

Evaluation of Energy Affordability Programs

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Abstract

Energy affordability programs have been implemented by state governments, public utility commissions, and utility companies around the country. The purposes of these programs are to make energy more affordable for low-income customers and reduce the problems that are associated with unaffordable energy bills. This paper describes how these programs are designed and evaluation strategies for assessing these programs. Results from several different affordability programs are compared and related back to differences in program design and implementation.

Introduction

Low-income customers have difficulty meeting their energy needs because of high energy usage and bills and/or because of insufficient income to meet their energy expenses. While low-income energy efficiency programs address the problem of high usage, bill payment assistance programs are often still needed for many low-income households. Energy affordability programs have been implemented by state governments, public utility commissions, and utility companies around the country to meet these needs. These programs aim to make energy more affordable for low-income customers and reduce the problems that are associated with unaffordable energy bills. There are many different design options that have been incorporated into these programs, and several of these options are discussed in this paper.

Given the large amount of funds that are spent on low-income energy affordability programs (about \$1.7 billion in 2005)¹, it is important to assess whether the programs are meeting their goals and how they can be more effective. Several different types of evaluation strategies are used to develop this information. This paper describes these evaluation activities, presents findings from four evaluations, and provides an analysis of how the characteristics of these programs are related to their effectiveness.

Affordability Programs

Energy affordability programs provide customers with assistance toward their utility bill and often forgive past due balances. There are many design options for energy affordability programs. Some of the design options include:

- *Coordination with energy efficiency programs:* Some programs target affordability participants for energy efficiency programs and some programs require that affordability participants accept energy efficiency services to continue as a participant in the affordability program.

¹ Source: LIHEAP Clearinghouse.

- *Benefit design*: Benefits may be designed in several different ways. For example, the customer may pay a percentage of income, the customer may be assigned a benefit based upon a number of factors, or the customer may receive a percentage discount on the bill.
- *Benefit payment*: Payments can be designed so that the customer pays a fixed amount each month, the customer receives a fixed credit each month, or the customer receives a percentage discount each month.
- *LIHEAP crediting*: Programs deal with other energy assistance benefits in different ways. Some programs credit Low-Income Home Energy Assistance Program (LIHEAP) benefits to the customer's bill and some programs use the LIHEAP benefit to offset the program benefit. Some programs charge the customer a penalty if the customer does not apply for LIHEAP.
- *Arrearage forgiveness benefits and responsibilities*: Many programs have an arrearage reduction component where customers have the opportunity to reduce prior balances if they meet certain requirements. This program aspect differs in terms of the customer's required responsibilities to receive arrearage forgiveness, the amount of arrears that are forgiven, and the length of time over which arrears are forgiven.

Table 1 displays the characteristics of four affordability programs whose evaluation results are described in this paper. All of the programs examined are run by gas and/or electric utilities. However, the utilities vary widely in terms of the number of customers served. Program participants range from 814 for the smallest utility to over 100,000 for the utility serving the largest number of residential customers. The number of participants has an impact on the way the utility manages the program. The smaller programs are managed on a case-by-case basis, for example one utility has a representative who calls customers who do not return applications, calls customers when their bills are about to come due, and calls customers again when their payments are late. Larger utilities usually have a call center that handles program related issues, and do not contact the customers other than for recertification and in a collections mode, if necessary. However, more personal contact may be required for improved performance.

While all of the programs serve customers with income at or below 150 percent of the Federal Poverty Level (FPL), some programs restrict participation to customers who have arrearages or who have broken at least one payment arrangement. Two of the programs provide various rate discounts, depending on FPL and two of the programs provide payments equal to a fixed percentage of income, depending on FPL. One program limits the benefit to \$840 over the calendar year.

All of the programs studied provide arrearage forgiveness to customers, granted that they meet bill payment guidelines. Arrearage forgiveness periods range from six months to three years, and arrearage forgiveness levels range from \$600 to the full arrearage (potentially thousands of dollars).

The two utilities with rate discount programs apply LIHEAP grants to the customer's bill payment responsibility, and the two with percentage of income programs use the LIHEAP payments to offset the program benefit cost. One of these programs charges customers a \$100 penalty if they do not apply for their LIHEAP benefit.

Table 1. Affordability Program Characteristics

	Utility 1	Utility 2	Utility 3	Utility 4
Fuel	Gas	Gas	Gas	Gas/Electric
Program Participants	814	2,346	58,143	104,599
Income Eligibility	150%	150%	150%	150%
Other Eligibility	\$200 in arrears	Broken payment arrangement (not enforced). Must have balance.	None	Payment troubled, defined broadly.
Program Length	3 years	Removed when balance reaches \$0.	Indefinite	Indefinite
Benefit	75%, 50%, 0% discount.	Payment equal to 7%, 8%, or 9% of income.	Payment equal to 8%, 9%, or 10% of income.	85%, 75%, 50%, or 25% discount on electric.
Benefit Payment	% discount	Fixed Payment	Fixed Payment	% discount
Maximum Credit	None	\$840	None	None
Arrearage Forgiveness	1/36 each month over 36 months, up to maximum of \$600.	\$5/month Match of additional payments up to \$400.	1/36 each month. No limit.	Forgiven in entirety after 6 full monthly payments.
LIHEAP Benefits	Applied to the customer's bill over a one-year period.	Applied to the program credit. \$100 penalty for failure to apply.	Applied to the program credit.	Applied to the customer's bill at the time of credit.
Enrollment	Utility, phone and mail in application	Utility phone for fixed income, LIHEAP, and CAP. Agency enrollment for others.	Visit one of utility's local customer service centers, or apply by mail.	Utility, phone and mail in application

The affordability program design options may impact the program's effectiveness in increasing bill payment compliance, maintaining or increasing LIHEAP grant receipt, and reducing customer balances. We examine how program characteristics are related to these impacts later in this report.

Evaluation Components

Evaluation designs differ, depending on the scope of the research and the key questions that the evaluation must answer. This section of the report describes the research activities that are generally undertaken in these evaluations, the information that these research activities provide, and challenges that may be involved when undertaking the research.

Background Research

Background research involves collecting and reviewing program documentation and interviewing program actors to develop an understanding of the goals, design, and implementation of the program. The extent of the background research varies, depending on whether the research focuses on process or impact issues, and may appropriately relate to the maturity of the program. Interviews with program managers and

program staff provide an understanding of how the program works, barriers to participation or success in the program, and potential improvement to program policies and procedures. A review of program documentation furnishes a broader understanding of how the program is designed and implemented. Review of basic program statistics provides information on the number of customers served and the amount of assistance provided.

Programs often do not have easily accessible and complete information on the goals, rules, and procedures for the program. As a result, the completed evaluation report often serves as the most comprehensive program manual, documenting program procedures, and how the program is implemented in practice. The background research sometimes shows that program managers and/or staff do not fully understand how the program is implemented. For example, managers and staff of one program asserted that customers were required to be payment troubled to enroll in the program. However, when examining each layer of the program enrollment process, it was clear that this requirement was never implemented.

The most challenging aspect of this research is often to find and sort through many pieces of conflicting information to put together an accurate description of how the program is designed and how it is ultimately implemented.

On-Site Observation

On-site observation of customer enrollment provides information on customer concerns and issues that arise during the enrollment process. Alternatively, observation at a customer call center can also provide insight into the enrollment process, customer questions that arise during the process, and challenges or barriers to program enrollment. Observation also provides important information on how customers are educated about the program and the actual requirements that they must meet to receive program benefits.

On-site observation is an important opportunity to learn how program implementation may differ from program design and documentation. If a sufficient number of observations is conducted, the evaluator can quantify the extent to which customer service representatives follow program procedures, and make conclusions as to whether procedures are burdensome and need to be adjusted, and whether additional staff training is needed.

Concrete findings from one affordability program evaluation included:

- Representatives explained the arrearage reduction portion of the bill in *less than one-third* of the enrollments.
- Representatives discussed the amount of arrearage forgiveness the customer would receive each month, and explained that the customer must pay his/her bill on time and in full to receive this arrearage forgiveness in *over three quarters* of the observations.
- Representatives notified the customer that his/her utility service could be shut off if he/she missed one payment in *less than one third* of the observations.
- Representatives explained the re-certification requirement in *just over half* of the cases observed and told the customer how to re-certify in *one-third* of the cases.

It is important for program managers to have quantifiable performance statistics to justify use of program resources for retraining.

Customer Interviews

Customers who currently participate in the program, who have left the program, and who have never participated in the program are surveyed to develop information about how the program affects the participants. Information from these interviews can be used to assess how communication between the administrator and the participants impacts program performance, how communication can be improved, and any existing barriers to improving these communications. These interviews also allow us to analyze the extent to which customers understand program requirements and benefits, participants’ perceived impact of the program, and problems customers face in meeting their energy and their other needs. We have asked the same battery of survey questions in many of these program evaluations, and therefore have a context for understanding the results. In this section, we provide a few samples of the questions and responses that we have received in these surveys.

Table 2 displays customer responses to the question, “What do you feel are the benefits of the program?” As expected, the most common response to the question is lower energy bills. However, one surprising finding is the percentage of customers who said that the equal monthly payments is a benefit of the program, as most utilities offer all customers the opportunity to participate in a budget billing plan where monthly payments are equalized over the year. For one of the programs evaluated, customers were even more likely to identify the equal payments as a benefit than they were to cite the reduced energy bills. Customers also may be more likely to pay their bills when they have a regular utility bill amount that is included in their monthly budget. Therefore, we recommend that utilities stress a budget bill offering to all lower income customers, even those who do not participate in the affordability program.

The other most common responses to the question about participants perceived benefits from the program are the ability to maintain utility service and reduced utility balances.

Table 2. Benefits of the Affordability Program – Unprompted Customer Survey Responses

“What do you feel are the benefits of the program?”				
	Utility 1	Utility 2	Utility 3	Utility 4
Lower energy bills	48%	33%	30%	50%
Even payments	29%	22%	41%	14%
Maintaining service	9%	20%	16%	11%
Reduced arrearages	14%	15%	16%	7%
Don’t know	9%	2%	9%	10%

Table 3 displays customer responses to the questions, “How difficult was it to make your monthly utility bill payments prior to participating in the affordability program” and “How difficult is it to make your monthly utility bill payments while participating in the affordability program?” All of the evaluations showed a large reduction in the percentage of customers who said that it was very difficult to pay their utility bills. However, a significant share of customers still said it was somewhat difficult to pay their energy bills even while participating in the affordability program. In three of the four programs studied, about half of the customers said that it was still very or somewhat difficult to pay their monthly utility bills while enrolled in the affordability program.

Table 3. Utility Bill Payment Problems – Customer Survey Responses

	“How difficult is it to pay your monthly utility bills?”							
	Utility 1		Utility 2		Utility 3		Utility 4	
	Prior to Enrolling	While Enrolled	Prior to Enrolling	While Enrolled	Prior to Enrolling	While Enrolled	Prior to Enrolling	While Enrolled
Very difficult	64%	10%	83%	9%	63%	15%	56%	9%
Somewhat difficult	24%	41%	9%	41%	20%	34%	31%	28%
Not too difficult	9%	24%	4%	19%	5%	29%	6%	35%
Not at all difficult	3%	24%	2%	30%	10%	1%	5%	27%

Table 4 displays customer responses to the questions, “Do you feel that you need additional assistance to pay your utility bill?” While a significant percentage of the participants in each study said that they needed additional assistance, the percent of current program participants who said that they needed additional assistance was much lower than the percentage of past participants and of non-participants.

Table 4. Additional Utility Bill Assistance Needed – Customer Survey Responses

	Utility 1	Utility 2	Utility 3	Utility 4
Current Participants	43%	52%	57%	60%
Past Participants	84%	63%	84%	62%
Non Participants	56%	82%	74%	79%

These surveys are also used to address specific program concerns about issues such as application procedures or LIHEAP applications. They provide information beyond what may be obtained from analyzing program, transactions, and energy usage data, and help to explain the results from these data.

While customer surveys are an informative and valuable component of the evaluation research, they are time-consuming and often make up a significant part of the evaluation budget. To obtain good quality data, survey questions must be pre-tested to confirm that responses provide the desired information; telephone interviewers must be trained and observed; and customers must be given a large window of time to respond, with call attempts made during the day, at night and during the weekend.

Billing Analysis

Billing, payment, and usage data are analyzed for customers who have participated in the program and for a sample of low-income eligible customers who have not participated in the program. Former program participants are also analyzed in certain cases. Data analyzed includes characteristics of program participants, program retention, and impacts of the program on energy affordability, cash and assistance payments, bill coverage rates, balances, collections actions and costs, and weather-normalized usage. This section of the report compares selected impact results from four affordability program evaluations that we conducted.

Table 5 displays the payment impact results from four affordability program evaluations that we have conducted. The gross change is the difference between the pre and post-treatment statistics for the treatment group. This is the actual change in behaviors and outcomes for those participants who were served by the program. Some of these changes may be due to the program, and some of these changes are due to other exogenous factors, but this is the customer's actual experience. The net change is the difference between the change for the treatment group and the change for the comparison group, and represents the actual impact of the program, controlling for other exogenous changes. We often use low-income non-participants or later program participants as a comparison group.

The table shows that three of the four programs resulted in a gross reduction in energy bills and all four programs results in a net reduction in energy bills. The level of change in the bill relates to the program benefit that was described above. The Utility 1 program provides smaller discount levels than the Utility 4 program, and participants from this utility have the smallest declines in their bills. While the Utility 2 program provides lower percentage of income payments than the Utility 3 program, the Utility 2 program caps benefits at \$840 annually, and the Utility 3 program provides unlimited benefit amounts. As expected, Utility 3 customers have larger declines in their bills.

One of the common goals of the affordability programs is to enable customers to maintain consistent utility bill payment practices. As a result of providing more affordable bills, customers may be more likely to make regular bill payments, and increase the total amount of payments that they make. This was the case for participants in three of the four programs where gross customer payments increased. Utility 4 participant payments declined. More detailed analysis on this program showed that it was likely related to the structure of this program benefit, which required most customers to pay less on the program than they had paid in the year prior to enrollment. However, while all other program participants showed a significant increase in their total bill coverage rate, Utility 4 participants had a very small increase in the coverage of their discounted bill, compared to the coverage of their full pre-program bill. However, Utility 4 customers had large declines in their balances, due to the generous and less restrictive arrearage forgiveness program.

Table 5. Affordability Program Payment Impacts

	Utility 1		Utility 2		Utility 3		Utility 4	
	2002 & 2003 Enrollees		2003 Enrollees		2003 Enrollees		2003 Enrollees	
	Gross Change	Net Change	Gross Change	Net Change	Gross Change	Net Change	Gross Change	Net Change
Energy Bill	\$96**	-\$86**	-\$127**	-\$273**	-\$304**	-\$441**	-\$312**	-\$315
Cash Payments	\$182**	\$65**	\$249**	\$97**	\$88**	-\$55**	-\$232**	-\$254**
Assistance Payments	\$44**	\$43**	-\$145**	-\$231**	-\$139**	-\$151**	\$5**	\$9
Total Payments	\$226**	\$108**	\$104**	-\$133**	-\$51**	-\$206**	-\$226**	-\$244**
Total Coverage Rate²	15%**	22%**	18%**	11%**	13%**	11%**	4%**	2%
Arrearage Forgiveness	\$60**	\$60**	\$42**	\$42**	\$87**	\$87**	\$392**	\$392**
Balance	\$11	-\$35**	--	--	\$72**	\$42	-\$248**	-\$262**
Information from Affordability Program Characteristics (Table 1)								

²The total coverage rate is the coverage of the asked to pay amount.

	Utility 1		Utility 2		Utility 3		Utility 4	
	2002 & 2003 Enrollees		2003 Enrollees		2003 Enrollees		2003 Enrollees	
	Gross Change	Net Change	Gross Change	Net Change	Gross Change	Net Change	Gross Change	Net Change
Benefit	75%, 50%, 0% discount.		Payment equal to 7%, 8%, or 9% of income.		Payment equal to 8%, 9%, or 10% of income.		85%, 75%, 50%, or 25% discount on electric.	
Maximum Credit	None		\$840		None		None	

**Denotes statistical significance at the 99% level.

Because the affordability programs reduce the required payments, they often lead to reductions in collections actions and service terminations. Table 6 shows that participants in two of the programs had a reduction in the probability of service termination, as compared to non-participants. Utility 2 and Utility 3 program participants showed statistically significant 6 and 10 percentage point declines in their termination rates.

Table 6. Service Terminations

	Utility 1	Utility 2	Utility 3	Utility 4
Pre	5%	14%	15%	4%
Post	7%	8%	4%	2%
Gross Change	1%	-6%**	-10%**	-3%**
Net Change	-1%	-6%**	-10%**	0%

**Denotes statistical significance at the 99% level.

Energy affordability programs reduce the cost of using energy, and therefore program managers are often concerned that they may result in increased energy usage. However, evaluations have shown that this is not an issue.³ Table 7 shows that net increases in weather normalized energy usage are not statistically significant, or are a small percentage of pre program usage. One utility even showed a small but statistically significant decline in energy usage.

Table 7. Weather Normalized Energy Usage

	Utility 2	Utility 3	Utility 4		
	Gas (ccf)	Gas (ccf)	Gas (ccf)	Electric Heat (kWh)	Electric Baseload (kWh)
Pre	1,489	1,184	933	12,840	7,258
Post	1,485	1,199	909	12,949	7,309
Gross Change	-4	15**	-24**	109	51**
Net Change	6	32**	-31**	555*	53

³ One exception is where the discount is provided on electricity, and not on the heating fuel, so customers switch to using electric space heaters to reduce their total utility expenses.

Utility bill payment analysis requires understanding of the utilities billing and accounting procedures. Some utilities have difficulty providing billing and transactions data due to IT department staff restrictions. Attrition is often a problem, as customers move or have their utility service terminated due to nonpayment, and then it is not possible to follow these customers over time. Evaluations are often only able to include analysis of fifty percent or fewer of the customers who enrolled in the program. However, despite these data limitations, comparison of program results can provide information as to the potential of the programs and the need for modifications to improve program outcomes.

Evaluation Recommendations

Results from energy affordability program evaluations are used by program managers to refine their programs. The synthesis of these studies can be used by policymakers to design programs to better meet the need of low-income households. This section describes some of the conclusions of the evaluations, and relates these conclusions back to program design issues.

Table 8 shows some findings relating to program administration and program design. We found that the smaller utilities can efficiently handle the data requirements associated with program evaluation, but larger utilities need more sophisticated data systems to organize and manage their larger databases.

The two smaller utilities were more restrictive in their eligibility criteria, requiring customers to have an overdue balance to enroll in the program. These utilities also did not meet their enrollment targets. Past program participants expressed an interest in enrolling in the program again, if they were given the opportunity. Our evaluations recommended that these programs re-contact prior program participants and encourage program application to increase the number of low-income customers served by the program.

Table 8. Program Administration - Findings and Recommendations

	Utility 1	Utility 2	Utility 3	Utility 4
Program Administration	Thorough and accurate program and customer data.	Efficient system for program and customer data.	Difficulty providing customer data.	Difficulty providing customer data
Program Eligibility	Balance requirement	Balance requirement	Unrestrictive	Unrestrictive

Two of the four programs studied offered quite significant arrearage forgiveness components, allowing customers the opportunity to have their full utility debt, sometimes adding up to thousands of dollars, forgiven by the utility. One salient finding from the evaluation studies was that while customers did not have a good understanding of the arrearage forgiveness aspect of the program, they felt that this incentive did impact their bill payment behavior in a positive manner. We found that customers may not be knowledgeable about this program component because of a lack of customer education at the time of program enrollment or because of customer bills that did not highlight this information. We made recommendations to increase staff training on this issue and to modify customer bills to highlight the arrearage forgiveness benefit. Customers should be able to clearly see their current arrearage and the amount that was forgiven due to good payment behavior on their bill each month.

The original premise of affordability programs was that by asking customers to pay less than the full bill, the utility could increase the amount that customers paid. The impact analysis showed that participants in three of the four programs had significant improvements in the amount of cash payments made after enrolling in the program. One program had significant declines in the amount of cash payments. Further analysis of these data showed that most of these program participants were asked to pay less with the program discount than they paid in the year prior to enrolling. Thus, we recommended that program managers re-examine the program payment structure. One potential refinement would be to develop two tiers of discounts, higher discounts for customers who are severely payment-troubled with arrears over \$500, and lower discounts for customers with less severe payment problems.

Table 9 also shows the change in total bill coverage rates from the pre to the post program period. The table shows that Utility 4’s participants had higher coverage rates at the time of enrollment, and smaller increases in their bill coverage rates. This information also suggests that targeting of benefits to those customers who show the greatest need may result in larger impacts on bill payment compliance.

One other important difference between the Utility 4 program and the other programs was the requirements placed upon the customers to receive arrearage forgiveness. Utility 4 had less stringent requirements and much higher arrearage forgiveness, despite customers’ lower levels of payment compliance. This utility may be able to increase payment compliance by providing more stringent requirements for forgiveness, and educating customers about the payment requirements that must be met to receive the arrearage forgiveness.

The two utilities that used LIHEAP grants to reduce the bill subsidy showed large decreases in the amount of assistance credited to the bill. This is partially due to the fact that even LIHEAP payments that are received, are not counted towards the customers’ payment responsibility. However, these customers’ changes in total assistance received by the utility (including the part that was not credited to the customer’s bill) for the customer was negative, compared to the other two utilities that credit assistance directly to the customer’s bill and had an increase or no significant change in assistance receipt. These utilities could provide more outreach and incentive to increase assistance payments.

Table 9. Program Impacts - Findings and Recommendations

	Utility 1	Utility 2	Utility 3	Utility 4
Payment Impacts	Significant improvements.	Significant improvements.	Significant increase in cash payments.	Significant reductions in cash payments.
Energy Assistance	Increase in energy assistance. Substantial outreach by program analyst.	Statistically significant net decline in grants received despite LIHEAP penalty.	Statistically significant net decline in grants received.	Insignificant change in grants received.
Bill Coverage Rates	Increased from 84% to 99%.	Increased from 75% to 93%.	Increased from 71% to 84%	Increased from 85% to 89%.

Conclusion

Low-income energy affordability programs can provide significant benefits for customers, helping them to afford their energy bills and reduce their utility arrearages. Significant research is required to understand how the programs are designed and implemented, and what impacts they have on participating customers. Research has shown that particular program components can increase the success of these programs. Some of these characteristics include:

- Providing benefits to customers that are related to the amount of assistance that they need. One indicator of need is arrearages, and another is an unsafe or unhealthy home environment.
- Allowing customers to continue to participate in the program, even after they have paid off their full arrearage.
- Providing an arrearage forgiveness component that is tied to bill payment compliance, and educating customers about this requirement.
- Providing customers with an incentive to apply for LIHEAP assistance.
- Charging the customers an amount that is at least as much as they paid in the year prior to enrollment.⁴
- Providing the customers (even those who do not participate in the program) with a fixed monthly payment.

Additional research is needed to further document the relationship between program design parameters and participant success, defined as increased affordability, bill payment compliance, and reduced collections actions.

⁴ Some customers sacrifice essential needs to make their utility payments. The utility should make exceptions to this recommended practice when customers appear to make payments beyond what their financial circumstances allow. One such example would be for a household that has excessive medical costs.