

Evaluating Low-Income Energy Efficiency Programs

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While low-income energy efficiency programs share many goals and characteristics with general market residential energy efficiency programs, they often differ in objectives, design, participants, and impacts. This poster focuses on three program areas – program design, analysis issues, and cost-benefit analysis – where different considerations should be taken into account when evaluating low-income programs. Some of the important implications for program evaluation are as follows.

Program Design

Program design issues that differ in low-income programs include the ability of the program to treat higher usage households and how measures are selected for installation.

- *Treating higher usage customers.* Treating higher usage customers has been shown to result in greater energy savings. While low-income energy efficiency programs can restrict participation to high usage households, general residential programs must target their marketing to encourage participation by the highest users.
- *Measure selection.* Programs that select cost-effective measures with the greatest impact on energy usage are most likely to achieve their goals for usage reduction. While low-income energy efficiency program auditors and installers select program measures according to priority lists or cost-benefit calculations, general residential programs must design incentive structures to encourage comprehensive cost-effective retrofits.

Analysis Issues

Analysis issues that distinguish low-income energy efficiency program evaluation from general market program evaluation include energy education, affordability and payment impacts, and program interactions.

- *Energy education.* Energy bills can be a large fraction of a low-income household's budget. The average household in the U.S. spends four percent of income on energy, but the average low-income household spends over 15 percent. Therefore, reduction in energy costs can have a much bigger impact on the low-income household's budget, and these customers may have greater motivation to change their behaviors to reduce energy usage. Many low-income programs are designed to provide intensive education to take advantage of this opportunity, so low-income evaluations should have an increased focus on assessing the quality and impacts of the energy education. General market residential programs may only achieve behavioral change in response to other motivators, such as environmental concerns.

- *Affordability and payment impact.* Low-income energy efficiency program evaluations should assess whether the program achieves the goal of reducing energy bills, increasing energy affordability, and increasing bill payment compliance.
- *Program interactions.* Free-ridership is not usually considered to be an important issue in the evaluation of low-income efficiency programs, as participants in these programs rarely undertake energy efficiency improvements in the absence of the program. However, a related issue is household participation in other available energy programs that may impact the energy usage of the home. These services may have been delivered separately or in conjunction with the program currently being evaluated. Questions that need to be addressed are whether the cost-effectiveness test is only based on the benefits that were derived from the program being evaluated and, if so, how to attribute savings to the different programs that may have contributed to the energy savings.

Cost-Benefit Analysis

Cost-benefit analyses of low-income energy efficiency programs should assess who accrues the benefits of the usage reduction, what economic benefits can result from reduced ratepayer subsidies, and how cost-effectiveness should be assessed.

- *Benefit accrual.* Energy cost reductions that result from low-income energy usage reduction may accrue to ratepayers and/or to low-income participants depending on the structure of bill payment assistance programs that households participate in.
- *Economic benefits from reduced ratepayer subsidy.* The economic benefits that result from low-income usage reduction programs include the multiplier on the reduced ratepayer subsidy that may result from these programs.
- *Measure of cost-effectiveness.* Low-income energy efficiency program measures should be individually cost-effective, as ratepayers bear the full cost of the measures. However, the cost-effectiveness calculation raises many questions. Should health and safety measure costs, that are not intended to save energy but to make sure that energy can be used safely in the home, be counted toward the overall cost-effectiveness calculation, or can these costs be excluded? Can measure savings be based on guidelines or on previous savings results for the individual program? Should expected measure savings be based on what would be saved for the average household, or should individual household characteristics be factored in?

These are some of the key issues that separate low-income energy efficiency program evaluation from other residential energy efficiency program evaluations, and they are important to take into account when conducting the different types of evaluations.