BONNEVILLE POWER ADMINISTRATION

Low-Income Energy Efficiency Process Evaluation Report & Findings

EXECUTIVE SUMMARY

This report presents findings from a process evaluation of the Bonneville Power Administration's (BPA's) low-income energy efficiency program. BPA supports low-income efficiency improvements through low-income measures described in the Implementation Manual, for which utilities can receive reimbursement through their Energy Efficiency Incentive (EEI) funds as well as grants to state and tribal governments in the Northwest. This evaluation focuses on the utility-delivered, EEI-funded low-income measures (also referred to as BPA utility incentives throughout this report). Utilities can choose which low-income measures, if any, to offer to their ratepayers. Utilities may deliver low-income measures through partnerships with a local Community Action Partnership (CAP) agency or independently, with either in-house staff or an implementation contractor managing the participation process.[1]

Evergreen Economics— together with Apex Analytics—conducted this evaluation in 2023 to: 1.) assess low-income program activity among BPA utilities, 2.) understand utilities' experience with BPA policies and practices and 3.) identify opportunities to expand program activities or offerings to increase low-income program participation in the Northwest.

Results from the evaluation are based on the following: 1.) a review of program documents and utility reporting, 2.) a review of best practices from low-income energy efficiency programs across the country, 3.) a demographic analysis to identify and characterize areas with high concentrations of low-income households, and 4.) interviews with BPA program staff, 32 utilities, and 13 CAP agencies.

In 2022, BPA utilities spent $3.8 million of their EEI funding on low-income measures, representing 16 percent of residential spending and 8 percent of total portfolio spending (see the section

Low-Income Program Activity for more information). Yet, only 30 percent of BPA utilities were responsible for all this activity (41 of 140). Approximately 1,000 homes received low-income measures through the utility-delivered EEI funds in 2022 with the greatest number of households receiving insulation and ductless heat pumps. This activity represented just over 0.2 aMW of savings, with ductless heat pumps providing the most energy savings.

Below is a brief summary of six conclusions from the research and their associated recommendations. The full text of conclusions and recommendations can be found in the section **Conclusions and Recommendations**.

Conclusion 1: BPA's Low-Income Program Is a Valuable Resource for Northwest Utilities.

BPA's EEI-funded low-income measures provide value to utilities. Utilities with CAP agency partners can potentially use the funding to install measures that would not otherwise pass the cost-effectiveness testing required under federal low-income retrofit programs. EEI funding for low-income measures further allows utilities without CAP agency partnerships to offer efficiency measures to low-income customers when they may not otherwise be able to do so. Interview findings further suggest that BPA's processes around low-income utility incentives largely work

[1] CAP agencies typically administer federal energy assistance programs, including retrofit programs like the Weatherization Assistance Program as well as bill assistance programs.

smoothly for the utilities. BPA requirements do not appear to pose major limitations on expanded low-income activity (see Conclusion 3).

Conclusion 2: Measure Cost Caps Constrain Program Activity.

Interviewed utilities reported that it was not possible to install certain measures at no cost to low-income customers within the cost caps defined in the Implementation Manual.[2] Some utilities were reluctant to offer these measures if they could not draw on CAP agency partners or alternate funding sources to cover the cost difference. BPA raised the cost caps during the course of the research conducted for this evaluation. Utilities viewed the increased caps positively; however, at the time of the interviews, it was not possible to determine whether the increased caps were sufficient to cover most installations.

Recommendation 2: To better support installation of low-income measures, we suggest the program assess whether the benefit of measure cost caps justifies the constraints placed on the program. If BPA determines cost caps are justified, it should develop a systematic approach to set and regularly update those caps based on an assessment of typical installation costs in the region.

Conclusion 3: Limited Installer Availability Is a Critical Barrier.

The most immediate barrier preventing increased low-income program activity in the Northwest is the limited capacity of contractors and measure installation crews as well as CAP agency administrative staff. Some utilities and agencies are more limited by their capacity to serve customers than by the availability of funding. Causes of this limited installer availability range from a general labor shortage in the building trades to training and certification requirements for federal weatherization programs. Distance compounds these challenges in more remote areas of BPA territory. CAP agency administrative staff turnover is also a challenge as these staff members have specialized knowledge related to braiding funding across multiple sources.

Recommendation 3: To alleviate capacity constraints, BPA should consider the following opportunities to increase contractor and CAP agency capacity:

- Workforce development efforts to increase contractor availability.
- Increased incentives to support measure installation in remote areas.
- An incentive adder explicitly targeted toward administrative costs.

Conclusion 4: Utility Staff Capacity Constraints Limit Low-Income Activity.

Managing low-income programs is labor intensive. There is a significant administrative burden in identifying and recruiting customers, verifying they qualify, managing measure installations, and ensuring they meet program requirements. While some utilities are able to work with CAP agency partners who take responsibility for many of these tasks, maintaining a successful relationship nonetheless requires active engagement on the part of utility staff, for example, to answer questions on the eligibility of specific installations. Staff capacity constraints can prevent

[2] Recognizing that low-income households often have more immediate needs than pursuing energy efficiency retrofits, BPA seeks to structure its low-income measure offerings so that utilities can offer them to low-income households at no cost.

some utilities from offering low-income measures if staff are unable to devote the necessary effort to inform potential partners about BPA's low-income offerings and build relationships.

Recommendation 4: BPA should consider opportunities to provide administrative or staffing support that could ease the burden on utility staff. This could range from third-party implementation support to directly supporting staff positions at interested CAP agencies, similar to an industrial Energy Project Manager, for individuals to act as utility program advocates or liaisons.

Conclusion 5: Increased Low-Income Funding May Compete with Other Priorities.

There is currently some competition between utility low-income programs and non-low-income EEI funding priorities, but staff, agency, and contractor availability constraints pose a greater barrier to increasing the number of households utility low-income programs can serve. However, if BPA and utilities are able to overcome capacity constraints, the need to meet non-low-income funding priorities may become a more important barrier to expanding low-income activity. Utilities might choose to prioritize projects that provide greater energy savings at a lower cost and require less effort from staff over support for residential low-income measures.

Recommendation 5: To address the potential for funding competition between low-income and other EEI-funded programs, we suggest BPA consider funding and utility incentive structures that distinguish low-income activity from other energy efficiency programs. Delivering low-income efficiency measures serves objectives that go beyond energy savings alone. As a result, BPA should consider establishing policies that specifically encourage low-income activity. This could include specific targets for low-income activity and/or funding designated to support low-income measures.

Conclusion 6: There May Be Opportunities to Broaden and Expand Program Outreach.

Utilities and CAP agencies reported that some residents/rate payers feel a social stigma against seeking or accepting assistance, making them reluctant to participate in low-income programs. Referring to those programs as "low-income" can exacerbate that stigma by emphasizing participants' limited means. As a result, some utility staff members reported their programs were moving away from using "low-income" terminology in favor of "income-qualified" or other more neutral terminology.

Recommendation 6: We suggest that BPA consider shifting the program name away from "low-income" toward more neutral terminology, consistent with other jurisdictions.

Conclusion 7: It Is Difficult to Accurately Track the Extent of Low-Income Activity in the Region.

Multiple funders support efficiency improvements in low-income households in the Northwest. Given this diversity of funding sources, it is difficult to develop a comprehensive sense of the overall amount of low-income retrofit activity occurring in the region and where that activity is taking place. Even within BPA's EEI-funded low-income energy efficiency program, gaps in reporting make it difficult to track the full extent of low-income program activity. Three large utilities with significant low-income programs do not fully report their low-income activity to BPA, in part because of challenges translating the whole home projects their partners complete into the measure-level reporting requirements for EEI-funded measures. Additionally, aspects of

BPA's data reporting system make it challenging to track low-income activity and BPA lacks internal processes to create standardized reports.

In combination, these factors make it difficult for BPA to determine what has been accomplished for low-income households in its territory. In turn, it becomes challenging to understand the remaining potential and target success of efforts in the areas with the greatest potential.

Recommendation 7: To support improved tracking of low-income activity, we suggest that BPA incorporate the following practices:

- Develop standardized reports for low-income EEI funding as well as state and tribal grant funding.
- Advocate for and support additional research to characterize the full extent of low-income retrofit activity occurring in the Northwest across funding sources, potentially carried out through a regional collaborative effort.
- Consider creating a pathway within the Implementation Manual to capture whole home projects, enabling some utilities to report their current activity.

1 INTRODUCTION

This report presents findings from a process evaluation that Evergreen Economics, in partnership with Apex Analytics (the Evergreen team), conducted for the Bonneville Power Administration's (BPA) low-income energy efficiency program. BPA supports low-income efficiency improvements both through support for low-income measures described in the Implementation Manual, for which utilities can receive reimbursement through their Energy Efficiency Incentive (EEI) funds and through grants to states and tribal governments in the Northwest. This evaluation focuses on the utility-delivered, EEI-funded low-income measures (also referred to as BPA utility incentives throughout this report).

1.1 BACKGROUND AND STUDY PURPOSE

For more than three decades, BPA has supported its customer utilities, tribes, state agencies and their Community Action Partnership (CAP) agency partners to improve access to energy efficiency for all Northwest residents. BPA's low-income program is a public purpose offering that focuses significantly on improving access to energy efficiency across the Northwest. Energy efficiency upgrades can reduce energy burden, increase comfort, and improve the health and safety of underserved residents and communities.

There has been significant progress nationally and locally to better serve low-income communities. For example, in Washington, the Clean Energy Transformation Act (CETA) was passed in 2019, requiring, among other things, all utilities serving retail customers in the state to focus more on serving low-income customers.

In order for BPA to improve its own low-income offerings and identify opportunities to allow more access, it commissioned this study in order to identify opportunities to increase low-income program activity in its service area.

1.2 PROGRAM DESCRIPTION

BPA's Implementation Manual allows dollar-for-dollar reimbursement for installations of a variety of residential efficiency measures in the homes of low-income customers, although some measures are subject to cost caps. The Implementation Manual also allows dollar-for-dollar reimbursement for the costs of repairs needed to install most low-income measures. Through this dollar-for-dollar reimbursement, BPA aims to allow its customer utilities to offer measures to income-qualified households at no cost, while maintaining reasonable limits on per-project spending. Available measures include but are not limited to insulation and air sealing, doors and windows, ductless and air-source heat pumps, duct insulation, thermostats clothes washers and dryers, and heat pump water heater installations.

In order to qualify for BPA utility incentives, a household must show that its income falls below the federal Weatherization Assistance Program (WAP) threshold of 200 percent of the federal poverty level (FPL). In order to streamline participation, the program also allows utilities to adopt other statewide or tribal eligibility definitions in effect in their territory. In October 2023, BPA updated the Implementation Manual to include a self-attestation option starting in the 2024–25 rate period, in which customers could self-certify that their income fell within the program's thresholds without needing to supply additional documentation. Multifamily properties are eligible to receive measures throughout the whole building if at least 50 percent of the households in the building qualify.

As with other measures in the Implementation Manual, BPA's customer utilities are free to determine which utility incentives, if any, they offer to their customers and how much funding they devote to those measures. The utilities are responsible for marketing and delivering the measures, in accordance with Implementation Manual requirements. Utilities may choose to work with a CAP agency or similar programs delivering federally supported low-income retrofit programs, like DOE's WAP, in their service area. Alternatively, utilities may choose to implement low-income measures independently or work with an implementation contractor.

Because it can be challenging to reach low-income households, BPA provides support to utilities and facilitates coordination between utilities and potential partners in program delivery. In addition to one-on-one advising and support, BPA staff administer a Low-Income Workgroup, which regularly brings together interested utility staff, CAP agencies, and other stakeholders.

A logic model illustrating the program's activities and intended outcomes is included in **Appendix 1: Program Logic Model**.

1.3 RESEARCH OBJECTIVES

BPA and the Evergreen team identified four broad research objectives to support BPA's goal of increasing low-income program activity in the Northwest. As summarized in Table 1, the team then defined a series of more specific research questions within each objective and identified the research activities best suited to address each.

Table 1: Research Objectives, Questions, and Activities

Research Objectives	Simplified Research Questions	Best Practices Review	Utility Interviews	CAP Agency Interviews	Demographic Analysis
Assess low-income program activity among BPA utilities	What approaches are utilities using to deliver low-income measures? How, if at all, do those approaches vary by utility characteristics?		X		
	Which of those approaches have been most successful?	X	X	X	
	What aspects of delivering low-income measures have been most challenging for utilities and their partners?	X	X	X	
	What prevents utilities from undertaking or increasing low-income activity?		X		
	What geographies or demographics has the program served most successfully? Where does the greatest potential remain?	X	X	X	X

Research Objectives	Simplified Research Questions	Best Practices Review	Utility Interviews	CAP Agency Interviews	Demographic Analysis
Understand utilities' experience with BPA policies and practices	What are the greatest advantages of BPA's Implemental Manual-based low-income offerings?		X	X	
	What is challenging and/or constraining about BPA's Implementation Manual-based low-income offerings?		X	X	
Identify opportunities to expand program activities and/or offerings to increase low-income activity	What types of support would allow utilities to increase low-income offerings?		X	X	
	What additional measures could BPA offer, or what changes to requirements for existing measures, if any, would allow increased participation?	X	X	X	
	What changes in funding structures or requirements, if any, might motivate or facilitate additional low-income activity?		X	X	
	What changes, if any, to BPA processes and documentation requirements could facilitate additional low-income activity?		X	X	
	What opportunities are there to expand program offerings and/or uptake to specific target markets?	X	X	X	X
	What role, if any, could BPA play in facilitating coordinated low-income program activity across utility territories?	X	X	X	

2 EVALUATION APPROACH

2.1 BPA PROGRAM DATA ANALYSIS

The evaluation team leveraged multiple sources of information from BPA, including:

- The BOOM report, which summarizes activity by measure, utility, and quarter. BOOM includes savings and quantities for all years but does not include spending on any measures reported into the BPA Energy Efficiency Tracking System (BEETS).
- IS2.0 database, which BPA provided for project-level information on low-income measures. These data included all spending and savings at the project level, including addresses, which allowed the evaluation team to calculate the number of households served by utilities.

- BEETS data for 2023. BPA also provided BEETS data on low-income measures for 2023; due to timing, the BEETS data could not be included in this version of the report.

The evaluation team analyzed all sources in order to provide insights into the low-income measure activity in the BPA territory.

2.2 NATIONAL PROGRAM REVIEW

The evaluation team searched for recent research published by key industry sources, excluding sources published prior to 2015. All sources referenced in the review are listed in the **References** section in **Appendix 2: Detailed National Program Findings**. Key sources included:

- ACEEE Summer Study on Energy Efficiency in Buildings conference proceedings for 2022, 2020, and 2018.
- IEPEC conference proceedings for 2022 and 2019.
- U.S. Department of Energy State and Local Solution Center, Low-Income Energy Library: Federal Resources and Tools.
- U.S. Environmental Protection Agency, Bringing the Benefits of Energy Efficiency and Renewable Energy to Low-Income Communities: Case Studies and Program Profiles.

2.3 DEMOGRAPHIC ANALYSIS

The evaluation team conducted a demographic analysis using U.S. Census data to estimate the size of the low-income population in BPA territories. We pulled Zip Code Tabulation Area (ZCTA) level data from the American Community Survey (ACS) data and defined "low income" as individuals living in households that make less than 200 percent of the FPL.[3] We then estimated the number of low-income households using average household sizes from the Census within the zip code. Using BPA service zip codes, our analysis was constrained within BPA territories.[4]

To further analyze BPA's territories, we selected zip codes with high concentrations of low-income individuals. This allowed a comparison between how zip codes with higher low-income populations differ from others in terms of home ownership, home type, internet access, heating fuel, and energy burden. All variables assessed were from the U.S. Census dataset except energy burden. We pulled in energy burden from the Low-Income Energy Affordability Data (LEAD) Tool from DOE. DOE defines energy burden as the average annual housing energy costs of an area divided by the average annual household income of the area.

[3] BPA low-income program eligibility includes more definitions than just 200 percent FPL. Households can qualify under other local or state definitions (such as 80 percent area median income or 60 percent statewide median income). The estimates in this analysis will be conservative compared to the true number of homes that are eligible to participate in a low income offering under BPA's guidelines.

[4] BPA service zip codes were determined by RTF Council's provided utility zip code mapping list of BPA utilities and their service zip codes, accessed via https://nwcouncil.app.box.com/v/201905RTFClimateZnMethodology. These zip codes were cross-referenced with a retail sales allocation zip code list provided by BPA to ensure no zip codes were dropped in the process. Some zip codes were not in the RTF council list, or in the BPA provided retail sales allocation list, and those were treated as non-BPA zip codes.

2.4 GROUP AND INDIVIDUAL INTERVIEWS

The evaluation team held group interviews with staff members at nine BPA utilities and three CAP agencies, and individual interviews with 23 BPA utilities and ten CAP agencies (Table 2). Interviewed staff members at utilities were part of their low-income programs, while CAP agency staff were engaged in residential efficiency projects and served households in BPA territories. Of the 32 interviewed utilities, six had no current low-income program.

Table 2: Interview Respondent Characteristics

EEI Allocation	# of Utilities Interviewed
Small	19
Large	13
Total	32

EEI allocation is grouped by small (<$1.6 million EEI) and large (>$1.6 million in EEI) allocations.

Low-Income Savings[2]	# of Utilities Interviewed
Low	17
High	15
Total	32

[2] Low-income savings are calculated as the share of reported residential savings (with ≥3.4 percent as large and <3.4 percent as small).

State	# of CAP Interviewed (13 total)	# of Utilities Interviewed (32 total)
Washington	6	19
Oregon	5	9
Idaho	1	3
Wyoming	0	1
Montana	1	0
Total	**13**	**32**

3 BPA LOW-INCOME POPULATION AND PROGRAM ACTIVITY

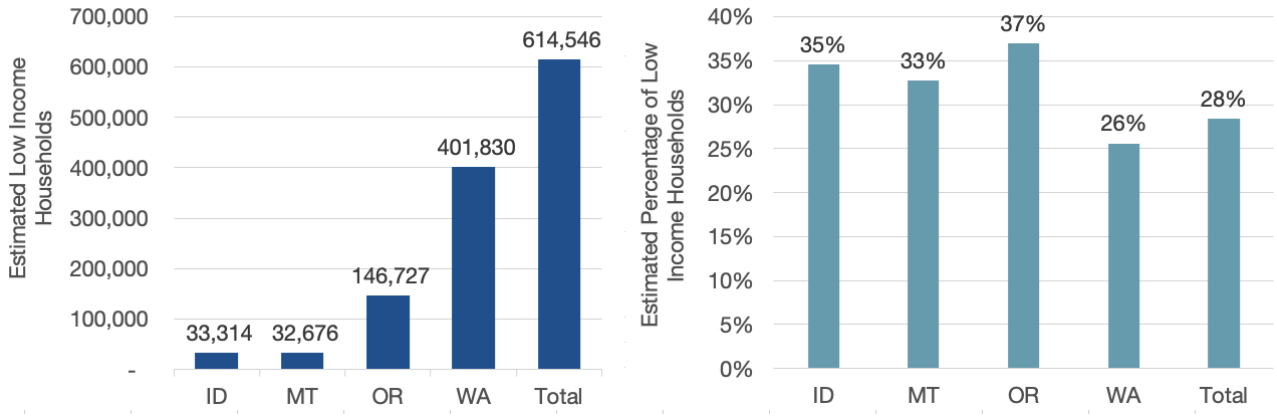
3.1 LOW-INCOME POPULATION

Consistent with BPA's primary definition, we defined "low-income" as households making less than 200 percent of the FPL.[5] Using this definition, there are an estimated 614,500 low-income

[5] BPA also allows other methods for income qualification such as participation in other programs and self-attestation. Therefore, the population of eligible residents is likely larger than what is shown in this analysis.

households in BPA service territories, representing 28 percent of the population served by BPA utilities. Figure 1 shows the number of low-income households by state and the portion of the state's total population those households represent. For example, Washington has the highest number of low-income households (over 400,000) yet has the lowest proportion of low-income at 25 percent. Oregon has the highest proportion of low-income households, with 37 percent.

Figure 1: Estimated Low-Income Households in BPA Territories by State



To investigate opportunities to better serve low-income populations, we compared zip codes with high concentrations of low-income individuals (lower income areas) against zip codes with lower concentrations of low-income individuals (higher income areas).[6] In general, we found correlations across the BPA service territory indicating that, in comparison to higher income areas, lower income areas have:

- Higher average energy burdens than in higher income areas (2.7 percent vs 1.9 percent)[7]
- More renters (43 percent vs 34 percent)
- More mobile homes (12 percent vs 7 percent)
- More households with no internet access (21 percent vs 13 percent)
- More households with limited English-speaking ability (10 percent vs 6 percent)
- More households with disabilities (15 percent vs 11 percent)[8]

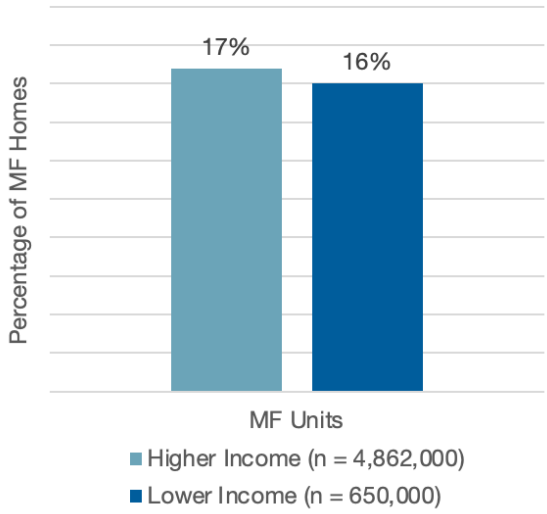
[6] Low-income individuals are those living in households that earn incomes less than 200 percent of the FPL.

[7] Average energy burden was pulled from the DOE LEAD Calculator. It is defined as the average annual housing energy costs divided by the average annual household income.

[8] This was defined by the U.S. Census as respondents who self-report they have one of six major disability types: hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, or independent living difficulty. For more detail on how the Census collects disability data from the ACS, see https://www.census.gov/topics/health/disability/guidance/data-collection-acs.html.

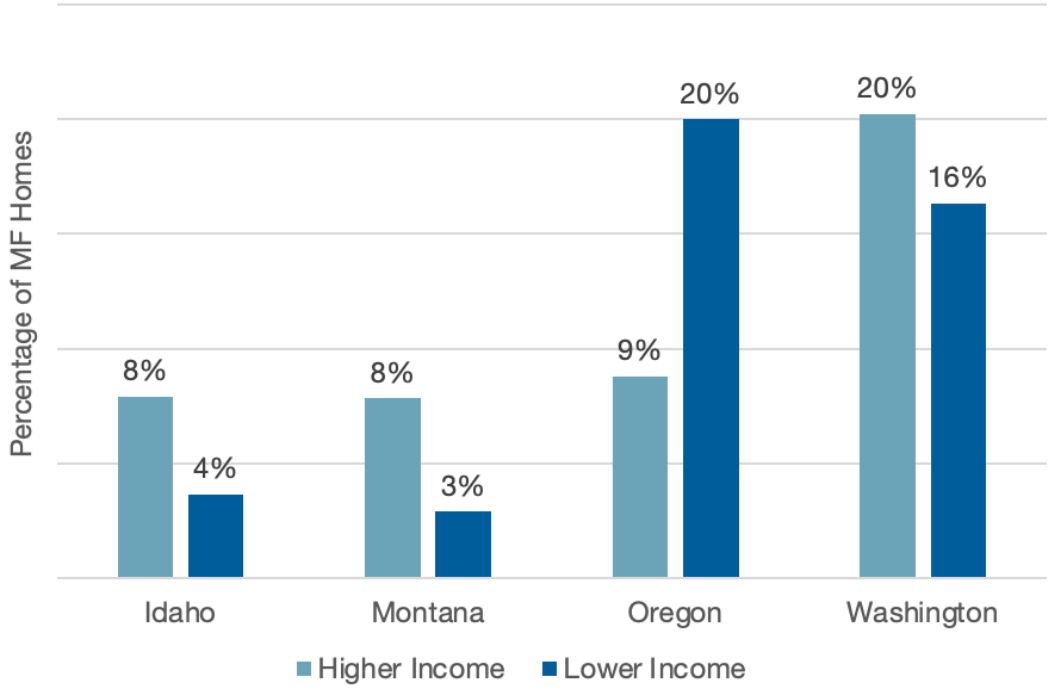
We also found that, for some variables, there were further differences when comparing across states. For example, in Figure 2, we show that across the BPA territory as a whole, there was not a significant difference in households living in multifamily units (defined as five or more units in a structure: 16 percent in lower income areas vs 17 percent in higher income areas).

Figure 2: Multifamily (MF) Homes in Lower and Higher Income Zip Codes in BPA Service Territory



However, a comparison of individual states finds that lower income areas in Oregon have a much higher concentration of multifamily households than in higher income areas (20 percent vs 9 percent), while in Montana, there are more households living in multifamily units in higher income areas (8 percent in higher income areas vs 3 percent in lower income areas). This finding suggests that low-income programs in Oregon may need to focus more on multifamily measures than other states (Figure 3).

Figure 3: MF Homes in Lower and Higher Income Zip Codes by State



3.2 LOW-INCOME PROGRAM ACTIVITY

As described above, BPA utilities use their EEI funding to implement low-income measures that are offered in the Implementation Manual. This section provides insights on the number of utilities reporting low-income measures, as well as the households served, the spending, and savings. This section draws on the information BPA utilities reported through IS2.0 or BEETS.

These data likely understate the true low-income program effort in BPA's territory. Possible reasons for this are as follows:

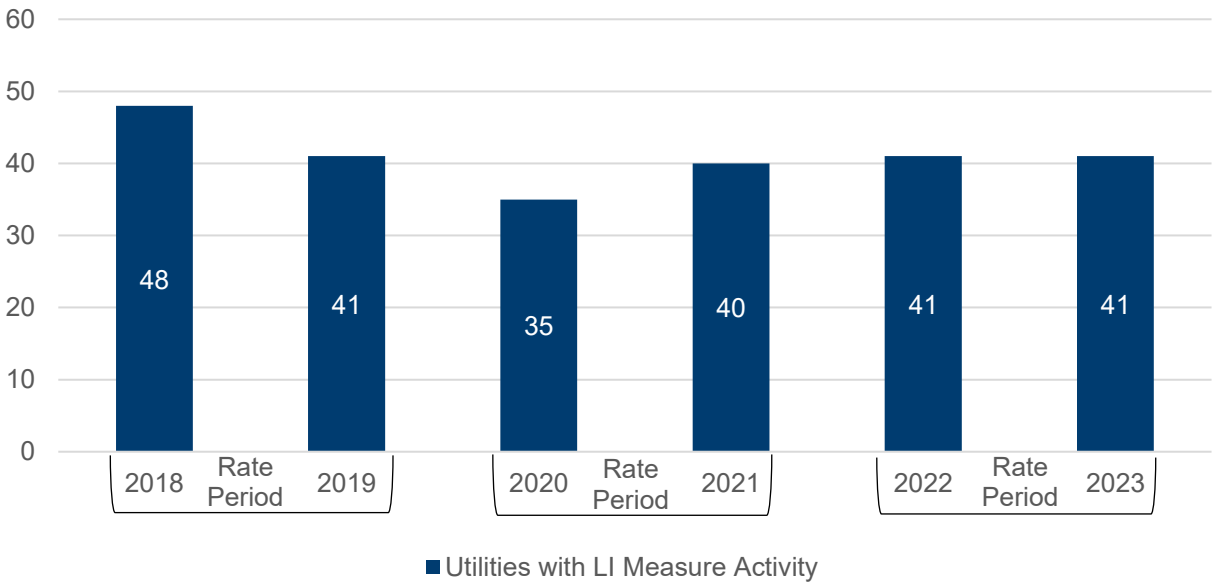
- Some utilities may conduct low-income activities but do not report them to BPA because of system issues or because they have run out of EEI (See **Funding and Reporting** section).
- Additional to EEI funding, BPA provides approximately $6 million per year in grant funding to states and tribes, which represents substantial savings and additional upgrades in homes that are not captured in this report. See Conclusion and Recommendation 6, in the **Conclusions and Recommendations** section, regarding tracking of activity.

In fiscal year (FY) 2023,[9] 41 utilities reported low-income measure activity to BPA (shown in Figure 4), representing approximately 30 percent of the 140 utilities that BPA serves. This number has fluctuated somewhat, with a reduction in 2020, which BPA staff attributed to

[9] All years referenced in this report reflect BPA's fiscal year of October–September.

COVID-related reductions in program effort and difficulties providing service to customers during this time.

Figure 4: Number of Utilities Reporting Utility Low-Income (LI) Measures



In 2022, utilities spent $3.8 million of their EEI funds on low-income measures, representing 16 percent of total residential spending and 8 percent of the total EEI portfolio across all sectors, as shown in Figure 5 and Table 3. Although there has been some variation, low-income spending has remained relatively stable since 2019, ranging between approximately $3 and $4 million. Multifamily is reported to be a small portion of the spending, representing 3 percent in 2022.

Figure 5: Utility EEI Spending

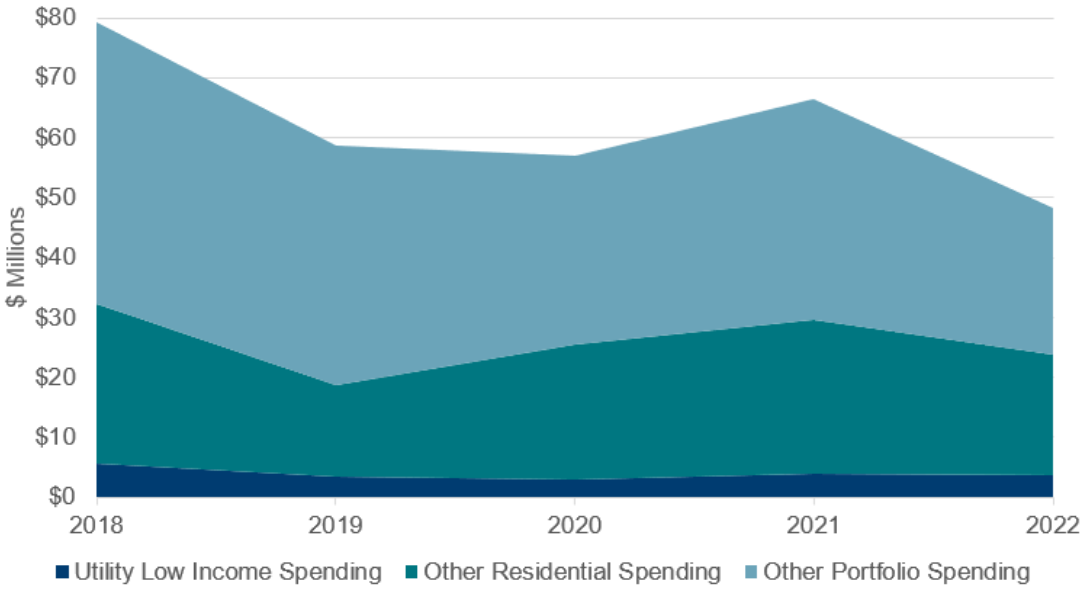


Table 3: Utility EEI Spending on Low-Income

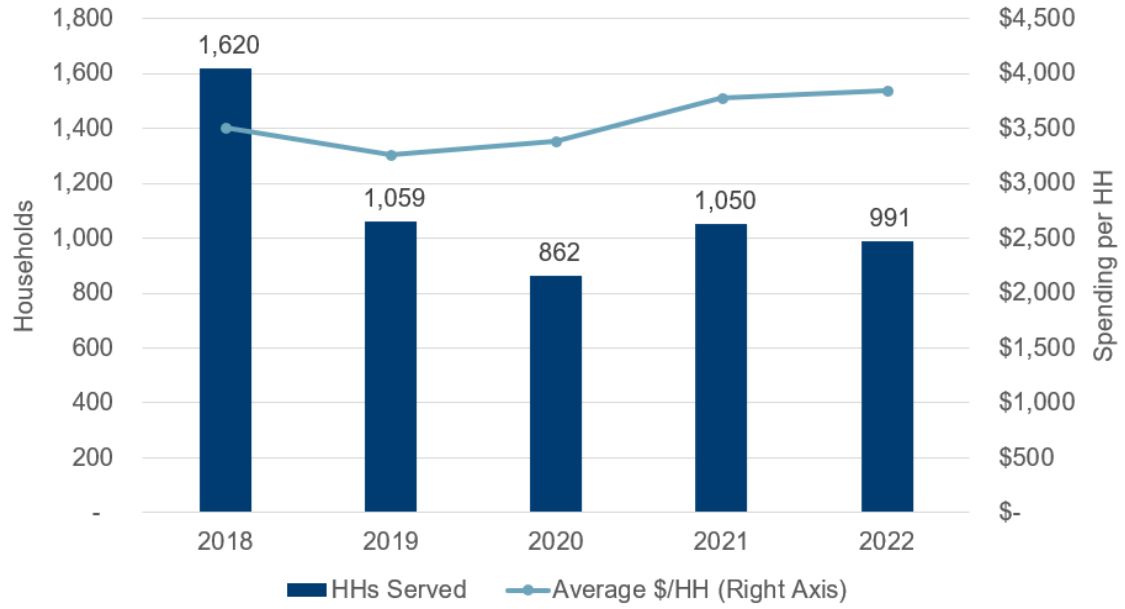
	2018	2019	2020	2021	2022
Utility Low-Income Spending[1]	$5.7	$3.4	$2.9	$4.0	$3.8
Low-Income Spending as % of Residential	18%	18%	12%	13%	16%
Low-Income Spending as % of Portfolio	7%	6%	5%	6%	8%

[1] Spending represents EEI-funded "BPA Dollars."

As noted earlier, less than half of BPA utilities report low-income activity. By definition, this means that those utilities reporting low-income efforts have a higher portion of residential and total spending on low-income measures than the average. For example, in 2022, for utilities reporting low-income measures, average spending was 26 percent of residential and 14 percent of total portfolio spending.

Since 2019, BPA utilities have served an average of approximately 1,000 households per year with low-income measures, with a decline in 2020. Figure 6 displays these results, as well as the average spending per household, which was $3,800 in 2022.

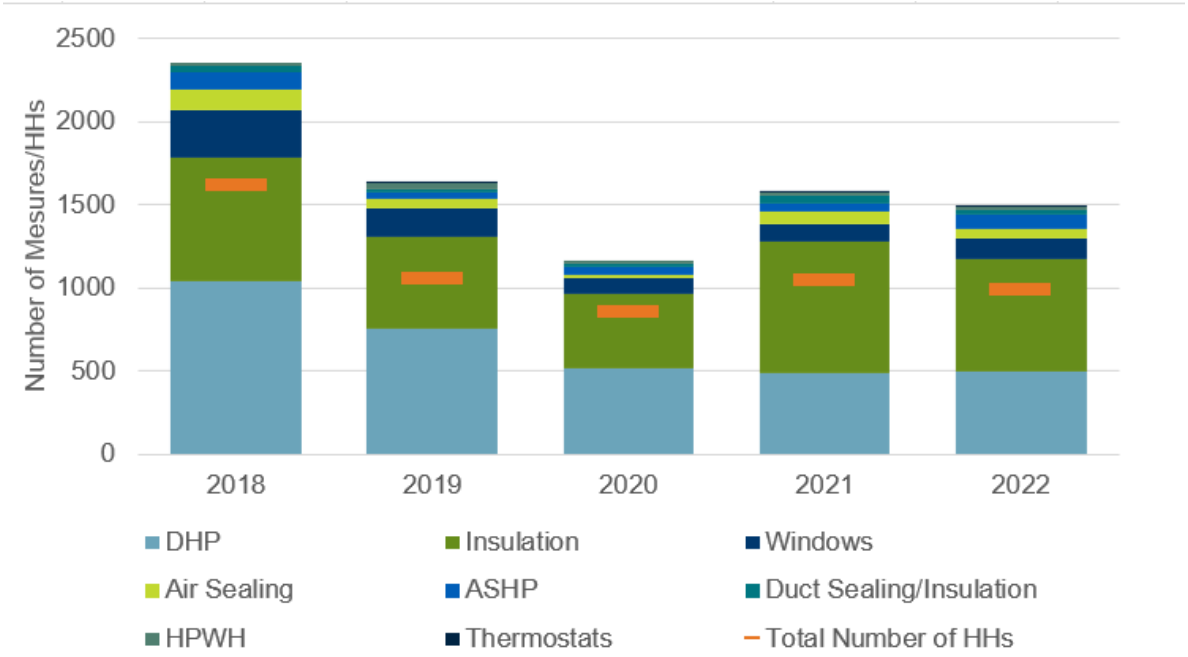
Figure 6: Households (HHs) Served and Average Spending per HH



To better understand the prevalence of households receiving multiple measures as well as shifts in delivery of different measures, Figure 7 displays the number of households receiving low-income measures, by key measure categories. The most prevalent measures were insulation and ductless heat pumps. The evaluation team also found that approximately 30 percent of households received multiple measures. For those households with multiple measures, they

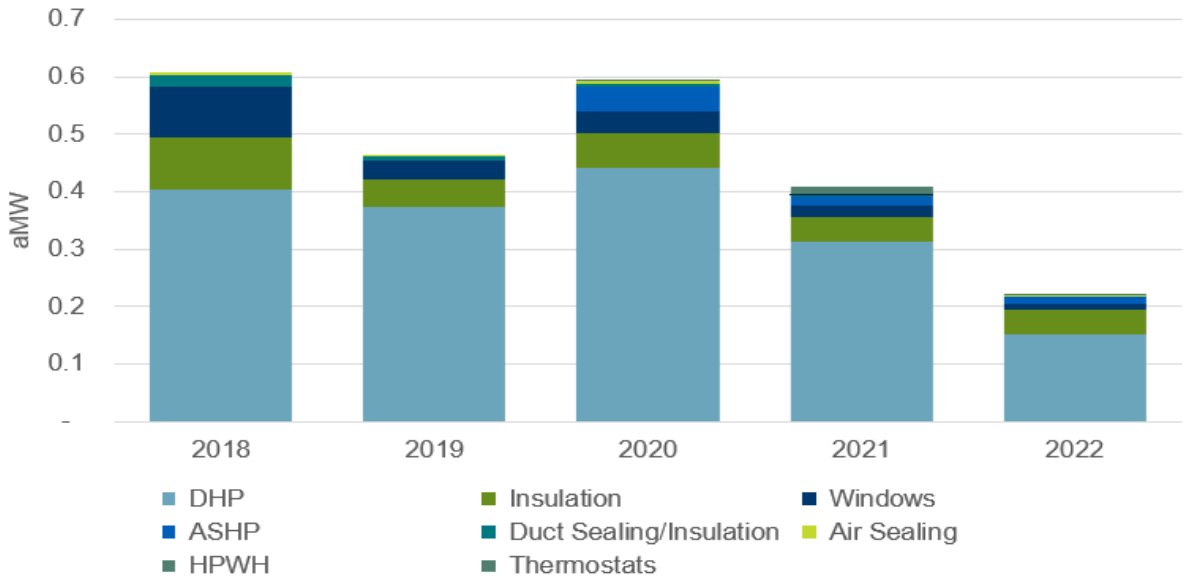
received an average of 2.7 measures per home. For additional detail, **Appendix 4: Measure Units by Year** includes the number of units reported by measure and year.

Figure 7: Measures Installed by Measure Type



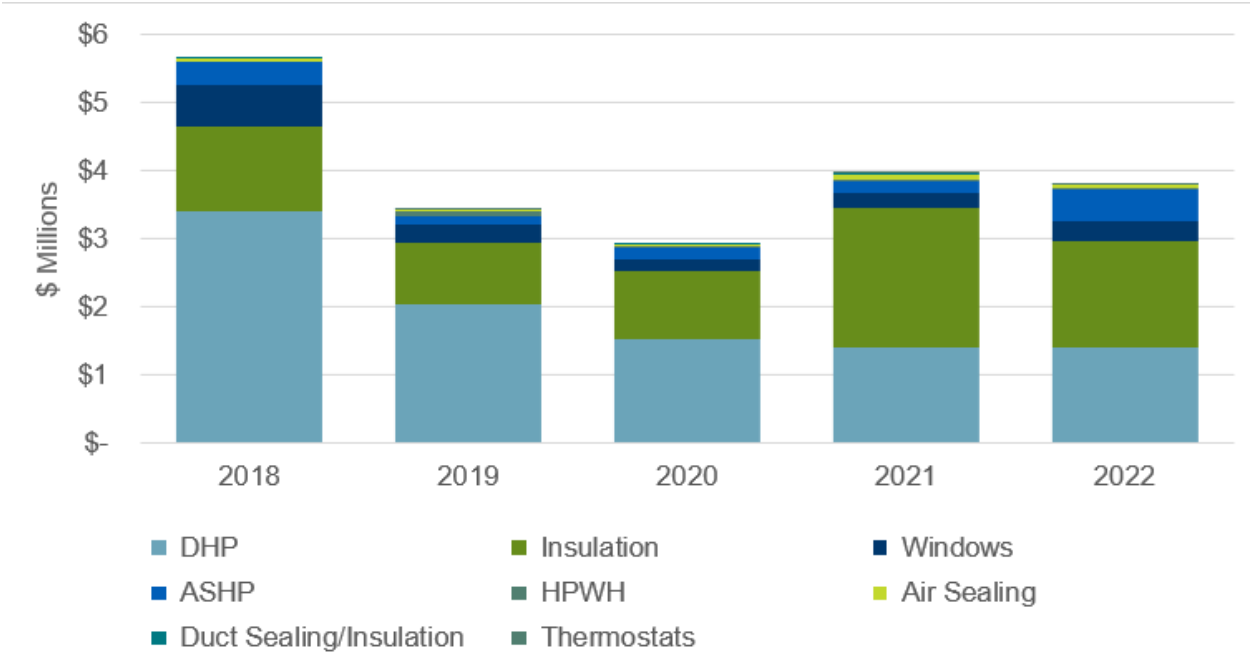
Although total spending and households served has been somewhat stable, energy savings have dropped notably by year (Figure 8). This decline is driven largely by ductless heat pumps, likely due to reduction in savings per unit for the measure.

Figure 8: Utility Low-Income Savings, by Measure Category



For comparison, Figure 9 shows spending by measure, demonstrating that the amount of EEI spent on insulation is notably larger than the amount of savings it provided (Figure 9).

Figure 9: Spending on Low-Income Measures, by Measure



4 BPA UTILITY INCOME-QUALIFIED PROGRAM STRUCTURE

4.1 UTILITY IMPLEMENTATION APPROACHES

The Evergreen team interviewed 32 utilities about their implementation of low-income programs. Of these 32 utilities, six utilities do not currently have low-income programs; however, three of the six had operated low-income programs recently.

Interviewed utilities with active low-income programs described three primary ways of delivering those programs: collaborating with community action agency/partnership (referred to here as CAP agencies), self-administering programs, and partnering with implementation contractors. As summarized in Table 4, each of these approaches has benefits and drawbacks, discussed in greater detail below. Included in the definition of CAP agency partnerships are programs delivered through municipal departments (e.g., a city's housing office), resembling CAP agency-utility collaborations.

Table 4: Implementation Approach Benefits and Drawbacks

Program Delivery Approach	# of Interviewed Utilities (32 Total)	Benefits	Drawbacks
CAP Agency Collaboration	19	• CAP agencies manage income verification • Agencies can braid funding from multiple sources • Agencies obtain referrals from bill assistance • CAP agencies manage installation logistics	• CAP staff capacity is limited • Approach may prioritize other funding sources over utility incentives • Service territories may not fully align
Self-Administered	5	• Ability to prioritize EEI • Potential to serve customers more quickly • Potential to reach customers not well served by CAP agencies	• Increased utility staff burden • Limited ability to braid funding • Less potential for customer referrals from bill assistance • Potential for overlap and/or conflict with CAP agency efforts
Implementation Contractor	2	• Ability to prioritize EEI and focus on utility incentives • Reduced burden on utility staff	• Cost • Limited ability to braid funding • Less potential for customer referrals
No current program as of October 2023	6	N/A	N/A

4.1.1 CAP AGENCY PARTNERSHIPS

CAP agency partnerships are the most common arrangement for utilities implementing low-income programs (19 interviewed utilities). These partnerships often take three forms:

- Utilities may allocate funding to the CAP agency, which oversees all aspects of low-income retrofits, including recruiting customers, conducting income verification, and installing measures using either its own crews or contractors. Two utilities also worked with other municipal agencies (like a city housing department) to deliver measures.
- Utilities may oversee installation of some measures, such as ductless heat pumps, with the CAP agency recruiting customers, conducting income verification, and implementing other measures (in some cases, purely weatherization).

- Utilities may oversee installation of all efficiency measures, relying on CAP agencies only to conduct income verification and direct billing-assistance customers to the utility.

In most cases, the CAP agency performs income verification and refers billing-assistance customers to utility programs. This income verification and customer recruitment provided significant benefits for utilities within CAP-utility partnerships by reducing the administrative work required of utility staff and alleviating privacy and data security concerns associated with collecting customers' income documentation. There were only a few utilities with partnered CAP agencies that performed income verification in-house.

Another significant benefit included the ability to leverage CAP agencies' other funding sources to fund a whole home project covering other necessary costs not directly tied to measure installation like administration, audits, and repairs. For example, one small Washington utility explained how a project met the Implementation Manual's cost cap for a ductless heat pump incentive, but their collaboration with a CAP agency allowed the project to access alternative funding. According to this respondent, "the ductless heat pump is one they always get capped at. BPA pays $4,400, and I'm looking at one that was $7,000. That's one they always have to find alternative funding for."

The primary drawback utilities described in their collaborations with agencies was related to the agencies' often limited capacity to manage or increase their project volume. Some utilities reported their local agencies were unable to meet the utilities' goals for spending, and customers faced long wait times on the agencies' waiting lists. Many agencies faced shortages of both internal administrative staff and skilled laborers that formed their installation crews. Compounding these challenges, agencies typically serve large geographic areas with territories that could extend beyond the utility's service area. Agencies also often felt pressure to spend out alternative funding sources before drawing on utility incentive funds (see **CAP Agency Funding Prioritization** section for more detail).

Nonetheless, nearly all utilities with active CAP agency partnerships were satisfied with their relationship. A common theme among these respondents was the importance of maintaining frequent and open communication between the CAP agency and the utility. One utility respondent described their relationship with their CAP agency partner saying, "we meet with them in person, and they just stopped in to see if we wanted to go to lunch...we stay in constant communication; we have a long-standing relationship for over a decade." Another respondent reported that the head of their CAP agency partner's weatherization efforts had come before their utility's board to discuss the importance of low-income retrofits.

4.1.2 SELF-ADMINISTERED

Five interviewed utilities self-administered their low-income program, carrying out administrative duties like income verification and overseeing measure installation. By administering programs independently in this way, utilities had greater control over their EEI spending, could ensure that their customers were being served promptly, and most of all, could control the pacing and delivery of projects from application to completion. At least one utility created an in-house program after struggling to work with their local CAP agency and feeling as though their funding was not used.

The primary drawback of self-administering programs is the burden placed on utility staff, who must confirm customer eligibility and recruit and manage contractors for installation work.

Reflecting this additional effort, as well as most utilities' inability to draw on funding beyond EEI for low-income incentives, utilities with self-administered programs often offered a narrower range of measures than utilities with CAP agency partnerships. While most utilities with CAP agency partnerships were able to draw on the CAP agencies' bill assistance programs to identify eligible households and fill their project pipelines, some utilities with self-administered programs struggled with identifying and reaching potential customers.

4.1.3 IMPLEMENTATION CONTRACTORS

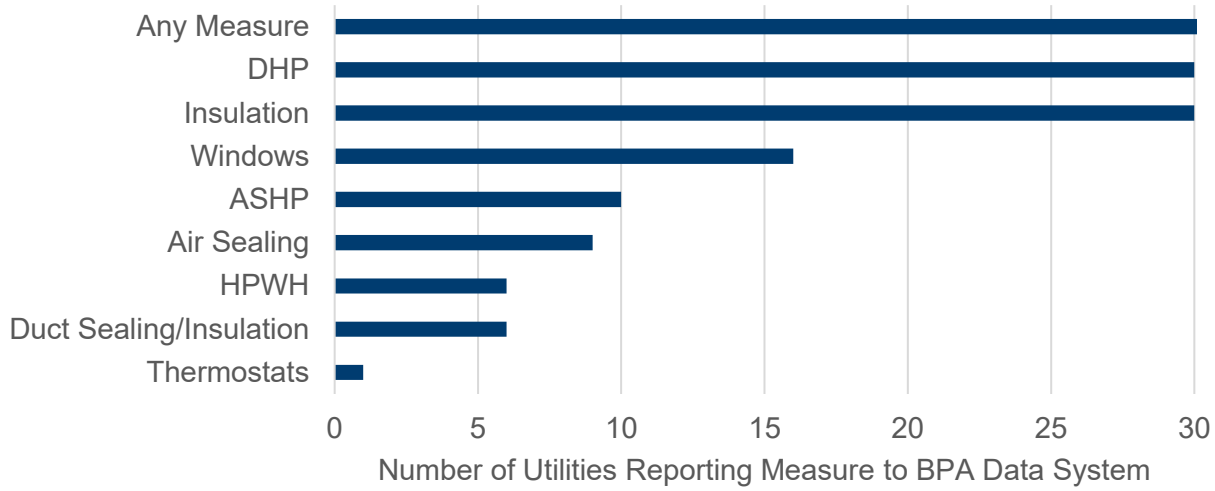
Only two interviewed utilities engaged an implementation contractor to assist with program delivery; for one utility, their implementation contractor performed only income verification. Both utilities were classified as small based on their EEI allocation. The other utility's partnership encompassed customer outreach and measure implementation. In both cases, the utility began a partnership with the implementation contractor after being dissatisfied with their local CAP agency's work.

The benefits of working alongside an implementation contractor was the perception that the utility's customers were prioritized. Both utilities expressed concern that CAP agency constraints affected the ability for their customers to be served. As one small rural utility in Oregon stated of their local CAP agency, "they were having a hard time using the funds that we allocate for them." These utilities also saw benefits in having a contractor specialize in tasks like outreach or income verification, as opposed to leaving these responsibilities to a utility or CAP agency staff person juggling other responsibilities. The downsides of working with an implementation contractor included the cost of paying for the services (especially without Implementation Manual funding on tasks like income verification) and the obstacles of incorporating and educating an external employee on BPA measure requirements and reporting processes.

4.2 MEASURES OFFERED

The low-income measures included in BPA's Implementation Manual are consistent with the low-income measures offered by investor-owned utility (IOU)-funded program administrators across the region and by other public utilities around the country. **Appendix 3: Measure Offering Comparison** includes a comparison of measures included in the Implementation Manual with offerings from other programs in the Northwest and elsewhere. The most common low-income measures that utilities reported installing included ductless heat pumps (DHP), insulation, and windows (Figure 10), although the number of utilities reporting each measure decreased across the past three rate periods.

Figure 10: Number of Utilities Reporting Low-Income Measure Type, FY 2023



4.2.1 COMMON MEASURES

Interview data are consistent with reported measure installations, with utilities most often reporting offering insulation, ductless heat pumps and windows. A smaller number of utilities (6) reported offering all low-income measures in the Implementation Manual. Interview findings suggest that utilities determine which measures to offer based on the benefits those measures offer customers, ease of installation, and their ability to provide the measures at a cost below the Implementation Manual's cost caps (see additional discussion of cost caps below). This section summarizes utilities' motivations around some of the most commonly offered measures.

Ductless Heat Pumps

Sixteen utilities reported offering ductless heat pumps, largely due to their relatively easy and minimally invasive installation. A respondent from a large, rural Washington utility with significant external grant funding described how heat pumps benefited both their utility and the customer: "Getting a heat pump for heating and cooling, efficiency-wise, into a home that doesn't have either is the best first step we could take for low-income customers and ensure we do as many projects as possible."

Utilities were divided in their ability to perform ductless heat pump installations within the cost cap of $4,400.[10] Some utilities were able to install ductless heat pumps within the cost cap by partnering with contractors who were willing to offer discounted pricing. As one utility respondent explained, "That contractor has been doing the work for us for years. He could charge a lot more…I don't know that we could be successful without that contractor. All the other contractors were [charging] $5,800 to $6,000."

Three utilities and four agencies reported they were not able to find contractors willing to conduct ductless heat pump installations within the cost cap. These utilities and agencies, which

[10] BPA increased cost caps for many low-income measures in October 2023 in the 2024-25 Rate Period Implementation Manual. At that time, data collection for this evaluation was ongoing. While some respondents were aware of the increased caps, they did not have sufficient experience with them to assess whether the new caps would be sufficient to cover most installations.

were located across the region, cited typical installation and equipment costs ranging from $5,000 to $7,000 for ductless heat pumps. One large Wyoming utility reported that, to offer a low-income program, they would have to compete against contractors' "high end residential" contracting work and "we don't have the contractors here that are willing to do that kind of work" for $4,400.

Insulation

Insulation was also a common measure, with 15 utility respondents offering it. Utilities noted the benefits of its dollar-for-dollar reimbursement, without a cost cap. A respondent from one large urban Oregon utility explained why they include insulation as one of their limited low-income measure offerings: "The one big reason is because insulation measures are dollar for dollar, and we knew we wouldn't be out of pocket much." In addition to 15 interviewed utilities offering insulation, others planned to expand their offerings to include insulation in the near future. One coastal Oregon utility noted, however, that they were reluctant to carry out insulation upgrades due to the more invasive nature of the upgrade and the relatively extreme climate in their service area. According to this respondent, "We get 110 inches of rain [a year], driven sideways. We're not really interested in drilling holes in the side of someone's house to put insulation in unless we're siding it," and the program does not support the cost of re-siding the home after installing insulation.

Windows

Utilities frequently (12 respondents) reported offering windows as a measure, and interview findings suggest that window replacements are appealing to customers. However, most of the utilities offering windows (9 respondents) also noted that the cost cap of $20 per square foot was not sufficient to cover the cost of window installations. Four utilities provided estimates for the cost of window installations in open-ended responses, with estimates ranging from $40 to $75 per square foot. As one respondent from a small urban Washington utility described, the cost of window installations had increased over time, while the cost cap had remained constant. According to this respondent, "It wasn't terribly low when I first started. It was like 80 percent, but just the way the economy and everything is gone is 20 percent. $20 doesn't hardly touch anything."

Utilities that reported window installation costs exceed the cost caps described a range of approaches to overcome the cost shortfalls. Four respondents reported partnering with CAP agencies, which could braid in funding from other sources, for window installations. An equal number of utilities reported that their customers would pay the incremental cost above the low-income incentive for window installations, one of which noted that they offered accessible financing for efficiency improvements. One utility reported self-funding the incremental cost of window installations.

4.2.2 ADDITIONAL MEASURE OPPORTUNITIES

Utility staff described some incentive opportunities they had seen throughout their work. Five utilities recommended incentives for residential electrical vehicle chargers. Three utilities suggested incentives for electrical work, such as for wiring and panel upgrades.

4.2.3 INFREQUENT MEASURES

The least popular measures included heat pump water heaters, followed by air source heat pumps, multifamily heat pumps, and smart thermostats. Eight utilities described that they did not offer or advertise the heat pump water heater measure. Utilities reported that, while incentives were sizable, heat pump water heaters were tricky to install in manufactured homes, a common dwelling type among limited-income customers, and that partnered contractors were unfamiliar with the technology and installation and therefore reluctant to offer heat pump water heaters. One respondent described contractors as “not wanting to do anything with heat pump water heaters.”

Five utilities stated that air-source heat pump installations could not be done at the current cost caps. One utility shared that they avoided advertising the air source heat pump measure as project costs required high customer contribution. They stated, “No contractor is going to do that job for the amount that is incentivized, so we don't even bother because we don’t want to get somebody’s hopes up and then say ’you're going to have to pay an extra $5,000.’"

Two utilities acknowledged that BPA had recently begun offering storm windows as a measure, but both reported they were unsure how to deliver the measure. According to one, “I would love to utilize the new…incentive for storm windows, but what products qualify? What installers are going to be doing it?” Another respondent expressed a similar perspective, saying storm windows are “not something we’ve found enough resources available in the market to send customers in that direction.”

4.2.4 WHOLE HOME VS PRESCRIPTIVE MEASURE APPROACH

In order to encourage comprehensive retrofits that address all energy efficiency opportunities in the home, federal and other funders on which CAP agency partners draw typically focus on whole home costs and energy savings, rather than single-measure upgrades. Some CAP agency respondents, as well as utility respondents who worked with agencies, saw benefits in this type of approach. According to one CAP agency respondent, “We are looking at everything we could possibly do in the home…health and safety, any related repairs…so you are really addressing it like an affordable housing component in addition to a conservation component.” Another CAP agency respondent reported that taking a comprehensive approach resulted in fewer customer complaints and higher satisfaction.

CAP agency staff noted, however, this type of comprehensive approach could be expensive. Staff members from five agencies (in Oregon, Washington, and Idaho) reported that their average project costs range from $20,000 to $25,000. Agencies would typically braid together multiple funding sources, including EEI-supported utility incentive funds, to cover those project costs.

In contrast, BPA’s utility low-income incentives are a prescriptive approach that provide more flexibility to address single measures within a home. This approach can both complement and conflict with a whole home approach.[11] Some respondents reported that utility incentive funding can be attractive to CAP agencies because the measures are not subject to the same

[11] A prescriptive measure is one that pays a set incentive and assumes a set amount of energy savings for all installations meeting defined criteria.

requirements that other funding sources impose, including stringent, site-specific cost-effectiveness requirements and prevailing wage requirements.

CAP agency respondents explained how residential weatherization-work pay rates under prevailing wage can make some measures non-cost-effective within savings-to-investment ratio (SIR) modeling software.[12] CAP agencies can avoid some of these costs by using BPA utility funding, which does not include prevailing wage requirements or SIR modeling. As a result, agencies can use utility funding to install measures, like windows that may not achieve SIRs. According to one CAP agency respondent, "[The deemed measures list] was the best thing BPA ever did, in my opinion. With us having to pay prevailing wage rates, a lot of things wouldn't get SIRs, because of the labor wage."

Conflicts can arise between BPA's prescriptive approach and more whole home-focused approaches when individual measure installations impact the cost-effectiveness of subsequent upgrades. For example, one utility respondent reported that a single-measure installation of a ductless heat pump can reduce a household's heating costs and thus reduce the potential cost savings from building shell improvements that reduce heating energy use. As a result, subsequent efforts to install insulation or other building shell measures may not meet a CAP agency's SIR thresholds. Extracting individual measures from a more comprehensive project for reporting purposes can also pose an administrative burden. As discussed below, this was one of the reasons some larger utilities did not report low-income activity to BPA.

4.3 LOW-INCOME MEASURE REQUIREMENTS

4.3.1 INCOME VERIFICATION

The majority of interviewed utilities leveraged their CAP agency or their implementation contractor to handle income documentation and verification. Only a few utilities with a CAP agency collaboration independently verified customer income. Generally, meeting the income verification requirements was not challenging for utilities, even for those conducting verification independently. Only two utilities reported finding income verification and collecting customer income documentation to be difficult.

Although few utilities reported challenges with income verification at their current level of low-income activity, some had concerns that managing income verification would become more difficult should project numbers increase. Privacy issues were the most commonly cited concern especially for small communities and for municipal utilities. Six utilities described some discomfort and awkwardness around collecting income documentation from residents. One member at a city utility stated that, "As government, there's a lot of that stuff we'd rather not know, it's a lot of private information."

Data security and safely storing customer-submitted documents and data were additional concerns that utilities described around income verification. One utility described storing customer-submitted paperwork and documentation as a burden. Another utility reported overcoming these challenges through the use of an income verification form, on which staff can certify that the customer is income qualified and identify the documents used to verify the customer's income. The utility then retains that form rather than the original income

[12] A more detailed definition of the SIR is available at: https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-436/subpart-A/section-436.21

documentation itself. A third utility avoided the need to store documents internally by assigning responsibility for income verification to an implementation contractor.

BPA recently adopted a policy allowing self-attestation, in which households could access BPA utility incentives by attesting that their income was below the program's threshold without providing supporting documentation, to ease income verification burdens. Utilities had mixed responses to this change. While some saw benefits in the potential to decrease administrative work and increase privacy, others expressed concerns that unqualified customers would access services, potentially leading to increases in program uptake that their programs would be unable to manage.

4.3.2 REPAIR COSTS

BPA's Implementation Manual allows utilities to report repair costs needed to install low-income measures for reimbursement. While some utilities valued the ability to submit these costs, interview findings suggest that other utilities may not be aware that reimbursement is available or may not be clear on what is covered. In open-ended responses, four utilities spoke positively about reimbursement for repair costs. According to one respondent, "the ability to do repairs is fantastic because that can completely shut down a job, if you have a repair that needs to be made in order to make the insulation last."

Three utilities reported their programs do not support repair costs, or limited their support, with responses indicating confusion around which costs would be covered and how much they could spend. Although the Implementation Manual does not explicitly limit repair costs, one respondent said, "The limits on the repairs, that has come up a few times. There have been projects where…even though it is a good measure, but needs a pretty decent repair, and they cap the dollars out on that."

One CAP agency respondent noting that the Implementation Manual included less detail on what types of repairs were eligible than other funding sources they use. As a result, they were concerned their utility partner might question reported repair costs. According to this respondent, "when I look at this BPA manual, it does say related costs, but it does seem pretty vague, and I don't know how much pushback I'd get. Even some of their examples are a little vague. Some things we do are health and safety, some roll into existing measures."

4.3.3 MEASURE COST CAPS

As noted above, the Implementation Manual's cost caps were an important determinant of the low-income measures that some utilities offered. Fifteen utilities reported that they were unable to install certain measures within the cost caps the Implementation Manual set. Cost caps were particularly challenging for utilities implementing programs independently, many of which were unable to provide self-funding to cover remaining costs. Eight utilities described that they could not provide additional funding if the cost of the work exceeded the cost cap. These utilities were unable to serve customers if their installations exceeded the cost caps unless the customer could pay the difference. Some utilities managed this by choosing not to offer or advertise measures, such as windows or air-source heat pumps, where the installation was likely to exceed the cap. Utilities with CAP agency partners were somewhat less affected by cost caps since the CAP agencies could draw on other funding sources to make up the difference between actual installation costs and the cost caps.

Two utilities objected to measure cost caps more generally, arguing that utilities should have discretion to spend their EEI budgets as they see fit. As one respondent explained, “if a utility is responsible for managing their EEI allocation, I wonder why they cannot access EEI funds…using excess EEI funds where they see fit to cover the full cost of implementation.”

4.4 FUNDING AND REPORTING

4.4.1 UTILITY FUNDING ALLOCATION TO LOW-INCOME MEASURES

BPA does not mandate how much EEI spending utilities must devote to low-income measures, allowing utilities to determine how much to allocate to low-income and how much to allocate to other efficiency offerings. Interview findings suggest that utility staff, CAP agency and contractor capacity constraints are a more pressing barrier to increased low-income program activity than funding limitations in the near term. However, some interview respondents described conflicts between funding low-income programs and other priorities, indicating a potential for funding allocations to become a more prominent barrier should capacity constraints ease.

Most utility respondents who discussed how they allocate funding to low-income measures (10 of 17) suggested their capacity to deliver low-income measures (or that of their CAP agency partners or contractor pool) was the primary limitation on the amount of funding they allocate. As one utility respondent explained, “[Our CAP agency partner has] so much to do and so many…other funding [sources to manage] that we are not able to really pay them any more out of our BPA implementation budget.” Another utility respondent described a similar experience, saying, “We have said [to our CAP agency partner], ‘if we can provide more funding, can you do more homes?’ And the answer has been, ‘no, we are at our administrative capacity to implement.’”

In contrast, six utilities reported that limits to the amount of EEI funding they allocated for their low-income programs constrained the volume of their low-income measure installations. As noted above, most interviewed utilities did not have funding sources for their low-income offerings beyond EEI. For example, an interview respondent from one large rural Washington utility reported they had to stop installing low-income measures in September, when their funding ran out. According to this respondent, “It was heartbreaking to have to shut it down.” A Washington CAP agency respondent also reported that “we turn people away each year, all dictated by funding.” Four of the six utilities that reported running out of funding for low-income projects offered a limited range of low-income measures. These more limited offerings may allow utilities to conduct a higher volume of projects, and thus exhaust their budgets, more quickly than utilities pursuing more comprehensive retrofits.

Four utilities indicated their spending on low-income measures was limited by a desire to ensure their EEI funding was allocated evenly across customer types or to maintain a cost-effective portfolio. As one respondent explained, “We’re trying to find a balance between helping low-income customers and having an affordable, cost-effective portfolio.” Utilities noted that Washington’s I-937 requirements could increase this pressure for utilities subject to it. One respondent stated that, “We have to serve all of our other sectors to be compliant with I-937. We have to divide our budget.” Other utilities noted that they were likely to increase their focus on low-income measures due to requirements in Washington’s CETA legislation.

Three additional utilities reported having funding sources beyond their EEI allocations (such as internal funding or proceeds from legal settlements) that could cover the costs of their low-

income programs. As a result, these utilities described less pressure to balance their low-income spending against other priorities, although one noted that those considerations could arise if their additional funding source runs out.

4.4.2 CAP AGENCY FUNDING PRIORITIZATION

CAP agencies work with a variety of funding sources, and interviews with both utility and CAP agency staff suggest that they often prioritize other funding sources over utility incentive funds. CAP agencies receive federal funding through DOE (through multiple programs, including WAP) as well as the Department of Health and Human Services (HHS), which administers the Low Income Home Energy Assistance Program (LIHEAP). Often, this funding is funneled through state offices like the Washington Department of Commerce and the Oregon Housing and Community Services (OHCS), which may also administer state grant programs like Washington Weatherization Plus Health (Wx+H) and Oregon's PGE Energy Conservation Helping Oregonians (ECHO) funds. In addition to this public funding, some CAP agencies also receive funding from both gas and electric IOUs, which interview respondents described as generous. IOUs often allowed substantial administrative funding (one example being 30 percent of project costs), broad definitions of permissible repairs, as well as additional low-income weatherization funds if allocated IOU funding was spent out. For example, one CAP agency staff member described how, with their IOU, "Every time we run out of money, we ask for more money, and they give it to us."

Eight of the ten interviewed CAP agencies reported braiding funds from multiple funding sources for a single project, and one of the two agencies that did not braid funds at the time of the interview reported plans to begin doing so. Including public utility incentive funding, CAP agency respondents reported that a whole home project may draw from between three and nine different funding sources, although projects typically use four to six sources. Most agencies described their average project cost as between $20,000 and $25,000, with only one CAP agency providing a notably lower estimate at $16,000.[13]

CAP agency respondents described a variety of factors that contribute to their decisions around which funding sources to draw upon for a particular installation, which included the following considerations:

- **The flexibility of the funding terms.** CAP agency respondents described LIHEAP funding, along with state programs like Wx+H and ECHO as among the most flexible. For example, CAP agency respondents noted that IOU funding typically does not require projects to meet SIR requirements and can support a premium of up to 30 percent to cover administrative costs.
- **The size of the funder's contribution to their overall budget.** Interviewed CAP agency staff reported feeling pressure to meet the needs of their largest funders. As one Oregon CAP agency respondent said, "OHCS is our state agency, they're the pass-through agency for our federal dollars. You have to keep them happy."
- **The need to spend funding allocations prior to a contract end date to avoid reductions in future allocations.** Finally, CAP agency respondents explained that

[13] This CAP agency respondent reported working with an IOU partner that maintains a rigid spending cap on total project costs, which may drive down this average.

some funding sources, like state LIHEAP contracts, might reduce a CAP agency's future funding allocations if the CAP agency did not fully spend their current allocation within the contract period.

- **The need to include DOE WAP funding.** Interviewed CAP agency staff described a need to include DOE WAP funding (which is administered at the state and local level) in as many projects as possible, despite the funding's relatively low project cost caps and stringent requirements. Respondents noted that several other funding sources had adopted DOE WAP rules. One respondent described DOE WAP funding as "the tail that wags the dog," while another called DOE "the mother contract of all contracts."

Given these spending considerations, both CAP agencies and utilities reported that they often give relatively low priority to utility incentive funding. Two interviewed agencies reported using braided funds but did not use BPA utility incentives. Utility incentives are often a small part of a CAP agency's overall budget. As one Washington CAP agency explained, their utility partner allocates $25,000 of EEI funding per year for utility incentives, an amount roughly equivalent to the average cost to serve a single home.

CAP agency respondents also reported that BPA utility incentive funding could be less flexible than other funding sources for two reasons. First, agencies noted that some utilities support a limited range of measures; for example, according to one Washington CAP agency, their utility partner "cherry-picks the measures—insulation, not even air sealing." Second, CAP agency respondents reported that utility incentives do not explicitly include allocations for administrative costs, while other funders, notably IOUs, do so. Two agencies reported coming to agreements with their BPA utility partners that would provide some funding to support administration.

At the time of interviews, CAP agency respondents were not clear on how Inflation Reduction Act (IRA) funds would impact their spending allocations. However, the experience of recent funding additions, such as the Bipartisan Infrastructure Law (BIL), suggests that IRA funds may further take precedence over BPA utility funding. One Oregon CAP agency explained that spending BIL funding, like DOE and state grant funding, was more urgent than utility funding, saying that they will use utility funding "to the extent of funding something that doesn't qualify well for the state grants."

4.4.3 LOW-INCOME MEASURE REPORTING

Over the past several years, roughly two-thirds of BPA utilities reporting EEI-funded energy efficiency measures did not report any low-income measure installations. Interview findings suggest most of these utilities do not offer low-income programs, although some large utilities were exceptions. Table 5 summarizes the status of the interviewed utilities' low-income program offerings.

Table 5: Low Income Program Status of Interviewed Utilities

Low-Income Program Status		Count of Utilities
Do not have active low-income programs		6
Have active low-income programs	Report all low-income measures installed	23
	Do not report all low-income measures installed	3
Total		**32**

Interviews indicated that BPA's reporting system (BEETS) is not a barrier limiting most utilities' likelihood to report projects. Utilities most often described reporting of low-income measures as comparable to reporting other savings (commercial and standard residential). Most utilities experienced no challenges using BEETS, with some considering it an improvement over the previous reporting system. Only four utilities reported difficulty learning and using the new software.

Although most utilities did not identify the BPA reporting system as a challenge, some utilities reported other challenges around measure reporting. Notably, there were three large urban BPA utility customers with active low-income programs who do not report all or some of their low-income projects to BPA. These utilities described the following barriers to BPA reporting.

- One municipal utility reported delivering low-income measures in partnership with other city departments as well as local CAP agencies. While this utility did not report difficulty using BPA's reporting system itself, they described challenges with converting the whole-home-focused reporting they received from these partners into the measure-level reporting format required for Implementation Manual measures. This respondent stated that, "a lot of those [measures], I thought, were not reportable to BPA." The respondent went on to explain that "If you have a project that has five measures, we don't report any of them, as it becomes more challenging."
- A second respondent also reported partnering with a city department to deliver low-income measures. This utility respondent stated that the city department's traditional record-keeping software was incompatible with the utility's data systems. This respondent noted that they had been working for more than four years to disaggregate the city department's data to make it more consistent with BPA reporting requirements. The respondent explained that their data were stored within "legacy systems that are hard to export from" and did not easily provide measure-level data needed for BPA reporting, like the square footage of insulation installed. As with the first respondent, this respondent indicated that the challenge was in generating the measure-level data needed for reporting to BPA and not with BPA's reporting system itself.
- An interview respondent from the third large utility that did not report all low-income projects reported that their systems were unable to track which customers were low-income if they were not part of the utility's billing assistance program.

5 SUCCESSFUL PROGRAM ELEMENTS

Interviews with utilities and CAP agencies identified elements contributing to the success of EEI-funded low-income programs in the Northwest. Two elements that stood out in the findings were the importance of having dedicated, knowledgeable staff at all aspects of program delivery, and the benefits of being able to blend funding from multiple sources through effective CAP agency partnerships.

Having active and engaged staff at all levels of program delivery was a common theme throughout utilities' and agencies' descriptions of successful programs. This engagement began with the relationship between the utilities and the agencies themselves. Three utilities highlighted mutually beneficial relationships with their partnered CAP agency as a building block to their program's success. These utilities recognized that a functional, communicative

relationship could be difficult to establish, and they were aware of other utilities' struggles with CAP agency partnerships.

Three utilities also described engaged program delivery staff, including utility staff, collaborating CAP agency staff (including in-house skilled labor crews) and contractors hired by the utility, as an element contributing to the success of their low-income program. Respondents noted it was important for contractors to promptly respond to customer interest in projects and for administrative staff to provide welcoming customer service to program participants. One large rural Washington utility explained how a staff member who provided advice on energy efficiency practices helped facilitate customer autonomy: "[He] will give advice on how to help savings, he's full service, he'll give advice on changing filters. It's put it back in their hands."

The ability to provide this type of prompt service was one of the primary reasons utilities reported implementing programs in-house, rather than relying on partnerships with overburdened CAP agencies. As one large rural Washington utility described, "Anyone that comes to us, we have the ability to help right now…There hasn't been a need to turn people away because we run out of funding."

Staff experience and engagement also arose as important for program success in interviews with agencies, where the ability to understand the offerings and requirements of multiple funders allowed for projects to draw on a wider pool of funding. A staff member from one Oregon CAP agency explained, "Weatherization isn't just going out and doing the work, it's a large program," and successfully understanding and navigating the intricacies of multiple funders required experienced CAP agency staff and partnered subcontractors.

Another CAP agency staff member similarly stated that their program had been successful because, "We actually became very sophisticated when it comes down to blending funding." This respondent and others explained that successfully blending funds can allow agencies to cover a wider range of project costs than any single funding source is likely to support. Agencies reported that blended funding could be particularly important for health-and-safety-related repairs. One Oregon CAP agency stated that from a funding perspective, "The real concern is the health and safety component. Blending the grant dollars with EEI dollars, the BPA grant allowances for health and safety and repair, can make up for the lack of rebate options in the local utilities."

Other program elements individual utilities pinpointed as positive aspects of their low-income programs included:

- Offering EEI measures to billing assistance customers for fast income verification.
- Offering utility loan program for rentals.
- Benefiting from word-of-mouth marketing.

Utilities also reported success in serving manufactured home communities, noting that they offered high concentrations of qualified households, allowing programs to benefit from word-of-mouth outreach.

6 KEY CHALLENGES AND BARRIERS TO PROGRAM DELIVERY

6.1 BARRIERS TO PROGRAM DELIVERY

A limited capacity to deliver low-income projects was the most prominent barrier that utilities and CAP agency staff described in interviews. These capacity limitations applied across utility staff, administrative staff at CAP agencies, in-house CAP agency installation crews, and installation contractors. This section describes each of these constraints in greater detail.

Eleven utilities described the **limited CAP agency staff capacity** of their CAP agency partners, on whom most of the utilities relied for income verification and measure installation, as a serious barrier. Interviewed CAP agency staff confirmed these capacity constraints, describing customer waiting lists ranging most commonly from a few months to two years. CAP agency capacity constraints were multifaceted, stemming both from a lack of skilled contractor staff to install measures and limited administrative staff to conduct income verification, coordinate projects and manage funding sources.

Utilities and agencies described **contractor availability** as a major barrier to serving more low-income customers. Thirteen interviewed utilities (including both respondents who worked with CAP agencies and those who delivered low-income programs in-house), and the majority of thirteen CAP agencies interviewed identified skilled labor as a primary barrier. Some CAP agencies employed installation crews directly, while others contracted out for measure installation. In either case, however, interview respondents described instances in which a single crew or contractor may be responsible for installations across a CAP agency's territory, which could span multiple utility territories. An interview respondent from one Washington CAP agency reported that the contractor company that conducts their low-income retrofits also serves at least five other agencies. A staff member from a CAP agency in Oregon also described contractor shortages, saying, "We used to have four HVAC contractors, now we have two. Our weatherization, we've lost two."

Weatherization and HVAC contractors and crew members (for agencies, specifically) were difficult to hire and retain for low-income weatherization and energy efficiency projects. Utility and CAP agency interview respondents described these contractor shortages as particularly challenging in more remote areas, where a project may require contractors to travel more than two hours. However, one CAP agency contact in Oregon noted that it was becoming increasingly common in more populated areas as well. According to this respondent, "The contractor staffing issue used to be rural, but now it's in the metro, it's in the valley. We're struggling to find contractors able and willing to meet the requirements for federal. Not that those regulations are bad or good, but they affect the availability and contractor willingness."

Utilities and agencies offered a range of explanations. Weatherization work, such as installing insulation, can be unpleasant given both the condition of homes receiving energy efficiency retrofits and the difficulty of the task (e.g., entering a crawl space of an older manufactured home to insulate a floor cavity). One Oregon CAP agency with an in-house installation crew explained, "Finding someone interested in becoming a [Quality Control Inspector] or home auditor, when they don't know what it is…training someone to do this…over time, so they don't get freaked out by crawl spaces, is a challenge and we're trying to work through it." Individuals with the skills needed for weatherization work may often find easier working conditions in new construction projects. Some funders of low-income retrofits also require inspections of

completed projects, potentially adding an additional burden that contractors would not face in other types of projects.

Federal and state funding sources many agencies use require new contractors to attend certain weatherization trainings and obtain certificates prior to beginning project work. CAP agency interview respondents noted that providing this training could pose a further challenge to increasing contractor availability. Respondents stated that the training is held infrequently (in some cases, twice a year) and may take place far from a CAP agency's headquarters. One Oregon CAP agency described how a training budget focused on maintaining certifications for existing staff was insufficient for training a new crew from scratch. This respondent described how costs went beyond the training itself, to include staff members' lodging and transportation to the training site, as well as lost revenue from non-program projects those staff members would have carried out during the training time.

Interview respondents reported that prevailing wage regulations, which CAP agencies in Washington must follow, can further deter contractors from participating. To accept prevailing wage work, like projects receiving state weatherization funding, interested contractors must attend an online class and submit the results to the state. A CAP agency staff member shared that fewer contractors had chosen to do so in recent years, explaining that, "People just don't want to take the time to do it because right now there's so much private work out there, they don't need to do it."

In addition to availability of installation staff or contractors, **internal administrative staffing at utilities and agencies** was also a challenge. Some smaller utilities and agencies reported facing insufficient staffing to carry out projects. For most utilities, staff wore multiple hats and managed other responsibilities in addition to the administration and implementation of low-income energy efficiency measures. As a small rural Oregon utility described, "It takes time and energy and effort and project management to bring these projects to completion."

Even though partnering with a CAP agency could streamline project implementation, interview findings suggest that low-income projects still require utility staff time and effort. As noted above, successful partnerships require utility staff to devote time to hands-on coordination and collaboration with their CAP agency partners. Depending on the scope of the partnership, utility staff also described carrying out tasks like marketing, communicating with partners, processing of payments, and project documentation. Utilities unable to partner with a CAP agency or implementation contractor further had to coordinate contractors, oversee implementation, and verify customer income.

Internally, agencies faced administrative staff turnover and early retirement due to the COVID-19 pandemic, reducing the staff available to review customer applications, conduct income verification, and complete measure/project paperwork. This was especially impactful for tasks like blending funds from multiple sources to cover project costs, a skill that most interviewed agencies described as requiring practice and experience, which not all CAP agency staff had. Three interviewed CAP agency staff members did not engage in braiding funds, instead using one funding source per project, though two of the three were interested in learning. Washington agencies noted that paperwork for weatherization projects could be even more complex with the inclusion of state prevailing wage requirements that require the prevailing wage funding structure and task designation.

6.2 BARRIERS TO CUSTOMER PARTICIPATION

Nine utilities (including both those that administered in-house programs and those that collaborated with agencies) described challenges identifying and recruiting customers to participate in their low-income programs. Utilities and agencies that offer billing assistance, for example through the federal LIHEAP program, indicated their billing assistance programs provided a source of referrals for weatherization services that often exceeded their capacity to complete retrofits. As a result, many agencies did little or no outreach to promote their weatherization work. Nonetheless, some respondents noted that billing assistance programs may not cover all eligible customers. Some customers may pay their utility bill at all costs and be excluded from the population of customers that is routed to referral for low-income programs. One utility staff member explained how, “A lot of times they will pay this bill and we won’t recognize them as someone who needs help.”

In addition to challenges identifying and recruiting customers, utilities reported customer follow-through was challenging to maintain. Interested customers may apply but fail to follow-through with program requirements or support program efforts later in the process, due to higher priorities in their lives. Utilities implementing programs in-house noted that, not only did their programs lose the opportunity to serve customers that drop out of the process, but the resources (in cost and staff time) devoted to those projects would reduce their capacity to serve additional households. Interview findings suggest customers may not be aware of, or prepared for, all that is involved in efficiency retrofits, which may require multiple visits, photographs of their home, and inspections.

Utilities suggested a variety of factors that contribute to challenges with customer recruiting and retention, as described below.

- **Customers have more pressing priorities** than undergoing the application and inspection process for a project. One staff member at a large Washington utility explained, “Feeding your family, putting a roof over your head and medication is more important. Vulnerable populations have more challenges than remembering to work with a landlord to install a ductless heat pump.”
- The **limited staff capacity** described above could also impact utilities’ outreach efforts. One staff member at a utility explained, “I’m a department of one. Staffing, we wear so many different hats. It gets the last attention so to speak, in terms of getting my fliers printed out, putting them at food banks, community events.”
- Potential participants’ **feelings of shame around accepting income-qualified assistance** was another barrier that utility staff described. Utility staff noted that many customers, particularly within the senior population, feel a stigma associated with receiving assistance. As one staff member at a rural Oregon utility explained, “our area has a lot of retired folks, and there is a pride element about reaching out for help.”

Utilities identified certain populations as underserved or particularly challenging for their low-income programs to reach, including:

- **Renters, particularly in multifamily properties:** Ten interviewed utilities reported challenges in serving renters. Conducting retrofits in multifamily properties requires the consent of the property owners or managers, who some utilities found difficult to identify

and reach, especially when they resided out of state. Larger properties also may have directors and boards to approve improvements. Utilities also described concerns that landlords may raise rents after upgrades.

- **Elderly/senior population:** Three utilities reported barriers engaging elderly residents in their low-income program. As mentioned earlier, issues of stigma around accepting low-income assistance were prevalent among older customers. Additionally, the need to provide income verification documents in-person at a CAP agency's office can be difficult for some elderly residents, given the large areas some agencies serve. The potential need for a return visit for additional or corrected documentation further compounds these challenges. Some utilities and agencies have addressed this issue by having senior-centered events at more accessible locations, as well as allowing mail-in forms and documentation.
- **Remote areas:** Three utilities stated the more rural/remote areas, deeper into their service area, were more difficult to engage given their distance from the utility (and partnered CAP agency) staff. Contractors may be unwilling to travel to conduct projects in these areas. Program advertising may be clustered in city centers rather than the fringes of their service area. One utility described how their partnered CAP agency is located in the northern part of their service area and disproportionately serves that area.
- **Older housing stock:** CAP agencies reported that low-income customers often reside in older homes requiring extensive repairs to enable retrofits. These projects require significantly more health and safety investments, including roof repairs, wall repairs, asbestos and vermiculite remediation, and carpet replacement. Some agencies can permit some projects like this, but often these projects are high cost and unable to meet DOE cost-effectiveness requirements or BPA cost caps.

6.3 BARRIERS TO OFFERING INCOME-QUALIFIED PROGRAMS

Six (of thirty-two) interviewed utilities did not have an active low-income program at the time of the interviews. These utilities were:

- primarily (4 of 6) small and rural.
- interested in creating a program in the near future (3 of 6).
- experienced with prior low-income programs (3 of 6).

All three of the utilities that had previously offered low-income programs reported their programs had ended due to breakdowns in their relationships with CAP agency partners. One large utility conducted a low-income program pilot in collaboration with a CAP agency but did not transition the pilot into an ongoing program. A small rural utility's relationship with their local CAP agency broke down over a request that the CAP agency return unspent funds; this utility respondent reported that the CAP agency no longer has an installation crew. Another small rural utility reported they stopped delivering low-income measures when key installation staff left their CAP agency partner.

Interview findings suggest that the barriers to program expansion described above, specifically limited utility and CAP agency staff capacity, are also key barriers preventing additional utilities from launching low-income programs. Four of the six utilities pointed out that limited internal

staff capacity was a major obstacle. As one small Oregon utility staff member stated, “I am the only staff member that handles any of our energy efficiency measures, as well as the four or five other random jobs that I do here. My bandwidth to develop our programs is pretty limited.” Even larger utilities without programs faced challenges with staffing. A large Washington utility staff member explained that, at their utility, “they have a lot of turnover, they have new employees,” making it difficult to develop a low-income program. Like other utility and CAP agency respondents, utilities without active programs also described a lack of contractor or installation crew availability as barrier to offering low-income measures.

Utilities without low-income programs suggested that simple, streamlined program materials directed at utility staff could help them build programs, as well as materials explaining the program and BPA for potential partners like CAP agencies. This was especially important for one small rural utility located on the edge of BPA’s service territory who had trouble making inroads when contacting CAP agencies for a collaboration. The utility staff member stated that, “You say BPA and they're like, huh?”

7 NATIONAL PROGRAM EXPERIENCE

As part of this evaluation, the research team conducted a review of relevant literature to identify best practices for low-income programs. The low-income program research provided insights into effectively running single-family and multifamily low-income programs. Key insights from this research that may be relevant to BPA and its utilities are listed below. Detailed findings are included in **Appendix 2: Detailed National Program Findings** of this report.

- **Set low-income spending and participation goals**. It is becoming increasingly common for utilities across the country to set low-income program goals. The literature shows that multiple metrics are used in setting goals, including spending and participation goals.
    - While some interviewed BPA utilities opt to define specific funding allocations for their low-income programs, BPA does not set requirements around the amount of EEI funding utilities must spend on low-income or the amount of savings attributable to low-income projects.
- **Think broadly about stakeholders and partnerships.** Partnerships and stakeholders may extend beyond CAP agencies and into community health organizations, nonprofits, food banks, housing financing organizations and gas utilities. Some of these organizations may be able to support utility low-income programs in creating “one-stop-shop” offerings for low-income customers that extend beyond energy retrofits into other needed services. Programs described in the literature review found that coordinating with gas utilities may provide opportunities to create a fuel-neutral program offering. Additionally, partnerships may be able to support programs with targeting and outreach of potential participants.
    - BPA utilities primarily partner with CAP agencies, although some, larger utilities also reported partnerships with city housing departments or other relevant municipal agencies. Many of the CAP agencies with which BPA utilities partner draw on multiple funding sources, including funding from gas utilities.

- **Provide contractor networks and training.** Limited availability of contractors with sufficient skills and training can pose challenges for both single-family and multifamily retrofit projects. Multiple programs across the country have created contractor networks, conducted and funded training, and supported quality control of projects in order to overcome this challenge.
    - Limited contractor availability was a common challenge for BPA utilities. BPA does not maintain a network of qualified contractors directly focused on low-income projects.
- **Leverage Census data.** Census data is being used for multiple purposes in low-income programs, including to understand and target customers, streamline eligibility and enrollment, and refine outreach.
    - BPA's low-income programs currently make limited use of Census data. Few utilities described efforts to use Census data to target their programs, and BPA does not offer geographically based eligibility (for example, automatically qualifying customers in Census tracts where the number of low-income households exceeds a certain threshold).
- **Consider the unique needs of multifamily buildings.** The best practices for multifamily programs are generally similar to single-family programs, such as creating one-stop shops, supporting contractors, and creating effective partnerships for outreach, funding and implementation. Yet, the research shows that multifamily programs need separate and focused efforts on their unique needs. Therefore, the multifamily program needs unique partnerships, its own one-stop-shop approach, and specialized contractor training. Tiered incentives may be especially effective within multifamily programs as well as financing offerings that consider the unique financing needs of multifamily owners.
    - BPA includes low-income incentives for measures installed in multifamily buildings in the Implementation Manual. Like single-family low-income measures, the multifamily measures offer prescriptive incentives. They do not take a tiered approach or offer multifamily-specific financing. Multifamily property owners were one of the populations that interviewed utilities reported were challenging to reach through their low-income programs.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSION 1: BPA'S LOW-INCOME PROGRAM IS A VALUABLE RESOURCE FOR NORTHWEST UTILITIES

Interviewed utilities valued the opportunity to offer EEI-funded low-income measures. Utilities are motivated to provide offerings benefiting all of their ratepayers. BPA utility incentives in the Implementation Manual give utilities an opportunity to offer efficiency measures to low-income customers even if they are unable to partner with a local CAP agency. For those utilities able to form CAP agency partnerships, the utility incentive funding provides benefits without the same type of cost-effectiveness testing required under federal low-income retrofit programs, potentially allowing agencies to install measures they would not otherwise be able to include in a project.

Interview findings suggest that BPA's processes around low-income utility incentives largely work smoothly for the utilities. While measure cost caps were challenging for some utilities (discussed further below), few respondents reported challenges with reporting or other measure requirements. Program processes do not appear to pose a limitation on expanded low-income activity. Utilities and CAP agencies also appreciated the coordination provided through BPA's Low-Income Workgroup.

8.2 CONCLUSION 2: MEASURE COST CAPS CONSTRAIN PROGRAM ACTIVITY

Recognizing that low-income households often have more immediate needs than energy efficiency retrofits, BPA seeks to structure its low-income measure offerings so utilities can offer them to low-income households at no cost. Interviewed utilities reported it was not possible to install certain measures, notably air-source heat pumps, within the cost caps defined in the Implementation Manual. As a result, utilities were reluctant to offer these measures if they did not have CAP agency partners that could draw on alternate funding sources or self-funding to cover the cost difference. BPA raised the cost caps during the course of the evaluation. While utilities viewed the increased caps positively, at the time of the interviews, it was not possible to determine whether increased caps were sufficient to cover most installations.

RECOMMENDATION:

BPA should assess whether the benefit of measure cost caps justifies the constraints they place on the program. If BPA determines cost caps are justified, it should develop a systematic approach to set and regularly update those caps. To that end, BPA should assess the extent to which its data on installed measures (both low-income measures and measures installed through standard residential programs) are sufficient to support a systematic review of installation costs. If reported measure data are insufficient, BPA should consider alternative data sources, potentially including gathering permit data from jurisdictions across the region or utilizing purchased datasets.

8.3 CONCLUSION 3: LIMITED INSTALLER AVAILABILTY IS A CRITICAL BARRIER

The most immediate barrier preventing increased low-income program activity in the Northwest is the limited capacity of contractors and installation crews delivering measures, as well as CAP agency administrative staff. Agencies and some utilities are often limited more by the capacity to serve customers than by the availability of funding.

Three key factors lead to limited installer availability:

- There is a general labor shortage in the building trades, and income-qualified retrofit work may compete for qualified workers with other types of work, like new construction with better working conditions and less administrative burden.
- It can be costly to provide new workers with required training and certification, and infrequent training can make it difficult to ramp up installation crews quickly. Although these training requirements primarily come from federal weatherization programs, they can impact installations funded by BPA utility incentives since CAP agencies often blend utility incentives with federal funds.
- Distance amplifies both of these issues: training and certification becomes still more challenging for contractors located farther from locations where training is held, and,

facing more available work than they can take on, contractors may be reluctant to travel to more remote areas to complete projects.

CAP agency staffing issues likely reflect the worker turnover prevalent in the broader market. CAP agency staff may be opting to retire or leaving for higher paying or otherwise more attractive jobs. Increased administrative funding for CAP agencies may help improve staff retention. A lack of an explicit allowance for administrative costs was a challenge some CAP agency staff described in using BPA utility incentives. These respondents noted that other funders, including IOUs, allow agencies to charge a percentage above the direct measure-installation cost to cover their administrative costs, and they described this administrative allowance as an attractive feature of those funding sources.

RECOMMENDATIONS:

BPA should consider the following opportunities to increase contractor availability and CAP agency capacity:

- **Workforce development efforts to increase contractor availability.** While BPA may have limited capacity to influence training and certification courses required for federal weatherization programs, there are steps it could take to increase availability of qualified installation staff. For example, BPA could consider externship programs or efforts to boost the capacity of existing contractors like those cited in the Best Practices review. In particular, these efforts could focus on building workforce in rural areas.
- **Increased incentives to support measure installation in remote areas.** BPA may be able to offer a bonus incentive to help utilities entice contractors to conduct low-income measure installations in areas with limited contractor availability or where contractors might need to travel from a larger population center.
- **An incentive adder explicitly targeted toward administrative costs.** Utility incentives and performance payments may include a consideration for administrative costs. However, CAP agencies may not recognize this if it is not explicitly designated, as other funders do. Providing an administrative adder may help CAP agencies increase and retain their staff.

8.4 CONCLUSION 4: UTILITY STAFF CAPACITY CONSTRAINTS LIMIT LOW INCOME ACTIVITY

Managing low-income programs is labor intensive for utility staff. There is a significant administrative burden in identifying and recruiting customers, verifying they qualify, managing measure installations and ensuring they meet program requirements, and providing all of the required documentation. Carrying out these tasks requires specialized knowledge and skills. Even if utilities work with a CAP agency partner that takes direct responsibility for many of these tasks, maintaining a successful relationship nonetheless requires active engagement on the part of utility staff, for example, to answer questions on the eligibility of specific installations.

Staff capacity constraints can also prevent utilities from offering low-income measures. At some utilities, a single staff member is responsible for all efficiency program offerings, and they may not have the capacity to inform potential partners about BPA's low-income offerings and build relationships. Utilities without low-income programs expressed a desire for simpler, more

streamlined program materials they could present to local CAP agencies and other potential partners, as well as potential participants, to explain the program.

Streamlining program processes helps to relieve the burden that program implementation places on utility staff, and BPA has made efforts to do so. The program allows flexibility in income-qualification guidelines to ensure its requirements do not conflict with other funding sources CAP agencies might draw upon, and the program recently adopted a self-attestation option for income verification. The evaluation did not identify any significant challenges with program processes. Nonetheless, utility staff, particularly at small utilities often have a range of other responsibilities limiting the amount of time they can devote to low-income programs.

RECOMMENDATIONS:

BPA should consider opportunities to provide administrative or staffing support that could ease the burden on utility staff. Third-party implementation support offers one potential approach, allowing an implementation contractor to pool resources across multiple, smaller utility service areas. Another approach could involve directly supporting staff positions at interested CAP agencies, similar to an industrial Energy Project Manager, for individuals to act as utility program advocates and liaisons.

8.5 CONCLUSION 5: INCREASED LOW-INCOME FUNDING MAY COMPETE WITH OTHER PRIORITIES

Currently, competition between low-income programs and other EEI funding priorities is limited as most utilities struggle to overcome capacity constraints limiting the number of projects they can complete. However, if BPA and utilities are able to overcome capacity constraints, competition between low-income programs and other priorities may become a more important barrier to expanding low-income activity. Low-income retrofit projects are costly and can require significant engagement from staff, particularly for utilities that implement programs in-house. At the same time, low-income residential retrofits often provide less energy savings than efficiency projects in other sectors. While BPA's utility customers are motivated to serve their income-qualified ratepayers, most do not self-fund low-income measures and must meet energy savings targets with limited EEI budgets.

RECOMMENDATION:

BPA should consider funding and utility incentive structures that distinguish low-income activity from other energy efficiency programs. Delivering low-income efficiency measures serves objectives that go beyond energy savings alone. As a result, BPA should consider establishing policies that specifically encourage low-income activity. This could include specific targets for low-income activity and/or funding solely designated to support low-income measures.

8.6 CONCLUSION 6: THERE MAY BE OPPORTUNITIES TO BROADEN AND EXPAND PROGRAM OUTREACH

Utilities and agencies cited a social stigma against seeking or accepting assistance as a barrier to ratepayer participation in low-income programs; referring to those programs as "low-income" can exacerbate that stigma by emphasizing participants' limited means. As a result, some utility staff members reported their programs were moving away from using "low-income" terminology in favor of "income-qualified" or other more neutral terminology.

RECOMMENDATION:

BPA should consider shifting the program name away from “low-income” to adopt more neutral terminology, consistent with other jurisdictions.

8.7 CONCLUSION 7: IT IS DIFFICULT TO ACCURATELY TRACK THE EXTENT OF LOW-INCOME ACTIVITY IN THE REGION

Multiple funders support efficiency improvements in low-income households in the Northwest. BPA offers EEI-funded low-income measures as well as state and tribal grants, both of which are blended with federal funding, state funding, and IOU funding. Given this diversity of funding sources, it is difficult to develop a comprehensive sense of the overall amount of low-income retrofit activity occurring in the region and where that activity is taking place. This makes it challenging to accurately assess how much potential remains for low-income efficiency retrofits and where that potential is likely to be concentrated.

Even within BPA’s EEI-funded low-income energy efficiency program, gaps in reporting make it difficult to track the full extent of low-income activity. While most utilities report all of their low-income activity, some large utilities with significant low-income programs do not fully report their low-income activity. These utilities largely do not report their low-income activity because of challenges translating the whole home projects their partners complete into the measure-level reporting requirements for EEI-funded measures.

Additionally, BPA’s data reporting system and internal processes have challenges with tracking and reporting low-income activity, as follows:

- The BOOM report does not include any costs from BEETS, thereby making it more difficult to track spending on low-income funding.
- The funding and activity data on low-income state and tribal grant funding were not easily merged with EEI funding data for a comprehensive view.
- BPA does not have an internal process to track or regularly report low-income activity. For example, the BOOM report includes pivot tables by sector, but low-income spending or savings is not part of the standard report.

In combination, these factors make it difficult for BPA to determine what has been accomplished for low-income households in its territory. In turn, it becomes challenging to understand the remaining potential and target efforts in the areas with the greatest potential.

RECOMMENDATION:

BPA should develop standardized reports for low-income EEI funding as well as state grant funding. BPA should conduct an analysis of the data that are available within the reporting system to understand the extent low-income achievements can be reported out, including key variables such as zip code and whether the project is multifamily.

RECOMMENDATION:

BPA should consider supporting additional research to characterize the low-income retrofit activity occurring in the Northwest more fully, across funding sources. This type of research could help guide BPA’s low-income activities by identifying areas where significant activity is

occurring outside of BPA funding as well as areas where there is limited activity overall, allowing the program to target its approach in each type of location. This type of research could benefit multiple program administrators across the region, and there may be an opportunity to carry it out through a coordinated effort, led by another regional entity. While BPA may not necessarily lead this effort, its motivation and support could be beneficial.

RECOMMENDATION:

BPA should consider creating a pathway within the Implementation Manual to capture whole home retrofits. Providing an option for utilities to report comprehensive retrofits as a single project, rather than breaking them into their component measures, could facilitate reporting for utilities working with partners that take a whole home approach. This could facilitate more complete reporting of low-income retrofit activity.

APPENDIX 1: PROGRAM LOGIC MODEL

A logic model is a graphic representation of a program's activities and how the program administrator anticipates those activities will lead to the desired outcomes. A logic model has three key components:

- **Activities:** The actions the program takes to bring about its desired outcomes.
- **Outputs:** The direct result of the program's activities, typically items that can be counted. Creation of outputs entirely reflects the program's activities; it does not depend on any response from the program's target audience or other market actors.
- **Outcomes:** Typically divided between short-, medium-, and long-term, outcomes reflect the program's target audience or market actors' response to program offerings in ways that interact and build on each other over time to achieve the program's ultimate objectives (typically expressed as long-term outcomes).[14]

The Evergreen team developed two logic models to represent BPA's low-income program. The first (Figure 11), illustrates program activities and anticipated outcomes from BPA's perspective. The second (Figure 12) illustrates the activities and anticipated outcomes from the perspective of the utilities and/or CAP agencies delivering measures to low-income households. The purpose of this logic modeling effort is to describe BPA's offerings as they currently exist, as an initial step toward identifying opportunities for program improvement. The Evergreen team developed these logic models based on a review of documents related to BPA's low-income offerings and interviews with BPA staff.

[14] In the logic models presented here, the distinction between short-, medium-, and long-term outcomes is designed to express the sequence in which they are expected to occur, rather than specifically-defined time periods.

Figure 11: EEI Low-Income Logic Model (BPA Perspective)

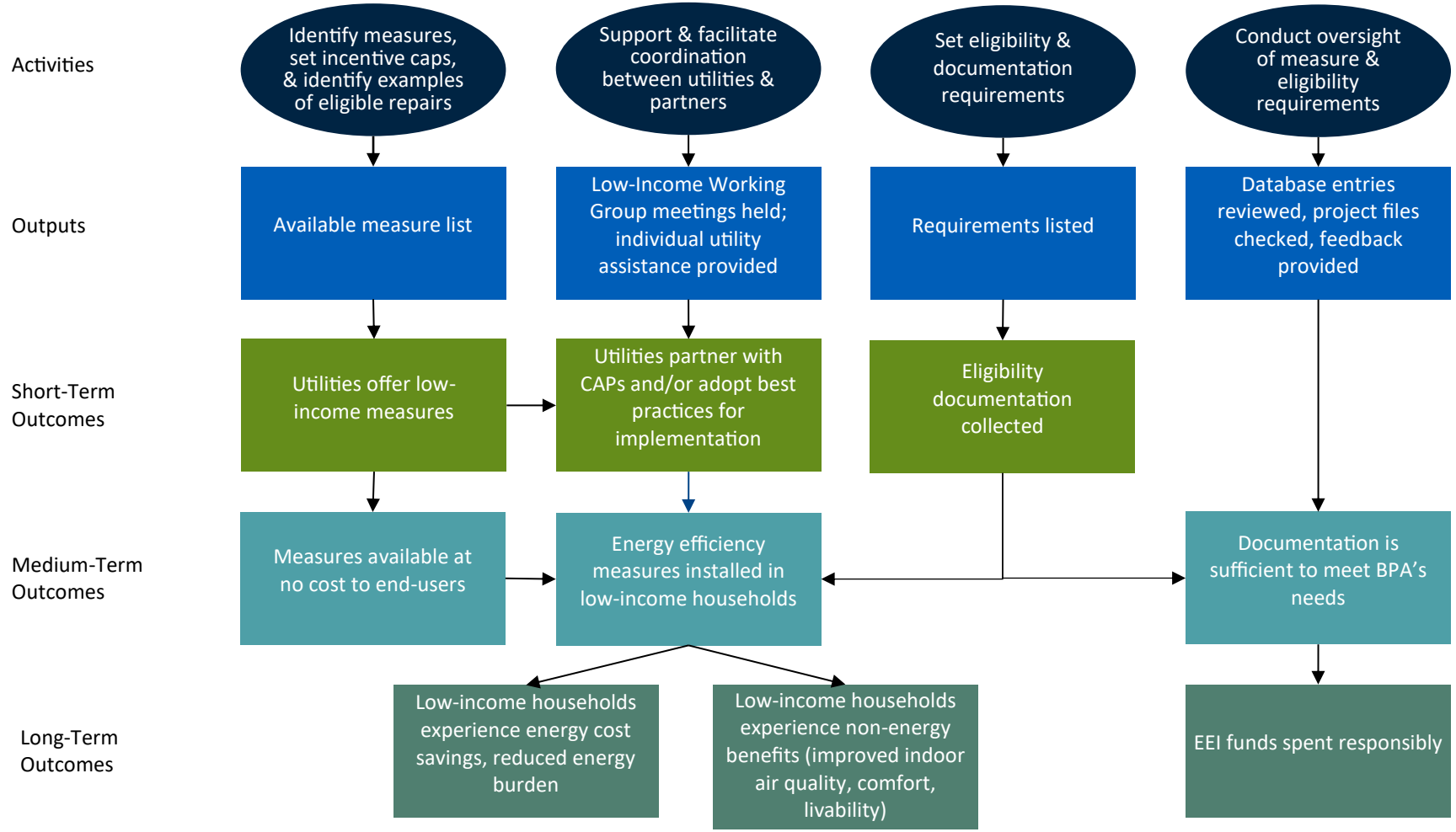
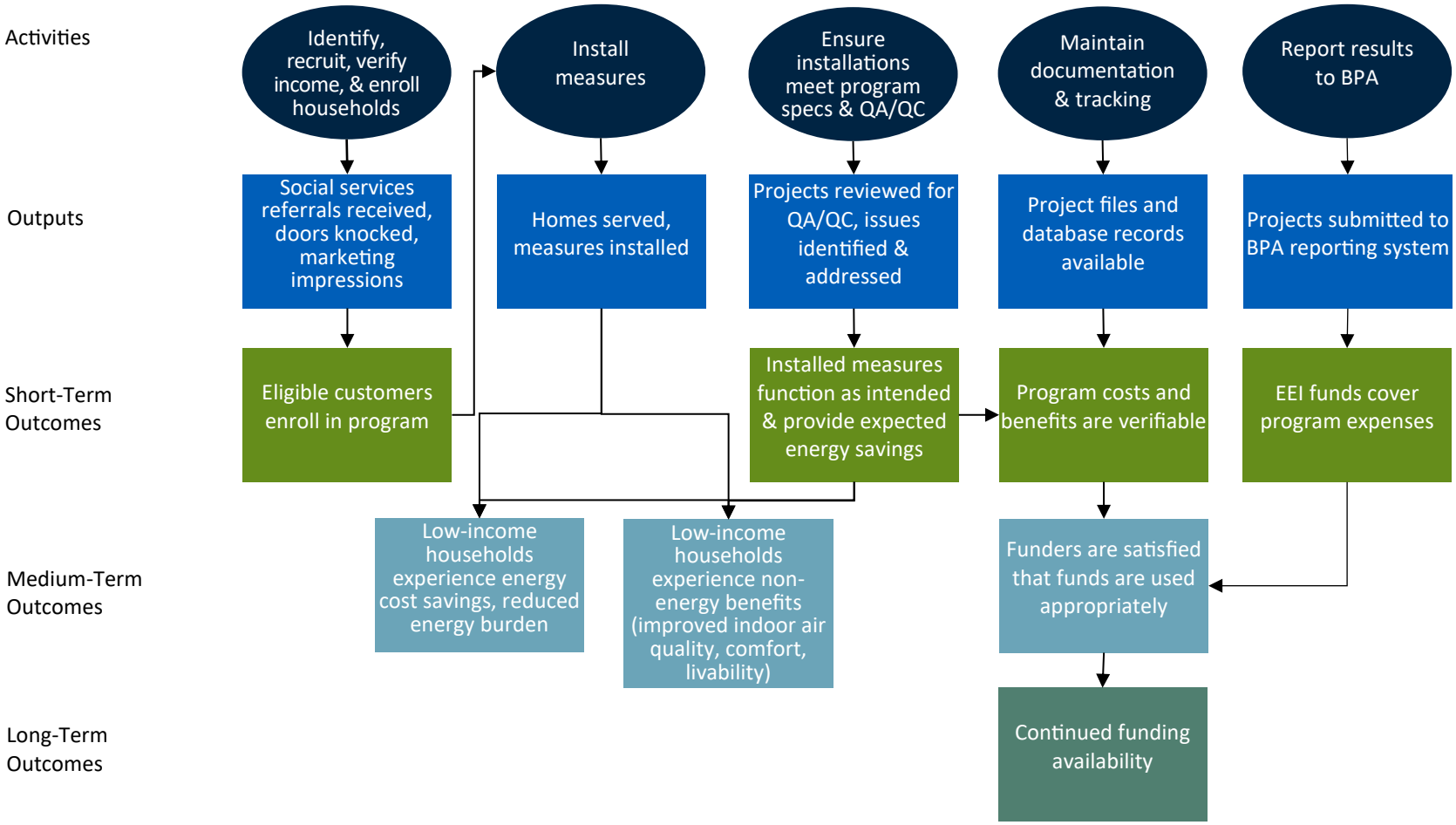


Figure 12: EEI Low-Income Logic Model (Utility/CAP Agency Perspective)



APPENDIX 2: DETAILED NATIONAL PROGRAM FINDINGS

SET LOW-INCOME SPENDING AND PARTICIPATION GOALS

Numerous states have established spending and/or participation goals for low-income programs to ensure low-income customers have the ability to benefit from energy savings (ACEEE, 2021). Some goals are broad; 2008 legislation from Michigan simply requires utilities to have low-income-focused energy efficiency programs (ACEEE, 2021). Other goals are more specific and define expected spending. For example, the Energy Conservation and Optimization Act in Minnesota requires that gas investor-owned utilities spend a minimum of 1 percent of their three-year average residential gross operating revenues on low-income programs and electric utilities are expected to spend 0.4 percent (ACEEE, 2023). Illinois's Future Energy Jobs Bill requires its largest electric utilities spend at minimum $25 million a year for low-income energy efficiency measures (ACEEE, 2021).

Alternatively, California's Long Term Energy Efficiency Strategic Plan set a goal for the Energy Savings Assistance Program of providing weatherization and energy efficiency measures to "100 percent of all eligible and willing customers" by 2020 (ACEEE, 2023).[15] Additional examples of state and utility goals include Colorado gas utilities' requirement that one-fourth of utilities' residential demand side management (DSM) program expenditures target low-income households, and Connecticut's goal to weatherize 80 percent of its homes by 2030 (ACEEE, 2023). These requirements, whether they are participation or spending goals, set formal expectations for utilities to dedicate staff and resources to low-income efforts.

DELIVER SERVICES VIA A "ONE-STOP SHOP"

To ease the burden of navigating programs, some low-income centered programs have developed a "one-stop shop" model of program delivery (Samarripas & York, 2019). In this model, low-income customers' encounters with the program are comprised of "a single point of contact, universal intake applications, comprehensive technical assistance, and streamlined access to program resources" (Morales & Nadel, 2022). Some iterations of one-stop shops include joint utility program offerings, such as coordinated programs between electric and gas (Tanabe, 2021).

The one-stop shop model for program delivery merges multiple services, and, at times, multiple programs, into a streamlined experience. In some cases, CAP agencies provide the coordination component of the one-stop shop. For example, Columbia Gas of Ohio's WarmChoice one-stop-shop design uses community action partnership (CAP) staff to simultaneously implement the low-income incentive projects via the WarmChoice program alongside direct install of the upgrades from Ohio Home Weatherization Assistance Program (HWAP) (Cluett et al., 2016). The WarmChoice program uses the same implementation contractors as Ohio's weatherization program and shares low-income customer information with it (Cluett et al., 2016).

Another practice adopted by programs to merge services includes the use of OneTouch in Vermont, a digital interface used in home audits to refer participants to other housing, energy

[15] Despite interruptions due to the COVID-19 pandemic, the California IOUs largely met this goal. Since 2020 the program has shifted to a focus on achieving deeper savings and improved coordination with other clean energy programs, with commission staff proposing household-level energy savings goals (CPUC, 2021).

and health programs (E4, 2020). As many as 30 percent of initial participants in 4,000 home audits were eligible for a referral to other services (E4, 2020).

Some one-stop programs are geared toward owners of multifamily properties, like Xcel's Multifamily Building Efficiency program, which incorporates building audits, energy use assessments, and contractor bid reviews as supplemental services for larger projects (Samarripas & York, 2019). Effective programs targeting affordable multifamily housing gave wide-ranging technical assistance to owners, including "analyzing and recommending equipment and system improvements, supporting the contracting and implementation of measures, and helping owners obtain and assemble the financial packages needed to pay for projects" (Samarripas & York, 2019, p.V).

THINK BROADLY ABOUT PARTNERSHIPS AND COORDINATE WITH STAKEHOLDERS

Numerous successful low-income programs utilize collaborations with stakeholders to combine program resources and support delivery (Cohn & Tanabe, 2022). This coordination takes place most frequently with hard-to-reach populations connected to other social services and aid opportunities. These arrangements may vary between organization types depending on the most suited partners.

For low-income customers, some utilities partner with community health organizations, nonprofits, and food banks to broadly distribute self-install products like lightbulbs, energy education materials and program information (Gilleo et al., 2017; Cluett et al., 2016). Efficiency Vermont's low-income programs strategically partner with food banks and the Women Infants and Children (WIC) program to distribute refrigerators to low-income homeowners with aged refrigerators (Cluett et al., 2016). WIC providers contacted their program participants (already income-qualified within WIC) about the refrigerator replacement opportunity and referred them to Efficiency Vermont's call center. Once WIC participants confirmed their age of refrigerator, they could schedule a refrigerator removal and replacement with Efficiency Vermont, which accepts their WIC eligibility as sufficient income documentation (Kuhn, 2015). Examples like this for low-income customers give the utility support and co-branding with community organizations and agencies, which may help bridge the distrust some potential participants feel when engaging with utility programs (Schauer et al., 2020).

For multifamily, some utilities collaborate with affordable housing organizations to learn about and recruit building owners interested in upgrading their properties (Samarripas & York, 2019). In the example of Centerpoint Energy and Xcel Energy's partnership through Minnesota's Multifamily Building Efficiency Program, discussed in greater detail later in the review, initial program participants/multifamily owners were identified and recruited through contacts in the housing sector (Samarripas & York, 2019).

INCLUDE FUNDING FOR HEALTH AND SAFETY REPAIRS

The current state of the property is often a significant barrier to utilization of available higher efficiency upgrades (US DOE, 2018). Issues may range from structural to personal health and safety concerns, like lead paint, roofs needing repair, faulty wiring, water issues and mold and asbestos (Morales & Nadel, 2022). Resolving these issues is necessary to move forward with a home retrofit project as well as for participation in many energy upgrade programs, but requires

additional funding, paperwork (if using program assistance), and the ability to navigate bureaucracy.

One example is ComEd's collaboration with the Illinois *Home Weatherization Assistance Program*, where the cost of health and safety improvements necessary for weatherization are equally shared between the state and the utility (Morales & Nadel, 2022). In some cases, ComEd collaborates with nonprofits like Elevate Energy and the Chicago Bungalow Association and, when implementing their projects, will cover the entire cost of necessary health and safety improvements (Morales & Nadel, 2022).

Utilities and their partners often braid funds together to cover household energy efficiency upgrades, while other organizational partnerships can provide and supplement funding for related repairs. Housing finance partnerships could potentially cover renovations of internal systems like HVAC and plumbing, while utility funding could support the purchase and installation of high-efficiency products (Samarripas & York, 2019). One example is Connecticut Green Bank, which crafted housing financing opportunities for multifamily renovations that complemented state funds for energy efficient upgrades (Samarripas & York, 2019).

CONSIDER WORKFORCE NEEDS, INCLUDING CONTRACTOR TRAINING, QUALITY CONTROL AND CONTRACTOR NETWORKS

The delivery of low-income programs may be impacted by the availability of contractors with sufficient skills and training. Utilities meet these skilled labor needs in different ways. Many utilities delegate implementation to CAPs of community action agencies (CAAs), which typically maintain partnerships with contractors. For example, Massachusetts' LEAN program has staff whose roles are to train the CAA implementers that install measures (Gilleo et al., 2017). Some programs like Arkansas's Ouachita Electric Cooperative's (OECC) HELP PAYS brought installers to a rural area that lacked skilled contractors while OECC trained their own utility staff to quality check installers' work.

While some low-income programs conduct quality control inspections on a sample of projects to streamline participation and reduce costs, HELP PAYS and Massachusetts LEAN take a more stringent approach, inspecting every project to ensure quality control requirements are applied (Gilleo et al., 2017). Programs with clients eligible for WAP funding can utilize the U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) trained and certificated workforce to help ensure the quality of work (US DOE, 2018).

Some utilities have allocated funding for training and education to support workforce development, generally. One example is the District of Columbia Sustainable Energy Utility (DCSEU), which administers energy efficiency programs in Washington, DC. DCSEU created an externship program for unemployed and underemployed individuals, recruiting potential participants through community-based organizations (Shoemaker et al., 2020). The program funds energy-efficiency-related certificates, provides training for job seeking skills like interviewing, and places participants in externship roles at government agencies in DC (Shoemaker et al., 2020).

Tennessee Valley Authority's (TVA's) Building Futures program is a different effort to support workforce growth (Shoemaker et al., 2020). The program collaborates with the Tennessee Urban League Affiliates to recruit minority contractors from Nashville, Knoxville, Memphis, and Chattanooga to provide the professional training necessary to meet TVA's Quality Contractor

Network (QCN) standards (Shoemaker et al., 2020). The ultimate goal for participants is to deliver TVA weatherization to low-income residents. While the program gives contractors the opportunity to learn energy efficiency practices, its focus is on training existing minority contractors as compared to programs like DCSEU's, which seek to bring more individuals into the contractor workforce.

One important way that utilities have secured program implementation partners is the creation of a trusted contractor network (Samarippas & York, 2019). For example, programs like Georgia Power's general Home Energy Improvement (HEI) Program and its multifamily-specific branch have a network of participating program contractors with program-required certificates as well as training on performing a general home energy audit. Program partner contractors are also educated on the scope of the program and its guidelines.

Outside of energy efficiency or specific trade contractors, some utilities have decided to incorporate general contractors to "provide 'bridge services' for income qualified customers" (e.g., roofing repairs), which may prevent their engagement in other programs like energy efficiency (WA Department of Commerce, 2023).

TARGET PROGRAM OFFERINGS AND CONSIDER INNOVATIVE OUTREACH EFFORTS

To aid in creating programs that will meet the various needs of low-income households, some utilities have developed customer/market segmentation approaches, with categories like building type (e.g., residents of manufactured homes, owners of affordable multifamily), demographics (e.g., senior customers), fuel type and energy use (e.g., high energy users) (Gilleo et al., 2017). Utilities then design a portfolio with offerings customized to the market segment and customer characteristics, incorporating tailored communication methods and outreach. Breaking the low-income category into specific customer segments with unique characteristics allows utilities to better fit program designs to the customers' needs.

The literature identified effective program communication and outreach strategies to low-income programs, including having a specialist staff for outreach efforts, an outreach specific supervisor/manager, regular meetings with implementers (e.g., CAAs) and clearly defining goals (e.g., a scorecard) (Samarripas & York, 2019). An outreach-specific component of a program can provide customer education specific to the customer's needs and maintain ongoing engagement, reducing the toll on customers of searching for programs and funding. It also provides the resources and labor to coordinate and support the translation of program materials, as well as strategize targeted communications (e.g., to specific market segments like seniors) (Kelley et al., 2022). An outreach staff also contributes to the establishment of the organization (or utility's) branding and recognition as a provider of services and opportunities among customers. Regular outreach may transform individual customer contact with a utility or program provider into a general experience and journey from start to finish (Forster et al., 2022).

Outreach efforts do not have to be limited to utility-driven efforts; many utilities have chosen to partner with CAP agencies to assist in outreach and client recruitment. An established CAP agency may already have clients who are eligible for low-income programs as well as relationships with contractors they work with to install measures (Cluett et al., 2016). In lieu of CAP agencies, utilities can work with other local agencies and existing programs, like rent

assistance and Low-Income Home Energy Assistance Program (LIHEAP), to identify potential program participants (Gilleo et al., 2017).

Another means of recruiting participants outside of intentional collaborations is passive referrals based on customer information. In New York, statewide policy requires utilities to identify customers with high energy use and lower incomes, who are referred to the Empower NY program (Gilleo et al., 2017). Through Empower NY, customers can access free direct install measures, a free home energy audit, and discounts on further energy efficiency upgrades. As the program is implemented statewide and relies on regular processes of customer identification by energy use, the Empower NY program needs no additional marketing (Gilleo et al., 2017). Empower NY also receives referrals from community-based organizations and social services (presumably in cases where potential low-income participants are not captured by their energy use). Efficiency Vermont utilizes a similar approach, where households using double the average kWh or more are identified, reached out to and recommended efficiency measures (Gilleo et al., 2017).

Lastly, some utilities like Eversource of Massachusetts and Ameren Missouri rely on census tract data to identify low-income neighborhoods (Morales & Nadel, 2022). These neighborhood tracts then receive low-income program marketing materials. Utilities in the Northwest have taken a similar approach, investing in tools and external assistance to identify high energy burden customers (WA Department of Commerce, 2023). Northwest utilities have used this information to send a box of efficient showerheads and LEDs, as well as an invitation to express interest in energy efficiency programs (WA Department of Commerce, 2023). As with any approach, evaluation of outreach efforts through measures like social media campaigns, mailing list sign-ups, link clicks and completed project customer evaluations, can provide feedback on the efficacy of outreach efforts and permit regular changes in strategy.

LEVERAGE CENSUS DATA FOR ELIGIBILITY AND OTHER PURPOSES

Income verification for low-income energy efficiency programs can be an administrative burden for the owner and/or resident seeking services and for the program staff. Utilities lack the resources to store customer data and demographic information over time; thus, geographic criteria, such as verification by census tract, has been a method rising in popularity with utility energy efficiency programs (Rewiring America, 2022). Qualifying neighborhoods for low-income efficiency measures rather than individual households can help build community trust, in addition to reducing the barrier of verification paperwork. Tampa Electric uses Florida census tract data to identify areas below poverty level and qualifies low-income customers broadly (Morales & Nadel, 2022). It requires no resident and/or owner submission of financial information for participation.

Currently, Illinois allows single-family projects to qualify by low-income Census tract, and policy changes are underway to allow multifamily households to qualify by Census tract.[16] Illinois program administrators can consult HUD's annual designated "Qualified Census Tracts," which "have 50 percent of households with incomes below 60 percent of Area Median Income or areas that have a poverty rate of 25 percent or more." Other verification alternatives include rent roll documentation to demonstrate that tenants' rents are less than or equal to 80 percent of

[16] IL_EE_Policy_Manual_Version_2.1_Final_12-7-2021-1.pdf

area median income, and participation in either an affordable housing program (like Low Income Housing Tax Credit) or preapproval/currently waitlisted for the WAP.

One available resource for Census tract identification is the DOE Low-Income Energy Affordability Data (LEAD) Tool. The online platform can help utilities and partners learn estimates of household energy burden by geographies like cities, counties and Census tracts. Puget Sound Energy (PSE) utilized the DOE LEAD data to create a methodology to estimate non-PSE bills for their customers. However, the tool has limitations—PSE discovered that the data provided by the tool showed the calculated average household energy burden was higher than the median, indicating that some households with very high energy burdens could drive up the average in an area. This should be considered when using the DOE LEAD data for income-qualification purposes.

Another potential issue with census tract as a tool is that Census tracts like those outlined in DOE LEAD do not fit neatly into utility service area boundaries (WA Department of Commerce, 2023). Census tract information for qualification can be treated independently or used in conjunction with other sources of information for customer qualification (Rewiring America, 2022).

For program administration purposes and metric tracking, some utilities are expanding customer data collection to consider geospatial data. For example, Snohomish PUD No 1 is collecting geospatial data as part of their traditional suite of energy efficiency program metrics for another way to understand customer needs (WA Department of Commerce, 2023).

DESIGN INCENTIVES TO ENCOURAGE COMPREHENSIVE RETROFITS

Programs that delivered notable energy savings made an intentional choice to prioritize measures with deeper savings. A few programs have accomplished this through a substantial range of rebate-eligible technologies, combined with a tiered incentive structure or rebates based on total project savings (Samarripas & York, 2019). One example for owners of low-income multifamily buildings is the Multifamily Building Efficiency Program, which CenterPoint Energy runs in partnership with Xcel Energy in Minnesota and utilizes a tiered incentive structure. It begins with a no-cost energy audit (administered by Xcel) and provides free direct installation of efficiency measures in tenant units and in common spaces (Samarripas & York, 2019; ACEEE, 2017). The program covers up to 80 percent of measure cost for upgrades beyond the direct install measures that exceed a minimum floor of 15 percent savings. The program also builds upon the one-stop-shop model, in which owners of units that use both utilities can utilize a single application, rather than use multiple utility applications to access varying incentives. Some similar programs also have a specific contractor incentive, delivered through a contractor network.

Another California program, the Association for Energy Affordability's Low Income Weatherization Program for Multifamily (LIWP-MF), is known both for its energy savings and wide participation of low-income residents (Cohn & Tanabe, 2022). To combat the "split incentive" issue, the LIWP-MF program gives higher incentives for buildings that have residential units with their own meters. Program implementers create custom projects dependent on the building with a blend of technologies (e.g., energy efficiency with solar), and overall produce, on average, approximately $830 in yearly utility savings for renters (Cohn & Tanabe, 2022). The energy efficiency incentives for the program are based on CO2e reductions

estimated to be produced by the new energy efficiency measures, whereas the solar PV incentives are based on solar system generation readings (Hill et al., 2020).

SEEK TO PROVIDE FUEL-NEUTRAL OFFERINGS

Programs offering comprehensive dual-fuel or fuel-neutral upgrades can broaden their potential customer base by permitting energy efficiency upgrades in eligible homes no matter the customer's primary heating fuel. For some states this requires combining funding sources, as single funding sources may not be sufficient for the range of upgrades. Some examples of program coordination across electric and natural gas utilities include Peoples Gas and ComEd in Illinois, where state regulation permits ComEd, an electric utility, to compensate customers for gas savings.

Sacramento Municipal Utility District's Go Electric for Multifamily Program features a multifamily retrofit program that supports upgrading gas equipment and appliances to electric with incentives to the property owner, with additional incentives for low-income focused properties (Cohn & Tanabe, 2022; SMUD, 2022). In addition, Go Electric gives property owners' incentives for the electric panel and wiring upgrades often needed. Given its newness, energy savings have not been reported yet, unlike other programs discussed in this review.

OFFER FLEXIBLE FUNDING AND FINANCING OPTIONS TO MEET MULTIFAMILY PROPERTY OWNER NEEDS

Some programs targeting multifamily building owners give owners the ability to structure their funding as loans or grants (Samarripas & York, 2019). Different project funding requirements may restrict or limit access to some funding types for retrofit projects. Some multifamily property owners prefer loans to avoid grants, which increase their taxable income. On the other hand, some affordable housing investors may prefer to limit their debt obligations.

Programs like the Multifamily Energy Efficiency and Housing Affordability Program from the Maryland Department of Housing and Community Development provide incentives in the form of project grants or loans to aid participants in reaching project capital needs according to their preferences (Samarripas & York, 2019). Access to funding options and information about pathways can help multifamily property owners invest in energy efficiency upgrades. In some cases, program sponsors structure these loan or grant offerings to prohibit property owners from raising rent above set thresholds for a specified period of time.

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APPENDIX 3: MEASURE OFFERING COMPARISON

The Evergreen team compared the low-income measures included in the BPA Implementation Manual to the measure offerings of IOU-funded low-income programs across the Northwest as well as measure offerings of select public utilities in other parts of the country. Table 6 summarizes the results of these comparisons.

Table 6: BPA Implementation Manual Low-Income Measures & Measures Offered By Other Regional & National Programs

Utility	State	LED Lighting	Building Shell				HVAC					Water Heating			Appliances: Refrigerators	Home repairs	Other
			Air sealing	Insulation	Windows	Doors	Ductless heat pump	Air source heat pump	Furnaces/ boilers	Duct sealing/ improvement	Thermostats	Gas water heaters	Heat pump water heaters	Showerheads & aerators			
BPA			*X*	*X*	*X*	*X*	*X*	*X*	*N/A*	*X*	*X*	*N/A*	*X*				
Avista	ID	X	X	X	X		X		X			X	X	X			
	OR		X	X					X	X						X	
	WA	X	X	X	X	X	X	X	X	X		X	X		X		
Energy Trust of Oregon	OR	X	X	X			X		X	X		X	X	X		X	
Idaho Power	ID	X	X	X	X	X			X			X		X			Bathroom/ kitchen fans
Puget Sound Energy	WA	X	X	X	X		X	X	X	X	X	X			X	X	Energy Recovery Ventilator, Whole house ventilation, Pipe insulation
Cape Light Compact	MA		X	X					X		X			X	X	X	Freezers, Dehumidifiers, Window AC, Clothes washers, Power strips
Southern MN Municipal Power Agency	MN		X	X					X		X						

APPENDIX 4: MEASURE UNITS BY YEAR

Table 7 shows the number of units of each measure type reported installed each year.

Table 7: Units Reported by Year by Measure

Measure	Unit Type	2018	2019	2020	2021	2022	2023
Air Sealing	Sq. ft.	112,628	127,639	63,097	24,623	109,599	93,624
ASHP	Each	-	93	32	42	43	102
DHP	Each	886	1,039	749	516	495	527
Duct Sealing/ Insulation	Each	56	42	19	17	798	1,823
HPWH	Each	-	9	41	20	23	20
Insulation	Sq. ft.	574,817	647,595	509,155	428,513	867,673	699,197
Thermostats	Each	-	-	5	-	6	2
Windows	Sq. ft.	30,264	31,985	19,550	11,395	15,035	15,633

APPENDIX 5: INTERVIEW GUIDE FOR UTILITIES

Discussion Guide for Utility Group and Individual Interviews

Introduction (Individual Interviews)

Thank you for taking the time to speak with me today. As I mentioned in my email, we are working with BPA on a process evaluation of its Low-Income energy efficiency program. As part of our research, we wanted to hear from utilities in the Northwest that work with BPA, particularly about their experience carrying out low-income measures in the Implementation Manual.

Do you have any questions before we begin?

I'll be taking notes as we talk, but would you mind if I also record our conversation? The recording is just to help with my notetaking. We won't share it with anyone including the public and Bonneville, and we won't report anything in a way that would identify individual respondents.

Introduction (Group Interviews)

Hello everyone, and thanks for joining us today. My name is [NAME], and I am going to be leading the discussion. As I mentioned when we reached out to you about joining this discussion, we are working with the Bonneville Power Administration on an evaluation of their Low-income Energy Efficiency program. We're specifically focused on the measures in BPA's implementation manual that are funded through EEI. We want to hear your perspectives on how the program can improve.

Before we get started, I am going to go over a few housekeeping items:

- Our discussion will take 90 minutes. If you need to step away during the discussion, that's OK, we just ask that you come back as soon as you can.
- There may be distractions and it is tempting to multitask, but I want everyone to stay focused on the discussion, just like you would if we were in a room together.
- If there is background noise where you are, please mute yourself when you are not speaking.
- Also, please assume positive intent during our discussion. Conversations online can be a bit awkward, and we don't all know each other, so we might need to give each other a little extra slack and patience.
- That said, it is OK to respectfully disagree with someone. Our goal is not to arrive at a consensus. We want to learn how your views and experiences are different as well as what is similar for each of you. We welcome different opinions.
- It is my job to make sure we hear from everyone, so if you haven't spoken up in a while, I might call on you. Or, if you have been talking a lot, I might ask you to give someone else a turn. I appreciate your understanding and cooperation in making sure everyone gets to speak.

We are also audio and video recording the conversation today. The purpose of the recording is to make sure we capture everything accurately. The recordings will not be available publicly, and we will not report our findings in ways that identify individual respondents.

Our goal is to learn from your experience and expertise, and we appreciate your honesty. Nothing you say here will have any impact on your relationships with the Bonneville Power Administration or your involvement in the Low-income Energy Efficiency Incentive program.

Any questions before we begin?

Great, let's get started.

Let's begin by going around with introductions—you can share your name, your position and utility, and how you're involved with low-income residential work.

Can X start?

Program Background

1. First of all, I'd like to know a little bit about your low-income programs. What does your process look like for delivering low-income measures to your customers? [*In group interviews, rather than asking open-ended, ask for a show of hands or chat responses: How many work with a CAA? How many have an implementation contractor? What do the others do?*]

    1. Do you/how many of you work with a CAA?

    2. Do you/how many of you have an implementation contractor that delivers your low-income programs?

    3. If not a CAA or implementation contractor, who recruits and verifies eligibility of low-income households? Who installs measures?

2. How satisfied have you been with your partnership with the CAA(s) and/or implementation contractor(s) you work with to deliver low-income measures? [*In group interviews, ask separately for CAAs, implementation contractors, and any other partners identified.*]

    1. What do you see as the greatest benefits in your relationship with your partner(s)?

    2. What, if anything, is challenging about working with your partner(s)?

3. **How do you define success for your low-income program offerings? (e.g., customer energy savings, participation numbers, etc.)**

    1. **Do you have specific goals for your low-income program offerings? If so, what are they?**

4. **What do you feel has been most successful about your low-income program? What are the reasons you consider this to be a success?**

    1. [*In group discussions, probe:*] Have others tried that approach? Have you found it successful?

2. To what extent do BPA low income offerings share and fit into those successful aspects?

3. [*If needed, probe:*] Are there any specific populations (whether demographic groups, housing types, or geographic areas) you feel your program has been particularly successful at reaching? [*If so:*] What actions or steps allowed you to reach them so successfully?

5. **What has been the biggest challenge about your low-income program? What has been challenging about it?**

1. [*In group discussions, probe:*] Have others found that challenging? Has anyone found a good solution for that?

6. **What are the most important factors that prevent your programs from serving more low-income households?**

1. What, if anything, could BPA do to help you overcome those challenges?

2. [*If not addressed:*] Do you see opportunities for coordination in program offerings across utility territories?

3. [*If coordination would be valuable:*] What could BPA do to better support coordinated low-income activity, across utility territories?

4. [*If not addressed:*] How much demand do you see for low-income efficiency upgrades in your service area? [*If perceive little demand, probe on prevalence of eligible households, desire of households for services, etc.*]

5. [*If not addressed:*] To what extent are you actively trying to increase uptake in your low-income programs? What are your drivers for this initiative?

7. Have there been any specific populations (demographic groups, housing types, or geographic areas) that have been particularly hard for your program to reach?

1. What are the reasons has it been hard to reach those populations?

2. [*In group discussions, probe:*] Have others found that/those population(s) difficult to reach? What solutions have you found to reach that/those group(s)?

3. What, if anything, could BPA do to help you reach those populations?

Funding Sources

8. [*Individual only*] What funding sources do you, or your CAA partners, use for your low-income programs, if any, beyond the EEI-funding for measures in the IM?

1. What share of your total low-income program spending comes from EEI?

2. To what extent do the measures those funding sources cover overlap with the low-income measures in the IM?

3. [*If not addressed:*] What do those funding sources cover that the IM does not?

4. For measures that are covered by the IM and other sources, how do you decide which to use?

9. Now, focusing in on the low-income measures included in BPA's Implementation Manual, which of those measures do you implement as part of your programs?

1. Are there available measures you do not offer or implement? If so, what are the reasons you choose not to offer them?

2. Are there measures you're interested in offering but have not done so yet? If so, which measures, and what are the reasons you have not yet offered them?

3. Is there anything BPA can do to encourage you to offer those measures?

4. What measure opportunities, if any, do you find in low-income households that are not included as low-income measures in the IM?

10. Are there cases where your programs install measures that qualify for low-income incentives through the IM that you do not report to BPA?

1. What are the reasons don't you report those measures?

2. How do you fund those installations?

11. What do you see as the greatest advantages of the low-income measures in the IM?

1. [*If not addressed:*] What are the advantages from the low-income household's perspective?

2. [*If not addressed:*] What are the advantages from the utility's perspective?

12. What is challenging or constraining about offering the low-income measures in the IM?

    1. What challenges, if any, do you run into with BPA's measure requirements? [*If needed, probe on requirements around existing conditions, efficient equipment types, etc.*]

13. BPA reimburses 100% of the cost for the low-income measures listed in the IM, but there are cost caps for many of those measures. How challenging is it for your program to accommodate those cost caps?

    1. Are the cost caps more challenging for some measures than for others?

    2. What do you do when an installation would exceed the cost cap?

    3. [*In group discussions, ask for show of hands; in individual interviews, probe on:*] Are there customers you are unable to serve because their installations would exceed the cost caps?

14. How easy or difficult is it for your program(s) to work with the income eligibility and documentation requirements for low-income measures in the IM?

    1. What are the reasons you say that?

15. **Finally, how easy or difficult is it to meet BPA's reporting requirements for low-income measures in the IM?**

    1. [*If difficult:*] What is challenging about BPA's reporting requirements?

16. How do you anticipate your low-income program will change in the next 3 years?

    1. What is driving those changes?

    2. [*If not addressed:*] Do you anticipate that new funding available through the Inflation Reduction Act will impact your program? If so, how? [*If respondent anticipates IRA funding will have a significant impact on their program, ask to follow-up with more detailed discussion (part of added scope under consideration).*]

17. Beyond income qualifications, does your organization use any other metrics to track the extent to which your programs are reaching customers?

    1. If so, what metrics do you track?

Closing

18. I'd like to wrap up with some broad questions *[if not already addressed above]*. First, what do you see as the greatest strengths of BPA's EEI-funded low-income offerings?

19. Overall, what are the biggest challenges or constraints in offering those measures?

    1. What changes could BPA make to address those challenges?

20. What, if anything, could BPA do that would help increase low-income program activity in your territory?

21. Those are all the questions I have prepared. Is there anything we haven't discussed that you think I should know about your experience with low-income programs or BPA's low-income offerings?

APPENDIX 6: INTERVIEW GUIDE FOR CAP AGENCIES

Discussion Guide for CAP Agency Group and Individual Interviews

Introduction (Individual Interviews)

Thank you for taking the time to speak with me today. As I mentioned in my email, we are working with BPA on a process evaluation of its Low-Income energy efficiency program, which includes offerings for weatherization, HVAC, water heating, and a range of other energy efficiency measures. As part of our research, we wanted to hear from community action agencies in the Northwest that deliver energy efficiency improvements to low-income households. Our research is focused on the BPA low-income measures implemented through utilities, rather than the state or tribal grants.

Do you have any questions before we begin?

I'll be taking notes as we talk, but would you mind if I also record our conversation? The recording is just to help with my notetaking. We won't share it with anyone, and we won't report anything in a way that would identify individual respondents.

Introduction (Group Interviews)

Hello everyone, and thanks for joining us today. My name is [NAME], and I am going to be leading today's discussion. As I mentioned when we reached out to you about joining this discussion, we are working with the Bonneville Power Administration on an evaluation of their Low-income Energy Efficiency program, which includes offerings for weatherization, HVAC, water heating, and a range of other energy efficiency measures. Our research is focused on the BPA low-income measures implemented through utilities, rather than the state or tribal grants. We want to hear your perspectives on how the program can improve.

Before we get started, I am going to go over a few housekeeping items:

- Our discussion will take 90 minutes. If you need to step away at any time, , that's OK, we just ask that you come back as soon as you can.
- There may be distractions and it is tempting to multitask, but I want everyone to stay focused on the discussion, just like you would if we were in a room together.
- If there is background noise where you are, please mute yourself when you are not speaking.
- Also, please assume positive intent during our discussion. Conversations online can be a bit awkward, and we don't all know each other, so we might need to give each other a little extra slack and patience.
- That said, it is OK to respectfully disagree with someone. Our goal is not to arrive at a consensus. We want to learn how your views and experiences are different as well as what is similar for each of you. We welcome different opinions. We won't know how to fix something unless we know what's not working well for you.
- It is my job to make sure we hear from everyone, so if you haven't spoken up in a while, I might call on you. Or, if you have been talking a lot, I might ask you to give someone else a turn. I appreciate your understanding and cooperation in making sure everyone gets to speak.

We are also audio and video recording the conversation today. The purpose of the recording is to make sure we capture everything accurately. The recordings will not be available publicly or to Bonneville, and we will not report our findings in ways that identify individual respondents.

Our goal is to learn from your experience and expertise, and we appreciate your honesty. Nothing you say here will have any impact on your relationships with the Bonneville Power Administration or your involvement in the Low-income Energy Efficiency Incentive program.

Any questions before we begin?

Great, let's get started.

Program Background

1. First, please tell me a little bit about your organization and your role there. Briefly, what types of support or programs does your organization offer?

    1. [*If not addressed:*] What energy-related programs or support do you offer?

    2. [*If not addressed:*] **What types of energy efficiency home retrofit programs do you offer?** [*If organization does not do energy efficiency work, terminate interview*.]

2. Approximately how many home energy efficiency retrofit projects do you carry out in a year?

    1. How many households do these projects serve?

    2. Are all of those projects in low-income households? [*If not:*] What share are in low-income households?

3. What is your role in your organization's efficiency retrofits?

4. How does your organization find clients for your efficiency retrofits?

    1. [*If not addressed:*] Do you actively recruit participants for efficiency retrofits? [*If so:*] How?

    2. [*If do not actively recruit:*] How do participants typically learn about your organization?

    3. Do you all perform one-off projects or are you required to address all the possible projects at that home that are cost effective?

5. Do you currently have a waiting list of customers eligible for your weatherization or other efficiency measures?

    1. [*If so:*] What's the typical wait time for a customer?

2. [*If not:*] What are the most important constraints that prevent you from serving more households with energy efficiency retrofits?

3. Is there anything BPA can do to help you address these barriers/constraints?

6. **What do you feel has been most successful about your agency's efficiency retrofits? What factors have contributed to this success?**

1. [*In group discussions, probe:*] Have others tried that approach? Have you found it successful?

2. To what extent do BPA low income offerings share those factors that contribute to success (like [insert participant suggestion for Q6)?

7. **What has been the most challenging about your agency's efficiency retrofits? What has been challenging about it?**

1. [*In group discussions, probe:*] Have others found that challenging? Has anyone found a good solution for that?

8. **Are there any particular customer groups or cohorts that participate in your efficiency retrofits at higher rates? [*If so:*] Which ones?**

1. In your opinion, what are the reasons those customers are more likely to participate?

9. **Are there any particular eligible customer groups or cohorts that are less likely to participate in your efficiency retrofits? [*If so:*] Which ones?**

1. In your opinion, what are the reasons those customers are less likely to participate?

2. What, if any, actions has your organization taken to increase participation among those groups? What have been the results of these efforts?

3. What, if anything, could BPA or your utility partner(s) do to help you reach those groups more effectively?

10. What funding sources does your organization use to support efficiency retrofits including and outside of BPA?

1. [*If not addressed:*] Do you partner with any utilities to fund efficiency upgrade work? [*In group interviews:*] By a show of hands, how many of you partner with utilities to fund efficiency retrofit work? [*If so:*] Which ones do you work with?

[*If respondent works with both BPA and non-BPA utilities, clarify:*] [UTILITY NAME] receives funding for low-income measures through the BPA funding stream that we are evaluating. This is not referring to the BPA grant funding.

When we ask about "utility funding" going forward, that BPA utility funding is the funding source that we are interested in. [*Adapt references to "utility funding" in remainder of interview as needed to clarify*].

2. [*If partner with more than one utility:*] What coordination efforts have you seen utilities take with regard to EE and weatherization offerings? What opportunity, if any, do you see for increased coordination?

3. Roughly what share of all the funding you use for energy efficiency work comes from each source?

4. [*If do not partner with utilities:*] Have you considered partnering with any utilities for energy efficiency work? [*If so:*] Which ones? What are some reasons those partnerships did not develop?

11. **In your opinion, what are the key differences between utility funding and the other funding sources you use for efficiency retrofits?**

1. What overlaps have you seen between utility funding for energy efficiency and retrofits and your other funding sources?

2. What measures or types of support does BPA utility funding cover that other sources do not?

3. What measures or types of support do other funding sources support that BPA utility funding does not?

4. What overlap have you seen between the eligibility requirements or customer types that utility funding supports and what your other funding sources support?

12. When different funding sources cover overlapping measures or services, how do you decide which source to draw from for a particular project?

1. **Thinking of utility funding specifically, when might you draw on utility funding over other potential sources? Why?**

2. **And when would you be more likely to use other sources instead of utility funding? Why?**

13. [*If not addressed:*] **What challenges do you run into with the measure requirements associated with your utility funding?** [*If needed, probe on requirements around existing conditions, efficient equipment types, etc.*]

14. I know that there are cost caps associated with many of the measures eligible for utility funding. How challenging is it for you to accommodate those cost caps?

1. Are the cost caps more challenging for some measures than for others? If so, which measures?

2. Are there some types of installations where the cost caps are more challenging? If so, which types?

3. What do you do when an installation would exceed the cost cap?

[*In group discussions, ask for show of hands or enter in chat; in individual interviews, probe on:*] Do you draw on alternate funding sources to cover the difference? If so, which ones?

Do you use alternate funding sources for the full measure cost?

Are there customers you are unable to serve because their installations would exceed the cost caps?

15. **How easy or difficult is it for you to work with the income eligibility and documentation requirements required for utility funding?**

1. Why do you say that – what makes it easy or difficult?

2. How do the requirements for utility funding compare to other funding sources you use to support your efficiency work?

16. **What additional federal- or state-level funding do you anticipate becoming available for low-income residential efficiency measures in the next 3 years?** [*If needed:*] Do you anticipate new funding becoming available as part of the Inflation Reduction Act? Any other sources?

1. What are your anticipated steps for integrating that funding into your program? What will it support?

2. What effect do you think that will have on the number of measures you install that draw on utility funding?

3. How do you think utility funding should shift to better complement these new funding sources?

17. I'd like to wrap up with some broad questions. First, what do you see as the greatest strengths of utility funding for low-income efficiency improvements?

18. Overall, what are the biggest challenges or constraints in using utility funding?

1. What changes could utilities, or BPA, make to address those challenges?

19. What, if anything, could utilities or BPA do that would help increase low-income program activity in your territory?

20. Those are all the questions I have prepared. Is there anything we haven't discussed that you think I should know about your experience with low-income programs and working with utility funding?