Fair, Abundant, and Low-Cost

A Handbook for Using Energy Efficiency in Clean Power Plan Compliance

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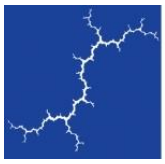

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EXECUTIVE SUMMARY

Energy efficiency is widely recognized as an abundant and low-cost option for states to comply with the requirements of the Environmental Protection Agency's Clean Power Plan. States that meet their targets by maximizing the large amount of untapped, cost-effective energy efficiency will enjoy benefits unmatched by other compliance strategies. Beyond reducing greenhouse gas emissions, energy efficiency reduces electricity bills, improves electric system reliability, reduces risk, promotes energy independence, and stimulates local economic development.

How much untapped energy efficiency is currently available to states? Many studies have shown that the United States can reduce electricity demand by 20-30 percent or more through energy efficiency savings—at comparatively lower cost. Many states have already demonstrated the ability to continuously reduce customer demand by 1-2 percent per year through efficiency programs, despite achieving high levels of savings for many years.

However, budgets for energy efficiency programs that are operated by electric utilities and funded by utility customers are often limited due to concerns about fairness between types of customers. While all customers experience some system-wide benefits of energy efficiency, customers who participate in these programs experience greater benefits than non-participants.

This issue is exacerbated by the fact that some electricity customers are hard to reach, and therefore are less likely to experience the direct benefits of program participation. Hard-to-reach customers include low-income households, renters, multi-family housing, small businesses, and government buildings.

This handbook describes ten strategies to mitigate concerns about fairness between customers. These strategies, presented in Table ES 1, are based upon the following key concepts:

- **Low- and no-cost measures.** States can adopt building energy codes; appliance standards; and building benchmarking, rating, and disclosure practices to promote efficiency across broad sectors of the economy at very low cost in general, and often at no cost to electric customers.
- **Diverse participation.** Efficiency programs can ensure that a broad and diverse array of customers, including hard-to-reach customers, can enjoy reduced bills and other benefits of energy efficiency.
- **More participation.** Energy efficiency initiatives can serve more customers in general, so that all or most electric customers will experience reduced bills.
- **Market transformation.** Market transformation initiatives—intervening in a market to create a lasting change in manufacturing, distribution, and purchasing behavior as well as building construction processes—can be used to achieve widespread improvement across efficiency products and markets, thereby relying less upon customer-funded efficiency programs and reducing the burden to non-participants.
- **Public funding.** Additional funding sources can be tapped to achieve efficiency savings for more participants.

Table ES 1. Summary of strategies for mitigating equity concerns of energy efficiency programs

10 Ways to Increase Customer Participation in Energy Efficiency	
State Policies and Initiatives States can implement policies and initiatives to achieve energy efficiency savings across all households, businesses, and industries.	**1. Adopt building codes and appliance standards** Adopt and enforce building codes and appliance standards to ensure that all new buildings and new products are as efficient as possible.
	2. Let customers know how their energy use compares Implement building benchmarking, rating, and disclosure practices to reveal efficiency levels and allow for building owners, managers, and buyers to respond accordingly.
	3. Enable governments to lead by example Implement state and local government efficiency programs to reduce taxpayer energy bills and to push efficiency markets by "leading by example."
Ratepayer-Funded Energy Efficiency Program Policies Public utility commissions can implement energy efficiency program policies that drive program administrators to reach all customers.	**4. Expand program reach** Adopt policies and initiatives that require program administrators to implement all cost-effective efficiency, improve cost effectiveness screening, and expand evaluation efforts to include program participation.
	5. Use targets, carrots, and sticks Provide efficiency program administrators with proper incentives to motivate them to serve hard-to-reach customers and maximize customer participation in general.
	6. Collaborate Establish collaboratives to allow low-income, business, and consumer advocates to provide input into program marketing, design, and implementation.
Ratepayer-Funded Energy Efficiency Program Designs Commissions can influence program administrators to adopt programs and program designs that maximize participation by all customers, especially hard-to-reach customers.	**7. Bring efficiency to all customers** Include a variety of programs to ensure that options are available to all customers, including those who are hard to reach.
	8. Maximize participation Design efficiency programs to ensure that options are available to all customers, including those who are hard to reach.
	9. Transform the efficiency market Design efficiency programs that emphasize opportunities to transform efficiency products and markets.
Ratepayer-Funded Energy Efficiency Program Funding Commissions can allow program administrators to use new funding sources to pay for a portion of their energy efficiency programs.	**10. Leverage new funding** Utilize funds generated by Clean Power Plan compliance to implement future energy efficiency.

Equitable Energy Efficiency and the Clean Power Plan

Energy efficiency is widely recognized as one of the lowest-cost options for complying with the requirements of EPA's Clean Power Plan.[1] Whether a state chooses a mass-based or a rate-based approach to compliance, energy efficiency should be the primary strategy that states use to comply with the regulation. In a mass-based approach, each fossil unit in the state has an emission reduction target based on total tons of carbon dioxide that can be emitted. Energy efficiency helps to reduce total emissions by reducing how much these plants are operating. In a rate-based approach, each fossil unit has a target in the form of a rate (pounds of carbon dioxide emitted per megawatt hour generated). Energy efficiency can help power plants reduce their emission rate by essentially adding zero-emission "generation" to the denominator of the emission rate calculation. Efficiency also offers a variety of benefits beyond greenhouse gas emission reductions, such as reduced electricity bills, a more reliable electric system, reduced risk, energy independence, and local economic development.

Unlike most other options to reduce carbon emissions, energy efficiency offers the benefit of reducing electricity system costs and electric customers' bills. As states increase their use of energy efficiency, they will experience reduced costs for compliance with the Clean Power Plan.[2]

Every state has a large amount of cost-effective energy efficiency available to it. Many studies have shown that the United States has the ability to reduce electricity demands by 20-30 percent or more over the next 10-20 years through energy efficiency savings—at comparatively lower cost.[3] Many states have already demonstrated the ability to reduce customer demand by 1-2 percent per year through efficiency programs funded by electricity customers and operated by electric utilities.[4]

Despite the fact that these customer-funded energy efficiency programs have existed for many years, there remains a large resource of untapped, cost-effective energy efficiency opportunity throughout the United States. There are many reasons why this low-cost option has not been fully implemented to date. Electricity customers face a wide variety of barriers that inhibit them from adopting cost-effective energy efficiency measures on their own.

While customer-funded efficiency programs seek to overcome these barriers, they only go so far. Regulators and other stakeholders frequently raise concerns about fairness between those customers who participate in customer-funded efficiency programs, and who see immediate reductions in bills, and those customers that do not. Since customer-funded efficiency programs impact the rates of all customers—participant or not—program budgets are often limited in response to concerns about customer fairness.[5]

This concern about unfairness between program participants and non-participants is exacerbated by the fact that several types of electricity customers are hard to reach with customer-funded programs, and are less likely to experience the direct benefits that participation has to offer. These hard-to-reach customers face a variety of barriers to implementing energy efficiency, including, for example:

- **Low-income customers** have limited time and money to commit to energy efficiency projects. In some areas, language may be a barrier to program participation. Also, low-income customers may be wary of interacting with utilities that have the ability to shut off service for nonpayment.

Efficiency program administrators are challenged by this customer segment as well. Program administrators often do not have the information they need to identify low-income customers. Even those program administrators that offer low-income rates typically achieve only partial participation from low-income customers.

- **Renters** and landlords can have "split incentives"—one party pays the energy bills but the other party pays for the upfront investment in efficient equipment. As a result, the person who is responsible for deciding whether or not to upgrade equipment may not have an incentive to do so.

- **Multi-family housing** diversity often presents a challenge. Properties may differ in size and use (i.e., some are classified as commercial and others residential), metering type (i.e., some are master metered and some have meters for each unit), and ownership structure (e.g., condominiums, market-rate housing, assisted living, campus living, and affordable housing).

- **Small businesses** typically have limited time and resources to commit to energy efficiency projects. Specifically, small businesses have no dedicated staff to plan for or manage contractors on site. These businesses are very diverse and can include convenience stores, offices, restaurants, and small manufacturers. Significant diversity also exists among them in terms of energy use, savings, financial needs, language spoken, and culture.

- **States, counties, cities, and towns** often have limited capital for energy efficiency in their buildings and limited staff to coordinate projects. However, it is important to serve municipal customers, as reduced energy costs for them can reduce taxes for all homes and businesses.

The Clean Power Plan provides added motivation for efficiency program administrators to accelerate implementation of energy efficiency measures designed to provide services to hard-to-reach customers. Under the Clean Energy Incentive Program (CEIP), certain early-action measures installed after a state has submitted its final compliance plan can earn credits for their energy savings or zero-emission generation occurring in 2020 and 2021. Among such resources, qualified low-income measures can receive one early-action emission rate credit (or equivalent allowances) from the state, along with one additional credit or equivalent allowances matched by EPA. Energy efficiency program administrators can then sell these credits or allowances to CO_2-emitting power plants for use during the compliance period. Revenue from these sales could generate funding to support energy efficiency efforts for all customers, including these hard-to-reach customers.[6]

Footnotes

[1] U.S. Environmental Protection Agency. "Fact Sheet: Energy Efficiency in the Clean Power Plan." Available at: http://www2.epa.gov/cleanpowerplan/fact-sheet-energy-efficiency-clean-power-plan.

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[4] Hibbard, P. J., A. M. Okie, K. A. Franklin. 2014. Assessment *of EPA's Clean Power Plan: Evaluation of Energy Efficiency Program Ramp Rates and Savings Levels*. Analysis Group, Inc. Available at: http://www.analysisgroup.com/uploadedFiles/Content/Insights/Publishing/Assessment_of_EPA_Clean_Power_Plan.pdf.

[5] It is important to note that all customers experience some system-wide benefits of energy efficiency, such as reduced risk and improved reliability on the electric system, reduced transmission and distribution costs, downward pressure on wholesale market prices, downward pressure on fuel costs, and reduced environmental impacts.

[6] Synapse Energy Economics. 2015. "Environmental Justice and the Clean Power Plan." Project description at: http://www.synapse-energy.com/project/community-and-environmental-justice-issues-clean-power-plan.

Strategies to maximize Energy Efficiency Participation

State legislatures, public utility commissions, and energy efficiency program administrators all have roles to play in improving the fairness of energy efficiency efforts. State legislatures can adopt policies and initiatives such as building codes and state appliance standards that drive energy efficiency improvements in buildings among all residents and businesses, including hard-to-reach customers. Public utility commissions can adopt policies and initiatives that require program administrators to serve hard-to-reach customers. Program administrators can adopt a mix of programs and program designs that maximize participation by all customers, including hard-to-reach customers.

This handbook describes ten strategies available to mitigate concerns about customer fairness and energy efficiency, summarized in Table 1.

Table 1. Summary of strategies for mitigating equity concerns of energy efficiency programs

Category	Initiative
State Policies and Initiatives	1. Adopt building codes and appliance standards 2. Let customers know how their energy use compares 3. Enable governments to lead by example
Ratepayer-Funded Energy Efficiency Program Policies	4. Expand program reach 5. Use targets, carrots, and sticks 6. Collaborate
Ratepayer-Funded Energy Efficiency Program Designs	7. Bring efficiency to all customers 8. Maximize participation 9. Transform the efficiency market
Ratepayer-Funded Energy Efficiency Program Funding	10. Leverage new funding

State Policies and Initiatives

1. Adopt Building Codes and Appliance Standards

State governments can legislate building energy codes and appliance standards and offer opportunities for all residents and businesses to improve their building and industrial energy efficiency. Building energy codes set minimum energy efficiency requirements for new residential and commercial buildings, as well as those undergoing major renovation. Appliance standards set minimum energy and water efficiency requirements for appliances and equipment—where cost-effective—and prohibit the production, import, or sale of appliances and equipment that do not meet those requirements. These policy initiatives can overcome the barrier of split incentives, where builders, developers, and appliance manufacturers have little interest in investing extra money to build energy-efficient buildings and products because they are not responsible for paying the operating costs.

How does this initiative promote equity?

Many energy efficiency program efforts are voluntary and require customers' time and resources to implement. This is a significant barrier to energy efficiency, especially for hard-to-reach customers. Building energy codes and appliance standards enable equitable access to all consumers by making energy saving practices and products the norm, rather than the leading-edge. These approaches are also seamless to customers in that customer do not have to make any additional effort to realize gains in efficiency. Additionally, appliance standards could, depending on the scope and level of standards, have significant and long-lasting impacts on the development and supply of energy-efficient products, as well as on consumer preferences for energy-efficient products in the market.

What are the potential energy savings from this initiative?

A majority of states (about 40) have adopted up-to-date building energy codes over the past five years. However, most of these states have not adopted the latest edition of the International Energy Conservation Code (IECC) or ASHRAE 90.1, an energy code from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Significant energy savings opportunities are available both to states that update their building codes and to states that have not yet adopted any building codes.

States can also seize energy savings opportunities by setting appliance standards for products not currently covered by federal standards. Such products include but are not limited to battery chargers, computers and battery backup systems, set-top boxes, game consoles, pool pumps, candelabra and intermediate base incandescent lamps, and commercial dishwashers.[7] The Appliance Standards Awareness Project estimated in 2012 that new standards for battery chargers, computers, external power supplies, game consoles, and set-top box together would save $5 billion annually and result in a cumulative net economic benefit of about $29 billion through 2025.[8]

What actions must states take to put this initiative in place?

There are advantages and disadvantages to adopting codes and standards as part of state implementation plans for the Clean Power Plan. As mentioned above, there are many states that have updated building codes. There are also some states—such as Massachusetts, California, Michigan, Kentucky, and Pennsylvania—that have legislation in place to adopt or revise energy codes in concert with the cycle of publication of new editions of model energy codes, such as the IECC and ASHRAE 90.1. However, because building codes are often implemented at the local levels (typically by cities and towns), enforcing compliance with the latest codes for all builders and verifying energy savings from them could be a challenge. States should actively support local governments in their efforts to enforce the state code by offering resources and training programs to the building construction community.[9] Also, commissions can allow program administrators to claim savings for providing training to the building community on new codes as a part of their efficiency offerings.

Adopting new state appliance standards for Clean Power Plan compliance may be more challenging than adopting new codes, because state agencies in most states do not have administrative authority to set new appliance standards. Interested state legislators need to enact new laws to set new standards, or to provide administrative authority to state agencies (such as state energy commissions) to set new standards or update existing standards. A few states—such as California, Oregon, Connecticut, and New York—have already given state agencies the administrative authority to set new standards.[10]

Equitable efficiency initiatives in action

Most states and local jurisdictions adopt two types of baseline building codes, namely the IECC and the ANSI/ASHRAE/IESNA Standard 90.1 Energy Standard for Buildings (ASHRAE 90.1). The IECC addresses all residential and commercial buildings, and ASHRAE 90.1 covers commercial buildings. These model codes are developed and updated periodically by associations of code officials. Many states make modifications to these model codes when adopting them. In addition, some states—such as Massachusetts, Vermont, and Oregon—have developed voluntary stretch codes for local jurisdictions to adopt that go beyond state-adopted building energy codes.[11]

Appliance standards can be adopted by federal or state governments. States cannot set efficiency standards for federally regulated products, but they can adopt standards for products not covered by federal standards. When new federal standards are developed, pre-existing state standards for those products are typically superseded by the federal standards; however, certain products receive exemptions.

The following two figures show the current building energy codes in each state. Figure 1 shows residential building codes and Figure 2 shows commercial building codes. Overall, the majority of states have not adopted the latest IECC or ASHRAE 90.1 building codes, implying that significant energy savings opportunities are available to states that update their building codes.

Figure 1. Current residential building codes adoption status

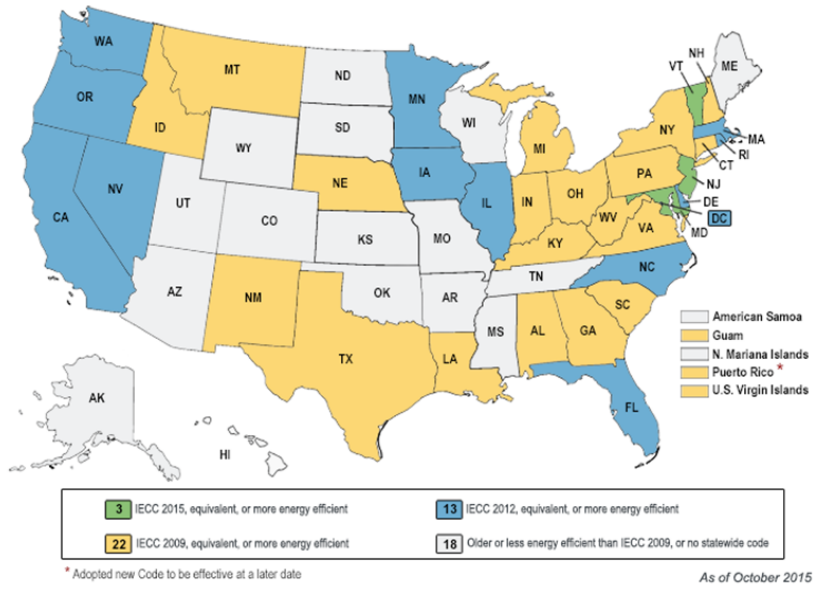
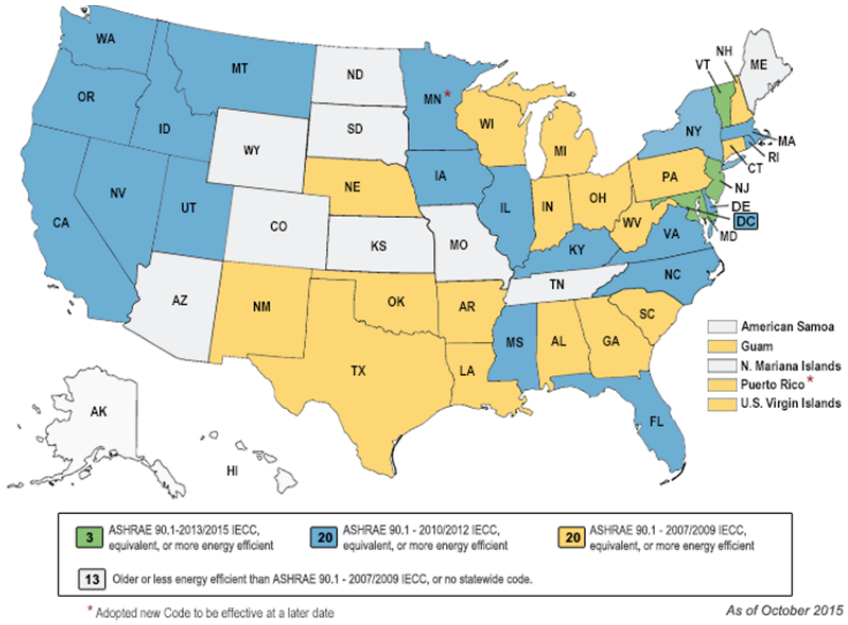


Figure 2. Current commercial building codes adoption status



Source: Reproduced from .S. Department of Energy – Energy Efficiency & Renewable Energy, Building Energy Codes Program. November 2015. "Status of State Energy Code Adoption." Available at: https://www.energycodes.gov/status-state-energy-code-adoption.

Footnotes

[7] Appliance Standards Awareness Project. "National Standards." Available at: http://www.appliance-standards.org/national.

[8] Appliance Standards Awareness Project. *The Efficiency Boom: Cashing In on the Savings from Appliance Standards*. Available at: http://www.appliance-standards.org/documents/reports/efficiency-boom-cashing-savings-appliance-standards.

[9] U.S. Department of Energy. February 2010. Building Energy Code 101. An Introduction.

[10] National Association of Clean Air Agencies. 2015. *Implementing EPA's Clean Power Plan: A Menu of Options*. Chapter 14. Available at: http://www.4cleanair.org/sites/default/files/Documents/NACAA_Menu_of_Options_LR.pdf.

[11] U.S. Environmental Protection Agency. 2012. "ENERGY STAR Portfolio Manager: Data Trends: Benchmarking and Energy Savings." Data Trends: Benchmarking and Energy Savings. Available at: http://www.energystar.gov/ia/business/downloads/datatrends/DataTrends_Savings_20121002.pdf.

2. Let Customers Know How Their Energy Use Compares

Policies and programs such as building energy benchmarking and disclosure requirements and building rating systems make customers' energy use transparent and available, and provide the average energy use of similar customers for comparison. Helping customers to be better informed about their current energy use is a first step toward promoting new energy efficiency efforts.

How does this initiative promote equity?

Building owners, potential home/building buyers, and apartment renters typically have little access to energy consumption and energy bill data for the buildings they own, occupy, or are interested in buying or renting. This lack of energy information—also called the efficiency gap—is one of the largest barriers to considering and implementing energy efficiency measures.[12] Energy benchmarking, disclosure, and rating systems can overcome this information barrier by increasing awareness of the benefits of energy efficiency among different stakeholders, motivating building owners to upgrade their buildings, and helping potential buyers and tenants select more energy-efficient buildings. Further, these initiatives help ratepayer-funded energy efficiency programs expand their customer reach, and could promote more energy efficiency among hard-to-reach customers.

What are the potential energy savings from this initiative?

Some studies show that benchmarking and building disclosure programs alone can result in some energy savings. A 2012 analysis by EPA found energy consumption decreased by 7 percent over three years in a pool of 35,000 benchmarked buildings.[13] Another study by Resources for the Future examined building disclosure programs in four cities and estimated that the average energy savings from the programs is about 3 percent per year.[14] In addition, benchmarking and building disclosure could have significant impacts on energy consumption when coordinated with other policies and programs such as energy efficiency resource standards, code enforcement, rebates, and energy efficiency financing programs.

What actions must states take to put this initiative in place?

States and local governments should adopt policies supporting building energy disclosure and benchmarking and implement rating systems. Further, program administrators should benchmark buildings, specifically for hard-to-reach customer segments.

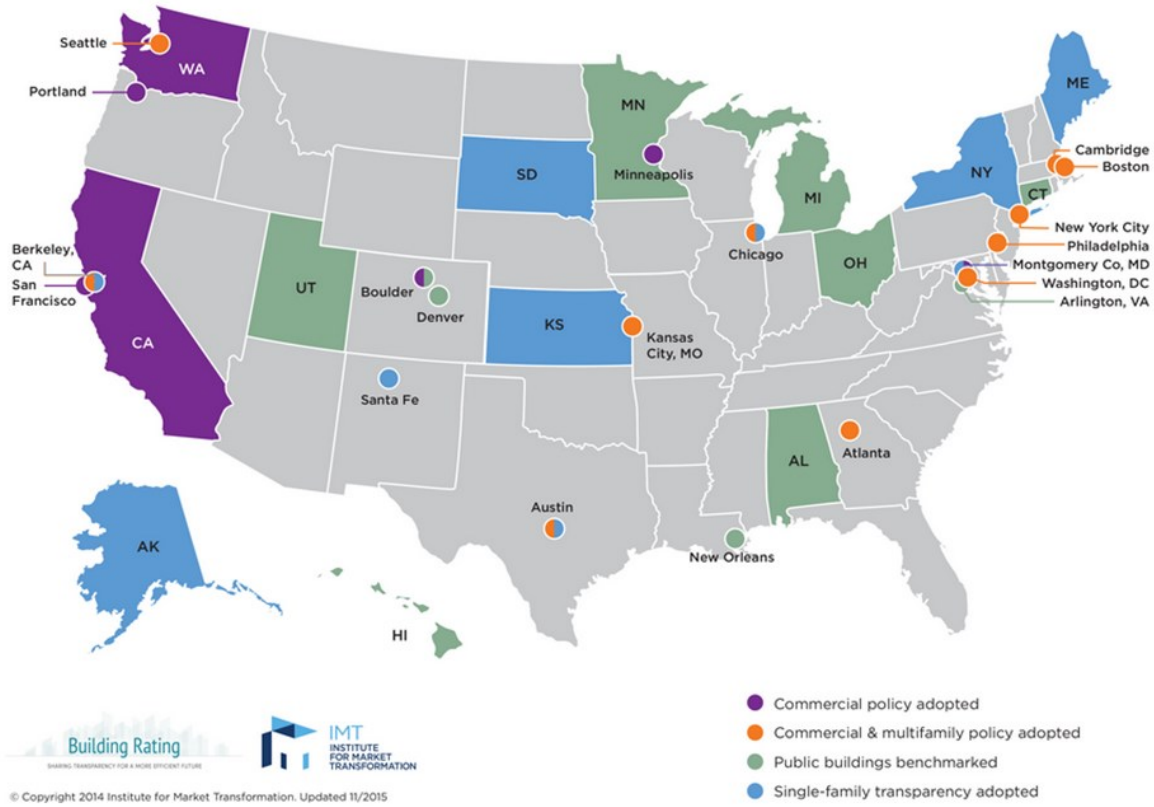
Equitable efficiency initiatives in action

Three types of building energy initiatives that help customers know and compare their usage are briefly discussed below:

- **Building Energy Disclosure:** Building energy disclosure requirements require the release of building energy data such as utility bills, energy audit data, and building characteristics to potential buyers or renters at the time of sale or rental. Some also require this information to be released to the government and posted on a public website.[15,16]
- **Building Energy Benchmarking**:
    - Cities often implement building energy benchmarking initiatives for commercial buildings along with building energy disclosure requirements. Most such benchmarking initiatives require the use of EPA's Portfolio Manager Tool to compare the building energy performance to other buildings.[17]
    - In Massachusetts, all multi-family properties have their energy usage benchmarked before implementation using a consistent statewide tool to facilitate targeting of high-energy users by program administrators. The program also requires that applicants participate in post-implementation benchmarking to track improvements. This has provided important data to building owners that motivates those who have not participated in the past to participate.[18]
- **Building Energy Rating Systems:** The major goal of building energy rating systems is to increase the visibility of building energy consumption and energy efficiency data by sending simplified messages about the level of energy efficiency to residents and businesses. Energy rating systems further aim to transform the market, so that sellers and buyers use the rating as a tool to guide energy efficiency improvements and real estate purchases. Examples of national building energy rating systems include LEED certification systems, ENERGY STAR buildings, and Residential Energy Services Network's Home Energy Rating System index. Some states also use voluntary rating systems such as Connecticut's Home Energy Solutions program and Massachusetts' Home MPG (for "miles per gallon") program and Building Asset Rating pilot. Further, the real estate industry is improving access to buildings' energy efficiency data by including LEED and ENERGY STAR ratings in multiple listing services.[19]

Figure 3 below shows the several states and cities that have mandatory disclosure laws for residential buildings, commercial buildings, or both. To date, 14 states have adopted some form of benchmarking or transparency policy. In addition, one or more cities in 13 states have adopted some form of benchmarking or transparency policy.[20,21]

Figure 3. Current residential building codes adoption status



Source: Reproduced from Institute for Market Transformation. 2014. "U.S. Benchmarking Policy Landscape." Available at: http://www.buildingrating.org/graphic/us-benchmarking-policy-landscape.

[12] American Council for an Energy-Efficient Economy. 2013. *Overcoming Market Barriers and Using Market Forces to Advance Energy Efficiency.* Available at: http://aceee.org/sites/default/files/publications/researchreports/e136.pdf.

[13] U.S. Environmental Protection Agency. 2012. *EnergyStar Portfolio Manager DataTrends: Benchmarking and Energy Savings*. Available at: http://www.energystar.gov/ia/business/downloads/datatrends/DataTrends_Savings_20121002.pdf?3d9b-91a5.

[14] Palmer, K. and M. Walls. 2015. *Does Information Provision Shrink the Energy Efficiency Gap? A Cross-City Comparison of Commercial Building Benchmarking and Disclosure Laws*. Resources for the Future. Available at: http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-15-12.pdf.

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[16] Gilleo et al. 2015. *The 2015 State Energy Efficiency Scorecard*. American Council for an Energy-Efficient Economy Report U1509.

[17] O'Keeffe, L., K. Palmer, M. Walls, and K. Hayes. 2015. *Energy Benchmarking and Disclosure: Summary of a Workshop on City Experiences, Market Impacts, and Program Evaluation*. Resources for the Future. Available at: http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-15-10.pdf.

[18] Nowak, S., M. Kushler, P. Witte, and D. York. 2013. "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs." American Council for an Energy-Efficient Economy.

[19] Ribeiro, D., V. Hewitt, E. Mackres, R. Cluett, L. M. Ross, S. Vaidyanathan, S. Zerbonne. May 2015. The 2015 City Energy Efficiency Scorecard. American Council for an Energy-Efficient Economy Report U1502.

[20] Institute for Market Transformation. 2014. "U.S. Benchmarking Policy Landscape." Available at: http://www.buildingrating.org/graphic/us-benchmarking-policy-landscape.

[21] There are about nine cities and ten states that have mandatory disclosure policies for residential or commercial buildings or both. For a full list of states and cities, see Table 25 of ACEEE (2015) The 2015 City Energy Efficiency Scorecard, and ACEEE (2015) The 2015 State Energy Efficiency Scorecard.

3. Enable Governments to Lead by Example

The federal government, states, cities, and towns can implement policies promoting the full participation of government buildings in energy efficiency programs. State and municipal policies can coordinate program marketing, incentives, and delivery with ratepayer-funded programs.

How does this initiative promote equity?

Reductions in the energy costs of municipal buildings reduce the portion of the budget dedicated to covering these costs. As a result, taxes that are used to collect these budgets can be reduced. This affects all of the local residents.

What are the potential energy savings from this initiative?

While policies requiring efficiency improvements are in place for federal buildings and many state government buildings, many cities and municipalities do not have policies in place. Also, the stringency of state policies vary widely.

What actions must states take to put this initiative in place?

States should work with cities and towns to implement policies similar to those of federal and state governments to drive energy efficiency in municipal buildings. States should work with public utility commissions and program administrators to coordinate programs with these municipalities to ensure that the specific needs of these buildings are represented in plans and that program administrators have experienced staff to serve these types of customers.

Equitable efficiency initiatives in action

- **Federal.** The federal government has set goals for existing buildings, requirements for efficiency and solar water heating equipment in new buildings and buildings undergoing major renovation, and equipment efficiency requirements. Existing federal buildings are required to reduce energy consumption by a fixed annual percentage through 2025. At least one-third of hot water demand for each new or renovated federal building must be met through the use of solar hot water heating, if it is cost-effective. New federal buildings must be designed to use two-thirds of the energy used today by the average new building, as long as the technologies to achieve this goal are cost-effective. Federal agencies must purchase energy-efficient products whenever an option that is more energy-efficient option is available, cost-effective, and meets the agency's needs. Agencies must also reduce water use when it is cost-effective.[22]

- **States.** Forty-seven states require that state-owned or -funded public buildings be more efficient as compared to the state energy code.[23]

- **Boston.** Boston adopted an emissions reduction target of 25 percent by 2020 for municipal buildings. The city reduced its greenhouse gas emissions by 27 percent between 2005 and 2013, achieving the local government portion of its overall goal well before 2020.[24]

Footnotes

[22] U.S. Department of Energy. 2015. "Energy Goals and Standards for Federal Government." Available at: http://energy.gov/savings/energy-goals-and-standards-federal-government.

[23] National Conference of State Legislators. November 2013. "Energy Efficiency Requirements for Public Buildings." Available at: http://www.ncsl.org/research/energy/energy-efficiency-requirements-for-public-buildings.aspx.

[24] American Council for an Energy-Efficient Economy. 2015. "Local Government Energy Efficiency Goals." Available at: http://database.aceee.org/city/local-government-energy-efficiency-goals.

Ratepayer-Funded Energy Efficiency Program Policies

4. Expand Program Reach

Public utility commissions can adopt policies and initiatives that require program administrators to implement all cost-effective efficiency, improve cost effectiveness screening, and expand evaluation efforts to include program participation.

4.1 Adopt All Cost-Effective Energy Efficiency Requirements

Some public utility commissions require energy efficiency program administrators to implement all of the energy efficiency that is cost-effective—that is, efficiency measures that cost less to implement than the cost to supply that energy. To meet this requirement, program administrators can start by conducting potential studies to determine the quantity and types of energy efficiency that is cost-effective. Program administrators then work with stakeholders to set annual energy savings as a proportion of sales targets. Currently, there are 25 states that have adopted Energy Efficiency Resource Standards (EERS) that set annual savings targets over multiple years. Because requirements to implement all cost-effective efficiency lead to the establishment of savings targets, these requirements are also regarded as part of EERS.

How does this initiative promote equity?

Requirements for program administrators to acquire all of the cost-effective energy efficiency are more likely to promote equitable energy efficiency for a number of reasons. First, this mandate requires an additional level of analysis to determine the maximum achievable savings as an appropriate level when compared with EERS policies without this mandate, and avoids artificially limiting the level of efficiency. In fact, among EERS states, states that also have all cost-effective energy efficiency mandates generally have set higher annual savings targets. Second, this mandate often accompanies a formal stakeholder or regulatory process, in which stakeholders actively provide feedback in order to determine targets for what constitute "all cost-effective savings."[25] Low-income advocates are often part of this stakeholder group. As a result, program administrators with all cost-effective requirements are better equipped to reach all customers and implementing as comprehensive a package of measures as is cost-effective for each customer.

What are the potential energy savings from this initiative?

Seven states require program administrators to achieve all cost-effective energy efficiency in addition to an EERS. These states set annual energy savings as a proportion of sales targets that were 65 percent higher than states with energy efficiency resource standards but no "all cost-effective efficiency" mandate.[26]

What actions must states take to put this initiative in place?

States should implement all cost-effective energy efficiency requirements. At the very least, this means that the amount of funding available must match the demand for or availability of all cost-effective energy efficiency. All interested customers must be served, and all cost-effective measures for each interested customer must be installed.

Equitable efficiency initiatives in action

California, Connecticut, Maine, Massachusetts, Rhode Island, Vermont, and Washington have all cost-effective energy efficiency policies.[27]

4.2 Improve Cost-Effectiveness Screening

Many public utility commissions require not only the overall portfolio of energy efficiency programs to be cost-effective, but for each individual energy efficiency program to be cost-effective. Commission initiatives to improve cost-effectiveness screening are underway in several states. This initiative encourages broader state participation in this effort.

How does this initiative promote equity?

Cost-effectiveness is calculated as a ratio of benefits over costs. The ratio must be greater than 1.0 if the program is cost-effective. Costs are easy to quantify, so they are usually accounted for. However, many benefits are not accounted for because they are uncertain or hard to quantify. As a result, cost-effectiveness screening results are often skewed and benefit-cost ratios for programs with certain benefits that are not being accounted for are underestimated. This can result in the termination or interruption of potentially cost-effective programs.

There are many more benefits that accrue to low-income and multi-family customers as compared to other customer segments. Therefore, improved cost-effectiveness practices have a greater impact on participation by hard-to-reach segments. Improved cost-effectiveness screening provides (a) a framework for states to use in thinking about how to apply cost-effectiveness and (b) improved calculations of benefits, allowing more benefits to be quantified, estimated, and included.

What are the potential energy savings from this initiative?

The benefits that are not currently being captured in many states are significant. Application of these benefits in Massachusetts suggests that the Commonwealth's low-income multi-family programs may account for more than 30 percent of total benefits, low-income single family programs nearly 25 percent of total benefits, and small business programs close to 20 percent of total benefits.[28]

What actions must states take to put this initiative in place?

Public utility commissions should open a docket to reexamine the policy framework used to evaluate cost-effectiveness, including the calculations of cost-effectiveness. The National Efficiency Screening Project's Resource Value Framework should be considered in this docket.[29,30]

Equitable efficiency initiatives in action

Several states have improved their estimation or representation of certain benefits in cost-effectiveness screening. Massachusetts quantified many non-energy benefits and included them in cost -effectiveness screening. Rhode Island adopted the values and approach used in Massachusetts. Some states have developed an adder to represent the total value of these benefits in screening. Finally, some states have implemented a qualitative approach to represent the benefits, including exempting low-income programs cost-effectiveness screening or adjusting the benefit-cost ratio threshold below 1.0 to reflect the additional benefits.[31,32]

4.3 Expand Evaluation to Program Participation

Understanding program participation rates is key to evaluating program equity issues in the context of energy rate and bill impacts from energy efficiency programs. Program administrators can collect and assess information on program participation across programs, years, and for different types of customers.

How does this initiative promote equity?

As the scale of energy efficiency increases across many states, rate and bill impacts from energy efficiency is becoming a key concern for stakeholders. One critical approach to mitigate the rate and bill impact concern is not to scale down the program, but instead to scale it up by serving more customers—across all customer segments. By examining participation rates for all programs, program administrators can understand how many of the customers in each program are currently served and are expected to be served over the long term, and can make sure that hard-to-reach customers are served sufficiently.

What are the potential energy savings from this initiative?

Without this additional data, program administrators are likely to forego energy savings for all customers, but for hard-to-reach customers in particular.

What actions must states take to put this initiative in place?

Program administrators first need to collect program participation counts as well as eligible customer counts for each program. Second, program administrators need to report participation rates in all annual reports and program plans. Finally, for filing program plans, program administrators need to provide projected participation rates for each program.

Equitable efficiency initiatives in action

National Grid in Rhode Island provides the results of rate and bill impacts modeling with its annual plan filing. National Grid has used historical data to improve estimates of participants and non-participants, an important input in to these models.

Footnotes

[25] Gilleo, A. "Picking All the Fruit: All Cost-Effective Energy Efficiency Mandates." American Council for an Energy-Efficient Economy. Available at: http://aceee.org/files/proceedings/2014/data/papers/8-377.pdf.

[26] Ibid.

[27] Ibid.

[28] Based on values from Massachusetts Program Administrators. October 2015. "Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan: 2016-2018." Available at: http://ma-eeac.org/wordpress/wp-content/uploads/Exhibit-1-Gas-and-Electric-PAs-Plan-2016-2018-with-App-except-App-U.pdf.

[29] Home Performance Council. 2014. "Cost Benefit Testing." Available at: http://www.homeperformance.org/policy-research/projects-initiatives/cost-benefit-testing.

[30] Woolf, T., E. Malone, C. Neme, R. LeBaron. October 2014. "Unleashing Energy Efficiency: The Best Way to Comply with EPA's Clean Power Plan." Public Utilities Fortnightly. Available at: http://www.homeperformance.org/sites/default/files/hpc_nesp-unleashing-energy-efficiency_201410.pdf.

[31] Woolf, T., E. Malone, J. Kallay, K. Takahashi. October 2013. "Energy Efficiency Cost-Effectiveness Screening in the Northeast and Mid-Atlantic States: A Survey of Issues and Practices, With Recommendations for Developing Guidance to the Regional Evaluation, Measurement & Verification (EM&V) Forum." Synapse Energy Economics. Available at: http://www.synapse-energy.com/sites/default/files/SynapseReport.2013-10.NEEP_.EMV-Screening.13-041.pdf.

[32] Synapse Energy Economics. "Energy Efficiency Cost-Effectiveness Tests." Available at: http://www.synapse-energy.com/sites/default/files/Appendix%20D%20from%20Michigan%20Report.pdf.

5. Use Targets, Carrots, and Sticks

In some states, program administrators have budget, savings, or participation targets for energy efficiency programs aimed at hard-to-reach customer segments or for customer participation more generally. These targets may be mandated or be accompanied by financial incentives (rewards and penalties).

How does this initiative promote equity?

Program administrators generally have weaker incentives to offer energy efficiency services to hard-to-reach customers because of the higher costs and level of effort required to serve this segment. In setting targets for hard-to-reach customers that are reinforced by rewards or penalties, regulators seek to ensure that energy efficiency services are available to underserved customers. If set sufficiently high, targets for general customer participation can also require program administrators to pay attention to hard-to-reach customers.

What are the potential energy savings from this initiative?

Estimates of the potential savings associated with setting or increasing targets are not available. The American Council for an Energy-Efficient Economy estimates that the potential associated with all residential low-income programs, assuming eligibility is based on income at or below 125 percent of median income, is 24 TWh by 2030.[33]

What actions must states take to put this initiative in place?

In some cases, implementing financial incentives for program administrators may require changes to legislation. However, state public utility commissions likely already have the authority to set targets without financial rewards or penalties. Regardless of whether financial incentives are used, care should be given to how targets are designed. Regulators should ensure that targets are not undercut by current financial incentives and that the magnitude of both the target and any incentives are reasonable and likely to motivate action. Pairing targets with other requirements can help to produce outcomes that are more balanced in terms of different goals. For example, spending targets should be coupled with other requirements (e.g., cost-effectiveness requirements or energy savings thresholds) to ensure that funds are used effectively. There are resources that describe considerations for designing targets and incentives to ensure they are effective over time.[34]

Equitable efficiency initiatives in action

Targets may focus on a specific program or a specific customer group—commonly low-income customers—and may be measured in terms of minimum energy savings goals, minimum spending levels, or customer participation targets. Examples of policies that adopt targets are described below.

- **Minimum Savings Goals.** Performance incentives for the utilities Consumers Energy and Detroit Edison are tied to requirements for minimum low-income program savings targets. Detroit Edison can receive a bonus of 12 percent of program spending by exceeding the legislated energy savings goal for all energy optimization programs by 15 percent, depending on the results of a cost-effectiveness test. On top of the base financial incentive, Detroit Edison can earn a low-income performance incentive ranging from 0.67 percent of program cost at 17 gigawatt-hours of low-income savings, up to 2 percent of program cost at 20.4 gigawatt-hours savings.[35]

- **Minimum Spending Levels. In** 2013, Maine passed legislation establishing that the public utilities commission must assess funding at "an amount necessary to capture all cost-effective energy efficiency that is achievable and reliable." By statute, at least 10 percent of funds for the independent administrator of efficiency programs, Efficiency Maine Trust, must support energy programs for low-income residents, and at least 10 percent of funds must support energy programs for small business customers.[36]

- **Customer Participation Targets.** The overall performance incentive for the energy efficiency program administrator Efficiency Vermont is reduced by 18 percent if fewer than 1,950 small business customers (with annual electric use of 40,000 kilowatt-hour per year or less) participate in its programs. The penalty for failing to achieve minimum participation by this sector was $437,647 from 2012 to 2014.[37]

Footnotes

[33] York, D., M. Molina, et al. January 2013. "Frontiers of Energy Efficiency: Next Generation Program Reach for High Energy Savings." American Council for an Energy-Efficient Economy. Available at: http://aceee.org/research-report/u131.

[34] See, e.g., Whited, Melissa, Tim Woolf, and Alice Napoleon. 2015. "Utility Performance Incentive Mechanisms: A Handbook for Regulators." Synapse Energy Economics. Available at http://www.synapse-energy.com/project/performance-incentives-utilities.

[35] Detroit Edison can earn additional incremental incentives for increasing the number of residential participants who install three or more measures, increasing the number of commercial and industrial participants who install two or more measures, and for reducing coincident peak demand. Overall incentives are capped at 15 percent of spending or 25 percent of net benefits (i.e., net cost reductions experienced by the provider's customers).

[36] American Council for an Energy-Efficiency Economy. July 2015. "Customer Energy Efficiency Programs." Available at: http://database.aceee.org/state/customer-energy-efficiency-programs.

[37] Galvin, T., B. Kim. 2013. "Show Me the Money: A Review of Recent Utility Energy Efficiency Performance Incentive Designs." Presented at the 2013 ACEE National Conference on Energy Efficiency as a Resource on September 23, 2013. Available at: http://aceee.org/files/pdf/conferences/eer/2013/2C-Galvin_0.pdf.

6. COLLABORATE

Public utility commissions can establish energy efficiency collaboratives to address issues associated with planning and running energy efficiency programs. Energy efficiency collaboratives are stakeholder groups that provide input into energy efficiency program marketing, design, and implementation. Collaboratives represent a wide variety of interests, from program administrators to low-income, business, and consumer advocates.[38]

How does this initiative promote equity?

Representatives of hard-to-reach customers are often members of energy efficiency collaboratives. These representatives are experts who advocate for state policies and initiatives promoting equitable energy efficiency. They also influence public utility commissions and program administrators to adopt a more equitable program mix and program designs that serve hard-to-reach customers.

What are the potential energy savings from this initiative?

While many states have some form of collaborative, few states have permanent statewide collaboratives. Permanent statewide collaboratives are established as a result of statute, commission order, or track record to address issues for all utilities, electric or electric and gas, in a state.[39] The establishment of permanent statewide collaboratives can drive additional energy savings over temporary, utility-specific collaboratives since participation, especially by hard-to-reach customers, is a dynamic and therefore ongoing issue that affects all utilities.

What actions must states take to put this initiative in place?

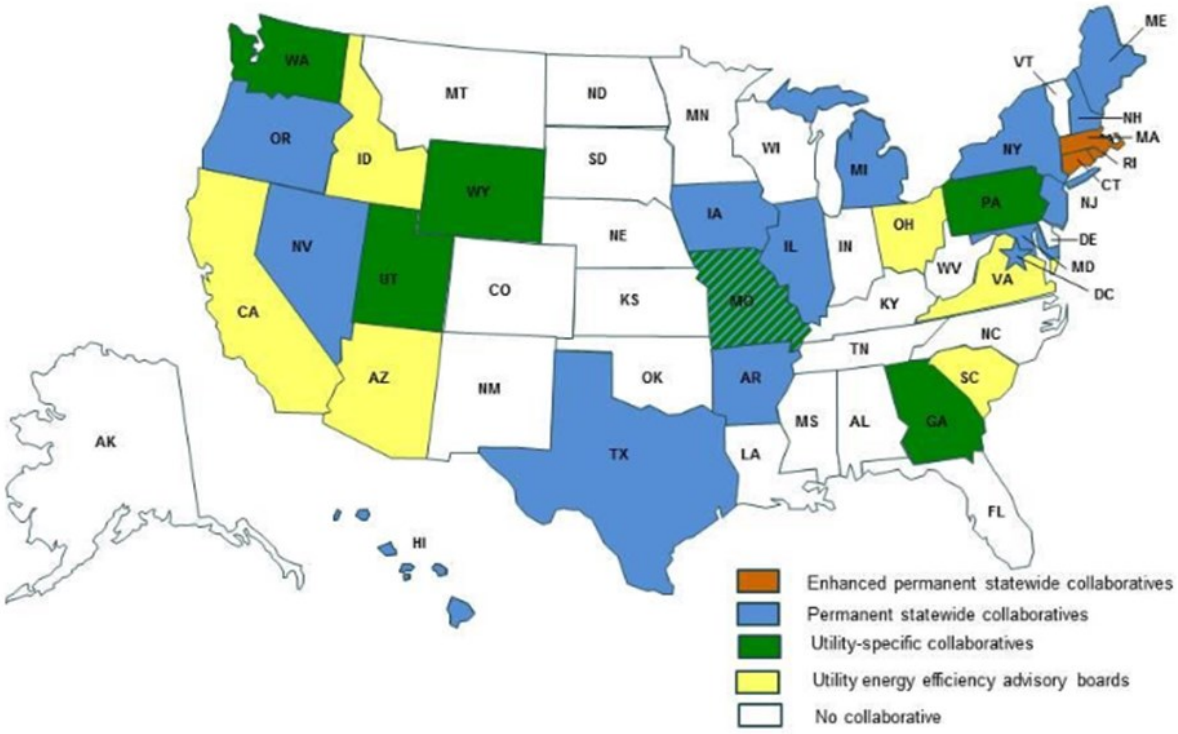
States should implement permanent statewide energy efficiency collaboratives with a broad representation of stakeholders. Further, states should institutionalize a minimum level of stakeholder diversity by requiring representation of certain hard-to-reach customer groups.

What actions must states take to put this initiative in place?

When Rhode Island changed its approach to energy efficiency by passing a comprehensive energy reform law in 2006, the state engaged a more rigorous and inclusive collaborative process to inform program efforts. Called the Rhode Island Energy Efficiency and Resource Management Council, the collaborative has formal membership requirements established in the state statute. The governor appoints the 13 council members, including one representative for small business customers and one representative for low-income customers.[40]

Figure 4 presents U.S. states that have established energy efficiency collaboratives. Sixteen states have permanent statewide collaboratives in place.

Figure 4. U.S. states with energy efficiency collaboratives



Source: Reproduced from State and Local Energy Efficiency Action Network. 2015. "Energy Efficiency Collaboratives: Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group."

Footnotes

[38] Li, M., J. Bryson. September 2015. *Energy Efficiency Collaboratives: Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group.* State and Local Energy Efficiency Action Network. Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/EECollaboratives-0925final.pdf.

[39] Ibid.

[40] State of Rhode Island, RI Energy Efficiency and Resource Management Council website. Available at: http://www.rieermc.ri.gov.

Ratepayer-Funded Energy Efficiency Program Designs

7. Bring Efficiency to All Customers

Many utilities and commissions consider certain types of efficiency programs to be essential to any efficiency portfolio to ensure that all customer sectors are being adequately served. These programs can be referred to as core energy efficiency programs. Core energy efficiency programs generally include low-income single family, low-income multi-family, non-low-income multi-family, and small business programs, as well as other basic programs (e.g., new construction, retrofit, direct install, and rebate programs).

How does this initiative promote equity?

Core energy efficiency programs can help to promote customer equity by serving specific types of customers that would otherwise be underserved.

What are the potential energy savings from this initiative?

The potential energy savings from this initiative are difficult to assess given that program designs are continually changing. A general requirement to maintain core energy efficiency programs will ensure ongoing savings for the hard-to-reach customers served by many of these programs.

What actions must states take to put this initiative in place?

Public utility commissions should require program administrators to include all core energy efficiency programs in their portfolios, regardless of whether they are currently cost-effective. Examples of utility best practice programs can serve as models for core programs.[41]

Equitable efficiency initiatives in action

Upon passage of New Hampshire's Restructuring Act, the public utilities commission requested that utilities collaborate to develop a set of core programs that are consistent in design and target cost-effective opportunities that would otherwise be lost due to market barriers.[42] The electric utilities established a set of energy efficiency programs serving residential, commercial, and industrial customers and including programs for low-income, small business, and government buildings. The utilities file periodic reports on the performance of the programs, including data on energy savings and the number of customers served. Individual utilities run programs in addition to the statewide programs.[43]

Footnotes

[41] See, Nowak, S. et al. June 2013. "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs." American Council for an Energy-Efficient Economy.

[42] American Council for an Energy-Efficient Economy. July 2015. "Customer Energy Efficiency Programs." Available at: http://database.aceee.org/state/customer-energy-efficiency-programs#sthash.kDtQxT8Q.dpuf.

[43] New Hampshire Public Utility Commission. "Core Energy Efficiency Programs." Available at: https://www.puc.nh.gov/Electric/coreenergyefficiencyprograms.htm.

8. Maximize Participation

The design of an energy efficiency program plays a large role in who it reaches and how well it reaches them. Many program administrators have targeted program designs for each type of hard-to-reach customer including low-income, multi-family, and small business customers.[44] The marketing, incentive, and delivery approaches for these programs are tailored specifically to address the key barriers that often prevent these customers from participating.

How does this initiative promote equity?

The marketing, incentives, and delivery approaches used by energy efficiency programs can and should be targeted to hard-to-reach customers. Customers are more likely to participate if they receive a customized offering that addresses their unique barriers to participation and meets their needs.

What actions must states take to put this initiative in place?

Public utility commissions should establish an overarching goal for program administrators to reach all customers and direct program administrators to assess and report on the customers they have not reached to date. Program administrators should set forth in their plans how they will reach and serve customers who have not participated. Creation of new program designs and adjustments to existing program designs are approaches that should be included in these plans. In the event that further information is needed to move forward, public utility commissions should consider establishing statewide working groups to better coordinate improvements to program designs and further investigate barriers to participation.

What are the potential energy savings from this initiative?

All states can benefit from implementing best practices for hard-to-reach programs. States that are leading the way with aggressive savings targets can benefit from the realization of additional savings. States with little to no experience with energy efficiency can leverage learning from years of experience with these programs and customers to get started on the right foot.

Equitable efficiency initiatives in action

Low-Income Programs. Program administrators can increase the reach of their low-income programs by implementing a one-stop shopping program design, improving program coordination and partnerships, and addressing health and safety issues in homes.

- One-stop shopping. Where there is more than one program administrator in an area, designating a single or primary service provider can produce a seamless approach and greatly simplify the process for participants. Making eligibility requirements consistent with other programs can reduce the administrative burden for participants and program administrators alike. Program administrators throughout Massachusetts collaborate with each other, which has helped to ensure comprehensive, fuel-blind, consistent services statewide.[45]

- Program coordination and partnerships. Partnerships can enable program administrators to leverage multiple funding sources and marketing and delivery resources (ratepayer, state, federal, or other) and thus achieve more than any single organization could on its own.
- Addressing health and safety issues. Low-income programs do not typically address health and safety issues, even though customers are often precluded from participating without related repairs. New Jersey's Comfort Partners program reviews, tests, and corrects for a wide range of health and safety issues in participants' homes.[46,47]

Multi-Family Programs. Multi-family buildings are frequently defined as buildings with five or more units. There is an overlap between multi-family programs and low-income programs in that some multi -family buildings provide affordable housing for low-income residents. Many of the approaches mentioned above with respect to low-income programs are also applicable to low-income multi-family programs. The approaches specific to increasing the reach of multi-family programs include benchmarking, market segmentation, and incentive design.

- Benchmarking. Massachusetts program administrators offer good examples of benchmarking through their statewide Low-Income Multi-Family program. All properties have their energy usage benchmarked before implementation using a consistent statewide tool so program administrators can target high energy users. The program also requires that applicants participate in post-implementation benchmarking to track improvements. This has provided important data to building owners that has motivated owners who have not participated in the past to participate.[48]
- Market segmentation. Energy Trust of Oregon's Multi-Family Retrofit Program offers a good example of market segmentation. The program has business development leads who specialize in the needs of a particular segment of the market, including market-rate, campus living, assisted living, condos, and affordable housing. These leads are developing marketing materials to target different levels of decision makers as well as their particular segment.[49]
- Incentive design. Puget Sound Energy's program has achieved the highest cumulative participation rate to date with its approach to incentives, reaching 49 percent of the buildings in its territory. After the free onsite energy audit that is required for eligibility, the owner can choose to schedule directly installation of no-cost measures such as lighting and hot water measures. A prequalified contractor is then identified by Puget Sound Energy's customer representative to follow up with owners regarding more extensive energy efficiency measures.[50,51] Sacramento Municipal Utility District's Multi-family Home Performance program offers a mix of no-cost direct install and rebates to lead to more comprehensive energy savings. The program also combines per-unit incentives and low-cost financing for buildings achieving 10 percent reductions in energy use. A tiered incentive approach of $40 per unit for each 1 percent of energy reduction drives both greater participation and additional savings per unit. This program has achieved 29 percent energy savings, greater than the 10 percent minimum requirement.[52]

Small Business Programs. Small business programs typically target customers with electric demand up to 100 or 200 kilowatts. Program administrators can increase the reach of their small business programs by implementing a one-stop shopping program design, improving incentive design, better segmenting their customers, and using a sales-focused marketing approach.

- One-stop shopping. The most widely adopted strategy to help overcome major barriers unique to this customer segment is to provide a one-stop shopping, full service program that brings all of the necessary services to small business customers. In this service, qualified contractors selected by

the program conduct energy audits and install measures, while the customers simply have to enroll in the program and approve specific measures.

- Incentive design. A best practice for small businesses is to offer generous incentives along with low - or zero-interest rate loans. For example, United Illuminating Company and Connecticut Light and Power's Small Business Energy Advantage program packages together offer an audit, significant incentives, and loans for a range of products. The more comprehensive the project, the greater an incentive is offered. The impact of the loans on participation is significant for small businesses, driving 50-67 percent participation for those who qualify for a loan versus 20 percent for those who do not.[53]
- Market segmentation. A good strategy to encourage higher participation at a lower cost is to target sub-segments of customers with similar needs and equipment, such as convenience stores. Program administrators can better meet the specific needs of this sub-segment through customized marketing and by developing packages of measures that are most applicable to these businesses.[54]
- Sales-focused marketing. The best small business programs sell efficiency services and products to customers in a way that meets each potential customer's unique needs and concerns.[55] After adopting this marketing approach by hiring auditors with significant sales experience, Minnesota's One-Stop Efficiency Shop program significantly increased participation rates over many years.[56]

Footnotes

[44] Government programs are typically rolled into new construction and retrofit programs for large and small businesses. However, the incentive for municipal buildings can be greater than for other buildings to overcome financial hurdles specific to these buildings and enable all customers to realize the multiple benefits of energy efficiency in these buildings (i.e., lower taxes).

[45] Nowak, S., M. Kushler, P. Witte, and D. York. 2013. "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs." ACEEE. p. 188-193.

[46] Ibid, p. 188.

[47] Kushler, M., D. York, and P. Witte. 2005. "Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs." ACEEE. p. 38.

[48] Nowak, S., M. Kushler, P. Witte, and D. York. 2013. "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs." ACEEE.

[49] ACEEE. "Effective Marketing and Outreach Strategies for Multi-family Energy Efficiency Programs."

[50] ACEEE. May 2014. "Recommendations and Best Practices for Revising Incentive Structure." Available at: http://aceee.org/sites/default/files/pdf/revising-incentive-structure.pdf.

[51] ACEEE. October 2014. "Effective Strategies for Achieving High Participation and Deeper Savings in Income-Eligible Multi-family Buildings." Available at: http://aceee.org/sites/default/files/pdf/strategies-high-participation-multifamily.pdf.

[52] ACEEE May 2014. "Recommendations and Best Practices for Revising Incentive Structure." Available at: http://aceee.org/sites/default/files/pdf/revising-incentive-structure.pdf.

[53] Nowak, S., M. Kushler, P. Witte, and D. York. 2013. "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs." American Council for an Energy-Efficient Economy.

[54] ACEEE. January 2015. "Expanding the Energy Efficiency Pie: Serving More Customers, Saving More Energy Through High Program Participation." Available at: http://aceee.org/sites/default/files/publications/researchreports/u1501.pdf.

[55] Ibid.

[56] Funk, K. 2012. Small Business Energy Efficiency: Roadmap to Program Design. Proceedings of 2012 ACEEE Summer Study on Energy Efficiency in Buildings.

9. Transform the Efficiency Market

Market transformation programs promote equity by removing various market and institutional barriers to implementing energy efficiency measures and making cost-effective energy efficiency measures widely available for all residents and businesses. Examples of market transformation activities and programs include, but are not limited to, research and development, customer education and outreach, technical assistance and training for vendors, new construction programs, and programs supporting the development of building energy codes and appliance standards.

Upstream incentive programs are a promising, emerging market transformation program strategy that could have a significant long-term impact on the market. Upstream programs provide incentives to partners in the market supply chain such as manufactures, distributors, and retailers instead of directly to customers. Upstream incentives have been used successfully for efficient lighting measures for many years, and more recently have been tried for other measures such as consumer products and heating, ventilation, and air conditioning systems.

How does this initiative promote equity?

Upstream incentive programs have the potential to dramatically increase the market penetration of energy-efficient measures at a significantly reduced unit cost. As a result, energy-efficient products are widely available to all customers, including hard-to-reach customers.[57,58]

What are the potential energy savings from this initiative?

The potential to increase program participants with upstream incentive programs is significant. For example, Pacific Gas and Electric Company adopted an upstream incentive strategy for its commercial heating, ventilation, and air conditioning program for the first time in 1998 and increased participation rates by 6 to 10 times since then. It is estimated that energy-efficient packaged heating, ventilation, and air conditioning equipment achieved 20 to 40 percent market share after upstream incentives were implemented.[59]

What actions must states take to put this initiative in place?

Program administrators should consider developing upstream incentive programs to significantly increase the uptake of energy efficiency measures and serve a greater number of hard-to-reach customers.

Equitable efficiency initiatives in action

The Energy Trust of Oregon's Existing Multi-Family Program has adopted upstream incentives by working with major equipment distributors in order to streamline its program application. The upstream incentives have made participation easier and quicker, increasing project volume and lowering transaction costs for property owners as well as for the program administrator. The number of participating properties in 2012 was more than double the number of participating properties in 2011, before the incentives were in place.[60]

Footnotes

[57] Quaid, M., H. Geller. May 2014. *Upstream Utility Incentive Programs: Experience and Lessons Learned*. Southwest Energy Efficiency Project. Available at: http://www.swenergy.org/data/sites/1/media/documents/publications/documents/Upstream_Utility_Incentive_Programs_05-2014.pdf.

[58] Sondhi, R., N. Strong, and G. Arnold. 2014. *The End of Prescriptive Rebate Forms? Massachusetts Moves Upstream*. ACEEE Summer Study on Energy Efficiency in Buildings. Available at: http://aceee.org/files/proceedings/2014/data/papers/4-618.pdf

[59] Quaid, M., H. Geller. May 2014. *Upstream Utility Incentive Programs: Experience and Lessons Learned*. Southwest Energy Efficiency Project. p. 6-7. Available at: http://www.swenergy.org/data/sites/1/media/documents/publications/documents/Upstream_Utility_Incentive_Programs_05-2014.pdf.

[60] Johnson, K., E. Mackres. March 2013. *Scaling Up Multi-family Energy Efficiency Programs: A Metropolitan Area Assessment*. American Council for an Energy-Efficient Economy. Available at: http://aceee.org/sites/default/files/publications/researchreports/e135.pdf.

Ratepayer-Funded Energy Efficiency Program Funding

10. Leverage New Funding

Most energy efficiency programs are funded by a small charge to each kilowatt-hour of energy used by customers. These funds enable program administrators to offer incentives to customers to install energy efficiency measures. The Clean Power Plan could be a new funding source for energy efficiency.[61]

How does this initiative promote equity?

Additional funding supports energy efficiency services for additional customers, including hard-to-reach customers.

What are the potential energy savings from this initiative?

The potential energy savings from the Clean Power Plan depend on the compliance mechanism used; whether the state sells/auctions allowances or credits to coal or gas plants; and how much of the allowances, credits, or money is made available to energy efficiency in each state.

What actions must states take to put this initiative in place?

States interested in providing additional temporary funds for energy efficiency can opt into the Clean Power Plan's Clean Energy Incentive Program. States and EPA each award program administrators with one allowance (or credit) for every megawatt-hour saved through low-income energy efficiency programs in 2020 and 2021. Starting in 2022, program administrators can sell these allowances to electric generating units that need them for compliance. The funds can be used to implement additional energy efficiency efforts in a subsequent year. Utility regulators can require program administrators to earmark these funds to programs serving low-income customers.

States interested in providing an additional ongoing funding stream for energy efficiency can take one of three approaches. Each approach generates funds from each year of energy efficiency program savings, funds that can be used to support program efforts in a future year or years.

Under mass-based compliance:

1. States can allocate all or a portion of the proceeds from an auction of allowances to program administrators.
2. Or, states can allocate all or a portion of the allowances to program administrators to sell to coal or gas power plants.

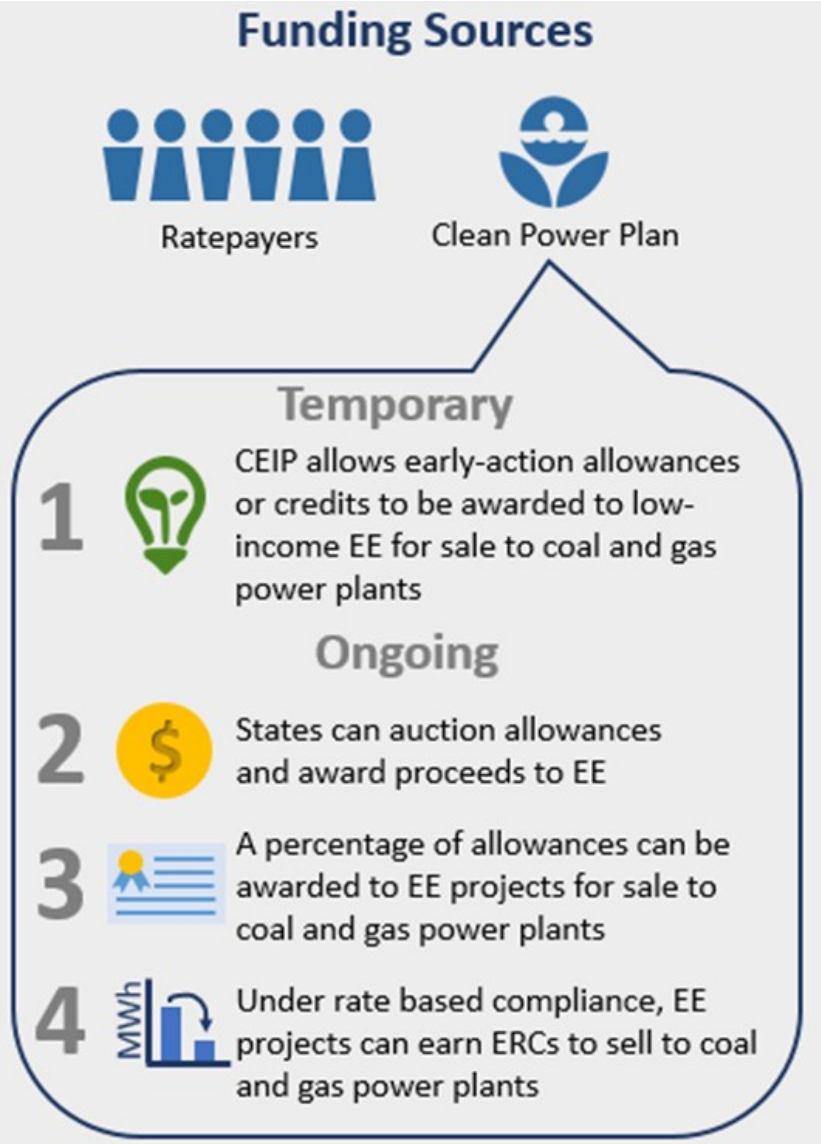
Under rate-based compliance:

3. Program administrators can earn credits equal to the previous years' megawatt-hour savings and sell them to power plants.

Equitable efficiency initiatives in action

States have yet to develop compliance plans for the Clean Power Plan, so examples are forthcoming. Figure 5 presents a schematic of the funding sources available for energy efficiency programs, including from the Clean Energy Incentive Program.

Figure 5. Funding sources for energy efficiency programs



Footnotes

[61] Other examples of energy efficiency funding sources for ratepayer-funded efforts include, but are not limited to, revenues from energy and capacity markets, regional carbon emission markets, federal funds for the low-income Weatherization Assistance Program (WAP), and third-party financing.