

Energy Efficiency Mass Distribution Program Innovations

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ABSTRACT

The Weatherization Assistance Program (WAP) and utility low-income energy efficiency programs provide low-income customers with extensive services aimed at reducing energy usage and increasing the affordability of energy bills. As energy prices have risen and states have begun to focus on reducing greenhouse gas emissions, several states have scaled up their efforts with additional programs that target much larger numbers of households with lower cost energy efficiency services.

Colorado has taken a research-based approach to expanding energy efficiency services. Their program is unique because it explicitly designed program services and provider cost structures to target a Savings to Investment ratio, using realistic measure installation and retention rates. The program is adding to the research on energy efficiency by testing three different distribution methods side by side: in-home service delivery; one-on-one in-person energy kit delivery at a non-profit agency; and mass mailing energy kit delivery.

Program evaluation research was designed to test assumptions about measure installation and retention rates, changes in energy use behavior, and actual program impacts. Findings from the evaluation will be used to modify the program design and will provide important information for other states that are looking to implement similar programs.

Introduction

Energy prices throughout the U.S. rose in 2005 and early 2006, leading many state energy offices to examine how they could provide energy efficiency services to many more households than those that the Federal Weatherization Assistance Program (WAP) could assist. Some states implemented low cost programs that provided low-income households with energy efficiency kits through the mail. These kits generally included compact fluorescent light bulbs, energy efficient showerheads, and educational material. In Colorado, a regional advocacy group proposed a program that would similarly provide mass distribution of low-cost and cost-effective energy efficiency devices.

Colorado legislation passed in 2006 provides funds from Colorado's severance tax on oil and gas production for both low-income energy efficiency services and bill payment assistance. The statute requires that the Governor's Energy Office (GEO) strive to "serve as many low-income households through the state as possible and achieve the maximum lifetime energy savings per dollar expended." One of the initiatives that was developed was the First Response Program, which aims to provide cost effective services to substantially more households than the number served by Federal Weatherization Assistance Program.

Program Design

GEO hired consultants to conduct background research and develop information on program design options. The consultants furnished information on service delivery models for high-volume, low-cost services that have been implemented in other states. The research found that there were three primary models that were used.

- Direct install – Service delivery contractors visit clients' homes, provide them with energy efficiency measures, and educate them on energy efficient behaviors.
- Workshop – Group sessions are convened where information on energy efficiency is provided in an interactive format and energy efficiency measures are distributed.
- Mass mailing – Energy saving kits that include energy measures and education materials are mailed to client homes.

Based on analysis of potential savings, the consultants concluded that a program that focuses on low-cost service delivery of cost-effective measures can be cost-effective, even with relatively low measure and action adoption rates. They recommended that GEO pursue all three options and use the first program year to assess the total energy savings from each program model and to measure the cost-effectiveness of the program. Based on results from short-term projections and longer-term impact evaluation, GEO could then revise the mix of programs each fiscal year to enhance the overall program effectiveness.

Service Delivery Mechanisms

GEO developed requirements for service delivery after reviewing the consultants' design recommendations. Customers were assigned to the following service delivery mechanisms based on geography.

- **Direct Installation** – Providers conduct short visits to clients' homes to install measures and provide basic education. The visit is done by a two-person team and lasts approximately 60 minutes. During this time, providers install CFLs, energy efficient showerheads, and carbon monoxide/smoke detectors. Providers also measure the temperature of the refrigerator, freezer, and hot water, educate the clients on safe and energy efficient temperatures, and adjust temperatures where applicable. They discuss the heating thermostat setting and lower this setting if applicable. They also provide the clients with a card to measure the refrigerator/freezer temperatures and a card to measure the hot water temperature.
- **Workshop** – A classic group workshop model was not implemented because the program designers could not identify a location where they could obtain high enough client attendance to make the workshop cost-effective. Rather, when clients show up at local emergency assistance agencies (nonprofits) for assistance with their energy bills (provided through a hardship fund), representatives provide one-on-one mini-workshops. As the client discusses arrears and financial issues, the representative discusses actions the client can take to reduce energy consumption, and distributes a kit that contains CFLs,

an energy efficient showerhead, thermometers to measure hot water and refrigerator/freezer temperature, and educational materials.

- **Mass Mailing** – Energy efficiency devices and educational information are distributed to clients through the mail. The kits include CFLs, an energy efficient showerhead, thermometers to measure hot water and refrigerator/freezer temperature, and educational materials.

The implementation of these different models provides the opportunity to test the performance of each and assess the appropriate contribution of each to low-cost, high volume service delivery.

Provider Selection

The design consultants created spreadsheets to be included with the provider request for proposals. The spreadsheets contained assumptions about measure installation frequency, measure retention rates, rates of energy saving actions that would be taken by participants, state-level fuel costs, and resulting energy savings. Based on these predicted savings and on program costs provided by contractors, the spreadsheets calculated the savings to investment ratio for the proposal. GEO required that contractors achieve an SIR of 2.5 or greater.

Eligibility and Targeting

Households who are eligible for energy assistance in Colorado, those with income below 185 percent of the federal poverty standard, are eligible for First Response program services. Additionally, the First Response Program targets customers whose electric and gas consumption is average or below average. The goal was to serve customers with electric usage below 7,000 kWh per year and gas usage below 800 therms per year. However, the energy assistance data, which are available to GEO because they are used by to determine benefit levels, only contains heating costs. Therefore, GEO targeted households with \$600 or less in their six months of winter heating costs. The State expects to obtain energy consumption data from gas and electric utility companies and to screen energy assistance recipients in year two of the program.

Measure Delivery Rates

First Response direct install measure installation rates were higher than initially anticipated in the program design. Table 1 provides statistics on the average number of CFLs, showerheads and smoke/CO detector units installed per home. GEO allowed an average of up to 15 CFLs per home, but had originally assumed an average of 7.5 per home. Actual installations averaged 13.1 across all of the providers. While showerheads were expected to be installed in approximately 40 percent of households served, they were installed in 70 percent of homes. Smoke/CO detectors averaged one per home. These statistics are based upon 2,378 clients who were served between January and June 2007.

Table 1. Direct Install Delivery Measure Installation Summary

| | Number Installed per Home | | | | |
|--------------|---------------------------|------|------------|-------------|----------|
| | 15 W | 20 W | Total CFLs | Showerheads | Smoke/CO |
| Total | 9.2 | 4.0 | 13.1 | 0.7 | 1.0 |

The workshop model delivered energy kits with the following materials to approximately 275 clients by summer 2007.

- One 13 watt CFL and one 23 watt CFL
- One energy efficient showerhead
- A thermometer device to measure the hot water and refrigerator/freezer temperature
- Information on how to use the thermometer
- A quick start guide and energy saving tips.
- An order form for up to eight additional CFLs and one additional showerhead.
- A follow-up survey to assess installation of the CFLs and showerhead.

Three different vendors were hired to mail out the energy kits. Table 2 shows some variation in the contents of the kits and education materials provided by the three vendors. Over 10,000 kits were mailed out by summer 2007.

Table 2. Contents of Mailed Energy Kits

| Vendor 1 | Vendor 2 | Vendor 3 |
|---|---|--|
| <ul style="list-style-type: none"> • Two 15 watt CFLs • Two 23 watt CFLs • One energy efficient showerhead • One hot water temperature gauge card • The brochure that GEO developed. This brochure explains the products and furnishes a toll free number for people to call GEO for more information on energy assistance. • Instructions on how to install the devices. | <ul style="list-style-type: none"> • Two 15 Watt CFLs • Two 20 Watt CFLs • One energy efficient showerhead • One temperature card for measuring the hot water temperature • One temperature card for measuring the refrigerator and freezer temperatures • The brochure that GEO has created • A postcard that clients can send back to request additional CFLs • An instruction flyer. | <ul style="list-style-type: none"> • Kit 1: one 13 watt CFL and three 23 watt CFLs • Kit 2: two 13 watt CFLs and two 23 watt CFLs • Kit 3: four 23 watt CFLs <p>All contained:</p> <ul style="list-style-type: none"> • One energy efficient showerhead • A thermometer device to measure the hot water and refrigerator/freezer temperature. • Information on how to use the thermometer. • A quick start guide and energy saving tips on other measures they can take and how much they can save. • A follow-up survey to assess whether the clients have installed the CFLs and showerhead. |

Client Survey Research

A survey was conducted in August and September 2007 with clients in the three delivery method groups: direct install, workshop, and mass mailing. The sample included clients served in the first six months of service delivery – January through June 2007. The sample frame was stratified by service delivery type and service delivery vendor. Less common delivery methods and service providers were oversampled to provide a significant sample size for each organization and delivery method. Interviews were conducted with 765 direct install clients, 106 workshop clients, and 563 mass mailing clients. The objectives of the survey were to assess program effectiveness overall and to compare the effectiveness of the program for the three delivery methods utilized.

Measure Installation and Retention

The survey asked respondents to report on the number of CFLs and efficient showerheads that the provider installed or that the client received in the energy kit, and the number that were still in use at the time of the survey, between two and eight months after service delivery. Key findings on measure recollection, installation, and retention are summarized below.

- **Respondent reports on the number of light bulbs received in their energy kits:** Survey responses for the number of CFLs provided roughly correspond to the number included in the kits, as shown in Table 3. The average number of bulbs that workshop recipients reported was 2.3, corresponding to the two bulbs provided in their kits, and the average number of bulbs that mass mailing clients reported was 3.9, corresponding to the four bulbs that they received in their kits.

Table 3. CFLs in Energy Kits

| Mean Number of CFLs in Energy Kit | | |
|-----------------------------------|----------|--------------|
| | Workshop | Mass Mailing |
| Provider Reports | 2.0 | 4.0 |
| Survey Response | 2.3 | 3.9 |

- **Respondent reports on the number of light bulbs installed by providers:** Table 4 displays the mean number of CFLs installed by all providers and by each local youth corps agency, as shown in provider reports and as reported by survey respondents. Provider reports for the direct install clients showed a range of 9 to 15 CFLs installed by the different providers. Overall, survey responses for the number of CFLs installed by providers are slightly lower than the provider reports, but are correlated with the differences in provider reports by agency. This discrepancy has been seen in other program research when large numbers of CFLs are installed by providers and clients do not recall all of the installations.

Table 4. CFLs Installed by Providers

| Mean Number of CFLs Installed | | | | | | |
|-------------------------------|-------------------------|------|------|------|------|------|
| | Direct Install Provider | | | | | |
| | All Providers | YC 1 | YC 2 | YC 3 | YC 4 | YC 5 |
| Provider Reports | 13.1 | 13.9 | 12.1 | 15.2 | 12.9 | 9.1 |
| Survey Response | 9.4 | 9.4 | 9.1 | 10.7 | 10.2 | 8.2 |

- **Respondent reports on provider showerhead installation:** Table 5 displays provider and survey respondent reports on the number of showerheads installed by all providers and by each local youth corps agency. Differences in respondent reports on showerhead installation by provider were also consistent with provider reports.

Table 5. Showerheads Installed by Providers

| Mean Number of Showerheads Installed | | | | | | |
|--------------------------------------|-------------------------|------|------|------|------|------|
| | Direct Install Provider | | | | | |
| | All Providers | YC 1 | YC 2 | YC 3 | YC 4 | YC 5 |
| Provider Reports | .72 | .77 | .67 | .68 | .75 | .55 |
| Survey Response | .66 | .74 | .60 | .58 | .70 | .45 |

Comparison of Delivery Methods

The initial design for the First Response program planned for a comparison of the cost-effectiveness of the three different delivery methods – direct install, workshop, and mass mailing. While the billing analysis impact results will provide the final answer on how the different methods compare, the survey results provide some preliminary information on the effectiveness of the three methods. Key findings from the survey were:

1. Direct install respondents had greater frequency of measure installation, retention and use.
 2. Workshop respondents were most likely to recall receipt of thermometers and report that they changed their hot water and refrigerator/freezer settings after receipt of program services.
 3. Workshop respondents were most likely to report that they made other changes in energy use after receipt of program services.
 4. Direct install and workshop respondents were more likely than mass mailing respondents to report that their energy bills were lower after receipt of program services.
- **Installation and retention of CFLs:** Table 6 displays statistics on CFL installation, retention, and use. According to program design, direct install program participants received a greater number of CFLs than workshop and mass mailing recipients. Direct install recipients recalled an average of 10 CFLs installed, compared to an average of 4 CFLs for workshop and mass mailing recipients. (Note: while workshop recipients only received 2 bulbs in their kits, they could request additional bulbs. The number in the table below factors in the additional bulbs that these clients requested and received.) The survey provided some evidence that the bulbs installed by the direct install providers were more likely to be placed in high use locations. While direct install respondents reported that an average of 2.8 of the CFLs provided are used more than four hours per day, workshop and mass mailing respondents reported that only an average of one of the installed CFLs was used more than four hours per day.

Table 6. Comparison of Delivery Methods - CFLs

| | Delivery Method | | |
|---------------------------------|-----------------|----------|--------------|
| | Direct Install | Workshop | Mass Mailing |
| # of CFLs Received | 9.8 | 4.3 | 4.0 |
| # of CFLs Installed | 9.8 | 3.2 | 2.8 |
| # of CFLs In Use | 9.1 | 3.2 | 2.7 |
| # of CFLs used > 30 minutes/day | 5.7 | 2.6 | 2.1 |
| # of CFLs used > 4 hours/day | 2.8 | 1.1 | 1.3 |

- **Installation and retention of efficient showerheads:** Table 7 displays statistics on showerhead installation and retention. While 58 percent of direct install respondents reported that they had an efficient showerhead installed, 46 percent of workshop respondents and 36 percent of mass mailing respondents reported that they installed an efficient showerhead. The majority of all of these respondents reported that the device was still installed at the time of the survey.

Table 7. Comparison of Delivery Methods - Showerheads

| | Delivery Method | | |
|--------------------------------|-----------------|----------|--------------|
| | Direct Install | Workshop | Mass Mailing |
| % with Showerhead Installed | 58% | 46% | 36% |
| % with Showerhead Still in Use | 55% | 44% | 31% |

- **Receipt and use of water temperature thermometers:** Table 8 displays statistics on receipt and use of water temperature thermometers. Workshop recipients were most likely to recall receipt of the thermometer, report that they used it, and report that they changed their water temperature setting. While 78 percent of workshop recipients reported that they received the thermometer and 42 percent reported that they changed their water temperature, only 18 percent of direct install recipients reported that the provider changed and they retained the water temperature setting, and 26 percent of mass mailing recipients reported that they changed their water temperature setting.

Table 8. Comparison of Delivery Methods - Water Temperature Thermometer

| | Delivery Method | | |
|---|-----------------|----------|--------------|
| | Direct Install | Workshop | Mass Mailing |
| Recalled Receipt of Water Temperature Thermometer | 42% | 78% | 54% |
| Understand How to Use Thermometer | 39% | 67% | 41% |
| Used Thermometer | 20% | 48% | 22% |
| Changed Water Temperature Setting | 18% | 42% | 26% |

- **Receipt and use of refrigerator/freezer thermometers:** Table 9 shows that workshop recipients were also most likely to recall receipt of the refrigerator/freezer thermometer, report that they used it, and report that they changed their refrigerator or freezer setting. This might be related to the fact that workshop recipients were provided with digital thermometers, while the rest of the respondents were provided with temperature cards (except Vendor 3 mass mailing clients, who also received the digital thermometer.) While 72 percent of workshop recipients reported that they received the thermometer and 43 percent reported that they changed their refrigerator or freezer or setting, 20 percent of direct install recipients reported that the provider changed and they retained the temperature change, and 28 percent of mass mailing recipients reported that they changed their refrigerator or freezer setting.

Table 9. Comparison of Delivery Methods - Refrigerator Thermometer

| | Delivery Method | | |
|--|-----------------|----------|--------------|
| | Direct Install | Workshop | Mass Mailing |
| Recalled Receipt of Refrigerator Thermometer | 48% | 72% | 67% |
| Understand How to Use Thermometer | 44% | 65% | 61% |
| Used Thermometer | 28% | 50% | 46% |
| Changed Refrigerator/Freezer Temperature | 20% | 43% | 28% |

- Change in other energy use behaviors:** Table 10 shows that workshop recipients were also most likely to report that they made other changes in energy use behavior as a result of the program. While 57 percent of workshop recipients reported that they made changes, only 26 percent of direct install recipients and 25 percent of mass mailing recipients reported that they changed their energy use behavior. Workshop recipients were more likely to provide unprompted changes in energy use behavior such as decreasing use of appliances, using less water, changing their air conditioner settings, turning off the computer when not in use, and using cold water for washing. They were also more likely to respond affirmatively to several questions about other changes that were made in energy use behavior after receipt of program services, as shown in the table below. For example, 27 percent of workshop respondents said that they began setting their heat at or below 68 during the day and 60 at night after receipt of program services, compared to 9 percent of direct install respondents and 13 percent of mass mailing respondents.

Table 10. Comparison of Delivery Methods - Change in Other Energy Use Behaviors

| Changes Made After Service Delivery | Delivery Method | | |
|---|-----------------|----------|--------------|
| | Direct Install | Workshop | Mass Mailing |
| Other Changes to Reduce Energy Usage | 26% | 57% | 25% |
| Reduced Use of Heat | 9% | 27% | 13% |
| Reduced Use of Air Conditioning | 3% | 7% | 10% |
| Got Rid of Extra Refrigerators/Freezers | 5% | 9% | 4% |
| Turn Off Computers When Not in Use | 7% | 11% | 8% |
| Turn Off Lights Not in Use | 6% | 21% | 13% |
| Use Cold Water for Clothes Washing | 9% | 19% | 10% |

- Overall program ratings:** Table 11 shows that workshop recipients were most likely to report that the program was very helpful in teaching them about energy use and ways to reduce energy cost. While 81 percent of workshop respondents reported that the program was very helpful, 64 percent of direct install respondents and 53 percent of mass mailing respondents reported that the program was very helpful. Direct install and workshop recipients were more likely than mass mailing recipients to report that their energy bills are lower after receipt of program services.

Table 11. Comparison of Delivery Methods - Overall Program Ratings

| | Delivery Method | | |
|--------------------------|-----------------|----------|--------------|
| | Direct Install | Workshop | Mass Mailing |
| Program was Very Helpful | 64% | 81% | 53% |
| Energy Bills are Lower | 53% | 51% | 39% |

Direct Install Provider Performance

Five different youth corps provide direct install service delivery. While the billing analysis impact results will show whether there are differences in the effectiveness of the different youth corps, the survey results provide some preliminary information on the relative effectiveness of the providers. Survey findings suggest that the lead youth corps was the most effective provider and that one of the subgrantees needs to work on their client communication. However, there were some demographic differences between the clients that were served by the different providers, so it is possible that the differences in outcomes relate to differences in the clients rather than to the quality of services delivered.

Mass Mailing Provider Performance

Three different organizations were retained to send out the energy efficiency kits. There were also two different delivery approaches that were used – a simple mass mailing approach where kits were sent to all clients on a list, and a business reply card approach where clients had to send back a postage paid card to receive the kit. In all, there were four different combinations of providers and delivery methods.

- One contractor provided services through a direct mass mailing.
- A second contractor provides services through a direct mass mailing and also through a business reply card approach.
- A third contractor provided services through a business reply card approach.

While the billing analysis impact results will show whether there are differences in the effectiveness of the different providers and delivery methods, the survey results provide some preliminary information on their relative effectiveness. Key findings from the survey included that clients who received the kit with greater education materials were more likely than other respondents to report that they made other changes in their energy use behavior since receiving the energy kit. The survey results also showed that clients who respond to the business reply card to request a kit are more likely to install the showerheads, recall receipt and report that they used the water temperature thermometer, and report that their energy bills are lower since receipt of service delivery.

Energy Savings Estimates

Table 12 displays assumptions for savings estimate calculations and Table 13 displays estimates of energy savings and the net present value of those savings, given delivery statistics from provider reports and from the survey responses.

Table 12. Assumptions for Cost-Effectiveness Calculations

| Costs and Retention | Measure Savings | Action Savings | Other |
|---|---|--|--|
| <ul style="list-style-type: none"> • \$.0906 per kWh. • \$1.0250 per Therms. • 90 percent of direct install CFLs retained. • 80 percent of direct install showerheads retained. | <ul style="list-style-type: none"> • A 23 Watt CFL replaces a 100 Watt incandescent and is used an average of 2.4 hours per day. • A 13 Watt CFL replaces a 60 Watt incandescent and is used an average of 2.4 hours per day. • Showerhead saves 14 therms/year. | <ul style="list-style-type: none"> • Hot water turndown saves 19 therms. • Refrigerator turndown saves 125 kWh. • Thermostat turndown saves 100 therms. • Thermostat setback saves 34 therms. • Computer turned off saves 292 kWh. • Cold water laundry saves 30 therms. | <ul style="list-style-type: none"> • Gas heating increases by .022 therms per kWh saved. • Discount rate of 5 percent. • Measure life of 7 years for a CFL, 10 years for a showerhead, 3 years for behavior change. |

Based on the provider reports, Table 13 shows that the total savings estimates for the direct install service delivery are 618 kWh and 6 therms, for a net present value of \$331 in savings. Based on the survey reports, the total savings estimates for the direct install are 440 kWh and 9 therms for a net present value of \$251 in savings. (Note: estimated savings from measures alone was \$208.) The average cost for service delivery was \$228.

Table 13. Direct Install Savings Estimate

| | Number per Client | kWh/therm Savings per Client | Net Present Value |
|---|-------------------|------------------------------|-------------------|
| Measures Installed – Provider Reports | | | |
| Provider Reports – CFLs | 13 | 573 kWh | \$301 |
| Provider Reports – Gas Heating Increase | -- | -13 therms | -\$75 |
| Provider Reports – Showerheads | .7 | 8 therms | \$62 |
| Measures Installed – Survey Response | | | |
| Survey - CFLs in Use | 9 | 395 kWh | \$207 |
| Survey – Gas Heating Increase | -- | -9 therms | -\$52 |
| Survey - Showerheads in Use | .6 | 7 therms | \$53 |
| Actions Taken | | | |
| Hot Water Turndown | .18 | 3 therms | \$10 |
| Refrigerator Temperature Change | .20 | 25 kWh | \$6 |
| Thermostat Turndown | .09 | 6 therms | \$17 |
| Turn off Computer | .07 | 20 kWh | \$5 |
| Cold Water Laundry | .09 | 3 therms | \$8 |
| Gas Heat Increase from Baseload Action Reduction | -- | -1 therm | -\$3 |
| Provider Report Totals | | | |
| Total kWh Savings | | 618 kWh | |
| Total Therm Savings | | 6 therms | |
| Net Present Value | | | \$331 |
| Survey Estimate Totals | | | |
| Total kWh Savings | | 440 kWh | |
| Total Therm Savings | | 9 therms | |
| Net Present Value | | | \$251 |

Table 14 shows the savings estimates for workshop delivery. Based on the survey reports, the total savings estimates are 232 kWh and 32 therms for a net present value of \$201 in savings. (Note: the total savings from measures alone was \$96.) The average cost for service delivery was \$121.

Table 14. Workshop Savings Estimate

| | Number per Client | kWh/Therm Savings per Client | Net Present Value |
|--|----------------------|---------------------------------|----------------------|
| Measures Installed | | | |
| Survey - CFLs In Use | 3 | 146 kWh | \$76 |
| Survey – Gas Heating Increase | -- | -3 therms | -\$19 |
| Survey - Showerheads in Use | .44 | 5 therms | \$39 |
| Actions Taken | | | |
| Hot Water Turndown | .42 | 8 therms | \$22 |
| Refrigerator Temperature Change | .43 | 54 kWh | \$13 |
| Thermostat Turndown | .27 | 18 therms | \$51 |
| Turn off Computer | .11 | 32 kWh | \$8 |
| Cold Water Laundry | .19 | 6 therms | \$16 |
| Gas Heat Increase from Baseload Action Reduction | -- | -2 therms | -\$5 |
| Survey Estimate Totals | | | |
| Total kWh Savings | | 232 kWh | |
| Total Therm Savings | | 32 therms | |
| Net Present Value | | | \$201 |

Table 15 shows the savings estimates for mass mailing delivery. Based on the survey reports, the total savings estimates are 197 kWh and 16 therms for a net present value of \$140 in savings. (Note: the total savings estimate for measures alone was \$84.) The average cost for service delivery ranged from \$21 to \$43.

Table 15. Mass Mailing Savings Estimate

| | Number per Client | kWh/Therm Savings per Client | Net Present Value |
|--|----------------------|---------------------------------|----------------------|
| Measures Installed | | | |
| Survey - CFLs in Use | 3 | 146 kWh | \$76 |
| Survey – Gas Heating Increase | -- | -3 therms | -\$19 |
| Survey - Showerheads in Use | .31 | 3 therms | \$27 |
| Actions Taken | | | |
| Hot Water Turndown | .26 | 5 therms | \$14 |
| Refrigerator Temperature Change | .22 | 28 kWh | \$7 |
| Thermostat Turndown | .13 | 9 therms | \$24 |
| Turn off Computer | .08 | 23 kWh | \$6 |
| Cold Water Laundry | .10 | 3 therms | \$8 |
| Gas Heat Increase from Baseload Action Reduction | -- | -1 therm | -\$3 |
| Survey Estimate Totals | | | |
| Total kWh Savings | | 197 kWh | |
| Total Therm Savings | | 16 therms | |
| Net Present Value | | | \$140 |

Analysis of Billing Data

The evaluation of initial implementation of Colorado's First Response Program will include analysis of utility billing data to determine actual energy savings that resulted from the energy services delivered. Results will be analyzed by service delivery mechanism and service delivery provider. Measure-specific saving estimates will also be developed. Based on the savings estimates, the cost of conserved energy will be calculated.

Summary and Conclusions

Colorado took a research based approach to implementing their mass distribution energy efficiency programs. The service delivery mechanisms were explicitly designed to deliver cost-effective energy efficiency services to a substantial number of low-income households. Initial program research provides evidence that this method was successful in achieving cost-effective energy savings. Provider training and modifications to some of the education materials may yield better results. Based on the survey, the evaluation recommended that the program make the following changes.

1. Use the business reply card approach for all mass mailing.
2. Enhance the education aspect of direct install service delivery, especially for the lowest performing youth corps.
3. Have the lead youth corps provider furnish additional training to some of the other youth corps.
4. Improve the education part of the mass mailing kit for some of the providers' mass mailing kits.

Analysis of customer billing data will provide more direct evidence on the effectiveness of the program, and may result in recommendations for increasing the use of one service delivery mechanism over another or revising education materials or procedures.

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