

## **Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs**

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October 2017

Report Number U1713

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## Acknowledgments

This report was made possible through the generous support of CenterPoint Energy, The JPB Foundation, and the US Department of Energy. The authors gratefully acknowledge external reviewers, internal reviewers, colleagues, and sponsors who supported this report. External expert reviewers included Elizabeth Chant from Vermont Energy Investment Corporation, Jerrold Oppenheim from Democracy and Regulation, Steven Jerue from Philadelphia Gas Works, Christopher Coll from New York State Energy Research and Development Authority, Michael DiRamio and Dave Rinebolt from the US Department of Energy, Scott Bloedorn and Paul Grimyser from Focus on Energy, Nick Mark from CenterPoint Energy, and Adrian Andrews from Columbia Gas of Ohio. Internal reviewers included Lauren Ross, Maggie Molina, Martin Kushler, Jennifer Amann, Neal Elliott, and Steven Nadel. The authors also gratefully acknowledge the assistance of the many program administrators we spoke to who provided data, program information, and context for this report. External review and support does not imply affiliation or endorsement. Lastly, we would like to thank Elise Marton for managing the editorial process and for copy editing, Fred Grossberg for editorial assistance, Eric Schwass for publication design, and Maxine Chikumbo and Wendy Koch for their help in launching this report.

## Executive Summary

Energy efficiency is an effective tool for lowering the total energy costs faced by low-income customers. Increasingly, for these customers, utilities are delivering specialized programs designed to lower specific barriers to participation like lack of capital, lack of credit, and aging housing stock that may need health and safety improvements. These programs offer measures including lighting, air sealing, and insulation at little or no cost to participants. In this report, we delve into low-income energy efficiency programs that are delivering deep savings and achieving high participation, building an understanding of the keys to these programs' success.

To identify successful low-income programs, we relied on data from prior ACEEE research, including *Low-Income Energy Efficiency Programs: A Baseline Assessment of Programs in the 51 Largest Cities* and the *2017 Utility Energy Efficiency Scorecard*.<sup>1</sup> We also conducted interviews with a set of industry experts knowledgeable in low-income energy efficiency program delivery. Since most of our data reflected large utilities serving urban population centers, we also sought out utility programs serving low-income customers in rural areas. We used several program screens, including participation rates, savings delivered per participant, and total savings achieved across the low-income customer base, to identify the top performers in this data set. We then conducted interviews with implementers of these top performers to better understand the program design and the elements that contributed to the program's success.

The implementers we interviewed credited many factors for their success. Features cited by multiple programs include the following.

*Statewide coordination.* Many of the successful programs we identified have formalized a statewide approach, either through regular coordination of various stakeholders to ensure that programs delivered by various implementers are consistent and equivalent, or through a single, statewide program implementer.

*Single point of contact for customers and for contractors.* Several program implementers we spoke to stressed that simplifying program design and administration is critical to success. Some programs work with only a single contractor, simplifying communication and ensuring a strong relationship between contractor and utility. Others noted that simplifying customer-facing communication is key.

*Market segmentation and targeted program offerings.* Several of the utilities and program implementers we spoke to offer a portfolio of low-income energy efficiency programs that focus on different types of customers, including high energy users, elderly customers, renters, and owners of multifamily buildings.

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<sup>1</sup> A. Dreihobl and F. Castro-Alvarez, *Low-Income Energy Efficiency Programs: A Baseline Assessment of Programs in the 51 Largest Cities* (Washington, DC: ACEEE, 2017); G. Relf, B. Baatz, and S. Nowak, *2017 Energy Efficiency Scorecard* (Washington, DC: ACEEE, 2017).

*Emphasis on quality control and training.* Many of the program implementers we spoke to noted that ongoing training for contractors and quality control professionals is critical and said they devote project funding specifically to regular trainings. Several program administrators also have strict quality control requirements for all projects rather than a sample.

*Leveraging of diverse funding sources to focus on comprehensive dual-fuel or fuel-neutral upgrades including health and safety measures.* Many of the programs we reviewed for this analysis combine funding from several sources to address a comprehensive set of measures at each project site that might not be feasible with only a single funding source.

*Accommodation of health and safety measures through program design and relaxed cost-effectiveness requirements.* Some utilities address health and safety issues by delivering stand-alone weatherization and health and safety projects for customers using different funding streams or by relaxing the cost-effectiveness rules that guide market-rate program delivery.

*Prioritizing measures that achieve deep savings.* The utilities we reviewed often deliver programs through a trusted contractor network. These utilities have designed contractor incentives that are savings based or are larger for deep-savings measures than for direct-install measures.

*Formation of partnerships to better market and deliver services to hard-to-reach customers.* Many of the utilities we surveyed noted that they have formed partnerships with food banks, health organizations, and nonprofits like Habitat for Humanity.

Our analysis also found that there is often a trade-off between maximizing participation and delivering deep savings to each program participant. Some utilities and program implementers have addressed the issue by including both low-cost direct-install measures and deep-retrofit programs within their low-income energy efficiency portfolio. Others have prioritized either participation or deep-savings opportunities. In addition to program design, state policy is also a notable factor of success for several programs, especially where states ensure a reliable funding source for low-income energy efficiency programs over the long term.

## Introduction

Ratepayer-funded energy efficiency programs provide important services to customers, lowering energy bills, making homes healthier and more comfortable, and giving residents and businesses more control over how and when they use energy. Utilities and other program administrators typically make these programs available to all commercial and residential customers.<sup>2</sup> But historically, program implementers have struggled to reach low-income populations. Low-income customers often face unique barriers to participation, and residential programs designed for non-low-income customers may not effectively meet their needs. Since low-income customers pay for energy efficiency on their utility bills, just as all other residential and commercial customers do, utilities have a responsibility to ensure that they have equitable access to efficiency programs. Many utilities and other program administrators, often driven by state policy goals, have developed programs specifically targeted at low-income customers and designed to alleviate some of the common up-front barriers to participation in energy efficiency programs.

This report offers examples of program design and delivery methods that have proved successful at reaching low-income customers. We define success in several ways, including maximizing program participation, delivering deep savings to participants, and achieving significant energy savings across the low-income customer base. We leveraged data collected by ACEEE in recent years to identify low-income programs achieving high levels of participation and deep energy savings for program participants (Cluett, Amann, and Ou 2016; Drehobl and Castro-Alvarez 2017; Relf, Baatz, and Nowak 2017). We focused on programs using utility customer funds, although many of these programs also leverage additional sources of funding or coordinate with existing services, including federal funding provided through the US Department of Health and Human Services Low Income Home Energy Assistance Program (LIHEAP) and the US Department of Energy's Weatherization Assistance Program (WAP). In this report we provide brief explanations of the keys to success for each of the energy efficiency programs we profile, with the intent of offering a range of possible pathways to achieving high energy savings and high participation.

## Background

Nearly 28% of families in the United States live on incomes below 200% of the federal poverty line (FPL) (Census Bureau 2017).<sup>3</sup> Low-income households are more likely to face high energy burdens, meaning that a larger portion of their total household income goes toward paying utility bills. ACEEE research found that for families living in large cities, the

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<sup>2</sup> In some states, the energy efficiency programs funded by utility customers are administered by a separate, designated nonutility entity. Examples include nonprofit organizations and government agencies. In the remainder of this report, when we use the term *utility* we include programs operated by nonutility administrators that are funded through utility rates.

<sup>3</sup> The 200% of FPL metric is the one most commonly used by utilities to define low-income program eligibility, but other definitions are also used. In a survey of 51 major electric utilities, about half based eligibility on household income at or below 200% of FPL. Six listed income qualifications of 60% of area or state median income. Less commonly, utilities used specific income tiers not based on state or national statistics or relied on housing characteristics or participation in other income-qualified programs. Some states, such as Arkansas, do not permit program qualification based on income.

median low-income household's energy burden was more than three times as high as that of non-low-income households: 7.2% compared with 2.3% (Drehobl and Ross 2016).

Energy efficiency is an effective tool for lowering the total energy costs faced by low-income customers. However these customers may experience significant barriers to participating in traditional residential energy efficiency programs. These barriers are numerous and have been well documented in multiple studies (e.g., Johnson 2013; Scavo et al. 2016; Kallay, Napoleon, and Chang 2016). They include:

- *High up-front costs of energy efficiency investments.* Energy efficiency programs often offer incentives designed to lower up-front costs. However a recent study of barriers to low-income household participation in California's efficiency programs reported that energy efficiency technologies still tended to be beyond the budgets of low-income customers, even taking into account the utility incentive (Scavo et al. 2016).
- *Split incentives between owners and renters.* A split incentive occurs when one party is responsible for the cost of an energy efficiency upgrade but another party receives the savings resulting from that upgrade. For example, a landlord of an individually metered multifamily building may not be motivated to invest in energy efficiency upgrades because the benefits will accrue to tenants paying utility bills. Likewise, if the landlord pays the utility bill, the tenant may not be motivated to practice energy-efficient behavior or invest in energy-efficient measures. Although the rental housing market is diverse, renters are more likely to have low incomes, making this a particularly salient barrier to participation in energy efficiency programs (JCHS 2015).
- *Lack of access to information about efficiency programs.* Information about utility programs may not effectively reach low-income customers, for example due to limited Internet access, language barriers, and limited established communication channels between utilities and low-income communities. Even in cases where information is available to households, surveys of service providers in several states have found that this information tends to be viewed with distrust unless it is delivered by the right messenger (Rocky Mountain Institute and Reos Partners 2015; Lotus 2015).
- *Aging housing stock.* Low-income customers may live in older buildings, which are more likely to have structural issues affecting health and safety. These issues can make energy efficiency upgrades unviable unless structural corrections are made first.

Increasingly, utilities are delivering specialized programs for low-income customers, designing them with these specific barriers in mind. A recent ACEEE survey of the electric and natural gas utilities serving customers in the 51 largest metro areas found that utilities in nearly all these cities offer low-income electric efficiency programs, although a smaller share (31) offer natural gas efficiency programs designed for low-income customers (Drehobl and Castro-Alvarez 2017). These programs offer low- or no-cost measures



including lighting, air sealing, and insulation. The same study found that programs pairing efficiency measures with health and safety upgrades are less common.<sup>4</sup>

While low-income efficiency programs are fairly widespread, they are serving only a small fraction of the eligible customer base. Low-income customers make up a large portion of the population in nearly every state, with individuals earning less than 200% of FPL ranging from 20% to 45% of total state populations (Census Bureau 2016). Spending on low-income programs does not reflect these demographics, however. An annual survey of electric utilities found that spending on low-income efficiency programs makes up about 17% of total efficiency spending in the residential sector and about 6–10% of efficiency spending overall (CEE 2017; Hoffman, Leventis, and Goldman 2017).

Low-income customers are not limited to participation in low-income energy efficiency programs. They can, and some do, participate in standard residential program offerings. However a meta-study of large programs in California found that low-income participation is especially limited in the standard residential efficiency programs that can provide the deepest savings, like whole-home retrofits and appliance incentives (Frank and Nowak 2015). Given the barriers outlined above, without specially designed programs, low-income residential customers are likely missing out on significant opportunities to achieve deep energy savings.

When barriers are properly addressed, there is often clear demand for efficiency programs that improve housing conditions and lower utility bills. Many, but not all, of the program implementers we interviewed for this report noted that programs are typically fully subscribed even with implementers investing in little to no marketing for their low-income programs. Participation is typically limited not by a lack of customer interest but by budget constraints.

Given these budget constraints, reaching the maximum number of customers and providing deep savings to participants require creativity, in terms of both program design and program delivery strategies. The implementers we interviewed for this report highlighted a variety of key features that have made their programs successful. These include well-developed stakeholder coordination and communication systems, streamlined contracting, targeted program design, and more. In this report, we delve into low-income energy efficiency programs that are delivering deep savings and achieving high participation, building an understanding of the keys to these programs' success. No program implementers we spoke to felt that their low-income energy efficiency programs were perfect—many highlighted the need for more resources, for example—but these successful programs nonetheless offer options and guidance for implementers trying to develop or improve low-income energy efficiency programs.

## Methodology

For this report we used both qualitative and quantitative criteria to assess low-income energy efficiency programs. Where quantitative data were available, we analyzed key

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<sup>4</sup> An ACEEE study profiling efficiency programs that offer health and safety measures is forthcoming.

metrics, including program participation and reported savings. However our data set was limited, especially in terms of participation numbers, and an approach that relied only on available quantitative data would have artificially narrowed our scope. Therefore we also relied on qualitative screening to help us better understand programs that are viewed as high performing by those in the field but may not be included in existing data sets.

To identify successful low-income programs, we turned first to data from the ACEEE paper *Low-Income Energy Efficiency Programs: A Baseline Assessment of Programs in the 51 Largest Cities* (Drehobl and Castro-Alvarez 2017). This data set contains a wide range of information on programs funded by electric and gas utilities serving the majority of customers in large cities, including spending, savings, and participation data. The data set also features information on the specific program designs offered by these utilities. To this data set we added the utilities included in ACEEE's *2017 Utility Energy Efficiency Scorecard* (Relf, Baatz, and Nowak 2017). The *Utility Scorecard* profiled the 51 largest electric utilities by retail sales volume; about half of these were absent from the *Baseline Assessment*. The data here were more limited, and we supplemented spending, savings, and revenue information with participation data reported in utility energy efficiency reports, where possible. Combined, the data from these two reports covered 70 utilities and efficiency program administrators delivering low-income electric efficiency programs and 46 utilities delivering low-income natural gas efficiency programs.<sup>5</sup>

We also conducted interviews with a set of industry experts knowledgeable in low-income energy efficiency program delivery. We asked them to identify the programs they considered to be top performers. Several of the programs they cited were not included in our original data set but were added on the basis of our interviews. We also wished to reflect a wide range of utility types. Since most of our data represented large utilities serving urban population centers, we sought out utility programs serving low-income customers in rural areas.

We used several program screens (described in the sections that follow) to identify the top performers in our data set. We then conducted interviews with implementers of these top performers to better understand the program design and the elements that contributed to the program's success.

### **SELECTION OF HIGH PERFORMERS**

We assessed high performers using four screens. The experts we interviewed suggested several lenses through which a program could be judged successful, but all pointed to some combination of high participation and deep savings. Often, utilities prioritize one of these factors at the expense of the other. We wanted to identify utilities that were successful on both counts. Therefore our screens included:

- *Maximizing participation.* This screen ranked utilities and program administrators on the basis of the number of participants compared with total estimated low-income customers. Low-income customers were estimated using residential customer data

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<sup>5</sup> We give a complete list of these utilities in Appendix A.

from the Energy Information Administration (EIA) and state-level data on income from the US Census.<sup>6</sup>

- *Delivering deep savings to participants.* This screen ranked utilities on the basis of kilowatt-hour (kWh) or therm savings per program participant.

Since many programs did not report participation data, we wanted a way to compare performance across the entire sample. We therefore included a third screen that looked at savings across the entire estimated low-income customer base:

- *Maximizing low-income savings across customer base.* This screen ranked utilities according to total incremental savings achieved by low-income programs divided across all low-income customers, not just participants. Low-income customers were estimated using residential customer data from EIA and state-level data on income from the Census.

We also recognized that our data were limited and that smaller utilities, particularly those serving smaller cities and rural areas, may have been overlooked. We therefore relied on our interviewed experts for a fourth screen:

- *Widely regarded as a best-practice program.* For this screen, we relied on the experts to guide us toward programs that were not included in our original data set, either because they were being implemented by smaller utilities or because they were statewide approaches that leveraged ratepayer funds but were not implemented by a utility included in our data set.<sup>7</sup>

## **DATA LIMITATIONS**

The data presented in this report are not meant to reflect a comprehensive assessment of all high-performing low-income energy efficiency programs. Rather, we consider the programs in this report to be illustrative and to serve as examples of best practices. We started from a base of available data, and therefore it is likely that some utilities delivering strong programs were not included in the screening we describe below.

We also relied heavily on participation data, which many utilities do not report. If participation data were not available through public reports or provided through ACEEE surveys, we were not able to include those utilities in some of the screening we used to identify successful programs. The participation data that were available to us were also

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<sup>6</sup> Note that utility eligibility criteria for low-income programs vary. Our use of 200% of FPL as a proxy for the low-income population does not necessarily reflect the portion of the population eligible for low-income programs offered by all utilities. Furthermore, these proportions reflect the state as a whole rather than a specific utility service territory. It should also be noted that this methodology varies somewhat from Drehobl and Castro-Alvarez (2017), which estimated low-income customers using Metropolitan Statistical Area data for municipal utilities.

<sup>7</sup> Some statewide administrators were included in our data set where they provided efficiency services on behalf of utilities serving large cities. Drehobl and Castro-Alvarez (2017) report these results by utility service territory, which we leveraged for our analysis. We report statewide data for some administrators in Appendix B.

somewhat opaque. Often utilities reported participation at the household level. However in some cases, especially for programs that included multifamily buildings, it is possible that participant counts represent building owners rather than individual units.

The utilities we examined for this report also set eligibility criteria in different ways. For example, 23 of the utilities included in our sample considered customers to qualify if they had incomes at or below 200% of FPL.<sup>8</sup> Four programs set maximum household income limits, such as \$40,000 or \$50,000 annually. Eleven utilities tied eligibility to state or neighborhood median income, and others adopted the eligibility requirements for WAP or other federal financial assistance. Both electric and gas utilities showed similar variation in eligibility criteria. We did not attempt to adjust participation or savings counts on the basis of these criteria.

Given the data limitations, we do not intend to suggest that we have identified the very best programs in the nation. Rather, we seek to highlight some successful programs and identify effective strategies that could be used by other program administrators.

## Findings

The section below lists the results of our three quantitative screens and one qualitative screen. In total, we reviewed low-income program data of 70 electric utilities (or the efficiency program implementers that serve the customers of those utilities) and 46 gas utilities. However not all these utilities provided all data points. In such cases, we did not include those programs in all of our quantitative screens but did consider them if experts referred to them during our interviews for the qualitative screen.

### ***BROAD PARTICIPATION***

Our assessment of participation covered only those programs whose administrators could report participant counts. Participation in low-income electric efficiency programs is shown in table 1, normalized by estimated low-income customers within the utility service territory. Of the 70 electric utilities included in our survey, 47 reported participant counts.

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<sup>8</sup> Several of the utilities included in this count have several pathways for eligibility. For example, customers of one utility can qualify if they have income levels below 200% of FPL or 50% of the state median income.

**Table 1. Electric utilities with the highest participation as a proportion of low-income customer base**

Electric utility	State	2015 low-income customers served	Participants as % of LI customers	Broad participation rank
National Grid	RI	10,500	8.17%	1
PG&E	CA	100,573	6.12%	2
DTE Energy	MI	39,675	6.01%	3
National Grid	MA	16,807	5.98%	4
Eversource	MA	14,120	5.42%	5

Our assessment includes only utilities that reported participant counts. We also did not include utilities that counted home energy report recipients as participants, since participation in this type of program is not commensurate with that of other programs.

The five utilities listed in table 1 achieved participation rates exceeding 5% of eligible customers in 2015. Some electric utilities reported much higher participation rates. For example, both Duquesne and PPL offer home energy reports to their low-income customers and include these households in their participant counts, bringing participation rates for these utilities to over 20%. However because home energy reports require customers to opt out rather than opt in, participation in this program is fundamentally different from participation in other types of energy efficiency programs. For this reason, we excluded these utilities from our participation analysis. For our sample overall, the median participation rate for low-income electric efficiency programs was about 1% of the estimated low-income population, meaning only a small portion of low-income residents receive these targeted efficiency services.

Several gas utility low-income efficiency programs that we reviewed also achieved high participation rates, with utilities in Michigan and Connecticut reaching more than 10% of eligible customers. For our sample overall, the median participation rate for low-income natural gas efficiency programs was below 1% of the estimated low-income population in the utilities' service territories. Table 2 shows natural gas utilities with high participation in low-income energy efficiency programs. Of 46 natural gas efficiency program administrators, 22 reported participant counts.

**Table 2. Natural gas utilities with the highest participation as a proportion of low-income customer base**

Natural gas utility	State	2015 low-income customers served	Participants as % of LI customers	Broad participation rank
Connecticut Natural Gas	CT	4,036	11.27%	1
DTE Energy	MI	39,675	10.25%	2
San Diego Gas & Electric	CA	20,209	6.22%	3
National Grid	RI	3,300	4.72%	4
SoCal Gas	CA	80,316	4.25%	5

Our assessment includes only utilities that reported participant counts.

Many of the program implementers we spoke to noted that participation in low-income energy efficiency programs is a direct function of program budgets. The largest constraint faced by program administrators tends to be funding. Those that can spend more dollars typically are able to reach more participants. The data included in our sample support this anecdotal evidence. Program administrators ranked high for participation also ranked high for spending (normalized by the number of low-income customers in their service territory). However the spending data we collected focused on utility ratepayer funding. Since these programs tend to leverage other funding sources as well, it is difficult to get a complete picture of how funding may influence participation. We discuss the relationship between program spending and participation in more depth later in this report.

Participation rates are likely also impacted by the additional hurdles program administrators face in identifying and recruiting low-income customers to participate in energy efficiency programs relative to their market-rate efficiency programs. For example, language barriers, time constraints, and hostile relationships with utilities may prevent some customers from participating (Cluett, Amann, and Ou 2016; Kallay, Napoleon, and Chang 2016). Research has shown that low-income customers tend to be less aware of efficiency programs than non-low-income customers (Opower 2014). Multifamily programs face some additional barriers to participation, ranging from split incentives between landlords and tenants to scenarios with multiple decision makers including property managers, building owners, and maintenance staff (Ross, Jarrett, and York 2016; Johnson 2013).

Low-income program implementers address these barriers not only through their marketing and outreach strategies, but also through core elements of program design. For example, they may align program enrollment with other income-qualified services, such as the Low-Income Home Energy Assistance Program (LIHEAP) or rental assistance. Ultimately, both smart design and availability of resources are important for ensuring low-income programs reach the maximum number of qualified participants.

### **DEEP SAVINGS FOR PARTICIPANTS**

Electric savings per program participant for the highest-performing utilities included in our sample are shown in table 3. As with our first screen, only program administrators that provided participant data were included in this piece of our analysis. We also eliminated

some data points where participation was reported for entire multifamily buildings as opposed to individual households since these were not comparable.

**Table 3. Utilities saving the most electricity per program participant**

Electric utility	State	2015 low-income program savings (MWh)	2015 low-income customers served	Savings per program participant (kWh)	Deep savings rank
Entergy New Orleans	LA	1,335	220	6,066	1
Oncor	TX	23,044	4,669	4,935	2
CenterPoint Energy	TX	3,843	1,023	3,756	3
AEP TX	TX	6,026	1,745	3,453	4
CPS Energy (City of San Antonio)	TX	13,759	4,051	3,396	5

Even among the top five utilities, savings per participant varied widely, from about 3,400 kWh to more than 6,000 kWh per participant (about three to six times the monthly electric usage for households in Louisiana and Texas). Median savings per participant for the utilities included in our sample was 1,040 kWh.

All the programs rising to the top in this category offer a mix of measures to low-income customers, including insulation and air sealing. Several of these programs point to high-performing contractors as factors in their success. For example, Entergy New Orleans limited delivery of its Assisted Home Performance with ENERGY STAR Program to the two top-performing contractors from the utility's Residential Solutions Programs, writing that "the success of the program was due to the collaborative effort with program staff and top contractors working together (Entergy New Orleans 2016)."

It is also noteworthy that there is little regional diversity among the high performers in our sample. This suggests that additional variables, such as weather patterns (i.e., hot climates) or housing stock characteristics, may also be a factor driving deep savings. Notably, the South Census region, which includes both Texas and Louisiana, is the only region where electricity is the fuel most commonly used for heating, meaning there are likely more electric efficiency measures available to program implementers than there are in other regions of the country (EIA 2017).<sup>9</sup>

Gas savings per program participant for the top five utilities included in our sample are shown in table 4. Savings per participant for these utilities ranged from about 200 therms to more than 300 therms. Median savings per participant for the total sample was just over 120 therms.

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<sup>9</sup> In the other three census regions, natural gas is most commonly used for heating homes.

**Table 4. Utilities saving the most natural gas per program participant**

Natural gas utility	State	2015 low-income program savings (MMtherms)	2015 low-income customers served	Savings per program participant (therms)	Deep savings rank
Columbia Gas of Ohio (Nisource)	OH	0.66	2,085	316	1
Oklahoma Natural Gas Co.	OK	0.09	311	289	2
NW Natural	OR	0.05	231	216	3
We Energies/Focus on Energy	WI	0.78	3,748	208	4
CenterPoint Energy	MN	0.37	1,799	205	5

Many of the experts we spoke with noted that delivering deep savings to participants is crucial for successful programs. Several also cited federal WAP rules as a driver for maximizing savings for program participants. These rules typically prevent providers from offering efficiency services to a household more than once (United States Electronic Code of Federal Regulations Title 10 §440).<sup>10</sup> Therefore program implementers focus on delivering as many measures as possible during a single visit.

As with electric efficiency programs, high-performing efficiency efforts for low-income natural gas customers tend to include a mix of measures, emphasizing HVAC tune-ups, insulation, and water heater upgrades. Four of the five highest performers also focus on water efficiency measures, and three offer health and safety upgrades in addition to efficiency measures.

Natural gas low-income efficiency programs achieving deep savings for program participants are more varied geographically than electric programs are, but most of the top performers are located in regions with cooler climates. These regional patterns reflect greater heating load and therefore greater gas use in colder northern climates.

### **MAXIMIZING SAVINGS FOR CUSTOMER BASE**

Table 5 shows average electric savings achieved per low-income customer (as opposed to savings per participant) for the top five utilities. This third screen, for which we normalize the total savings achieved in the low-income sector by our calculated estimate of low-income customers in each utility's service territory, allows us to understand how much energy efficiency is being delivered to the low-income sector as a whole.

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<sup>10</sup> In order for a home to be re-weatherized with federal funds, services originally provided must have been rendered prior to September 30, 1994. If WAP has touched the home since that date, the home is not eligible for weatherization using federal funds. However agencies can and occasionally do provide services using other funding sources, primarily to replace appliances with utility funding or HVAC with utility or LIHEAP funds.



**Table 5. Electric utilities achieving high savings per low-income customer**

Electric utility	State	2015 low-income program savings (MWh)	Savings per LI customer (kWh)	Savings per LI customer rank
Eversource	MA	23,490	90.1	1
National Grid	MA	21,850	77.8	2
Seattle City Light	WA	5,907	65.1	3
CPS Energy	TX	13,759	56.1	4
Eversource	CT	14,098	54.9	5

Average electric savings per low-income customer ranged from 54.9 kWh to 90.1kWh (about 6–10% of the average household’s monthly electricity usage) for the top five utilities in our sample. Taken together, median electric savings per low-income customer for the 70 utilities we reviewed was about 10 kWh per customer.

Table 6 shows average natural gas savings per low-income customer for the top five utilities in our sample. While 25 utilities in our sample reported spending on natural gas efficiency programs for low-income customers, only 19 reported savings data associated with these programs. Median savings per customer across the entire sample was about 1.6 therms, with Connecticut Natural Gas achieving more than double the savings achieved by the second-highest performer in this category.

**Table 6. Natural gas utilities achieving high savings per low-income customer**

Natural gas utility	State	2015 low-income program savings (MMtherms)	Savings per LI customer (therms)	Savings per LI customer rank
Connecticut Natural Gas	CT	0.45	12.61	1
We Energies/Focus on Energy	WI	0.78	6.19	2
ConEdison	NY	1.54	5.14	3
Philadelphia Gas Works	PA	0.65	5.11	4
Washington Gas/DC SEU	DC	0.23	5.09	5

Successfully delivering energy efficiency programs to customers depends both on maximizing program participation and ensuring that each project delivers the greatest possible savings. Therefore, looking only at participation data or only at savings per participant may not paint the full picture of the energy savings achieved in the low-income sector. The metric of savings per low-income customer gives a better sense of how well the utility’s low-income energy efficiency effort is serving its low-income customer base as a whole. It also allows assessment of a larger group of utilities, since many of the utilities in

our sample did not report participation data and were therefore excluded from both the deep savings per participant screen and the broad participation screen.

### **QUALITATIVE SCREEN: EXPERT INTERVIEWS**

Recognizing that data limitations may have caused us to overlook several programs implementing best practice approaches, for our fourth screen we relied on interviews with experts. These interviews pointed us toward utilities not captured in our screens above for a variety of reasons. For example, some statewide approaches may not have been picked up in our data set, especially if the utilities in the state serve smaller sets of customers in less populous areas or if utilities did not report participation.

In general, these experts pointed toward statewide approaches. California, Massachusetts, Vermont, and Wisconsin were all named by multiple experts. While Vermont and Wisconsin deliver programs through a statewide administrator, Massachusetts utilities rely on a well-coordinated network of community action agencies to deliver programs. We have profiled these efforts in Appendix B.

We also asked our experts specifically to identify programs serving low-income households in rural areas and small towns. One out of every ten households in the United States is located in a rural area. These households typically use slightly more energy and have fewer options when it comes to the technologies and energy sources available to them (Muratori 2013). The utilities that serve these customers also face unique challenges in delivering energy efficiency. Many rural utilities are smaller and have less funding available for energy efficiency. Their customers may live farther from one another and in more remote locations, creating challenges both for informing customers about relevant programs and getting contractors to isolated communities.

Data on energy efficiency programs offered by rural cooperatives are limited, making it difficult to do a data-driven screening of these programs. However the experts we interviewed mentioned several utilities they believed to be delivering exemplary low-income energy efficiency programs. These included Ouachita Electric Cooperative's HELP PAYS program and Roanoke Electric Cooperative's Upgrade to \$ave program, both of which follow the pay-as-you-save (PAYS) model. Although there are no income qualifications for participation in these programs, and utilities do not collect or report participants' income demographics, the PAYS model features elements that address barriers typically faced by low-income customers. For example, there are no up-front costs, and the programs are designed to be cash-flow positive. Utilities offer customers energy efficiency upgrades without requiring any initial payments, then place a fixed charge, designed to be less than the estimated savings generated by the efficiency measures, on the customer's monthly bill. A profile of Ouachita Electric Cooperative's HELP PAYS program is included in Appendix B.

### **SUMMARY OF HIGH-PERFORMING PROGRAMS**

Our screens presented a range of high-performing programs. Several of these utilities and program administrators ranked high for more than one screen, but it was most common for a low-income effort to excel in one area. Furthermore, there were several programs that did not make the top five in any particular category but showed strong performance across

multiple screens. Table 7, below, lists these programs with a ○ symbol. Programs appearing in the top five in a category are marked with a ● symbol. We elaborate on the key features of these programs below.

**Table 7. Summary of utilities and program administrators with notable low-income energy efficiency efforts**

Utility	State	High-performance category				Key features
		Broad participation	Deep savings	Savings across base	Recognized by experts	
AEP TX	TX		●			Focus on hard-to-reach customers
CenterPoint Energy*	MN	○	●	○		Market segmentation, health and safety focus
CenterPoint Energy	TX		●			Marketing partnerships with nonprofits, comprehensive whole-home focus
Columbia Gas of Ohio*	OH		●			High-usage focus, health and safety measures, single point of contact, coordination with weatherization services
ConEdison/NYSERDA*	NY	○	○	●		Comprehensive measures, state policy guidance, fuel neutrality, portfolio cost effectiveness
Connecticut Natural Gas*	CT	●		●		Single point of contact, streamlined delivery process, partnerships to address health and safety
CPS Energy	TX		○	●		Multilingual communication, partnership with other low-income services
DTE Energy*	MI	●		○		Strong partnerships, supportive state policy, special services for hard-to-reach customers
Efficiency Vermont*	VT				●	Strong coordination with weatherization agencies, focus on hard-to-reach and high-use customers
Entergy New Orleans	LA		●			Contractor-led outreach; focus on air sealing, duct sealing, and attic insulation
Eversource*	CT	○		●		Single point of contact, streamlined delivery process, partnerships to address health and safety
Eversource*	MA	○		●	●	State policy guidance, fuel-blindness, multiple funding sources, comprehensive quality control and training, stakeholder coordination
First Energy	OH	○		○		Statewide stakeholder coordination, partnership with community action agencies
Louisville Gas & Electric	KY		○			Streamlined program across multiple service territories, dual-fuel focus
National Grid	RI	●	○	○		Collaboration with state agencies, focus on training and regular stakeholder meetings, statewide operations manual

Utility	State	High-performance category				Key features
		Broad participation	Deep savings	Savings across base	Recognized by experts	
NW Natural	OR		•			State-facilitated delivery, multiple funding streams
Oklahoma Natural Gas	OK		•			Coordination with electric utility, single trusted contractor
Oncor*	TX		•			Prioritization of measures, strong ally network
Ouachita EMC*	AR				•	Broad eligibility, comprehensive quality control and training
PG&E*	CA	•			•	Portfolio of low-income programs, statewide coordination
Philadelphia Gas Works	PA	○	○	•		Streamlined participation with payment assistance program, competitive contractors
San Diego Gas & Electric	CA	•			•	Statewide coordination; dual-fuel program; financing, health and safety, and behavioral components
Seattle City Light	WA			•		Supportive local policy, coordination with state agencies, portfolio of measures
SoCal Gas	CA	•				Streamlined eligibility, market segmentation and targeted program delivery, statewide coordination
Washington Gas (DCSEU)	DC			•		Portfolio of low-income programs, combined solar-efficiency efforts
We Energies/ Focus on Energy*	WI	○	•	•	•	Integrated marketing, multiple funding sources, broad eligibility, portfolio cost effectiveness
Xcel*	CO	○		○		Multiple funding sources, relaxed cost effectiveness, comprehensive project assessments

\* Profiled in Appendix B. In some cases, these programs are delivered by a third-party administrator.

## Successful Program Strategies

Through our screens, we identified a group of utilities and program implementers achieving high participation, deep savings, or both. Through interviews with these program implementers, we pinpointed a variety of strategies that they credit as the keys to their success. We briefly describe these strategies here and offer overviews of many of these programs in Appendix B.

*Statewide coordination.* Many of the successful programs we identified have formalized a statewide approach, either through regular coordination of various implementers and other key stakeholders to ensure that programs are consistent and equivalent, or through a single, statewide program implementer. *Examples:* Massachusetts utilities and the Low-Income

Energy Affordability Network (LEAN), Ohio utilities and the Home Weatherization Assistance Program (HWAP) Policy Advisory Committee, and Energy Outreach Colorado.

*Single point of contact for customers and for contractors.* Several program implementers we spoke to stressed that simplifying program design and administration is critical to success. Some programs work with only a single contractor, simplifying communication and ensuring a strong relationship between contractor and utility. Others noted that simplifying customer-facing communication is key. Even if these utilities offer several low-income programs, customers are directed to a single point of contact who helps coordinate services. *Examples:* United Illuminating Home Energy Solutions—Income Eligible program, Columbia Gas of Ohio, Oklahoma Gas & Electric, and Oklahoma Natural Gas.

*Market segmentation and targeted program offerings.* Several of the utilities and program implementers we spoke to offered a portfolio of low-income energy efficiency programs focusing on different types of customers, including high energy users, elderly customers, renters, and multifamily building owners. This segmentation informed marketing and communication strategies, enabling program implementers to get information about efficiency programs more effectively into the hands of their target markets. *Examples:* Centerpoint Minnesota, Pacific Gas & Electric, Efficiency Vermont.

*Emphasis on quality control and training.* Many of the program implementers we spoke to noted that ongoing training for contractors and quality control professionals is critical and said they devote project funding specifically to regular trainings. Several program administrators also have strict quality control requirements for all projects rather than a sample, which helps incentivize contractors to perform high-quality work. *Examples:* Massachusetts LEAN and Ouachita Electric Cooperative HELP PAYS.

*Leveraging of diverse funding sources to focus on comprehensive dual-fuel or fuel-neutral upgrades including health and safety measures.* Many of the programs we reviewed for this analysis combine funding from several sources to address a comprehensive set of measures at each project site that might not be feasible with only a single funding source. This includes combining funding from both electric and gas utilities to address multiple end uses. Program implementers also leverage federal weatherization dollars and other state or local dollars to maximize flexibility in dealing with non-cost-effective structural issues. In some cases, efficiency upgrades may not be possible unless structural problems like roof leaks are first eliminated. Rather than disqualifying homes and buildings with structural issues as potential program participants, many utilities and program implementers carefully combine funding streams to provide health and safety services. *Examples:* Columbia Gas of Ohio WarmChoice, Connecticut Home Energy Solutions (income-qualified track), and Massachusetts LEAN.

*Accommodation of health and safety measures through program design and relaxed cost-effectiveness requirements.* At times, low-income efficiency providers may not be able to address efficiency-related issues without first eliminating health and safety problems like asbestos or structural flaws. Some utilities address these issues by delivering stand-alone weatherization and health and safety projects for customers using different funding streams. Others have formed partnerships with community groups and public health institutions, coordinating to address health issues in advance of energy efficiency projects.

Several of the utilities we spoke to also relax the cost-effectiveness rules that guide market-rate program delivery in order to address the health and safety components often associated with low-income programs. *Examples:* CenterPoint Energy, Connecticut Home Energy Solutions—Income Qualified Track, and Energy Outreach Colorado.

*Prioritizing measures achieving deep savings.* The utilities we reviewed often deliver programs through a trusted contractor network. To ensure that contractors focus on deep savings rather than limit projects to direct-install measures, these utilities have designed contractor incentives that are savings based or are larger for deep-savings measures than for direct-install measures. *Example:* Oncor.

*Formation of partnerships to market and deliver services to hard-to-reach customers.* To extend the reach of program marketing and delivery, many of the utilities we surveyed noted that they have formed partnerships with food banks, health organizations, and nonprofits like Habitat for Humanity. These agencies and organizations can then help their clients receive energy efficiency services while ensuring that other critical needs are also met. Partnerships also have helped utilities reach key communities that might otherwise be hard to reach. *Example:* DTE Energy.

Most of the successful programs we examined for this report rely on more than one strategy to deliver strong programs to low-income customers. See Appendix B for more information on the success strategies used by a variety of programs.

## Discussion

### **BALANCING HIGH PARTICIPATION AND DEEP SAVINGS**

As we outlined above, program implementers often base their program design and outreach strategy on one of two approaches: maximizing participation or delivering deep savings to each program participant. Resources for these programs are typically the limiting factor, and program implementers must take care in deciding how to allocate these funds. In some cases, utilities and program implementers choose to spread efficiency spending thinly over a large number of participants, ensuring that as many low-income customers as possible are served in a given year. In other cases, program implementers prioritize making the biggest impact possible in each household they enter. That means investing a greater portion of total program funding in each household. Though these programs may be delivering efficiency services to fewer customers, those who do get upgrades and weatherization are likely to receive more measures that achieve larger savings. Many of the program implementers we spoke to recognized this trade-off. Some utilities and program implementers have addressed the issue by including both low-cost direct-install measures and deep retrofit programs in their low-income energy efficiency portfolio. Others have prioritized either participation or deep-savings opportunities.

The data in our sample bear out this trade-off somewhat. Figure 1 shows an inverse relationship between participation rates and savings per customer. In other words, utilities in our sample that delivered deeper savings to individual participants were associated with lower overall participation rates. However the correlation between savings and participation was extremely low for the electric utilities sampled ( $R^2 < 0.01$ ), suggesting that some utilities have found ways to achieve both high savings and high participation. The negative correlation between deep savings and broad participation was somewhat stronger for natural gas utilities ( $R^2 = 0.16$ ).

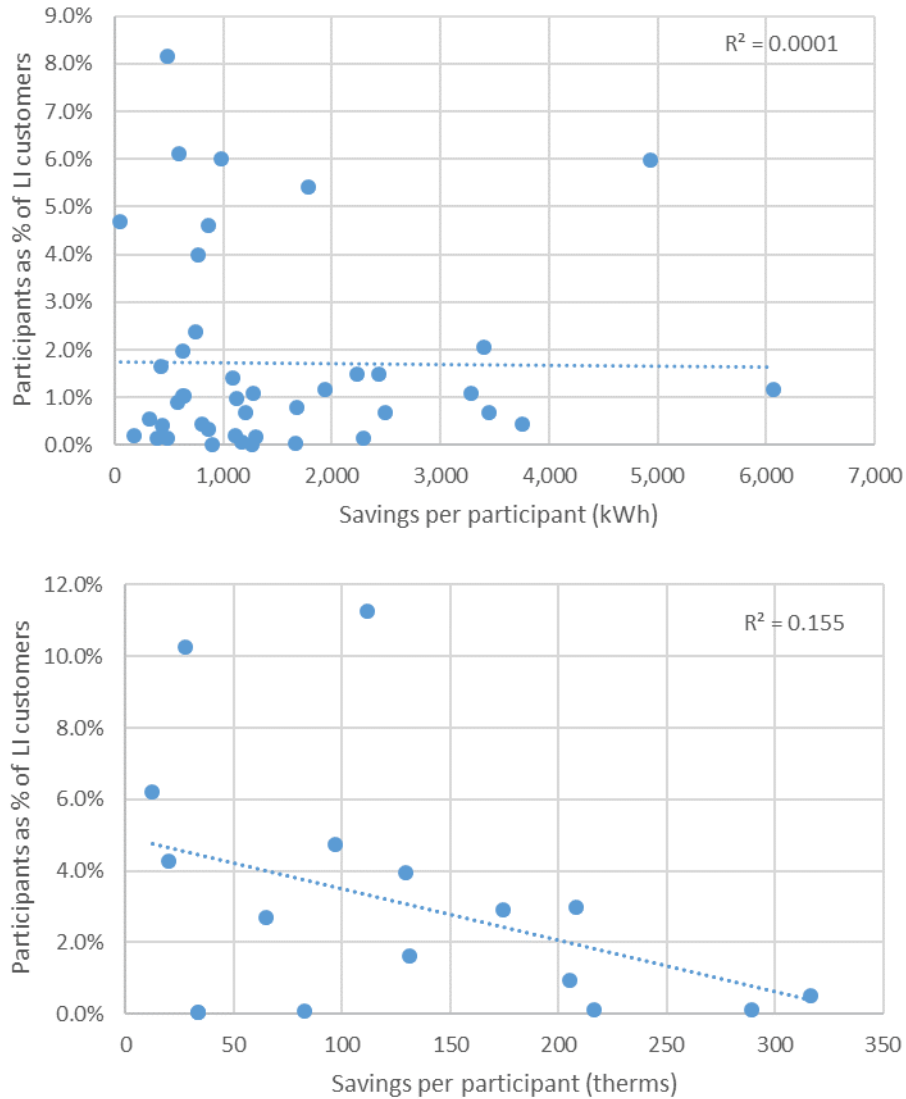


Figure 1. Correlation between participation rates and savings per participant for electric (top) and natural gas (bottom) utilities. Only utilities reporting participation data are included.

The data also show that maximizing participation can increase overall savings delivered to the sector. As figure 2 shows, both electric and natural gas low-income efficiency programs showed a relatively strong correlation between participation and total savings ( $R^2=0.18$  and  $R^2=0.55$ , respectively).

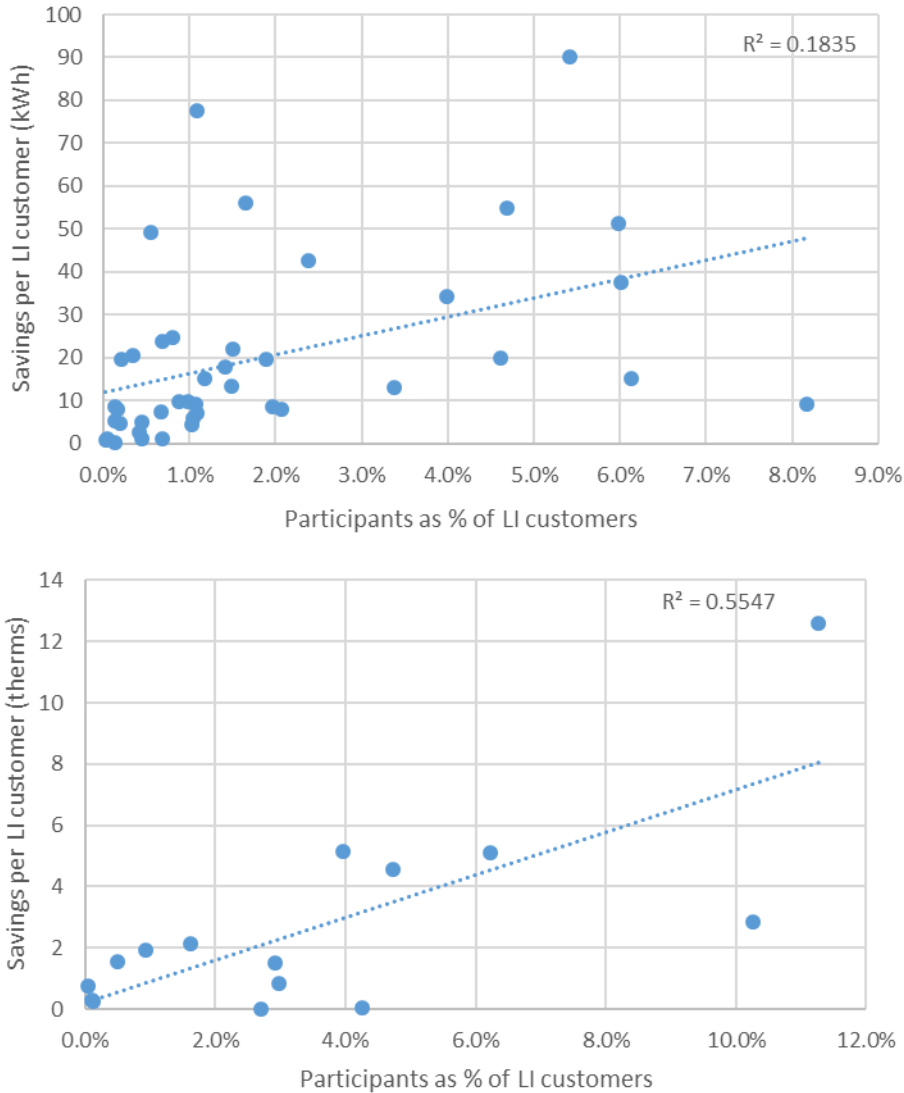


Figure 2. Correlation between participation rates and savings per low-income customer for electric (top) and natural gas (bottom) utilities. Only utilities reporting participation data are included.

As figure 3 shows, the relationship between savings per participant and the overall savings achieved in the low-income sector is less clear. There is almost no correlation between the two factors for electric utilities included in our sample ( $R^2=0.03$ ). The same is true for natural gas programs ( $R^2=0.02$ ). This could suggest that driving participation is more effective than pursuing deep savings as a way to deliver higher overall savings levels to the low-income sector overall. However confounding variables like relative spending on low-income programs likely also play a role. More data and exploration would be useful to flesh out this correlation.



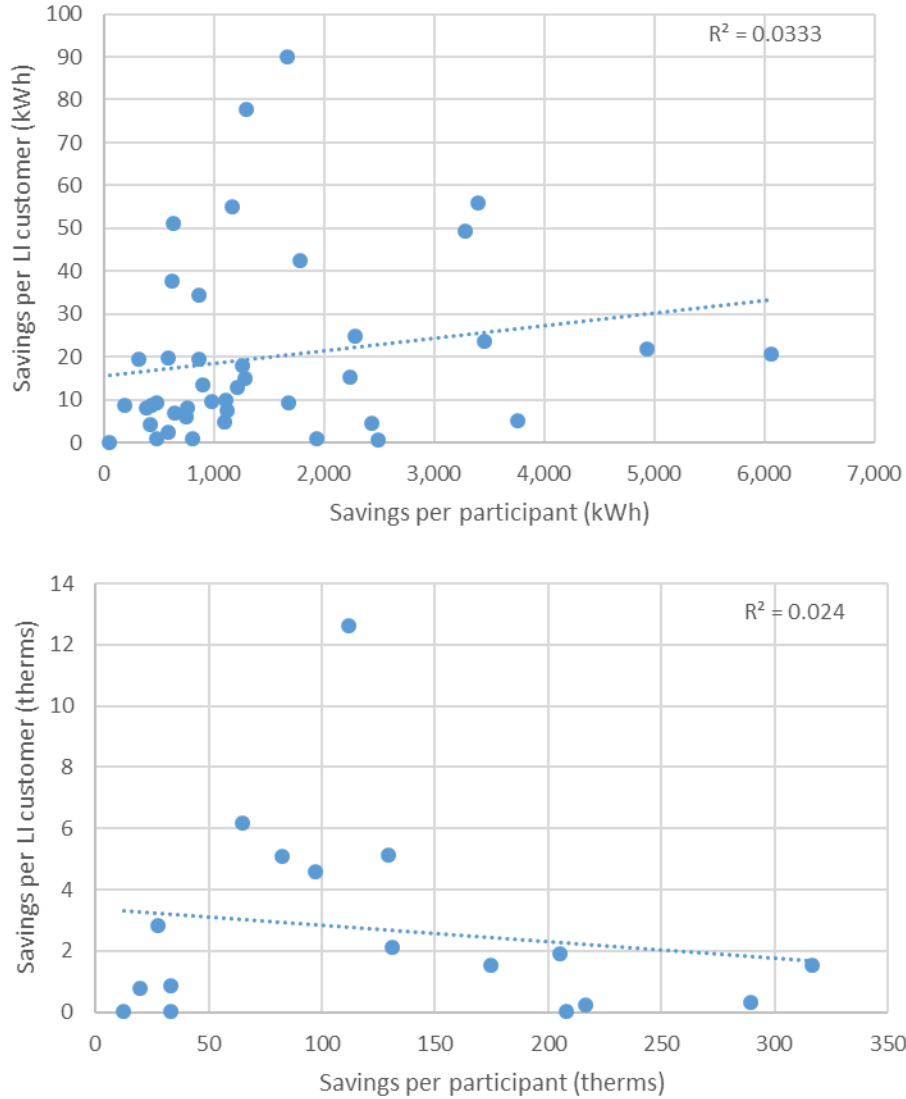


Figure 3. Correlation between savings per low-income customer and savings per participant for electric and natural gas utilities. Only utilities reporting participation data are included.

***THE IMPACT OF FUNDING ON SUCCESS METRICS***

Our limited snapshot of ratepayer dollars indicates that devoting funds to low-income programs is important for reaching more customers. As figure 4 shows, utilities that spend more money on their low-income customer base also tend to achieve higher savings for these customers.

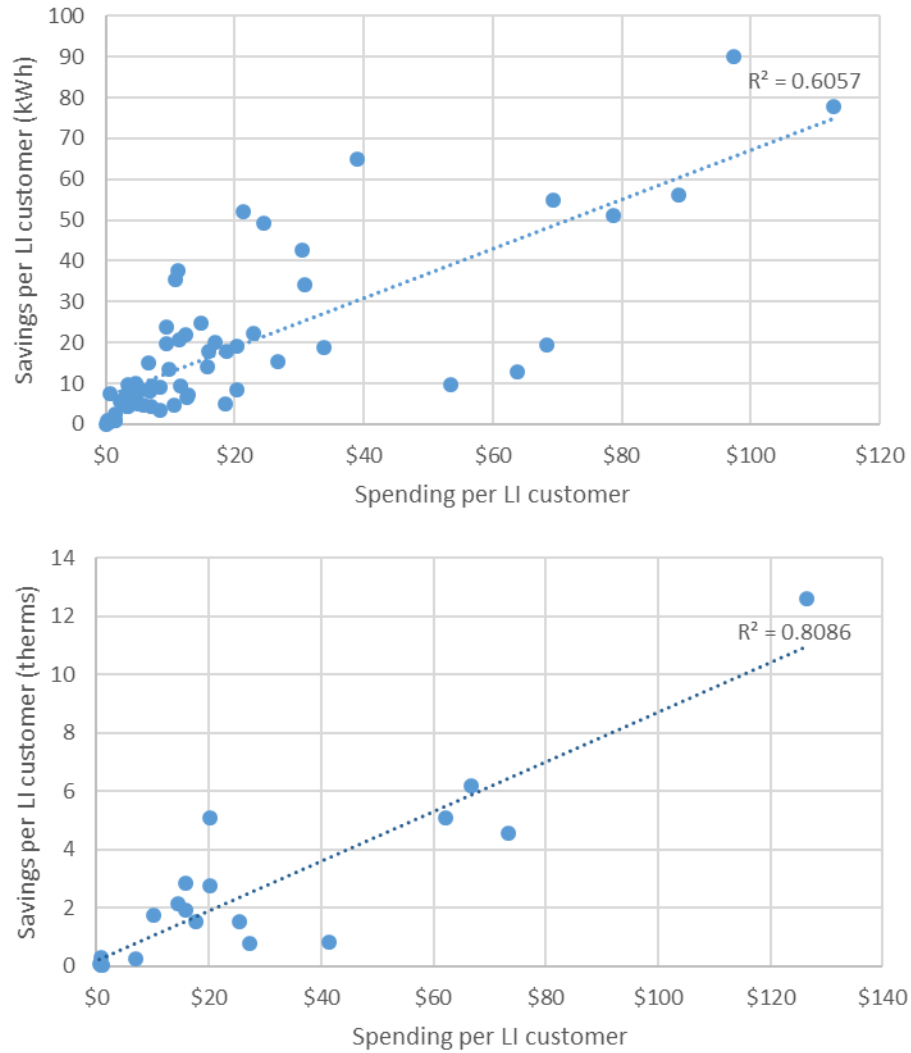


Figure 4. Correlation between spending and savings per low-income customer for electric and natural gas utilities.

The correlation between spending and savings is extremely strong, both for electric programs ( $R^2 = 0.61$ ) and for gas programs ( $R^2 = 0.81$ ). This trend indicates that pushing more dollars into these programs is likely to result in higher energy savings. Program administrators we spoke to expressed confidence that they would reach more customers if they had larger budgets, even without significant additional expenditures for marketing and outreach.

**STATE POLICIES AND STATE AGENCY COORDINATION**

State policies guiding the delivery of ratepayer-funded low-income energy efficiency programs spur the initial development of such programs and facilitate their success. We asked managers of the exemplary programs profiled in this report what state policies, if any, supported their programs’ success. From their responses we concluded that supportive policies tend to fall into two major categories: requirements for offering or funding programs, and cost-effectiveness rules. Interagency coordination also plays a role in

program success, streamlining ratepayer-funded low-income programs by integrating them with WAP services. Program implementers we spoke to also pointed to other state policies, such as energy savings targets, as drivers of program success. Supportive policies are listed in table 8 and described further below.

**Table 8. State policies supportive of high-performing low-income programs by state**

State	Requirements for minimum level of state or utility support of low-income energy efficiency programs	Special cost-effectiveness provisions for low-income energy efficiency programs	Coordination of funding, administration, or implementation between utility and WAP programs	Other state-specific policies supporting low-income programs
Arkansas*	No	Yes <sup>e</sup>	Yes	Yes
California	Yes <sup>c</sup>	Yes <sup>f</sup>	Yes	Yes
Colorado	No	Yes <sup>g</sup>	Yes	No
Connecticut	Yes <sup>a,c</sup>	Yes <sup>e</sup>	Yes	Yes
Massachusetts	Yes <sup>a</sup>	Yes <sup>d</sup>	Yes	Yes
Michigan	Yes <sup>a</sup>	Yes <sup>e</sup>	Yes	No
Minnesota	Yes <sup>a</sup>	Yes <sup>e</sup>	Yes	Yes
New York	Yes <sup>a</sup>	Yes <sup>e</sup>	Yes	Yes
Ohio	No	Yes <sup>e</sup>	Yes	Yes
Oklahoma	Yes <sup>a</sup>	Yes <sup>f</sup>	No	Yes
Pennsylvania	Yes <sup>b,c</sup>	Yes <sup>e</sup>	No	No
Vermont	Yes <sup>a</sup>	Yes <sup>f</sup>	Yes	Yes
Wisconsin	Yes <sup>a</sup>	Yes <sup>e</sup>	No	Yes

\* Arkansas does not allow utilities to base program qualification on income explicitly, but utilities reach low-income customers through programs designed for customers who are “hard to reach.” <sup>a</sup> A required level of spending on low-income energy efficiency has been established. <sup>b</sup> A required savings goal for low-income energy efficiency has been established. <sup>c</sup> A customer participation goal has been established. <sup>d</sup> Quantifiable low-income nonenergy benefits (NEBs) are included in cost-benefit calculations. <sup>e</sup> Low-income programs are not required to, or are exempted from, passing cost-effectiveness test. <sup>f</sup> Cost-effectiveness threshold has been lowered to accommodate low-income programs. <sup>g</sup> Multiplicative adder is applied to approximate low-income NEBs. *Source:* Berg et al. 2017.

Utilities are often required by state law to offer a low-income program or to spend at least a minimum amount or portion of their budget on low-income energy efficiency. For example, Efficiency Vermont was required to spend at least \$10.5 million on low-income programs during the most recent three-year planning period. Michigan, meanwhile, requires low-income programs to be funded by all utility customers in an amount proportionate to the customer’s funding of the total energy efficiency portfolio. State laws creating public benefits funds with ratepayer dollars are a common source of funding. Wisconsin and New York, among many other states, have funded low-income energy efficiency programs this way for many years.

State policy directives may also be necessary to help utilities overcome the higher costs associated with delivery of low-income energy efficiency programs. These programs tend to be more expensive because low-income customers typically have no discretionary money to pay for a portion of energy efficiency measures, so the program must pay the full cost. In addition, low-income homes often need other repairs or safety upgrades before certain efficiency measures can be installed. For these reasons, low-income programs may not pass standard cost-effectiveness tests based strictly on energy savings per dollar spent. Many states have accounted for the additional benefits of low-income programs by adopting special provisions regarding their cost effectiveness.<sup>11</sup> Several of the managers of top-performing low-income programs cited relaxed—or eliminated—cost-effectiveness requirements as state policies that have contributed to their programs' high energy-savings performance.

In Minnesota, homes served by CenterPoint Energy's ratepayer-funded low-income natural gas programs are not required to meet the savings-to-investment ratio (SIR) that federally funded weatherization programs must meet.<sup>12</sup> Similarly, for low-income programs in New York under the newer Clean Energy Fund regulations, cost effectiveness will be measured at the portfolio level. This is a far less restrictive approach than assessing cost effectiveness at the measure or program level and provides more room for less cost-effective programs, including low-income programs, to be balanced by more cost-effective ones in the portfolio. (Low-income programs in New York were subject to measure-level cost-effectiveness testing until 2016.)

State policy can also help to ease other barriers to program delivery by allowing utilities to deliver services across multiple fuel types. For example, the New York State Energy Research and Development Authority (NYSERDA), a state program-administration agency, is permitted to spend its low-income program funds in a fuel-neutral manner, enabling it to serve more customers. Fuel neutrality in this case allows customers with homes heated by fuel oil to participate in low-income energy efficiency programs. A second supportive policy is the requirement that regulated utilities in New York identify low-income customers with high energy use and refer them to the NYSERDA low-income energy efficiency program, Empower NY. This requirement is actively enforced, and therefore, since the utilities are referring all eligible, high-energy-use customers to NYSERDA, no additional program marketing is needed. Other households not referred by utilities are also eligible to participate if they meet the income guidelines, as the program takes referrals from several other sources such as social service and community-based organizations.

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<sup>11</sup> These additional benefits include health and safety improvements (e.g., better indoor air quality resulting from mold and asbestos abatement and better ventilation systems), the related community benefits of lower health care costs, greater resident comfort, and many others.

<sup>12</sup> SIR is the ratio of the savings from an energy efficiency project to the cost, used to assess project feasibility for US Department of Energy WAP programs, among others.

Some of the program implementers we spoke to cited energy savings targets as a key policy driver.<sup>13</sup> The presence of an energy efficiency resource standard (EERS) can give a utility or other program administrator incentive to achieve greater savings through their low-income program as a way to meet their overall portfolio savings targets. In some states, these targets are for entire efficiency portfolios. In others, there are specific sub-targets related to low-income energy efficiency. For example, in Pennsylvania electric utilities are required to obtain at least 5.5% of their total consumption-reduction targets from the low-income sector. In Connecticut, program implementers noted that they are driven by a directive from the governor to weatherize 80% of all homes in the state by 2020.

Finally, leveraging funding streams beyond ratepayer dollars can significantly expand the money flowing into energy efficiency programs while also allowing the streamlining of multiple services for low-income customers. States have a role to play in this process. For example, the Minnesota Department of Commerce's Division of Energy Resources administers WAP, the State Energy Program (SEP), and LIHEAP and regulates the Conservation Improvement Programs (CIP), which are the state's ratepayer-funded utility energy efficiency programs. Proximity of these programs within the department allows the coordination of services for low-income households. The Department of Commerce's Energy Assistance Program (EAP) offers a simple one-stop shop for applying to EAP and WAP.

Ohio too has a state agency that serves as a central point of coordination among agencies, contractors, and utilities. The Office of Community Assistance, operating within the Community Services Division of the Ohio Developmental Services Agency, is responsible for administering LIHEAP, the Community Services Block Grant, the Percentage of Income Payment Plan Plus Program, the State Energy Plan, and the Electric Partnership Program. Thus the HWAP network integrates federal weatherization funds with utility resources through a single, coordinated funding model, managing programs in conjunction with all seven major utilities. The key here is that the utility money does not go through the state, resulting in more-efficient administration.

Even when programs are not directly coordinated by a state agency, the state can play a role in ensuring that stakeholders are well coordinated and well represented. For example, in Massachusetts, state law requires that a low-income representative be a member of the statewide energy efficiency stakeholder collaborative. Program implementers noted that this requirement is important for the advocacy of interests related to low-income programs and administration.

## Conclusion

Both maximizing participation and achieving deep savings were mentioned frequently as goals by the program administrators we spoke to during our research. Administrators tended to emphasize one over the other and design programs accordingly. Some sought to

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<sup>13</sup> Energy efficiency resource standards are specific, long-term energy savings targets required by state law or regulation—usually expressed as a percentage of annual retail sales—which gas or electric utilities must achieve through their energy efficiency program portfolios.

reach the largest number of qualified participants possible and spread out their resources among them. Others focused on maximizing their impact at a single project site, investing more dollars into individual projects, including health and safety measures that might not meet cost-effectiveness requirements. Both approaches are valid, and as programs mature they may be able to leverage well-honed administration strategies and multiple funding sources to both maximize participation and deliver deep energy savings.

There is no single key to success for delivering energy efficiency to low-income customers. Many of the programs we reviewed have gradually adjusted their strategies over time, emphasizing the elements that work best. Many programs have streamlined their delivery strategies, working with fewer vendors and contractors and emphasizing single points of contact. Others focus on organized stakeholder coordination, with regular meetings and information sharing among program implementers.

State policy support, especially policies that provide a reliable funding source, has been critical in allowing these successful programs to develop over time. Utilities and program administrators reported several other key program features and administrative strategies as well. Statewide coordination is important for many of the successful programs outlined in this report, including efforts to deliver programs through a single, statewide administrator; state agency coordination of multiple programs; and formalized stakeholder engagement to ensure program parity across service territories. This streamlining of efficiency services also helps utilities and program administrators leverage non-ratepayer funding sources to maximize impacts for participants. In addition, successful implementers focus on improving customer-facing efforts by ensuring that a single point of contact can engage customers in all relevant efficiency programming. Program design was also pointed to as a key feature contributing to success. High-achieving efforts typically offer a portfolio of low-income energy efficiency programs tailored to distinct customer segments, including high-energy-users, multifamily owners and renters, and others. Further, these administrators show a commitment to quality in their programs by emphasizing training and quality control measures.

The strategies outlined in this report should inform future program development, but it is likely that different combinations of approaches will work best for different regions. A secure funding source that allows experimentation and fine-tuning of strategies may therefore be the best first step to facilitate a successful low-income energy efficiency program.

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## Appendix A. Utilities Surveyed

Utility	State	Included in survey of electric programs	Included in survey of natural gas programs
AEP TX	TX	●	
Alabama Power	AL	●	
Alagasco	AL		●
Ameren IL	IL	●	
AmerenUE (Union Electric)	MO	●	
American Electric Power (Ohio Power)	OH	●	
Arizona Public Service	AZ	●	
Atlanta Gas Light	GA		●
ATMOS Energy	TX		●
Austin Energy	TX	●	
Baltimore Gas & Electric	MD	●	●
CenterPoint Energy	TX	●	●
CenterPoint Energy	MN		●
Citizens Energy Group	IN		●
City of Riverside Public Service	CA	●	
Columbia Gas of Ohio (Nisource)	OH		●
ComEd	IL	●	
ConEdison/NYSERDA	NY	●	●
Connecticut Natural Gas	CT		●
Consumers	MI	●	
CPS Energy (City of San Antonio)	TX	●	●
Dominion East Ohio	OH		●
Dominion Virginia Power (Virginia Electric P&L)	VA	●	
DTE Energy	MI	●	●
Duke Energy Carolinas	NC	●	
Duke Energy Ohio	OH	●	●
Duke Energy Progress	NC	●	
Duke FL	FL	●	
Duke IN	IN	●	
Duke SC	SC	●	
Duquesne Light Co	PA	●	

Utility	State	Included in survey of electric programs	Included in survey of natural gas programs
El Paso Electric	TX	●	
Entergy AR	AR	●	
Entergy LA	LA	●	
Entergy New Orleans	LA	●	●
Eversource	MA	●	
Eversource CT	CT	●	
Exelon—PECO	PA	●	
First Energy (Cleveland Electric Illuminating)	OH	●	
Florida City Gas	FL		●
Florida Power & Light Co.	FL	●	
Georgia Power	GA	●	
Indianapolis Power & Light	IN	●	
JCP&L	NJ	●	
JEA	FL	●	
KCP&L	MO	●	
Laclede Gas	MO		●
LADWP	CA	●	
LIPA	NY	●	
Louisville Gas & Electric	KY	●	●
Memphis Light, Gas & Water	TN	●	●
MidAm IA	IA	●	
Missouri Gas	MO		●
Nashville Electric Service	TN	●	
National Grid	MA	●	●
National Grid	RI	●	●
National Grid/NYSERDA	NY	●	●
NEU (Connecticut Light and Power)	CT	●	
NV Energy (Nevada Power Co.)	NV	●	
NW Natural	OR		●
Ohio Edison	OH	●	
Oklahoma Gas & Electric	OK	●	●
Oklahoma Natural Gas Co.	OK		●

Utility	State	Included in survey of electric programs	Included in survey of natural gas programs
ONCOR	TX	●	
Orlando Utilities Commission	FL	●	
Peoples Gas	IL		●
Peoples Natural Gas	PA		●
PEPCO	DC	●	
Piedmont Natural Gas	TN		●
Piedmont Natural Gas	NC		●
PG&E	CA	●	●
PGW	PA		●
Portland General Electric Co.	OR	●	
PPL	PA	●	
PSE	WA	●	
PSE&G	NJ	●	
PSNC Energy	NC		●
Puget Sound Energy	WA		●
Questar Gas	UT		●
Richmond Department of Public Utilities	VA		●
Rocky Mountain Power (PacifiCorp)	UT	●	
Salt River Project	AZ	●	
San Diego Gas & Electric	CA	●	●
SCE&G	SC	●	
Seattle City Light	WA	●	
SMUD	CA	●	
SoCal Gas	CA		●
Southern California Edison	CA	●	
Southwest Gas	NV		●
Southwest Gas	AZ		●
Tampa Electric Co	FL	●	
TECO Peoples Gas	FL		●
Texas Gas Service	TX		●
Virginia Natural Gas (AGL Resources)	VA		●
Washington Gas (DC SEU)	DC		●
We Energies/Focus on Energy	WI	●	●

Utility	State	Included in survey of electric programs	Included in survey of natural gas programs
West Penn Power	PA	●	
Xcel (Northern States Power)	MN	●	
Xcel (Public Service Co. of CO)	CO	●	●

## Appendix B. Summaries of Successful Programs

In this section, we summarize key components of many of the successful programs—and, in some cases, portfolios of programs—that we identified in our survey. These programs performed well in at least one of the three quantitative screens and one qualitative screen described in the methodology section of this report. We also included several profiles of programs and program portfolios that did not rank in the top five of any one category but performed well enough in several categories to be notable.

### ***CENTERPOINT ENERGY MINNESOTA PORTFOLIO OF GAS LOW-INCOME PROGRAMS***

#### **Program Description**

CenterPoint's portfolio of natural gas low-income programs serves multiple residential sectors. It consists of five projects: Low-Income Weatherization, Non-Profit Affordable Housing, Low-Income Multifamily Building Rebate, Low-Income Heating System Tune-Ups, and Low-Income Rental Efficiency.

- *Low-Income Weatherization* is the primary weatherization program. It uses federal funding (in addition to ratepayer funding) and meets US Department of Energy guidelines. The project gives CenterPoint the flexibility to fund stand-alone health and safety repairs or maintenance called for by federal regulations before energy efficiency work can be done. Examples of such health and safety work include removal of knob-and-tube electrical wiring and removal of asbestos.
- *Non-Profit Affordable Housing* is a new construction and major retrofit program that covers the full incremental cost of high-efficiency measures and equipment. The financial incentives make choosing high-efficiency measures and equipment cost-neutral for the nonprofit developers.
- *Low-Income Multifamily Building Rebate* is a prescriptive commercial sector program aimed at affordable housing providers. It offers rebates 25% higher than those for market-rate residential property owners.
- *Low-Income Heating System Tune-Ups* provides free heating system tune-ups to eligible low-income owners of single-family homes.
- *Low-Income Rental Efficiency* serves the owners of one- to four-unit buildings, covering half of the incremental cost of energy efficiency improvements.

CenterPoint offers additional incentives to owners of low-income multifamily buildings through the Multifamily Building Efficiency and Energy Design Assistance program within its commercial portfolio.

*High-performance categories:* Deep savings, broad participation, savings per low-income customer.

#### **Keys to Success**

*Market segmentation.* Having five projects enables CenterPoint to segment the low-income market and effectively serve more types of customers. This enables greater program participation and energy savings by customizing program design to meet the unique needs of each customer group.

*Health and safety.* CenterPoint coordinates projects with weatherization but also develops stand-alone projects for weatherization customers in order to address health and safety

needs like asbestos abatement or fire code compliance. Program implementers are given leeway to invest in certain health and safety measures even if they do not generate gas savings.

## Historic Performance

Table B1. Multiyear energy savings by program (decatherms)

Program	2014 savings (Dth)	2015 savings (Dth)	2016 savings (Dth)
Low-income weatherization	9,521	8,746	8,029
Nonprofit affordable housing	1,841	2,354	2,099
Low-income multifamily buildings	9,165	22,498	1,221
Low-income heating system tune-ups	1,352	1,771	1,811
Low-income rental efficiency	107	1,569	1,090
TOTAL	21,986	36,937	14,250

Table B2. Participation by program (number of measures)

Program	2014	2015	2016
Low-income weatherization	511	402	361
Nonprofit affordable housing	75	104	70
Low-income multifamily buildings	156	259	44
Low-income heating system tune-ups	751	984	1,006
Low-income rental efficiency	5	50	36
TOTAL	1,498	1,799	1,517

Participation figures for the low-income multifamily building project represent measures rebated. Frequently a participating building will install multiple measures. *Source:* N. Mark, manager, Conservation and Renewable Energy Policy, CenterPoint Energy, pers. comm., June 23, 2017.

## COLUMBIA GAS OF OHIO WARMCHOICE®

### Program Description

WarmChoice is a low-income home weatherization program for buildings with up to four units, offering attic and sidewall insulation and air sealing as well as furnace replacement. The program provides full energy audits, each of which includes a home inspection and infrared and blower door tests. The audits are the basis of a comprehensive work order. There is no charge to income-eligible program participants. Columbia Gas of Ohio invests an average of \$4,500 per home.

*High-performance categories:* Deep savings, broad participation, savings per low-income customer.

### Keys to Success

*Targeting high-usage customers.* Since its inception, the program has focused on customers with high natural gas usage and high arrearages. In particular, the program is promoted via

print mailings and social media advertising to customers on the Percentage of Income Payment Plan. Regulators require the large regulated utilities to offer this payment plan to customers with high arrearages and high energy use.

*No cost-effectiveness requirement.* Projects and measures are not required to meet a specific savings-to-investment ratio (SIR). No benefit-cost calculations are needed for an eligible customer to be served or for a measure to be incented in the program. Customers qualify if their income is below 150% of federal poverty guidelines and they live in a dwelling of four units or fewer.

*Single point of contact/one-stop shop.* Agencies implementing the Home Weatherization Assistance Program (HWAP) also implement WarmChoice and electric utility low-income energy projects, making participation convenient and accessible for customers.

*Coordination with weatherization.* Federal weatherization assistance is fully coordinated with utility ratepayer-funded energy efficiency programs. WarmChoice and HWAP use the same qualified trade ally contractors, who also work with the local electric utility low-income programs. Both federal and utility funds may be combined for the same project in the same home; using all available funding streams can allow more measures to be installed.

*Health and safety.* Columbia Gas of Ohio will pay for addressing health and safety problems in a home to allow energy efficiency projects to go forward. For rental properties, the landlord or building owner is only asked to make a contribution toward the cost of remediating mold or other health and safety problems.

## Historic Performance

Table B3. Multiyear energy savings and participation

	2012	2013	2014	2015
Net savings (Dth)	68,315	68,626	64,521	67,565
Participants	2,052	2,021	1,971	2,085
Net savings per participant (Dth)	33.3	34.0	32.7	32.4

*Source:* A. Andrews, team leader, NiSource/Columbia Gas of Ohio, pers. comm., July 21, 2017

## CONNECTICUT HOME ENERGY SOLUTIONS—INCOME ELIGIBLE (HES-IE) (STATEWIDE, ALL UTILITIES)

### Program Description

HES-IE is a comprehensive, whole-house program that is offered statewide. It provides both gas and electric measures for single-family and one- to four-unit buildings. Services include an in-home energy checkup (audit) with a blower door test, furnace and water heater safety checks, and post-installation inspection. Measures include air sealing, duct sealing, low-flow showerheads, pipe wrap, faucet aerators, windows, heating and cooling system equipment replacement, and quality installation and verification. Gas and electric utility representatives meet monthly to ensure that program design and implementation is consistent throughout the state.

*High-performance categories:* Broad participation, savings per low-income customer.

**Keys to Success**

*Single point of contact/one-stop shop.* The program is run in-house by a manager who is a utility employee. Customers have a single point of contact. The program manager contracts with trade allies to install both gas and electric measures.

*Streamlined processes.* HES-IE installs electric and gas measures during the same visit to minimize touch points with customers. To manage response time, interaction with a customer must be within three weeks of the customer’s submission of an application; this also keeps more interested customers in the program.

*Institutional partnerships to address health and safety.* HES-IE has partnerships with hospitals, local health departments, and the Connecticut Department of Public Health so that health and safety problems such as lead abatement can be resolved, after which HES-IE can proceed to weatherize the home.

**Historic Performance**

**Table B4. Multiyear energy savings and participation, United Illuminating, Connecticut Natural Gas, Southern Connecticut Gas**

	2013	2014	2015
Net savings (Dth)	74,887	90,670	65,476
Net savings (kWh)	3,787,540	3,754,495	1,993,980
Participants, gas	4,429	6,161	5,223
Participants, electric	4,932	4,948	2,783
Net savings per participant, Dth	16.9	14.7	12.5
Net savings per participant, kWh	768	759	716

*Source:* M. Estremera, program administrator, United Illuminating, pers. comm., June 9, 2017

**DTE ENERGY PORTFOLIO OF LOW-INCOME ENERGY EFFICIENCY PROGRAMS**

**Program Description**

DTE’s dual-fuel low-income program has four components.

- *Energy Efficiency Assistance (EEA)* is the utility’s retrofit program for residential customers. In partnership with community action agencies and nonprofits, DTE offers furnace and refrigerator replacements, weatherization services, and energy kits.
- *Home Energy Consultation* is a direct-install pilot program offered in Detroit. It includes an educational component that teaches customers how to adjust thermostats, check for leaks, and change furnace filters.
- *Home Energy Reports* do not specifically target low-income customers, although DTE does receive credit for low-income customer participation. The utility estimates how these projects touch low-income customers by analyzing zip code demographics. DTE works with landlords to deliver this program, which includes in-unit lighting and water-saving measures.



*High-performance categories:* Broad participation (electric and gas), savings per low-income customer (gas).

**Keys to Success**

*Supportive state policy.* Michigan law requires that all customers contribute funding toward low-income energy efficiency programs, not just customers in the residential sector. Low-income programs are also exempt from cost-effectiveness rules.

*Partnerships and coordination across service territory.* DTE partners with 28 community action agencies and nonprofits including Habitat for Humanity and food banks. DTE has also sought out nontraditional partners in order to access hard-to-reach communities. For example, DTE has a partnership with the Alliance for Deaf Services to help promote its programs in American Sign Language and deliver programs using technology that helps installers communicate with deaf customers.

**Historic Performance**

Table B5. Multiyear energy savings and participation

	2013	2014	2015
Net savings (MWh)	20,300	21,900	25,500
Net savings (Dth)	1,368,000	1,159,000	1,097,000
Participants	45,563	42,396	39,675

Source: DTE electric and gas reconciliation filings, 2013-2016

**EFFICIENCY VERMONT PORTFOLIO OF LOW-INCOME ELECTRIC ENERGY EFFICIENCY PROGRAMS**

**Program Description**

Efficiency Vermont (EVT), a statewide program administrator, offers a suite of services available to low-income Vermonters through multiple programs and delivery channels, including the following:

- *Contract with the state’s five weatherization agencies.* As part of the Low-Income Electrical Efficiency Program (LEEP), the contract calls for the weatherization agencies to install electric efficiency measures including LED bulbs, faucet aerators, low-flow showerheads, heat pump water heaters, and cold-climate heat pumps when the homeowner or renter is eligible. Vermont defines *low-income* as 80% of the county median income.
- *Direct outreach to high-electricity-use customers.* Efficiency Vermont looks at usage data and flags households using more than 10,000 kWh per year, which is about double the average in Vermont. Renters are eligible if they get the approval of their landlord for in-unit measures.
- *Multifamily rental property rebates.* In addition to in-unit measures for renters, Efficiency Vermont offers a smaller set of prescriptive measures to landlords for common areas, including common area lighting and heating.
- *Efficient products distribution.* EVT gives out free energy-efficient products, primarily CFL and LED light bulbs, to low-income Vermonters through food banks and community centers.

There are two low-income programs for single-family customers, LEEP and the Zero Energy Modular Home Program. The multifamily programs are called Multifamily Retrofit, Rental Property Rebate, and Multifamily New Construction.

The numbers in table B6 do not include utility customers reached via food bank product distribution. The Vermont Food Bank reports that it reaches approximately 153,000 Vermonters annually. In 2016, Efficiency Vermont distributed 35,000 bulbs through the food bank and generated savings of 1,594,000 kWh.

*High-performance category:* Noted by experts.

### Keys to Success

*Market segmentation (or multiple delivery channels).* Efficiency Vermont provides electricity-saving measures to low-income Vermonters in various market segments through multiple delivery channels. It contracts with state weatherization agencies to install energy efficiency measures, undertakes direct outreach to high-usage low-income customers, invites landlords of low-income renters to apply for common-area measures, contracts for deep retrofits of multifamily buildings serving low-income residents, and distributes LED light bulbs through food banks across the state.

*Coordination with weatherization agencies.* Through its contract with the state's weatherization agencies, the LEEP program has electric energy efficiency measures delivered in addition to the thermal energy efficiency measures the agencies provide.

### Historic Performance

Table B6. Multiyear energy savings and participation

	2013	2014	2015	2016
Net savings (MWh)	1,266	1,772	2,484	2,522
Net savings (Dth)	3,772	3,111	3,243	5,373
Participants	1,039	1,016	1,107	1,295

*Source:* L. Wentz, program manager, Efficiency Vermont, pers. comm., September 25, 2017

## ENERGY OUTREACH COLORADO AND XCEL COLORADO PORTFOLIO OF LOW-INCOME PROGRAMS

### Program Description

Xcel Colorado funds four programs for low-income customers: distribution of energy savings kits, a multifamily weatherization program, a specialized program for nonprofit organizations, and a single-family weatherization program. Energy Outreach Colorado delivers all of Xcel's low-income programs except for the energy savings kits.

*High-performance categories:* High participation, deep savings, savings across low-income customer base.

### Keys to Success

*Combining funding sources.* Energy Outreach Colorado (EOC) uses utility funding, federal weatherization funds, state and regional funding, and private donations to deliver

programs to Xcel's customers. EOC also combines funding from multiple utilities, allowing it to deliver programs using a fuel-blind approach and incorporating health and safety measures that might not be covered by utility funds alone. Leveraging funding sources also helps EOC bring down the up-front cost of projects in cases where utility rebates do not cover all project costs.

*Lenient cost-effectiveness rules.* EOC bundles measures with the goal of making overall projects cost effective. Regulators in Colorado have emphasized that low-income programs should address both electricity and natural gas users. Natural gas projects have proved challenging to implement cost-effectively for low-income customers, but EOC has continued to implement these projects where there is determined to be significant need, with support from the Colorado Public Utilities Commission.

*Comprehensive project assessments:* For both multifamily and nonprofit programs, EOC provides customers with a bundled proposal outlining a variety of measures, allowing the customer to choose a combination of measures that meets their needs. EOC also performs facility walkthroughs with multifamily building owners and managers, helping to identify potential projects beyond failing equipment.

## **MASSACHUSETTS LOW-INCOME ENERGY AFFORDABILITY NETWORK (LEAN)**

### **Program Description**

Massachusetts LEAN, created in 1997, is a network of community action agencies (CAAs) that coordinate delivery of energy efficiency services throughout the state. LEAN delivers both federally funded weatherization services and utility-funded low-income programs. Lead vendors subcontract to CAAs throughout the state. Programs are fuel-blind, with an emphasis on comprehensive whole-home projects.

*High-performance categories:* Savings across low-income customer base, noted by experts.

### **Keys to Success**

*Strong state policy guidance.* Massachusetts's Restructuring Act of 1997 includes a requirement that utilities deliver energy efficiency programs and that low-income programs be delivered by CAAs and other nonprofits coordinating weatherization and fuel assistance programs—essentially codifying the LEAN network structure and ensuring a funding source for low-income programs. The Green Communities Act of 2008 provides additional support, requiring that at least 10% of electric efficiency expenditures and 20% of gas expenditures go to low-income programs. LEAN also has a legislatively mandated seat at the statewide Energy Efficiency Advisory Council, and the network engages in regulatory proceedings and legislative processes that could impact low-income programs.

*Combining funding sources to deliver fuel-blind savings.* Low-income programs in Massachusetts leverage a variety of funding sources, including utility funds, federal weatherization dollars, and funding that may come from the state for one-time programs. LEAN integrates these program dollars to maximize the benefits that participants receive and to ensure that program design and delivery meet the requirements of different funding sources. By leveraging these funding streams, LEAN can deliver fuel-blind programs that reduce energy usage overall, rather than focus on a single fuel source.

*Focus on training and quality control.* LEAN lead vendors include full-time employees tasked with training CAA implementers. For example, lead vendor Action Inc. dedicates two full-time staff to training the agencies they subcontract with and the contractors who do the work in the home. Each subcontractor is visited four times per year. In addition to providing regular training for vendors, LEAN assures high-quality work by performing quality control measures on every completed job.

*Stakeholder coordination.* LEAN has monthly meetings to ensure that programs delivered by the CAAs on behalf of the utilities are consistent and equivalent across the state. Stakeholders also meet quarterly to deal with technical issues and measure design.

*Networked approach with direct contracting.* Although stakeholders coordinate on a statewide basis, utilities contract directly with LEAN lead vendors rather than funnel funding through a centralized agency, thereby eliminating a potential bottleneck. Lead vendors then subcontract with CAAs on behalf of the utilities with which they coordinate.

## Historic Performance

Table B7. Multiyear energy savings and participation

	2014	2015	2016
Net savings (MWh)	46,372	53,202	119,297
Net savings (Dth)	266,802	204,917	205,566
Fuel oil savings (MMBtu)	74,468	61,860	254,455
Propane savings (MMBtu)	495	885	11,334
Participants	46,579	33,322	105,730

Source: Statewide data summed from individual utility annual reports, 2014-2016, [ma-eeac.org/results-reporting/annual-reports/](http://ma-eeac.org/results-reporting/annual-reports/)

## EMPOWER NEW YORK (NYSERDA)

### Program Description

The EmPower New York program serves single-family and multifamily households statewide, with the exception of Long Island.<sup>14</sup> New York's gas and electric utilities refer eligible low-income customers with high energy usage to NYSERDA, the state's independent statewide program administrator. The program provides comprehensive measures applicable to electric, gas, and delivered-fuel end uses, at no charge to the customer. In addition to energy efficiency measures, the program offers free health and safety checks of smoke detectors and appliances as well as in-home energy education.

*High-performance categories:* Deep natural gas savings, broad participation.

<sup>14</sup> Low-income energy programs on Long Island are administered by PSEG Long Island and National Grid.

## Keys to Success

*Comprehensive measures.* EmPower New York takes a whole-house approach, offering multiple measures for each participant for all fuels. These include insulation and home envelope measures, refrigerator and freezer replacement (not just recycling), and lighting. In-home energy education is also provided to help participants make more-informed decisions on how they use energy.

*State policy support.* Under Governor Andrew Cuomo’s Reforming the Energy Vision (REV) initiative, New York State has made energy affordability and access to clean energy technologies priorities for low-income households. In 2016, the NYS Public Service Commission (PSC) enacted the Energy Affordability Policy, which limits annual energy costs for low-income utility customers to 6% of their annual household income. In addition, NYSERDA will invest \$234 million over the first three years of the Clean Energy Fund (CEF) to increase access to clean energy solutions for low- and moderate-income residents. The PSC requires utilities to refer high energy users eligible for low-income programs to NYSERDA, so no additional market segmentation or target marketing efforts are needed, though customers also can apply directly or be referred by another organization.

*Lenient cost-effectiveness requirements.* Cost effectiveness is measured at the overall portfolio level, so the low-income program and the projects and measures within it may have a benefit-cost ratio below 1.0.

*Fuel neutrality.* NYSERDA is permitted to deliver energy efficiency services on a fuel-neutral basis, so it can deliver programs to customers who use deliverable fuels to heat their homes.

## Historic Performance

Table B8. Multiyear energy savings and participation

	2012	2013	2014	2015	2016
Electric savings (MWh)	12,926	10,555	8,855	7,473	5,963
Gas savings (Dth)	150,923	148,420	201,569	222,771	138,068
Other fuel savings (Dth)	21,883	31,260	18,165	59,870	43,874
Participants*	13,427	12,803	13,478	15,742	13,179

\*Not all participants receive both thermal and electric savings measures. *Source:* C. Coll, program manager, NYSERDA, pers. comm., August 28, 2017.

## ONCOR LOW-INCOME PROGRAM PORTFOLIO

### Program Description

As a transmission and distribution utility in Texas, Oncor is required to commit at least 10% of its energy efficiency program dollars to low-income weatherization. Oncor offers two programs aimed at low-income customers:

- *Targeted Weatherization Low-Income Standard Offer Program (SOP)* is designed for households with income at or below 200% of the federal poverty line. The program is delivered through the Texas Association of Community Action Agencies (TACAA). Utility funds are pooled with federal weatherization dollars to deliver efficiency

measures including insulation, HVAC replacement, appliance upgrades, and window replacements.

- *Hard-to-Reach SOP* is designed for households with income at or below 200% of the federal poverty line. Contractors deliver this program throughout Oncor’s service territory. Common measures include weather-stripping, caulking, and insulation.

*High-performance category:* Deep savings per participant.

**Key to Success**

*Prioritization of measures.* Oncor focuses first on weather-sensitive measures, including shell weatherization and air sealing. Only then do contractors move on to additional issues, including air-conditioning, refrigeration, and lighting. Oncor has raised incentives over time for measures that deliver deep savings, and this has encouraged contractors to look for these savings and focus less on lighting.

*Strong network of trade allies with incentives for strong performance.* Oncor’s Hard-to-Reach SOP is delivered through a network of more than 60 contractors. These companies are the main source of program marketing, so having such a large network ensures that programs are marketed and delivered evenly across Oncor’s service territory. Oncor also ensures that programs reach rural customers by offering higher incentives to contractors who deliver services outside of metro areas. Payments to contractors are scaled on the basis of energy savings, so contractors are incentivized to deliver the maximum amount of cost-effective energy efficiency at each project site.

**Historic Performance**

Table B9. Multiyear energy savings by program

Program	2014 savings	2015 savings	2016 savings
Targeted LI weatherization SOP (MWh)	3,885	3,442	3,916
Hard-to-reach SOP (MWh)	20,450	19,602	20,136
TOTAL	24,336	23,044	24,051

*Source:* Oncor Energy Efficiency Plan and Report, 2015–2017, [www.texasefficiency.com/index.php/regulatory-filings/oncor](http://www.texasefficiency.com/index.php/regulatory-filings/oncor)

**OUACHITA ELECTRIC COOPERATIVE HELP PAY AS YOU SAVE (PAYS)**

**Program Description**

Ouachita Electric Cooperative’s HELP PAYS program is a tariff-based residential energy efficiency financing program. The utility offers a no-cost home assessment for its customers, identifies cost-effective energy efficiency opportunities, and allows customers to select any set of measures from the list. There are no up-front costs for the work; customers pay over time through their monthly utility bills. Projects are required to be cash-flow positive. The program is not technically a low-income program, in that it has no income qualifications and program implementers do not target customers of any particular income level.

*High-performance category:* Noted by experts.

### Keys to Success

*Comprehensive eligibility and no up-front costs.* All of Ouachita Electric Cooperative's customers are eligible for the HELP PAYS program. The utility has focused on eliminating barriers to participation. It does not require credit checks or income information. There are no up-front costs, and projects are required to be cash-flow positive. The cash-flow positive requirement does limit the project scope. For example, only very old HVAC systems are likely to be included within a project, and health and safety measures are typically not included. Some customers do opt for a co-pay so they can include non-cost-effective measures within a project, such as window replacements.

*Comprehensive quality control and training.* Since programs are required to be cash-flow positive, all HELP PAYS projects are assessed after a contractor has completed the work. Contractors are paid by the cooperative upon completion of the assessment. Ouachita also facilitates trainings for its contractors in quality control techniques, so that contractors understand assessment methodologies.

### **ENERGY SAVINGS ASSISTANCE (ESA), PACIFIC GAS AND ELECTRIC, SOUTHERN CALIFORNIA EDISON, SAN DIEGO GAS AND ELECTRIC, SOUTHERN CALIFORNIA GAS**

#### Program Description

ESA is a free direct-install program offered statewide by California's investor-owned utilities to eligible residential customers. Customers are eligible if they meet the California Alternate Rates for Energy (CARE) income guidelines.<sup>15</sup> ESA serves renters and owners of single-family, multifamily, and mobile homes with weatherization, energy-saving light bulbs, energy-efficient appliances, and energy education. Energy efficiency measures include attic insulation, energy-efficient refrigerators, evaporative coolers, air conditioners, weather-stripping, caulking, low-flow showerheads, water heater blankets, and door and building envelope repairs.<sup>16</sup>

*High-performance category:* Broad participation (electric).

### Keys to Success

*Supportive state policy.* ESA's primary metric for success is the number of homes treated, which accounts for the high customer participation. California state law requires the California Public Utilities Commission (CPUC) to ensure that all eligible low-income customers have had the opportunity to participate in energy efficiency programs by December 31, 2020. It further requires that the commission and utilities make all reasonable efforts to collaborate and that the programs be designed to achieve long-term reductions in energy consumption at the premises. To comply, utilities track the number of participants as well as the numbers of eligible and ineligible customers and the number of customers who

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<sup>15</sup> The CARE program provides reduced rates for electricity and natural gas to qualifying residential customers; it is administered in conjunction with ESA.

<sup>16</sup> Evergreen (Evergreen Economics). 2016. *Needs Assessment for the Energy Savings Assistance and the California Alternate Rates for Energy Programs, Volume 1*. Sacramento: California Public Utilities Commission. <http://liob.cpuc.ca.gov/Docs/2016%20LINA%20Final%20Report%20-%20Volume%201%20of%202.pdf>.

affirmatively opt out of participation.<sup>17</sup> The state also requires program implementers to install all feasible energy efficiency measures, even if the benefit-cost ratio is below 1.0.

*Statewide program.* Statewide reach provides customers and contractors with consistent program features across the four utilities and utility service territories. It also makes ESA one of the largest energy efficiency programs in the United States, resulting in greater buying power, economies of scale, and reduced administrative overhead. The ESA budget for PG&E alone was \$162 million per year for 2015 and 2016. Statewide, ESA budgets at the four investor-owned utilities totaled \$390 million in 2014.

## Historic Performance

Table B10. Multiyear energy savings and participation

Pacific Gas and Electric	2012	2013	2014	2015	2016
Net savings (MWh)	37,480	42,860	43,070	31,960	26,460
Net savings (Dth)	121,000	192,000	194,000	221,000	156,000
Participants	115,229	123,566	123,539	100,573	74,319
Southern California Edison	2012	2013	2014	2015	2016
Net savings (MWh)	19,190	30,950	32,120	28,290	27,490
Participants	49,026	69,031	76,983	54,127	41,070
San Diego Gas and Electric	2012	2013	2014	2015	2016
Net savings (MWh)	8,960	6,150	7,100	3,760	3,260
Net savings (Dth)	31,000	32,000	35,000	26,000	26,000
Participants	22,415	17,568	22,039	20,209	17,740
Southern California Gas	2012	2013	2014	2015	2016
Net savings (Dth)	100,000	310,000	314,000	157,000	95,000
Participants	96,893	106,948	92,967	80,316	56,608

Source: CPUC, 2013–2017 ESA CARE annual report tables, [www.cpuc.ca.gov/igap.aspx](http://www.cpuc.ca.gov/igap.aspx)

## WISCONSIN FOCUS ON ENERGY HOME PERFORMANCE WITH ENERGY STAR®, INCOME-QUALIFIED TRACK

### Program Description

Focus on Energy's Home Performance income-qualified track is a whole-home residential program providing gas and electric building-shell measures including insulation, air sealing, and others. Prescriptive rebates are set higher than for the non-income-qualified Home Performance program. Homes treated are entirely separate from those served by the state weatherization program, which does not combine or coordinate funding or program administration directly.

<sup>17</sup> See part E in [codes.findlaw.com/ca/public-utilities-code/puc-sect-382.html](http://codes.findlaw.com/ca/public-utilities-code/puc-sect-382.html).



*High-performance categories:* Deep savings, savings across low-income customer base, noted by experts.

### Keys to Success

*Integrated marketing and administration program design.* The low-income part of the Wisconsin Focus on Energy Home Performance with ENERGY STAR® program is not promoted or marketed primarily as low-income weatherization or a low-income program, but rather as an income-qualified track within the larger program. The income-qualified track was previously called Assisted Home Performance, but the name was changed due to the negative associations people had with the idea of “assistance.”

*Multiple funding sources.* The statewide energy efficiency program Focus on Energy is funded via a 1.2% charge on customer bills. Three Wisconsin utilities also have what are known as voluntary programs, which are approved by the Public Service Commission. Of these, two provide low-income programs that are additional and complementary to the Focus on Energy Home Performance income-qualified track. Each utility identifies its residential customers with the greatest need, considering very low incomes and high energy use, identifies a contractor, and uses its voluntary conservation program funds in addition to Focus on Energy funds to pay for home repairs alongside energy efficiency measures. Eligibility is the same as for the market-rate Home Performance program. This benefits approximately 200 homes per year out of Focus on Energy’s program participation.

*Broad eligibility.* To participate, customers may qualify with a household income below 80% of the state median, which is considered to include moderate-income as well as low-income households. Landlords owning one- to three-unit rental homes may also apply and qualify for the program based on their tenants’ incomes.

*Lenient cost-effectiveness requirements.* Cost effectiveness is measured at the overall portfolio level, so the low-income program and the projects and measures within it may have benefit-cost ratios below 1.0.

### Historic Performance

Table B11. Multiyear energy savings and participation

	2012	2013	2014	2015	2016
Electric savings (MWh)	25.3	394.9	444.4	434.7	211.0
Gas savings (Dth)	834	21,230	18,286	19,871	16,293
Participants	95	578	534	511	317

Savings are gross energy savings and do not account for free riders or spillover. *Source:* S. Bloedom, residential program manager, Focus on Energy, pers. comm., August 22, 2017.