

Best Practices in Developing Energy Efficiency Programs for Low-Income Communities and Considerations for Clean Power Plan Compliance

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About the Author

Mary Shoemaker analyzes state and federal legislation and agency regulations that affect energy efficiency. In particular, she explores the role of energy efficiency in complying with air pollution regulations, with an emphasis on the Clean Air Act and Section 111(d) obligations for states. Mary also manages ACEEE's technical assistance for state energy efficiency policies. She joined ACEEE in 2014.

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Abstract

This is the third in a series of papers intended to guide states as they embark on the path to Clean Power Plan (CPP) compliance. As one of many approaches to reducing pollution and complying with the CPP, states and localities can offer energy efficiency programs to low-income households or businesses and community-based organizations that serve low-income communities. This guide discusses some best practices for implementing and evaluating low-income energy efficiency programs and addresses considerations in using them for CPP compliance. It highlights exemplary states as it describes the advantages of various approaches including utility-run low-income programs (single-family and multifamily), weatherization, and energy savings performance contracting. The guide goes on to discuss the suitability of each of these approaches for CPP compliance and ways of measuring their performance. It concludes with strategies for incentivizing low-income efficiency efforts in state CPP compliance plans.

Introduction

Energy efficiency investments in low-income households offer many benefits to residents, utilities, and the community as a whole. Low-income energy efficiency upgrades improve participants' quality of life by helping them invest in their homes and enhance the comfort and functionality of their living environments. Efficiency programs can also be targeted toward the businesses and community-based organizations that serve low-income neighborhoods. Through these programs, utilities can help keep their low-income customers' electricity bills low and reduce bill nonpayment problems. Building owners and state entities can improve the conditions of affordable housing units, reduce operating expenses, and spur local economic development. Energy efficiency programs not only keep electricity affordable for low-income families but also advance states' broader goals of economic development, improved public health, job creation, and environmental protection.¹

Under the Clean Power Plan (CPP) put forth by the US Environmental Protection Agency (EPA), states can use low-income energy efficiency programs to meet carbon emission reduction requirements.² Electric generating units (EGUs) responsible for complying with the Clean Power Plan can tap into the immense energy and emission reduction potential that remains in low-income communities, which have historically been underserved by energy efficiency program providers. States that incorporate low-income energy efficiency programs into their compliance strategies create an incentive for expanding existing programs and offering new ones. As part of the CPP, EPA created the Clean Energy Incentive Program (CEIP) to encourage wind and solar generation and energy efficiency measures in low-income communities.³ Under the CEIP, administrators of low-income energy efficiency programs in participating states may receive double credit for the emission reductions they achieve—a valuable incentive that can spur additional investments in this underserved market. Equally important, if not more so, is the potential for energy efficiency to lower electricity bills as states comply with air regulations. A recent Synapse analysis shows a direct correlation between using energy efficiency to comply with the CPP and maintaining energy affordability for low-income customers, as shown in figure 1 (Knight et al. 2016).

¹ Qualification criteria for low-income energy efficiency programs vary among program implementers, but many programs, such as the Low Income Home Energy Assistance Program (LIHEAP) and the Weatherization Assistance Program (WAP), define *low-income* as having an income at or below 200% of the federal poverty level (Cluett, Amann, and Ou 2016).

² In February 2016 the Supreme Court issued a stay suspending EPA's timeline for state compliance plan development (SCOTUS 2016). The stay delays implementation of the final rule until the court has ruled on its merits. Many states have publicly committed to continuing to develop compliance plans.

³ If states opt to participate in the CEIP, emission reductions must be achieved between 2020 and 2021 from qualifying energy efficiency projects in low-income communities that are installed after plans are submitted. While the details of the CEIP and states' CPP compliance timeline are not yet clear, states can continue to plan for the broader compliance period and evaluate energy efficiency opportunities.

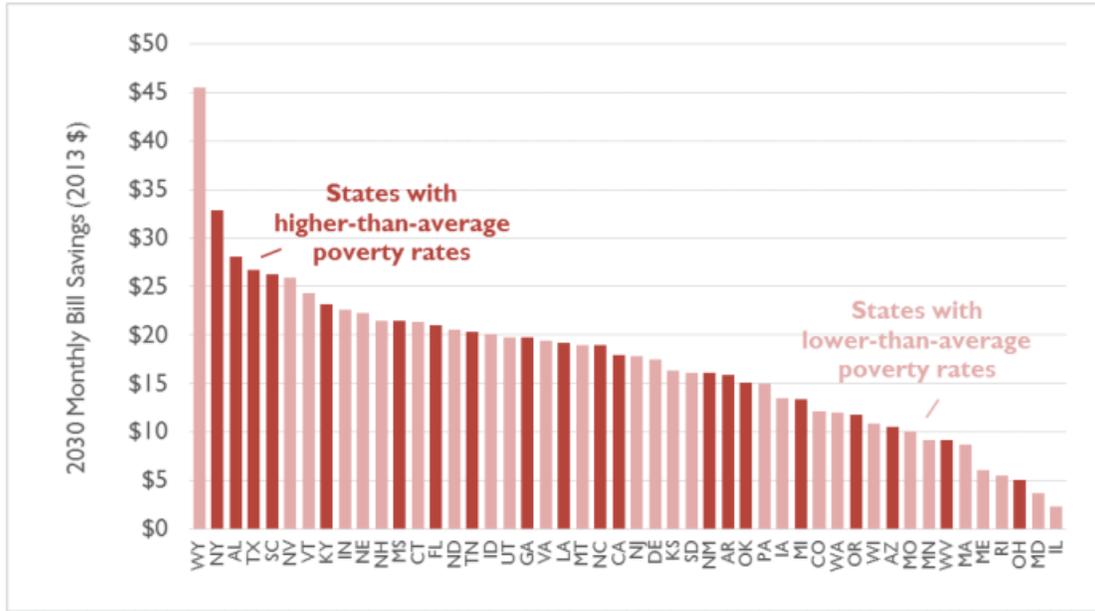


Figure 1. Synapse calculates 2030 residential monthly bill savings from CPP compliance. Synapse compares several CPP scenarios, including business as usual without the rule and compliance using cost-effective energy efficiency and renewables. Its analysis shows that business-as-usual scenarios result in average household monthly electric bills \$17 higher in 2030 than if states make strong energy efficiency investments. Five of the eight states with the highest monthly bill savings have higher-than-average poverty rates (Knight et al. 2016).

The purpose of this document is to provide a guide to designing and implementing low-income energy efficiency programs that are well suited for compliance credit under the Clean Power Plan. We discuss strategies that utilities, state agencies, public housing authorities, and other affordable housing entities can use to develop energy efficiency programs and maximize energy savings in low-income communities. We then describe opportunities for these programs to be incorporated in the CPP planning process. We draw on existing ACEEE research on best practices for utility energy efficiency programs that serve low-income households and communities, and we identify the stakeholders involved in developing effective programs. These guidelines can be used to create new programs and improve those already in place.

Convene Low-Income Stakeholders for CPP Planning

State CPP planning involves a new level of coordination among utilities, state agencies, energy planners, and representatives of the public interest. EPA requires state air offices to engage communities “vulnerable” to climate change (80 FR 64858). Organizations that serve low-income households can help engage these constituencies so that their needs are better met through the planning process. Below, we discuss some of the key stakeholders involved in compliance planning and low-income program development, and we discuss their roles.

STATE AIR OFFICES

State air offices are responsible for engaging the public, developing CPP compliance plans, and submitting the plans to EPA. While these organizations are becoming increasingly familiar with energy efficiency, they might not be aware of energy efficiency delivery channels to low-income homes. State air offices can engage administrators of low-income energy efficiency programs and members of the affordable housing sector to learn more

about existing programs and opportunities for expansion. In turn, air agency staff can help low-income efficiency program providers understand how to ensure their programs are eligible for credit under the CPP.

STATE ENERGY OFFICES

The majority of state energy offices (SEOs) manage non-ratepayer-funded energy efficiency programs across the residential, industrial, commercial, and public sectors. SEOs often assist low-income communities by coordinating state weatherization programs and partnering with housing finance agencies. In some states, the SEO leverages private capital to use alongside state and federal funding. SEOs can help state air offices understand which existing low-income programs could count toward CPP compliance and identify new program opportunities.

UTILITIES

The CPP affects existing fossil fuel-fired EGUs with capacities greater than 25 megawatts (MW), and all types of owners or operators of affected EGUs may have to contribute to a state's emission reduction activities.⁴ Many utilities have a responsibility to deliver ratepayer-funded energy efficiency programs. Some utilities design and target programs toward low-income households, multifamily buildings with low-income residents, and municipalities and local organizations that provide services to low-income communities. Because utilities are major players in delivering low-income energy efficiency programs, they can coordinate with state air offices to include these programs in state compliance plans. Utilities can help state air offices to better understand their programs, including how they are delivering them, how much savings they are achieving, and how much they are spending on them.

UTILITY REGULATORS

State utility regulators typically oversee the energy efficiency activities of investor-owned utilities in their states. Public utility commissions (PUCs) can evaluate their utility incentive policies and adopt mechanisms to drive utility investments in energy efficiency programs for low-income households.⁵ Because PUCs play a key role in determining a state's protocols for the evaluation, measurement, and verification (EM&V) of energy savings, they can work with state air regulators to understand EPA's draft EM&V recommendations and how they align with existing practices. PUCs can also guide the process by which states determine the cost effectiveness of ratepayer-funded energy efficiency programs. In doing so, PUCs can ensure that the state's cost-effectiveness testing framework captures the many

⁴ This includes vertically integrated utilities and merchant generators, investor-owned utilities (IOUs), municipal utilities, customer-owned (cooperative) utilities, and owners or operators of single-unit fleets of generating units (80 FR 64752).

⁵ A recent ACEEE report explores opportunities for improving the utility business model so that ratepayer-funded energy efficiency programs benefit customers and utilities alike. This includes decoupling utility profits from sales, allowing program cost recovery, offering performance incentives, and enacting an energy efficiency resource standard: [aceee.org/white-paper/policies-matter](https://www.aceee.org/white-paper/policies-matter).

nonenergy benefits of low-income programs in the state.⁶ Alternatively, PUCs can adjust or waive requirements for low-income programs to pass cost-effectiveness tests. This will maximize state credit for such programs during the CEIP and into the compliance period.

HOUSING FINANCE AGENCIES

Housing finance agencies (HFAs) are state-designated entities that help finance the construction and rehabilitation of affordable rental housing.⁷ Because HFAs have processes in place to verify the incomes of building residents, they play a role in targeting energy efficiency programs to specific populations. HFAs can also allocate funding with a preference given to projects that reduce residents' energy usage. For example, as HFAs distribute low-income housing tax credits (LIHTC) within their states, they often prioritize energy efficiency by requiring or encouraging above-code building energy or insulation standards, green certification criteria, energy-efficient products, ENERGY STAR[®] appliances, or energy-efficient HVAC systems (Fuhry et al. 2012). To contribute to state CPP efforts, HFAs can introduce, maintain, or expand energy efficiency requirements in their allocation of state and federal funds. HFAs can also require applicants for financing to leverage utility programs as a prerequisite (NHT 2015).⁸ Because HFAs are familiar with the financing arrangements and construction timelines of affordable housing projects, they can provide valuable insight to the state air office on program design, delivery, and qualification for CPP allowances or Emission Rate Credits (ERCs).⁹

Spotlight on Tennessee

The Tennessee Department of Environment and Conservation (TDEC), responsible for developing and implementing the state's CPP compliance plan, has leveraged other state agencies' relationships with low-income, minority, and vulnerable communities as part of its CPP stakeholder engagement process. TDEC partnered with the Tennessee Housing Development Agency—the state's housing finance agency—to leverage the latter's experience identifying communities with low-income households. TDEC also used a county profile tool created by the Tennessee Department of Economic and Community Development to evaluate statewide, county-level demographic, housing, income, tax, labor force, industry, education, health, climate, and community data (TDEC 2016).

⁶ Low-income programs tend to cost more than other programs because of the market barriers they must overcome. As a result, failure to account for some of the nonenergy program impacts (e.g., health, safety, or air quality improvements) in quantifying efficiency costs and benefits could lead program administrators to find low-income programs not to be cost effective (Woolf et al. 2012).

⁷ The National Council of State Housing Agencies has a directory of HFAs and related organizations: www.ncsha.org/housing-help.

⁸ Some HFAs do this by requiring applicants for financing to submit a list of utility-sponsored, local, regional, or federal efficiency incentives for which the property is eligible. The Minnesota Housing Finance Agency (MHFA) requires applicants for affordable multifamily financing to first apply for local utility incentives, then submit a letter to MHFA as proof, including the value of the incentives for which they applied (NHT 2015).

⁹ In a mass-based scenario, EGU owners will have to acquire allowances that permit them to emit CO₂. In a rate-based scenario, generators that exceed their designated emission rates will need to secure ERCs to be in compliance.

PUBLIC HOUSING AUTHORITIES

Public housing authorities (PHAs) own and operate public housing, including many low-income multifamily buildings. When PHAs upgrade aging public buildings, they improve the quality of their housing stock and reduce energy expenses.

PHAs sometimes engage energy service companies (ESCOs) to finance and implement energy efficiency improvements to their properties. In 2006, PHAs nationwide invested approximately \$350 million in energy savings performance contracts (ESPCs) and saved about \$37 million (HUD 2016). (We will discuss ESPCs more thoroughly in a later section.) Before PHAs enter into an ESPC, they must receive permission from their US Department of Housing and Urban Development (HUD) field office and coordinate with that office throughout project implementation.¹⁰

In negotiating an ESPC, PHAs can request multiple packages of energy conservation measures, then review and select the measures that would most benefit their residents. A contract that guarantees energy cost savings lends reliability to the effort and potentially increases the likelihood that a project will earn CPP allowances or ERCs.

OTHER AFFORDABLE HOUSING ENTITIES

There are several additional players whose involvement can improve the implementation of low-income programs as part of a state's CPP compliance plan. Affordable housing owners and operators own, build, and maintain housing for low-income families, so they are familiar with the time, resources, and capital constraints of their tenants. Whenever possible, administrators of low-income energy efficiency programs should engage with affordable housing owners and operators to improve the design and delivery of their programs to increase participation.

Affordable housing membership organizations are similarly familiar with the needs of their members and are well suited to coordinate with utilities to target programs and improve program design and delivery. These organizations can also engage community action agencies, weatherization providers, and others to help the state air agency engage low-income households.

Some states have a PUC- or utility-sponsored low-income program advisory committee or working group that utilities or other program administrators must engage to ensure they are designing their programs to best fit the needs of the low-income community. Such a committee could represent the needs of the affordable housing community and help energy efficiency providers evaluate the state of existing programs and opportunities for expansion

¹⁰ HUD encourages PHAs to engage in energy performance contracting and enables PHAs to capture the monetary benefits of such programs. HUD provides extensive guidelines for this engagement and requires PHAs to conduct an investment-grade energy audit to identify savings opportunities. PHAs can finance efficiency conservation measures through bank, utility, or government loans; their own budgets; or shared savings agreements with ESCOs. For additional HUD guidelines, visit: portal.hud.gov/hudportal/documents/huddoc?id=pih2011-36.pdf.

or improvement. The committee could also discuss how eligibility requirements for existing programs diverge and where they could be streamlined.

Determine the Appropriate Program Approach

A variety of elements will affect which approach to low-income program delivery is best for a given state. Low-income households tend to spend a larger percentage of their monthly income on energy expenses and have appliance, equipment, and end-use characteristics that differ from those of the general population. Energy efficiency and weatherization programs that serve low-income households will gain more participants and save more energy if they take these unique characteristics into account (Cluett, Amann, and Ou 2016). Another major consideration is how quickly a program can be implemented. In a rate-based compliance scenario, energy efficiency measures installed on or after January 1, 2013 that are still achieving savings in 2022 are eligible for ERCs. Under a mass-based approach, any reductions in electric-sector emissions achieved during the compliance period will move states toward their emission reduction targets. The following section discusses three separate program approaches that states may use to deliver low-income programs as part of their CPP compliance plan.

UTILITY-RUN LOW-INCOME PROGRAMS

Ratepayer-funded energy efficiency programs account for a substantial portion of energy savings opportunities in states. As part of their energy efficiency portfolios, some utilities offer programs targeted toward their low-income customers. Most utility-run, single-family, low-income energy efficiency programs offer whole-building retrofits (weatherization) and address heating and cooling energy use by upgrading insulation and air sealing and offering heating, ventilation, and air conditioning (HVAC) measures. In some cases, these programs also offer customers lighting, appliance, or water-heating measures (Cluett, Amann, and Ou 2016). Utilities often make programs available at no cost to their low-income customers, or with higher financial incentives than for non-low-income residential programs. In delivering these programs, utilities sometimes coordinate efforts with state-supported and federally funded weatherization efforts to streamline programs and offer additional energy conservation measures.

In a 2016 report, Cluett, Amann, and Ou explored best practices in designing and implementing utility-run low-income energy efficiency programs. They found that utilities can improve program delivery and participation by offering a range of measures and programs (including high-efficiency appliances and equipment), coordinating with other organizations (e.g., community action agencies, housing rehabilitation organizations, or bill assistance providers), and educating customers about energy-saving opportunities. Expanding program participation, targeting new customer segments, or improving delivery mechanisms will enable utilities to achieve higher levels of savings in the low-income sector that could count toward CPP compliance.

Utility-delivered programs can work well for CPP compliance due to existing EM&V frameworks. Public utility commissions typically require utilities to track and verify electricity savings associated with ratepayer-funded energy efficiency programs. Because utilities use established EM&V protocols, savings from their programs tend to be well documented. While EM&V is not required in all compliance scenarios, it can help ensure

that each dollar invested in energy efficiency results in the highest possible energy savings.¹¹ This makes EM&V critical even in a mass-based compliance approach where EPA does not require EM&V protocols to be submitted as part of a compliance plan.

Low-Income Multifamily Programs

About 25% of dwellings in the United States are in multifamily buildings, and almost 90% of multifamily buildings are occupied by renters, of which a large portion are low-income households (NMHC 2015).¹² Utility spending on energy efficiency programs has continuously grown for the past decade (Gilleo et al. 2015), but spending on multifamily housing has not risen proportionally (Johnson and Mackres 2013). A 2012 report by ACEEE and Elevate Energy (previously CNT Energy) estimates that multifamily buildings nationwide could save \$3.4 billion annually on their utility bills through energy efficiency upgrades (McKibbin et al. 2012).

While some multifamily programs target low-income buildings, this market has unique characteristics that make the application of residential or commercial energy efficiency programs difficult, including split tenant-owner incentives, a lack of capital or project capacity, and regulatory obstacles for assisted housing.¹³ To ensure utilities offer energy efficiency programs to low-income multifamily buildings, states can require that a certain percentage of savings comes from this sector.¹⁴ Multifamily customers are eligible for some residential or commercial energy efficiency programs, but programs more clearly designed for and marketed toward multifamily building owners and tenants will enable wider participation (Johnson 2013). Because multifamily housing units represent such a large untapped portion of the US housing stock, the ability to expand energy efficiency programs in this sector and capture them in CPP compliance plans could contribute meaningfully toward state compliance efforts.

Utilities can take several steps to increase participation and maximize energy and emission savings from their multifamily programs. They can provide customers with a single point of contact throughout project implementation, align eligibility requirements with those of other low-income programs, or reach out to state weatherization providers to make sure

¹¹ We describe the scenarios in which EM&V is required in the section below on measuring program performance.

¹² Multifamily buildings are typically characterized as buildings with five or more units.

¹³ Johnson 2013 further describes challenges associated with delivering energy efficiency programs in the multifamily sector. Split incentives exist between building owners and their tenants when one party is responsible for paying for an energy efficiency upgrade but the other party reaps the benefits. Access to capital is another issue, as most building or unit owners must be able to cover at least a portion of the up-front cost of a project, but low-income housing providers often have constrained financial resources. Property managers may also lack the time or technical expertise to oversee a project. Low-income multifamily building owners may also face restrictions on how they can pay for and monetize energy efficiency improvements.

¹⁴ Pennsylvania requires electric distribution companies in its Energy Efficiency and Conservation Program to obtain at least 5.5% of overall portfolio savings from low-income programs or verified low-income participants in multifamily programs: www.puc.pa.gov/pdocs/1367313.doc.

they are trained and encouraged to deliver services to the low-income multifamily housing market (NHT 2015).

Spotlight on Illinois

Elevate Energy's multifamily program was founded in 2007 in partnership with the Community Investment Corporation in an effort to preserve affordable rental housing in the Chicago area (Johnson 2013). As one of the early one-stop-shop program models, Elevate Energy offers loans to owners of apartment buildings to finance energy and water efficiency upgrades. They first conduct an energy assessment to identify cost-effective improvements, then determine the appropriate loan, rebate, incentive, or grant to finance the project. Elevate Energy assists apartment building owners throughout the construction process and provides them with annual savings reports for up to two years after improvements are complete. In addition, it provides program participants a single point of contact throughout project implementation, which helps to maintain high rates of participation and project completion (Elevate Energy 2014). Through this program, Elevate Energy has served 56,933 households and saved 15,801,500 kWh and 5,834,400 therms since 2008 (Ross, Jarrett, and York 2016).

WEATHERIZATION

Through the Weatherization Assistance Program (WAP), the US Department of Energy (DOE) provides funding to help low-income households lower their energy bills. Currently operating in all 50 states, the program awards grants to state-level agencies that work with community action agencies (CAAs) or other local entities to deliver weatherization services to eligible populations.¹⁵ States often use DOE funding alongside utility or state funds or support from the US Department of Health and Human Services' Low-Income Home Energy Assistance Program (LIHEAP) (DOE 2016, Tonn et al. 2014). WAP upgrades usually involve installing insulation, sealing ducts, repairing or replacing heating and cooling systems, mitigating air infiltration, and reducing electric base load through lighting and appliance improvements (HUD 2010). Low-income households sometimes have fundamental health and safety deficiencies that must be addressed when energy efficiency improvements are made. Weatherization providers can increase program participation by first offering home rehabilitation services. During and after the weatherization process, providers can offer post-purchase counseling to new low-income homeowners to help them maintain their investment and prevent delinquency and foreclosure (Cluett, Amann, and Ou 2016).

States can use these program delivery channels to expand low-income energy efficiency efforts and advance their emission reduction efforts. CAAs often have strong relationships with the low-income communities they engage, an established program infrastructure, and a trained workforce. These resources also position them well to help implement programs jointly funded by utilities (Cluett, Amann, and Ou 2016). Through this collaboration, utilities can gain access to low-income customers, and WAP providers can take advantage of new funding sources. WAP providers demonstrated during the years of the American Reinvestment and Recovery Act of 2009 that they can successfully ramp up activities when additional resources become available (Cluett, Amann, and Ou 2016; Tonn et al. 2014). WAP

¹⁵ The National Association of State Community Services Programs (NASCP) provides support to WAP grantees and maintains the Weatherization Assistance Program Technical Assistance Center: www.waptac.org.

providers' proven ability to expand their programs can be seen as an indication that they would be able to increase energy and emission savings if a state decides to invest additional funding in WAP programs to be used toward CPP compliance.

Spotlight on Massachusetts

The Massachusetts low-income program combines DOE weatherization funds with ratepayer funds to offer income-qualified customers free home energy audits and energy efficiency measures. State policy set forth in the Green Communities Act of 2008 mandates that at least 10% of total electric efficiency spending and 20% of gas energy efficiency spending be invested in comprehensive low-income residential demand-side management and educational programs (An Act 2008). The state requires these programs to be implemented through low-income weatherization and fuel assistance program networks. The Massachusetts low-income program is implemented by program administrators—mostly electricity and gas providers—along with the Massachusetts Low-Income Energy Affordability Network (LEAN), created to ensure statewide coordination and consistency in implementation. LEAN members include the state Department of Housing and Community Development, public housing authorities, community development corporations, and community action agencies (CAAs).¹⁶ These CAAs manage program funding, determine participant eligibility, and arrange for audits, measure installation, and progress reports on energy efficiency projects (Ward et al. 2012).

ENERGY SAVINGS PERFORMANCE CONTRACTS WITH PUBLIC HOUSING AGENCIES

Public housing is owned and operated by HUD and public housing agencies (PHAs). PHAs can partner with energy service companies (ESCOs) to reduce the cost of operating public housing, improve their building stock, and contribute to CPP compliance efforts. An energy savings performance contract (ESPC) is an agreement between a client interested in installing energy efficiency measures and an ESCO paid to install these measures. The ESCO covers up-front costs, guarantees a certain amount of energy savings, and receives compensation over time based on project performance. Historically, most performance contracting activity has taken place in public and institutional markets (Carvallo, Larsen, and Goldman 2014). However affordable housing developers and owners also use ESPCs to improve the energy efficiency of the properties they manage. Energy conservation measures typically employed through ESPCs can include boiler or furnace upgrades, thermostatic controls, building envelope improvements, efficient lighting, and other high-efficiency technologies or systems (HUD 2011). Because ESPCs do not require PHAs to invest up-front capital, these financing arrangements make energy efficiency projects in public housing more feasible.

ESCOs often guarantee energy savings for their clients, so PHA-implemented ESPCs are a promising source of reliable energy and emission reductions. Qualifying efficiency measures installed by PHAs can earn implementers allowances or ERCs for emission reductions achieved.¹⁷ States could allocate allowances or award ERCs to ESCOs, which

¹⁶ This example was also used as a case study in Johnson 2013. For more information: leanmultifamily.org/sites/default/files/LIMF_Program_Guide_Final_2014.pdf.

¹⁷ During the CEIP period (2020–2021), qualifying energy efficiency measures installed in low-income communities after plans are submitted will earn double allowances or ERCs relative to the energy saved. During the compliance period (2022–2030), qualifying measures can continue to earn allowances or ERCs on a 1:1 basis.

could then sell them to power plants and generate revenue, expanding the pool of projects that are financially attractive. Alternatively, states could allocate allowances or issue ERCs to PHAs, and then the PHAs could sell the allowances or ERCs to affected electric generating units (EGUs) that need the credits to be in compliance. The PHAs could then use that revenue to make capital improvements to their housing stock.¹⁸ PHAs and ESCOs can negotiate ownership of allowances or ERCs that result from joint projects. As part of the contract for their project, these parties can develop measurement and verification (M&V) protocols that are consistent with EPA's guidance.

Spotlight on Jersey City, New Jersey

In 2011 the Jersey City Housing Authority (JCHA) entered into an energy performance contract with Siemens Industry, Inc. with the goal of retrofitting 1,600 units across the JCHA multifamily public housing portfolio (JCHA 2011). JCHA's energy performance contract met guidelines from the state of New Jersey and HUD. It included measures to improve electrical infrastructure, replace heating systems, upgrade boilers, and install efficient lighting fixtures. JCHA also leveraged a local utility incentive and funding from the American Recovery and Reinvestment Act (ARRA) to expand the scope of the program. To ensure a smooth implementation process, JCHA and Siemens communicated with residents and building staff before implementing energy efficiency measures, offered workshops to address potential concerns, and designated an onsite superintendent at each property to meet with residents and staff as needed. In the first two years of implementation, JCHA benefited the residents of almost 1,700 housing units and saved over \$5 million, surpassing original cost-saving estimates (DOE 2016).

Consider the Value of Low-Income Programs for CPP Compliance

By including energy efficiency programs for low-income households and communities in their compliance plans, states support the fair distribution of compliance benefits – reduced pollution, reduced energy expenditures, and improved buildings – across their population and to those most vulnerable to climate change.¹⁹ Using these programs for CPP compliance will provide them a sense of permanence, give states another reason to capture energy savings in this hard-to-reach sector, and make administrators of low-income energy efficiency programs eligible for any additional funding that a state decides to offer for CPP compliance efforts.

States have ample authority to expand low-income implementation approaches and employ them as key CPP compliance strategies. Four of the biggest opportunities are summarized in table 1.

¹⁸ An earlier paper in this best practice series discusses performance contracting in state and local buildings as well as considerations for Clean Power Plan compliance: aceee.org/white-paper/lbe-best-practices.

¹⁹ A recent report by the US Global Change Research Program explores relationships among climate change, air quality, and human health: s3.amazonaws.com/climatehealth2016/high/ClimateHealth2016_FullReport.pdf.

Table 1. Summary of low-income energy efficiency programs and their suitability for CPP compliance

Program type	Description	Suitability for CPP compliance
Utility-run low-income programs	These programs address heating and cooling energy use by offering a broad range of measures. They achieve most electric savings from whole-building retrofits and direct install measures.	Established EM&V practices mean that energy savings from utility programs are reliably tracked and will likely be well suited for inclusion in a state compliance plan with little or no changes to existing methods.
Low-income multifamily programs	These programs offer measures that range from equipment and product rebates and direct install services to comprehensive energy retrofits or new construction programs.	Market barriers in the low-income multifamily sector have left substantial untapped energy and emission savings, and each building has the potential to generate savings from multiple residences, so engaging this sector could result in widespread project development and significant energy and emission savings for use toward state CPP targets.
Weatherization programs	These programs typically offer whole-house retrofits or building envelope upgrades. Sometimes programs offer lighting and appliance upgrades.	Existing relationships and program delivery channels can be leveraged to quickly deepen energy and emission savings, moving states closer to their CPP targets.
Energy savings performance contracts with public housing authorities	These programs offer energy conservation measures including boiler or furnace upgrades, thermostat controls, building envelope improvements, efficient lighting, and other high-efficiency technologies or systems.	Public housing authorities do not need up-front capital to engage in ESPCs, so they can launch energy efficiency projects and ramp up energy savings in time for the CPP compliance period.

Measure Program Performance

The process for evaluating energy efficiency program performance depends largely on the entity administering the program. Because utilities are accountable to their ratepayers and regulators, they often have rigorous and well-developed EM&V mechanisms for establishing and attributing energy savings. Nonutility energy efficiency program administrators also typically have protocols for tracking energy savings and measuring program performance. Evaluation protocols enable state regulators to measure program success and leverage programs for CPP compliance.

EPA’s EM&V guidance for states varies with the type of compliance plan the state decides to submit. In states taking a rate-based approach to CPP compliance, energy efficiency providers must submit an M&V report to their state air office in order to earn ERCs. In states taking a mass-based approach to CPP compliance, energy efficiency providers are not required to submit an M&V report unless their state is participating in the CEIP or has

chosen to use efficiency to address leakage in its allowance allocation process.²⁰ All projects seeking credit under the CEIP will likely need to meet the standards proposed in EPA's EM&V guidance, so it will be important for administrators of low-income energy efficiency programs to understand these provisions in order to make their projects eligible. Regardless, some states may require robust EM&V in order to ensure that investments achieve the best possible results.

In tracking energy savings from programs with multiple funding sources, it will be essential to avoid double-counting savings, particularly in compliance scenarios where ERCs are generated. To do this, EPA recommends that states and energy efficiency providers use existing tracking and reporting systems to track customer, vendor, retailer, or manufacturer energy efficiency actions with as much granularity as possible, then use these data to identify and correct duplicate energy efficiency records (EPA 2015).

Administrators of low-income energy efficiency programs can articulate to the state air office the energy savings potential and evaluation practices of their efforts. In turn, state air offices can help administrators understand what kind of evaluation EPA expects and how this aligns with current practices. Table 2 outlines some specific guidance EPA has provided on recommended EM&V that would be applicable to different low-income efficiency program approaches.

²⁰ States that select a mass-based approach to compliance must demonstrate to EPA that they are not shifting electricity demand from existing power plants and onto new plants, a shift called leakage (80 FR 64890). One of the ways states can demonstrate this is by setting aside emission allowances dedicated to energy efficiency. We explore this topic further in the first paper in this best practice series: aceee.org/energy-efficiency-and-clean-power-plan-steps.

Table 2. Evaluation protocols by program type

Program type	Program evaluation practices	Clean Power Plan evaluation requirements ¹
Utility-run energy efficiency program	Evaluation for ratepayer-funded programs is conducted mostly by third-party evaluators. Public utility commissions often formally review and use energy savings reports, but in some states they play a more active role in calculating and reporting savings. Most states have evaluation rules for quantifying and reporting energy efficiency program savings that are established through an array of channels (e.g., through regulatory orders, legislation, and/or other agencies). Utilities take a variety of approaches to quantifying savings and often use energy savings to make decisions on future programs, report on program accomplishments, or determine eligibility for utility performance incentives and lost revenue recovery (Kushler, Nowak, and White 2014).	EPA provides separate EM&V guidance for direct and indirect energy efficiency programs. ² For direct programs, EPA outlines a variety of options based largely on what states are currently doing. Savings can be determined using project-based M&V (PB-MV), comparison group approaches, or deemed savings. For indirect programs, EPA allows comparison group methods. EPA allows several approaches to defining the baseline for each of these designs but requires that evaluators describe their rationale in their EM&V plan (EPA 2015).
Weatherization Assistance Program	While DOE’s primary metric for evaluation is the number of homes weatherized (EPA 2015), WAP grantees and subgrantees must also demonstrate that they are following program rules; installing appropriate, cost-effective measures; appropriately treating health and safety issues; and conducting inspections as required (DOE 2015). Energy savings from weatherization programs are often analyzed using a comparison group (SEE Action 2012).	Same as above.
Energy savings performance contract	ESCOs, or their third-party evaluators, conduct M&V to assure their clients’ savings. They often use project-based M&V (PB-MV) or measure-based deemed savings values, meaning they quantify savings for each project, rather than just a sample of projects (EPA 2015). To ensure a fair comparison of energy use before and after project implementation, ESCOs or evaluators adjust deemed savings values based on factors such as weather and building occupancy (SEE Action 2012).	EPA recommends that ESCOs use PB-MV or a deemed savings approach, separately or in conjunction. To account for independent factors (e.g., variability in weather or building occupancy), ESCOs should base energy savings on actual conditions with PB-MV methods or use normalized or typical conditions with deemed savings methods. To ensure the accuracy and reliability of reported savings values, evaluators should describe in their M&V reports the certainty of reported savings values, quality control measures used, sources of deemed savings values, details of data metering practices, and baseline used (EPA 2015).

¹ As of this report’s publication date, EPA has issued its draft version of *Evaluation Measurement and Verification (EM&V) Guidance for Demand-Side Energy Efficiency (EE)* and is considering public comments on that draft (EPA 2015). ² EPA notes that both direct and indirect energy efficiency programs can be directed toward low-income households. EPA defines direct actions as those that result in direct implementation of energy efficiency measures at end-use energy consumer facilities and offers the following as examples: consumer product rebates, incentives for HVAC and lighting retrofits, incentives and technical assistance for new energy-efficient building construction, whole-house retrofits, streetlight retrofits, and commissioning and retro-commissioning. EPA defines indirect programs as those that facilitate or indirectly result in implementation and offers the following as examples: consumer behavior, marketing and outreach, workforce education and training, financing, and energy audit programs.

Design Compliance Plans to Incentivize Low-Income Energy Efficiency Efforts

In order to fully capture low-income energy efficiency opportunities while implementing the Clean Power Plan, states should consider all options for maximizing efficiency. In addition to participating in the CEIP, state agencies tasked with developing a compliance plan can work with administrators of low-income energy efficiency programs early and often to guide EM&V planning. This will increase the likelihood that emission reductions from their programs will count toward the CEIP and in any compliance scenario. In addition, state agencies and providers of existing programs can work together to improve current low-income energy efficiency programs (both single- and multifamily), such as those delivered by utilities, weatherization providers, and energy service companies. They can also initiate new programs when feasible.

In a mass-based compliance approach, states can directly allocate a portion of allowances to administrators of low-income energy efficiency programs. Administrators can then sell allowances to EGU owners who need them to meet compliance obligations. States can also auction allowances to affected EGUs and then divert revenue from these sales to low-income providers so that they can expand or improve their programs.²¹

For rate-based compliance, states can issue ERCs to low-income efficiency providers that generate, measure, and verify emission reductions. In either compliance approach, states can set aside a portion of emission allowances for low-income efficiency providers and then allocate them during the CEIP or the compliance period.

By requiring states to demonstrate engagement of low-income stakeholders, the CPP puts a spotlight on energy efficiency programs that serve these communities. Utilities, state agencies, public housing authorities, and other affordable housing entities can take advantage of this opportunity to inform their state's CPP compliance plans and generate support for their energy efficiency programs.

Conclusion

While best practices for low-income energy efficiency program design have been documented and implemented in many states, discussions about the role of these programs under the CPP are ongoing. In spite of some uncertainty surrounding the mechanics of the Clean Energy Incentive Program, using low-income energy efficiency programs for CPP compliance will ensure that all citizens can benefit from reduced pollution and lower electricity bills.

EPA requires states to address the needs of low-income and other vulnerable populations during their stakeholder engagement and compliance plan development processes (80 FR 64858). If state air offices work with members of the low-income housing and energy efficiency communities to include these programs in state plans, they could generate a sense of permanence for their work. By linking these programs to Clean Power Plan compliance,

²¹ See ACEEE's joint comments for more options that states can consider to incentivize energy efficiency in a mass based compliance scenario: [aceee.org/regulatory-filing/joint-comments-mass-based-012116](https://www.aceee.org/regulatory-filing/joint-comments-mass-based-012116).

states can help to maintain and even expand programs targeting low-income communities. This unique opportunity to weave low-income energy efficiency efforts into state goals for environmental improvement can help to improve the rigor of data reporting and garner additional financial support for these programs.

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