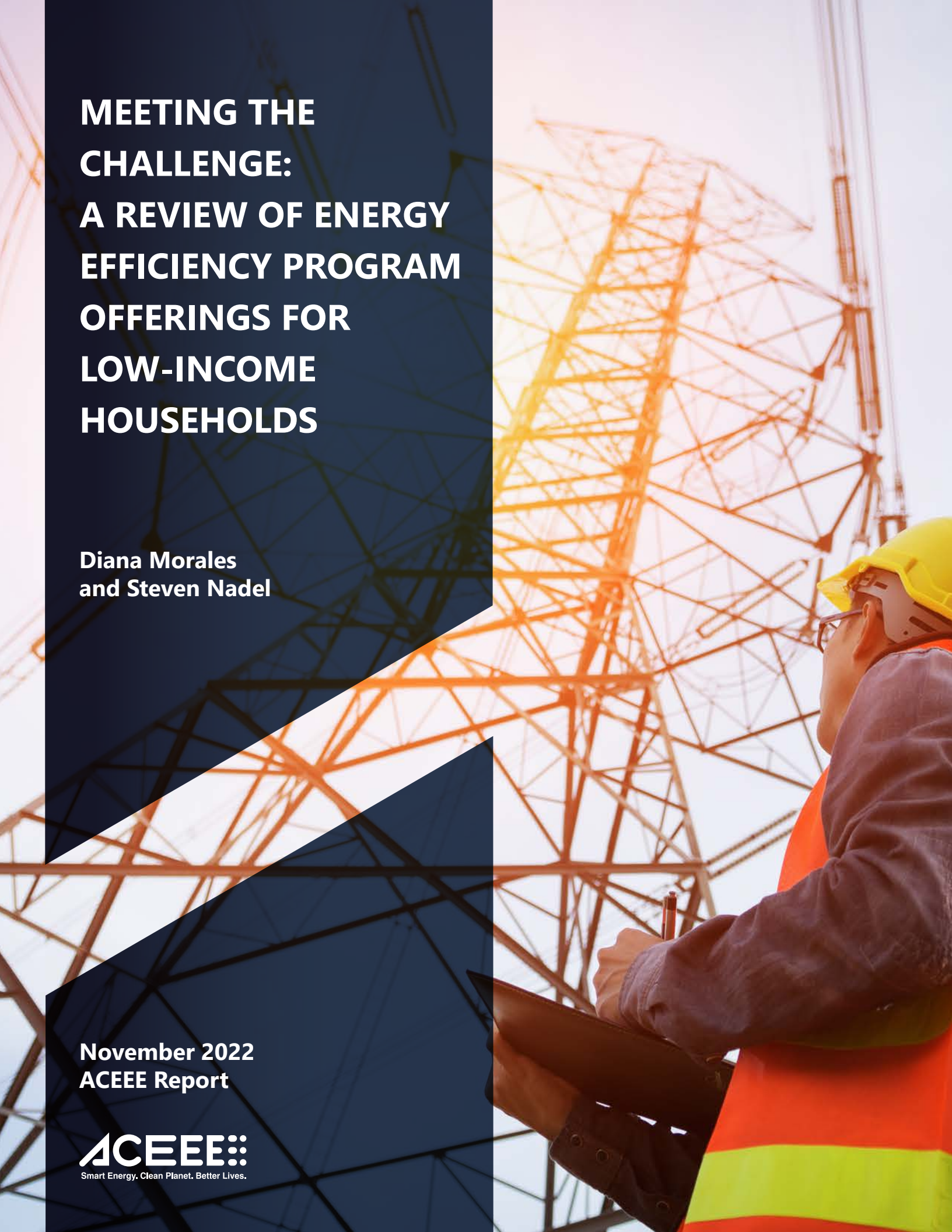
MEETING THE CHALLENGE: A REVIEW OF ENERGY EFFICIENCY PROGRAM OFFERINGS FOR LOW-INCOME HOUSEHOLDS

Diana Morales and Steven Nadel



November 2022
ACEEE Report

ACEEE
Smart Energy. Clean Planet. Better Lives.

Contents

About ACEEE

The **American Council for an Energy-Efficient Economy** (ACEEE), a nonprofit research organization, develops policies to reduce energy waste and combat climate change. Its independent analysis advances investments, programs, and behaviors that use energy more effectively and help build an equitable clean energy future.

About the Authors

Diana Morales conducts research on energy efficiency and clean energy policy led by local governments in cities and metropolitan regions in the United States. She also contributes to the City Clean Energy Scorecard. Diana joined ACEEE in 2021. Before joining ACEEE, Diana worked at the U.S. Green Building Council. She holds a master of sustainability with a focus on urban and energy systems from Chatham University and a Bachelor of Arts in psychology and anthropology from Indiana University of Pennsylvania.

Steven Nadel joined ACEEE in 1989 and has served as executive director since 2001. Before his promotion he served as deputy director and director of ACEEE's Utilities and Buildings programs. Before ACEEE, Steve worked for Massachusetts' largest electric utility and largest environmental group and worked with an inner-city housing organization in Connecticut. He has worked in the energy efficiency field for more than 40 years and has over 200 publications. His current research interests include energy and climate change policy; strategies to decarbonize the buildings, transportation, and industrial sectors; utility-sector energy efficiency programs and policies; and appliance and equipment efficiency standards. Steve earned a Master of Science in energy management from the N.Y. Institute of Technology and a Master of Arts in environmental studies and Bachelor of Arts in government from Wesleyan University.

Acknowledgments

This report was made possible through the generous support of Consolidated Edison, Energize Connecticut (Eversource and United Illuminating), Energy Trust of Oregon, Los Angeles Department of Water and Power, National Grid U.S., and the Tennessee Valley Authority. The authors gratefully acknowledge external reviewers, internal reviewers, colleagues, and sponsors who supported this report. External expert reviewers included (in alphabetical order by last name) Ariel Drehobl (U.S. Department of Energy), Will Bryan, PhD (Southeast Energy Efficiency Alliance), Derek Schroeder (U.S. Department of Energy), Rosy Tavares (Kinetic Communities Consulting), and Lauren Wentz (VEIC). Amanda Dewey served as internal advisor. Other internal reviewers included Jennifer Amann, Roxana Ayala, Dave Ribeiro, and Dan York. External review and support do not imply affiliation or endorsement. We also note that some of the sponsors of this research as well as several ACEEE board members represent companies whose programs are included in this report.[1] At each stage of

[1] Consolidated Edison, Eversource and Pacific Gas & Electric.

report review we have endeavored to treat these companies the same as all other companies covered in this report. Last, we would like to thank Mary Robert Carter for managing the editing process, Jacob Barron for copy editing, Phoebe Spanier for proofreading, Kate Doughty for graphics design, and Mark Rodeffer and Nick Roper for their help in launching this report.

Suggested Citation

Morales, D., and S. Nadel. 2022. *Meeting the Challenge: A Review of Energy Efficiency Program Offerings for Low-Income Households*. Washington, DC: American Council for an Energy-Efficient Economy. www.aceeee.org/research-report/u2205.

Report Update

Updated December 2022: Figures 4 and 5 and associated metrics have been updated to reflect data provided to ACEEE by a dual fuel utility.

Executive Summary

KEY FINDINGS

- Data from 2019 show spending of about $936 million on ratepayer funded low-income energy efficiency programs by the 93 electric and gas utilities for which we have data, up significantly from a similar study based on 2015 data.
- For the utilities providing low-income program spending data, the median electric and gas utility spending is about 13% of total energy efficiency program budgets. The level of spending represents a significant shortfall relative to the approximately 27.5% of the U.S. population who are income-qualified for these programs.
- Average program spending per participating low-income customer was $2,059 in 2019 and spending averaged over all income-eligible customers was only $36; at this current spending rate, it would take 57 years to offer average program services to all currently income-eligible households. To provide average program services to all eligible households over 20 years, spending would need to nearly triple.
- The programs provided by the 97 electric and gas utilities in our database served about 1.5 million program participants in 2019, with many receiving low-cost measures such as LED lightbulbs and energy-saving kits, as well as tens of thousands receiving more comprehensive weatherization services.[2]
- Relative to the number of U.S. households with income at or below 200% of the federal poverty level in each utility service territory, the average annual participation rate per low-income energy efficiency program was about 5%, although many of these households received only low-cost measures. Programs offering comprehensive weatherization programs tend to invest more and have greater direct energy use savings.
- Some states have recently established a goal of at least 1% average annual savings for low-income customers, but electric utilities for whom we have the relevant data averaged only 0.55%.[3] Nationwide, energy efficiency programs across all programs and income levels are reducing energy consumption by 0.72%. Low-income energy efficiency programs are providing about half of this benefit to low-income households, leaving this population underserved.
- Several utilities stand out for strong low-income program performance, such as several utilities in California, Commonwealth Edison, Eversource, National Grid, and Detroit Edison. These utilities allocate substantial funding, offer comprehensive services, often have multiple programs, and work with partners to address different

[2] This includes four utilities for which we do not have spending data.

[3] Maryland is one such example. This goal was recently established in 2021 and therefore progress toward this goal has not been evaluated.

segments of the eligible population (e.g., single-family and multifamily retrofits as well as low-cost measures).

- Low-income energy efficiency programs rarely use equity metrics (e.g., energy burden) to inform their program offerings. Several utilities have a goal for program accessibility, yet often do not have more comprehensive equity-focused goals that would help inform and prioritize resources and program impacts.

Between 2015 and 2019, low-income utility energy efficiency program spending and resulting savings have grown substantially. Overall, about 1.7 million low-income households were served by low-income energy efficiency programs in 2019 compared to about 362,000 in 2015.[4] However, these programs still fall far short of providing equitable access to all income-eligible households, as low-income energy efficiency programs in our database only served an average of 5% of income-eligible households in 2019, and many only receive low-cost measures.

Even though households with income ≤200% of the federal poverty level represent about 27.5% of the U.S. population, low-income utility energy efficiency programs account for only about 13% of the median efficiency program budget. **As it stands, these low-income utility energy efficiency programs are not providing adequate services to low-income communities.** While some utilities are achieving above average low-income savings and enrollment, all utilities can learn from others to continue to improve their program design, implementation, and evaluation to direct greater program benefits to low-income communities.

More low-income energy efficiency program funding is needed to meet the great need for weatherization and energy efficiency upgrades in low-income communities. To provide average program services to all eligible households over 20 years, spending would need to approximately triple; funding for comprehensive services to all households over 20 years would require a funding increase of more than 600%.[5] Funding can be increased through more utility spending and by tapping other funding sources (e.g., affordable housing, health). As part of program expansion, utilities can improve their community engagement to build greater trust and identify how best to design programs to meet their communities' needs.

[4] Our sample includes over 1.7 million households served, but some households participate in more than one program. Most utilities did not break down customers by program and we therefore estimate the number of households served by one or more programs in our executive summary.

[5] Tripling funding would reduce the 57 years to about 19 years. For comprehensive services, a rough estimate is as follows: if $4,000 of services (complementing federal and other funding sources) are provided to 30 million low-income households, $120 billion will be needed over 20 years, an average of $6 billion per year, which is more than six times the funding documented in this report.

This report reviews 97 utilities' electric and natural gas low-income utility program data from 2019 and compares program outcomes to those from ACEEE's previous study of 2015 utility data.[6] This study finds that utilities are generally directing greater resources to their low-income energy efficiency programs and reaching more customers, yet there are still funding and program access gaps. At current program spending rates, for the utilities covered in our report, it would take an average of 57 years to serve all income-eligible households. Furthermore, many of the customers served are receiving only limited services (e.g., direct install measures such as efficient lightbulbs) and not comprehensive weatherization services.

Based on our findings, our recommendations encompass the following areas: program funding, equitable community engagement, program design, and data collection and program evaluation.

Program Funding

- Since about 27.5% of U.S. households have low incomes (≤200% of the federal poverty level), these households should receive at least 27.5% of utility energy efficiency spending for residential energy efficiency programs. Some states such as New York are devoting 35% to 40% of budgets to low-income energy efficiency programs, in line with federal level initiatives such as Justice40 (J40), which seeks to direct 40% of new climate and clean energy investments to communities that are "marginalized, underserved, and overburdened by pollution" (White House 2022).[7] Ideally, budgets should be set at levels that can provide comprehensive services to all income-eligible households over a period of about 20 years (an aggressive but feasible goal). The 20-year goal would cost more than 27.5% of current utility energy efficiency spending and hence would require substantially increased spending as discussed above. In order to equitably serve households who have historically not had access to energy efficiency program resources and address the large backlog of unaddressed needs, program efforts need to steeply ramp up. This will require regulatory support.
- To meet the multiple needs of individual homes, utilities should consider braiding a variety of funding sources in order to provide comprehensive services including weatherization, efficient appliances, and health and safety repairs. Utilities can leverage available health funding resources and design programs so that they can allow for flexibility in energy efficiency program spending to cover needed health and safety repairs that may otherwise defer households from participation in energy

[6] This includes four utilities without spending data and thus differs from the 93 utilities with spending data mentioned earlier.

[7] Investments covered under the J40 initiative include: "climate change (mitigation technology), clean energy and energy efficiency, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure" (White House 2022).

efficiency programs. Other funding sources include the federal Weatherization Assistance Program (WAP) and federal, state, and local affordable housing programs.

Equitable Community Engagement

- To build successful programs and accurately assess the needs and challenges of customers, it is important for utilities to create processes that center and meaningfully engage low-income households, households of color, and other communities that have experienced and continue to experience historic disinvestment, so that they define and drive program outcomes.

Program Design

- Utilities can use best practices to improve low-income energy efficiency program offerings and design to increase program impact by
    - Offering dual-fuel programs wherever possible
    - Creating a single point of contact and one-stop-shop approach that simplifies access and information for eligible households
    - Setting multiple thresholds or definitions for eligibility to streamline enrollment and reach more households
    - Coordinating with other organizations, particularly local community-based organizations, WAP service providers, and bill payment assistance programs on program outreach and delivery
    - Addressing health and safety issues to avoid program deferrals
    - Offering deep saving energy efficiency measures and a variety of measures to best meet participant needs
- To increase energy affordability, reduce energy burdens, and address energy poverty, deeper saving programs are ultimately needed. In order to provide these benefits to most eligible households, programs should steadily serve increasing numbers of households with deep services. Shallow savings programs should be considered an interim, short-term step.
- Utilities can design programs that devote greater resources to disinvested communities, such as communities with higher energy burdens, in order to more equitably address energy insecurity. To do so, utilities will generally need to collect and track data on customer demographics, energy burden, and geographic factors to understand who is best served by their programs (or not being reached and why) and measure their program impacts.

Data Collection and Program Evaluation

- Utilities can improve program evaluation through more comprehensive data collection and tracking efforts that incorporate metrics measuring equitable outcomes. When necessary, utilities may work with regulators and state or local governments to ensure they have the necessary resources and authority to do so.

- As utilities make commitments and set goals for achieving equitable outcomes through their programs, they also need to establish metrics to track their progress and procedures for making adjustments to achieve their goals.

SUGGESTED STAKEHOLDER ROLES

Utilities, regulators, local community groups, and others have unique roles in supporting the implementation of these recommendations.

Utilities can expand their current low-income energy efficiency program offerings by deploying the strategies outlined in this report. Utilities can seek equitable community engagement to ensure that low-income energy efficiency program design, implementation, and evaluation are adjusted based on input from the communities they serve. All utilities can increase their program budgets to better serve low-income households, with budgets preferably increasing to the amount needed to provide all income-eligible households in the utility's service territory with comprehensive weatherization and energy efficiency services over the next 20 years. While comprehensive low-income programs require greater resources than lower-cost direct install programs, utilities are well positioned to provide critical energy-saving services to those most in need.[8] In addition, utilities can improve data collection efforts to ensure they are collecting and tracking data to measure the equitable impacts and outcomes of their low-income energy efficiency programs.

Regulators can require regulated utilities to increase their low-income energy efficiency program budgets to more equitably serve households and can require that utilities track equity data to report on progress towards these goals. They can establish guidelines to help utilities plan their programs (e.g., expectations on number of households served, savings achieved, and/or proportion of total budgets allocated) and can support strong budgets for low-income energy efficiency programs that will enable whole-home retrofits of all eligible households over about a 20-year period.

Local community groups and community leaders can advocate for improved program funding, design, implementation, and evaluation to better address low-income community needs and can work with utilities to help make the programs as successful as possible.

Research organizations, such as ACEEE, can continue to review programs and provide information on trends and best practices.

While utilities have made significant progress on better serving low-income households with energy efficiency programs over the past four years, there are clear steps they can take to improve their programs over the years to come.

[8] Comprehensive low-income programs provide efficiency measures that go beyond direct-install options to address the whole building envelope (Samarripas et al. 2021).

Key Concepts and Definitions

LOW-INCOME

Low-income is a broad term referring to households that qualify for incentives or assistance based on specific income thresholds. Energy efficiency program administrators and utility commissions typically specify income thresholds to determine eligibility for certain incentives and utility, state, and/or federal assistance programs. Eligibility for incentives may vary based on jurisdiction and program design. Thresholds often relate to a certain percentage of the Federal Poverty Level (FPL) or the Area Median Income (AMI). Specific thresholds commonly used are at or below 200% FPL and for 80% of the AMI. This study does not define eligibility thresholds for low-income programs but rather examines all low-income programs according to the definition of income-eligible used by the utility or state.[9] This report uses ≤200% FPL when quantifying households nationally that could be eligible to participate in low-income energy efficiency programs, but it is important to note that thresholds vary by utility. It is also important to note that income represents only one dimension of inequities present in the energy sector, which occur across dimensions like race, disability, age, and immigration status.

DISINVESTED COMMUNITIES

Disinvested communities are those most impacted by community decision making and whose life outcomes are disproportionately affected by social structures (Drehobl 2021). A lack of investment in these communities leads to a worse quality of life for these communities relative to other communities. These groups often include people of color, low-income residents, youth, the elderly, recently arrived immigrants, people with limited English proficiency, people with disabilities, and the unhoused, among others. In some contexts, disinvested communities are referred to as disadvantaged or underserved communities (Drehobl 2021).

ENERGY INSECURITY

Energy insecurity is the inability to adequately meet basic household energy needs (Hernandez 2016). Researchers at Columbia University have identified three dimensions of energy insecurity: economic, physical, and behavioral. These dimensions reinforce one another (Hernandez 2016). For example, a low-income household that lives in a disinvested neighborhood with low-quality housing and energy-inefficient appliances (i.e., a physical dimension), may have a high energy burden (i.e., an economic dimension). This economic hardship, in turn, might lead that household to significantly curtail the use of energy by, for

[9] Although a household might be eligible to participate in a low-income program because they meet income qualification requirements, not all eligible households are able to participate in low-income programs, often due to factors such as poor-quality housing (e.g., health and safety issues that need to be addressed prior to weatherization, among others).

example, not turning on air conditioning during hot weather (i.e., a behavioral dimension), thus creating uncomfortable and unsafe indoor temperatures. Reams (2016) offers a similar, complementary definition of energy/fuel poverty as the "inability of households to afford energy services for adequate heating and cooling resulting in uncomfortable indoor temperatures, material deprivation, and accumulated utility debt."

ENERGY BURDEN

Energy burden is an income-based energy insecurity metric defined as the percentage of household income spent on home energy bills (Drehobl, Ross, and Ayala 2020). The median U.S. household spends 3.1% of annual income on home energy bills. Households that spend 6% or more of annual income are considered energy burdened, while households that spend more than 10% are considered severely burdened. Low-income households are more likely to have high or severe energy burdens. ACEEE's latest energy burdens research shows that two thirds of low-income households (≤200% FPL) have high energy burdens and two in five low-income households are severely energy burdened, spending more than 10% of their income on energy bills. High energy burdens are also more likely to affect Black, Hispanic, and Native American households, as well as renters, older adults, and residents of manufactured housing (Drehobl, Ross, and Ayala 2020).

EQUITY (ENERGY EQUITY)

There is a growing recognition that under the current energy system, certain communities (including low-income households, communities of color, refugees, immigrants, people with disabilities, and others) are systematically excluded from decision-making processes that affect them and force these communities to shoulder the burdens of harmful policies and practices (Hays et al. 2021). Creating a more equitable energy system requires intentional steps to ensure the benefits of energy efficiency and clean energy investments are justly distributed. **To embed energy equity into research and practice and strive for equitable outcomes, ACEEE adapted a framework developed by the Urban Sustainability Directors Network (USDN) that considers four dimensions when developing sustainability-related goals, programs, and policies: procedural, structural, distributional, and transgenerational equity** (Park 2014). This energy equity framework prioritizes greater inclusion in decision making processes, removal of structural barriers, equitable distribution of benefits and burdens, and accounting for the long-term impacts of decisions on future generations. ACEEE considers an equitable energy system as one that institutionalizes accountability for achieving equitable outcomes; embeds authentic community engagement and participation in the development of policies and programs; recognizes and addresses historic and institutional structures that have created past and current inequities; ensures full representation, power, and influence from communities and their advocates in decision making and implementation processes; considers impacts to future generations and avoids imposing burdens on future generations; and achieves a fair distribution of benefits and burdens of the energy system to all communities (Drehobl 2021).

Introduction

This report analyzes ratepayer-funded utility low-income energy efficiency programs from the electric and natural gas utilities that serve the 100 largest metro areas in the country.[1]

Low-income households face significant energy challenges compounded by systemic, physical (infrastructure), and economic conditions, and manifest in a state of energy insecurity, whereby basic household energy needs are inadequately met (Hernandez 2016). Low-income energy efficiency programs can provide additional access and benefits to households who are typically underserved.

Low-income communities and communities of color experience high energy burdens compared to white households (Drehobl and Ross 2016; Drehobl, Ross, and Ayala 2020). Notably, our most recent energy burdens research finds that two-thirds of low-income households, living at ≤200% Federal Poverty Level (FPL), spend more than 6% of their income on energy bills and two out of every five low-income households spend more than 10% of their income on energy bills (Drehobl, Ross, and Ayala 2020).[2] ACEEE's research finds that Black household median energy burdens are 43% higher than non-Hispanic white households, a finding consistent with other research examining the relationship between race and energy insecurity (Drehobl, Ross, and Ayala, 2020; Hernández, Aratani, and Jiang 2014). In addition, high energy burdens can be linked to poor quality housing and inefficient appliances as a result of historic divestment driven by racist policies like redlining and segregation (Drehobl, Ross, and Ayala 2020).[3]

---

[1] Not all low-income energy efficiency programs are funded through ratepayer dollars. At the federal level, non-utility funded programs such as the U.S. Department of Energy's Weatherization Assistance Program (WAP) and the U.S. Department of Health and Human Services' Low-Income Home Energy Assistance Program (LIHEAP) are important sources of funding for energy efficiency investments and comprehensive retrofits in low-income households. States and local governments may also provide funding and support for low-income energy efficiency programs. These programs often work closely with utilities to deliver weatherization measures to low-income households.

[2] Households that spend more than 6% of their income on energy bills are considered to have high energy burdens. Households spending more than 10% of their income on energy bills are considered severely energy burdened. These categories are not mutually exclusive (Drehobl, Ross, and Ayala 2020). Reducing the percent of income spent on utility bills below 6% for low-income households is crucial to achieving energy affordability.

[3] Redlining is a practice that "consists of the systematic denial of services such as mortgages, insurance loans, and other financial services to residents of certain areas, based on their race or ethnicity. Redlining disregards individual's qualifications and creditworthiness to refuse such services, solely based on the residency of those individuals in minority neighborhoods, which were deemed 'hazardous' or 'dangerous.'

Beyond the discriminatory banking practice of excluding certain neighborhoods from financial services, redlining can also reach the withholding of more important and essential services such as the construction of grocery stores and supermarkets or even the withholding of healthcare services (Cornell Law School 2022)." Relatedly, segregation is the "physical separation of the races in residential contexts. It was imposed by legislation, supported by major economic institutions, enshrined in the housing policies of the federal government, enforced by the judicial system, and legitimized by the ideology of white supremacy that was advocated by churches and

High energy burdens can have significant financial and health consequences on individual and community-level wellbeing. High energy bills can lead low-income customers to take out high-interest payday loans, potentially further entrenching them in debt and cycles of poverty (Graff et al. 2022). High energy costs may also lead low-income households to limit their energy consumption to prevent further financial hardship and/or engage in unsafe behavior to maintain comfort, such as using stoves to increase indoor temperatures in the winter rather than using an inefficient heating system that is costly to operate (Hernandez 2016; Cong, Nock, and Qui 2022; U.S. Global Change Research Program 2018). Affordable heating and cooling are well recognized benefits of energy efficiency for low-income households, but this is increasingly becoming a life-or-death situation in the face of a changing climate, rather than an issue of comfort. An estimated 13,000 deaths occur annually in the U.S. from extreme heat and related complications, with low-income groups, people of color, and elderly populations at higher risk of death (Cong, Nock, and Qui 2022; Ebi et al. 2018).

Weatherization upgrades and efficient appliance replacements can substantially address energy insecurity and improve energy affordability for low-income households. Yet without financial assistance, those most in need are unlikely to realize the benefits of energy efficiency. Energy efficiency upgrades that can substantially reduce energy waste, reduce energy burdens, and create health and safety benefits often have high upfront costs that are too costly for low-income households. Moreover, low-income households are more likely to be renters, which also limits their ability to undertake these upgrades (JCHS 2022; Samarripas and Jarrah 2021). Utility programs play a critical role in subsidizing energy-efficiency upgrades that not only lower high energy burdens but also reduce greenhouse gas emissions (GHG), provide health and safety benefits to communities (Hayes, Kubes, and Gerbode 2020), and strengthen the local energy efficiency workforce (Shoemaker, Ayala, and York 2020.)[4]

BACKGROUND AND RESEARCH GOALS

ACEEE's 2017 report *Low-Income Energy Efficiency Programs: A Baseline Assessment of Programs Serving the 51 Largest Cities* analyzed low-income programs offered by 70 electric and natural gas utilities that served the 51 largest metro areas (Drehobl and Castro-Alvarez 2017). The 2017 ACEEE research explored low-income program spending and savings, low-income program participation, measures offered by low-income programs, and best practices for reaching low-income households.

---

other cultural institutions. These institutional policies combined with the efforts of vigilant neighborhood organizations, discrimination on the part of real estate agents and home sellers, and restrictive covenants to limit the housing options of black Americans to the least desirable residential areas (Williams and Collins 2001)."

[4] Greenhouse gas emissions are gases that trap heat in earth's atmosphere. An increase in the atmospheric concentrations of anthropogenic greenhouse gases (man-made, for example through vehicle use or emissions from the built environment) produce a warming effect also known as climate change (EPA 2022a).

This new assessment updates this prior report and benchmarks program spending, savings, and customers served by utility low-income programs. This new report also identifies best practices for improving low-income program impact and briefly explores how programs are making progress toward achieving equitable outcomes. Consistent with our other equity focused research, in this report ACEEE focuses on equity in energy efficiency programs through a framework informed by the Urban Sustainability Directors Network (USDN) that includes four dimensions of equity, including procedural, distributional, structural, and transgenerational equity (Park, 2014).[5] This report provides examples of leading low-income programs to illustrate how utilities can achieve deeper low-income program savings, set equity-centered goals, and serve high numbers of low-income households.

A growing number of utilities have set equity-focused goals for their energy efficiency and clean energy programs, and many are developing new tools and processes to track progress towards these goals (Sierra Club ND). States and public utility commissions (PUCs) are also beginning to incorporate equity metrics and considerations into new clean energy legislation. These regulators play an important role in encouraging utilities to invest in programs that could remove barriers to participation in energy efficiency programs for low-income households, target the specific needs of these households, and create both financial and non-financial benefits (such as health and safety benefits) for low-income communities.

As a part of their larger decarbonization and climate goals, 11 states have proposed or codified legislation requiring utilities to take equity considerations into account for their programs and operations (Draklellis et al. 2022; Farley et al. 2021).[6] Although these considerations are broad and vary by state, many of these efforts emphasize procedural equity by increasing and utilizing inclusive and accessible stakeholder and/or community engagement.[7] Some examples of efforts to increase equitable outcomes in low-income energy efficiency utility programs by focusing on various dimensions of equity (procedural, structural, distributional, and transgenerational) include[8]

- **California**. The California PUC directs utilities to incorporate environmental and social justice objectives into integrated resource planning and establishes equity metrics for energy efficiency programs for customers of regulated utilities.

[5] See "Key Terms" for more information on the dimensions of equity.

[6] Some of these states include California, Colorado, Maryland, Illinois, Massachusetts, New Jersey, New Mexico, New York, Oregon, Virginia, and Washington. For more information on state mandated requirements and goals for low-income utility programs, see our State Policy Database (ACEEE 2022b).

[7] Many of the state efforts cited in Draklellis et al. 2022 use working groups or advisory groups to embed equity considerations into decision making. Creating these groups can enhance procedural equity in decision making and program design.

[8] For more examples see ACEEE's State Policy Database as well as *Supporting Low-Income Energy Efficiency: A Guide for Utility Regulators,* ACEEE 2021. *https://www.aceee.org/toolkit/2021/04/supporting-low-income-energy-efficiency-guide-utility-regulators.*

- **Illinois**. In 2021 the Climate and Equitable Jobs Act (CEJA) significantly increased minimum spending levels for low-income energy efficiency programs and has created robust energy efficiency workforce development programs to increase diversity and inclusion within the clean energy industry (Illinois Commerce Commission 2022).[9]
- **New York**. The Climate Leadership and Community Protection Act (CLCPA) directs that 35–40% of the program's benefits go to historically disadvantaged communities.
- **Maryland**. Legislation sets targets for reducing low-income energy consumption by an average of at least 1% per year through increased investment in low-income programs.

Project Scope and Methodology

Data used in this report are from calendar year 2019 unless otherwise indicated. Using 2019 data allows us to compare and measure programs before the COVID-19 pandemic, which introduced many changes and challenges to low-income energy efficiency program spending and outcomes. ACEEE hopes to do a future assessment using 2021 data when these data become available.

This assessment primarily uses data collected for the Energy and Water Utilities chapter in ACEEE's 2021 *City Clean Energy Scorecard* (Samarripas et al. 2021*)*. For the *City Scorecard,* data requests were sent to electric and natural gas utilities (or their energy efficiency program administrators) serving 100 of the largest metro regions in the U.S.[10] The data collected for the 2021 *City Scorecard* look at utilities at the state level, as does this report. Some utilities operate in multiple states and in this report have been treated as two separate utilities (for example, National Grid Massachusetts is counted as a separate utility from National Grid New York). If a utility reported having a low-income program in 2019 as part of the 2021 *City Clean Energy Scorecard* data request, the utility was included in this report.[11]

---

[9] For more information on CEJA see: icc.illinois.gov/programs/climate-and-equitable-jobs-act-implementation. Under CEJA, utilities such as Ameren and ComEd are required to increase spending from $8.3 million a year to $13 million per year, and $25 million per year to $40 million per year, respectively (Goldberg 2021).

[10] Some cities are served by multiple utilities. For the *2021 City Clean Energy Scorecard*, ACEEE included the utility that served the highest number of customers within the metropolitan statistical area. For this report, we did not distinguish between cities, but rather focused on utilities at the state level. One hundred twenty-one utilities were featured in the 2021 *City Scorecard*, but not all had low-income programs or we were not able to confirm low-income program data for some utilities.

[11] Although we include all utilities reporting "yes" to having a low-income program, there are several instances where not all data fields were completed and therefore we did not have the data fields necessary for certain analyses or comparisons. For example, some utilities responded "yes" to having a low-income program but left out their savings or spending data, rendering us unable to compare across spending and saving for the particular utility. Cases where this occurred have been noted in table footnotes or marked as "no data," "N/A," or are blank in table cells. We have at least one of three data points (spending, customers served, savings) for 97 electric and gas utilities. We have data for low-income program spending for 93 gas and electric utilities, customers served data for 94 gas and electric utilities, and data on low-income program savings for 88 utilities.

Using the low-income program data obtained through these data requests and additional research, our sample includes a total of 97 electric and natural gas utilities.[12] Our sample includes 17 dual fuel low-income utility programs. The utilities included in this report are shown in figure 1 (electric utilities), figure 2 (gas utilities), and figure 3 (dual fuel utilities).

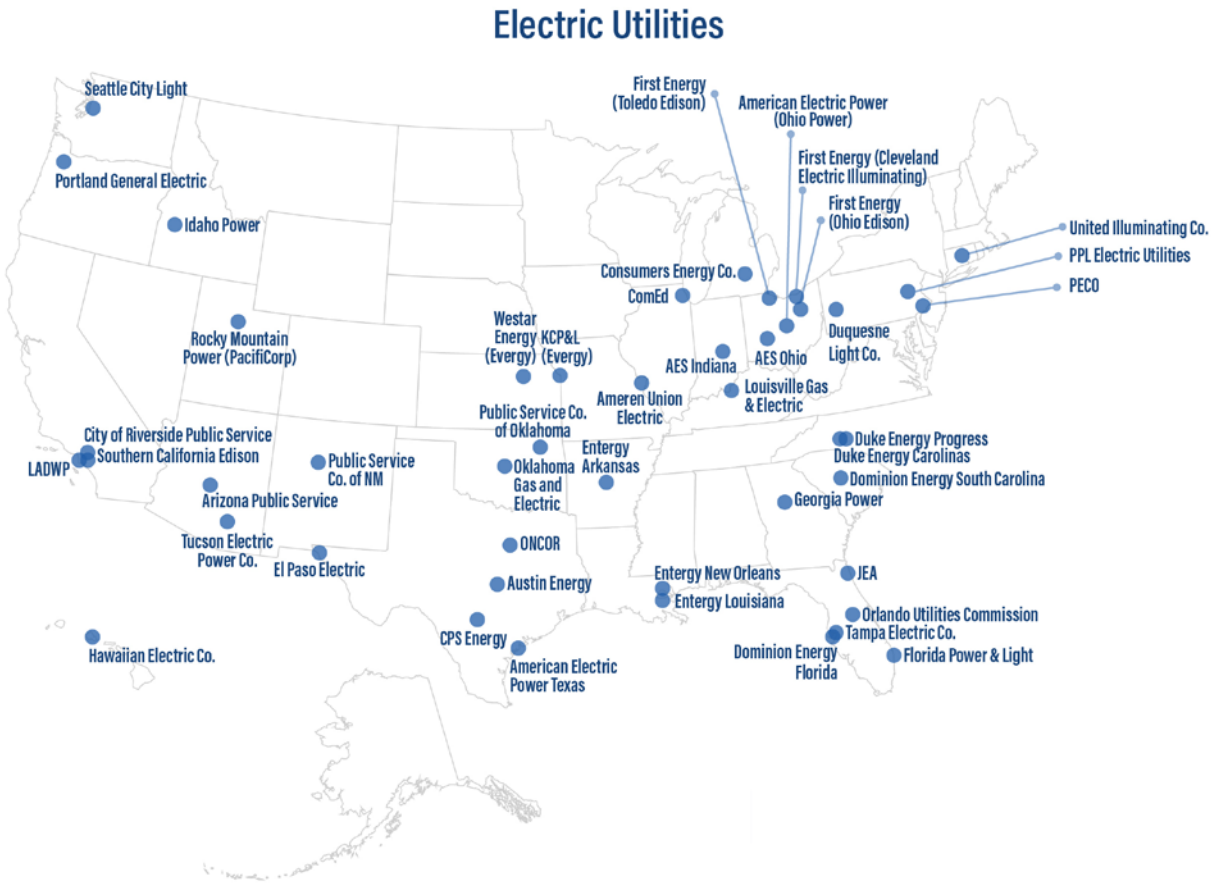


Figure 1. Location of electric utilities included in our report. Some utilities operate in more than one state or city. This map shows the location of utility headquarters.

[12] Dual fuel utilities are utilities that provide both gas and electric services. Not all dual fuel utilities in this sample had dual fuel low-income programs.

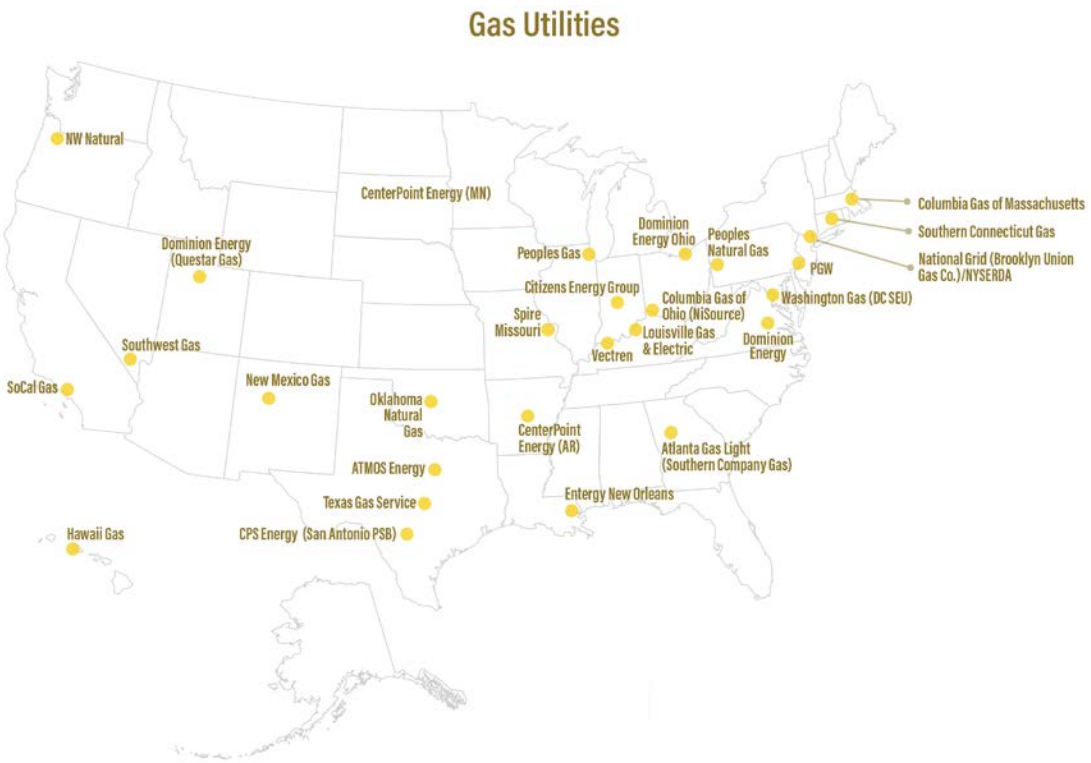


Figure 2. Location of gas utilities included in our report

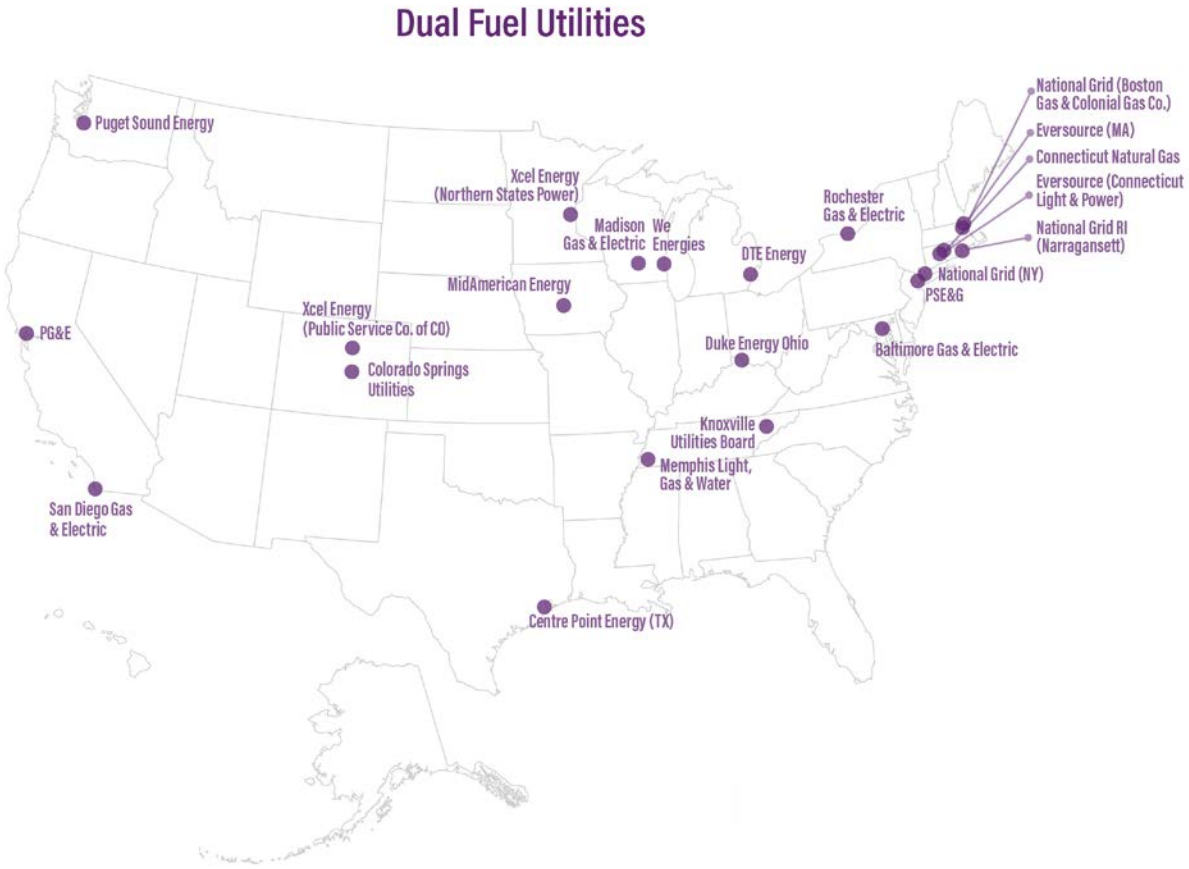


Figure 3. Location of dual fuel utilities included in this report

Since criteria for eligibility of low-income households vary by utility, we defer to each utility's definition of which households qualify as low-income; we do not normalize program definitions. We include details on each utility's definition of low-income households in Appendix A.

Metrics Analyzed

We analyzed low-income utility program data using a variety of metrics. Table 1 includes the metrics analyzed in this report.

Table 1. Data metrics and their purpose

Metric	Purpose
Total low-income utility program spending	Measures the total spending across utilities and allows for identification of utilities who spend the most on their low-income customers
Low-income program spending as a percentage of energy efficiency spending	Allows for comparisons across utilities of different sizes and assesses whether low-income programs are receiving a fair share of spending relative to overall utility spending
Low-income program spending per low-income participant	Normalizes spending based on low-income customer base and provides an indication of how deep the savings are per household
Spending per low-income eligible customer	Normalizes spending based on low-income customer base and identifies total spending compared to the need for low-income programs
Low-income program participation	Compiles totals and identifies utilities serving the most low-income customers
Low-income program participation as a percentage of low-income eligible customers	Normalizes low-income program participation based on utility size and the low-income customer need
Total low-income program energy savings	Compiles electric and/or natural gas low-income program savings totals and identifies utilities saving the most
Low-income energy savings per participant	Normalizes electric and/or natural gas low-income program savings by utility and program size and assesses the depth of savings
Low-income energy savings as a percentage of low-income customer energy consumption	Normalizes electric and/or natural gas low-income program savings by utility and program size and assesses savings relative to the low-income savings potential

Metric	Purpose
Low-income energy bill reduction	Translates electric and/or natural gas energy savings into bill reductions using national average energy prices

Study Limitations

This study relies on the data request used for the ACEEE 2021 *City Scorecard* (Samarripas et al. 2021). Where possible, we used demand-side management reports, annual reports, and website information to obtain data that were not provided through the data requests. We were able to verify most of the data provided through the responses, but not all. Details on data that were verified through data request or additional research can be found in Appendix C. Not all low-income programs are tracked and reported on to PUCs separately from non-low-income programs. Therefore, some of the data may underestimate totals and savings associated with a utility's low-income energy efficiency programs. We reached out to 57 utilities to verify data where we had questions and excluded utility data that we did not have or could not verify.

Low-Income Program Eligibility and Enrollment

Key Takeaway: A variety of metrics are used to determine eligibility for low-income programs, and the most common is an income threshold of ≤ 200% of the federal poverty level (FPL). Some utilities use multiple ways to qualify low-income customers, including participation in the Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps) or other low-income federal assistance programs, which streamlines enrollment for low-income households.

This section examines what criteria utilities use to determine eligibility for low-income utility energy efficiency programs. Of the 97 gas and electric utilities included in this report, the majority (78%) use ≤200% FPL as their low-income program threshold. The various criteria and characteristics used for eligibility in low-income utility energy efficiency programs are summarized in table 2.

Table 2. Low-income program thresholds used by utilities covered in this report

Low-income program threshold or qualification	Description
Federal poverty level	Below or at 200% of FPL. This threshold is also used for federal programs such as LIHEAP and WAP.[13]
Area median income	Varies by utility but typically 60–80% of median incomes of a given area adjusted for family size.[14]
Qualifying for other assistance programs and streamlining enrollment through partnerships or shared definitions	Some utilities identify customers through other agencies or programs; for example, if a customer qualifies for LIHEAP.

A notable practice for program eligibility among utilities in this report is to work with other agencies to streamline enrollment. Streamlining enrollments reduces administrative burdens for utilities and makes it easier for low-income households to participate in multiple assistance programs by borrowing definitions. For example, if a household is eligible for SNAP, this will automatically make the customer eligible for some utilities' low-income energy efficiency programs. Of the utilities in this report, 21% streamline enrollment by coordinating with other programs.

Prioritizing Customers Based on Energy Burden

Several states identify and prioritize reaching households with high energy burdens in their state weatherization programs and some are requiring utilities to also take steps to ensure customers with high energy burdens are being identified and served by low-income energy efficiency programs.[15] For example, Wisconsin's Public Service Commission now requires the state's seven largest utilities to track energy burdens, with the goal of developing policies and programs to assist low-income households experiencing high energy burdens (Citizens Utility Board of Wisconsin 2021).

This approach is a promising path to alleviating energy burdens for low-income customers. However, identifying neighborhoods and households with high energy burdens can be difficult and time consuming, especially for utilities that have not tracked such data in the past or have limited staff and financial resources for conducting an energy burden analysis of their service territories. Moreover, data and privacy challenges may prevent utilities from targeting/identifying specific households by using energy burden indicators. Utilities can advocate and collaborate with regulators and governments to ensure they have the necessary resources and authority to use data to target households and can collaborate with

[13] Low Income Home Energy Assistance Program (LIHEAP) is a federal utility bill assistance program.

[14] While area median income varies locally, on a national basis, 60% of median income is very similar to 200% of FPL (details discussed later in this report).

[15] Energy burden has been an allowable priority for WAP grantees for many years.

community organizations to shape data approaches based on community values. Granular data on energy burdens (data at the household level) may be difficult to collect. However, some utilities such as Ameren Missouri, DTE Energy, JEA, and Tampa Electric Co. use census tract level data to identify neighborhoods that would qualify for their low-income programs. Eversource (MA) uses census tracts for marketing their low-income programs. Duquesne Light Company partners with a third-party contractor to help identify customers who are experiencing high energy burdens (S. Walker, Clean Energy Advisor Duquesne Light Company, pers. comm., August 26, 2022).

Low-Income Energy Efficiency Program Spending

Utility spending on low-income programs varies widely and key factors affecting spending are discussed in the following section. Utility low-income program spending captures the size/scale of the financial resources that utilities dedicate to low-income energy efficiency programs.[16] We analyze total spending by utility on low-income energy efficiency programs in 2019 compared to 2015 spending. We also analyze 2019 spending per participating low-income customer to normalize utility spending relative to utility and program size, and spending per eligible low-income program participant to examine spending relative to the total need in a utility service area.[17]

TOTAL SPENDING ON LOW-INCOME PROGRAMS

Key Takeaways: Total spending across the 93 low-income utility programs for which we had data totaled $936 million in 2019. Spending is up overall for utilities included in both our 2019 and 2015 database.

In 2019 spending on low-income energy efficiency programs by electric and gas utilities in our sample was about $571 million and $365 million respectively, for a total of about $936 million. This includes a total of 57 electric utilities and 36 gas utilities for which we had spending data (dual-fuel utilities are counted under both electric and gas).[18] Utilities with the highest spending are large utilities (by service territory and customer base). The electric utility that spent the most on low-income energy efficiency programs in 2019 was Pacific Gas & Electric (PG&E) followed by Southern California Edison and Commonwealth Edison

[16] Some utilities have more than one low-income program which may also target specific groups such as elderly low-income customers or residents of manufactured homes, for example.

[17] As we note, most low-income programs included in this report use 200% of the FPL for determining program eligibility. Given its frequent use, we use 200% of the FPL to examine spending per eligible low-income program participant.

[18] $571,078,303 total low-income program electric spending in 2019, $365,028,795 total gas low-income program spending, $936,107,098 total for both natural gas and electric utilities. This data includes dual fuel program spending.

(ComEd). The gas utility that spent most on low-income energy efficiency programs in 2019 was Southern California Gas followed by PG&E and National Grid (MA).

We have included additional utilities in this report that were not included in the report on 2015 data—97 utilities for 2019 and 75 for 2015 (2015 data from Drehobl and Castro-Alvarez 2017). Almost all utilities that were included in our first report are included in our current report.[19] To compare changes in spending since our last report, we analyzed average total spending for low-income programs in 2019 and 2015 using the same utilities for direct comparison. For electric spending, the average spending in 2015 was $8,226,865. In 2019, these same electric utilities spent an average of $9,592,635. After adjusting for inflation, these utilities spent about 8% more on low-income programs in 2019 compared to 2015.[20] For gas utilities, the average spending in 2015 was $7,574,899. In 2019 these same gas utilities spent an average of $14,380,244. After adjusting for inflation, these utilities spent about 77% more on low-income programs in 2019 compared to 2015.[21]

LOW-INCOME PROGRAM SPENDING AS A PERCENTAGE OF TOTAL ENERGY EFFICIENCY SPENDING

Key Takeaways: In 2019 low-income program spending by individual utilities ranged from about 0.2% of energy efficiency spending to over 70% of total spending, with a median of about 13% of program spending for both gas and electric utilities. This is significantly less than the approximately 27.5% of U.S. households that are low-income, indicating that for many utilities, low-income communities are not receiving an equitable share of funding.

One way to measure efforts to serve low-income customers is low-income program spending as a percentage of total energy efficiency spending. This metric shows the prominence of low-income programs in the overall portfolio and is also one way to account for utility differences in size (service territory and customers served). This measure was not analyzed in our last report.

Using this metric, we found that in 2019 low-income program spending by individual utilities ranged from just over 0.2% to over 70% of total low-income program spending, with a median of about 12% of program spending for the electric utilities providing spending data and 13% for the gas utilities. Data on utility spending on low-income programs relative to

[19] Utilities that were included in our 2015 report but not in our 2019 report include Laclede Gas and Missouri Gas. Details on the data available for comparison in this current study can be found in Appendix B2.

[20] According to the U.S. Bureau of Labor Statistics, $8,226,865 in 2015 is the equivalent of about $8,844,499 in 2019. *www.bls.gov/data/inflation_calculator.htm*. July was selected as the month in the inflation calculator for all metrics that require accounting for inflation.

[21] According to the U.S. Bureau of Labor Statistics, $7,574,899.00 in 2015 is the equivalent of about $8,143,5868 in 2019. *www.bls.gov/data/inflation_calculator.htm*. July was selected as the month in the inflation calculator for all metrics that require accounting for inflation.

total energy efficiency spending for utilities that are above average on this metric are listed in table 3.

Table 3. Low-income program spending as a percent of total energy efficiency spending (over 15%)

Utility	State	Fuel	2019 low-income spending	2019 total EE spending	Low-income as % of total spending[22]
PG&E	CA	Gas	$50,711,276	$69,359,099	73.1%
Rochester Gas & Electric	NY	Gas	$11,458,307.11	$15,821,691	72.42%
National Grid (NY)	NY	Gas	$28,765,352	$41,147,401	69.9%
Dominion Energy Ohio	OH	Gas	$6,786,397	$10,548,398	64.3%
CPS Energy (City of San Antonio)	TX	Elec	$20,095,988.00	$32,114,907	62.6%
We Energies	WI	Gas	$8,492,824	$16,837,354	50.4%
PG&E	CA	Elec	$96,478,592.00	$219,637,147	43.9%
PSE&G	NJ	Gas	$8,490,000	$19,625,308	43.3%
National Fuel Gas	NY	Gas	$10,046,354	$25,303,270	39.7%
Peoples Gas	IL	Gas	$9,232,823	$23,434,030	39.4%
Columbia Gas of Ohio (NiSource)	OH	Gas	$11,283,698	$29,559,487	38.2%
TVA	TN	Elec	$9,950,000.00	$27,441,184	36.3%
Washington Gas (DC SEU)	DC	Gas	$1,306,889	$3,895,400	33.5%
Southern California Edison	CA	Elec	$78,613,898.00	$239,597,000	32.8%
We Energies	WI	Elec	$18,585,494.00	$58,016,045	32.0%
Connecticut Natural Gas	CT	Gas	$4,515,924	$14,185,295	31.8%
Rochester Gas & Electric	NY	Elec	$11,458,307.11	$38,057,615	30.1%
Austin Energy	TX	Elec	$4,266,908.00	$14,699,000	29.0%
DTE Energy	MI	Gas	$8,371,838	$29,457,955	28.4%
SMUD	CA	Elec	$10,320,184.00	$36,459,000	28.3%
New Mexico Gas	NM	Gas	$1,765,000	$6,390,426	27.6%

[22] Several utilities in our report spent over 100% on this metric, either because of data errors or because they can access other funds besides energy efficiency funds for their low-income programs. We were not clear which utilities fall into which category and therefore do not include any utilities over 100% in this table. Utilities that scored above 100% include: Rochester Gas & Electric (Gas), SoCal Gas, San Diego Gas & Electric (Gas), and Knoxville Utilities Board (Gas).

Utility	State	Fuel	2019 low-income spending	2019 total EE spending	Low-income as % of total spending[22]
Baltimore Gas & Electric	MD	Gas	$4,142,895	$15,341,552	27.0%
Xcel Energy (Public Service Co. of CO)	CO	Gas	$3,863,558	$14,471,991	26.7%
Spire Missouri	MO	Gas	$1,510,734	$6,397,222	23.6%
Southern Connecticut Gas	CT	Gas	$3,049,996	$13,089,459	23.3%
National Grid RI (Narragansett)	RI	Gas	$6,919,900	$30,141,700	23.0%
Eversource (MA)	MA	Gas	$11,181,028	$52,666,653	21.2%
National Grid (Boston Gas & Colonial Gas Co.)	MA	Gas	$32,021,931	$152,646,150	21.0%
PECO	PA	Elec	$7,969,000.00	$38,889,000	20.5%
PSE&G	NJ	Elec	$5,660,000.00	$28,714,000	19.7%
PPL Electric Utilities	PA	Elec	$9,946,000.00	$55,911,000	17.8%
MidAmerican Energy	IA	Gas	$1,750,382	$10,924,654	16.0%
Dominion Virginia Power	VA	Elec	$4,050,714.00	$25,802,000	15.7%
San Diego Gas & Electric	CA	Elec	$9,610,143.00	$62,756,000	15.3%

A total of 24 utilities in our sample spent more than 25% of their energy efficiency budgets on low-income programs including 7 at 50% or more. These include utilities with large efficiency programs and a large commitment to low-income programs (e.g., PG&E for gas) as well as some utilities with more modest efficiency programs but with an emphasis on low-income programs (e.g., Nashville Electric Service). Utilities in this latter category can generally do more on energy efficiency, both for low-income and other customers. Thus, this metric should not be looked at in isolation but considered in the context of the many metrics we examine in this report, including number of customers served.

To put these numbers in perspective, in 2021 27.5% of the U.S. population lived in households with income below or at 200% of FPL (Census Bureau 2022). For low-to-moderate income (LMI) customers to equitably reap the benefits of energy efficiency investments, these households and their communities (including businesses in these communities) should receive at least 27.5% of total spending.[23]

Some states as well as the federal government have set policies specifying what percentage of program spending should target low-income customers. For example, New York State has

[23] We did not collect data on utility energy efficiency spending to benefit businesses in low-income communities. Such spending would also contribute towards a 27.5% of spending target.

legislated that at least 35% of energy efficiency spending should benefit low-income consumers, with a goal of reaching 40% by 2050 (NYSERDA 2022). This goal mirrors the federal government's—an initiative known as the Justice40 (J40) initiative—that at least 40% of new federal spending on climate and clean energy should reach and benefit low-income communities (White House 2022).

In our sample, 66 utilities spent less than 27.5% of their total energy efficiency spending on residential low-income programs, ranging from 27% to less than 1%. We find that most utilities (70% in our sample) did not spend 27.5%, let alone 40%, of their budgets on low-income programs and would need to significantly increase investment in programs and partnerships to reach these levels.

We also analyzed spending per low-income participant, and spending per low-income eligible customer. These metrics normalize for utility size and help us to assess spending relative to need.

SPENDING PER LOW-INCOME PARTICIPANT

Key Takeaway: Spending per program participant averaged $2,059 in 2019.[24] These averages mask that there are often two types of programs—comprehensive programs that often spend more than $4,000 per participant and low-cost programs that generally spend less than $500 per participant. Both approaches are useful, with the former providing large benefits to participating households and the latter serving many more households, but with only modest efficiency benefits.

This metric helps us understand the depth of the program services provided as explained below. Data on spending per participant for utilities spending above $2,000 on this metric are provided in table 4. Spending more per customer would allow for investment in deeper energy savings measures, which could reduce energy burdens for households and reduce energy waste.

Table 4. Spending per low-income program participant

Utility	State	Fuel	2019 low-income spending[25]	2019 customers served	Spending per low-income participant
TVA	TN	Elec	$9,950,000.00	605	$16,446
Tucson Electric Power Co.	AZ	Elec	$641,947.00	74	$8,675
NW Natural	OR	Gas	$1,809,809	260	$6,961
Idaho Power	ID	Elec	$2,261,353.00	326	$6,937

[24] Some of the utilities that we had data for in 2015 did not respond to our data request or we are missing data from other fields to do this analysis using 2019 data, so a direct comparison of spending per participant using 2015 versus 2019 data is not included.

[25] Details on program offerings can be found in the Appendix.

Utility	State	Fuel	2019 low-income spending[25]	2019 customers served	Spending per low-income participant
We Energies	WI	Elec	$18,585,494.00	2,954	$6,292
Portland General Electric	OR	Elec	$5,335,564.00	856	$6,233
Columbia Gas of Ohio (NiSource)	OH	Gas	$11,283,698	1,938	$5,822
CPS Energy (City of San Antonio)	TX	Elec	$20,095,988.00	3,727	$5,392
National Grid (Boston Gas & Colonial Gas Co.)	MA	Gas	$32,021,931	6,621	$4,836
Citizens Energy Group	IN	Gas	$114,123	26	$4,389
National Grid (NY)	NY	Gas	$28,765,352	6,621	$4,345
National Grid (NY)	NY	Elec	$28,765,351.58	6,621	$4,345
Rochester Gas & Electric	NY	Gas	$11,458,307.11	2,664	$4,301
Rochester Gas & Electric	NY	Elec	$11,458,307.11	2,664	$4,301
Dominion Energy Ohio	OH	Gas	$6,786,397	1,579	$4,298
Eversource (MA)	MA	Gas	$11,181,028	2,763	$4,047
Ameren UE (Union Electric)	MO	Elec	$5,455,000.00	1,368	$3,988
National Fuel Gas	NY	Gas	$10,046,354	2,579	$3,895
Baltimore Gas & Electric Co.	MD	Elec	$9,974,457.00	2571	$3,880
PSE&G	NJ	Gas	$8,490,000	2,298	$3,695
National Grid (MA)	MA	Elec	$33,370,919.00	9,259	$3,604
National Grid (Brooklyn Union Gas Co.)/NYSERDA	NY	Gas	$7,793,439	2,305	$3,381
ConEdison	NY	Elec	$7,793,439.18	2,305	$3,381
Atlanta Gas Light (Southern Company Gas)	GA	Gas	$694,235	220	$3,156
Knoxville Utilities Board	TN	Gas	$701,667	234	$2,996
National Grid RI (Narragansett)	RI	Gas	$6,919,900	2,685	$2,577
Colorado Springs Utilities	CO	Gas	$484,308	222	$2,182
PSE&G	NJ	Elec	$5,660,000.00	2,684	$2,109
Xcel Energy (Northern States Power)	MN	Gas	$1,548,353	759	$2,040
Eversource (MA)	MA	Elec	$32,043,930.00	15,825	$2,025
National Grid RI (Narragansett)	RI	Elec	$12,595,100.00	6,229	$2,022

***Tennessee Valley Authority is a wholesale electricity provider that serves many municipal utilities, three of which are included in our study: Knoxville Utilities Board, Memphis Light, Gas & Water and Nashville Electric service. Spending reported for TVA includes all power companies that work with TVA.**

In 2019, the average spending per customer for all of the programs in our database (including additional utilities not included in our previous report) was $2,059, with an average of $1,986 for electric utilities and $2,173 for gas utilities. The programs with the highest spending per customer provided whole-building retrofits to their low-income customers.

Program Strategies: High Participation versus Deep Savings

There are a variety of approaches for serving low-income customers, ranging from low-cost programs that serve many participants and emphasize lighting and low-cost kits, to programs that provide comprehensive home retrofits at much higher cost and serve fewer households with deeper savings. As noted throughout this report, some utilities emphasize serving many customers. For example, ComEd takes this approach and in 2019 achieved impressive participation and overall savings (both discussed in subsequent sections). TVA takes the opposite approach, emphasizing comprehensive retrofits at a cost of about $10,000 per home. Many utilities offer multiple programs, some emphasizing shallow savings and others emphasizing deep savings. The data we collected are at the utility level and not the program level, so we cannot provide data on how common each approach is. Utilities decide which approach is best to meet their goals. Shallow savings to many customers provide some initial benefits to these customers and tend to be lower cost per customer and per unit of energy saved. More comprehensive energy efficiency programs with deep energy savings have much more impact on household energy burdens as well as health and home comfort. **If the goal is to lower energy burden and increase equitable energy efficiency spending and program impact, then deeper savings programs are ultimately needed. In order to ultimately provide these benefits to most eligible households, programs should steadily serve increasing numbers of households with deep services.** Shallow savings programs should be considered an interim, short-term step.

SPENDING PER LOW-INCOME ELIGIBLE CUSTOMER

Key Takeaway: Average spending per income eligible customer in our sample is $36 across both gas and electric utilities. At this rate it will take 57 years to serve all customers given the average program spending per participant we found of $2,059.

Most low-income utility programs do not serve all customers in need. Much of this is due to limited budgets and staffing to deliver programs as well as barriers to participation, which we discuss in later sections. In this section, we examine low-income program spending in 2019 relative to our estimated number of low-income customers in a utility service area.[26]

[26] It is important to note that this is not the same as eligible customer base. Some low-income households may not qualify for energy efficiency programs due to a variety of factors (e.g., quality of home, renters, already participated, immigration status, etc.).

This analysis helps us to assess how much of the total potential need is being met by utility low-income programs. Utilities did not provide data on the number of low-income households eligible for their low-income programs. We therefore estimated the number using Energy Information Administration (EIA) and Census Bureau data.[27]

Using the average spending per participant of $2,059 in the previous section, this metric provides a window into how program spending compares to overall need. In our sample, spending per eligible low-income customer ranged from $0.24 to $188 with an average of $35.89 and a median of $19.45. The average spending per eligible customer for electric utilities in 2019 was $34.40. For gas programs in 2019, the average spending per eligible customer was $38.35. Table 7 includes details for average spending per eligible low-income customers across both electric and natural gas utilities. We list utilities that spent at least $20 per eligible customer in 2019.

These figures also illustrate how current programs are only meeting a small fraction of existing need. As a rough gauge, if we take average spending per participant ($2,059) and divide by average spending per eligible customer ($36), we find that it will take an average of 57 years to serve all eligible customers at the level of the average program. And even for our top-spending program, National Grid (Boston Gas & Colonial Gas Co.) with $188 per eligible customer, it will take nearly 11 years.

[27] We estimated the number of LMI households for each utility by taking their total number of residential customers (as reported to the Energy Information Administration in form EIA-861, 2019) and multiplying by the LMI proportion of households in their state, using data from the U.S. Census Bureau, which defines LMI as 200% of the federal poverty level (Census Bureau 2020).

Table 5. Low-income program spending per eligible customer

Utility	Fuel	2019 LI spending	Number of residential customers	Percent below 200% FPL[37]	Estimated number of low-income customers	2019 customers served	Spending per LI participant
National Grid (Boston Gas & Colonial Gas Co.)	Gas	$32,021,931	654,117	26.00%	170,070	6,621	$188
Eversource (MA)	Gas	$11,181,028	269,509	26.00%	70,072	2,763	$159
Rochester Gas & Electric	Gas	$11,458,307.11	341,658	23.30%	79,606	2,664	$143
Rochester Gas & Electric	Elec	$11,458,307.11	341,658	23.30%	79,606	2,664	$143
National Grid RI (Narragansett)	Elec	$12,595,100.00	437,964	21.70%	95,038	6,229	$132
Nashville Electric Service	Elec	$9,950,000.00	365,555	20.60%	75,304	258	$132
CPS Energy (City of San Antonio)	Elec	$20,095,988.00	759,772	20.50%	155,753	3,727	$129
National Grid (MA)	Elec	$33,370,919.00	1,158,014	26.00%	301,084	9,259	$110
We Energies	Elec	$18,585,494.00	1,019,025	17.20%	175,272	2,954	$106
Eversource (MA)	Elec	$32,043,930.00	1,239,884	26.00%	322,370	15,825	$99

[37] These percentages represent the percentage of low-income households at the state level. If a utility operates in multiple territories, we examined them separately. For example, National Grid operates in both New York and Massachusetts and therefore National Grid (NY) has an associated low-income percentage of 23.3% and National Grid (MA) has an associated low-income percentage of 26%

Utility	Fuel	2019 LI spending	Number of residential customers	Percent below 200% FPL[37]	Estimated number of low-income customers	2019 customers served	Spending per LI participant
Connecticut Natural Gas	Gas	$4,515,924	165,596	31.10%	51,500	5,785	$87
National Fuel Gas	Gas	$10,046,354	500,788	23.30%	116,684	2,579	$86
National Grid RI (Narragansett)	Gas	$6,919,900	437,964	21.70%	95,038	2,685	$72
National Grid (NY)	Gas	$28,765,352	1,794,304	23.30%	418,073	6,621	$68
National Grid (NY)	Elec	$28,765,351.58	1,794,304	23.30%	418,073	6,621	$68
PG&E	Elec	$96,478,592.00	4,845,482	33.60%	1,628,082	196,573	$59
SoCal Gas	Gas	$111,539,060	5,607,689	33.60%	1,884,184	122,037	$59
SMUD	Elec	$10,320,184.00	5,62,578	33.60%	189,026	6,657	$54
Southern Connecticut Gas	Gas	$3,049,996	180,556	31.10%	56,153	5,314	$54
TVA	Elec	$9,950,000.00	918,630	20.60%	189,238	605	$52
Southern California Edison	Elec	$78,613,898.00	4,489,462	33.60%	1,508,459	95,397	$52
Knoxville Utilities Board	Elec	$1,821,667.00	181,304	20.60%	37,349	234	$48
We Energies	Gas	$8,492,824	1,019,025	17.20%	175,272	4,347	$48
Austin Energy	Elec	$4,266,908.00	446,898	20.50%	91,614	4,356	$46
United Illuminating Co.	Elec	$4,180,741.00	304,670	31.10%	94,752	6,521	$44

Utility	Fuel	2019 LI spending	Number of residential customers	Percent below 200% FPL[37]	Estimated number of low-income customers	2019 customers served	Spending per LI participant
ComEd	Elec	$45,310,943.00	3,657,896	28.90%	1,057,132	615,114	$42
Peoples Gas	Gas	$9,232,823	8,13,917	28.90%	235,222	6,258	$39
Columbia Gas of Ohio (NiSource)	Gas	$11,283,698	1,337,871	22.90%	306,372	1,938	$36
PPL Electric Utilities	Elec	$9,946,000.00	1,265,281	22.10%	279,627	29,394	$35
Seattle City Light	Elec	$2,689,075.00	419,601	18.70%	78,465	2,359	$34
Public Service Co. of Oklahoma	Elec	$3,659,104.00	479,194	22.90%	109,735	2,048	$33.
LADWP	Elec	$15,014,391.00	1,349,209	33.60%	453,334	14,573	$33
Baltimore Gas & Electric Co.	Elec	$9,974,457.00	1,172,806	26.40%	309620.784	2571	$32
El Paso Electric	Elec	$571,016.00	88,405	20.50%	18,123	1,420	$31
Entergy New Orleans	Elec	$1,560,964.00	183,618	27.00%	49,577	830	$31
PG&E	Gas	$50,711,276	4,845,482	33.60%	1,628,082	106,573	$31
Portland General Electric	Elec	$5,335,564.00	7,79,673	22.20%	173,087	856	$30
Washington Gas (DC SEU)	Gas	$1,306,889	154,375	30.80%	47,548	1,022	$27
DTE Energy	Elec	$13,783,082.00	2,003,653	25.40%	508,928	86,985	$27
Dominion Energy Ohio	Gas	$6,786,397	1,115,280	22.90%	255,399	1,579	$26

Utility	Fuel	2019 LI spending	Number of residential customers	Percent below 200% FPL[37]	Estimated number of low-income customers	2019 customers served	Spending per LI participant
PEPCO	Elec	$2,158,763.00	282,277	30.80%	86,941	4,103	$24
PECO	Elec	$7,969,000.00	1,488,143	22.10%	328,880	14,536	$24
San Diego Gas & Electric	Elec	$9,610,143.00	1,306,318	33.60%	438,923	16,271	$21
Ameren UE (Union Electric)	Elec	$5,455,000.00	1,066,035	24.30%	259,047	1,368	$21

Comparison of 2019 and 2015 Spending Per Low-Income Eligible Customer

In 2015, the five highest and lowest electric and gas utilities ranked on spending for low-income energy efficiency programs per eligible customer ranged from $62–92 per participant. The top utilities in table 4 are generally higher. Many of the leaders in 2015 are also leaders in 2019, with most increasing their spending per customer.

Low-Income Program Participation

Key Takeaway: The programs in our sample served over 1.7 million low-income customers in 2019, ranging from programs that provided low-cost measures such as lightbulbs to programs emphasizing comprehensive home retrofits.

The total number of participants across our electric and gas utility samples is over 1.7 million customers. This includes some households that participated in more than one program. Table 6 includes the six utilities that served more than 50,000 participants.[38] In interpreting this information, please note that these utilities often achieve high participation numbers with low-cost measures, supplemented with lower participation for more comprehensive services. For example, Commonwealth Edison reports 1,417,675 light bulbs distributed through several light bulb programs, 2,183 comprehensive weatherization recipients, and an additional 12,724 participants in special programs such as construction of new affordable housing. For light bulbs, we estimate the number of participants by assuming an average of six lightbulbs per participant.[39] To put lightbulbs in perspective, if a household replaces 6 lightbulbs, the annual electric bill savings will be about $52.[40] To make a more meaningful difference in a family's finances (and in GHG emissions), deeper measures like weatherization and appliance upgrades are needed.

Table 6. Utilities with more than 50,000 participants in their low-income programs in 2019

Utility	Fuel	Number of residential customers (EIA)	Number of participants 2019
ComEd	Elec	3,657,896	615,114
PG&E	Elec	2,003,653	196,573
DTE Energy	Gas	5,607,689	122,426

[38] Detroit Edison is listed twice, once each for electric and gas.

[39] This number is based on an estimate provided by ComEd during data verification when asked about the average number of lightbulbs provided to low-income customers.

[40] If the old lightbulb averages 75 watts and the new bulb 15 watts, and each lamp operates an average of three hours per day, at the 2020 national average electricity price of $0.1315 per kWh, each lightbulb replaced will save $8.64 ((75-15)*3*365 days/year/1000 watts/kilowatt*$0.1315).

Utility	Fuel	Number of residential customers (EIA)	Number of participants 2019
SoCal Gas	Gas	4,845,482	122,037
PG&E	Gas	4,489,462	106,573
Southern California Edison	Elec	2,003,653	95,397
DTE Energy	Elec	5,607,689	86,985

All of these are large utilities (more than 2 million customers) located in states that have legislative requirements supporting energy efficiency and low-income efficiency programs in particular, as previously discussed. ComEd distributed a very large number of light bulbs via food banks and discounts at stores; bulbs alone were about 60% of their 2019 low-income savings (M. Catlett, Manager, Data Management & Reporting, Commonwealth Edison, pers. comm., July 28, 2022).

PARTICIPANTS AS A PERCENTAGE OF INCOME ELIGIBLE HOUSEHOLDS

Key Takeaway: The average program provided services in 2019 to 5% of eligible customers, but some programs served a higher percentage—up to 57% in the case of a utility with a wide-ranging lightbulb program.

In this section, we normalize total participants by low-income participation to compare smaller utilities more effectively to larger ones. To do this we calculated a participation rate that looks at the number of participants in low-income programs in 2019 as a percentage of our estimate of all low-income customers (income ≤ 200% of FPL) in their territories.

By this metric, low-income household participation as a percentage of total participation ranged from fractions of a percent to as high as 57% (ComEd) with an average participation rate of about 5% and a median rate of 2% among the utilities for which a participation rate could be calculated. Several utilities had participation rates of 5% or more as shown in table 7. Some of these utilities with high low-income participation were noted and discussed previously (Commonwealth Edison (ComEd), Detroit Edison (DTE), and PG&E). Other stand-outs on this metric were Duquesne Light (PA), Mid-American Energy (Iowa), and Connecticut and Southern Connecticut Natural Gas. Unfortunately, two of these utilities (Mid-American and Duke Ohio, have scaled back their energy efficiency efforts since 2019 due to new directives from their legislatures to redirect energy efficiency budgets to other uses (Kushler 2018; Gilleo 2019).

Table 7. Participation rate in low-income programs (participants as a percentage of income eligible customers)

Utility	Fuel	#Partic, 2019	Est. # ≤200% FPL	Participation rate
ComEd	Elec	1,057,132	615,114	57.0%
DTE Energy	Gas	508,928	122,426	24.1%
DTE Energy	Elec	508,928	86,985	17.1%
Duquesne Light Co.	Elec	120,157	18,695	15.6%
Public Service Co. of NM	Elec	110,433	16,234	14.7%
PG&E	Elec	1,628,082	196,573	12.1%
Connecticut Natural Gas	Gas	51,500	5,785	11.2%
PPL Electric Utilities	Elec	279,627	29,394	10.5%
MidAmerican Energy	Elec	168,230	16,436	9.8%
Southern Connecticut Gas	Gas	56,153	5,314	9.5%
El Paso Electric	Elec	18,123	1,420	7.8%
Duke Energy Ohio	Elec	147,480	10,709	7.3%
MidAmerican Energy	Gas	168,230	12,169	7.2%
United Illuminating Co.	Elec	94,752	6,521	6.9%
National Grid RI (Narragansett)	Elec	95,038	6,229	6.6%
PG&E	Gas	1,628,082	106,573	6.5%
SoCal Gas	Gas	1,884,184	122,037	6.5%
Southern California Edison	Elec	1,508,459	95,397	6.3%

***In our data request, ComEd provided participation rate through both households served and measures installed. ComEd estimated that an average of six lightbulbs were provided per household.[41]**

Participation rates were not calculated in the 2017 report using 2015 data and therefore comparisons with 2015 cannot be made.

[41] Details on customers served/measures installed for ComEd's portfolio of low-income programs are as follows: Single-Family Retrofits: 2,183 Homes, Multifamily Retrofits: 618, Multifamily Buildings, Affordable Housing New Construction: 10, Projects Completed, Public Housing Authority Program: 12,714 measures installed, Food Bank LED Distribution: 1,879,860 measures distributed, Income Eligible Lighting Discounts: 1,417,675 Bulbs Incentivized, Low Income Kits: 50,000.

Low-Income Program Energy Savings

ELECTRIC UTILITIES

TOTAL SAVINGS

Key Takeaway: The programs in our database have total annual electricity savings of about 650,000 MWh, equivalent to the annual electricity consumption of about 65,000 average U.S. households.

This section details the energy savings achieved by each electric utility's low-income energy efficiency programs.

Our sample includes 58 electric utilities who provided data on their low-income energy savings data. Across these utilities, low-income programs in 2019 saved about 654,000 MWh of electricity (654 GWh). This savings comes from 2019 program participants and does not include energy saved in 2019 from participants in prior-year programs. These electricity savings are equivalent to the average annual electricity consumption of about 65,400 U.S. households.[42] The 10 utilities with the largest savings are listed in table 8.

Table 8. Utilities with the highest MWh savings from 2019 programs

Electric utility	2019 LI savings (MWh)
ComEd	219,829
PG&E	68,481
Southern California Edison	47,430
PECO	35,888
PPL Electric Utilities	28,401
DTE Energy	27,660
Consumers Energy Co.	26,906
Eversource (MA)	18,327
National Grid (MA)	15,646
CPS Energy (City of San Antonio)	14,715

[42] Based on an average household consumption of about 10,000 kWh per year.

ComEd particularly stands out in this table with 220,000 MWh of savings.[43] The utility has a portfolio of programs that combines the distribution of large numbers of lightbulbs with retrofit programs focused on single and multifamily housing as well as affordable housing. ComEd's programs also braid funds for health and safety measures to deliver high savings measures to low-income households. Addressing health and safety issues that prevent low-income households from participating in energy efficiency programs allows for investments in deep energy savings measures. Furthermore, ComEd partners with gas utilities to complete energy efficiency upgrades for low-income households.

Others on this list include several large utilities and programs that we have discussed earlier in this report such as utilities in California and Massachusetts. Also on this list are PECO (which serves the Philadelphia area) and PPL (another Pennsylvania-based utility). The Pennsylvania programs offer free energy audits, energy education, and direct installation of a range of energy efficiency products such as refrigerator replacements. PECO's low-income program includes weatherization, installation of compact fluorescent (CFL) bulbs, health and safety measures, and water efficiency measures. In 2022, Pennsylvania introduced the Whole-Home Repairs legislation (Senate Bill 1135), which seeks to fund health and safety measures to facilitate low-income retrofits in multifamily and single-family buildings (Pennsylvania General Assembly 2022). CPS Energy (which serves San Antonio) offers the Casa Verde weatherization program, which offers LED light bulbs, insulation, air sealing measures, water heater insulation, water efficiency measures, thermostats, and air-conditioning duct system improvements.

Energy Savings Per Participating Customer

Key Takeaway: For programs providing data, the average annual savings is 1,557 kWh, worth $164 at national average energy prices, in addition to other savings related to improved health and other benefits. But many programs save significantly more or less than these averages.

One way to evaluate the impact of low-income energy efficiency programs is to measure average annual energy savings per participating customer.[44] In our data set, annual savings per participating customer ranged from 109 to 5,845 kWh, with an average of 1,557 kWh and a median of 1,019 kWh. To put these figures into perspective, at the national average 2019 residential electricity rate of 10.54 cents per kWh, the average savings is worth $164 per year to a participating household (EIA 2020b).[45] Overall, the top utilities on this metric

[43] This figure includes substantial gas savings that were converted to kWh equivalent—Illinois rules allow and even encourage this.

[44] There are many benefits that arise from increased energy efficiency in low-income households. Energy savings is just one of many. It is important to consider and highlight non-financial benefits such as reduced asthma rates, increased health and safety, and improved thermal comfort.

[45] These values were found using data from the Energy Information Administration www.eia.gov/electricity/state/archive/2019/.

have programs that focus on deep savings measures such as retrofits and weatherization strategies. The distribution in savings per participant is illustrated in figure 4 below.

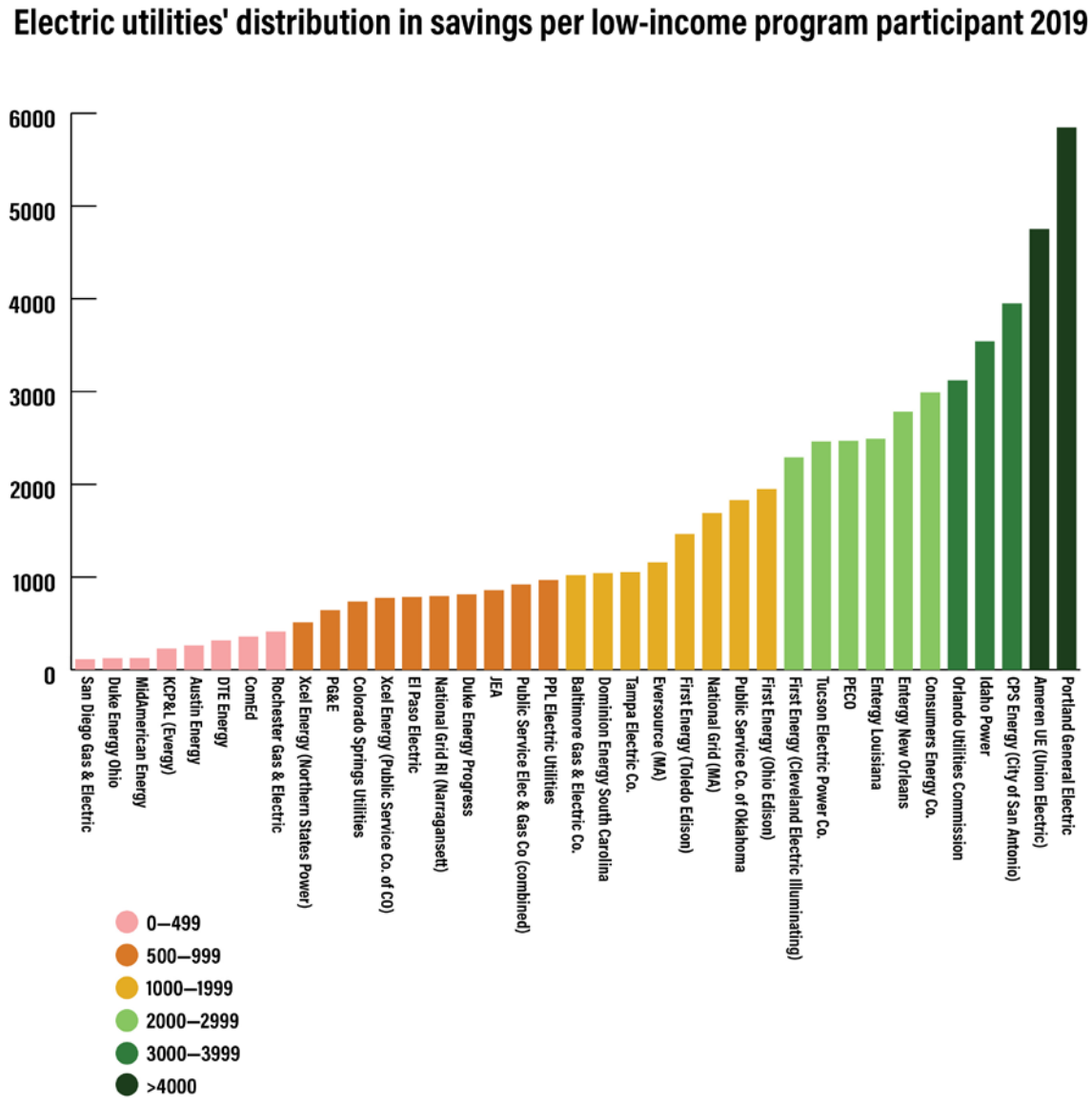


Figure 4. Savings per participant distribution for electric utilities

Savings as a Percentage of Low-Income Electricity Consumption

Key Takeaway: The average low-income program is reducing eligible customer energy use by 0.55%. This percentage is less than the percentage savings for the average utility efficiency portfolio overall, indicating that low-income customers are generally underserved by programs. There are a few notable exceptions to this finding.

Most of the utilities listed in table 8 serve a large number of customers. To normalize and compare utilities of different sizes, we looked at low-income program savings as a percentage of total kWh sales to low-income customers. We estimated this metric by

multiplying total residential consumption by the estimated percentage of customers that are low-income (income ≤ 200% of FPL).[46]

Overall, low-income savings as a percentage of low-income consumption averages about 0.55% for the utilities where we have data to calculate this figure. Nationwide, energy efficiency programs are reducing energy consumption about 0.72% per year (Berg, Cooper, and DiMascio 2022). Low-income customers are achieving less savings and thus on average are being underserved by energy efficiency programs.

However, eight utilities were achieving 0.75% or more savings as a percent of estimated low-income customer consumption. Utilities above 0.5% on this metric are listed in table 9. Savings for low-income programs can be influenced by utility commissions as well as utility equity goals. For example, in states such as Maryland the legislature enacted a bill in 2022 directing that low-income utility programs achieve a goal of 1% annual savings beginning in 2025 (Walton 2022).[47]

Table 9. Low-income program energy savings as a percentage of estimated electricity sales to low-income customers

Electric utility	2019 low-income savings (MWh)	2019 total residential sales (MWh)	Approx. low-income proportion	Low-income savings as % of low-income sales
Austin Energy	1,145	76,323	20.50%	7.32%
ComEd	219,829	26,813,059	28.90%	2.84%
PECO	35,888	13,680,029	22.10%	1.19%
Eversource (MA)	18,327	6,708,000	26.00%	1.05%
PPL Electric Utilities	28,401	14,448,866	22.10%	0.89%
Consumers Energy Co.	26,906	12,484,700	25.40%	0.85%
Public Service Co. of NM	6,173	3,227,338	23.40%	0.82%

[46] Implicit in this calculation is the assumption that low-income customers use as much energy as the average customer. In fact, while some low-income customers use a lot of energy because they live in inefficient homes, on average low-income customers use a little less electricity than the average customer (EIA 2018). But since we do not have data on average low-income customer energy use for each of the utilities, we use average consumption for all customers, while recognizing that this is not fully accurate. EIA Residential Energy Consumption Survey (RECS)-Consumption & Expenditures data for more recent years is not yet available but is scheduled to be released in 2023.

[47] The outgoing governor vetoed the bill, but one candidate for governor has pledged to sign the bill when or if the legislature repasses it.

Electric utility	2019 low-income savings (MWh)	2019 total residential sales (MWh)	Approx. low-income proportion	Low-income savings as % of low-income sales
Orlando Utilities Commission	6,071	2,600,463	30.20%	0.77%
PG&E	68,481	27,513,436	33.60%	0.74%
DTE Energy	27,660	15,066,395	25.40%	0.72%
CPS Energy (City of San Antonio)	14,715	10,101,623	20.50%	0.71%
United Illuminating Co.	4,226	2,080,554	31.10%	0.65%
LADWP	14,645	7,851,621	33.60%	0.56%

GAS UTILITIES

Total Savings

Key Takeaway: The programs in our database have total annual natural gas savings of about 2.8 trillion Btu, equivalent to the annual gas consumption of 48,000 average U.S. households that use gas.

Our sample includes 31 gas utilities who provided data on energy savings from their low-income energy efficiency programs.[48] Across these utilities, low-income programs in 2019 saved about 2.8 trillion Btu (2,800,000 dekatherms (Dth), enough gas to serve about 48,400 average American homes).[49] This is savings from 2019 program participants and does not include energy saved in 2019 from participants in prior-year programs. The utilities with the largest savings are listed in table 10.

Table 10. Utilities saving at least 25,000 dekatherms from 2019 programs

Natural gas utility	2019 low-income EE program savings (Dekatherms)
DTE Energy	208,272
National Grid (Boston Gas & Colonial Gas Co.)	146,000

[48] Details on these programs can be found in the accompanying spreadsheet for this report on our website.

[49] Dekatherm (Dth) is a common metric used in the gas industry. A Dth is 10 therms and is the same as a million Btu. Estimates are based on average residential gas consumption of 57.8 million Btu per household in 2015. More recent RECS data is not available yet. These households also use substantial electricity; weatherization to reduce gas used for space heating will also often reduce electricity used for space cooling.

Natural gas utility	2019 low-income EE program savings (Dekatherms)
Dominion Energy Ohio	134,800
National Grid (NY)	133,080
Peoples Gas	99,600
SoCal Gas	90,556
Xcel Energy (Public Service Co. of CO)	78,000
We Energies	65,000
Rochester Gas & Electric	54,085
Columbia Gas of Ohio (NiSource)	52,094
National Fuel Gas	51,469
PG&E	47,091
Eversource (MA)	45,191
Connecticut Natural Gas	35,556
National Grid (Brooklyn Union Gas Co.)/NYSERDA	35,308
National Grid RI (Narragansett)	31,000
Southern Connecticut Gas	30,426
Oklahoma Natural Gas	28,300
New Mexico Gas	27,000

Particularly large savings have been achieved by DTE in Michigan, National Grid in Massachusetts and New York, and Dominion Energy Ohio. DTE, for example, has a large number of customers served (122,000) across four low-income programs—Energy Efficiency Assistance, Low-Income Multifamily, Low-Income Home Energy Consultation, and Low-Income Behavior.

Savings per Participating Customer

Key Takeaway: For programs providing data, the average annual savings is 168 therms, worth $170 at national average energy prices. But many programs save significantly more or less than this average.

As with electric programs, we also calculated average gas savings per participating customer. In our data set, savings per participating customer ranged from 1.4 to 897 therms.[50] Across

[50] A therm is 100,000 Btu and approximately 100 cubic feet of natural gas. Overall, average and median annual savings per participating customer were 168.4 and 120 therms, respectively.

all the utilities in our database, average savings per participant were 168 therms and median savings 120 therms. To put these figures into perspective, at the national average 2019 residential natural gas rate of $1.01 per therm, the average savings is worth $170 per year to a participating household (EIA 2020c). The distribution in savings per participant is illustrated in figure 5.

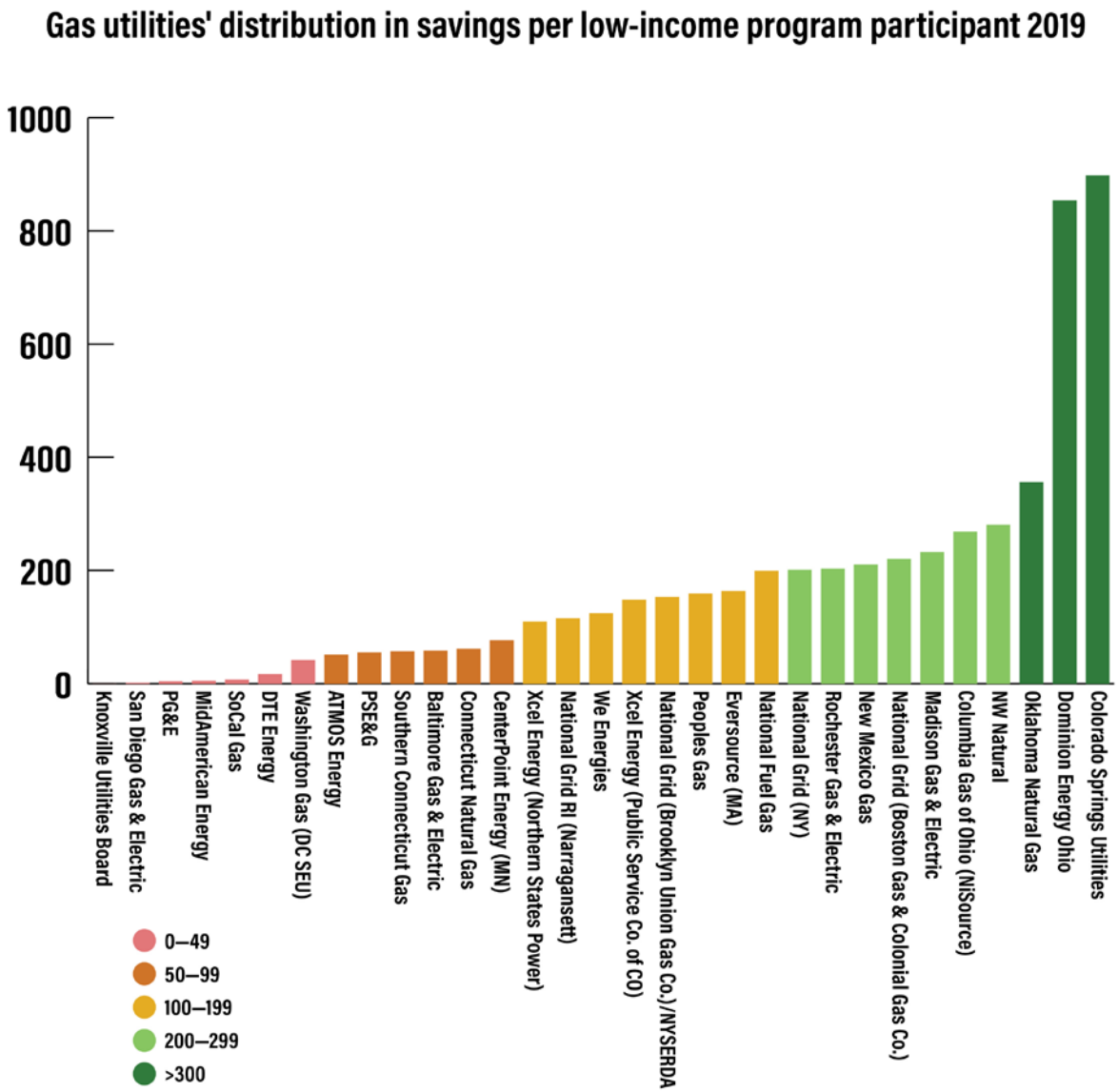


Figure 5. Distribution of saving per participant for gas utilities

Within our dataset are ten utilities saving more than 200 therms per participant—Colorado Springs Utilities, Dominion Ohio, Oklahoma Natural Gas, NW Natural, Columbia Gas of Ohio (NiSource), Madison Gas and Electric, National Grid (Boston Gas & Colonial Gas Co., New Mexico Gas, Rochester Gas and Electric, and National Grid (NY). In general, these utilities emphasize comprehensive weatherization services, with high savings per participant. For

example, the Oklahoma Natural Gas program includes direct installation of natural gas and electricity measures including attic insulation, duct sealing, and air infiltration measures (J. King Bush, Manager, Energy Efficiency Programs. ONE Gas, pers. comm., July 26, 2022).

Savings as a Percentage of Low-Income Gas Consumption

Key Takeaway: The average low-income program is reducing eligible customer energy use by about 0.4% and the median program by about 0.2%. For leading gas utility programs, low-income customers are receiving a level of efficiency savings (on a percentage basis) similar to that of other customers. But for many gas utilities (as represented by the median), low-income customers are generally underserved by programs.

Most of the utilities listed in table 10 are fairly large. In order to normalize and compare utilities of different sizes, we looked at low-income program savings as a percentage of total gas sales to low-income customers. This latter figure we estimated by multiplying total residential consumption by the estimates percentage of customers that are low-income (income ≤ 200% FPL).[51]

Overall, low-income savings as a percentage of low-income consumption averages about 0.4% and the median is about 0.2% for the utilities where we have data to calculate this figure. This is a very large difference between the average and median, indicating that the average is being driven by some utilities with high percentage savings. Nationwide, gas energy efficiency programs are reducing energy consumption by about 0.44% (Berg et al. 2022). Thus, the average low-income program percentage savings is in-line with gas utility energy efficiency programs overall, but the median program is achieving less than half these savings. This indicates that low-income customers are receiving the same degree of energy efficiency services as other customers for the utilities with high percentage savings, but for other gas utilities (as shown by the median), the same type of customers are being underserved by energy efficiency programs.

However, four utilities are achieving savings of 0.8% or more as a percentage of estimated low-income customer consumption. These are listed in table 11 along with data on other utilities above the median for which we have the data needed to calculate this metric.

Table 11. Low-income program energy savings as a percentage of estimated natural gas sales to low-income customers

Natural gas utility	2019 low-income EE program savings (Dekatherms)	2019 total residential sales (1,000 cu. ft.)	Low-income savings as % of low-income sales
National Grid (NY)	133,080	53,689,675	1.0%

[51] The same limitation on this data applies as noted previously in the electricity savings section.

Natural gas utility	2019 low-income EE program savings (Dekatherms)	2019 total residential sales (1,000 cu. ft.)	Low-income savings as % of low-income sales
Rochester Gas & Electric	54,085	27,787,058	0.8%
National Grid (Boston Gas & Colonial Gas Co.)	146,000	68,455,698	0.8%
We Energies	54,000	38,294,557	0.8%
Eversource (MA)	45,191	22,578,081	0.7%
National Grid RI (Narragansett)	31,000	19,891,520	0.7%
Connecticut Natural Gas	35,556	18,156,064	0.6%
Southern Connecticut Gas	30,426	16,801,583	0.6%
Colorado Springs Utilities	19,932	13,236,492	0.4%
National Fuel Gas	51,469	54,088,405	0.4%
Peoples Gas	99,600	101,938,366	0.3%
New Mexico Gas	27,000	36,831,633	0.3%
Virginia Natural Gas (AGL Resources)	8,700	14,883,020	0.3%
Xcel Energy (Public Service Co. of CO)	78,000	101,763,474	0.2%
Columbia Gas of Ohio (NiSource)	52,094	109,637,026	0.2%
Oklahoma Natural Gas	28,300	59,681,545	0.2%
MidAmerican Energy	6,486	12,510,985	0.2%
Baltimore Gas & Electric	15,000	39,169,674	0.1%
CenterPoint Energy (MN)	22,000	73,398,699	0.1%

The program managers of the Connecticut programs attribute their high savings to increased insulation rebates, bonuses for implementing multiple measures, and increased resident interest resulting in higher participation (S. Borrelli, Customer Programs and Products Manager, Avangrid, pers. comm., July 21, 2022).

COMPARISON OF 2019 AND 2015 SAVINGS

As with spending on low-income programs, savings from low-income programs also increased between 2015 and 2019. In 2015 the largest electricity savings was 31,960 MWh (PG&E), and in 2019 the largest was from Commonwealth Edison (220,000 MWh) with PG&E

second (69,000 MWh, more than double their 2015 savings). Similarly, for gas utilities, the largest savings in 2015 was also from PG&E (2.21 million therms), whereas in 2019 the largest is from Dominion Ohio at more than 10 million therms. Of the top utilities in 2015, PG&E, PECO, Eversource and CPS Energy remain in the top 10 utilities with highest energy savings for low-income programs.

Likewise, on the various metrics of savings per program participant and savings per eligible customer, the leaders are generally slightly higher in 2019 than in 2015. Several of the leaders in 2015 remain leaders in 2019.

Energy Bill Reductions

In order to put these energy savings in context, it is useful to translate savings into reductions in energy bills. We did not collect data from utilities on the impact their energy efficiency programs had on reducing high energy bills for low-income customers. However, using national average residential energy prices for 2020, we can approximate these impacts, as summarized in table 12. Overall, we find that electric and gas low-income programs are together reducing low-income household energy bills by about $83 million across the U.S., with the typical individual utility program saving low-income households $320,000-$1.2 million depending on fuel and whether the average or median is used.[52]

Table 12. Total and average approximate energy bill reductions

Metric	Electric	Gas
Total for all programs	$68,881,596	$13,791,593
Average program	$1,208,425	$475,573
Median program	$377,004	$320,230

Equity-Related Goals and Strategies

CONTEXTUALIZING ENERGY EQUITY

As stated in earlier sections of this report, ACEEE research has defined equity in energy efficiency by using a framework informed by USDN that includes four dimensions of equity: procedural, distributional, structural, and transgenerational (Park 2014). This framework is illustrated in figure 6.[53] This framework helps to break the broad concept of equity into more

[52] National average 2020 electricity and natural gas prices from EIA: www.eia.gov/electricity/state/ (electric) and www.eia.gov/state/seds/sep_prices/res/pdf/pr_res_US.pdf (gas).

[53] ACEEE has used this framework to inform our equity research and to be clear about how we define terms, but there are other existing frameworks around equity and other organizations with extensive expertise in energy equity and equity broadly that we recommend organizations consult when defining their own approach.

specific components that include the multiple important factors that must all be addressed to achieve an equitable energy system. This section describes the equity goals, strategies, and metrics reported by both gas and electric utilities in our sample.

Energy poverty and energy unaffordability have been described as distributional inequities because the benefits and burdens of the current energy system are not equally distributed (Reams 2016). Moreover, Reams (2016) highlights the role of procedural inequity in sustaining and producing distributional inequities in the energy sector due to the lack of consultation and participation of low-income communities in decision making processes related to energy efficiency programs and policies. To address the current inequities, utilities can create goals for low-income energy efficiency programs (e.g., savings, spending, households served), emphasize non-financial benefits of low-income utility programs, and create pathways for genuine consultation and accountability mechanisms for addressing input from low-income communities of color into their programs (ACEEE 2021).

This report has discussed the structural inequities that have excluded (and continue to exclude) low-income households from experiencing the benefits of energy efficiency. As institutions that have assisted in the creation and perpetuation of inequities in our current energy system, utilities have a large role and responsibility in removing barriers and creating pathways for low-income communities to access energy efficiency.

Figure 6. Framework for achieving an equitable energy system. Adapted from the Urban Sustainability Directors Network's 2014 report written by A. Park, Equity in Sustainability: An Equity Scan of Local Government Sustainability Programs. Source: Drehobl 2021.

UTILITY COMMITMENTS TO EQUITY

As utilities make commitments and set goals for achieving equitable outcomes through their programs, they also can establish metrics to track their progress and structures to achieve their goals. ACEEE's 2017 report did not include an analysis of equity metrics used by low-income energy efficiency programs to support the targeting of programs and benefits to historically disinvested households, but we examined these commitments for this edition.

We found that very few utilities have explicitly aimed to institutionalize dimensions of energy equity through their low-income programs. For example, ACEEE generally found little evidence that utilities are incorporating procedural equity in the development of low-income energy efficiency programs. From our data, with one exception, we were unable to identify a utility that indicated that they worked directly with impacted communities or community-based organizations to inform the development of their low-income energy efficiency program.[54] The one exception was National Grid (RI), which has created a working group composed of community-based organizations (CBOs), advocacy organizations, state agencies, and other stakeholders to identify ways to increase equity in the delivery of their energy efficiency programs (Green & Healthy Homes Initiative 2021).[55] **Without a robust process to receive and integrate the input of impacted communities, low-income efficiency programs likely will not incorporate the needs and priorities of the communities they serve.** Reaching out to better understand the barriers to participation can create more trust in programs and utilities, which ultimately can lead to better programs that address community needs.

Most programs in our sample described their equity goal as being to reach as many low-income customers as possible, to save as much energy as possible in their low-income programs, and generally to reduce energy burdens, without indicating the use of metrics to track progress or having specific goals to meet. Utilities that aim to reduce energy burdens did not elaborate on the ways energy burden reductions were tracked and measured. Utilities in our report that do have specific targets include CPS in Texas, with a specific goal of weatherizing 3,600 homes per year; Ameren Missouri's Income Eligible program, which aims to achieve a 15% energy reduction for participating low-income customers; and JEA (Florida), which targets at least 1,200 to 1,400 households annually for their low-income programs. The most common equity goal outside of serving low-income customers listed by utilities is workforce development. Utilities such as National Grid RI (Narragansett), Washington Gas (including spending by the DC Sustainable Energy Utility), Nashville Electric Service, and Southern California Edison reported having a workforce development effort in their programs, but they do not all aim to create job opportunities for low-income customers in their service territory.

TAKING A HOLISTIC APPROACH TO EQUITY EFFORTS

While it is important to reach low-income customers and ensure they have access to utility programs, focusing only on income misses the potential to address other vulnerabilities or barriers faced by customers. Accurate understanding of energy

[54] In earlier sections we discussed DTE Energy's work with community groups to reach high numbers of customers. However, we did not receive information from DTE's outreach or collaboration with CBOs in our data request or the extent to which partners are able to influence the design of their low-income programs. These efforts were identified outside of the data request.

[55] For more information on National Grid's Energy Efficiency Equity Working Group, see: rieermc.ri.gov/wp-content/uploads/2021/10/national-grid-equity-working-group_eermc-presentation-_10.21.2021.pdf

insecurity and related vulnerabilities could lead to better programs. For example, understanding that most urban households that are energy insecure often live in rental housing and that these households also tend to experience high incidences of the heat island effect could lead to more efficient approaches to efficiently cooling urban rental housing (Draklellis Gold, and Millar et al. 2022).[56] Energy burdens are part of the energy insecurity picture, but not the whole story. Understanding the unique energy needs and struggles of low-income households can improve program outcomes and advance energy equity.

Common measures of success for non-low-income energy efficiency programs use savings and spending indicators to demonstrate achievements and/or meet state regulatory requirements. These indicators are also used to determine cost effectiveness and the effectiveness of the specific program measures for reducing energy use (e.g., weatherization, lightbulb replacements). When utilities choose to focus just on tracking energy savings, this can obscure (1) the broader challenges faced by communities and (2) the benefits of energy efficiency investments, such as making sure that arrearages are reduced. For example, low-income households often use less energy than wealthier households and preemptively limit their energy use (including through unsafe heating and cooling practices) because of concerns around energy affordability (Cong, Nock, and Qui 2022). Programs reaching these households could provide numerous benefits to families and improvements to wellbeing, health, and safety that might not be captured by energy savings alone.

Undertaking a more holistic and effective approach to advancing equity also requires utilities to consider the additional barriers faced by certain communities. Some of the existing barriers to participation in low-income energy efficiency programs overall are high upfront costs for comprehensive energy efficiency upgrades, a lack of ongoing financial and staffing support for programs that affect a utility's ability to effectively serve customers, language barriers that prevent customers from being reached effectively, and split incentives for renters, among others (Cluett, Amann, and Ou 2016; Gilleo, Nowak, and Drehobl 2017).[57] The Just Solutions Collective has identified and categorized barriers to participating in low-

[56] Heat island effects occur when "structures such as buildings, roads, and other infrastructure absorb and re-emit the sun's heat more than natural landscapes such as forests and water bodies. Urban areas, where these structures are highly concentrated and greenery is limited, become 'islands' of higher temperatures relative to outlying areas (US EPA ND)."

[57] Examples of high upfront costs needed before program participation include roof repairs (so that new insulation does not get wet) and mold abatement (for health reasons and to protect program administrators from claims that weatherization might have caused these preexisting problems). Many low-income community members live in substandard housing that needs numerous costly repairs before program implementers can serve these homes. Some utilities in our sample emphasize health and safety measures, which are often a prerequisite for high impact measures such as weatherization. Many health and safety measures reported by utilities in our sample involve installing smoke and carbon monoxide detectors, which, while useful, are low-cost measures that do not have as much potential impact as measures that address the presence of mold or asbestos.

A split incentive occurs when the party that pays for a retrofit (the owner) differs from the party that benefits financially from it (the tenant) (Srivastava and Mah 2022).

income energy efficiency programs that aim to reduce energy burdens into four categories: informational, transactional, stigma, and lack of trust in utilities (Juarez 2022). These categories are particularly useful for understanding the challenges a customer faces when there are existing programs that are not reaching low-income customers. Just as burdens of the energy system are disproportionately concentrated in historically disinvested communities, these same communities tend to be more affected by the barriers above. Therefore, addressing barriers to participation is one piece of advancing more equitable outcomes in energy efficiency programs.

Program administrators can reduce barriers by providing opportunities for low-income community members to identify their needs and constructing programs to address those needs. In addition, community-based organizations may be able to support utilities in reaching low-income customers through various types of stakeholder engagement, which can be useful for informing and improving program design or promoting programs in low-income communities. Partnering with CBOs and compensating for their time and expertise can help bridge participation gaps and allow for more customers to take advantage of low-income program offerings by understanding their needs and priorities.

Overall, there is room for utilities to expand and increase the benefits of their programs for communities that have been historically disinvested and to ensure that households in these communities benefit from energy efficiency programs. Utilities can make commitments, set goals, and create accountability structures that allow them to steer their efforts to communities who have been historically disinvested and would benefit most. In the following section, we discuss barriers to program participation to highlight possible solutions in the realm of program design.

Low-Income Program Design Best Practices

ACEEE research has identified and refined a set of best practices for low-income energy efficiency programs. We outlined these practices in our earlier study on 2015 programs (Drehobl and Castro-Alvarez 2017) and later revised them in Appendix D to our 2020 report on household energy burdens (Drehobl, Ross, and Ayala 2020). In the following section we condense this 2020 material and incorporate additional recent examples, including some from the programs profiled in this report. We address coordination, collaboration, and segmentation; funding and financing; effective measures and targeting; evaluation and quality control; and workforce development and training.

COORDINATION, COLLABORATION, AND SEGMENTATION

Community engagement and participatory planning can ensure that programs are designed to meet community needs and build trust. By involving the community in the planning process, energy efficiency programs create outcomes that best meet community needs, leverage community networks to achieve higher program participation, and improve visibility and support within the community for program implementers. For example, Professor Tony Reames conducted a community engagement study of Kansas City, Missouri to understand barriers that low-income households face in participating in weatherization.

This stakeholder engagement led to the development of innovative strategies to overcome barriers, such as hiring an all-African American staff to help build trust within the local community (Reames 2016).

Statewide coordination models enable consistent low-income program delivery across utilities, WAP implementers, and local jurisdictions. Some states have one implementer for the state's low-income programs who ensures that similar program offerings are available to all customers in the state. California, New Jersey, New York, Colorado, and Massachusetts, for example, offer statewide low-income program models that aim to coordinate resources from multiple sources through a single program. These efforts are coordinated through the Low-Income Energy Affordability Network (LEAN), which includes community action agencies, public and private housing owners, government organizations, and public utilities that all work together to provide low-income efficiency solutions in the state. California's Energy Saving Assistance Program is offered by all regulated investor-owned utilities across the state.

One-stop-shop program models minimize barriers and allow low-income households to access all available resources in one place. The models provide a single point of contact, universal intake applications, comprehensive technical assistance, and streamlined access to program resources. One-stop-shop models should be replicated in various locations and combine each location's available offerings. For example, Commonwealth Edison partners with Elevate Energy to offer the "Energy Savers" program, providing comprehensive services to multifamily buildings (Gunn 2013).

Fuel-neutral programs allow energy efficiency measures to be completed in a home regardless of the electric and/or natural gas utilities that service it. This is critical for addressing the high costs associated with delivered fuels (oil, propane) and for coordinating across electric and natural gas utilities. For example, in the Chicago area, Commonwealth Edison and Peoples Gas closely coordinate their programs and the state regulator allows the electric utility to pay for gas savings. Similarly, in New York, low-income programs are implemented on a fuel-neutral basis by the New York State Energy Research and Development Authority (NYSERDA).

Market segmentation helps to design programs to meet the specific needs of subsets of highly burdened households, such as people living in affordable multifamily buildings or manufactured housing. Low-income customers are a diverse segment with diverse energy needs. By segmenting customers by fuel, amount of energy use, building type, and key demographic categories, program designers can then work to identify a specific customer segment's energy usage characteristics and program needs. This can lead to more impactful outreach, relationship building, program design, and results. For instance, Eversource partnered with Oracle Utilities Opower to develop a first-of-its-kind approach to digitally characterizing and targeting customers that require assistance (Lin et al. 2020).

FUNDING AND FINANCING

Leveraging diverse funding sources allows programs to address health and safety issues and include greater investment and available measures. Funding for low-income energy efficiency programs often comes from electric and natural gas utility ratepayer dollars,

federal WAP and LIHEAP funds, state and local funds, nonprofit resources, and other private funding sources. Leveraging funding from various sources can give program implementers greater flexibility, as some federal and utility funding sources limit the types of measures they fund. Leveraging diverse funding sources can lead to a more comprehensive program outcome that has the flexibility to address health and safety issues and incorporate more complex sets of energy efficiency investments than would be available through a single source of funding.

Aligning utility and housing finance programs can encourage energy efficiency upgrades in low-income multifamily buildings. Incorporating utility-customer funding in the current climate of affordable housing refinancing and redevelopment can yield deeper, more comprehensive energy efficiency improvements than if each program pursued its goals separately. The extensive renovations made possible through utility/housing finance partnerships may involve replacing outdated building systems, and utility-customer funds can be used to help cover the incremental cost of installing more efficient equipment than would otherwise be required. For example, the Connecticut Green Bank coordinates and aligns its efforts with the incentives of the state's energy efficiency initiatives, including state and utility incentives. In addition, the Connecticut Green Bank's financing opportunities are designed to complement the available funding for energy efficiency upgrades from the Connecticut Housing Finance Authority and the Connecticut Department of Housing (Samarripas and York 2018).

Inclusive financing models, such as no-interest loans, loan guarantees, and the elimination of credit requirements, can help low-income households overcome upfront cost barriers to accessing traditional private financing options. Inclusive financing options include Pay As You Save (PAYS) programs and on-bill tariff models, which allow low-income households to install energy efficiency investments that are paid off over time on the customer's bill (Levantis, Kramer, and Schwartz 2017). In the low-income multifamily sector, limiting or eliminating upfront costs to building owners can help them undertake substantial energy efficiency projects and overcome barriers related to the competition for scarce funding for capital projects. Low-interest financing and on-bill repayment can help owners spread out their energy efficiency project costs over time.

EFFECTIVE MEASURES, MESSAGING, AND TARGETING

Including health and safety measures and healthier building materials can reduce deferral rates and improve indoor air quality, comfort, and long-term health outcomes for program participants. Programs often address health and safety concerns through leveraged funds. However, rather than disqualifying households due to building health and safety issues such as structural problems, mold, or asbestos, utilities and program implementers can combine funding streams to provide health and safety services. For example, ComEd coordinates program delivery with the state's WAP. For programs coordinated with WAP, health and safety costs are split 50-50 between state and utility programs. For projects done in partnership with Chicago Bungalow Associates and Elevate Energy, as well as the Public Housing Program, the utilities cover 100% of the necessary health and safety costs. Additionally, projects completed under the Affordable Housing New Construction Program

typically leverage Illinois Housing Development Authority funding for health and safety measures (Samarripas et al. 2021). Another example is the Bronx Healthy Buildings Program, which aims to reduce asthma-related hospital visits and address the social determinants of health through education, organizing, workforce development, and building upgrades. Energy audits, building inspections, and tenant organizing aim to identify needed repairs and opportunities for energy efficiency improvements (BUILD Health Challenge 2021).

Prioritizing deep energy-saving measures through a single program and/or engagement can help achieve high levels of energy savings. For example, Oncor's Targeted Weatherization Low-Income program first prioritizes deep energy-saving measures such as building-shell weatherization and air sealing, and then focuses on additional measures such as air-conditioning, refrigeration, and lighting (Gilleo, Nowak and Drehobl 2017).

Integrating direct-installation and rebate programs can encourage extensive improvements. For low-income single and multifamily projects, direct-installation programs that offer no-cost energy efficiency measures can provide an opportunity to connect with building owners, complete an on-site energy assessment, and encourage owners to take advantage of rebates for more extensive improvements such as HVAC upgrades, weatherization, common-area lighting retrofits, and other building-shell improvements. For example, the Connecticut Home Energy Solutions program combines an energy audit with direct installation of lighting and air-sealing measures and then refers residents to rebates for other measures. For income-qualified customers the audit is free and the incentives often higher, up to 100% for approved insulation projects (Energize Connecticut 2022).

Targeting high energy users and vulnerable households can generate the greatest energy savings and impact. By using utility data to identify households with the highest energy use, energy efficiency providers can achieve the highest energy savings. Even so, energy use should be looked at in combination with other factors that lead to household energy vulnerability. Although high energy use can lead to high savings, households with lower energy use can still experience high energy burdens. Efficiency Vermont, for example, changed its program qualification to focus on low-income households with high energy burdens rather than low-income households with high energy use. This let the program qualify more customers and prioritize services for the most vulnerable households (Efficiency Vermont 2020).

Integrating energy efficiency and solar program offerings can maximize participant benefits. To do this, combined renewable and energy efficiency programs should first invest in energy efficiency to reduce the home's overall energy needs, and then invest in renewable energy so that (1) individual households can install the right size solar system or (2) households can access community solar options as a group. For example, the Connecticut Green Bank collaborates with PosiGen, a private company, to deliver both solar and energy efficiency to low-income customers. The Green Bank helps PosiGen generate capital to provide 20-year solar leases combined with energy efficiency upgrades to program participants, leading to the most cost-effective investments (EDF 2018). Another example is the District of Columbia Sustainable Energy Unit (DCSEU) "Solar for All" program that can provide free solar systems to income qualified residents (DCSEU 2022).

Incorporating new and emerging technologies in low-income programs can expand the technology scope of low-income energy efficiency programs to technologies they do not traditionally incorporate—such as smart meters, energy storage, and electric vehicles. Using these advanced technologies can significantly improve energy affordability and equitable access to these technologies for low-income households (Brown et al. 2020). Unless we ensure that new technologies are available to low-income and underinvested communities, inequities in access to these technologies will continue to grow. Programs that incorporate these emerging technologies can address access barriers for low-income communities and ensure more equitable distribution of their benefits. For example, the DCSEU ran a pilot low-income decarbonization program that combined deep energy efficiency retrofits with solar and conversion of heating, hot water, and cooking equipment to electricity (York et al. 2022).

Effective messaging—showcasing clear value and actionable guidance—helps achieve high program participation and builds trust and understanding of program benefits. Investing in energy efficiency often takes time and resources for both single and multifamily building owners. Although programs typically focus on energy savings and energy cost reductions benefits, programs must also market the many non-energy benefits that result from energy efficiency improvements, such as health and comfort. Furthermore, they should include actionable guidance—that is, clear steps that residents and building owners can take to learn more about program services and enroll in the program.

EVALUATION AND QUALITY CONTROL

Collecting and sharing metrics on program outcomes, equity impacts, and other tracked data can help hold implementers accountable to program requirements and goals. These metrics can include factors such as race and/or ethnicity, income status, property ownership, energy burden, and energy vulnerability. Often, program implementers publish demand-side management reports that include metrics on low-income program savings, spending, and customers served. Implementers can report additional equity factors such as energy burden data, demographic data, and participation distribution. For example, Vermont Energy Investment Corporation (VEIC) published a guide that surveys energy industry metrics for measuring program equity. These include metrics to define target populations, determine disparate impacts, and include representative voices in program design, implementation, evaluation, and oversight (Levin, Palchak, and Stephenson 2019).

Robust research and evaluation practices should be used to assess achieved reductions in energy usage. Such evaluations help document and clarify program performance. Impact evaluations measure the direct and indirect benefits from programs, while process evaluations provide systematic assessments of how programs operate. By completing robust evaluations, program planners can determine how to best improve their programs for greater impact and efficiency, and better meet the needs of the target community.

Prioritizing quality control as a core element of programs can help ensure that energy efficiency services are effective and homes are left in a safe condition. Many program implementers incorporate ongoing training for contractors and quality control professionals, viewing this as critical to program success and devoting project funding to regular trainings. Some program administrators also include strict quality control requirements for all projects

rather than for a sample, which helps incentivize contractors to perform high-quality work. For example, Ouachita Electric Cooperative's HELP PAY program, a tariff-based residential energy efficiency financing program, evaluates every project after completion and facilitates trainings for its contractors in quality control techniques to ensure that all contractors understand the assessment methodologies (Gilleo, Nowak, and Drehobl 2017).

Incorporating non-energy benefits into cost-effectiveness testing can strengthen the case for the cost effectiveness of low-income programs. Without monetizing non-energy benefits, utility-operated low-income energy efficiency programs cost more to implement per household—and are less cost effective by traditional measures—than utility-operated energy efficiency programs serving higher income groups. However, low-income energy programs deliver benefits beyond energy savings to low-income households that are not typically incorporated into traditional cost-effectiveness testing methods. The National Standard Practice Manual discusses how low-income program benefits can be considered at the societal level (NESP 2017). States can decide to adjust cost-effectiveness tests for low-income programs to incorporate these additional benefits. For example, California, Colorado, Kentucky, Massachusetts, and Nevada all have special cost-effectiveness rules for low-income programs (ACEEE 2021).

Workforce Development and Training—to grow a diverse and strong energy efficiency workforce that represents the local community—is important to the continued success of programs. Utilities should ensure that training opportunities are linked to high-quality, well-paid, and stable careers in the energy efficiency and clean energy workforce sector. States and local governments, utilities, and other program implementers can focus on diversifying suppliers, increasing the worker pipeline by offering training for both contracting firms and students, and partnering with skills-training providers and state agencies—all while working to overcome barriers faced by historically excluded community members. Implementers can also co-deliver training for energy efficiency and renewable energy technologies. For example, the Los Angeles Department of Water and Power (LADWP), in partnership with the International Brotherhood of Electrical Workers, has operated a Utility Pre-Craft Trainee program for many years that is an "earn-and-learn" pre-apprenticeship training program in which entry-level trainees work full time weatherizing homes and small businesses while learning skills and preparing for civil service exams and career opportunities in the utility (Scott and Zabin 2016). And Chicago-based nonprofit Elevate Energy coordinates a Clean Energy Jobs Accelerator that trains individuals from economically excluded communities for careers in solar and energy efficiency (Elevate Energy 2022).

RECOMMENDATIONS AND ACTIONS NEEDED

Our review of 2019 utility low-income programs relative to 2015 programs finds that utilities are generally using more resources for their low-income programs and reaching more customers, but there are still large gaps in reaching low-income households. At 2019 program spending rates, for the utilities covered in our report, it will take an average of 57 years to serve all eligible customers. Furthermore, many of the customers served are receiving only limited services (e.g., lightbulbs) and not comprehensive services. Despite recent improvements, we find that utilities are underserving low-income communities. Based

on our findings, we make recommendations in the following areas: funding, program design, equity, and data/evaluation.

Funding

- Budgets should be set at levels that can provide comprehensive services to all eligible households over a period of about 20 years (this means serving about 5% of customers per year with comprehensive services, an aggressive but potentially feasible level of service). Since about 27.5% of U.S. households are classified as low-income, low-income energy efficiency programs should be at parity with at least 27.5% of utility energy efficiency budgets for residential customers dedicated to low-income energy efficiency programs. The 20-year goal would cost more than 27.5% of current utility energy efficiency spending and hence would require increased spending.[58] Leading states currently target 35–40% of energy efficiency budgets to low-income households. There is a large backlog of unaddressed needs; program efforts need to steeply ramp up. This will require regulatory support.
- Utilities need to braid a variety of funding sources in order to address such issues as health and safety and to meet the multiple needs of individual homes.[59] They should tap into health funding sources wherever possible and ensure that program rules allow for health and safety improvements that are necessary.

Program Design

- Implementers should use best practices to improve program offerings and design, such as offering dual-fuel programs wherever possible; setting multiple thresholds or definitions for eligibility to reach more households; coordinating with other organizations, particularly local community-based organizations, WAP service providers, and bill payment assistance programs; addressing health and safety; and offering multiple eligible measures (Drehobl, Ross, and Ayala 2020).
- Utilities should set up a single point of contact and one-stop-shop approach that simplifies access for customers (Juarez 2022). For example, ComEd has worked with Elevate Energy to set up such a program in Chicago (City of Chicago ND).
- All utilities should learn from and begin to emulate the leading programs noted in this report in order to provide energy efficiency services to the households that most need them. Utilities in California consistently scored in the top across many metrics and had an emphasis on weatherization and health and safety measures. Other top

[58] As a rough estimate, if $4,000 of services (complementing federal and other funding sources) are provided to 30 million low-income households, $120 billion will be needed over 20 years, an average of $6 billion per year.

[59] See Rose, E., B. Hawkins, L. Ashcraft, and C. Miller (2015) and ACEEE's *Pathways to Healthy, Affordable, Decarbonized Housing: A State Scorecard* (Hayes et al. 2022) for more research on the importance of health and safety measures for low-income utility programs.

utilities across many metrics include Commonwealth Edison, Eversource (MA and CT), National Grid (both MA and NY), and Detroit Edison (MI).

- Utilities should target program offerings to particular customer segments with high energy burdens and work to address the root causes of high energy costs and inefficient homes, using robust partnerships and engagement practices to identify the community's particular needs. This will generally require better tracking energy burdens and providing comprehensive retrofits to these homes. This may also require additional program qualification criteria based on energy burdens.

Equity

- To build successful programs and accurately assess the needs and challenges of customers, utilities should increase procedural equity by setting up systems and processes that center and meaningfully engage the voices of low-income households, households of color, and other communities that have been disinvested (Juarez 2022).
- Utilities should advance structural equity by measuring benefits and costs of programs alongside demographic data and neighborhood characteristics and setting clear equity-related goals that recognize the sources of existing inequities.
- Furthermore, implementers should make commitments to equitably distribute benefits and costs of programs and create an accountability structure to measure progress and adjust actions when progress is not on track toward distributional equity.

Data/Evaluation

- Utilities should improve and increase data collection so that they can evaluate the success of their programs. When necessary, utilities and CBOs can advocate and collaborate with regulators and governments to ensure they have the necessary resources and authority to do so.
- As utilities make commitments and set goals for achieving equitable outcomes through their programs, they also need to establish metrics to track their progress and structures for making adjustments to achieve their goals.

In order to implement these recommendations, there will be roles for utilities, regulators and others:

Utilities should take the lead on expanding current programs, drawing from the lessons in this report. This will often require seeking more input from affected communities and improving programs based on this input and lessons learned from successful programs offered by other utilities. Most utilities will need to increase their budgets for low-income programs, preferably to levels that will provide comprehensive services to households over approximately the next 20 years. Comprehensive low-income programs can be expensive, but utilities are well positioned to provide critical services to those most in need. Ultimately, utilities will need to strike a reasonable balance in their budgets between equity, energy

savings, and emissions reductions. In addition, utilities will often need to do a better job on data collection, clear reporting, and analysis.

Regulators should require utilities to take the steps noted in the paragraph above. They should establish guidelines to help utilities plan their programs (e.g., expectations on number of households served, savings achieved, and/or proportion of total budgets allocated) and should support strong budgets for these programs, helping to make the case for these budgets to elected officials and the general public.

Local community groups and other program supporters can advocate for improved programs to better address low-income community needs and should work with utilities to help make the programs as successful as possible.

Research organizations, such as ACEEE, should continue to review programs and provide information on trends and best practices.

Conclusion

Our review of 2019 utility low-income programs shows that program spending and savings have grown substantially since our prior review of 2015 programs. Overall, approximately 1.5 million low-income households were served in 2019. However, these programs are only starting to reach eligible households, with a median annual participation rate of about 2% of eligible households, and many of these households are only receiving low-cost measures. Households with income ≤200% of FPL represent about 27.5% of the U.S. population, but utility low-income programs account for only 13% of the median utility energy efficiency budget.[60] Some leading utilities are doing better than average, as noted throughout this report. All utilities can learn from these leaders, including utilities who are leading on some metrics but are not as strong on others.

The need for low-income energy efficiency investments is much greater than the supply. Programs need to be expanded and budgets need to increase. Some of the need might be addressed by coordinating with other programs and funders, such as in the health sector. Much more effort is needed to engage local communities about their needs and how best to serve them. Such engagement will build interest and trust, ultimately making programs more successful at reaching the households they target. Significant progress has been made in the past four years; we hope that even more progress can be made in the future.

[60] As discussed in the main report, if low-income households are 27.5% of all households, then about 27.5% of budgets should be spent in low-income communities, including businesses in those communities. We do not have data on utility spending on businesses in low-income communities, but adding such spending is likely to modestly (but far from completely) close the gap between spending on low-income programs and the 27.5% target.

References

ACEEE. 2021. "Supporting Low-Income Energy Efficiency: A Guide for Utility Regulators." www.aceee.org/toolkit/2021/04/supporting-low-income-energy-efficiency-guide-utility-regulators.

———. 2022a. "Energy Equity." www.aceee.org/topic/energy-equity.

———. 2022b. "State and Local Policy Database." database.aceee.org/.

Berg, W., E. Cooper, and M. DiMascio. 2022. *State Energy Efficiency Scorecard: 2021 Progress Report*. Washington, DC: ACEEE. www.aceee.org/research-report/u2201.

Brown, M., A. Soni, M. Lapsa, and K. Southworth. 2020. *Low-Income Energy Affordability: Conclusions from a Literature Review*. Prepared by Oak Ridge National Laboratory. Washington, DC: DOE. info.ornl.gov/sites/publications/Files/Pub124723.pdf.

BUILD Health Challenge. 2021. "The Bronx Healthy Buildings Program." buildhealthchallenge.org/communities/awardee-bronx-nyc/.

Census Bureau. 2020. "Below 185% and 200% of Poverty -- All People (1, 5)". https://www2.census.gov › pov46_weight_10050_3

Census Bureau. 2022. "POV-01. Age and Sex of All People, Family Members, and Unrelated Individuals." www.census.gov/data/tables/time-series/demo/income-poverty/cps-pov/pov-01.html#par_textimage_30.

City of Chicago. ND. Retrofit Chicago Residential Partnership FAQs. www.comed.com/WaysToSave/ForYourBusiness/Pages/EEOutreachTeam.aspx.

Citizens Utility Board of Wisconsin. 2021. "CUB Applauds Move to Analyze Utility Energy Burden." cubwi.org/feb-15-2021-cub-applauds-move-to-analyze-utility-customers-energy-burden/.

Cluett, R., J. Amann, and S. Ou. 2016. *Building Better Energy Efficiency Programs for Low-Income Households*. Washington, DC: ACEEE. www.aceee.org/research-report/a1601.

Cong, S., D. Nock, and Y. Qiu. 2022. "Unveiling Hidden Energy Poverty Using the Energy Equity Gap." *Nature Communications* 13: 2456. doi.org/10.1038/s41467-022-30146-5.

Cornell Law School Legal Information Institute. 2022. "Redlining." www.law.cornell.edu/wex/redlining.

DCSEU (District of Columbia Sustainable Energy Utility). 2022. "Solar for All." www.dcseu.com/solar-for-all.

Draklellis, E., R. Gold, K. Millar, and M. Sugihara. 2022. "Five Steps for Utilities to Foster Authentic Community Engagement." *RMI*, June 2. rmi.org/five-steps-for-utilities-to-foster-authentic-community-engagement/.

Drehobl, A. 2021. *ACEEE's Leading with Equity Initiative: Key Findings and Next Steps*. Washington, DC: ACEEE. www.aceee.org/white-paper/2021/12/aceees-leading-equity-initiative.

Drehobl, A., and F. Castro-Alvarez. 2017. *Low-Income Energy Efficiency Programs: A Baseline Assessment of Programs Serving the 51 Largest Cities*. Washington, DC: ACEEE. www.aceee.org/white-paper/low-income-ee-baseline.

Drehobl, A., and L. Ross. 2016. *Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low-Income and Underserved Communities*. Washington, DC. ACEEE. www.aceee.org/research-report/u1602.

Drehobl, A., L. Ross, and R. Ayala. 2020. *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burdens across the U.S.* Washington, DC: ACEEE. www.aceee.org/research-report/u2006.

Ebi, K., J. Balbus, G. Luber, A. Bole, A. Crimmins, G. Glass, S. Saha, M. Shimamoto, J. Trtanj, and J. White-Newsome. 2018. "Chapter 14: Human Health." *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* (Reidmiller, D., C. Avery, D. Easterling, K. Kunkel, K. Lewis, T. Maycock, and B. Stewart, eds.). Washington, DC: US Global Change Research Program. nca2018.globalchange.gov/chapter/14/.

EDF (Environmental Defense Fund). 2018. *Low-Income Energy Efficiency: A Path to Clean, Affordable Energy for All*. Prepared by APPRISE (Applied Public Policy Research Institute for Study and Evaluation). New York: EDF. www.edf.org/sites/default/files/documents/liee_national_summary.pdf.

Efficiency Vermont. 2020. "Targeted Communities Program Update." www.efficiencyvermont.com/trade-partners/targeted-communities-program-update.

EIA (Energy Information Administration). 2018. "Residential Energy Consumption Survey: 2015 RECS Survey Data." www.eia.gov/consumption/residential/data/2015/.

———. 2020a. "Annual Electric Power Industry Report, Form EIA-861 detailed data files: 2019." www.eia.gov/electricity/data/eia861/.

———. 2020b. "Electricity, State Electricity Profiles." Washington, DC: EIA. https://www.eia.gov/electricity/state/archive/2019/

———. 2020c.Table ET3. Residential Sector Energy Price and Expenditure Estimates, 1970-2020, United States. Washington, DC: EIA. https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_prices/res/pr_res_US.html&sid=US

Elevate Energy. 2022. "Contractor and Workforce Development." www.elevatenp.org/contractor-workforce-development/.

Energize Connecticut. 2022. "Home Energy Solutions℠—Income Eligible." energizect.com/energy-evaluations/income-eligible-options.

EPA (Environmental Protection Agency). 2022a. "Greenhouse Gas Emissions Overview of Greenhouse Gases." www.epa.gov/ghgemissions/overview-greenhouse-gases.

———. 2022b. "Heat Island Effect." www.epa.gov/heatislands.

Farley, C., J. Howat, J. Bosco, N. Thakar, J. Wise, and J. Su. 2021. *Advancing Equity in Utility Regulation*. Prepared by Berkeley Lab. Washington, DC: DOE.

emp.lbl.gov/publications/advancing-equity-utility-regulation#:~:text=Increasingly%2C%20states%20are%20recognizing%20equity,%2C%20safe%2C%20and%20fairly%20priced.

Gilleo, A. 2019. "ACEEE Debunks the Myths Behind the Ohio Bill That Would Gut Efficiency Programs." Washington, DC: ACEEE. www.aceee.org/blog/2019/04/aceee-debunks-myths-behind-ohio-bill.

Gilleo, A., S. Nowak, and A. Drehobl. 2017. *Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs*. Washington, DC: ACEEE. aceee.org/sites/default/files/publications/researchreports/u1713.pdf.

Goldberg, L. 2021. "The Unsung Hero of Illinois' Climate Law: Energy Efficiency." *NRDC Expert Blog*, October 6. www.nrdc.org/experts/laura-goldberg/unsung-hero-illinois-climate-law-energy-efficiency.

Graff, M., D. Konisky, S. Carley, and T. Memmott. 2022. "Climate Change and Energy Insecurity: A Growing Need for Policy Intervention." *Environmental Justice* 15: 2 (April): 76–82. www.liebertpub.com/doi/10.1089/env.2021.0032.

Green & Healthy Homes Initiative. 2021. *National Grid Energy Efficiency Equity Working Group Report*. Waltham, MA: National Grid. rieermc.ri.gov/wp-content/uploads/2021/10/national-grid-equity-working-group_eermc-presentation-_10.21.2021.pdf.

Gunn, R. 2013. *Impact Evaluation of the Energy Savers Program for Large Multifamily Buildings*. Chicago: Navigant. www.elevatenp.org/wp-content/uploads/Impact_Evaluation_of_the_Energy_Savers_Program_for_Large_Multifamily_Buildings.pdf.

Hayes, S., C. Kubes, and C. Gerbode. 2020. Making Health Count: Monetizing the Health Benefits of In-Home Services Delivered by Energy Efficiency Programs. Washington, DC: ACEEE. www.aceee.org/researchreport/h2001.

Hayes, S., M. MacPherson, C. Gerbode, and L. Ross. 2022. *Pathways to Healthy, Affordable, Decarbonized Housing: A State Scorecard*. Washington, DC: ACEEE. www.aceee.org/research-report/h2201.

Hays, J., M. Toloui, M. Rattu, and K. Wright. 2021. *Equity and Buildings: A Practical Framework for Local Government Decision Makers*. Port Washington, WI: USDN (Urban Sustainability Directors Network). www.usdn.org/uploads/cms/documents/usdn_equity_and_buildings_framework_-_june_2021.pdf.

Hernández, D. 2016. Understanding 'energy insecurity 'and why it matters to health. Social Science & Medicine, 167, 1-10. www.sciencedirect.com/science/article/pii/S0277953616304658.

Hernández, D., Y. Aratani, and Y. Jiang. 2014. Energy Insecurity Among Families with Children. academiccommons.columbia.edu/doi/10.7916/D89G5JX8.

Illinois Commerce Commission. 2022. "Climate and Equitable Jobs Act Implementation." icc.illinois.gov/programs/climate-and-equitable-jobs-act-implementation.

JCHS (Joint Center for Housing Studies of Harvard University). 2022. *America's Rental Housing 2022*. Cambridge, MA: JCHS. www.jchs.harvard.edu/sites/default/files/reports/files/Harvard_JCHS_Americas_Rental_Housing_2022.pdf.

Juarez, Z. 2022. Energy Burden and the Clean Energy Transition: Challenges and just solutions from energy assistance practitioners and advocates from around the country. Just Solutions Collective. www.justsolutionscollective.org/solutions/energy-burden-and-the-clean-energy-transition-challenges-and-just-solutions-from-energy-assistance-practitioners-and-advocates-from-around-the-country.

Kushler, M. 2018. "Iowa Takes Huge Step Backward on Energy Efficiency, While Other States Move Ahead." Washington, DC: ACEEE. www.aceee.org/blog/2018/05/iowa-takes-huge-step-backward-energy.

Leventis, G., C. Kramer, and L. Schwartz. 2017. *Energy Efficiency Financing for Low- and Moderate-Income Households: Current State of the Market, Issues, and Opportunities*. Prepared by Berkeley Lab. Washington, DC: SEE Action (State and Local Energy Efficiency Action Network). emp.lbl.gov/publications/energy-efficiency-financing-low-and.

Levin, E., E. Palchak, and R. Stephenson. 2019. *The State of Equity Measurement: A Review of Practices in the Clean Energy Industry*. Winooski, VT: VEIC. www.veic.org/Media/default/documents/resources/reports/equity_measurement_clean_energy_industry.pdf.

Lin, J., K. Rodgers, S. Kabaca, M. Frades, and D. Ware. 2020. "Energy Affordability in Practice: Oracle Utilities Opower's Business Intelligence to Meet Low and Moderate Income Need at Eversource." *The Electricity Journal* 33 (2): 1–11. www.doi.org/10.1016/j.tej.2019.106687.

NESP (National Efficiency Screening Project). 2017. *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*. Framingham, MA: NESP. www.nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf.

NYSERDA (New York State Energy Research and Development Authority). 2022. "New York State Releases Draft Disadvantaged Communities Criteria to Advance Climate Justice." www.nyserda.ny.gov/About/Newsroom/2022-Announcements/2022-03-09-New-York-State-Releases-Draft-Disadvantaged-Communities-Criteria.

Park, A. 2014. *Equity in Sustainability: An Equity Scan of Local Government Sustainability Programs*. Chicago: USDN (Urban Sustainability Directors Network). usdn.org/uploads/cms/documents/usdn_equity_scan_sept_2014_final.pdf.

Pennsylvania General Assembly. 2022. *Senate Bill 1135, Housing Stabilization Initiative Act*. Harrisburg: Pennsylvania General Assembly. www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?syear=2021&sind=0&body=S&type=B&bn=1135.

Reames, T. 2016. "A Community-Based Approach to Low-Income Residential Energy Efficiency Participation Barriers." *The International Journal of Justice and Sustainability* 21 (12): 1449–66. www.tandfonline.com/doi/abs/10.1080/13549839.2015.1136995.

Rose, E., B. Hawkins, L. Ashcraft, and C. Miller. 2015. *Exploratory Review of Grantee, Subgrantee and Client Experiences with Deferred Services under the Weatherization Assistance Program*. Prepared by ORNL (Oak Ridge National Laboratory). Washington, DC: DOE. weatherization.ornl.gov/wp-content/uploads/pdf/WAPRecoveryActEvalFinalReports/ORNL_TM-2014_364.pdf.

Samarripas, S., and A. Jarrah. 2021. *A New Lease on Energy: Guidance for Improving Rental Housing Efficiency at the Local Level*. Washington, DC: American Council for an Energy-Efficient Economy. www.aceee.org/research-report/u2102.

Samarripas, S., and D. York. 2018. *Our Powers Combined: Energy Efficiency and Solar in Affordable Multifamily Buildings*. Washington, DC: ACEEE. www.aceee.org/research-report/u1804.

Samarripas, S., K, Tanabe, A. Dewey, A. Jarrah, B. Jennings, A. Drehobl, H. Bastian, S. Vaidyanathan, D. Morales, A. Patronella, S. Subramanian, and C. Tolentino. 2021. *The 2021 City Clean Energy Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u2107.

Scott, M., and C. Zabin. 2016. *Training for the Future II—Los Angeles's Utility Pre-Craft Trainee Program: Progress to Date*. Berkeley: University of California, Berkeley Labor Center. www.laborcenter.berkeley.edu/pdf/2016/Training-for-the-Future-2.pdf.

Shoemaker, M., R. Ayala, and D. York. 2020. *Expanding Opportunity through Energy Efficiency Jobs: Strategies to Ensure a More Resilient, Diverse Workforce*. Washington, DC: ACEEE. www.aceee.org/research-report/u2010.

Sierra Club. ND. Campaign Roadmap: Phase 6. www.sierraclub.org/clean-energy-toolkit/campaign-roadmap/implementation-and-beyond.

Srivastava, R., and J. Mah. 2022. *Moving the Needle on Comprehensive Commercial Retrofits*. Washington, DC: ACEEE. aceee.org/research-report/b2203.

U.S. Environmental Protection Agency. ND. Heat Island Effect. www.epa.gov/heatislands#:~:text=Heat%20islands%20are%20urbanized%20areas,as%20forests%20and%20water%20bodies.

U.S. Global Change Research Program. 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. nca2018.globalchange.gov/.

Walton, R. 2022. "Maryland Lawmakers Set Low-Income Energy Savings Target in 'Crucial' Equity, Efficiency Legislation." *Utility Dive*, March 23. www.utilitydive.com/news/maryland-lawmakers-set-low-income-energy-savings-target-in-crucial-equity/620857/.

White House. 2022. "Justice40: A Whole-of-Government Initiative." www.whitehouse.gov/environmentaljustice/justice40/.

Williams, D., and C. Collins. 2001. "Racial Residential Segregation: A Fundamental Cause of Racial Disparities in Health." *Public Health Reports* 116 (5): 404–16. www.ncbi.nlm.nih.gov/pmc/articles/PMC1497358.

York, D., C. Cohn, D. Morales, and C. Tolentino. 2022. *Building Decarbonization Solutions for the Affordable Housing Sector*. Washington, DC: ACEEE. www.aceee.org/research-report/u2204.

Appendix. Additional Detailed Data

A. ELIGIBILITY CRITERIA FOR LOW-INCOME PROGRAMS BY ELECTRIC UTILITY

Electric utility	Definition of low-income
AES Indiana	200% FPL.
AES Ohio	
Ameren UE (Union Electric)	Participation in a federal, state, or local subsidized housing program. Proof of resident gross annual income levels at or below 80% of Area Median Income (AMI). Fall within a census tract included on the Company's list of eligible low-income census tracts. When a multifamily property does not meet one of the criteria above and will have a combination of qualifying and non-qualifying residents, at least 50% of the residents must be eligible in order for the entire property to qualify.
American Electric Power (Ohio Power)	Income level at or below 200% of the Federal Poverty Level.
American Electric Power (TX)	
Arizona Public Service	200% FPL.
Austin Energy	80% of the Median Family Income for the City of Austin.
Baltimore Gas & Electric Co.	Eligibility is established by the Maryland Department of Housing & Community Development. See: https://dhcd.maryland.gov/Residents/Pages/lieep/default.aspx
CenterPoint Energy (TX)	
City of Riverside Public Service	Household income within 200% of the Federal Poverty Guidelines.
Colorado Springs Utilities	250% FPL; must be owner and live in a single-family house, condo, or multifamily unit or mobile home.
ComEd	Annual income falls at or below 80% Area Median Income.

Electric utility	Definition of low-income
ConEdison	Multifamily program uses affordable housing proxy requirements for how to determine if a building has enough low-income tenants to receive an enhanced offer. The requirements include: HUD-Regulated Affordable Housing, DHCR Regulated Affordable Housing, Low-Income Housing Tax Credits, NYCHPD Regulated Housing, SONYMA mortgage insurance, Weatherization Assistance Program, HFA 80/20 programs, NYCHDC 80/20 or mixed income programs and rent rolls where at least 25% of the units must have a calculated household income of no more than 80% of Area or State Median income.
Consumers Energy Co.	For Multifamily, 66% of tenants at or under 200% of the FPL or 80% AMI.
CPS Energy (City of San Antonio)	A customer being at or below 200% of the Federal Poverty Level.
Dominion Energy South Carolina	No data
Dominion Virginia Power	The Company's low-income Programs conform to both the Virginia Development Housing Authority and the Virginia Department of Housing and Community Development qualification guidelines, which is currently set at 60% State Median Income or 80% of the Local Area Median Income, whichever is higher. It is also available to customers who are 60 years or older with a household income of 120% of the State Median Income.
DTE Energy	The DTE Energy Efficiency Assistance (EEA) program defines low-income as 200% FPL or below or 80% AMI or below. Customers can also qualify if they are participating in the DTE Low Income Self Sufficiency Plan or other state low-income public assistance programs (SNAP, WIC, etc.).
Duke Energy Carolinas	The Residential Income-Qualified Energy Efficiency and Weatherization Assistance for Individuals Program is based on household income that qualifies for the State of North Carolina Weather Assistance Program. The NES Program typically considers "low-income" as neighborhoods that have 50% or more of the households with income less than or equal to 200% of the poverty level established by the U. S. Government.
Duke Energy Florida	No data

Electric utility	Definition of low-income
Duke Energy Ohio	The low-income services program for weatherization and refrigerator replacement is for customers up to 200% of the federal poverty level and who have not participated in the program within the past 10 years. The Electric Maintenance Service program is available for low-income elderly and disabled customers up to 175% of poverty level. The Neighborhood Energy Saver Areas targeted for participation in this Program will have approximately 50% of the households at an income equal to or less than 200% of the Federal Poverty Level as established by the Department of Energy.
Duke Energy Progress	Neighborhoods that have 50% or more of the households with income less than or equal to 200% of the poverty level established by the U.S. Government.
Duquesne Light Co.	Customers at or below 150% of the Federal Poverty Guideline. Customers at or below 200% of the Federal Poverty Guidelines are eligible for the Hardship Fund. Under LIURP a small percentage of seniors up to 200% of the FPIG can receive service as well.
El Paso Electric	200% Department of Health and Human Services (HHS) poverty.
Entergy Arkansas	The definitions are set in accordance with the standards by Act 1102.
Entergy Louisiana	Residential Entergy Louisiana customers who meet the income qualification of 200% of the Federal Poverty Level.
Entergy New Orleans	The Energy Smart energy efficiency program uses 200% of the Federal Poverty Level as its standard.
Eversource (Connecticut Light & Power)	60% of State Medium Income (SMI).
Eversource (MA)	Income eligible is defined as at or below 60% of the state median income level for 1–4 unit buildings and at or below 60% of the area median income level for 5+ unit buildings. Customers qualify for the utility discount rate by meeting low-income home energy assistance (LIHEAP) eligibility or by meeting the eligibility requirements for other means-tested programs, such as Chapter 115 Veterans' Service Benefits,

Electric utility	Definition of low-income
	Supplemental Security Income, and Supplemental Nutrition Assistance Program services.
First Energy (Cleveland Electric Illuminating)	No data
First Energy (Ohio Edison)	No data
First Energy (Toledo Edison)	No data
Florida Power & Light	No data
Georgia Power	200% FPL
Hawaiian Electric Co.	No data
Idaho Power	No data
JEA	Identifies qualifying neighborhoods as having 50% or more of the residents living at or below 150% of the Federal Poverty guidelines.
KCP&L (Evergy)	Each low-income program follows guidelines from the Federal Poverty Guidelines (FPL), but at different percentages based on the program.
Knoxville Utilities Board	80% of HUD. TVA: 200% FPL.
LADWP	200% FPL. The Low-Income Discount Program considers "low-income" the combined gross income of all persons living in the household. Members in Household Maximum Annual Gross Income: 1) $34,480 2) $34,480 3) $43,440 4) $52,400 5) $61,360 6) $70,320 7) $79,280 8) $88,240 Each additional member adds $8,960. The Senior Citizen/Disability Lifeline Rate applies to households with income $45,050 or less.
Louisville Gas & Electric	No data
Madison Gas & Electric	Focus on Energy definition: 80% of State Median Income for Focus on Energy income-qualified Tier 2 incentives.

Electric utility	Definition of low-income
Memphis Light, Gas & Water	200% FPL
MidAmerican Energy	As defined by the Department of Energy's Weatherization Assistance Program.
Nashville Electric Service	200% FPL
National Grid (MA)	Low income is defined as at or below 60% of the state median income level for 1–4 unit buildings and at or below 60% of the area median income level for 5+ unit buildings. Customers that qualify for the utility discount rate are also considered income eligible. Customers qualify for the utility discount rate by meeting low-income home energy assistance (LIHEAP) eligibility or by meeting the eligibility requirements for other means-tested programs, such as Chapter 115 Veterans' Service Benefits, Supplemental Security Income, and Supplemental Nutrition Assistance Program services.
National Grid (NY)	No data
National Grid RI (Narragansett)	Customers who qualify for the Income Eligible Services program are currently on the A-60 or 1301 Low Income Discount Rate, or who qualify for LIHEAP funds from the State with household income levels below 60% of the Area Median Income (AMI).
NV Energy	No data
Oklahoma Gas & Electric	No data
ONCOR	No data
Orlando Utilities Commission	Household income of $40,000 or less.
PECO	150% FPL
PEPCO	"Low-Income Households" are households that have annual incomes equal to or below 80% of the Area Median Income ("AMI") or 60% of the State Median Income ("SMI"), whichever is higher. For a household of 4 persons, the area median income in the Washington Metropolitan Statistical Area as set forth in the periodic calculation provided by the United States Department of Housing and Urban Development. "Low-Income

Electric utility	Definition of low-income
	Housing" is defined as the District's stock of affordable, low-income housing. It is defined as either (a) a single home where the owner or occupant meets the definition of "low-income households" in this Contract, (b) a multifamily building where at least 66% of the households meet the definition of "low-income households" in this Contract, (c) buildings owned by non-profit organizations or government that meet the definition of "low-income households" in this Contract, or (d) buildings where there are contracts or other legal instruments in place that assure that at least 66% of the housing units in the building will be occupied by low-income households.
PG&E	Household income must be equal to or less than 200 percent of the Federal Poverty Guidelines with income adjustments for family size.
Portland General Electric	200% FPL
PPL Electric Utilities	Customers must be at or below 150% of the federal poverty level to qualify
PSE&G	250% FPL
Public Service Co. of NM	Low income is defined as at or below 200% of federal poverty level.
Public Service Co. of Oklahoma	Household income below $50,000.
Rochester Gas & Electric	No data
Rocky Mountain Power (PacifiCorp)	The definition of low income is defined in the Low-Income Weatherization Tariff. Low-income customers are qualified based on current Utah Department of Work Force Services, Housing and Community Development Division guidelines.
San Diego Gas & Electric	200% Federal Poverty Guideline.
Seattle City Light	70% SMI
SMUD	200% FPL
Southern California Edison	200% FPL

Electric utility	Definition of low-income
Tampa Electric Co.	Tampa Electric uses the Florida Census tract data to determine low-income customer qualifications as well as help determine the locations within their service area that are considered below poverty level. Tampa Electric however does not collect financial information to participate in the program, TECO primarily uses the census tract data to target and focus on the highest low-income ranked areas within the census tract.
Tucson Electric Power Co.	200% FPL
United Illuminating Co.	HES-IE's income eligibility is based on 60% of state median income or below. Customers attempting to receive services through HES-IE must be at that guideline or below to qualify for HES-IE services.
We Energies	<80% SMI
Westar Energy (Evergy)	No data
Xcel Energy (Northern States Power)	For single family residents, the customer's income must be at or below 50% of State Median income or 200% of Federal Poverty Level—whichever is greater—to qualify for HESP or LIHES. For 2–4 unit multifamily buildings to qualify as low income, 50% or more of the building residents must have incomes at or below 50% of State Median income. For 5+ unit multi-family buildings to qualify as low-income, they must have 66% or more of their units dedicated to residents with an income level at or below 50% of State Median income. If the building meets this criterion, the whole building is considered qualified low income for the CIP program offerings.
Xcel Energy (Public Service Co. of CO)	Energy Savings Kits: In order to participate, customers must receive LIHEAP, LEAP, or any energy assistance funding (including county assistance and fuel fund assistance) or other low-income state assistance programs. Multifamily Weatherization: Eligible customers for this product are building owners or property managers of multifamily housing complexes with at least 66% of the rental units occupied by low-income customers whose income is below 80% of the local area median. Customers meeting the U.S. Department of Energy Weatherization Assistance Program funding guidelines as determined by the Colorado Energy Office (CEO), EOC, local governments, or their agencies, are automatically deemed income eligible.

Electric utility	Definition of low-income
	Single-Family Weatherization: In order to participate, customers must purchase retail electricity or gas from Public Service on a residential tariff and have a household income below 80% AMI. Customers meeting the DOE Weatherization Assistance Program funding guidelines, as determined by the third-party implementer, local government, or local agencies, are automatically eligible.

B. ELIGIBILITY CRITERIA FOR LOW-INCOME PROGRAMS BY NATURAL GAS UTILITY

Natural gas utility	Has low-income program	Definition of low-income
CenterPoint Energy (AR)	Yes	LIHEAP qualified households or 65+ years of age
Atlanta Gas Light (Southern Company Gas)	Yes	Up to 200% FPL
ATMOS Energy	Yes	200% FPL
Baltimore Gas & Electric	Yes	Eligibility is established by the Maryland Department of Housing & Community Development. See: https://dhcd.maryland.gov/Residents/Pages/lieep/default.aspx
CenterPoint Energy (MN)	Yes	50% SMI or 200% FPG (whichever is higher)
CenterPoint Energy (TX)	Yes	
Citizens Energy Group	Yes	Up to 70% SMI
Colorado Springs Utilities	Yes	250% FPL; must be owner and live in a single-family house, condo, or multifamily unit or mobile home
Columbia Gas of Massachusetts	Yes	
Columbia Gas of Ohio (NiSource)	Yes	150% FPL

Natural gas utility	Has low-income program	Definition of low-income
Connecticut Natural Gas	Yes	HES-IE's income eligibility is based on 60% of state median income or below. Customers attempting to receive services through HES-IE must be at that guideline or below to qualify for HES-IE services.
Dominion Energy	Yes	No data
Dominion Energy (Questar Gas)	Yes	No data
Dominion Energy Ohio	Yes	200% FPL
DTE Energy	Yes	Customers can obtain a low-income flag from the DTE billing system. If they have LI=Y, they would immediately qualify. Outside of the DTE billing system, there are several other ways to qualify. The DTE Energy Efficiency Assistance (EEA) program defines low-income as 200% FPL or below or 80% AMI or below. Customers can also qualify if they are participating in the DTE Low Income Self Sufficiency Plan or other state low-income public assistance programs (SNAP, WIC, etc.).
Entergy New Orleans	Yes	The Energy Smart energy efficiency program uses 200% of the Federal Poverty Level as its standard.
Eversource (MA)	Yes	Income eligible is defined as at or below 60% of the state median income level for 1–4 unit buildings and at or below 60% of the area median income level for 5+ unit buildings. Customers qualify for the utility discount rate by meeting low-income home energy assistance (LIHEAP)

Natural gas utility	Has low-income program	Definition of low-income
		eligibility or by meeting the eligibility requirements for other means-tested programs, such as Chapter 115 Veterans' Service Benefits, Supplemental Security Income, and Supplemental Nutrition Assistance Program services.
Hawaii Gas	Yes	
Knoxville Utilities Board	Yes	80% of HUD
Madison Gas & Electric	Yes	Focus on Energy definition: 80% of State Median Income for Focus on Energy income-qualified Tier 2 incentives. Documentation: https://focusonenergy.com/Tier2 WI Weatherization Assistance Program definition: "You may be eligible for weatherization services if: -You received benefits from Wisconsin's Home Energy Assistance Program (WHEAP) or your gross income for the last month is equal to or less than 60% of Wisconsin's state median income (SMI) for your family size. Your dwelling/apartment has not been weatherized before. -Your household meets certain priorities that may include a high energy burden or use, an elderly or disabled member or a child under six. Documentation: http://homeenergyplus.wi.gov/category.asp?linkcatid=819&linkid=118
Memphis Light, Gas & Water	Yes	200% FPL
MidAmerican Energy	Yes	As defined by the Department of Energy's

Natural gas utility	Has low-income program	Definition of low-income
		Weatherization Assistance Program.
National Grid (Boston Gas & Colonial Gas Co.)	Yes	Low income is defined as at or below 60% of the state median income level for 1–4 unit buildings and at or below 60% of the area median income level for 5+ unit buildings. Customers that qualify for the utility discount rate are also considered income eligible. Customers qualify for the utility discount rate by meeting low-income home energy assistance (LIHEAP) eligibility or by meeting the eligibility requirements for other means-tested programs, such as Chapter 115 Veterans' Service Benefits, Supplemental Security Income, and Supplemental Nutrition Assistance Program services.
National Grid (Brooklyn Union Gas Co.)/NYSERDA	Yes	No data
National Grid (NY)	Yes	No data
National Grid RI (Narragansett)	Yes	Customers who qualify for the Income Eligible Services program are currently on the A-60 or 1301 Low Income Discount Rate; or who qualify for LIHEAP funds from the State with household income levels below 60% of the Area Median Income (AMI).
New Mexico Gas	Yes	200% FPL
NW Natural	Yes	No data
Oklahoma Natural Gas	Yes	The program is available to all residential customers who own or lease a single-family, duplex, or mobile home and

Natural gas utility	Has low-income program	Definition of low-income
		have an income of less than $50,000 per year.
Peoples Gas	Yes	Income-qualified customers are defined as below the 80% Area Median Income (AMI) level, as defined by geography/location of the building.
Peoples Natural Gas	Yes	Typically, 150% of Federal Poverty Level although we can provide services to customers up to 200% of Federal Poverty Level if there are special needs.
PG&E	Yes	The ESA Program is available to income-qualified PG&E customers living in single family, multifamily, and mobile homes, including homeowners and renters. To qualify for the ESA Program, the total customer household income must be equal to or less than 200% of the Federal Poverty Guidelines with income adjustments for family size.
PGW	Yes	The ESA Program is available to income-qualified PG&E customers living in single family, multifamily, and mobile homes. Including homeowners and renters. To qualify for the ESA Program, the total customer household income must be equal to or less than 200 percent of the Federal Poverty Guidelines with income adjustments for family size.
PSE&G	Yes	250% FPL
Puget Sound Energy	Yes	Program qualification is consistent with the Washington Department of

Natural gas utility	Has low-income program	Definition of low-income
		Commerce definition which is 200% Federal Poverty Level (FPL) or 60% State Median Income (SMI), whichever is higher.
San Diego Gas & Electric	Yes	200% Federal Poverty Guideline
SoCal Gas	Yes	SoCalGas low-income program limits are updated June 1 of each year in compliance with Public Utilities Code Section 739.1a which applies to customers with an annual household income that is no greater than 200% of the Federal Poverty Guideline level. Customers may also qualify for the program if they or someone in the household receives benefits from one of the qualifying Categorical Eligibility programs.
Southern Connecticut Gas	Yes	HES-IE's income eligibility is based on 60% of state median income or below. Customers attempting to receive services through HES-IE must be at that guideline or below to qualify for HES-IE services.
Southwest Gas	Yes	No data
Spire Missouri	Yes	There are many definitions Spire has when referring to "low-income." WX program – 200% of the Federal Poverty Level (FPL). LIHEAP Assistance – 135% of FPL. Red Tag Assistance – 185% of FPL. Fixed Charge Asst. Program – 185% of FPL. Arrearage Repayment Program – 185% of FPL

Natural gas utility	Has low-income program	Definition of low-income
Texas Gas Service	Yes	Texas Gas Service relies on the referrals of third-party agencies (e.g., Meals on Wheels, county assistance agencies) to qualify customers. The low-income definition can vary by agency but is typically 200% of the federal poverty level or below or <80% MFI for the area.
Vectren	Yes	VWP I serves customers with a household income up to 200% of FPL. VWP II serves customers with a household income within 201% and 300% of FPL.
Washington Gas (DC SEU)	Yes	"Low-Income Households" are households that have annual incomes equal to or below 80% of the Area Median Income ("AMI") or 60% of the State Median Income ("SMI"), whichever is higher. For a household of 4 persons, the area median income for a household of 4 persons in the Washington Metropolitan Statistical Area as set forth in the periodic calculation provided by the United States Department of Housing and Urban Development. "Low-Income Housing" is defined as the District's stock of affordable, low-income housing. It is defined as either (a) a single home where the owner or occupant meets the definition of "low-income households" in this Contract, (b) a multifamily building where at least 66% of the households meet the definition of "low-income households" in this

Natural gas utility	Has low-income program	Definition of low-income
		Contract, (c) buildings owned by non-profit organizations or government that meet the definition of "low-income households" in this Contract, or (d) buildings where there are contracts or other legal instruments in place that assure that at least 66% of the housing units in the building will be occupied by low-income households.
We Energies	Yes	<80% SMI
Xcel Energy (Northern States Power)	Yes	For single family residents, the customer's income must be at or below 50% of State Median income or 200% of Federal Poverty Level—whichever is greater—to qualify for HESP or LIHES. For 2–4 unit multifamily buildings to qualify as low income, 50% or more of the building residents must have incomes at or below 50% of State Median income. For 5+ unit multifamily buildings to qualify as low-income, they must have 66% or more of their units dedicated to residents with an income level at or below 50% of State Median income. If the building meets this criterion, the whole building is considered qualified low income for the CIP program offerings.
Xcel Energy (Public Service Co. of CO)	Yes	Energy Savings Kits: In order to participate, customers must receive LIHEAP, LEAP, or any energy assistance funding (including county assistance and fuel fund assistance) or other low-

Natural gas utility	Has low-income program	Definition of low-income
		income state assistance programs). Multifamily Weatherization: Eligible customers for this product are building owners or property managers of multifamily housing complexes with at least 66% of the rental units occupied by low-income customers whose income is below 80% of the local area median. Customers meeting the U.S. Department of Energy Weatherization Assistance Program funding guidelines as determined by the Colorado Energy Office (CEO), EOC, local governments, or their agencies, are automatically deemed income eligible. Single-Family Weatherization: In order to participate, customers must purchase retail electricity or gas from Public Service on a residential tariff and have a household income below 80% AMI. Customers meeting the DOE Weatherization Assistance Program funding guidelines, as determined by the third-party implementer, local government, or local agencies, are automatically eligible.

C. UTILITIES INCLUDED IN OUR 2015 STUDY

State	Electric utility
MO	Ameren UE (Union Electric)
OH	American Electric Power (Ohio Power)
AZ	Arizona Public Service
TX	Austin Energy
MD	Baltimore Gas & Electric
TX	CenterPoint Energy (TX)
CA	City of Riverside Public Service
IL	ComEd
NY	ConEdison
TX	CPS Energy (City of San Antonio)
VA	Dominion Virginia Power
MI	DTE Energy
NC	Duke Energy Carolinas
OH	Duke Energy Ohio
NC	Duke Energy Progress
PA	Duquesne Light Co.
TX	El Paso Electric
LA	Entergy New Orleans
CT	Eversource (Connecticut Light & Power)
MA	Eversource (MA)
VA	Dominion Virginia Power
OH	First Energy (Cleveland Electric Illuminating)
FL	Florida Power & Light
GA	Georgia Power
FL	JEA
MO	KCP&L (Evergy)
CA	LADWP
KY	Louisville Gas & Electric
TN	Memphis Light, Gas & Water

State	Electric utility
TN	Nashville Electric Service
RI	National Grid RI (Narragansett)
NV	NV Energy
OK	Oklahoma Gas & Electric
TX	ONCOR
FL	Orlando Utilities Commission
PA	PECO
DC	PEPCO
CA	PG&E
UT	Rocky Mountain Power (PacifiCorp)
CA	San Diego Gas & Electric
WA	Seattle City Light
CA	SMUD
FL	Tampa Electric Co.
WI	We Energies
MN	Xcel Energy (Northern States Power)
CO	Xcel Energy (Public Service Co. of CO)

State	Natural gas utility
MD	Baltimore Gas & Electric
MN	CenterPoint Energy (MN)
IN	Citizens Energy Group
OH	Columbia Gas of Ohio (NiSource)
CT	Connecticut Natural Gas
UT	Dominion Energy (Questar Gas)
MI	DTE Energy
KY	Louisville Gas & Electric
MA	National Grid (Boston Gas & Colonial Gas Co.)
RI	National Grid RI (Narragansett)
OR	NW Natural
OK	Oklahoma Natural Gas

PA	Peoples Natural Gas
CA	PG&E
PA	PGW
CA	San Diego Gas & Electric
CA	SoCal Gas
DC	Washington Gas (DC SEU)
WI	We Energies
CO	Xcel Energy (Public Service Co. of CO)

D. DATA VERIFICATION FOR ELECTRIC UTILITIES

State	Electric utility	Verified LI savings	Verified LI customers	Verified LI spending
IN	AES Indiana	Yes	Yes	Yes
AL	Alabama Power	No	No	No
MO	Ameren UE (Union Electric)	Yes	Yes	Yes
OH	American Electric Power (Ohio Power)	No	No	No
TX	American Electric Power (TX)	No	No	No
AZ	Arizona Public Service (APS)	No	No	No
TX	Austin Energy	No	No	No
MD	BG&E	No	No	No
TX	CenterPoint Energy (TX)	No	No	No
CA	City of Riverside Public Service	No	No	No
CO	Colorado Springs Utilities	Yes	Yes	Yes
IL	ComEd	No	No	No
NY	ConEdison	No	No	No
MI	Consumers Energy	No	No	No

State	Electric utility	Verified LI savings	Verified LI customers	Verified LI spending
TX	CPS Energy (City of San Antonio)	No	No	No
OH	Dayton Power & Light	No	No	No
SC	Dominion Energy South Carolina	No	No	No
VA	Dominion Energy Virginia	Yes	Yes	Yes
MI	DTE Energy	Yes	Yes	Yes
NC	Duke Energy Carolinas	No	No	No
FL	Duke Energy Florida	No	No	No
OH	Duke Energy Ohio	No	No	No
NC	Duke Energy Progress	No	No	No
PA	Duquesne Light Co	Yes	Yes	Yes
TX	El Paso Electric	Yes	Yes	Yes
AR	Entergy Arkansas	No	No	No
LA	Entergy Louisiana	No	No	No
LA	Entergy New Orleans	Yes	No	No
KS	Evergy Kansas Central	No	No	No
MO	Evergy Metro	No	No	No
CT	Eversource (Connecticut Light and Power)	Yes	Yes	Yes
MA	Eversource (MA)	Yes	Yes	Yes
OH	First Energy (Cleveland Electric Illuminating)	No	No	No
OH	First Energy (Ohio Edison)	No	No	No
OH	First Energy (Toledo Edison)	No	No	No
FL	FP&L	No	No	No
GA	Georgia Power	No	No	No
HI	Hawaii Energy (Hawaii Electric Co Inc)	No	No	No
ID	Idaho Power	Yes	Yes	Yes
FL	JEA	Yes	Yes	Yes
TN	Knoxville Utilities Board	Yes	Yes	Yes

State	Electric utility	Verified LI savings	Verified LI customers	Verified LI spending
CA	LADWP	Yes	Yes	Yes
FL	Lakeland Electric	No	No	No
FL	Lee County Electric Cooperative	No	No	No
KY	Louisville Gas and Electric	No	No	No
WI	Madison Gas & Electric	Yes	Yes	Yes
TN	Memphis Light, Gas, and Water	No	No	No
IA	MidAmerican Energy	Yes	Yes	yes
TN	Nashville Electric Service	No	No	No
MA	National Grid (MA)	Yes	Yes	Yes
NY	National Grid (NY)	Yes	Yes	Yes
RI	National Grid RI (Narragansett Electric)	Yes	Yes	Yes
NV	NV Energy	No	No	No
OK	Oklahoma Gas & Electric	No	No	No
NE	Omaha Public Power District	No	No	No
TX	ONCOR	No	No	No
FL	Orlando Utilities Commission	Yes	Yes	Yes
PA	PECO	Yes	Yes	Yes
DC	PEPCO	No	No	No
CA	PG&E	Yes	Yes	Yes
OR	Portland General Electric	No	No	No
PA	PPL Electric Utilities	Yes	Yes	Yes
UT	Provo City Power	No	No	No
NJ	PSE&G	No	No	No
NM	Public Service Co of NM (PNM)	No	No	No
OK	Public Service Co of Oklahoma	Yes	Yes	Yes
PR	Puerto Rico Electric Power Authority	No	No	No

State	Electric utility	Verified LI savings	Verified LI customers	Verified LI spending
NY	Rochester Gas & Electric	Yes	Yes	Yes
UT	Rocky Mountain Power (UT)	No	No	No
AZ	Salt River Project	No	No	No
CA	San Diego Gas & Electric	No	No	No
WA	Seattle City Light	No	No	No
CA	SMUD	No	No	No
CA	Southern California Edison Co (SCE)	Yes	Yes	Yes
FL	Tampa Electric Co	No	No	No
AZ	Tucson Electric Power Co	Yes	Yes	Yes
CT	United Illuminating	Yes	Yes	Yes
WI	We Energies	Yes	Yes	Yes
CO	Xcel (CO)	Yes	Yes	Yes
MN	Xcel (MN)	Yes	Yes	Yes

E. DATA VERIFICATION FOR NATURAL GAS UTILITIES

State	Natural gas utility	Verified LI savings	Verified LI customers	Verified LI spending
AL	Alagasco	Yes	Yes	Yes
GA	Atlanta Gas Light (Southern Company Gas)	Yes	Yes	Yes
TX	ATMOS Energy	Yes	Yes	Yes
MD	BG&E	Yes	Yes	Yes
AR	CenterPoint Energy (AR)	Yes	Yes	Yes
TX	CenterPoint Energy (TX)	No	No	No
MN	CenterPoint Energy (MN)	Yes	Yes	Yes
IN	Citizens Energy Group	No	No	No

State	Natural gas utility	Verified LI savings	Verified LI customers	Verified LI spending
CO	Colorado Springs Utilities	Yes	No	Yes
MA	Columbia Gas of Massachusetts	Yes	Yes	Yes
OH	Columbia Gas of Ohio	Yes	Yes	Yes
CT	Connecticut Natural Gas	No	No	No
TX	CPS Energy (City of San Antonio)	No	No	No
UT	Dominion Energy Utah	No	No	No
OH	Dominion Energy Ohio	Yes	Yes	Yes
SC	Dominion Energy South Carolina	No	No	No
MI	DTE Energy	Yes	Yes	Yes
OH	Duke Energy Ohio	No	No	No
LA	Entergy Louisiana	Yes	Yes	Yes
LA	Entergy New Orleans	No	No	No
MA	Eversource (MA)	Yes	Yes	Yes
FL	Florida City Gas	No	No	No
HI	Hawaii Energy (Hawaii Electric Co Inc)	Yes	Yes	Yes
ID	Intermountain Natural Gas	No	No	No
KS	Kansas Gas Service	No	No	No
TN	Knoxville Utilities Board	Yes	Yes	Yes
CA	Long Beach Energy Resources	No	No	No
KY	Louisville Gas and Electric	No	No	No

State	Natural gas utility	Verified LI savings	Verified LI customers	Verified LI spending
WI	Madison Gas & Electric	Yes	Yes	Yes
TN	Memphis Light, Gas & Water	Yes	Yes	Yes
NE	Metropolitan Utilities District of Omaha	Yes	Yes	Yes
IA	MidAmerican Energy	Yes	Yes	Yes
RI	National Grid RI (Narragansett Electric)	Yes	Yes	Yes
NY	National Fuel Gas	No	No	No
MA	National Grid (MA)	Yes	Yes	Yes
NY	National Grid (NY)	Yes	Yes	Yes
NY	NYSERDA	No	No	No
NM	New Mexico Gas	No	No	No
NV	NV Energy	Yes	Yes	Yes
OR	Northwest Natural	Yes	No	Yes
OK	Oklahoma Natural Gas	Yes	Yes	Yes
IL	Peoples Gas	Yes	Yes	Yes
PA	Peoples Natural Gas	Yes	Yes	Yes
CA	PG&E	Yes	Yes	Yes
PA	PGW	Yes	Yes	Yes
NC	Piedmont Natural Gas	No	No	No
TN	Piedmont Natural Gas	No	No	No
NJ	PSE&G	Yes	Yes	Yes
NC	PSNC Energy	No	No	No
WA	Puget Sound Energy	No	No	No

State	Natural gas utility	Verified LI savings	Verified LI customers	Verified LI spending
VA	Richmond Dept of Public Utilities	No	No	No
NY	Rochester Gas & Electric	Yes	Yes	Yes
CA	San Diego Gas & Electric	No	No	No
CA	SoCal Gas	No	No	No
CT	Southern Connecticut Gas	Yes	Yes	Yes
NV	Southwest Gas	No	No	No
MO	Spire Missouri	No	No	No
FL	TECO Peoples Gas	Yes	Yes	Yes
TX	Texas Gas Service	No	No	No
PA	UGI Utilities	Yes	Yes	Yes
OH	Vectren	Yes	Yes	Yes
VA	Virginia Natural Gas (AGL Resources)	Yes	Yes	Yes
DC	Washington Gas (DC SEU)	Yes	Yes	Yes
WI	We Energies (Wisconsin Energy)	Yes	Yes	Yes
CO	Xcel (Public Service Co of CO)	Yes	Yes	Yes
MN	Xcel Energy (Northern States Power)	Yes	Yes	Yes

F. MEASURES INCLUDED IN EACH UTILITY PROGRAM

Electric utility	Program name(s)	Measures included
AES Indiana		Efficient lighting, power strips, faucet aerators, low-flow showerheads, pipe wrap, air sealing, attic insulation, radiant

Electric utility	Program name(s)	Measures included
		heat barrier, refrigerator replacement, water heater setback and programmable thermostats.
AES Ohio	Smart Energy Community Program	The program offers free energy-saving home improvements to income-eligible customers. This program offers a free energy audit and an assessment of energy use along with equipment and improvements that will help the customer save energy and money. Through this program eligible customers may receive energy efficiency LED light bulbs, refrigerators, low flow showerheads, faucet aerators, insulation, or smart thermostats. DP&L partners with Community Action Agencies in each county to administer the program. DP&L allows agencies administrating the program to braid program funds to address health and safety issues.
Ameren UE (Union Electric)		Single Family Income Eligible Program: Employs multiple delivery channels to provide a one-stop-shop for single family and mobile homes, whole-home energy efficiency upgrades at no cost for the benefit of low-income residential customers. The Single-Family Income Eligible program is co-delivered with Spire NG Inc. to offer incentives for upgrades of natural gas energy efficiency measures.
American Electric Power (Ohio Power)		Baseload measures such as lighting, appliance upgrades, HVAC, and electric hot water measures.
American Electric Power (TX)	Targeted Low-Income Energy Efficiency Program (TLIP)	No info in program description
Arizona Public Service	Energy Wise Limited Income Assistance Program	This program serves low-income customers with various home improvements including cooling system repair and replacement, insulation, sunscreens, water heaters, window repairs and improvements, refrigerator replacement, efficient lighting, as well as other general repairs. The program also includes funding for health and safety measures.
Austin Energy		Pays for up to $7,500 in energy efficiency improvements and is part of our partnership with the Department of Energy (DOE) and Energy Star. The program is designed to provide energy improvement measures similar to those in our Home Performance with Energy Star Program. Local contractors contracted by Austin Energy deliver the energy efficiency measures in comprehensive projects. The program energy efficiency improvement measures offered are: A/C Tune Up and repair, Comprehensive (air infiltration and duct sealing), Duct System Improvements, Attic Insulation, Solar Screens,

Electric utility	Program name(s)	Measures included
		High Efficiency LED Lighting, WIFI Thermostats, Life Safety (Smoke and CO Detectors), and Performance Testing such as blower door, duct blower, static pressure and combustion testing. The program also offers an HVAC rebate and loan component with a low interest loan and an accompanying rebate to offset the cost of the system.
Baltimore Gas & Electric Co.		Installation of insulation, air sealing, replacement of old refrigerators and HVAC systems, health and safety measures, and water efficiency measures
CenterPoint Energy (TX)	Hard-to-Reach Standard Offer Program	CenterPoint Energy offers the Hard-to-Reach Standard Offer Program to qualified low-income residential customers. Through this program, incentives are paid to project sponsors for qualifying measures installed in retrofit applications that provide verifiable demand and energy savings to low-income customers. Qualifying measures include installation of insulation, air sealing, replacement of air conditioning duct systems, refrigerator replacement, water-saving measures, and lighting fixtures.
City of Riverside Public Service	Energy Savings Assistance Program	
Colorado Springs Utilities	Home Efficiency Assistance Program (HEAP) and Electric-Efficiency Product Promotion (EEPP) Program	No data
ComEd	Single-Family Retrofits both with Illinois Home Weatherization Assistance program ("IHWAP") co-funding and a separate offering ("non-IHWAP"), Multi-Family Retrofits ("non-IHWAP and IHWAP), Affordable Housing New Construction, Public Housing Authority Program offering,	No data

Electric utility	Program name(s)	Measures included
	Food Bank LED Distribution, Income Eligible Lighting Discounts, Income Eligible Energy Savings Kits, Existing Manufactured Homes Retrofits	
ConEdison	EmPower New York	No-cost energy efficiency solutions including air sealing, insulation, replacement of inefficient refrigerators and freezers, water efficiency measures, thermostats, and new energy-efficient lighting.
Consumers Energy Co.	Energy's Income-Qualified Energy Efficiency Assistance Program	Consumers Energy's Income-Qualified Energy Efficiency Assistance Program aids single-family, income-eligible Consumers Energy customers with no-cost direct services that include energy efficiency upgrades, home energy assessments, and energy-saving education. This program offers direct install of free products including LED bulbs, pipe wrap, showerheads, and faucet aerators. The program also provides access to prescriptive measures for HVAC, lighting, water heating, and building envelope.
CPS Energy (City of San Antonio)	The Casa Verde Weatherization Program	No-cost retrofit measures including LED light bulbs, insulation, air sealing measures, solar screens, water heater insulation, water efficiency measures, thermostats, and AC duct system improvements.
Dominion Energy South Carolina	Neighborhood Energy Efficiency Program (NEEP) and NEEP Mobile Home	For NEEP: direct installation of low-cost energy saving measures. The NEEP Mobile Home offering provides mobile home weatherization measures to customers who participated in the NEEP core offering. Measures include air sealing, attic plug & fill insulation, belly board insulation, duct sealing, and appropriate energy efficiency measures not provided within the core NEEP offering.
Dominion Virginia Power	Residential Income and Age Qualifying Program	Program measures include ENERGY STAR® qualified LED light bulbs (screw base), energy-saving showerhead(s), high-efficiency faucet aerators, pipe wrap insulation for hot water pipes, and attic insulation.
DTE Energy		Weatherization, furnace tune up and replacement, insulation, water heater replacement, plus the replacement of inefficient refrigerators with ENERGY STAR® model refrigerators in single-family homes and low-income multifamily dwellings, and in-home consultation and installation of energy-efficient measures through the Home Energy Consultation (HEC) Program. Low-cost measures such as LEDs, pipe wrap, energy

Electric utility	Program name(s)	Measures included
		efficient showerheads, and faucet aerators are installed at no cost to low-income multifamily tenants. The low-income multifamily program also expanded its measure offerings to multifamily tenants to include more expensive items, such as refrigerators, also at no cost to the customer.
Duke Energy Carolinas	Neighborhood Energy Saver Program	Direct-install measures such as lightbulbs, aerators, showerheads, weather stripping, door sweeps, caulk and insulation, and water heater adjustments.
Duke Energy Florida	Neighborhood Energy Saver program	LED light bulbs, insulation, duct repair, faucet aerators, low flow showerheads, weatherstripping, and HVAC tune-ups
Duke Energy Ohio	The Low-Income Services, Pay for Performance, and the Neighborhood Energy Saver programs	Duke Energy Ohio offers the Low-Income Services, Pay for Performance, and the Neighborhood Energy Saver program to qualified low-income customers. Customers may receive energy efficiency products and services such as compact fluorescent bulbs (CFLs), low-flow showerheads and faucet aerators, water heater wraps, HVAC cleaning, HVAC filters, and energy efficiency education. The program is offered through a partnership with People Working Cooperatively (PWC) and specifically targets elderly customers.
Duke Energy Progress	Neighborhood Energy Saver (NES) Program	The program includes measures such as filters, AC covers, switch plate thermometers, weather stripping, door sweeps, caulking, foam, bulbs, efficient lighting, water heater insulation and temperature adjustment, water efficiency measures, and energy savings calendars.
Duquesne Light Co.	Low-Income Whole House Energy Audit for both single and multifamily households	Homes that use electric heat receive the most measures, including attic, wall, and floor insulation; blower door testing and air sealing; crawl space and heater insulation; electric heating repair or replacement; duct insulation; caulking and weather-stripping; and heat pump water heaters. Electric water heating customers also receive water heater pipe wrap, faucet aerators, and water heater tank wrap. Non-electric heating customers receive efficient lighting, smart power strips, and refrigerator replacements.
El Paso Electric	The Low-Income Residential Solutions Program	This program provides incentives through local contractors to assist customers with attic insulation, air infiltration, duct sealing, windows and sliding glass doors, solar screens, HVAC Tune-Ups, refrigerated air, evaporative coolers, pool pumps, cool roofs, water heater pipe and tank insulation, and water measures including kitchen and bathroom aerators and low-flow showerheads.
Entergy Arkansas		Program started in 2020. No data.

Electric utility	Program name(s)	Measures included
Entergy Louisiana		
Entergy New Orleans	Income-Qualified Weatherization	Projects range from direct install measures, such as LED light bulbs and water savings measures, to smart thermostats and comprehensive envelope measures (attic insulation, air sealing, and duct sealing).
Eversource (Connecticut Light & Power)	Home Energy Solutions	The Home Energy Solutions program provides no-cost weatherization measures and low-cost energy efficiency upgrades. Weatherization measures include air sealing, duct sealing, lighting fixtures, water efficiency measures, and insulation. Energy-efficient upgrades include appliance replacements, water heaters, HVAC systems, and windows. The program also includes funds to address health and safety issues.
Eversource (MA)	Low-Income Energy Affordability Network (LEAN),	No cost measures such as lighting and smart strips, appliance replacement, water saving measures, insulation and air sealing, and heating system replacement.
First Energy (Cleveland Electric Illuminating)	No data	
First Energy (Ohio Edison)	No data	
First Energy (Toledo Edison)	No data	
Florida Power & Light	Residential Low-Income Program	Energy survey, followed by measures including weatherization (caulking/stripping/door sweeps), duct testing and repair, air conditioning unit maintenance, air conditioning outdoor coil cleaning, faucet aerators, low-flow showerheads, and water heater pipe wrap.
Georgia Power	Home Energy Efficiency Assistance Program (HEEAP)	Qualified participants may receive the following direct install measures: LED Lightbulbs, Smart programmable thermostat(s), water heater insulating jacket and/or pipe wrapping. Based on the in-home assessment additional services may be installed by a program contractor, such as: Attic Insulation, Air Sealing, Duct Sealing, HVAC replacement, Mini-HVAC systems, or an HVAC tune-up
Hawaiian Electric Co.	Energy Smart 4 Homes (ES4H) program	High-efficiency lighting and water measures and energy management devices.

Electric utility	Program name(s)	Measures included
Idaho Power	Easy Savings Program	Provides income-qualified households with a coupon for a free HVAC tune-up and one-on-one education. Idaho Power partners with Community Action Partnership organizations to deliver the incentives through its service territory. Idaho Power also offers free energy efficiency upgrades to low-income customers. A certified auditor will determine upgrades eligible in a customer's home, which may include new windows and doors, insulation and weatherstripping, bathroom and kitchen fans, new furnace and water heater, and efficient light bulbs.
JEA	Neighborhood Energy Efficiency Program	LED bulbs, LED night lights, low-flow shower heads, faucet aerators, toilet flappers, new EPA WaterSense toilets, AC filters, exterior door weather stripping, caulking, and attic insulation.
KCP&L (Evergy)	Weatherization programs for both single- and multifamily low-income residential customers	Attic, duct, floor, and wall insulation; furnace tune-ups; high-efficiency boilers and furnaces; heat pump replacement; lighting retrofits; heating system replacements; and water pipe insulation. Additional measures may be included on a case-by-case basis. The multifamily program includes direct install measures such as lighting, water efficiency measures, and smart power strips.
Knoxville Utilities Board	Home Uplift	Improvements may include air sealing, duct sealing/replacement, attic insulation, water heater & pipe insulation, wall insulation, HVAC clean & tune, HVAC replacement, windows & door replacement, heat pump, water heater, refrigerator, LED bulbs, low-flow showerheads.
LADWP	Energy Savings Assistance Program, Refrigerator Exchange Program, Home Energy Improvement Program	No data
Louisville Gas & Electric	Residential Low-Income Weatherization Program (WeCare)	Measures include air and duct sealing, attic and wall insulation, energy-efficient water devices, heating and cooling tune-ups, LED lightbulbs, programmable thermostats, and refrigerator and window air conditioner replacements. The program also includes health and safety measures and water efficiency measures.
Madison Gas & Electric	The Home Performance with ENERGY STAR program, Focus on	No data

Electric utility	Program name(s)	Measures included
	Energy administered programs	
Memphis Light, Gas & Water	Share the Pennies program and Home Uplift	This program provides the necessary capital and labor to make repairs to improve the energy efficiency of customers' homes. Repairs include AC condenser replacement, attic access hatches, attic insulation, duct replacement, furnace replacement, leaks (gas and water), water heater replacement, window and door replacement, and health and safety improvements.
MidAmerican Energy	Residential Low-Income program	Home Energy Reports, with messaging specifically crafted for low-income customers.
Nashville Electric Service	Home Uplift	No data
National Grid (MA)	Low-Income Energy Affordability Network (LEAN)	No data
National Grid (NY)	EmPower New York	No data
National Grid RI (Narragansett)	Income Eligible Multifamily program	No-cost comprehensive energy assessment along with no cost measures such as lighting, insulation, air sealing, and mechanical upgrades.
NV Energy	Appliance replacement program	Appliance replacement program.
Oklahoma Gas & Electric	Weatherization Residential Assistance Program (WRAP)	No-cost weatherization measures including insulation, air sealing, duct sealing, blower door testing, and energy-saving light bulbs in order to reduce energy consumption. The program also includes health and safety measures such as testing for lead paint, as well as carbon monoxide testing and detectors.
ONCOR	Hard-to-Reach Standard Offer Program and a Targeted Low-Income Weatherization Program	Measures include duct sealing, water efficiency measures, insulation, weatherstripping, and caulking.

Electric utility	Program name(s)	Measures included
Orlando Utilities Commission	Residential Efficiency Delivered Program	This program provides up to $2,000 of energy and water efficiency upgrades based on the needs of the customer's home. Upgrades include ceiling insulation, duct system repair, pipe insulation, window film, window caulk, door caulk, door weatherstripping, door sweep, threshold plate, air filter replacement, toilet replacement, irrigation repairs, water flow restrictors, and minor plumbing repairs.
PECO	Low-Income Energy Efficiency (LEEP) Program	Improvements include weatherization, installation of CFL bulbs, health and safety measures, water efficiency measures, and the replacement of inefficient refrigerators.
PEPCO	Low-Income Multifamily Implementation Contractor Direct Install, Low-Income Multifamily Comprehensive, Solar PV and Hot Water programs	No data
PG&E	Energy Savings Assistance	Energy education and direct installation of weatherization and hot water measures, lighting efficiency upgrades, HVAC tune-ups, smart power strips, and refrigerator recycling/replacement at no charge.
Portland General Electric	The Low-Income Weatherization program	Program resources may be used for shell measures such as windows, doors, and insulation as well as for energy efficient appliances and lighting
PPL Electric Utilities	Energy Efficiency Kits and Education program and The Low-Income WRAP program	Energy assessments and direct install measures at no cost to the customer. Program measures include ENERGY STAR® qualified LED light bulbs (screw base), energy-saving showerhead(s), high-efficiency faucet aerators, pipe wrap insulation for hot water pipes, and attic insulation.
PSE&G	"Comfort Partners" program	Efficient lighting products; hot water conservation measures (water heater insulation, water heater pipe insulation and energy-saving showerheads and aerators); replacement of inefficient refrigerators; thermostats; insulation upgrades (attic, wall, etc.); blower-door guided air sealing; duct sealing and repair; heating/cooling equipment maintenance, and other measures.
Public Service Co. of NM		Weatherization, a free direct mail kit which contains direct installation measures for participants to install at home, multi-family retrofit program for tenant units and common areas, free home energy assessments including direct installation of measures such as LEDs, water measures, smart strips, and a

Electric utility	Program name(s)	Measures included
		free refrigerator replacement (if eligible). Other energy efficiency programs PNM offers such as efficient school kits, residential lighting discounts, and refrigerator recycling also have a positive impact on low-income communities.
Public Service Co. of Oklahoma		PSO provides free energy-saving upgrades, such as attic insulation, air and duct sealing, LED light bulbs and more.
Rochester Gas & Electric	Same as other NY utilities	
Rocky Mountain Power (PacifiCorp)	Weatherization (state program), MF program	Provides incentives for appliances, building shell, HVAC systems, lighting, weatherization, and water heating.
San Diego Gas & Electric	Energy Savings Assistance (ESA) Program	Energy-efficient lighting, water efficiency measures, health and safety measures, door and window replacement, appliance upgrades, insulation, weather stripping, and caulking.
Seattle City Light	HomeWise and Multifamily Direct Install program	Window retrofits and insulation upgrades; boilers, furnaces, water heaters, heat pumps and air conditioners; insulation of all types (roof, attic, wall, floor, ducts, and pipes); sealing Drafts (a.k.a. air sealing); LED Lighting; windows and doors; refrigerators; exhaust fans; make-up air units (MAUs); energy recovery ventilation; building controls; additional weatherization measures as determined by energy conservation benefit.
SMUD	Special Assistance Delivery includes EAPR (Energy Assistance Program Rate)	Weatherization, deep home retrofits, solar bundles installations coupled with energy efficiency, and energy efficiency products for apartments, single-family, and tenants' mobile homes.
Southern California Edison	ESA	No data
Tampa Electric Co.	Neighborhood Weatherization Program	Energy-efficient installations at no cost to the customer include duct sealing, caulking, insulation, lighting fixtures, water heater wrap, water efficiency measures, and energy efficiency education materials, amongst others.
Tucson Electric Power Co.		Duct repair, pressure management/infiltration control, attic insulation, and repair or replacement of non-functional or hazardous appliances.

Electric utility	Program name(s)	Measures included
United Illuminating Co.	Home Energy Solutions- Income Eligible (HES-IE	Health and safety testing, blower door guided air sealing, duct sealing, installation of efficient domestic hot water products such as low flow aerators, low flow showerheads, and pipe wrap. Additionally, during the direct install visit the entire home is evaluated for the potential of add-on measure installations which are classified as appliances, insulation, window, hot water systems, HVAC system replacements.
We Energies	Focus on Energy (same as other WI utility)	
Westar Energy (Evergy)		No info in program description.
Xcel Energy (Northern States Power)	Home Energy Savings Program (HESP), Low Income Home Energy Squad Program (LIHES), and Multi-Family Energy Savings Program (MESP).	HESP offers free home energy education and improvement services to income-qualifying customers. Refrigerator, freezer, room air conditioner replacement, and recycling. For natural gas customers the program offers replacement of furnace, boiler, or water heater.
Xcel Energy (Public Service Co. of CO)	Single-Family Weatherization Program, the Low-Income Multifamily Weatherization Program, Low-Income Nonprofit Program, and Low-Income Energy Savings Kit Program	Weather stripping, insulation, replacement of inefficient furnaces and refrigerators, water efficiency measures, and installation of efficient lighting.

Gas utility	Program name(s)	Measures included
Atlanta Gas Light (Southern Company Gas)	Bill assistance	Bill assistance
ATMOS Energy	Keeping the Warmth Program	Natural gas piping repair, attic and wall insulation, gas water heater replacements, duct sealing, caulking, weather-stripping, wall outlet insulation, and faucet aerators

Gas utility	Program name(s)	Measures included
Baltimore Gas & Electric	Empower MD Program	Insulation, air sealing, replacement of old refrigerators and HVAC systems, health and safety measures, and water efficiency measures
CenterPoint Energy (AR)	No data	
CenterPoint Energy (MN)	Low-income Weatherization program, Low-Income Rental Efficiency program, Low-Income Free Heating System Tune-Up program, Non-Profit Affordable Housing rebate program, and Low-Income Multifamily Housing Rebate program	Insulation, furnaces, boilers, water heaters, water efficiency measures, thermostats, and health and safety measures. The Non-Profit Affordable Housing program provides rebates for insulation, furnaces, boilers, water heaters, and energy recovery ventilation. The Multifamily program provides a 25% bonus to building owners on any equipment eligible for a commercial rebate in an affordable housing building.
CenterPoint Energy (TX)	Hard-to-Reach Standard Offer Program	Incentives are paid to project sponsors for qualifying measures installed in retrofit applications that provide verifiable demand and energy savings to low-income customers. Qualifying measures include installation of insulation, air sealing, replacement of air conditioning duct systems, refrigerator replacement, water-saving measures, and lighting fixtures.
Citizens Energy Group	Whole house weatherization program	No data
Colorado Springs Utilities	Home Efficiency Assistance Program (HEAP):	No data
Columbia Gas of Massachusetts	Low-Income Energy Affordability Network (LEAN)	No cost measures such as lighting and smart strips, appliance replacement, water saving measures, insulation and air sealing, and heating system replacement.
Columbia Gas of Ohio (NiSource)	WarmChoice program	Air sealing, and attic and sidewall insulation. Natural gas appliances are inspected for safety and repaired or, if necessary, replaced with high efficiency models.
Connecticut Natural Gas	Home Energy Solutions- Income Eligible (HES-IE)	The direct install services include: health and safety testing, blower door guided air sealing, duct sealing, installation of efficient domestic hot water products such as low flow aerators, low flow showerheads, and pipe wrap

Gas utility	Program name(s)	Measures included
Dominion Energy	Low-Income Efficiency Program	No data
Dominion Energy (Questar Gas)	Low-Income Efficiency Program	No data
Dominion Energy Ohio	Housewarming Program	Free weather stripping, attic and sidewall insulation, door sweeps, smoke detectors, programmable thermostats, as well as the repair or replacement of certain natural gas appliances and heating systems.
Entergy New Orleans	Low-Income Audit & Weatherization program	Projects range from direct install measures such as LED light bulbs and water savings measures, to smart thermostats and comprehensive envelope measures (attic insulation, air sealing and duct sealing).
Eversource (MA)	Low-Income Energy Affordability Network (LEAN),	No-cost measures such as lighting and smart strips, appliance replacement, water saving measures, insulation and air sealing, and heating system replacement.
Hawaii Gas	Energy Smart 4 Homes (ES4H) program,	High-efficiency lighting and water measures and energy management devices.
Knoxville Utilities Board	Home Uplift	Improvements may include air sealing, duct sealing/replacement, attic insulation, water heater & pipe insulation, wall insulation, HVAC clean & tune, HVAC replacement, window & door replacement, heat pump water heaters, refrigerators, LED bulbs, low-flow showerheads.
Louisville Gas & Electric	Residential Low-Income Weatherization Program (WeCare)	Measures include air and duct sealing, attic and wall insulation, energy-efficient water devices, heating and cooling tune-ups, LED lightbulbs, programmable thermostats, and refrigerator and window air conditioner replacements. The program also includes health and safety measures and water efficiency measures.
Madison Gas & Electric	The Home Performance with ENERGY STAR program, Focus on Energy administered programs	No data
Memphis Light, Gas & Water	Share the Pennies program and Home Uplift	This program provides the necessary capital and labor to make repairs to improve the energy efficiency of customers' homes. Repairs include AC condenser

Gas utility	Program name(s)	Measures included
		replacement, attic access hatches, attic insulation, duct replacement, furnace replacement, leaks (gas and water), water heater replacement, window and door replacement, and health and safety improvements.
MidAmerican Energy	Residential Low-Income program	Home Energy Reports, with messaging specifically crafted for low-income customers.
National Grid (Boston Gas & Colonial Gas Co.)	Low-Income Energy Affordability Network (LEAN)	No-cost measures such as lighting and smart strips, appliance replacement, water saving measures, insulation and air sealing, and heating system replacement.
National Grid (Brooklyn Union Gas Co.)/NYSERDA	EmPower New York	No-cost energy efficiency solutions including air sealing, insulation, replacement of inefficient refrigerators and freezers, water efficiency measures, thermostats, and new energy-efficient lighting.
National Grid (NY)	EmPower New York	No-cost energy efficiency solutions including air sealing, insulation, replacement of inefficient refrigerators and freezers, water efficiency measures, thermostats, and new energy-efficient lighting.
National Grid RI (Narragansett)	Income Eligible Multifamily program	No-cost comprehensive energy assessment along with no cost measures such as lighting, insulation, air sealing, and mechanical upgrades.
New Mexico Gas	Native American Energy Efficiency Program and Multi Family Program	No info in program description.
NW Natural	Energy Trust of Oregon Programs	No data
Oklahoma Natural Gas	Low-Income Energy Efficiency Assistance Program	No data
Peoples Gas	Income eligible gas kits program, Affordable housing new construction program, Income eligible single family retrofits program, Public housing retrofits program, Income eligible multifamily	No info in program description.

Gas utility	Program name(s)	Measures included
	programs: Income eligible multifamily savings program, Multifamily savings IHWAP	
Peoples Natural Gas	Low-Income Usage Reduction Program (LIURP)	Heating system improvements and replacements, insulation, caulking, weatherstripping, hot water treatments, and tank improvements and replacements
PG&E	Energy Savings Assistance	Energy education, and direct installation of weatherization and hot water measures, lighting efficiency upgrades, HVAC tune-ups, smart power strips, and refrigerator recycling/replacement at no charge.
PGW	Home Comfort Program and pilot Low Income Multifamily Efficiency ("LIME") program	Air sealing, insulation, duct sealing, programmable thermostats, heater replacements and repairs, high-efficiency water heaters, water heater pipe wrap, and water efficiency measures.
PSE&G	"Comfort Partners" program	Efficient lighting products, hot water conservation measures (water heater insulation, water heater pipe insulation and energy-saving showerheads and aerators), replacement of inefficient refrigerators, thermostats, insulation upgrades (attic, wall, etc.), blower-door guided air sealing, duct sealing and repair, heating/cooling equipment maintenance and other measures.
Puget Sound Energy	Weatherization Assistance	No data
San Diego Gas & Electric	Energy Savings Assistance (ESA) Program	Energy-efficient lighting, water efficiency measures, health and safety measures, door and window replacement, appliance upgrades, insulation, weather stripping, and caulking.
SoCal Gas	Energy Savings Assistance (ESA) Program	Energy-efficient lighting, water efficiency measures, health and safety measures, door and window replacement, appliance upgrades, insulation, weather stripping, and caulking.
Southern Connecticut Gas	Home Energy Solutions- Income Eligible (HES-IE)	The direct install services include health and safety testing, blower door guided air sealing, duct sealing, installation of efficient domestic hot water products such as low flow aerators, low flow showerheads, and pipe wrap

Gas utility	Program name(s)	Measures included
Southwest Gas	LIEC Weatherization program	General weatherization and energy efficiency measures. Water efficiency measures.
Spire Missouri	Dollar Help (Spire Assistance Program Funds)	Bill assistance.
Texas Gas Service	Natural Gas Equipment Program	Free installation of new and replacement CO detectors, smoke detectors, wall and central furnaces, natural gas water heaters, and ranges as well as any necessary plumbing or carpentry upgrades to ensure a safe and code compliant home.
Vectren	Vectren Weatherization Program (VWP)	No info in program description.
Washington Gas (DC SEU)	Low-Income Multifamily Implementation Contractor Direct Install, Low-Income Multifamily Comprehensive, Solar PV and Hot Water programs	No data
We Energies	Focus on Energy Programs	No data
Xcel Energy (Northern States Power)	Home Energy Savings Program (HESP), Low Income Home Energy Squad Program (LIHES), and Multi-Family Energy Savings Program (MESP)	HESP offers free home energy education and improvement services to income-qualifying customers. Refrigerator, freezer, room air conditioner replacement and recycling. For natural gas customers the program offers replacement of furnace, boiler, or water heater.

Gas utility	Program name(s)	Measures included
Xcel Energy (Public Service Co. of CO)	Single-Family Weatherization Program, the Low-Income Multifamily Weatherization Program, Low-Income Nonprofit Program, and Low-Income Energy Savings Kit Program	Weather stripping, insulation, replacement of inefficient furnaces and refrigerators, water efficiency measures, and installation of efficient lighting.