing, is forecast to produce only about one percent of its total residential
14 sector savings.

15 • **Insufficient planning to offset what will be a significant loss of**
16 **residential-lighting savings potential once the 2020 federal EISA**
17 **efficiency standards go into effect.** DEC's filing does not demonstrate how
18 the Company will make up for the loss of lighting savings following full
19 implementation of the federal efficiency standards for lightbulbs. DEC's
20 over-emphasis on short-term savings and under-emphasis on longer-lived
21 major measures is a structural problem with the Company's portfolio.
22 Greater promotion of longer-lived measures will diversify DEC's program
23 portfolio, which will be an acute need following the loss of lighting savings.

- 1 • Need for increased investment in lower-income communities and in
2 programs that reach rental units.

3 **Q: HOW COULD DEC MODIFY ITS 2019 PORTFOLIO OF PROGRAMS**
4 **TO ADDRESS THESE SHORTCOMINGS?**

5 A: I have four recommendations for improvement:

- 6 • First, DEC should endeavor to improve participation in its Residential
7 Smart\$aver program significantly through establishment of a midstream
8 channel for promoting some of the measures through equipment distributors
9 (and possibly retailers and/or other parts of the supply chain), increasing
10 incentives, enhancing marketing, and/or other means to reach more
11 customers.
- 12 • Second, DEC should consider greater promotion of whole-building retrofits,
13 including support for both (A) improvements to building envelopes (e.g.
14 insulation and air leakage reduction); and (B) retrofitting single-family and
15 multi-family buildings that currently have electric-resistance heating with
16 high-efficiency heat pumps. Such efforts could initially be targeted to lower-
17 income communities, but should ultimately aim to address all such cost-
18 effective opportunities within the residential sector. One option would be to
19 emulate an Energy Arkansas program that is weatherizing manufactured
20 homes. Another would be to consider a new pilot-program in Illinois that is
21 promoting heat-pump retrofits in electric-resistance-heated multi-family
22 buildings.

- 1 • Third, DEC should build on recent success and progress in promoting
2 efficiency measures for business customers through the midstream channel of
3 its non-residential Smart\$aver prescriptive rebate program. DEC's current
4 forecast that lighting savings will be reduced to half in 2019 of what they
5 were in 2017 raises questions about whether the Company is planning to
6 make some unfortunate changes to one of its best-performing programs. It
7 should instead be endeavoring to increase these savings.
- 8 • Fourth, DEC should assess the potential to reduce the number of customers
9 who opt out of its programs by improving business customers' understanding
10 of its programs and/or improving the designs of its programs to make them
11 more attractive to such customers.

12 **Q: HOW DO YOU RECOMMEND THAT THE UTILITIES COMMISSION**
13 **ADDRESS YOUR RECOMMENDATIONS?**

14 A: Both the EM&V issues and the efficiency-portfolio design issues that I raise are
15 complicated and would probably best be addressed, at least initially, through in-
16 depth discussions between the utilities and other parties, with solutions ultimately
17 brought back to the Utilities Commission. Thus, I recommend that the Utilities
18 Commission refer the issues to the DEC Collaborative, with a requirement that
19 DEC report back on decisions in their 2019 Rider proceeding. Note that this may
20 require more intensive engagement between DEC and other parties than has
21 historically been the case, or than is even possible through quarterly
22 Collaborative meetings alone. However, my experience with collaboratives in
23 other jurisdictions suggests that this can be accomplished by establishing

1 subcommittees or working groups that meet as often as required to reach
2 resolution on specific issues and to identify any points of disagreement that
3 cannot be bridged.

4 **III. DEC's Energy-Efficiency Savings Estimates**

5 **Q: WHAT IS YOUR UNDERSTANDING OF HOW DEC ESTIMATED**
6 **SAVINGS FOR ITS EFFICIENCY PROGRAMS IN THIS PROCEEDING?**

7 A: DEC witness Evans explains that the Company applied the EM&V Agreement
8 developed by DEC, SACE, and Public Staff, and approved by the Commission in
9 November 2011, in Docket No. E-7, Sub 979. As I understand it, that agreement
10 essentially states that:

- 11 • The Company uses “initial estimates” of savings – i.e. estimates developed
12 from sources other than direct impact of evaluation of its programs in the
13 Carolinas – until such impact-evaluation results are available;
- 14 • Once the first set of impact-evaluation results are available, the Company
15 uses those results both retrospectively – to adjust past savings estimates based
16 on “initial estimates” – and prospectively; and
- 17 • When any subsequent impact-evaluation results become available (i.e., from
18 the second or third or subsequent evaluation of a program), such subsequent
19 evaluation results are only applied prospectively.

20 These principles apply to all programs except for the Non-Residential SmartSaver
21 Custom Rebate Program and the Low-Income Energy-Efficiency and
22 Weatherization Assistance Program.

1 **Q: IS THIS A REASONABLE FRAMEWORK FOR ESTIMATING**
2 **SAVINGS?**

3 A: Yes. This is a well-conceived framework, particularly in the context of policies
4 that compensate the utility for lost revenues and provide shareholder incentives
5 based on estimates of economic net benefits. As long as the program impact
6 evaluations follow industry standards and are sufficiently rigorous, it ensures that
7 all lost revenue and shareholder incentive payments are ultimately based on local
8 evaluation of efficiency-program impacts.

9 There are trade-offs inherent in policy choices between EM&V requirements,
10 particularly regarding retrospective application (or not) of EM&V results. At one
11 extreme, retrospective application of all EM&V results minimizes risk to
12 ratepayers of paying for results that did not occur, though they can also end up
13 paying more than expected if results are better than expected. At another
14 extreme, only applying EM&V results prospectively rewards utilities for
15 performance relative to plans. Since they cannot control how some efficiency
16 measures perform in the field (other than in limited cases such as custom business
17 measures), limiting application of EM&V results to future programs ensures that
18 shareholder incentives are based on performance utilities can control. The
19 approach developed for DEC is a defensible middle ground between these two
20 ends of the spectrum. It seems particularly reasonable given that shareholder
21 incentives are based on estimated net economic benefits to the system rather than
22 to achievement of specific savings targets which were established under a fixed
23 set of planning assumptions.

1 **Q: HAVE YOU FOUND THE IMPACT-EVALUATION STUDIES**
2 **SPONSORED BY DEC TO FOLLOW INDUSTRY STANDARDS AND BE**
3 **SUFFICIENTLY RIGOROUS?**

4 A: While I have not reviewed every detail of each of the program-evaluation studies
5 filed by DEC in this proceeding, my high-level review suggests that they have
6 generally been conducted professionally, using appropriate methodologies and
7 with sufficient rigor.

8 **Q: BASED ON YOUR REVIEW, ARE YOU IN A POSITION TO ENDORSE**
9 **THE SAVINGS ESTIMATES PUT FORWARD BY DEC IN THIS**
10 **PROCEEDING?**

11 A: No, but not because I have reason to think that there are widespread problems.
12 Such a thorough review is beyond the scope of my engagement with NC Justice
13 Center, et al., and would take more time and resources than I could devote to this
14 case. It would be a less burdensome task to undertake such a review, however, if
15 DEC or the State as whole made use of a Technical Reference Manual (“TRM”).⁴

16 **1. Value of Technical Reference Manual (TRM)**

17 **Q: WHAT IS A TRM?**

18 A A TRM publicly documents all current estimates of efficiency-measure energy-
19 savings, peak-demand savings, other fuel savings, savings life, incremental costs
20 and, other related assumptions – as well as references for the sources of each
21 assumption. When evaluation studies suggest that an assumption needs to be
22 updated, the TRM is also updated. This typically takes place annually. TRMs
23 also sometimes document protocols and/or EM&V methods that should be used

⁴ Note that in some jurisdictions, this is called a Technical *Resources* Manual instead of Technical Reference Manual.

1 to estimate savings from custom projects for which prescriptive assumptions are
2 not appropriate.

3 **Q: WHAT IS THE VALUE OF A TRM?**

4 A: TRMs provide a single reference that regulators and other parties can use to
5 ensure that utility savings estimates are based on the correct assumptions. They
6 also provide transparency for regulators and other parties regarding the basis for
7 all utility-savings estimates, as well as other key inputs to cost-effectiveness
8 calculations. That makes it easier for all parties to identify quickly when key
9 assumptions may be outdated and/or when targeted evaluation activity may be
10 needed to update assumptions. That includes assumptions, such as savings life
11 and incremental cost, that are often not addressed by impact evaluations. Such
12 assumptions are important inputs to cost-effectiveness calculations and
13 shareholder-incentive calculations.

14 **Q: DO MOST STATES HAVE A TRM?**

15 A: Yes. In my experience, the vast majority of states – especially those with fairly
16 robust efficiency-program offerings – have TRMs. For example, in the South
17 there are TRMs currently in use in Arkansas (currently on their seventh
18 iteration),⁵ New Orleans (currently on its first iteration),⁶ Texas (currently on its
19 fifth iteration),⁷ and by TVA (currently on its seventh iteration).⁸ TRMs have
20 also been developed and used by utilities in Illinois, Indiana, Michigan, Ohio,
21 Pennsylvania, Missouri, New Jersey, other mid-Atlantic states, New York, the

⁵ <http://www.apscservices.info/EEInfo/TRMv7.0.pdf>.

⁶ No on-line link is available.

⁷ <http://www.texasefficiency.com/index.php/emv>.

⁸ <https://www.tva.gov/Energy/EnergyRightSolutions>.

1 New England states, the Pacific Northwest states, California, and at least half a
2 dozen other states.⁹

3 **2. My Home Energy Report Program Savings Life**

4 **Q: WHAT IS YOUR UNDERSTANDING OF DEC'S ASSUMPTION**
5 **REGARDING THE LIFE OF SAVINGS FROM ITS MY HOME ENERGY**
6 **REPORT PROGRAM?**

7 A: DEC is assuming that the savings from this program last one year.¹⁰

8 **Q: WHAT ARE THE IMPLICATIONS OF THAT ASSUMPTION?**

9 A: DEC assumes that in each year, in addition to sometimes reaching new
10 participants, it needs to “re-reach” the previous year’s participants in order to
11 reacquire savings procured the previous year, which are assumed to have
12 “expired.” Thus, each year, DEC counts the savings from all program
13 participants, regardless of the year in which they started participating, as part of
14 its estimates of the new annual savings it is producing each year.

15 **Q: IS THAT A REASONABLE ASSUMPTION?**

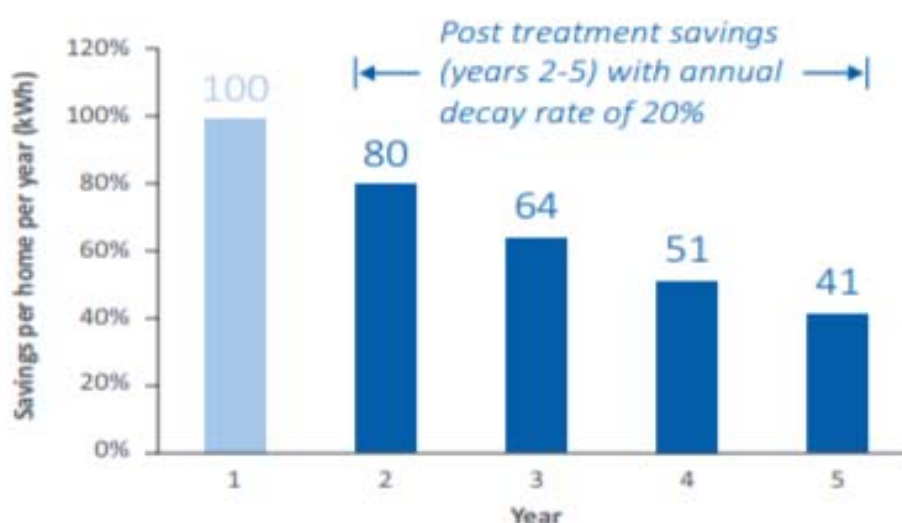
16 A: Probably not. A number of studies of residential behavior programs have shown
17 that savings produced from a given year of program delivery do not expire after
18 one year if the program is stopped. Instead, a significant portion of the savings
19 will persist into the years following program termination, though the amount that
20 persists declines over the course of several years. One commonly referenced
21 study suggests that, on average, savings achieved during a program year decay

⁹ For a list of jurisdictions with TRMs as of a year ago see U.S. Department of Energy, *SEE Action Guide for States: Guidance on Establishing and Maintaining Technical Reference Manuals for Energy Efficiency Measures*, Evaluation, Measurement and Verification Working Group, June 2017 (https://www4.eere.energy.gov/seeaction/system/files/documents/TRM%20Guide_Final_6.21.17.pdf).

¹⁰ Evans Exhibit C, p. 70 of 138.

(or decline) by about 20 percent every year following program termination.¹¹ As Figure 1 illustrates, that would mean that 80 percent of the program-year savings persist into the first year following program termination, 64 percent persist into the second year following program termination, 51 percent persist into the third year following program termination, etc.

Figure 1: Home Energy Report Savings Persistence 20 Percent Annual Decay Rate¹²



Q: DO ANY OTHER JURISDICTIONS ADJUST SAVING ASSUMPTIONS TO ACCOUNT FOR THIS UNDERSTANDING OF SAVINGS PERSISTENCE FROM RESIDENTIAL BEHAVIOR PROGRAMS?

A: Some states have adjusted the way that they estimate savings from such programs. For example, the Illinois TRM now requires electric utilities in the state to assume that 80 percent of savings achieved in a program-participation year persist into the first year following program termination, 54 percent into the

¹¹ Khawaja, Sami and James Stewart, Long-Run Savings and Cost-Effectiveness of Home Energy Report Programs, published by The Cadmus Group, Inc., Winter 2014/2015 (http://www.cadmusgroup.com/wp-content/uploads/2014/11/Cadmus_Home_Energy_Reports_Winter2014.pdf).

¹² This is a copy of Figure 3 from the Cadmus paper.

1 second year, 31 percent into the third year and 15 percent into the fourth year.¹³

2 Thus, if a utility measures annual savings of 100 kWh per participating customer
3 each year, it can only claim 20 kWh of new incremental annual savings in the
4 second consecutive year of delivery to the same set of customers.¹⁴

5 **Q: CAN THAT APPROACH TO ACCOUNTING FOR THE PERSISTENCE**
6 **OF SAVINGS FROM RESIDENTIAL BEHAVIOR PROGRAMS AFFECT**
7 **PROGRAM-DELIVERY STRATEGY?**

8 A: Yes, it can, for a couple of related reasons. First, it significantly reduces the
9 amount of *new* annual savings a utility can count from repeat participants towards
10 any annual savings goals. And because the cost of the program per participant
11 does not change, the cost per unit of new annual savings from repeat participants
12 goes up considerably. That, in turn, at least has the potential to make program
13 delivery to repeat participants comparatively more expensive per new annual
14 kWh saved than other programs to which efficiency portfolio budgets can be
15 allocated. Second, it can even render it not cost-effective to deliver the program
16 to repeat participants.

17 As a result, it may make sense to adjust program design and delivery strategy.
18 One option is to rotate delivery of residential behavior programs to different sets
19 of customers each year, and not return to a group of customers until at least three
20 or four years have passed since they were last treated. That is the strategy that

¹³ Illinois TRM Version 6.0, Volume 4, p. 9

(http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_6/Final/IL-TRM_Effective_010118_v6.0_Vol_4_X-Cutting_Measures_and_Attach_020817_Final.pdf).

¹⁴ Unless savings per customer increase, which they sometimes do after more than one year of participation. For example, if average savings per customer were 100 kWh in the first year and grew to 120 kWh in the second year, the utility could claim 40 kWh of new incremental annual savings per repeat participant, or the difference between the 120 kWh measured in the second year and the 80 kWh that would have persisted into the second year had the program not been offered again to the same customers.

1 Ameren Illinois has adopted for its 2018-2021 plan. There are undoubtedly other
2 options that merit consideration as well.

3 **Q: ARE YOU SUGGESTING THAT DEC NEEDS TO CHANGE ITS**
4 **ASSUMPTION OF A ONE-YEAR LIFE FOR SAVINGS FROM ITS MY**
5 **HOME ENERGY REPORT PROGRAM, WITH ATTENDANT CHANGES**
6 **IN THE AMOUNT OF NEW SAVINGS IT COUNTS EACH YEAR?**

7 A: I think it likely that it will be appropriate to change that assumption. However, I
8 would recommend that more analysis be done, considering the applicability of
9 the results of other studies' estimates of savings decay/persistence to DEC's
10 program, before making any specific changes. It may also be appropriate to stop
11 delivering the program for a set of participants and to perform an evaluation of
12 savings persistence over time for those participants to refine any assumption
13 changes. Finally, it will be important to consider whether and the extent to which
14 any change in assumption regarding measure life – as well as other concerns I
15 discuss further below – supports changes to program emphasis and delivery
16 strategy. This is an issue that the Utilities Commission may wish to refer to the
17 DEC Collaborative for discussion, analysis, and ultimately recommendations on
18 how to proceed.

19 **3. EISA Impact on Residential Light Bulb Savings Life**

20 **Q: WHAT MEASURE-LIFE ASSUMPTION IS DEC USING FOR**
21 **RESIDENTIAL LED LIGHT BULBS ITS PROGRAMS ARE**
22 **CURRENTLY PROMOTING?**

1 A: Based on the evaluation report for DEC's Free LED program, it appears as if
2 DEC is assuming that most LED light bulbs have an average life of about 12
3 years.¹⁵

4 **Q: IS 12 YEARS A REASONABLE ASSUMPTION FOR THE MEASURE**
5 **LIFE OF AN LED LIGHT BULB?**

6 A: Depending on the specific LED products DEC is promoting, 12 years could be a
7 reasonable assumption for the equipment life of the bulbs, or how long the LED
8 light bulbs will physically last. However, at least for most LEDs, it is not a
9 reasonable assumption regarding the average life of the first year savings – i.e.,
10 the *savings life*. Put another way, multiplying the first-year savings of a standard
11 LED by its assumed 12-year measure life will be produce an unrealistically high
12 estimate of lifetime savings for the measure.

13 **Q: WHY IS THE SAVINGS LIFE SHORTER THAN THE EQUIPMENT**
14 **LIFE?**

15 A: For most measures they are the same. But they can be different in cases in which
16 the equipment life of the efficiency measure and the equipment life of the
17 baseline measure being replaced or displaced are different. That is the case with
18 LED light bulbs.

19 An LED light bulb that is purchased today – or next year – is assumed to be
20 purchased instead of a halogen light bulb. The electricity savings produced by an
21 LED in its first year of operation will therefore be equal to the difference between

¹⁵ A 12-year life is the assumption for between 85% and 90% of the light bulbs DEC is forecasting for its 2019 Residential Energy Efficient Appliances and Devices program in North Carolina. The remaining bulbs have an assumed measure life of 15 years (DEC confidential response to SACE et al Data Request 2-3b). Though the underlying data source for this analysis was from a spreadsheet marked “confidential” by DEC, counsel for the Company has confirmed that no confidential material is included in my summary of the average useful life of lighting measures.

1 its electricity consumption and that of the halogen that would have otherwise
2 been purchased and installed. In addition to consuming less energy, LEDs last a
3 lot longer than halogens. Depending on the product and other factors, it can be
4 reasonable to assume that LEDs last an average of 12 years. In contrast, halogens
5 that are replaced by LEDs typically last only a year or two.¹⁶ Thus, in the
6 baseline scenario, the customer would be buying a new light bulb roughly every
7 year or every other year, for as long as the baseline product remains a halogen
8 bulb. If it were reasonable to assume that the baseline product would remain a
9 halogen bulb for the next 12 years, the savings in each of the next 12 years of the
10 LED equipment life would be the same as in the first year. In that case, the LED
11 savings life would be equal to the LED equipment life. But that is not a
12 reasonable assumption for standard LEDs because federal efficiency standards
13 under the Energy Independence and Security Act (EISA) that will go into effect
14 in 2020 will effectively require all new general service, screw-based lamps – i.e.,
15 those that “standard LEDs” would replace – to be as efficient as compact
16 fluorescent light bulbs (CFLs). Thus, the annual savings estimated for standard
17 LEDs will decline significantly starting in 2020. Put another way, rather than
18 assuming that the current annual savings of an LED will last 12 years, the annual
19 savings for an LED installed in 2017 should only have been assumed to continue
20 at the 2017 level for three or four years, followed by eight or nine years of much
21 lower levels of savings.¹⁷ Similarly, for a standard LED light bulb installed in

¹⁶ Based on review of a variety of screw based halogen light bulbs for sale from Home Depot (<https://www.homedepot.com/s/halogen%2520light%2520bulb?NCNI-5>).

¹⁷ Similarly, for a standard LED installed in 2019, the current annual savings estimate would be appropriate for only one or two years, followed by 10 or 11 years of much lower levels of savings. And

1 2019, the current annual savings estimate may be appropriate for only the first
2 year or two of the LED bulb's physical life, with lower savings assumed for the
3 remaining 10 or 11 years.

4 **Q: IS THAT KIND OF ADJUSTMENT APPROPRIATE FOR ALL LED**
5 **LIGHT BULBS?**

6 A: No, this kind of adjustment is only appropriate for the kinds of light bulbs that are
7 governed by the EISA product-efficiency standards. That means all of what are
8 commonly known in the industry as "standard LEDs," particularly "A-Line
9 LEDs," but also likely directional and decorative lamps that are included in a
10 recently expanded definition of "general service lamp" adopted by the U.S.
11 Department of Energy. DEC's programs may include savings from both LEDs
12 that are covered by EISA and LEDs that are not. The savings from the LEDs not
13 covered by EISA would be unaffected by the shifting baseline efficiency
14 associated with EISA. I do not know what fraction of the LED light bulbs
15 promoted by all of DEC's programs fall into each category, though at first blush
16 it appears as if all of the bulbs proposed to be promoted in 2019 through its
17 Residential Energy Efficient Appliances and Devices program will be affected by
18 EISA.¹⁸

19 **Q: IS THE KIND OF ADJUSTMENT TO STANDARD LED SAVINGS LIVES**
20 **THAT YOU ARE SUGGESTING CONSISTENT WITH NATIONAL BEST**
21 **PRACTICE?**

the savings for any standard LED installed in 2020 or later will be much smaller in every year of its operation (i.e. requiring a lower first year savings value as well as lower savings in subsequent years).

¹⁸ Based on my review of product types listed in DEC's Excel attachment to its confidential response to SACE 2-3b.

1 A: Yes. This is kind of savings adjustment was recommended a couple of years ago
2 by the national “Uniform Methods Project,” a national effort designed to bring
3 best practice consistency to energy-savings estimation and evaluation:

4 *Bulbs expected to be in use in 2020 and beyond will be affected by the*
5 *EISA backstop provision mentioned in Section 1. The life cycle savings*
6 *of CFLs, therefore, should either terminate for any remaining years in*
7 *the expected life beginning in mid-2020, or be substantially reduced*
8 *after 2020 to account for the backstop provision. Similarly, the life*
9 *cycle savings for LEDs should incorporate this upcoming baseline*
10 *change.*¹⁹

11 **Q: ARE THERE OTHER STATES THAT MAKE SUCH SAVINGS**
12 **ADJUSTMENTS FOR STANDARD LEDS STARTING IN OR AROUND**
13 **2020?**

14 A: Yes. Illinois is an example of a state that makes this adjustment. The Illinois
15 TRM explains the LED “mid-life baseline adjustment” as follows:

16 *During the lifetime of a standard Omnidirectional LED, the baseline*
17 *incandescent/halogen bulb would need to be replaced multiple times.*
18 *Since the baseline bulb changes over time (except for <300 and*
19 *>2600+ lumen lamps) the annual savings claim must be reduced*
20 *within the life of the measure to account for this baseline shift.*

¹⁹ Dimetrosky, Scott, Katie Parkinson and Noah Lieb, “Chapter 21: Residential Lighting Evaluation Protocol,” The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures, published by the National Renewable Energy Laboratory, February 2015, <http://energy.gov/sites/prod/files/2015/02/f19/UMPCChapter21-residential-lighting-evaluation-protocol.pdf>.

For example, for 60W equivalent bulbs installed in 2014, the full savings...should be claimed for the first six years, but a reduced annual savings (...[initial first year energy savings]...multiplied by the adjustment factor in the table below) claimed for the remainder of the measure life.²⁰

Minimum Lumens	Maximum Lumens	LED Wattage (WattsEE)	Delta Watts 2014-2019 (WattsEE)	Delta Watts Post 2020 (WattsEE)	Mid Life adjustment (made from June 2020) to first year savings
1490	2600	37.2	34.8	8.3	23.8%
1050	1489	23.1	29.9	5.1	17.1%
750	1049	16.4	26.6	3.6	13.5%
310	749	9.6	19.4	2.1	10.8%

As one can see from the table, the portion of initial LED savings that no longer apply after 2020 varies by lamp light output level. The average remaining savings across the four categories shown is 16 percent, representing an 84-percent reduction from pre-2020 annual savings levels.

The Arkansas TRM uses the same conceptual approach, but with slightly different assumptions. Specifically, it assumes that the baseline shift for standard LEDs does not change until 2022 instead of after 2020, so it assumes that there are a couple more years of the higher levels of savings and a couple fewer years

²⁰ Illinois Statewide Technical Reference Manual for Energy Efficiency, Version 5.0, Volume 3: Residential Measures, Final; February 11th, 2016; effective June 1st, 2016; p. 261, http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Effective_060116_v5.0_Vol_3_Res_021116_Final.pdf.f

1 of lower levels of savings.²¹ That difference is a function of different
2 assumptions regarding the average life of a current baseline halogen lamp.

3 **Q: WHAT ARE THE IMPLICATIONS OF ACCOUNTING FOR THIS EISA-**
4 **DRIVEN BASELINE SHIFT WHEN ESTIMATING SAVINGS FROM**
5 **LED LIGHT BULBS?**

6 A: The EISA-driven baseline shift, by definition, does not affect estimated first year
7 savings from LEDs, at least not until 2020 when the prohibition on sale of
8 products not meeting EISA standards goes into effect. However, because it
9 affects estimated savings for a significant portion of the assumed physical life of
10 the average LED governed by such standards, it will reduce estimates of the net
11 economic benefits of such light bulbs.

12 **Q: ARE YOU SUGGESTING THAT ANY PART OF DEC'S APPLICATION**
13 **IN THIS PROCEEDING BE ADJUSTED TO ACCOUNT FOR SUCH**
14 **IMPACTS?**

15 A: No. There are several issues that would need to be worked out in detail before
16 making adjustments to DEC's economic net benefit calculations, including the
17 nature of the specific baseline shifts to be made, assumptions regarding the
18 products for which they should be made,²² assumptions regarding the assumed
19 life of the average halogen baseline lamp being displaced today (the longer the
20 halogen life, the longer the average period before the baseline shift occurs), etc.

²¹ Arkansas Public Service Commission, Arkansas Technical Reference Manual, Version 7.0, Approved in Docket 10-100-R, filed 8/31/2017 (<http://www.apscservices.info/EEInfo/TRMv7.0.pdf>).

²² The U.S. Department of Energy's expanded definition of general service lamp is being challenged by some parties. While it appears likely to withstand such challenges, it may be appropriate to assess that likelihood thoroughly before making definitive decisions regarding the products for which adjustments should be made.

1 That said, this is an important issue for a measure that accounts for a significant
2 portion of DEC's estimated annual savings. Thus, as with the issue of the My
3 Home Energy Report program savings decay/persistence, the Utilities
4 Commission should consider referring this issue to the DEC Collaborative for
5 discussion, analysis, and ultimately recommendations on how to proceed.

6 **IV. DEC's Efficiency Program Mix**

7 **1. Overview**

8 **Q: WHAT IS YOUR VIEW OF DEC'S PLANNED ENERGY-EFFICIENCY** 9 **PROGRAM PORTFOLIO FOR 2019?**

10 **A:** There are some admirable elements to the portfolio:

- 11 • First, it appears as if DEC is planning to achieve annual savings of 0.95
12 percent of total annual sales and an even higher percentage of annual sales to
13 non-opt-out customers – 1.38 percent – in 2019.²³ Though it is possible to
14 acquire greater levels of cost-effective savings than that, 0.95 percent of total
15 sales and 1.38 percent of sales to non-opt-out customers still represent
16 significant milestones.
- 17 • Second, the efficiency-program portfolio is very cost-effective, demonstrating
18 that efficiency programs are a least-cost resource for meeting consumers'
19 electricity needs. For every dollar that DEC spends on its programs, it is

²³ The Company is forecasting that it will achieve 451.9 GWh of residential efficiency program savings and 327.0 GWh of non-residential efficiency program savings for a total efficiency program savings of 778.9 GWh at the generator in 2019 (Evans Exhibit 1, p. 5). Approximately 72.81 percent of those savings – or 567 GWh – is allocated to North Carolina (Evans Exhibit 5, p. 1). Adjusted for 6.2187 percent line losses (Duke response to SACE 2-6), the North Carolina savings are about 534 GWh at customers' meters. DEC's forecast 2019 sales are 56,057 GWh (Miller Exhibit 6). DEC is forecasting that business customers with annual sales of 17,253 GWh will opt out of its programs, so sales to non-opt-out customers will be 38,804 GWh in 2019.

- 1 eliminating the need to spend \$2.46 on new power plants, the fuel to run those
2 power plants, new power lines, and other investments otherwise needed to
3 supply electricity to inefficient homes and businesses. This calculation is
4 based on DEC's estimated UCT benefit-cost ratio as reported in Evans
5 Exhibit 7. DEC's analysis also suggests that the programs are very cost-
6 effective under the TRC test (benefit-cost ratio of roughly 2 to 1).²⁴ It is
7 notable that in just the four years from 2014 through 2017 DEC's efficiency
8 programs provided enough peak demand savings to eliminate the need for
9 more than four average-sized natural gas "peaker" power plants.²⁵
- 10 • Third, DEC's efficiency program portfolio is fairly broad. That is, it
11 promotes a fairly wide range of efficiency measures through a range of
12 programs that at least theoretically could be accessed a by wide range of
13 residential and non-residential customers.
- 14 • Fourth, I am impressed by the sophistication and advanced nature of some of
15 the DEC programs or program elements. In particular, the Company deserves

²⁴ And this is a very conservative estimate of TRC cost-effectiveness because, as I understand it, DEC's application of the TRC test excludes many benefits – including natural gas and other fuel savings, water savings, and various participant non-energy benefits – that a TRC test should include if it is to assess properly the cost-effectiveness of the impacts on the utility system plus program participants, which is the conceptual construct of the TRC (see Woolf, Tim, et al., *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Edition 1, Spring 2017 (https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf)).

²⁵ The sum of the incremental annual peak savings for each year for all DEC's efficiency programs other than the My Home Energy Report program is 298 MW. Since virtually all of the savings from those programs had a life of at least four years, that is a reasonable estimate of the persisting peak savings after four years. On top of that, the My Home Energy Report program had a peak savings of 79 MW in 2017 (since this is a program that is estimated to have just a one-year life, I only include the peak savings from 2017), bringing the total for the efficiency program portfolio to 377 MW by the end of 2017. (DEC confidential response to SACE et al Data Request 2-3b). Though the underlying data source for this analysis was from a spreadsheet marked "confidential" by DEC, counsel for the Company has confirmed that no confidential material is included in my summary of annual peak savings. Note that this analysis is for efficiency programs only; the peak savings from DEC's demand-response programs are additional to that amount. According to U.S. Energy Information Administration data, in 2016 DEC had 32 natural-gas-fired combustion turbines, with summer capacities ranging between 42 MW and 160 MW and an average summer capacity of 86 MW.

1 great credit for initiating a new midstream channel to its Non-Residential
2 Smart\$aver Prescriptive program for promoting a range of efficient products
3 (HVAC, lighting, food service, and IT measures) to business customers. This
4 is a national state-of-the-art practice.

5 That said, I do have several concerns regarding the composition of the portfolio
6 of programs and, perhaps even more importantly, the relative contributions of
7 different programs to the Company's estimated savings.

8 **Q: WHAT ARE THOSE CONCERNS?**

9 A: I have several inter-related concerns:

- 10 • Too much relative emphasis on programs that deliver only very short-lived
11 savings.
- 12 • Insufficient promotion of long-lived major measures and comprehensive
13 treatment of buildings. This is a corollary to the point above.
- 14 • Insufficient planning to offset what will be a significant loss of residential-
15 lighting savings potential once the 2020 federal EISA efficiency standards go
16 into effect.
- 17 • Need for expanded focus on delivering energy-saving programs in lower-
18 income communities.

19 Though I express these concerns at the portfolio level, they are most pronounced
20 for the residential sector.

21 **2. Short-Lived Savings vs. Longer-Lived Savings**

22 **Q: WHAT DO YOU CONSIDER TO BE "SHORT-LIVED" SAVINGS?**

1 A: If I had to draw a line, it would be savings from measures with a life of less than
2 7 to 10 years. However, I think it is more appropriate to take a more nuanced
3 view by looking at the mix of savings lives.²⁶

4 **Q: WHAT IS THE BASIS FOR YOUR CONCERN REGARDING DEC'S**
5 **LEVEL OF EMPHASIS ON SHORT-LIVED SAVINGS?**

6 A: To begin with, nearly 70 percent of DEC's residential annual savings and roughly
7 40 percent of the DEC's *total* forecast 2019 incremental annual savings are
8 forecast to come from just its Residential My Home Energy Report behavioral
9 program. Those are extremely high percentages.
10 Second, it appears as if the vast majority of other savings DEC is forecasting to
11 acquire from the residential sector is lighting savings.²⁷ As I discussed in the
12 previous section to this testimony, most residential lighting savings will not
13 persist past 2020 (or maybe 2021) because of the baseline shift resulting from the
14 2020 federal EISA efficiency standards.
15 Finally, data from the American Council for an Energy Efficient Economy's
16 (ACEEE's) 2017 Utility Energy Efficiency Scorecard, which rated the efficiency
17 performance of 51 utilities across the country, also suggest that the average
18 savings life of DEC's efficiency programs is much lower than average.
19 Specifically, though DEC's average *annual* savings was only just below average

²⁶ For example, if 60 percent of savings are from measures that have a life of less than seven years, but most of those have lives of six years, that would be much better than if 50 percent of savings are from measures that have a life of less than seven years, but most of those have a life of one year.

²⁷ Most of the balance of DEC's forecast 2019 residential savings are from its Energy Efficient Appliances and Devices program. Light bulbs likely dominate savings from that program, with roughly 1.6 million free LED light bulbs and 2.1 million lighting measures – mostly light bulbs – rebated through the “retail lighting” program component in 2017 (Evans Exhibit 6, pp. 8-9 of 126). Energy-efficient lighting is also a key focus of almost all of the other residential programs targeted to the residential sector in 2019. For example, 67 percent of the measures installed in the Multi-Family program were lighting measures (Evans Exhibit 6, p. 53 of 126).

1 for the 51 utilities analyzed, its average *lifetime* savings was only about half of
2 the average lifetime savings achieved by the same utilities.²⁸

3 **Q: HOW DOES THE 40 PERCENT OF TOTAL PORTFOLIO SAVINGS**
4 **THAT DEC IS FORECASTING TO ACHIEVE THROUGH ITS**
5 **RESIDENTIAL BEHAVIOR (MY HOME ENERGY REPORTS)**
6 **PROGRAM COMPARE TO OTHER UTILITIES?**

7 A: I am unaware of any other investor-owned electric utility (other than DEC's
8 affiliated company, Duke Ohio) that is planning to get that much of its total
9 savings from a residential behavior program. To illustrate that point, I have
10 compiled estimates of the percentage of both residential and total savings that
11 residential-behavior programs provide for 19 electric utilities in the eastern half
12 of the United States, including nine Southern utilities. Though this is not an
13 exhaustive review, I have endeavored to collect data for the largest utilities in
14 most Southern, mid-Atlantic and Midwestern states. Those estimates are
15 provided in Table 1 below. Where possible, I have provided planned numbers to
16 compare to DEC's plan for 2019; otherwise I have provided actual performance
17 numbers for a recent year (mostly 2017). None of these utilities come close to
18 achieving as large a portion of total electric portfolio savings from their
19 Residential Behavior programs as does DEC, which projects that 40 percent of its
20 overall savings in 2019 will come from My Home Energy Report. In fact, the
21 average non-DEC utility is getting only 9 percent of total portfolio electric
22 savings from its residential behavior programs – less than one-quarter as much as
23 DEC – and the average of the other southern utilities for which I obtained data is

²⁸ Relf, Grace et al., 2017 Utility Energy Efficiency Scorecard, ACEEE Report U1707, June 2017.

1 even less. Only one utility – Baltimore Gas & Electric – is planning to get even
 2 half as much of its savings from its Residential Behavior program as DEC.²⁹

3 **Table 1: Percentage of Total Savings from Residential Behavior Programs**³⁰

Utility	State	Plan or Actual	Year	MWh Savings			Behavior Savings %	
				Res. Behavior Program	All Res. Sector Programs	All Programs, All Sectors	% of Res. Sector Savings	% of Total Savings (All Sectors)
Duke Energy Carolinas	NC/SC	Plan	2019	312,934	451,520	778,508	69%	40%
Entergy New Orleans	LA	Plan	2019	8,000	19,416	53,894	41%	15%
Entergy Gulf States	LA	Actual	2017	0	10,419	17,057	0%	0%
Entergy Louisiana	LA	Actual	2017	0	18,101	28,456	0%	0%
Entergy Mississippi	MS	Actual	2017	0	13,227	26,294	0%	0%
Mississippi Power	MS	Actual	2017	3,421	7,611	18,333	45%	19%
Entergy Arkansas	AR	Actual	2017	7,901	104,051	264,992	8%	3%
SWEPCO	AR	Actual	2017	0	12,617	33,667	0%	0%
Georgia Power	GA	Actual	2017	12,366	94,119	375,375	13%	3%
Florida Power and Light	FL	Actual	2017	0	23,600	71,400	0%	0%
PEPCO	MD	Plan	2019	48,710	130,189	262,357	37%	19%
Baltimore Gas & Electric	MD	Plan	2019	138,200	335,267	500,267	41%	28%
PECO	PA	Plan	2016-20	304,999	844,412	2,091,301	36%	15%
All MA Utilities	MA	Actual	2016	140,547	723,392	1,569,661	19%	9%
Commonwealth Edison	IL	Plan	2018	275,502	575,606	1,619,028	48%	17%
Ameren Illinois	IL	Plan	2018	6,290	92,971	347,176	7%	2%
First Energy	OH	Plan	2017-19	125,788	632,302	1,781,833	20%	7%
American Electric Power	OH	Plan	2019	75,000	212,600	611,500	35%	12%
DTE	MI	Plan	2019	73,668	291,013	702,850	25%	10%
Consumers Energy	MI	Plan	2019	31,442	157,846	479,471	20%	7%
Avg of Southern Utilities	Various	Mix	Mix				12%	4%
Avg of All Utilities	Various	Mix	Mix				21%	9%

5 **Q: YOU TESTIFIED THAT THE AMOUNT OF NEW INCREMENTAL**
 6 **ANNUAL SAVINGS PRODUCED BY DEC'S MY HOME ENERGY**
 7 **REPORT PROGRAM MAY BE OVER-STATED. IF THAT PROVES TO**
 8 **TRUE, AND PERSISTENT SAVINGS WERE INSTEAD ACCOUNTED**

²⁹ The 28 percent provided in the table for BG&E includes only efficiency programs designed to promote efficiency actions by customers. BG&E also gets significant customer savings from conservation voltage regulation, which I did not include in the total savings into which I divided their residential-behavior program savings. If CVR savings were included, the BG&E average would drop to 21 percent.

³⁰ All values are from publicly available sources, either filed utility plans or utility annual reports. Specific references are available upon request.

1 **FOR, WOULD THAT ELIMINATE YOUR CONCERN ABOUT TOO**
2 **MUCH OF THE COMPANY'S SAVINGS BEING SHORT-LIVED**
3 **SAVINGS?**

4 A: No. Though it is true that such an adjustment would reduce the percentage of
5 annual portfolio savings coming from the My Home Energy Report program, this
6 isn't just an accounting issue. As I note above, I have a corollary concern that
7 DEC is not acquiring enough longer-lived savings. Moreover, if the My Home
8 Energy Report *annual* savings declined because it was determined to be more
9 appropriate to account for persistence of savings from participants over multiple
10 years, DEC would need to acquire additional savings from other measures and
11 programs in order to get back up to (or exceed) the 1.0 percent of prior-year sales
12 target. Those additional savings should ideally come from longer-lived measures
13 because they provide more lasting benefits both to consumers and to the utility
14 system.

15 **Q: CAN YOU GIVE EXAMPLES OF THE KINDS OF ADDITIONAL**
16 **LONGER-LIVED SAVINGS DEC COULD ACQUIRE IN THE**
17 **RESIDENTIAL SECTOR?**

18 A: I would begin by suggesting efforts to increase significantly the number of
19 customers participating in rebate offers for high-efficiency heat pumps, central air
20 conditioners, heat-pump water heaters, pool pumps, attic insulation, air sealing,
21 and duct sealing. There should be significant savings potential from these
22 measures as they address the largest electricity end-uses in homes. However,
23 DEC's Residential SmartSaver Energy Efficiency Program – the program through
24 which all of these measures are promoted – is forecast to produce only about one

1 percent of the Company's annual residential savings in 2019. Participation rates
2 for these measures could potentially be increased in a variety of ways. In short,
3 though DEC includes many of the major residential measures with big savings
4 potential in its program, it is not getting nearly enough uptake or participation
5 with those measures. Perhaps most notably, they could be dramatically increased
6 by moving some of the measure incentives (e.g., those for heat pumps, central air
7 conditioners, and heat pump water heaters) upstream to distributors, as the
8 Company has recently done for a number of non-residential prescriptive
9 incentives. Utilities that have made such transitions have achieved dramatic
10 increases in participation. For example, United Illuminating in Connecticut saw a
11 more than six-fold increase in participation in its heat pump water heater rebates
12 when it moved rebates upstream to distributors.³¹ Changes in rebate levels,
13 marketing strategies, paperwork requirements, options for financing investments
14 (for example, through on-bill financing), and/or other program elements may also
15 enable increases in participation.

16 In addition, the Company could increase longer-lived savings through greater
17 promotion of whole-building retrofits, for residential and potentially small
18 business customers too. Such whole-building retrofits should include both (A)
19 improvements to building envelopes (e.g. insulation and air leakage reduction),
20 and (B) retrofitting efficient heat pumps in single-family and multi-family homes

³¹ Jennifer Parsons (UI, SCG and CNG), "Energize Connecticut Upstream Residential HVAC Program," presented at the 2015 ACEEE National Conference on Energy Efficiency as a Resource in Little Rock, Arkansas, September 2015 (http://aceee.org/sites/default/files/pdf/conferences/ee/2015/Jennifer_Parsons_Session4A_EER15_9.22.15.pdf).

1 currently using inefficient electric-resistance heat. There may be quite a large
2 number of such inefficiently electrically heated housing units.³²

3 **Q: CAN YOU GIVE EXAMPLES OF THE KINDS OF ADDITIONAL**
4 **LONGER-LIVED SAVINGS DEC COULD ACQUIRE IN THE NON-**
5 **RESIDENTIAL SECTOR?**

6 DEC reports that in 2017, incentive payments in its prescriptive rebate program
7 increased (relative to 2016 levels) by 69 percent for lighting, 24 percent for
8 pumps and motors, 71 percent for process equipment, and five percent for HVAC
9 equipment.³³ One key reason for the growth is the increased interest in LED
10 lighting, which is likely tied to both fast improving product quality and declining
11 costs. Another key to the increase was improvements to the midstream channel
12 through which 56 percent of program savings were processed in 2017. Absent
13 any changes to the program to dampen participation, I would expect participation
14 and savings to increase further in the future as LED lighting products become
15 even more attractive and as distributors' comfort with the midstream channel
16 continues to increase. However, it appears as if DEC is actually forecasting a
17 nearly 50 percent decline in lighting savings from this program – from 230 GWh
18 in 2017 to just 123 GWh in 2019.

³² I do not have statistics specific to DEC's North Carolina service territory. However, 62 percent of North Carolina homes use electricity as their primary heating fuel [U.S. Census, Selected Housing Characteristics, 2012-2016 American Community Survey 5-Year Estimates (<https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>)]. Census data also suggest that more than half of electrically heated homes in the South Atlantic region rely upon some form of electric-resistance heating system, whether a furnace, electric baseboard, or portable electric heaters (U.S. Energy Information Administration, Residential Energy Consumption Survey, Table HC6.8: "Space heating in homes in the South and West Regions, 2015" (<https://www.eia.gov/consumption/residential/data/2015/#sh>)).

³³ Evans Exhibit 6, p. 77.

1 In addition, customers responsible for approximately half of DEC's forecast
2 commercial and industrial sales have opted out and/or are forecast to opt out of
3 its efficiency programs for 2019. In my experience, business customers opt out
4 of efficiency-program offerings (when they have the option) for a variety of
5 reasons. Some of those reasons are outside the control of the utility. Others are
6 not. For example, some business customers opt out because they do not feel that
7 the utility's efficiency-program offerings adequately address their needs.
8 Sometimes this feeling is a function of the business customer not fully
9 understanding the efficiency programs that the utility offers. Other times,
10 business customers have legitimate concerns about the structure and nature of
11 available program designs. I cannot speak to the extent to which either of those
12 issues exists with respect to DEC's programs. However, if DEC could improve
13 awareness of how its programs can help business customers while also improving
14 its offerings to better serve customers that are otherwise inclined to opt out, the
15 Company could tap into another source of substantial energy savings. Many of
16 these savings would likely be long-lived and very cost-effective and would
17 further reduce the amount of more expensive supply-side resources the Company
18 would need to procure.

19 I understand that last year the Utilities Commission instructed DEC to explore
20 how it could reduce opt-outs. DEC witness Evans very briefly discusses this
21 issue in his testimony, simply stating that the Company continues to assess ways
22 to improve its non-residential programs and to use its Large Account Management

1 Team to ensure customers are aware of product offerings and opt-in windows.³⁴
2 However, a more extensive and structured approach to assessing options for
3 decreasing opt-outs – perhaps including a formal study involving solicitation of
4 feedback from those customers who have opted out (to the extent that has not yet
5 been undertaken) – may be appropriate.

6 **3. Preparing for the Impact of the 2020 EISA Federal Lighting Efficiency**
7 **Standards**

8 **Q: WOULD THESE KINDS OF CHANGES TO THE COMPANY'S**
9 **PROGRAM PORTFOLIO THAT YOU HAVE IDENTIFIED ADDRESS**
10 **YOUR CONCERN REGARDING THE COMING 2020 EISA**
11 **STANDARDS AND THE NEED TO REPLACE RESIDENTIAL**
12 **LIGHTING AS A SIGNIFICANT SOURCE OF ENERGY SAVINGS?**

13 A: Yes. The kinds of program additions, changes, and enhancements I have
14 suggested should not only lead to longer-lasting savings and benefits, but also
15 help diversify the sources of DEC's energy savings.

16 **Q: WHY IS SUCH DIVERSIFICATION IMPORTANT?**

17 A: As I noted earlier, the 2020 EISA standards are going to eliminate much of the
18 residential energy savings that appears to currently make up a large majority of
19 DEC's non-behavior program savings in the residential sector. There is unlikely
20 to be a single measure or even a single program that, by itself, could fill the
21 "savings gap" that EISA will create – at least not in the residential sector. Thus,
22 it is important that DEC consider several different new programs and/or changes
23 to existing programs that may collectively fill the gap.

³⁴ Evans testimony, p. 34, lines 13-19.

1 **Q: IS IT IMPORTANT THAT SUCH DIVERSIFICATION EFFORTS BEGIN**
2 **SOON?**

3 A: Yes, it is very important. 2020, when the new lightbulb standards go into effect,
4 is only two years away. Depending on the program and market, it can take a year
5 or two to launch new initiatives and then begin to gain significant traction in the
6 market with them. Thus, the Company should be ramping up efforts now to
7 acquire other important sources of savings.

8 **4. Equitably Serving Lower Income Communities**

9 **Q: WHY IS IT IMPORTANT FOR DEC'S ENERGY-EFFICIENCY**
10 **PROGRAM PORTFOLIO TO INCLUDE AN EXPANDED FOCUS ON**
11 **LOW-INCOME COMMUNITIES?**

12 A: There are at least three related reasons. The first is equity. Low-income
13 customers are generally less likely to participate in programs marketed to the
14 residential sector as a whole because such programs usually offer financial
15 incentives to defray, but not totally eliminate, the incremental cost of efficiency
16 measures. Low-income customers rarely have the financial means to make any
17 contribution to efficiency-measure costs. They can also be more likely to be
18 renters, who face greater barriers to efficiency program participation than home
19 owners. Second, low-income customers need energy-efficiency improvements
20 more than other customers. This is because the portion of their income devoted
21 to paying for energy tends to be much higher than for non-low-income customers.
22 In addition, because of their limited means, paying their energy bills can force
23 trade-offs with other necessities of life like food and health care. Finally, because
24 of their financial constraints, low-income households are generally more likely to

1 have problems paying their bills. DEC, like all utilities, incurs costs managing
2 relationships with customers with bill-payment problems. To the extent that low-
3 income efficiency programs can lower such costs, there are added utility-system
4 benefits that do not accrue to other programs (at least not to the same level).

5 **Q: WHY DO RENTERS FACE GREATER BARRIERS TO EFFICIENCY**
6 **PROGRAM PARTICIPATION THAN HOME OWNERS?**

7 A: In rental properties (including in multi-family buildings) in which tenants pay the
8 energy bills, there is what is commonly known as a split-incentive problem.
9 Specifically, the party who incurs the costs of making any major investments in
10 building envelop, HVAC, and appliance-efficiency measures – the landlord – is
11 different than the party who will see the resulting savings on their energy bills –
12 the tenant.

13 **Q: COULD ANY OF THE IDEAS YOU PUT FORWARD IN YOUR**
14 **TESTIMONY FOR INCREASING LONGER-LIVED SAVINGS ALSO BE**
15 **TAILORED TO ADDRESS THE NEEDS OF LOWER INCOME**
16 **CUSTOMERS?**

17 A: Yes. For example, a new residential, whole-building retrofit program could be
18 targeted first to electrically heated low-income neighborhoods³⁵ and/or offered
19 with a tiered incentive structure, with income-eligible customers receiving the
20 retrofit services for free when necessary to enable them to participate.³⁶
21 Depending on capabilities, relationships, and other factors, such a program could

³⁵ Although for equity reasons, there would be value to initially targeting such a program offering to electrically heated low-income customers, such a program should ultimately aim (over time) to address all cost-effective opportunities for all customers, regardless of income.

³⁶ There can be situations, particularly in the case of multi-family buildings, where it may not be necessary to offer efficiency upgrades for free (e.g., where building owners are paying the energy bills and/or when building owners see enough value in lowering energy costs, reducing turnover rates, etc., that they are willing to bear a portion of the cost).

1 even be delivered on DEC's behalf by community action agencies (CAAs) that
2 already perform low-income home retrofits using federal and/or state dollars.
3 DEC has experience with this kind of partnership following its investment in the
4 Helping Home Fund.³⁷ I recommend that the Commission direct the
5 Collaborative to analyze the Helping Home Fund for cost-effectiveness and
6 determine whether any aspects of the program could serve as a model for an
7 additional DSM/EE program offering.

8 There are a variety of other options that could also be considered. Later this year,
9 Commonwealth Edison will launch a pilot program promoting heat-pump
10 retrofits exclusively in electric-resistance-heated, low-income, multi-family
11 buildings in the Chicago area.³⁸ Entergy Arkansas is currently running a
12 program weatherizing manufactured homes, 37 percent of which were occupied
13 by low-income households and another 29 percent either "likely" to be or
14 "potentially" low-income.³⁹ That program had a remarkable 8.56-to-1 TRC
15 benefit-to-cost ratio in 2017. These programs could be models for similar future
16 DEC initiatives.

17 **5. Process for Consideration of New Program Ideas**

18 **Q: ARE YOU SUGGESTING THAT THE UTILITIES COMMISSION**
19 **REQUIRE DEC TO LAUNCH SPECIFIC NEW EFFICIENCY**
20 **PROGRAMS IN THE AREAS YOU HAVE IDENTIFIED?**

³⁷ CN Ex. 2, Helping Home Fund Report.

³⁸ Illinois Commerce Commission, Order, Docket 17-0312, September 11, 2017
(<https://www.icc.illinois.gov/docket/files.aspx?no=17-0312&docId=256554>).

³⁹ Energy Arkansas, Arkansas Energy Efficiency Program Portfolio Annual Report, Docket No. 07-085-TF, 2017 Program Year, May 1, 2018
(<http://www.apscservices.info/EEInfo/EEReports/Entergy%202017.pdf>).

1 A: No. Before a commitment to new program design or even a significant change to
2 an existing program design is made, one would need to: flesh out the details of
3 the proposed approach; assess the market; estimate likely participation and
4 savings; develop a specific budget; and conduct a cost-effectiveness analysis.⁴⁰

5 **Q: WHAT DO YOU SUGGEST THE UTILITIES COMMISSION DO WITH**
6 **RESPECT TO THE NEED FOR CHANGES TO DEC'S EFFICIENCY-**
7 **PROGRAM PORTFOLIO?**

8 A: As with the potential concerns I have raised regarding DEC's current savings
9 assumptions, I suggest that the Utilities Commission direct DEC to explore
10 program options for decreasing emphasis on short-lived savings, increasing
11 investment in longer-lived measures, filling the "savings gap" that will be created
12 by the elimination of most residential-lighting savings potential in 2020, and
13 increasing program offerings to low-income communities. This direction should
14 include, but not be limited to, a requirement to consider the program ideas I have
15 put forward. Analysis and consideration of all such program ideas should be
16 pursued through the DEC Collaborative in order to involve stakeholders. Note
17 that this will require more than a quarterly meeting; it will likely require
18 significant subcommittee or "working group" discussions in between such
19 meetings.

20 **Q: HAVE YOU PARTICIPATED IN UTILITY-STAKEHOLDER**
21 **COLLABORATIVE PROCESSES?**

⁴⁰ The program concepts that I have proposed have been shown to be quite cost-effective in other jurisdictions, including jurisdictions in the South. That is a good indicator that they could be cost-effective in DEC's North Carolina service territory. However, a DEC-specific analysis should ultimately be required.

1 A: Yes. I have participated as a technical advisor in numerous utility-stakeholder
2 collaborative processes in a wide range of jurisdictions. For example, since 2010,
3 I have actively participated in virtually every collaborative meeting of Illinois's
4 Stakeholder Advisory Group (SAG), which typically meets monthly, as well as in
5 much more numerous and more regular SAG subcommittee or working-group
6 discussions. In recent years, I have also participated in a number of similar
7 regular collaborative discussions in Michigan, the Canadian province of Ontario,
8 and, to a lesser degree, in Ohio. I am also currently working with the Arkansas
9 collaborative, called the "Parties Working Collaboratively" ("PWC"), to support
10 an effort that the Arkansas Commission directed to assess how its current cost-
11 effectiveness test aligns with the best practice principles of the *National Standard*
12 *Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency*
13 *Resources*.

14 **Q: IN YOUR EXPERIENCE, CAN SUCH COLLABORATIVE**
15 **DISCUSSIONS BETWEEN UTILITIES AND STAKEHOLDERS**
16 **EFFECTIVELY ADDRESS COMPLEX PROGRAM DESIGN AND**
17 **EM&V ISSUES?**

18 A: Yes. In fact, they are often much more effective venues for addressing such
19 issues than regulatory proceedings.

20 **Q: WHY IS THAT?**

21 A: Because the complex and often arcane nature of the issues demands both
22 specialized expertise and significant "back-and-forth" dialogue to fully explore
23 concerns and options for addressing them. In jurisdictions where well-
24 functioning collaborative processes have become institutionalized, regulators

1 often choose to focus their efforts on higher-level policy issues, such as savings
2 targets and budgets, and direct the collaboratives to work out EM&V, program
3 design, and other operational issues.

4 **Q: CAN YOU ELABORATE ON THE KINDS OF ISSUES THAT**
5 **COMMISSIONS HAVE DEFERRED TO COLLABORATIVES TO**
6 **RESOLVE?**

7 A: Because I am most familiar with Illinois, I will use it as an example. The Illinois
8 Commerce Commission (“ICC”) has directed the Illinois SAG to address the
9 following issues, among others:

- 10 • **Statewide TRM.** Development of a statewide TRM that documents all
11 savings, cost, measure life, and other relevant assumptions for estimating
12 savings from the two electric utilities’ and three gas utilities’ efficiency
13 programs. The SAG developed the first such statewide TRM in 2012. It also
14 developed a process for annually updating and filing the TRM with the ICC.⁴¹
15 To date, every TRM filed has been a consensus document. However, the
16 SAG also has a process for filing any updates when there is disagreement.
- 17 • **Net-to-gross (NTG) program assumptions.** The SAG has a similar annual
18 process for engaging with all parties, including the utilities’ independent
19 evaluators, to develop NTG assumptions for every program the utilities are
20 operating.
- 21 • **Energy-Efficiency Policy Manual.** A couple of years ago, the SAG
22 developed a policy manual which it now also updates annually and files with

⁴¹ For the current version (6.0), which is in four volumes, see
(http://www.ilsag.info/il_trm_version_6.html).

1 the ICC. The policy manual explains how the SAG works as well as the
2 TRM and NTG processes discussed above. The manual also spells out how
3 TRC cost-effectiveness calculations are to be performed; sets forth schedules
4 and processes for developing EM&V plans and reviewing and finalizing
5 EM&V reports; dictates consistent statewide utility quarterly and annual
6 reporting requirements; and covers related issues.

- 7 • **Cost-effectiveness testing parameters.** In the past, when there were
8 disagreements between parties over the parameters of cost-effectiveness
9 analyses, the ICC directed the SAG to flesh out the issues and attempt to
10 resolve them. There was partial resolution with a couple of remaining
11 disagreements that the ICC was going to address (but subsequent legislation
12 addressed them first).
- 13 • **Large industrial self-direct program design.** Several years ago there was
14 disagreement in a contested proceeding over the effectiveness of a utility's
15 program offerings for large industrial customers. Following a directive from
16 the ICC, the SAG worked by consensus to develop a self-direct program for
17 large industrial customers.
- 18 • **Low-income program design and delivery.** The ICC has directed the SAG
19 to work to identify ways to increase the effectiveness (particularly savings) of
20 low-income efficiency programs.
- 21 • **Calculation of weighted average measure life (WAML).** Illinois's electric
22 utilities now amortize the cost of their efficiency programs over the weighted
23 average life of the efficiency measures installed. Interestingly, three different

1 parties initially put forward three different ways of calculating WAML. The
2 ICC directed the SAG to attempt to reach consensus on the most appropriate
3 way to calculate WAML.

- 4 • **Program budget reallocations.** The ICC has required that whenever a utility
5 plans to change an approved program budget by more than 20 percent, it must
6 report and discuss that proposed change to the SAG, with the goal that
7 consensus on such changes (and the rationale for them) be reached without
8 requiring Commission involvement.

9 The SAG has also taken upon itself efforts to negotiate details of the utilities'
10 multi-year plans prior to their filing with the ICC. In the vast majority of cases in
11 the last two multi-year planning cycles, consensus plan filings have been
12 achieved.

13 **Q: IN YOUR EXPERIENCE, WHAT FACTORS ALLOW THE ILLINOIS**
14 **SAG, AND OTHER WELL-FUNCTIONING COLLABORATIVES, TO**
15 **SUCCEED?**

16 A: In my experience, there are several key factors that allow collaboratives to
17 function well:

- 18 • **A genuine willingness on the part of all parties to work together.** That
19 does not mean that there will be no disagreement. There will be. But in my
20 experience, the number and importance of such disagreements decline over
21 time as parties work together, begin to appreciate the others' perspectives, and
22 look to find compromises that work for everyone.
- 23 • **A commitment to meet often enough to effectively work through complex**
24 **issues.** In my experience, this means eight to 10 times a year, almost

1 monthly, for larger group discussions, as well as more numerous sub-group
2 working sessions focused on specific topics (for example, examination and
3 analysis of a particular program design, or updating the TRM).

- 4 • **All parties having a voice in establishing priorities for discussion,**
5 including specific meetings agendas.
- 6 • **Independent facilitation of Collaborative meetings.** In Illinois, an
7 independent facilitator has been hired to manage the SAG process. In
8 Arkansas, an individual hired by the Commission to serve as an Independent
9 Evaluation Monitor facilitates the Collaborative meetings. In Michigan, a
10 Commission staff person manages the monthly Collaborative meetings and
11 related subcommittee or working-group meetings. An independent facilitator
12 ensures that all voices are heard, including in the setting of agendas for
13 meetings, and enables participants in the Collaborative to focus on the topic at
14 hand rather than the actual running of meetings.
- 15 • **Institutionalization of working processes.** This starts with simple things
16 like establishing a schedule for meetings and what those meetings will cover;
17 distributing agendas; and distributing meeting notes, summaries of
18 agreements/ disagreements, and lists of next steps. All of these steps must be
19 taken with enough advance notice for parties to be able to meaningfully
20 prepare and participate in the meetings. Over time, more formal processes
21 should be developed (e.g., annual processes for reviewing and updating and
22 documenting savings assumptions – ideally in a TRM). The
23 institutionalization evolves over time as the collaborative parties get used to

1 working together and develop an increasing list of work products that require
2 periodic updating.

3 • **Accountability.** Well-functioning collaboratives are expected to produce
4 results and to report back to regulators, increasingly in the form of consensus
5 filings, on progress made on key issue

6 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

7 A. Yes.

CERTIFICATE OF SERVICE

I certify that the parties of record on the service list have been served with the Direct Testimony of Chris Neme on Behalf of the North Carolina Justice Center, Natural Resources Defense Council, and Southern Alliance for Clean Energy either by electronic mail or by depositing in the U.S. Mail, first-class postage prepaid.

This the 22nd day of May, 2018.

/s Robin G. Dunn

Robin G. Dunn



CHRISTOPHER NEME, PRINCIPAL

EDUCATION

M.P.P., University of Michigan, 1986
B.A., Political Science, University of Michigan, 1985

EXPERIENCE

2010-present: Principal (and Co-Founder), Energy Futures Group, Hinesburg, VT
1999-2010: Director of Planning & Evaluation, Vermont Energy Investment Corp., Burlington, VT
1993-1999: Senior Analyst, Vermont Energy Investment Corp., Burlington, VT
1992-1993: Energy Consultant, Lawrence Berkeley National Laboratory, Gaborone, Botswana
1986-1991: Senior Policy Analyst, Center for Clean Air Policy, Washington, DC

PROFESSIONAL SUMMARY

Chris specializes in analysis of markets for energy efficiency, renewable energy and strategic electrification measures and the design and evaluation of programs and policies to promote them. During his 25+ years in the clean energy industry, Mr. Neme has worked for energy regulators, utilities, government agencies and advocacy organizations in nearly 30 states, 5 Canadian provinces and several European countries. He has defended expert witness testimony before regulatory commissions in ten different jurisdictions; he has also testified before several state legislatures.

SELECTED PROJECTS

- **Green Mountain Power (Vermont).** Support development and implementation of GMP's plan for reducing customers' direct consumption of fossil fuels. Also developed 10-year forecast different levels of promotion of residential heat pumps and electric vehicles. (2016 to present)
- **Ontario Energy Board:** Serve on gas DSM Evaluation Committee, advisory committee on gas efficiency potential study and advisory committee on carbon price forecast. (2015-present)
- **Alberta Energy Efficiency Alliance.** Drafting white paper on key ways in which consideration of "efficiency as a resource" could be institutionalized. Paper followed presentations to government agencies and others on behalf of the Pembina Institute. (2017 to present)
- **Green Energy Coalition (Ontario).** Represent coalition of environmental groups in regulatory proceedings, utility negotiations and stakeholder meetings on DSM policies (including integrated resource planning on pipeline expansions) and utility proposed DSM Plans. (1993 to present)
- **New Jersey Board of Public Utilities.** Serve on management team responsible for statewide delivery of New Jersey Clean Energy Programs. Lead strategic planning; support regulatory filings, cost-effectiveness analysis & evaluation work. (2015 to present)
- **Natural Resources Defense Council (Illinois, Michigan and Ohio).** Critically review multi-year DSM plans and IRPs of Illinois, Michigan and Ohio utilities. Draft and defend regulatory testimony. Represent NRDC in stakeholder-utility processes governing development of efficiency policy manuals, annual TRM updates, annual NTG updates, etc. (2010 to present)
- **Toronto Atmospheric Fund.** Helped draft an assessment of efficiency potential from retrofitting of cold climate heat pumps into electrically heated multi-family buildings (2017).



CHRISTOPHER NEME, PRINCIPAL

- ***E4TheFuture.*** One of five authors of a new 2017 National Standard Practice Manual for cost-effectiveness analysis of energy efficiency and other distributed resources. (2016-present)
- ***Regulatory Assistance Project - U.S.*** Provide guidance on efficiency policy and programs. Lead author on strategic reports on achieving 30% electricity savings in 10 years, using efficiency to defer T&D system investments, & bidding efficiency into capacity markets. (2010 to present)
- ***Regulatory Assistance Project - Europe.*** Provide support on efficiency policies in the UK, Germany, and other countries. Reviewed EU policies on Energy Savings Obligations, EM&V protocols, and related issues. Drafted policy brief on efficiency feed-in-tariffs. (2009 to present)
- ***Northeast Energy Efficiency Partnerships.*** Helped manage Regional EM&V forum project estimating savings for emerging technologies, including field study of cold climate heat pumps. Led assessment of best practices on use of efficiency to defer T&D investment. (2009 to 2015)
- ***Ontario Power Authority.*** Managed jurisdictional scans on leveraging building efficiency labeling requirements and non-energy benefits. Led staff workshop on efficiency as an alternative to T&D investment. (2012-2015)
- ***Vermont Public Interest Research Group.*** Conducted comparative analysis of the economic and environmental impacts of fuel-switching from oil/propane heating to either natural gas or efficient, cold climate electric heat pumps. Filed regulatory testimony on findings. (2014-2015)
- ***National Association of Regulatory Utility Commissioners (NARUC).*** Assessed alternatives to first year savings goals to better promote longer-lived savings. (2013)
- ***California Investor-Owned Utility.*** Senior advisor on EFG project to compare the cost of saved energy across ~10 leading U.S. utility portfolios. The research sought to determine if there are discernable differences in the cost of saved energy related to utility spending in specific non-incentive categories, including administration, marketing, and EM&V. (2013)
- ***New York State Energy Research and Development Authority (NYSERDA).*** Led residential & renewables portions of several statewide efficiency potential studies. (2001 to 2010)
- ***DC Department of the Environment (Washington DC).*** Part of VEIC team administering the DC Sustainable Energy Utility (SEU). Helped characterize the DC efficiency market and supported the design of efficiency programs that the SEU will be implementing. (2011 to 2012)
- ***Ohio Public Utilities Commission.*** Senior Advisor to a project to develop a web-based Technical Reference Manual (TRM). The TRM includes deemed savings assumptions, deemed calculated savings algorithms and custom savings protocols. It was designed to serve as the basis for all electric and gas efficiency program savings claims in the state. (2009 to 2010)
- ***Vermont Electric Power Company.*** Led residential portion of efficiency potential study to assess alternatives to new transmission line. Testified before Public Service Board. (2001-2003)
- ***Efficiency Vermont.*** Served on Sr. Management team. Supported initial project start-up. Oversaw residential planning, input to regulators on evaluation, input to regional EM&V forum, development of M&V plan and other aspects of bidding efficiency into New England's Forward Capacity Market (FCM), and development and updating of nation's first TRM. (2000 to 2010)



EVALUATION OF DUKE ENERGY'S HELPING HOME FUND

October 15, 2017



EXECUTIVE SUMMARY

Between 2015 and 2017, Duke Energy worked with the North Carolina Community Action Association (NCCAA) and Lockheed Martin to administer the Helping Home Fund, a program helping low-income customers improve their health and safety and manage their energy costs.

Duke Energy was the funding sponsor, with Duke Energy Carolinas and Duke Energy Progress providing a total of \$20 million to support appliance replacement, health and safety measures, weatherization, and heating/cooling replacement and repair in participating homes. NCCAA was chosen as the program administrator and contracted with Lockheed Martin to assist with implementation.

In all, the Helping Home Fund reached 3,516 homes with an average of \$5,151 in performed work per home. The Helping Home Fund was designed to leverage additional funding as well, including the State Weatherization Assistance Program (NCWAP), which consists of U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) and Low Income Home Energy Assistance Program (LIHEAP) funds, the PNC Home Beautification Fund, and funds from the North Carolina Housing Finance Agency (NCHFA). Without the Helping Home Fund, more than 40 percent of the participating homes would have been deferred due to funding limitations and program guidelines in the NCWAP. During the time period that the Helping Home Fund was operating, the program spent \$20 million. Leveraged funding included:

- **NCWAP: \$17 million**
- **PNC Home Beautification: \$250,000**
- **NCHFA: \$234,000**

Funds were also leveraged from other private funding sources, such as the City of Raleigh and City of Charlotte Urgent Repair Programs, but we were unable to obtain data on their funding levels.

Duke Energy had an interest in understanding the full impact of the program, including leveraging opportunities, and economic and non-energy impacts, such as health, safety and comfort. A number of approaches were taken for this effort. First, the team developed two surveys that were distributed to participating homeowners and service providers. The surveys gauged views of the Helping Home Fund and how people thought the program impacted the lives of families and the larger community. Second, a review of prior research evaluated the monetized values of potential energy and non-energy benefits associated with the program.

Results from the surveys demonstrated that both homeowners and service providers had a very favorable view of the Helping Home Fund. Homeowners noted that they felt safer, more comfortable and healthier in their homes, and reported financial savings that would allow them to pay for other necessities. Service providers applauded the program for its flexibility, staff and communication. Furthermore, the literature review of other low-income weatherization programs revealed that homeowners experienced a variety of non-energy benefits. Conservative estimates in the literature found monetized values for these benefits to be between \$4,500 and \$10,000 per home.

With the success of the program and the merger between Duke Energy and Piedmont Natural Gas, an additional \$2.5 million will be used for a similar program to provide assistance to even more income-qualified families in North Carolina.

The Helping Home Fund reached 3,516 homes with an average of \$5,151 in performed work per home.



INTRODUCTION

As a result of the Duke Energy North Carolina rate cases in 2013, Duke Energy allocated \$20 million (\$10 million from Duke Energy Carolinas [DEC] and \$10 million from Duke Energy Progress [DEP]) to assist low-income customers. For both utilities, the \$10 million was allocated in the following ways: \$3 million was used for health and safety measures and appliance replacement (for DEP, some of these funds also went toward weatherization; DEC has a separate weatherization program), and \$7 million was used for heating/cooling system replacement and repair. The actual breakdown of the funds at the time of this report can be seen in **Table 1**.

The program provided income-qualified customers with repairs and energy efficiency upgrades at no cost.

This program, known as the Helping Home Fund, ran from January 2015 to May 2017. The goal of the funding was to assist low-income customers. Duke Energy saw an opportunity to provide assistance that did not currently exist by providing health and safety repairs, new energy-efficient appliances, and heating systems to help homeowners manage energy costs and increase their disposable income. To meet this

goal, the Helping Home Fund worked primarily through weatherization service providers as well as other non-profit agencies that serve families at or below 200 percent of federal poverty guidelines. The program provided income-qualified customers with repairs and energy efficiency upgrades at no cost.

The Helping Home Fund was funded by Duke Energy and administered by the North Carolina Community Action Association (NCCAA). NCCAA partnered with Lockheed Martin, who provided the database for data tracking and reporting, and quality assurance (QA) and quality control (QC). The Helping Home Fund was designed to leverage the State Weatherization Assistance Program (NCWAP) and other public/private funding sources. The funds were allocated to local North Carolina weatherization service providers and several non-profit agencies who completed the projects and were reimbursed once the work was completed. The program was allowed to use 10 percent of the funding for administrative purposes, with 5 percent going to the administrator and 5 percent to the service providers.

The monies were transmitted in total to the NCCAA to manage and deposited at PNC Bank. As a result, PNC Bank suggested that the NCCAA apply for a grant from their foundation, which ultimately provided another \$250,000 for Helping Home Fund recipients for external beautification or maintenance, such as painting, roof repairs or landscaping.

TABLE 1 • HELPING HOME FUND BREAKDOWN

	DEC	DEP	TOTAL
APPLIANCE REPLACEMENT	\$950,343	\$620,399	\$1,570,742
HEALTH & SAFETY	\$1,765,387	\$873,998	\$2,639,385
HEATING/COOLING REPLACEMENT/REPAIR	\$6,395,779	\$6,388,239	\$12,784,018
WEATHERIZATION TIER 1		\$100,217	\$100,217
WEATHERIZATION TIER 2		\$1,018,932	\$1,018,932
PROJECT TOTAL	\$9,111,509	\$9,001,785	\$18,113,294
AVERAGE PER HOUSE			\$5,151
ADMINISTRATION	\$928,344	\$928,344	\$1,856,688
OVERALL TOTAL	\$10,039,853	\$9,930,129	\$19,969,982

INTRODUCTION

Because of federal regulations, the NCWAP has a limited amount of funding it can use per house for health, safety and energy measures. If repair monies were not available from either federal or local sources, the home would be deferred. The Helping Home Fund filled this gap, allowing the NCWAP to serve customers who would have otherwise been deferred by service providers by providing the funding to make the needed repairs. Furthermore, North Carolina weatherization agencies' energy efficiency improvements waitlist had been experiencing lengthy delays, and customers were not getting work scheduled or completed. The funding provided additional services to customers and helped to leverage federal and state funds for maximum customer benefit and impact.

The Helping Home Fund focused on four main components:

- 01 • Health and safety
- 02 • Appliance replacement
- 03 • Weatherization (in DEP territory only)
- 04 • Heating/cooling system replacement and repair

In DEC territory, homes already had access to weatherization through the existing energy efficiency Weatherization Program.

LM Captures is Lockheed Martin's tracking and reporting system that service providers used to enter the individual home data for the program. The database required comprehensive data input for customer, home and project details to determine eligibility and track program expenditures and measure level detail by project type. All program activities, including QA/QC and reimbursement request/fulfillment, were also reported.

Funds for health and safety were originally capped at \$800 per home, but due to customer needs learned throughout the program, the limit was later raised

to \$3,000. Health and safety measures included bath fans, vapor barriers, roof repairs, electrical/plumbing repairs, ingress/egress repairs, range repair and replacement, and water heater repair and replacement. Appliance replacement also started with an allotment of \$800 per home, but this amount was increased to \$2,000. This work included replacing inefficient appliances with ENERGY STAR® refrigerators, clothes washers, clothes dryers and room air conditioners.

Weatherization services were broken down into two tiers.

TIER 1

Tier 1 weatherization was for homes using < 7 kilowatt-hours (kWh) per square foot, < \$0.23 per square foot oil/liquid propane (LP) gas heat, or < \$0.38 per square foot oil/LP gas heat and water heating. Up to \$600 was allotted for the following measures:

- ✓ Heating system tune-up and cleaning
- ✓ Heating system repair
- ✓ Water heater wrap and pipe wrap for electric water heaters
- ✓ Cleaning or replacement of electric dryer vents
- ✓ ENERGY STAR-certified compact fluorescent lamps (CFLs)
- ✓ Low-flow showerheads and aerators
- ✓ Weatherstripping doors and windows
- ✓ Energy education

INTRODUCTION

TIER 2

Tier 2 weatherization was provided to homes using ≥ 7 kWh per square foot, $\geq \$0.23$ per square foot oil/LP gas heat, or $\geq \$0.38$ per square foot oil/LP gas heat and water heating. Here, up to \$4,000 was provided for the following:

-  Tier 1 services
-  Attic insulation
-  Air sealing
-  Duct sealing/repair
-  Wall insulation
-  Crawl space insulation
-  Floor insulation

Since heating/cooling systems account for the majority of an energy bill, 70 percent of the monies were allocated to improve customers' heating systems. The intent was to decrease customers' energy use, thereby providing them with more disposable income. Existing electric furnaces, electric baseboards, and oil or propane systems were replaced with high efficiency heat pumps (minimum 14 Seasonal Energy Efficiency Ratio [SEER] and 8.2 Heating Seasonal Performance Factor [HSPF]). In addition, many homes were found to have elderly residents with wood stoves, and new heating systems and ductwork were installed in these situations as well.

A maximum of \$10,000 could be used for heating/cooling system replacement and repair (\$6,000 max for heating/cooling and an additional \$4,000 to upgrade electrical and/or install new ductwork). Consistent with Tier 2 weatherization, heating/cooling system replacement and repair required energy usage per year to meet the following requirements:

- ≥ 7 kWh per square foot,
- $\geq \$0.23$ per square foot oil/LP gas heat, or
- $\geq \$0.38$ per square foot oil/LP gas heat and water heating.

High efficiency mini splits were allowed when a home did not have a centrally ducted system or the duct repairs exceeded an estimated threshold. Funds could also be used to upgrade the electrical system or repair/replace duct systems. All of the ductwork had to be insulated and sealed with mastic. Homes also had to have been weatherized as part of the installation of a new heating/cooling system, requiring proper sizing of the system.

STUDY DESCRIPTION AND METHOD

As the Helping Home Fund was nearing completion, Duke Energy had an interest in understanding the impacts of non-energy benefits among program participants and implementation service providers. Non-energy benefits can include a wide variety of improvements, such as those to economics, health, safety, quality of life and comfort. Studying and documenting these benefits helps determine the true cost-effectiveness of home energy programs and interventions.

In performing the analysis, the first step was to narrow down the array of potential non-energy benefits to specific ones to evaluate within the Helping Home Fund. The team selected health,

safety, comfort, improved disposable income, and economic sustainability/community impact.

To measure these impacts, two surveys were developed (see Appendix I). One survey went to participating homeowners, and a second survey was administered to the service providers that implemented the program measures and coordinated the work. To supplement the survey results and further characterize the outcomes of the Helping Home Fund, the team conducted a literature review to monetize the non-energy benefits. The results of this component of the program can be found later in the report.

NON-ENERGY BENEFITS



HEALTH

Health included measures such as the number of doctor's visits, decreased asthma symptoms and other homeowner health effects.



SAFETY

Safety included homeowners' accessibility or ability to move about their homes, as well as electrical and durability issues.



COMFORT

Comfort addressed whether occupants felt that their homes were more comfortable.



DISPOSABLE INCOME

Disposable income looked at whether the Helping Home Fund provided homeowners with additional income to spend on other necessities.



ECONOMIC SUSTAINABILITY

Economic sustainability/community impact included effects on service provider employment and home deferrals, among others.

PROGRAM SUMMARY

The Helping Home Fund served 3,516 homes with an average of two projects each (e.g., appliance replacement, heating/cooling system replacement/repair, health and safety measures). Homeowner incomes had to be below 200 percent of federal poverty guidelines to participate. The homes were assessed by local service providers serving low-

income customers to determine what measures were most appropriate. The work was then completed by either service provider-based crews or subcontractors.

The homes were reported and tracked on a project level. Table 2 shows the average dollars spent per project category.

TABLE 2 • AVERAGE DOLLARS SPENT PER PROJECT

	APPLIANCES	HEALTH & SAFETY	HEATING/COOLING REPLACEMENT/ REPAIR	WEATHERIZATION TIER 1	WEATHERIZATION TIER 2	TOTAL
TOTAL SPENT	\$1,570,742	\$2,639,385	\$12,784,018	\$100,217	\$1,018,932	\$18,113,294
NUMBER OF PROJECTS	1,676	2,731	1,878	323	488	7,096
PROJECT TOTAL	\$937	\$966	\$6,807	\$310	\$2,088	\$2,553

Through the heating/cooling system replacements and repairs, more than 1,300 homes went from non-functioning to functioning heating systems (Table 3).

TABLE 3 • PRE-RETROFIT HEATING BREAKDOWN OF HOMES RECEIVING HEATING REPLACEMENT

EXISTING FUEL TYPE	NUMBER FUNCTIONING	NUMBER NON-FUNCTIONING	TOTAL
WOOD	7	26	33
ELECTRICITY	410	1,060	1,470
KEROSENE	9	9	18
NATURAL GAS	1	14	15
OIL/LP	107	222	329
NO HEAT	0	13	13
TOTAL	534	1,344	1,878

Note. All heating types converted to heat pumps with a SEER of 14 or greater.

The majority of homes (92 percent) were single-family detached and mobile homes. The remaining were multifamily units and townhomes or condominiums (Table 4).

TABLE 4 • BREAKDOWN OF HOMES SERVED BY THE HELPING HOME FUND

	SINGLE-FAMILY DETACHED	MOBILE HOME	MULTIFAMILY (5+ UNITS)	MULTIFAMILY (2-4 UNITS)	TOWNHOME/ CONDO	TOTAL
NUMBER OF HOMES	2,362	858	196	67	33	3,516

PROGRAM SUMMARY

The subset of customers that responded to the homeowner survey provided information regarding the number of children, elderly, and individuals with disabilities or respiratory illness (Table 5). With these varying degrees of vulnerability, it can be difficult for occupants to stay in their homes. The Helping Home Fund was able to provide services to populations that may not have otherwise been reached.

TABLE 5 • HELPING HOME FUND SURVEY RESPONSE

OCCUPANT CATEGORY	NUMBER OF OCCUPANTS
UNDER THE AGE OF 18	112
OVER THE AGE OF 60	275
IDENTIFY AS DISABLED	237
IDENTIFY AS HAVING A RESPIRATORY ILLNESS	171

Note. Included data from 317 survey respondents.

The Helping Home Fund spending on each participating home ranged from \$114.32 to \$19,825.31, with an average of \$5,151. Additional funding sources were used on these homes as well, including the NCWAP, PNC Home Beautification and the NCHFA (Table 6). NCWAP funds were used

“We are no longer cold during the winter and hot in the summer.”

for heating/cooling systems and weatherization, while PNC Home Beautification focused on exterior improvement, such as landscaping, painting and roofing. NCHFA funds were used for heating/cooling systems, weatherization and structural repairs. Therefore, although a house received an average of \$5,151 through the Helping Home Fund, additional work may have been performed thanks to these other funding sources.

TABLE 6 • HELPING HOME FUND LEVERAGED FUNDS (2015-2017)

SOURCE	AMOUNT LEVERAGED
NCWAP (INCLUDES DOE WAP AND LIHEAP)	\$17,321,491
PNC HOME BEAUTIFICATION	\$250,000
NCHFA	\$234,000

Note. Unable to obtain data for amount leveraged from other private funding.

To ensure that measures were installed correctly and funding was properly documented, randomly selected QC inspections were performed on completed jobs. At least 10 percent of homes with health and safety projects, appliance replacement or weatherization measures received QC, along with at least 25 percent of homes with heating/cooling system replacements and repairs.

QC inspectors conducted monitoring visits to evaluate effectiveness, safety, workmanship and compliance with program guidelines. They also addressed educational opportunities with local providers and customers during the on-site verification process. The process included a paper file review as well as an on-site visit with representation from a service provider. All measures installed with Duke Energy funds were verified to be present and compliant with work orders and materials invoiced. The quality of the workmanship was also evaluated, and QC inspection results were documented and discussed.

All QC documentation, on-site inspection details, reports and actions were uploaded into LM Captures. QC return visits were minimal, and all issues were addressed.

SURVEYS

The surveys sought to gauge the non-energy benefits and impacts of the Helping Home Fund. The full surveys, as well as responses from homeowners and service providers, can be found in Appendices I-III.

Homeowner Survey

The homeowner survey was designed to understand how the Helping Home Fund affected program occupants. Homeowners were randomly selected, and outbound calls were conducted by Duke Energy's call center for approximately one month. A total of 901 homeowners were contacted, with 317 completing the survey (a 35 percent completion rate).

The homeowners overall had a highly positive view of the Helping Home fund. Ninety-two percent of respondents reported feeling safer in their homes, and 81 percent said they have better home accessibility (e.g., getting into and out of the home). Additionally, 91 percent said the improvements from

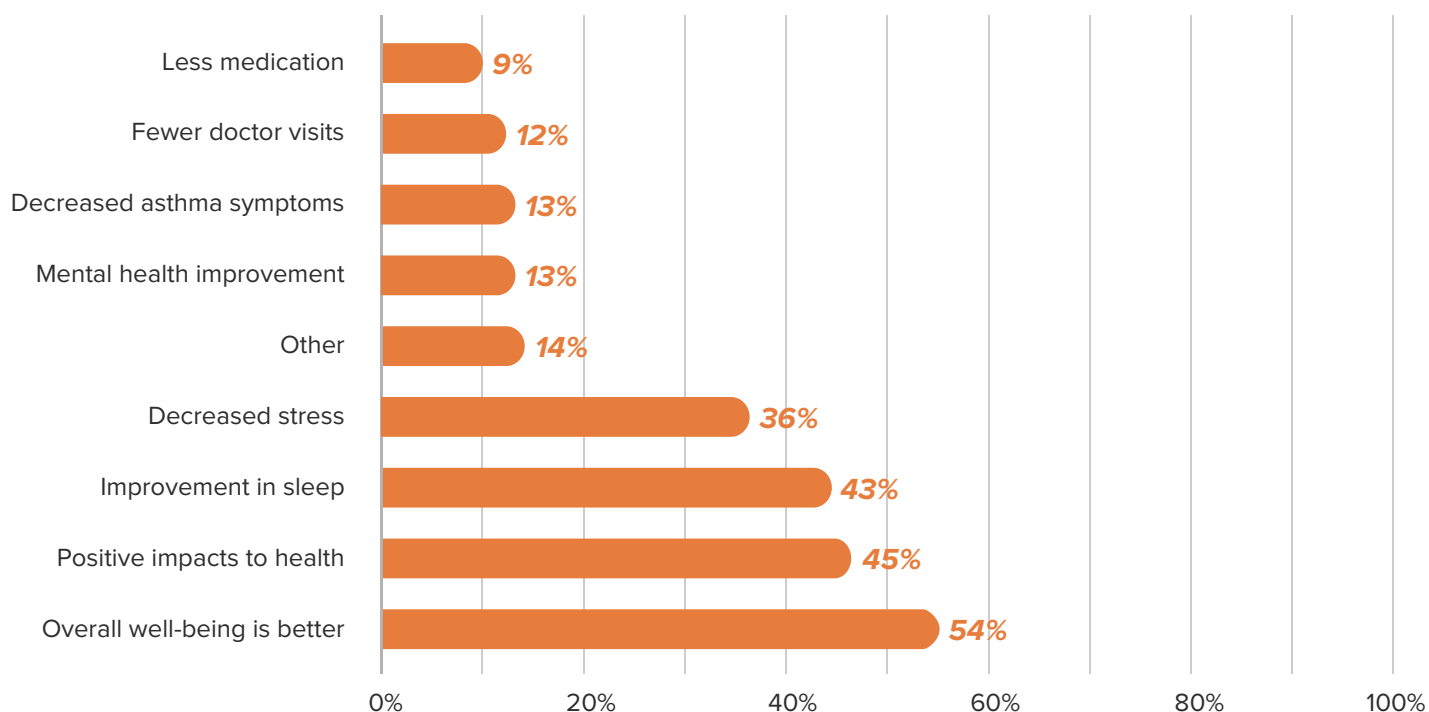
the Helping Home Fund made it possible for them to stay in their current location, and 96 percent responded that their lives have been made easier in some form. "They did a good job and it really helped me a long way," said one homeowner. "They put windows in my home so it feels warmer and I truly appreciate everything that you all did."

"My light bill has been a lot lower, so that helps me have extra money. My water bill has been lower too. It has been a lot better than in years past."

Forty-nine percent of respondents indicated that the Helping Home Fund upgrades definitely allowed them to have more money available to pay for other necessities, while an additional 29 percent said they somewhat did.

FIGURE 1 • HOMEOWNER SURVEY RESPONSES

Survey question: Have you (or any family members) noticed any positive health impacts due to the upgrades to your home? Check all that apply.



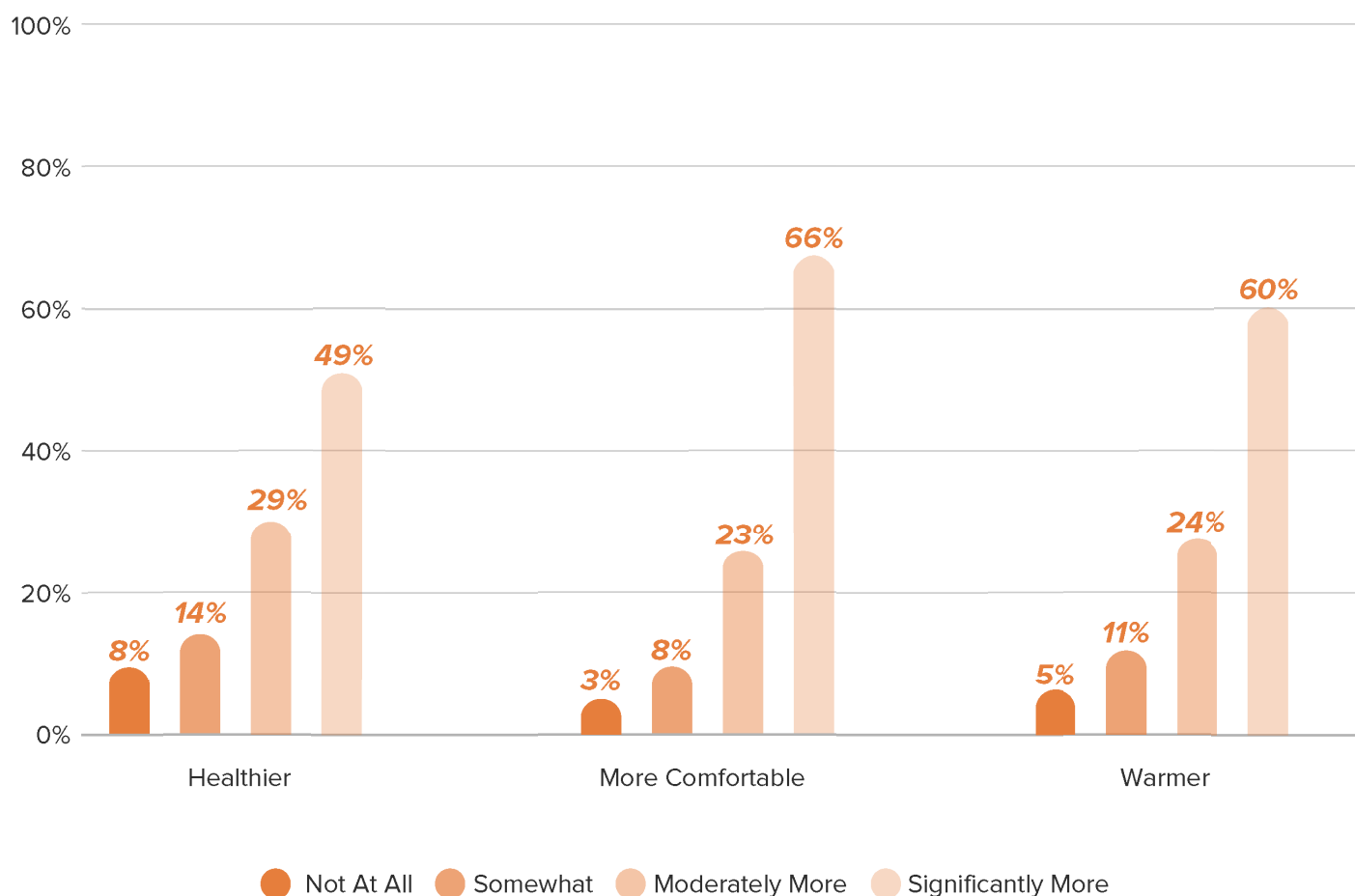
SURVEYS

Homeowners reported a number of positive health impacts for themselves and their families, including better overall well-being, sleep improvement and decreased stress (Figure 1). “If it wasn’t for Duke I

could still be in the hospital. Heat affects me very bad with my medical condition so to feel cooling has made a world of difference. I am now able to keep my body temperature down,” reported one homeowner. Likewise, homeowners said they generally feel healthier, more comfortable and warmer as a result of

FIGURE 2 • HOMEOWNER SURVEY RESPONSES

Survey question: Are you healthier / more comfortable / warmer in your home because of the improvements made?



SURVEYS

Service Provider Survey

The service provider survey was developed to assess the effects of the Helping Home Fund on participating service providers, their crews and subcontractors, and the homeowners they served. Twenty-four participating service providers were sent the survey via email, and all responded. The service providers had a very positive view of the Helping Home Fund. They applauded the staff, communication, benefits to homeowners, flexibility and reimbursement process. According to one service provider, “Overall, (the) Helping Home Fund has been both impactful for the community and rewarding for our agency to serve others in need. We would love to be considered for future opportunities.”

In particular, service providers praised the Helping Home Fund for its effect on low-income homeowners: Every provider responded that the program had a positive influence. They reported that an average of 44 percent of the homes they worked on through the Helping Home Fund would have otherwise been deferred.

Fifty-four percent of respondents felt there was a strong positive influence of the Helping Home Fund on the local community. In terms of service provider hiring, 46 percent of service providers indicated that the program affected staff employment, 4 percent said it somewhat did, and 50 percent said it did not.

The most commonly completed measures by service provider-based (i.e., agency-based) crews included insulation and air sealing, duct sealing and structural repairs to roofs, stairs, railings and windows (Table 7). Subcontractors also performed substantial work. Service providers reported that during 2015 and 2016, subcontractors were hired to help complete over 90 percent of jobs, which included electrical work, heating/cooling system repair or replacement, and plumbing (Table 7). All service providers noted that the quality of the contractor crews was either good or excellent, and most (83 percent) did not have difficulty finding contractors to work on homes. When there was difficulty, it was typically regarding electrical contractors.

“It has allowed us to serve more people in our counties that would not have gotten any service this fiscal year.”

The service providers reported receiving funding from a variety of sources in addition to the Helping Home Fund. As noted earlier, more than \$17 million was leveraged from the NCWAP, NCHFA and PNC Home Beautification, as well as other undisclosed funding sources. Service providers noted some variability and uncertainty in funding over the last five years. One

TABLE 7 • SERVICE PROVIDER SURVEY RESPONSES

Survey question: What measures did you install with an agency-based crew? What measures did you install using subcontractors? Check all that apply.

MEASURE	NUMBER OF SERVICE PROVIDERS USING AGENCY-BASED CREWS	NUMBER OF SERVICE PROVIDERS USING SUBCONTRACTORS
PLUMBING	2	19
ELECTRICAL	2	23
HEATING/COOLING REPAIR/REPLACEMENT	2	22
INSULATION/AIR SEALING	13	13
DUCT SEALING	13	11
STRUCTURAL REPAIRS	11	13

SURVEYS

service provider stated, “With the support of (the) Helping Home Fund, we were able to expand service delivery to Duke Energy Progress customers. Our agency’s primary funding source was limited for FY 2017; therefore, Helping Home Funds were leveraged

and resulted in more customers receiving home improvements to support energy use reduction and for some improved health conditions. In addition, the opportunity to complete appliance replacement might not have happened without Helping Home Funds.”

MONETIZING NON-ENERGY IMPACTS

To get a better understanding of the monetization of non-energy impacts of the Helping Home Fund, we examined prior studies and program analyses. We relied heavily on a study conducted by Tonn, Rose, Hawkins, and Conlon (2014), which monetized non-energy benefits from the DOE WAP. This study was relevant for a number of reasons, including its focus on low-income housing and the overlap in non-energy measures being explored. It also used a robust sample size, attributing results to more than 80,000 homes.

Tonn et al. (2014) used a variety of approaches to monetize the non-energy impacts. The researchers evaluated pre- and post-weatherization survey data, relied on objective cost data from existing databases where available, and then performed monetization exercises to calculate the lifetime benefit over 10 years. The researchers categorized their results into three tiers based on the reliability of the outcomes. Tier 1 estimates were the most reliable, followed by Tiers 2 and 3. Tonn et al. also considered the value of lives saved in their analyses.

We also included data from a literature review from Schweitzer and Tonn (2003). The researchers reviewed approximately 25 articles; some were reports that presented primary research from

previous weatherization programs, and others used a meta-analytic approach to examine multiple studies. This effort led to a large set of non-energy benefits, many of which were not addressed by Tonn et al. (2014). Using the available data from the prior literature, Schweitzer and Tonn selected a point estimate for individual non-energy benefits to represent an average value that could be applied to nationwide weatherization programs. In this case, monetized values were calculated using a lifetime benefit over 20 years.

Tables 8 through 12 contain the relevant non-energy benefit monetization estimates from Tonn et al. (2014) and Schweitzer and Tonn (2003). We took certain steps to err on the side of caution with the data to avoid overestimating the monetized values. For Tonn et al., we de-rated their Tier 2 estimates (by 50 percent) and Tier 3 estimates (by 75 percent). We also did not take into account the value of lives saved. For Schweitzer and Tonn, when calculating the monetized value of all non-energy impacts, we only took into account the environmental benefit associated with natural gas, the lower value, and not electricity. All estimates were converted to 2017 dollars using historical consumer price index data.

MONETIZING NON-ENERGY IMPACTS

TABLE 8 • MONETIZATION OF ECONOMIC AND SOCIAL BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
INCREASED PROPERTY VALUE		\$244.80
DIRECT AND INDIRECT EMPLOYMENT		\$1,089.36
AVOIDED UNEMPLOYMENT BENEFITS		\$159.12
NATIONAL SECURITY		\$436.56
REDUCED MOBILITY		\$378.08
LOST RENTAL		\$1.36
IMPROVED WORKPLACE PRODUCTIVITY (SLEEP)	\$512.17	
IMPROVED HOUSEHOLD PRODUCTIVITY (SLEEP)	\$375.44	
FEWER MISSED DAYS AT WORKS	\$227.62	
WATER/SEWER SAVINGS		\$368.56
REDUCED NEED FOR SHORT-TERM LOANS	\$39.99	
REDUCES TRANSACTION COSTS		\$50.32
TOTAL	\$1,155.22	\$2,728.16

TABLE 9 • MONETIZATION OF HEALTH AND SAFETY BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
CO POISONING*	\$4.19	
FEWER FIRES	\$50.04	\$92.48
FEWER ILLNESSES		\$74.80
THERMAL STRESS (COLD)	\$194.28	
THERMAL STRESS (HEAT)	\$95.79	
ASTHMA RELATED	\$2,270.09	
REDUCED NEED FOR FOOD ASSISTANCE	\$940.16	
INCREASED ABILITY TO AFFORD PRESCRIPTIONS	\$1,090.01	
REDUCED LOW-BIRTH WEIGHT BABIES FROM HEAT-OR-EAT COMPROMISE	\$55.96	
TOTAL	\$4,700.52	\$167.28

MONETIZING NON-ENERGY IMPACTS

TABLE 10 • MONETIZATION OF UTILITY SERVICE BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
CARRYING COST OF ARREARAGES		\$77.53
BAD DEBT WRITE-OFF		\$121.04
FEWER SHUTOFFS AND RECONNECTIONS FOR DELINQUENCY		\$10.88
AVOIDED RATE SUBSIDIES		\$28.56
INSURANCE SAVINGS		\$1.36
REDUCED GAS SERVICE EMERGENCY CALLS		\$137.36
FEWER NOTICES AND CUSTOMER CALLS		\$8.16
TRANSMISSION AND DISTRIBUTION LOSS REDUCTION		\$65.28
AVOIDED SHUTOFFS AND RECONNECTIONS		\$23.12
TOTAL	\$0	\$473.29

TABLE 11 • MONETIZATION OF ENVIRONMENTAL BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
AIR EMISSIONS - ELECTRICITY		\$1,324.64
AIR EMISSIONS - NATURAL GAS		\$435.20
OTHER BENEFITS		\$745.64
TOTAL	\$0	\$2,505.48

TABLE 12 • MONETIZATION OF ALL NON-ENERGY BENEFITS

Tonn et al. (2014) and Schweitzer and Tonn (2003)

NON-ENERGY BENEFIT	MONETIZED VALUE FROM TONN ET AL. (2014) VALUES BASED ON 10-YEAR LIFETIME BENEFIT	MONETIZED VALUE FROM SCHWEITZER AND TONN (2003) VALUES BASED ON 20-YEAR LIFETIME BENEFIT
ALL	\$5,856	\$4,550

Note. The total monetized value from Schweitzer and Tonn (2003) excludes air emissions associated with electricity.

MONETIZING NON-ENERGY IMPACTS

The two studies reveal that weatherization and other energy efficiency upgrades can produce a wealth of non-energy benefits with values in the thousands of dollars. At the same time, it is worth noting the lack of overlap in the impacts that Tonn et al. (2014) and Schweitzer and Tonn (2003) examined. Therefore, the overall value of non-energy benefits may be even higher than those reported here.

Given the similarities in the housing stock, occupants and measures installed in the Tonn et al. (2014) and Schweitzer and Tonn (2003) studies when compared to the Helping Home Fund, it is possible to assume that participants in the Helping Home Fund received a similar level of non-energy benefits. Even with our conservative estimates, the non-energy benefits associated with the Helping Home Fund, then, could approach an average of \$10,000 per home (the sum of the total non-energy benefits from the two studies). Indeed, the homeowner survey results confirm that those participating in the program did receive non-energy benefits, from health improvements to enhanced comfort and increased ability to stay in their homes. These benefits can be

particularly important for occupants who are children, elderly, or have disabilities, respiratory illness or asthma.

The Helping Home Fund was not designed to reduce overall energy use but rather to provide other benefits to low-income customers, such as improved health, comfort and safety. For example, approximately 35 percent of the homes had non-functioning heating systems and the program was able to provide new systems to these customers. The program also provided new washers, dryers and room air conditioning units, since other programs typically did not address this. However, because the program highly leveraged the NCWAP, we can assume that these customers would also receive energy benefits. Based on the literature review, DOE WAP achieves average lifetime energy savings of \$4,890 per home (Tonn, Carroll et al. 2014).

Table 13 summarizes the average costs and benefits for participating homes based on total invested funds and estimated benefits from the literature review.

TABLE 13 • SUMMARY OF COSTS AND BENEFITS FOR HELPING HOME FUND

	AVERAGE PRESENT VALUE PER HOME	PRESENT VALUE FOR TOTAL HOMES
ENERGY BENEFITS (COST SAVINGS) ¹	\$5,115.33	\$17,985,500
NON-ENERGY BENEFITS ²	\$10,312.83	\$36,259,910
ECONOMIC AND SOCIAL	\$3,883.38	\$13,653,964
HEALTH AND SAFETY ³	\$4,775.32	\$16,790,025
UTILITY SERVICE	\$473.29	\$1,664,088
ENVIRONMENTAL ⁴	\$1,180.84	\$4,151,833
TOTAL BENEFITS	\$15,428.16	\$54,245,410
TOTAL COSTS	\$10,124.37	\$35,597,294
HELPING HOME FUNDS	\$5,151.68	\$18,113,294
LEVERAGED FUNDS	\$4,972.69	\$17,484,000

1. Value based on Tonn, Carroll et al. (2014)

2. Value (and subcategories below) based on summed benefits of Tonn et al. (2014) and Schweitzer and Tonn (2003)

3. Uses the lower monetized estimate of fewer fires, from Tonn et al. (2014)

4. Excludes air emissions associated with electricity from Schweitzer and Tonn (2003)

CHALLENGES AND LESSONS LEARNED



The NCCAA was the appropriate choice for administering these funds, forming a valuable relationship with Duke Energy. The NCCAA provided access to a network of service providers who were already intricately involved in low-income communities across the state. These service providers were able to quickly access homeowners who met the requirements for participation in the Helping Home Fund. The NCCAA also saw value in being involved with individual agencies throughout the implementation of the program, getting to know their particular challenges and strengths. With this experience and data, the NCCAA is able to provide recommendations to the NCWAP to improve overall performance.



The NCCAA collaborated with Lockheed Martin to assist with the administrative duties of the program. Lockheed Martin is a strong partner, providing invaluable recommendations for program implementation, QC and data documentation. In addition, Lockheed Martin oversaw key communication and training with service providers that kept the program running smoothly. The ability to adapt and be flexible with service providers, who had varying degrees of experience with implementing programs, was essential.



Funding levels for individual measures (health and safety - \$800 and appliances - \$800) were initially too low, resulting in huge requests for exceptions. As a result of these requests, funding for health and safety was increased to \$3,000 per home and appliances to \$2,000 per home in 2016.



Funding allocation for administrative costs (5 percent) was insufficient for some of the service providers; however, this could not be changed due to the regulatory filing.



Delays in obtaining contracts and funding between the service providers and the NCWAP caused issues with completing projects in a timely manner.



While the data collection process was thorough, some data was not collected during this initial spending cycle but was later learned through the customer surveys. In the future, the Helping Home Fund may consider including the following in data collection:

- **Number of occupants by age group (to capture number of elderly/children)**
- **Number of occupants with asthma or disabilities**
- **Tracking of leveraged funds per home**
- **Tracking of when measures are installed**
- **Pre-retrofit survey of homeowners**



Now that the service providers have been oriented and trained to the program, it should be less costly for them to support the program.



Based on some of the homeowner surveys, it was determined that they did not realize Duke Energy had funded some of their repairs. While a brochure was developed and available for the agencies to provide homeowners, its use may have dwindled over time. There is an opportunity for better marketing of the program to both homeowners and local communities.



There were mixed reviews of LM Captures, which is understandable when working with a network of providers with varying degrees of experience with technology and availability of local resources. Role-based dashboard reports provided updates for status and planning. The NCCAA and Lockheed Martin worked closely with service providers to provide one-on-one customer service and support during program launch

CHALLENGES AND LESSONS LEARNED

and throughout the program. Feedback from service providers has resulted in ongoing updates to LM Captures, including easily identified required fields, less data entry on the home page, additional options in drop-down selections and revisions to heating/cooling data entry fields.



Programs such as the Helping Home Fund are not designed to pass energy efficiency tests. Therefore, the utility only receives funds in special cases, such as during rate cases or mergers. However, evaluating non-energy benefits in addition to traditional energy benefits can help determine the true cost-effectiveness of these programs, and allow the utility to capture the benefits such a program can offer.



Weatherization service providers are limited in the funds they can spend on health and safety measures, causing many homes to be deferred each year. Working closely with service providers ensured that they used the Helping Home Fund monies in the anticipated manner. This funding source, along with others such as the NCHFA's

Single Family Rehab program, works well with WAP so that homes can be retrofit, and homeowners benefit from access to multiple programs that can address different needs. As one example, the Macon County Housing Department "was able to use the monies from the Helping Home Fund in conjunction with other programs such as the Urgent Repair Program, LIHEAP Heating and Air Repair and Replacement Program (HARRP), Single Family Rehab Program and the Weatherization Program."



Leveraging other programs, while a benefit, was also a challenge for some service providers. It took time for providers to learn how to effectively use different funding sources on the same homes. To help them get up to speed, the Helping Home Fund used multiple methods to train service providers, including webinars, on-site training and ongoing mentoring. Overall, they found that one-on-one training was more effective than group training. The QC field visits were an additional training opportunity for service providers.

NEXT STEPS

The Helping Home Fund recently received an additional \$2.5 million when Duke Energy merged with Piedmont Natural Gas. This money will go toward a similar program and will be used in the following ways: \$800 for heating/cooling repair and/or maintenance, \$3,000 for health and safety, and \$2,000 for appliance replacement (refrigerators, washers, dryers, room air conditioners and dehumidifiers). Duke Energy decided to reduce the

allocation toward heating/cooling systems due to the limited funding, and to allow the funds to be available over a 12-18 month period.

With the success of the Helping Home Fund, the team is sharing its experience with stakeholders around the country so that others may learn from it and build upon it.

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ABBREVIATIONS AND ACRONYMS

DEC	Duke Energy Carolinas
DEP	Duke Energy Progress
DOE	Department of Energy
HHF	Helping Home Fund
HSPF	Heating Seasonal Performance Factor
LIHEAP	Low Income Home Energy Assistance Program
LM Captures	Database developed and maintained by Lockheed Martin
kWh	Kilowatt-hours
LP	Liquid Propane
NCCAA	North Carolina Community Action Association
NCHFA	North Carolina Housing Finance Agency
NCWAP	North Carolina (State) Weatherization Assistance Program
PNC Home Beautification	Fund offered by PNC bank
QA	Quality Assurance
QC	Quality Control
SEER	Seasonal Energy Efficiency Ratio
WAP	Weatherization Assistance Program

APPENDIX I • SURVEYS

HOMEOWNER SURVEY

Intro Section: (Provide context and explain the value of participating in the survey)

Hello, my name is ____ and I am calling on behalf Duke Energy. I'm calling today because your household participated in a program to receive free home improvements through the XXX Weatherization Agency. As part of this program, a contractor would have come into your home and installed free energy saving products and made home improvements. We would like to take just a few minutes to ask you a few questions.

Are you the person in your household who is most familiar with the improvements that were made to your home?

- ☐ Yes ☐ Don't know
☐ No ☐ Refused

We're speaking with customers who have participated in the program to complete a short survey to learn about their experience and satisfaction with the program. This is not a sales call, and all of your responses will be kept confidential.

Homeowner questions

1. How many children under the age of 18 currently live in the home?
2. How many people over the age of 60 currently live in the home?
3. How many residents in your household identify as disabled?
4. How many residents in your household identify as having a respiratory illness (e.g., asthma)?
5. Can you recall any of the weatherization improvements that were specifically made to your home?
6. Are you aware that the Duke Energy Helping Home Funds were used in your home?
7. If yes, do you know which improvements were paid for by HHF?
- 8-10. Are you healthier / more comfortable / warmer in your home because of the improvements made?
☐ Not at all ☐ Moderately more
☐ Somewhat ☐ Significantly more
11. Have the upgrades to your home allowed you to have more money available to pay for other necessities?
☐ Definitely ☐ Somewhat ☐ No
12. Have you (or any family members) noticed any positive health impacts due to the upgrades to your home? Check all that apply.
☐ Positive impacts to health, Less doc visits, overall well-being is better, mental health improvement, improvement in sleep, decreased stress, less medication, decreased asthma symptoms, Other (fill in the blank)
13. Have the improvements made on your house made it possible for you to remain at home (as opposed to needing to move to another location)?
☐ Yes ☐ No
14. Has your life been made easier through these upgrades?
☐ Yes ☐ No
15. Do you have better accessibility or access to your home because of these upgrades (e.g., ability to get in and out of your home)?
☐ Yes ☐ No
16. Do you feel safer in your home (e.g., from injury due to durability issues)?
☐ Yes ☐ No ☐ Somewhat
 (If yes or somewhat, please describe)
17. Any other comments regarding Duke Energy's Helping Home Fund you would like to share?

That is all the questions I have today. Thank you so much for your time and have a great day.

APPENDIX I • SURVEYS

Service Provider Survey

Duke Energy launched the Helping Home Fund in North Carolina in January 2015. This fund was designed to assist low-income customers with managing their energy costs while also addressing health and safety. As the first round of funding comes to a close, we are reaching out to participating Weatherization Agencies to hear your feedback. We want to learn about your experience with the program, as well as gather data on how the program impacted local communities. We sincerely appreciate you taking the time to provide responses to the following questions.

Service provider questions

1. Contact Info:
 - ☐ Name
 - ☐ Agency
2. Has the Helping Home Fund had a positive impact on the low-income homeowners that you serve?
 - ☐ Yes, Somewhat, No
3. Have you noticed any positive effects on the local community (beyond the occupants of the homes) from your participation in the Helping Home Program?
 - ☐ Yes, Somewhat, No
4. What % of homes were you able to work on that would have been deferred because of the Helping Home Fund?
5. Did the Helping Home Program have an impact on how many staff your agency employed during the program years?
 - ☐ Yes, Somewhat, No
6. What types of funding does your agency receive on an annual basis? Check all that apply.
 - ☐ LIHEAP
 - ☐ NCHFA
 - ☐ DOE Weatherization
 - ☐ Utility Funds
 - ☐ PNC Beautification Funding
 - ☐ Private Funds
 - ☐ Other (_____)
7. Has that funding varied over the last five years? If yes, please explain to what degree it has varied.
8. What measures did you install with an agency-based crew?
 - ☐ Plumbing
 - ☐ Electrical
 - ☐ HVAC Repair or Replacement
 - ☐ Insulation/Air Sealing
 - ☐ Duct Sealing
 - ☐ Structural Repairs (Roof, Stairs, Railing, Windows)
9. Did the Helping Home Fund impact your ability to retain an agency-based work crew?
 - ☐ Yes, Somewhat, No
10. What measures did you install using subcontractors?
 - ☐ Plumbing
 - ☐ Electrical
 - ☐ HVAC Repair or Replacement
 - ☐ Insulation/Air Sealing
 - ☐ Duct Sealing
 - ☐ Structural Repairs (Roof, Stairs, Railing, Windows)
11. How was the overall quality of contractor crews?
 - ☐ Excellent / Good / Fair / Poor (If fair or poor, please explain what was lacking)
12. Did your agency have difficulty finding local contractors to work on homes?
 - ☐ Yes, Somewhat, No
13. If yes, any suggestions of what could help remedy this situation?
14. If yes, how did this affect what work was completed?

APPENDIX I • SURVEYS

15. If yes, what type of contractors did you having trouble finding?
 - Plumbing
 - Electrical
 - HVAC Repair or Replacement
 - Insulation/Air Sealing
 - Duct Sealing
 - Structural Repairs (Roof, Stairs, Railing, Windows)
16. What percentage of jobs did you hire subcontractors to help you complete the work in 2015 and 2016?
17. If the Helping Home Fund was to be continued as a program, what improvements / changes would you suggest?
18. What worked well about the program?
19. Were there any houses or families that stood out with regard to the impact you observed from participation in the program?
20. Is there anything you want to tell us about your experience with this program?
21. Can we contact you with additional questions?
If yes, Name, email address, phone number.

APPENDIX II • HOMEOWNER RESPONSES

I really like the program. Years before I didn't know about different things to make my home efficient. I have told people about it too. I feel like Duke Energy really tried to help people. Thank you so much.

I am so amazed by all Blue Ridge took care of for me with my new ac, the insulation, the moisture barrier the sensor for carbon monoxide and the replacing of my duct work. I am also happy to learn that Duke Energy had a hand in this too. Kudos to Duke Energy. Keep doing what you all doing. I have a testimony about everything that was done for me. I am so grateful. Mr. Dale and his crew were amazing. They did an outstanding job. They gave me a sense of everything going to be alright. The inspector was also great and offered his number to if anything should go wrong with my unit to call him. They did everything they said and much much more. This program is great for older disabled people like me. Anytime you need live customer data or feedback, please call me because I have nothing but good things to say about Blue Ridge and Duke Energy.

I just want to say everybody was nice and good to me. I thank you all. I love my new ac unit. I didn't know Duke Energy was responsible for doing that. I don't have to worry about that being done anymore. This is a good thing to have and I am thankful.

It was very helpful and nice to know assistance is out there for people who may be in a struggle. This is wonderful program also for older customers or those with health issues. I was more concerned with the efficiency of my home and the insulation has been great since added. I'm not worried about how often my units cycles on and off.

Everybody was so kind that came out. Very polite and were courteous to take off their shoes and not track dirt into the home. They also cleaned up after

themselves. Very thoughtful. I am thankful for the good Lord to make something like this available to me. The agency also helped replace the faucets and I got light bulbs. I am very thankful for this program. I'm not sure if anything can be done or if someone can direct me, but I am in need of windows. The windows I have now are terrible. I'm using duct tape and plastic to close them shut. I would just love if someone could help guide me to a agency or a program that can help me with my windows.

I thank God for the program. Really overwhelmed with joy and happiness that there was such a program available to help me.

Appreciate this program so much. Helped me because I would have had to find another job to have to done some of the things that were done, especially the new heat pump that was installed. I was blessed with this program and to be able to qualify. I am thankful. It didn't push me into anymore debt and although I am on a fixed income at 73 yrs. old I can still pay my bills and not scraping to make ends meet.

It's the best thing that happened to me, I couldn't afford to have these structure repairs done.... wonderful thing to happen to me it's highly blessing that fell on me!!! the best thing that could have happened for me! So grateful and thankful

All of them were very nice people. I am definitely appreciative of having an electrical heating system in my house. I feel safer now since I don't have to mess with the kerosene heating and worrying about it tipping over or not changing the filter or the possibility o hit burning down more house.

APPENDIX II • HOMEOWNER RESPONSES

Where the back porch was they built steps with a handrail... I was very appreciative, I needed the work done and had no idea how I was going to do it, I was so happy to qualify for the program.... it was a blessing.... I said my prayers and this happened... I really appreciate it....

I am so grateful.....when the contractors came out to my house - I cried.... I was so thankful..... I just want to thank everyone at duke energy from the bottom of my heart!! I don't have to worry about spinning my air unit by hand....it would freeze up and we would have to cut it off by the breakers.... old a/c unit finally stopped running... I had everyone in my family send a letter to the agency thanking them for everything....I send them Christmas cards, send them thank you notes.....

I thought my light bill would come down....but it hasn't.... put insulation in the roof, I appreciate all of the improvements that were done..... thankful for the help.... did a lot of work....

I appreciate the program and I would recommend it to anyone. You guys did such a wonderful job, from the bottom of my heart.

I'm so grateful...I. would like to say thank you from the bottom of my heart... it was getting to the crisis mode where I thought I would have to move..

They put insulation in attic, fixed heat ducts so heat would go down... it's a good thing to help people, it's a good fund if people don't have the income to put stuff in...it's good.

The contractors that were used were excellent, the approach, communication, they were a great group.

I would like to say thank you for the program, its been a life saver...

I think this is a great program. It helped me and my family. I hope more funding becomes available to help other families.

I must say that everyone who came out I was well pleased with. They were all kind mannered and promised to be here and was here at the time given. I am very happy with all things done and happy for my new ac unit. The guy who installed my new system explained everything to me very well.

The crew was great. I hope Duke will be about to continue this service. It has a lot of benefits to the community and I appreciate being able to have had the opportunity. I was out of work during the time my new system was installed so I am thankful. This program is one of the Best programs Duke offers and is an excellent service.

I am surprised that they were able to install my new heat and cool unit in my home because I have an old mill house so I am very grateful that they managed to install it. They did a great job. Everyone was nice and cleaned up after themselves. The inspectors were nice too. I wish I had money to contribute to this fund to help others in need because it is hard when you need improvements and don't have the money or means to pay for it. I am thankful Duke has a program like this and the weatherization agencies.

APPENDIX II • HOMEOWNER RESPONSES

I just think is Godsend. It is such a wonderful program for senior citizens, someone who is disabled that cannot afford to help themselves.

I'm on equalized payment and my bill went from 193 to 120 dollars per month... that extra savings can pay for another bill... I was flabbergasted when I qualified for the program, my heat pump was replaced, washing machine is great, (this machine wrings out clothes so less drying) replaced every light bulb... they were fabulous, couldn't believe it... I work at a non-profit organization, it was unreal, it I hadn't been worked there i wouldn't have known about the program.

Power bill has gone from 500 to 200 dollars per month. We were using space heaters to heat the home & a window unit to cool the home. I'm 100% satisfied that they helped me as much as they did!

My mother doesn't have to worry about buying oil this winter or using a space heater, which is dangerous. Many people do not know about this program and its because of the line of work I am in to why I found out. This has been a life saver. I do not live with my mother but my brother and I were there when everything was being done and I don't know what we would have done without this program because financially we don't have the money to have made these sort of upgrades. My mother is elderly and it gives her now a sense of being safer, warmer and saving money. She can also stay in her own home and not in a living facility. This program saved our lives and we thank you so much.

Having the new windows make me feel safer. Overall I feel better and I am grateful and thank you all.

It was just wonderful and I thank and appreciate it. It's fantastic that Duke can set aside funds to help people like myself that is on a fixed income and elderly. I am a widower and I can't thank you all enough for my new air conditioning system. I am very appreciative of everything and Duke.

The program has done a lot for a lot of people in the neighborhood. I hope that the program continues and help others. My light bill is very very good. I really enjoy the way it is. I hope they decide to do more of this program, especially for senior people who can't afford it. It really came in handy.

It's a great program to help people. I always worked and made it on my own and I have been very independent and then had a lot of medical issues. I have been in a pretty bad shape, and my stuff went out, so I was glad for that program.

I think is a great program for people who really need it. Sometimes is hard to make meets end, so anything that you can do to lower the electric bill, so I think you should do more of these programs.

I really want to thank you for having the program. It helped very much. I am in a lot of medications, so this helped me a lot. I have told people that Duke Energy helped me a lot and that's why I feel better. My bill also decreased and is very nice now.

The whole process was painless. I couldn't have asked for a better set of people. Mark and David were exception. They were great. Neat and courteous. I was so appreciative I cooked them a little something to say thanks.

APPENDIX II • HOMEOWNER RESPONSES

I never knew that Duke Energy was involved. The people that worked on the house they were some of the best people ever. The people that were hired were great people.

I think the program is amazing, for citizens who pay taxes like myself. These improvements allow me to tell others about this program. It's great. I am truly blessed.

They did so much!!! I think it's a real good program who need assistance.. when winter comes I'll really get the benefits.... appreciate the program, a really good program.... the people who administrated the program did a great job! They let me know all of the information.

I just think the program is wonderful. They did so much for us. Me and my sister live here and we are getting out there in age, fixed income, and we couldn't have done any of this without you guys. We don't have to worry about things breaking down. We know that we will be able to stay here for a long time. It is just wonderful!

They all did a fantastic job with the upgrades. After they finished my evaluation my refrigerator went out 4 days later, and it wasn't included.... thank the lord for that program and I was eligible for it. it's a great thing you do for people who can't afford those things, i don't know what i would have done... all the guys were very nice and friendly and everything I'm glad to be a duke energy customer.

Thanks a lot, if it weren't for the upgrades I don't know what me and my mom would do, keep

the program going... most definitely... if you can help anybody else like you've helped us, please continue. It was amazing for us!! It was an amazing experience.. the people that did the work were very considerate of me and my home...

I think Duke Energy is good, everything is great, all the upgrades, I couldn't ask for anything any better thanks to duke power, what would we do without them.

Door is a lot more secure, windows are more secure.... previously on windy days you could actually hear the wind blowing inside, it was so bad the wind would move the blinds... there was a lack of sealing previously... I'm glad to know Duke Energy was behind a lot of it.... this place really needed it (public housing).

I think it is a good program for people that are on social security and can't afford big bills. Everyone who came out was really nice and I thank Duke Energy for helping me.

The little boys that the installed the equipment were really nice, they did a good job.. Ms. Cannon wanted to make sure everyone got involved with the installation got an A+ After my a/c was installed I told my girls "I believe I've went to heaven when I woke up."

It has made a world of difference... wasn't aware Duke Energy HHF was involved.. couldn't believe I was eligible for all this equipment... I want to thank Duke Energy for being a company that has helped a consumer, feels very very good!! Absolutely remarkable...

APPENDIX II • HOMEOWNER RESPONSES

Don't have to use plug in heat, feel safer now.... not worried about fires as much, fire/gas alerts system make customer feel safer... Duke Energy has done a wonderful job to help the seniors, a lot of customers can't afford a heating/cooling system, we didn't have the money to put in heating/cooling system. The people who installed the system did a good job, cleaned up before they left.... appreciate washer/dryer, appreciate that..... customer really appreciates everything to the highest..... they removed a lot of stuff from the bottom of the house and they had it all removed... can't complain about any of the services.

Feel safer in home because old heaters were bought from Walmart and they weren't as safe. The HHF has been a blessing, it has made our lives so much easier... Hopefully others can benefit from this program... our electric bills have been cut in 1/2...

I appreciate everything that was done. I appreciate it so much that I wrote thank you letters to everyone with Community Action Opportunities. I am very thankful. I used to burn oil and I didn't have to spend the money this year. They also upgraded my wiring to get the new heat pump in. They took good care in what they did and with me.

I am glad that Duke Energy had the funds to help and assist the disabled. It helped me tremendously. It has helped my bill a lot. It has decreased my bill for about \$100 or so.

I am just glad that it was available and we qualified for it, for our HVAC. It was really expensive for us because of kerosene.

I am so thankful for everything that was done for me. Everyone who came out from each of the companies were very professional. Even the Inspectors were nice and not snobs. They assured me that all the electrical work was done correctly. They even installed a smoke and gas detector alarm.

I appreciate the new appliances, because they are more energy efficient. I know down the line they will help me with the electric bill. I greatly appreciate it.

Customer says he and his mother are on disability and it was blessing, and they really appreciated what Duke has done for them.

My personal opinion, I think this program is a blessing. I think that DE is one of the most wonderful companies to help people who are disabled. My husband passed away last year from cancer and this program helped me so much. I am so thankful.

I am greatly thankful for Duke Energy and this type of program. I was in shocked that I could apply and actually got accepted. They replaced my washer and dryer and my ac unit. They also gave me a refrigerator. My house was hot and moldy previous to the improvements and had deteriorated and had critters. I feel healthier overall. If it wasn't for Duke I could still be in the hospital. Heat affects me very bad with my medical condition so to feel cooling has made a world of difference. I am now able to keep my body temperature down. This is a mobile home so it isn't very efficient to begin with. Thank Duke and the weatherization Action Pathways for everything.

Everyone that was sent out was professional from start to finish. From the first inspector to the final inspection inspector. This was very convenient and mindful and everyone was friendly. Definitely keep

APPENDIX II • HOMEOWNER RESPONSES

this type of system around. I hope it can extend across the nation to others in need. I recommend it. Sad to hear that our fearless leader is trying to take programs away like this but I am grateful that it is available. Thank you so much for taking the time out to call to ask about my experience.

.....

I would tell anyone that has the opportunity to do this to please do it immediately. Be careful who you said yes to, but if you know if it is a program that Duke Energy is responsible for, then they will take care of you.

.....

I can breathe a lot better. You all did such a good job. Thank you all for doing this. I am so pleased. Everyone was so nice and the entire thing was enjoyable.

.....

Keep program up. Elderly people need it. After you work all your life then to end up on a fixed income it's hard when things need to be fixed. Sometimes you have to choose to do without meds or maybe food depending on how bad it gets. I thank you all for doing this and keep it up.

.....

Thankful for heat pump and thankful overall for everything that was done and is coming out to her home. During the winter customer feels a lot warmer and during the summer hot months she is a lot cooler. She has noticed breathing better although she doesn't have an issue breather. The quality of the air is better. In the past she has used fans but now feels better overall during the hot days.

If it wasn't for Duke Energy I don't know where I would have been this winter. With previously having to use a wood burner for heat which caused my sons breathing issues I am thank you to Duke for installing a new heat and cool system. I am tickled to death and so pleased of all the work that was done. I am so happy that Duke cares about people who need help and from the bottom of my heart I am thankful.

.....

I was not aware Duke Energy money was used towards the improvements in my home so knowing this is great and I appreciate you all so much. I also like the tips you send out on think that can be done in the home to save money like hanging the clothes to dry instead of using the dryer.

.....

I sure appreciate the things that were done because it helped to better the household. To have a better heating and cooling unit helped a greater deal. They also did the cracks and the bathrooms which was good too.

.....

I have nothing negative to say about my experience. The air conditioning company (Mr. Richard) was awesome. Make note that Mr. Richard explained that this was one of the biggest jobs they have done. It was starting from scratch. No insulation in the attic, no central heat or cool. They also added vent in bathroom and a main breaker. I am so very grateful and thankful and happy to recommend this is anyone I know. I had to wait 2-3 years for this and I am thankful my home had all these improvements made. Tell the program manager that this was exceptional for Duke and the other workers to do.

.....

They did a good job and it really helped me a long way. They put windows in my home so it feels warmer and I truly appreciate everything that you all did. One person in here asthma is as bad and overall we feel good and is comfortable. Thank you so much.

APPENDIX III • SERVICE PROVIDER RESPONSES

WARM was able to assist so many families with these funds. We are so grateful, and wish there were more funds to continue to help so many more families that are in need.

We worked very hard within a short time frame to spend the original allocation, plus the additional funds we requested and received. In about a two year period, we installed over 175 heating systems, a great many appliances, and health & safety and weatherization measures. In spite of all that was accomplished, the need exists for that much more to be done.

It has been an great program for all our eligible clients.

We look forward to continuing to work with Duke, it has been an outstanding opportunity for our agency as well as the customers that have been touched by this program. It has given us the opportunity to bundle services with other agencies to serve customers and provide additional measures in the home.

This was a great program, but the need is still great (10x).

The program support team was very helpful in assisting us from the start to finish and we were able to leverage the funding to provide needed services to the low-income folks CADA serves.

This was one of the best programs we have administered to assist homeowners with appliances. (2x).

The staff at NCCAA and the Martin group were very helpful and easy to work with. The requests for exceptions were processed quickly as were agency reimbursements. This program was a win-win for all involved.

Overall, HHF has been both impactful for the community and rewarding for our agency to serve others in need. We would love to be considered for future opportunities.

Joel Groce with NCCAA did an outstanding job administering the dollars.

This has been a great program. The Duke HHF staff were great and very knowledgeable. Payments were also processed timely.

The HHF program has helped offset many program expenses and has allowed us to continue working longer through the year until the new contract is completed and/or funding is released.

CONTRIBUTORS

Advanced Energy

Kelsy Green

Maria Mauceri

Matt Murray

Jonathan Susser

Duke Energy

Casey Fields

Lorrie Maggio

Lockheed Martin

Deborah Hill

North Carolina Community Action Association

Joel Groce

Sharon Goodson



advanced
energy

Testimonials

██████████ is a Columbus County resident that applied for weatherization due to the high cost of heating and cooling her home. ██████████ qualified for the HVAC replacement program through Duke and was able to get an energy efficient heat pump installed. ██████████ stated, "I don't have to seek assistance anymore with filling my tank to heat my home. I am very pleased with all of my services."



Old Unit



New Energy Efficient Unit



Non-Functioning CO Detector



New CO Detector



Old Thermostat



New Energy Efficient Thermostat

Helping Homes Fund gives Hickory woman her first heating and AC system ...

By KJ HIRAMOTO khiramoto@hickoryrecord.com

Sep 9, 2016



Janet Lutz of Brookford adjusts her thermostat to her new heating and cooling system from Duke Energy's Helping Home Fund.



Janet Lutz of Brookford has already started covering her new refrigerator from Duke Energy's Heling Home Fund with photos of her grandchildren.

HICKORY – The thermostat at Janet Lutz’s house in Hickory has remained at exactly 72 degrees Fahrenheit throughout the summer. While Lutz insisted she is comfortable with the temperature setting in spite of some of the hottest and most humid days during previous summer, it was also due in part to her being overwhelmed by the technology.

“I’m scared to touch the buttons,” Lutz said jokingly. “But it feels great around the house. ... My sister also told me to keep the fans in the living room going to keep the air flowing.”

Before having the thermostat installed in her house, Lutz had never owned a heating and air conditioning system.

“I’ve always had my wood stove for over 40 years,” Lutz said. “I made my boys go out buy a loaf of wood, stack a pile outside, bring some inside the kitchen and we’d heat it with a stove.”

Thanks to the collaborative efforts between Duke Energy and Blue Ridge Community Action (BRCA), Lutz’s days of making her grandsons gather wood to generate heat around the house is over.

Lutz was among the families selected by BRCA as one of the recipients of Duke Energy’s Helping Home Fund.

Helping Home Fund is a program that offers free assistance for income-qualified Duke Energy customers with up to \$10,000 in energy efficiency upgrades. After receiving a complete home energy assessment, they also receive assistance and counseling to help the families save on their future energy bills.

BRCA’s role is to administer the home improvements for the chosen Duke Energy customers as soon as the non-profit organization receives the allocations from Helping Home Funds. They identify the clients who apply for the program, send out contracted auditors to test the home then the auditors send the reports back to BRCA, which then follows up with a select group of clients based on their eligibility scores.

BRCA Energy Director Shawna Hanes said the program operates in a team effort with all the contracted partners and Duke Energy all playing their own roles.

“We have qualified contractual partners that we had carefully selected which we are glad to have with us,” Hanes said. “And we would not have been able to install the system (in Lutz’s home) if it weren’t for the funding received by Duke Energy.”

In addition to assessment and counseling, chosen families like Lutz’s receive services from the program such as health and safety repairs and installation of home ventilation systems.

And for Lutz’s case, she received repairs on her home windows and a refrigerator as additional services provided by the program.

Lutz said ever since the installations for the series of home improvements were completed several months ago, she had been pleasantly surprised to see her house is a lot more energy efficient, evident by the noticeable difference in her monthly Duke Energy bills.

“When we used the wood around the house, it went around \$200 a month,” Lutz said. “Now it’s between \$120 to \$140. ... Now I can spend the extra money on the boys’ school supplies and (school) uniforms.”

Lutz said the new heating system in the house has enabled her to give her two grandsons -- Daniel, 15, and Nick, 11 -- extra time in the evenings by not having to make them go out to gather wood for the stove. But as a result, she did add more chores around the house for the boys.

"They're not going to sit around," Lutz said jokingly. "Daniel likes to cook so I have him prepare the main dishes, and Nick likes to bake pastries and I get him to organize the Bible shelves."

All jokes aside, Lutz said the series of home improvements and installations have helped the family immensely, especially for her two grandsons. They've struggled with asthma when their house was in its previous conditions.

"They're nowhere near as affected by it now," Lutz said. "I couldn't be more thankful for Helping Home Fund."

Hanes said seeing the families experience improvements to not only their home utility systems, but also to the quality of their lives makes her job that much more fulfilling.

"It's always exciting to see all the work get done," Hanes said. "It keeps our staff motivated when they get a chance to see these families smile in-person."

Application Process

Although BRCA is nearing the end of its Duke Energy HHF allocation period, Hanes said she encourage clients to apply for services since they will continue to provide weatherization services to low-income families. Hanes said if a client is unable to come to the BRCA office locations, our organization's service workers could make a home visit when possible.

For more information on the weatherization services, visit their website at <http://www.brcainc.org/weatherization>. The Weatherization Services page provides more information about how weatherization helps low income families save energy and money and also informs clients on how to qualify for weatherization. Applicants must qualify for weatherization in order to qualify for the Duke funds.

Duke Energy's Helping Home Fund aides Lincolnton woman



MATT CHAPMAN
Staff Writer

Duke Energy launched its Helping Home Fund in January of last year and has since provided more than 2,000 families in North Carolina with up to \$10,000 of energy efficiency upgrades at no cost to the customer.

The Helping Home Fund is a \$20 million program funded by Duke Energy shareholders that was authorized through an agreement with the N.C. Public Staff and approved by the N.C. Utilities Commission in 2013. It serves families at or below 200 percent of federal poverty guidelines and helps income-qualified customers with upgrades that include the replacement of outdated washers and dryers, HVAC replacements, insulation and other weatherization benefits.

Duke Energy contracted the N.C. Community Action Association to administer the \$20 million of funding through 28 agencies across the state. In Lincoln County, more than \$58,000 from the Helping Home Fund has been administered through I Care Inc., a private non-profit that works to expand economic security for vulnerable families.

Patrenia Fair is one of the Lincoln County residents who has been helped by this collaboration between Duke Energy and I Care. She spent years living through sweltering summers and harsh winters in a home without a properly functioning heating and cooling system. Fair lacked the

disposable income to make the required fixes and the problems snowballed as the use of space heaters and window air conditioning units drove her energy costs through the roof.

“I thank God for these people who have helped me,” Fair said while fighting back tears. “I’m glad that they came by to see about me and cared enough to come check on me.”

Fair applied for the program through I Care and as a Duke Energy customer was eligible for assistance through the Helping Home Fund. Work began on her home in April as I Care replaced her electric baseboard heating and installed a brand new heat pump. In addition to the new heating system, Fair’s home also received weatherization upgrades and the fund provided her with a new, energy efficient refrigerator to help save additional money each month.

“I’ve been in this job for almost seven years and I’ll never forget the first home I went into,” Rick Stotts of I Care said. “It was a mobile home and it was in the winter time and it was freezing cold in there. I saw this young girl laying on the sofa with a bunch of blankets over her and I didn’t realize it right away, but she had a little baby under there trying to keep it warm. I have a real soft spot for older folks and kids. They’re so appreciative for what you do for them and you can see the difference it makes in their lives.”

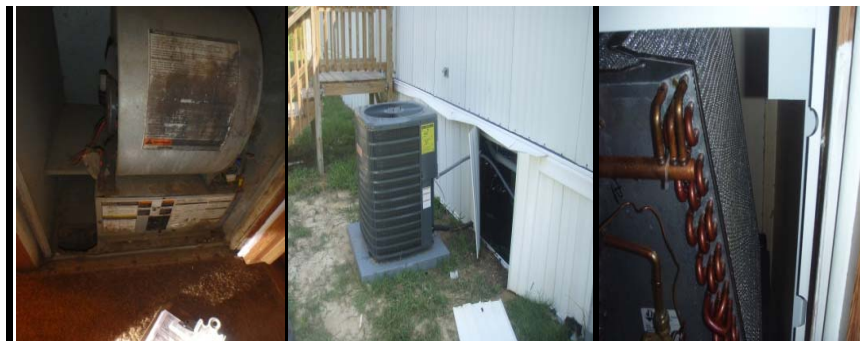
The Helping Home Fund is a one-time program, meaning that once the \$20 million has been spent the program is over. However, Duke Energy representatives are working on putting a similar initiative together sometime in the near future

“We are a very large company, but we want to try to reach out to everybody and have a conversation,” Duke Energy program manager Casey Fields said. “If it means that we can make a big enough change in someone’s life that you get emotional or you feel good about it, it makes my job much, much better at the end of the day. This is a phenomenal program and this is the right thing that we’re doing and it’s what we should be doing.”

Image courtesy of Matt Chapman

The customer was in need of energy saving measures for his mobile home. He is disabled and has limited income, which made it difficult to get much needed measures done to his home. [REDACTED] was grateful for all the assistance that Action Pathways along with Duke Energy's Helping Homes Funding provided to his home. [REDACTED] was very pleased with all the services he received by from weatherization program and has already seen a change in the way his home feels.

[REDACTED]'s Home



Old System

New Energy Efficient System



No Vapor Barrier



Vapor Barrier



Old Bath Fan



New Bath Fan

Since the start of the Duke Helping Homes program we have helped over 125 families in Macon County addressing health and safety issues and installing energy efficient appliances and heating systems to reduce their energy usage and monthly bills.

The health and safety part of the program enabled us to install handicap ramps, grab bars and do much needed porch repairs so that our clients could stay in their homes. Also we were able to install new heating and air conditioning systems where they were non-existent or beyond repair. This was so very important to our clients on oxygen and with health issues.

██████████ is one of our clients with health issues and cannot endure extreme cold or heat. She is very comfortable in her home now with her new heating and air system and does not have to go stay with relatives as she did in the past.

██████████ is a client who is on oxygen and installing a new heating and air system to his home eliminated the wood burning stove. He could no longer lift the logs and a dangerous situation was eliminated.

██████████ was in a nursing home and could not return home until a handicap ramp was installed. She is now able to be in her own home.

██████████ was in desperate need of a handicap ramp and since his wife is on oxygen, we were able to replace the propane system with a heat pump and install the handicap ramp.

██████████ was in need of porch repairs and a handicap ramp. He is now able to enter and exit his home safely and can stay there for many more years.

██████████ **and his wife** are both disabled and have a young child. They are truly grateful for the handicap ramp and heating and air system.

██████████ lives alone in a very rural area and was in need of a handicap ramp. She was in a nursing home and couldn't return home. We were able to install the needed ramp and also install a mini split heating system for her. She is now able to be at home.

So many of our clients have commented about how their lives have been changed for the good and how happy they are to see the reduction in their energy bills due to the appliance replacement program and HVAC replacement program.

Macon County Housing Department was able to use the monies from the Helping Home Fund in conjunction with other programs such as the Urgent Repair Program, HARRP, Single Family Rehab Program and the Weatherization Program.

We wish the program would be continued as there are many elderly, disabled and single parent families here who would benefit from being able to switch from wood burning stoves and the expensive propane heating to the energy efficient heat pumps.

Various Success Stories from Duke Energy's Helping Home Fund

██████████
Wilmington, NC

To Duke Energy Helping Home Fund:

How will I ever be able to thank you for kindness & generosity in helping us to get a new HVAC system put in. After living over a decade without heat and air, it had pretty much become a way of life for us to live in one room during cold and hot days. Using an electric heater to stay warm was neither safe or efficient. As students (trying to improve our lives) we would sit and do homework with hat, coat, & gloves on. For us, it was a normal way of life for many years. However, thanks to your Home fund and giving back to the community, Wilmington Area Rebuilding Ministry, Inc. was able to see to it that we were matched with you to be a recipient of your gift. It has changed our life overnight to have this new system in place. Thank you again and WARM for your kindness & especially for the volunteers at WARM for treating us with dignity & respect.

██████████
Durham, NC

[Received Air Sealing and Mechanical Ventilation]

This letter is to thank you for the amazing and wonderful maintenance work that was done to bring my home up to standard. I would never have been able to pay or save for the service that Your Company did for me. The company is a God Sent for Seniors.

I would like to thank the people (men) who performed the service, they were ██████████, the Auditor, ██████████, and the other two men from Charlotte, NC who did the electric work. They were very polite, friendly and respectable to me and my home. After the work was completed they checked to see if everything was working or performing correctly.

Again, Thank all of You.

██████████ [HVAC Replacement]

To whom it may concern. We just wanted to thank you for all you did for us. We could not have afforded this ourselves. It's good to know that in this messed up world we live in today, there is still people with goodness in them. I believe God will bless and prosper your company for what you do. We appreciated all your crews that came out. God bless you and good luck in the future.

██████████
Willow Spring, NC

[HVAC Replacement – Mechanical Ventilation]

Thank you for the weatherization of our home. The things did have definitely made a difference in our electric bill. We are so appreciative for the services that you provided because they were needed so badly and we could not afford to have any of the work done.

The gentlemen from your organization and the service providers from Therma Direct, Carolina Weatherization, and Lowe's were so respectful and extremely courteous.

[Redacted]
[Plumbing repairs & HVAC Repairs]

Wanted to say thank you so very much for help in facilitating all the repairs on my home. Already seeing a difference in energy bills. I have nothing but good things to say about your agency. Hope you all keep up the great work.

[Redacted]
Zebulon, NC
[HVAC Replacement]

My deepest appreciation to all administrators of Wake County Weatherization and Duke Energy Progress Heat/AC Assistance Programs. Because of your programs, I was blessed to get my Heat and AC needs met for only 25% of the total cost which was paid by my landlady.

[Redacted]
Henderson, NC

I would like to express my appreciation for this program. It has really helped me a lot. I would not have been able to have this work done without your help. My house has never been better.

The works were very professional and kept me informed on what was going on. They had to rework the duct work, install insulation, replaced attic steps, replaced roofing (ceiling tiles) and installation of the unit. There "wore" the best. Without this program, a lot of families would be without heat or air and a comfortable place to live.

[Redacted]
Just wanted to thank you and let you know how much I appreciate all that you all have done for me. The heating and cooling unit works great, and the washer and dryer are great, makes doing laundry a pleasure. All who came to my house to install everything, were so very very nice. I have never had that many new things that I didn't have to make monthly payments on. What a blessing.

Homeowner serviced by Coastal Community Action in New Port, NC

[Redacted] [Executive Director of Coastal Community Action] called this morning after receiving a call from a lady who had been helped through the Helping Home Fund. This lady was a retired teacher who because of sickness was no longer able to work. She had replaced the roof on her home before her funds ran out. She has been without heat for a very long time. The actual work will not be completed until tomorrow, but the lady was so overwhelmed with the kindness shown to her that she called [Redacted] and talked for over an hour. She said that she had never been treated as kind and was so appreciative of the professional staff at Coastal.

[Redacted]
Mount Airy, NC

Dear [Redacted] /Weatherization and Duke Power,

Just a note to say THANK YOU, so much, All of you, for my new A/C unit and the free installation of same. I've worked hard all my life and it is so much appreciated. To find people willing to help me so much in my older, non-working time and age. And what a year to get such a blessing – So hot!

██████████
Fuquay Varina, NC

I just had to thank you and your company for caring about our community and seniors. I have been so afraid of falling “again” in the winter with 2 inches of ice on my stairs, not even able to get out of my home. Through the money you gave to Senior Weatherization I am now much safer going in and out of my home. I am more than grateful for your helping me! I will be praying for God's blessings to overtake you and your company and your family.

You truly have been used by God to answer my prayers to keep me safe Thank you one million times

██████████
Charlotte, NC

I wanted to take this time to thank you for your service in making sure I have received my new GE Appliances, what a difference it has made in my home. Having appliances that are not only brand new, but are updated and just simply beautiful.

Thank you for your Help and the Change it has made in my life.

██████████
Raleigh/Durham

Season Greetings,

I did not want another day to go pass without me giving you all this big appreciative love email!! I am speechless and so grateful for all the work that was done to my home! I came to you with lots of concerns and not to mention a \$1200.00 light bills for two months. My family barely made it through the year because there was only money for the basics but God!!! There was no way I could have ever afford to do any of the work you all did! I am less stressed because my power bill has been cut down tremendously, we all sleep safe at night because you have installed smoke detectors and carbon monoxide detectors, I won't have animals crawling in the crawl space and it was fully insulated as well, and although it's not the last thing you all did but you all got rid of my 1980s refrigerator and blessed us with a new one. I am emotional right now just writing this email! If I ever was wavering in my faith, I am reminded every time I opened the front door and step inside my warm and cozy home 2 things-God has angels on earth and He is still performing miracles.

██████████
Boonville, NC

From the agency that served ██████████

I had a delightful telephone call from [REDACTED] and wat to shar it. [REDACTED] is an elderly lady. She's an expressive person and has a jolly attitude and outlook about most things.

She called me to let me know Lowe's delivered her new refrigerator at 8:08am Tuesday morning. She said she "had no idea it would be so big and so pretty and so nice! That's a rich lady's refrigerator! I have never had a refrigerator I didn't have to buy on credit, make payments on, and do without, in order to get it. I'll be 83 next Wednesday and I think this is my birthday present from heaven! I don't know if other people call you to thank you for their refrigerators and let you know how nice they are, but I had to. I want to thank each one of you that had anything to do with helping me get my new refrigerator and heat pump. My house is nice and warm now!"

Success Story from Charlotte Area Fund

Good Afternoon [REDACTED],

I really did not know what I was going to do! For almost 5 years, my washing machine had been leaking, it took more than 2 hours for 1 load of clothes to dry, my refrigerator made a "humming" noise, and my oven door was broken.... the whole house was falling apart and honestly so was I!

I was barely making enough money to survive and just the thought of trying to replace worn out broken appliances was almost too much to bare. And then.... I read the article in the *Charlotte Area Fund Spring 2016 Newsletter* about the Charlotte Area Fund and Duke Energy Replacement Appliance Assistance Program and like an **angel** you helped a struggling resident obtain new appliances!

[REDACTED], you made the process so easy, you completed the paperwork quickly, and you were very professional. The contractor and the delivery personnel you sent to my home were extremely professional, courteous and completed the job in a timely manner. I thank the Good Lord for this program. I can now cook in a new modern oven, wash my clothes in an energy efficient washer and it only takes about **15 minutes for a load to dry!!**

I am so overjoyed at receiving these appliances words can hardly express my joy and gratitude!!

Thank you so much [REDACTED], the Charlotte Area Fund, and Duke Energy for this awesome program.

God Bless you once again.

POSTED ON [SEPTEMBER 7, 2016](#) BY [STOKES NEWS](#)

Couple benefit from Duke Energy's Helping Home Fund

By Amanda Dodson - adodson@civitasmedia.com



Anthony and Lydia Prysock, a retired couple living in the Walnut Tree community, were the recipients of home upgrades through Duke Energy's Helping Home Fund.

Anthony and Lydia Prysock, a retired couple living in the Walnut Tree community, were the recipients of a new high efficiency heating and cooling heat pump, a washer and dryer, and safety measure upgrades to their home through the Helping Home Fund. The two-year initiative, launched in January of 2015 by Duke Energy, reduces the burden of energy costs and electricity for families in North Carolina. The \$20 million community investment pays up to \$10,000 per household for repairs, new appliances, retrofitting for efficiency, and other electricity costs based on household income.

Last winter, the Prysock's were paying nearly \$400 a month using baseboard heating, a grueling amount for the couple who are on a fixed income. While they've slowly completed home renovations over the years, there was a mounting list of more to do.

"I noticed one of my neighbors down the street was having a heat pump put in and I asked the contractor to write up an estimate of how much it would cost at our house," Prysock said. "But as I was talking to the young lady, she told me about this program and I gave them a call."

After doing some research, Prysock realized he and his wife were eligible for Duke Energy's Helping Home Fund, and the program would easily cut his power bill in half.

"We applied and went through the process. I'm really thankful for this and for Duke Energy giving to our area. This is how you rebuild communities. What little money we did have we redid the cabinets and put on a new roof. It would have been a long time before we could have done anything like this."

The Helping Home Fund has invested over \$175,000 in Stokes County and helped 55 families receive energy-saving upgrades at no charge to income-qualified customers.

"The Prysock's are one of more than 2,000 families we've helped all over North Carolina. We've spent almost \$10 million dollars and we still have about another \$10 million," explained Lisa Parrish, Duke Energy's Government and Community Relations Manager. "We have great organizations we work with like YVEDDI that just know how to get it done."

Tommy Eads, the weatherization director from YVEDDI, said the program has been flooded with applicants and said when considering homes, they look at household size, yearly kilowatts usage, and income.

"We've done several houses on this street and some others close by. There's 334 projects that we have either started or completed in homes from Stokes, Surry, Yadkin and Davie. We service all four counties with the state and the Duke Energy program," Eads said. "It's great to be able to help the community. I feel like we get to be a part of making a difference one homeowner at a time."

Amanda Dodson can be reached at 336-813-2426 or on Twitter at AmandaTDodson.

June 12, 2015

Governor Pat McCrory
Office of the Governor
20301 Mail Service Center
Raleigh, NC 27699-0301

Dear Governor McCrory,

My heating and air conditioner quit working in January. I purchased some little heaters that kept me warm. I was employed for many years and was a single parent of two children. Unfortunately, I had to retire sooner than expected and being independent made that a hard transition. I called several companies for estimates and realized faith was my only solution. My daughter contacted an agency by the name of Coastal Community Action Inc, specifically its Weatherization Assistance Program and the Heating and Air Repair and Replacement Program. It was an answer to prayer! I called and spoke with [REDACTED] at Coastal Community, and she had me send in the necessary paper work to see if I qualified. She was very kind and helpful. My daughter had originally spoke with her boss, [REDACTED] and he talked with me and was very helpful, explaining the process that would take place. Next [REDACTED] the auditor, came to my house to inspect my whole house to see what could be done to weatherize my home. He was very precise checking throughout my home, and he explained how different things would be beneficial. I called and talked with [REDACTED] who is in charge of the whole program. She told me something that really stuck in my heart. She had presented a three hour presentation to get the funds and grants to help people. I had much gratitude that she had accomplished receiving the grants that would be a gift to so many people. I have never received such help so I am very appreciative. Then they sent the crew out to weatherize my home and to put in an exhaust fan, to wrap my hot water heater, to put a new shower head on, and carbon monoxide detection. They also put insulation around the duct work. These guys were very mannered and it was obvious there was great team work. These guys were [REDACTED], [REDACTED], [REDACTED]. [REDACTED] came to inspect their final job. These guys were awesome!

Coastal Community Action Inc. used an electrician, [REDACTED], with For A Electric and he was a super gentleman. They selected McLeans Heating and A/C, owner [REDACTED], whose workers were [REDACTED] and [REDACTED]. They installed a new unit and duct work. I was very pleased with their work and kindness.

I wanted to express my gratitude and share the great blessing I received and felt you should be aware of this wonderful organization and the gracious grants offered by Coastal Community Action! I would be so happy if you could acknowledge my appreciation to each one that has made my life more comfortable and efficient. I want to thank Duke Energy for their assistance and the other donors at Coastal Community Action who made the grants possible.

Sincerely,

.cc Coastal Community Action, CEO Lynn Good (Duke Energy)

April 28, 2016

Blue Ridge Community Action Inc.
601 East Fifth Street Ste. 255
Charlotte NC 28202

To Whom It May Concern,

My name is [REDACTED]. I have been a life long resident of the Stanly County area. During this time I made choices in my life that did not reflected a thoughtful planned out success for my future. So I struggled financially. Unfortunately, I never qualified to receive any of the grant money that was allotted to Stanly County to help those who were in need of assistance.

During my life in Stanly County I was blessed to have a son with disabilities which required total care. This job was the love and joy of my life for twenty years. Within that time I was attending school to get a degree which would increase pay, so I can better provide for my children. I had to drop out of school and had to let go many jobs because of my responsibility at home. He passed in 2009, and life itself was a struggle. At one point of my I had no hope nor did it even matter whether I got it together or not. One day, God, just gave me a want- to- live spirit again. So I found jobs that lasted short term and applied for assistance many times. This was very embarrassing and degrading because the people made you feel you just wanted a hand-out. The workers made you feel like scum. After being rejected many times, you have a fear of even seeking help. When it was cold I would put cover up to block off rooms so we would stay in one area of the house, using a space heater. When it was too hot, we would visit someone or mess around in stores until it cool off to go home. I heard about you through a friend at the Community Action in Albemarle. At my wits end I fearfully applied at the Blue Ridge Community Action.

My vocabulary does not even extend far enough to express what my heart truly feels for the blessing you gave my daughter and I. For two years we have been without heat and air. As a single parent making minimum wage and not forty hours a week, I had to prioritize which bills got paid and I just couldn't seem to fit this in my budget during that time. Through Gods power we survived.

I truly thank God for this program, and especially to one of your workers [REDACTED]. The compassionate spirit and concern was of one I have never experienced. Never once did I feel as though I was being seconded guessed about any information, nor made me feel inferior concerning my needs. Out of all the rejections and mistreatments were worth the reward of compassion we received.

Our hats off to you guys and our hands up to God for his mighty acts he showed through you as workers. Continue to show his love and he will continue to bless this business and each one individually for what you do for others.

Thanks,

[REDACTED]

Team effort helps keep man in home

Tim Reaves
reporter@thefranklinpress.com

Kenneth Cruse stood proud on his porch on West Old Murphy Road on Thursday.

"You don't know how much I appreciate it, folks," he said to a group of people from the county who helped him stay in his home.

Cruse, 64, is the beneficiary of a number of emergency repairs, weatherization and energy efficiency upgrades to his 86-year-old home. Over the last two years, he's seen his house repainted, his roof replaced, electrical service upgraded and the installation of an HVAC system, water heater, oven and insulation.

Cruse said the equipment upgrades and weatherization improvements have cut his power bill in half.

"It's quieter, it's warmer, I enjoy it now," he said. "I don't have to sit around in a sweat suit."

Duke Energy contributed about \$10,000 from its \$20 million statewide Helping Home Fund for a new stove, the rails on the porch and various weatherization upgrades, said Lisa Parrish, government and commu-

nity relations manager for the company. Other funding came from the North Carolina Housing Finance Agency. World Changers did much of the housework on Cruse's home, including the new porch.

"This is probably one of the best examples of a public-private partnership," said John Fay, housing director for Macon County Housing Department (MCHD). "It's really a melding of funds and effort by many different organizations. ... It was really great, because we got to do so much here."

Cruse is the third generation of his family to own the house, and he's lived there for 32 years. But propane expenses and electrical inefficiencies were pushing him to the breaking point.

"The way the house was set up before the intervention, there was no way," he said. "It's the only way I could've stayed in it."

Cruse, who lives on Social Security Disability and Supplemental Security Income, said he had no insulation in his home and an old gas furnace that seemed ready to catch on fire.

"Over the years, things

happened, things just deteriorated," he said.

He said a friend of his let him know about MCHD, so he filled out an application to see if he qualified for any of the funding. It's typical of most MCHD clients, Fay said. They usually hear about the agency and its programs from friends and family members or local medical or senior services. Then they come to the MCHD office on Old Murphy Road and fill out an application. Staff members look at a number of factors, including income level and problem severity to prioritize the work. MCHD has 250 homes that need some kind of repairs or weatherization upgrades.

"We make that determination and match the work with the capabilities," Fay said. "And sometimes we don't have those. Sometimes we end up having to use, for instance, Habitat for Humanity, Macon Baptist Association, various people in the community that are volunteers."

The work on Cruse's home represents a broader philosophy that places value on letting seniors age in place, Fay said.



Press photo/Tim Reaves
Kenneth Cruse pulls a pan out of an oven, which he received as part of Duke Energy's Helping Home Fund.

"It's important for people to be able to be around the things that they have comfort with and to be able to feel at home and not have to worry about it falling in on them," he said.

MCHD is located at 1419 Old Murphy Road, Franklin. Housing help is available for those who qualify. For more information, call 828-369-2605.

Norlina, NC - Warren County

To whom this may concern,

I wanted to send this letter of appreciation to Franklin Vance Warren and all of the companies that contributed to helping us make our home energy efficient, as well as, safe and livable. For the 2 years that we have had our home, it did not have a heating source. We used kerosene to stay warm in the winter and it was awful. My four children and myself developed asthma and breathing issues that we never had prior to using kerosene. The smell of the kerosene was so strong sometimes that it made our eyes water. We couldn't afford to do anything else besides the kerosene at that time. We finally invested in propane as our heating source, but it didn't heat up the whole house, so we used electric heaters as well. I am so thankful and grateful for the FVW programs because with their help, we were able to qualify for a program that installed central heating and air in our home and a gas pump that has now been such a blessing. With all of the work that the electricians and heating and cooling guys did, we would've never been able to afford such quality work and installation of this system. Not only did they help us in regards to our new heating source, but they also installed more insulation, installed a carbon monoxide detector, installed new shower heads, fixed holes in our walls, sheet rocked around our windows all in effort to help save us from wasting money by making our home energy efficient. They did so much and worked hard to make sure it was done correctly and with love. I can't imagine how my children and I, health would be today, if FVW hadn't been there for us. The most frustrating thing as a parent, is to watch your kids get sick while trying to protect them from freezing to death. It was like torture, to know that you had to do what you had to do to keep us all warm, while sacrificing our extended health in the process. I had to give my children breathing treatments daily, they suffered from headaches, nausea, and low energy and I believe it was from that kerosene. But now, they don't complain about headaches, they haven't had any breathing treatments since, and they are full of healthy energy. We are all happier and warm throughout the entire house. I now have peace of mind and deep gratitude in my heart for the program that I believe saved my families life. Thank you again for all of your help and investments into making our living situation better. Miracles&Blessings.

With Love,

[REDACTED]