

# **Cinergy's Home Energy House Call (HEHC) Program: An Information Program That Changes People's Lives**

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## **ABSTRACT**

The Home Energy House Call (HEHC) program is an in-home energy audit program offered to Cinergy's residential customers in south central Ohio and northern Kentucky. The program was designed by Kathy Schroder and Van Needham of Cinergy, Rick Morgan, of Morgan Marketing Partners and Honeywell-DMC (HDMC) manager Leslie Carlson. The program service is an "expanded" audit followed by a 45-minute presentation of the results, covering both energy and environmental technologies and practices. The three hour audit results in a comprehensive 8 page report, presented to the customer immediately following the inspection, presenting recommended measures, estimated costs and projected benefits. The 1998 program evaluation conducted by TecMRKT Works examined energy savings using a pre and post-program weather adjusted electric and gas consumption comparison (*PRISM*) using a matched control group, and the use of participant surveys to document energy and environmental behavior changes, energy recommendations taken and not taken, reasons for taking or not taking actions, time needed to take actions, program satisfaction levels and recommendations for program improvements. The evaluation concluded that the program changed behaviors resulting in technology installations and significant savings to participants.

## **Program Description**

The HEHC program is an in-home energy audit program created in 1996 by combining four residential programs offered by Cinergy. The HEHC program was developed in 1996 by merging 4 other residential programs. The program educates participants about actions that can be taken in their home to reduce electric and gas consumption. In addition, the program provides an environmental impact assessment and includes these recommendations within the 8-page audit report. The report is delivered at the time of the audit. The program provides the recommendations prioritized by cost effectiveness.

The program is based on the hypotheses that an energy examination linked with a high-quality audit report and educational presentation provides customers with the information needed to make decisions and take actions to reduce or control energy consumption. It is also assumed that the average customer does not fully understand what actions are appropriate for their home, and may not be considering cost-effective actions, or even the right set of actions without the audit.

The HEHC program has served over 7,000 customers since its start in 1996. Program participation is obtained through a series of zip-targeted mailings. Mailings are staggered so that response rates match service ability. The enrollment sign-up rate is about 3%. The mailing consists of a letter presenting the program and describing benefits. The letter contains a toll-free telephone number to HDMC's office just outside Cincinnati. Customers enroll in the program by calling the toll-free number and scheduling a time for the home audit. The process is simple and effective.

Participation can be arranged during a single call to the HDMC. During the call staff explain the program and schedule the audit. The audits are assigned to a specific auditor during this call. Before each audit, HDMC staff calls the customer to remind them about the audit. At this time the audit is confirmed, rescheduled or cancelled. At the appropriate time the auditor receives a download of the customer billing history, travels to the site and conducts an audit, visually examining the home's mechanical systems, the thermal envelope, and asks about customer behaviors. Typically the customer accompanies the auditor and discusses the audit and the condition of the home. The auditor also records the results of the examination on a set of forms specifically designed for this audit. The auditor then keys the data into a small hand-held modem-equipped computer. Once the forms are entered the auditor dials up the HDMC computer and uploads the data. The HDMC computer processes the data and downloads the audit report to be printed on the professionally pre-formatted audit report. The auditor then prints the report and presents it to the customer. Graphics and text are of high quality and appearance is near laser quality from the portable ink-jet printer. The auditor then reviews the report with the customer and goes over each recommendation, explaining how it should be taken and the expected benefits. The auditor gives the customer a weatherization brochure and a price list of what the recommended measures should cost if the customer did it themselves and if they hired a contractor. The auditor then addresses any questions or issues the customer has before going to the next audit. The entire process takes about 2 to 3 hours depending upon the complexity of the audit and the condition of the home.

Honeywell-DMC maintains their own tracking system for participants and reports progress to Cinergy monthly. The tracking system documents customers participation in the HEHC program, including contact dates, audit dates, audit results and report recommendations. The system is capable of searching records by customer, audit measures, dates, reports and other criteria. This system is downloaded to Cinergy on a periodic schedule. Cinergy program staff are trained in the operations of the tracking system and have access to the tracking system information through HDMC.

## **Evaluation Methodology**

In order to evaluate the HEHC Program, Cinergy contracted with TecMRKT Works to conduct a process and impact evaluation. The evaluation consisted of five activities:

- Interviews with Cinergy program designers, managers and implementers,
- Interviews with HDMC managers, auditors and support staff,
- An examination of HDMC customer files and tracking systems,
- Billing (PRISM) analysis of 520 participants and 545 matched non-participants using 12 months of pre and 12 months of post-program energy bills, and
- Telephone interviews with 202 HEHC participants.

The interviews with Cinergy and the contractor staff focused on the design and operation of the program, the program marketing and customer enrollment efforts, and the delivery of audit and audit reports. The records examination consisted of reviews of HDMC program records and participation files. The energy analysis efforts included a pre- and post-program weather adjusted comparison of changes in electric and natural gas consumption with the same information of a "matched" comparison group of non-participants randomly selected from the same block as participants and matched for energy consumption profiles.

In addition to these evaluation efforts, telephone interviews were conducted with 202 participants. The surveys were split between participants in Ohio and Kentucky such that two-thirds (142) of the surveys were conducted in Ohio and one-third (60) in Kentucky. The sample was stratified so that one-third of the surveys were conducted with customers who participated from January to June of 1996, one-third from January to June of 1997, and one-third from January to June of 1998. This stratification provided a time-series range of customer contacts with both short-term and long-term recall and experience with measure implementation.

The survey asked about customer opinions of the program and the implementation activities associated with the program as well as what measures were implemented and when the actions were taken. The survey was also innovative in that it employed a seldom-used survey technique that tailored each survey to each participant. That is, each survey was different from all others in that it asked each customer about the individual recommendations made to them by the auditor and included in the audit report. In order to limit survey length, we asked about 8 recommendations even though audit reports typically included more. Measures selected for the survey were the measures projected to provide the greatest benefit/cost for the customer. The surveys averaged about 30 minutes and were conducted from the TecMRKT Works Wisconsin office. The survey was conducted using SPSS computer aided terminal entry system and allowed real-time production of survey results. The evaluation was conducted during the summer of 1998.

## **Evaluation Findings**

### **How Customers Found out about the Program**

Customers (27%) primarily heard about the program through the zip code targeted mailings that were sent by Honeywell-DMC at Cinergy's direction. However, some customers (11%) said they heard about the program through the newspaper, 10% radio or TV announcements, and 8% said they heard about the program through friends and neighbors. The rest could not recall how they heard about the program.

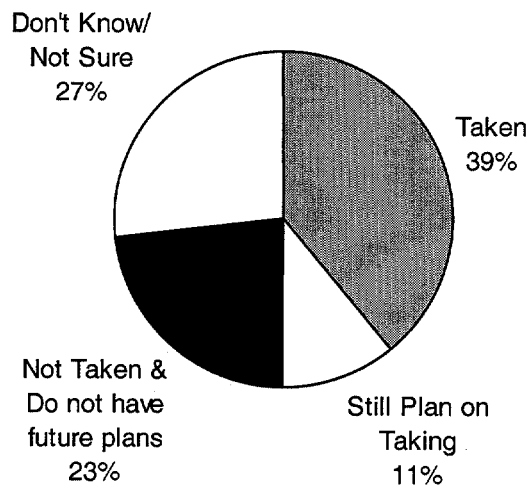
When customers were asked if they discussed the program with friends and neighbors 69% said that they did. The average number of people with whom participants had discussed the program was 4.8 individuals. Of the customers who had discussed the program with others 80% said that they had recommended the program to their friends and neighbors.

### **Why Customers Participated**

The primary reason customers participated in the HEHC program was to reduce their energy bills. Forty-six percent of the customers said they participated for this reason. However, 25% said they wanted to obtain more knowledge about their home, 19% said they were interested in saving energy, and 15% wanted to verify their home's efficiency. Another 11% wanted to learn what improvements needed to be made to their home. Lastly, 7% wanted a real estate inspection. This small group had all been in their home for less than 5 years. This data indicates that the program is serving multiple purposes depending upon the individual customer, but primarily is helping people reduce costs, become more knowledgeable about their home and save energy. While a large group of customers want to reduce costs, the importance of customer knowledge goals should not be underestimated.

## Participant Actions Following the Audit

According to the customers surveyed, 39% of all recommended actions were taken between the time of the audit and the evaluation survey (see Figure 1). Another 11% of the recommended actions are still on the customers list of things they plan on doing. Only 23% of the recommended actions customers say they do not plan on taking and another 27% are not sure of taking or not taking the recommended actions in the future.

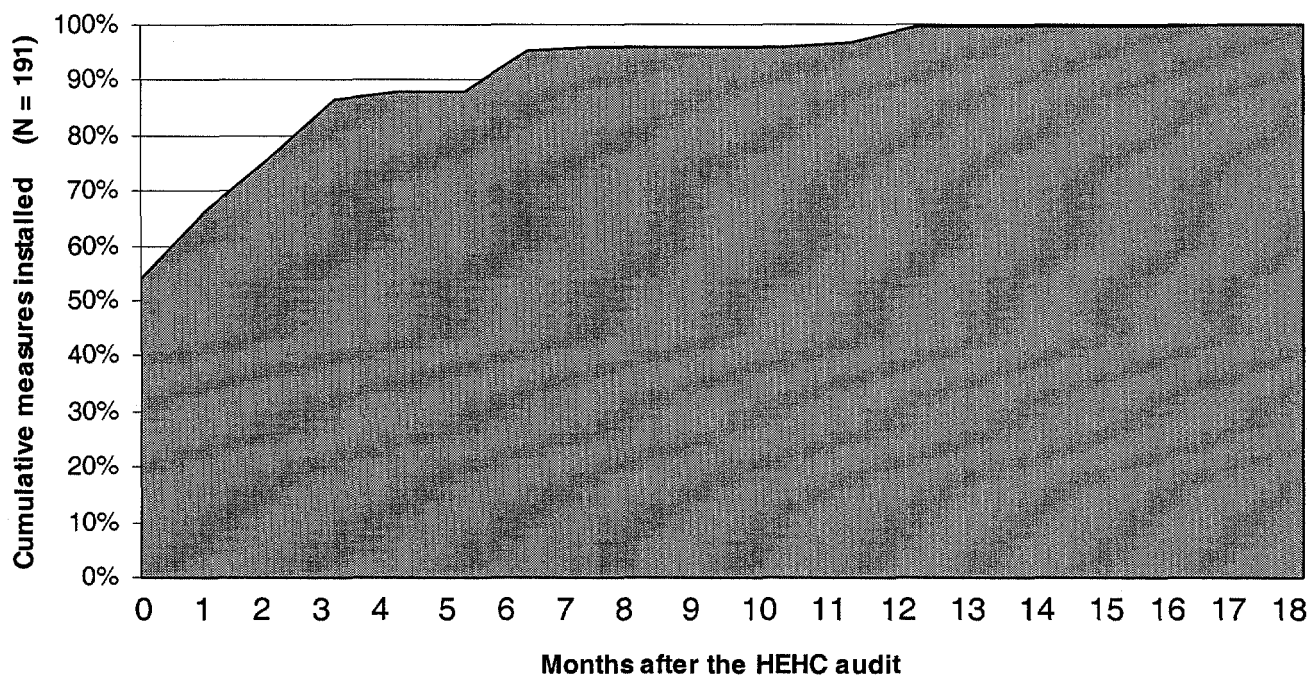


**Figure 1 Actions taken and not yet taken 6 months to 2 years after the audit (N = 1161)**

The overwhelming majority (80%) of measures were implemented by the homeowner. Most of the remaining measures (17%) were implemented by contractors and 4% were implemented by “others” (i.e. friends, neighbors, or relatives). Customers almost always made thermostat or hot water temperature adjustments by themselves. This, along with lighting system replacement or upgrades and weather-stripping and air sealing were done predominately by customers. Surprisingly, insulation of attics and walls and duct work (along with hot water pipe insulation and tank wrap) were also done by customers most of the time. In contrast to this, HVAC system upgrades, replacements, and maintenance were almost always done by hired contractors. Implementation of window replacements and water saving devices showed a roughly even split between do-it-yourselfers and hired contractors. Please see Table 8 for measure specific details on who took actions, when, and how.

Because 1/3 of the customer surveys were with participants who had completed their audit within the last year, some customers many have not had enough time to take some of the recommendations. However, as Figure 2 illustrates, over 80% of the recommended measures that were implemented were installed within the first 4 months following the audit.

In this evaluation we were able to identify how long it takes customers to implement many of the recommended actions presented in the audit report. Based on the evaluation results it takes an average of 1.7 months after the audit to implement the average measure. Among these, 55% were taken within the first month. The remaining 45% took longer than 1 month, but were implemented on average 3.7 months after the audit.



**Figure 2 Cumulative rate of energy efficient measure installation**

### **Measures Installed Following the Audit**

As expected, major measures (items that typically cost over \$200 to install and often require the use of a contractor) were installed at a lower rate than the minor measures. Eighteen-percent of the major measures were implemented during the period of time between the audit and the evaluation survey (see Table 1). In contrast to the rate of major measure implementation, was the rate at which minor measures are installed. A subset of the eight most commonly recommended minor measures was analyzed and found to have a 53% implementation rate, about 3 times greater than the implementation rate for the major measures (see Table 1). This is a significant difference and suggests there are substantial barriers to implementing major measures that do not exist for minor measures. These may include barriers such as; high capital costs, high labor costs and lack of knowledge or skill

associated with major measure. Minor measures typically require a small expenditure and the use of standard maintenance and household skills, and are often taken by the customers rather than by a contractor. Major measures however, typically must be planned into a household budget and must compete with other family and household needs and customers may not have the skills or the time to install these measures if the budget is available. A complete list of the measures and an account of the number of occasions that each measure is taken-or-not-taken is found in Table 8.

Of the major measures that were implemented, the average amount of time it took to take the recommended action was 3.5 months. Several examples include furnace replacement (11.7 months), installation of storm windows (3.0 months), and replacement of standard windows with low emissivity windows (2.0) months. Average customer satisfaction scores with the savings from major and minor measures were similar (8.8 for major and 8.5 for minor) indicating that customers are very satisfied with the actions they have taken.

**Table 1 Implementation rate for major and minor measures**

| Major measure                 | Times recom. | % taken    | Saving satisf | Months after audit | Minor measure                         | Times recom. | % taken    | Saving satisf | Months after audit |
|-------------------------------|--------------|------------|---------------|--------------------|---------------------------------------|--------------|------------|---------------|--------------------|
| Replace hot water heater      | 10           | 30%        | 10            | 0                  | Turn down hot water temperature       | 39           | 100%       | 7.7           | 0.8                |
| Install storm windows         | 39           | 26%        | 8.5           | 3.0                | Set-back heating thermostat           | 49           | 67%        | 8.3           | 0.6                |
| Replace furnace               | 20           | 25%        | 10            | 11.7               | Seal window air leaks                 | 57           | 54%        | 8.9           | 1.8                |
| Insulate walls where possible | 26           | 19%        | 8.0           | DK                 | Seal door air leaks                   | 63           | 52%        | 8.4           | 2.1                |
| Increase attic insulation     | 37           | 16%        | 8.3           | 0.7                | Use energy efficient lighting systems | 113          | 45%        | 7             | 1.9                |
| Install storm doors           | 32           | 16%        | 7.7           | DK                 | Insulate hot water pipes              | 109          | 39%        | 8.5           | 3.4                |
| Replace windows w/ low-E      | 29           | 10%        | 9.0           | 2.0                | Bathroom sink flow restrictors        | 36           | 28%        | 9             | 1.5                |
| Insulate exterior walls       | 8            | 0%         | NA            | DK                 | Kitchen sink flow restrictor          | 40           | 23%        | 10            | 0.9                |
| <b>Total</b>                  | <b>201</b>   | <b>37</b>  |               |                    | <b>Total</b>                          | <b>496</b>   | <b>258</b> |               |                    |
| <b>Average (unweighted)</b>   |              | <b>18%</b> | <b>8.8</b>    | <b>3.5</b>         | <b>Average (unweighted)</b>           |              | <b>52%</b> | <b>8.5</b>    | <b>1.6</b>         |

### Estimated Program Impacts on Energy Savings

The energy savings analysis in this report is based on a 12 month pre and 12 month post-program comparison group design. To conduct this billing analysis TecMRKT Works used PRISM Advanced Version 1.0.

Across both the test and comparison groups, weather normalized energy consumption increased over the evaluation period. This is consistent with residential consumption during improving economic conditions when local consumption will typically increase with local economic growth. The net energy savings that resulted from the HEHC program was calculated by subtracting the normalized weather adjusted growth in consumption of the test group from the normalized weather adjusted consumption of the control group. This permits the comparison of the difference between the two groups that is expected as a result of the HEHC program. The net energy savings for the HEHC program is 4% for gas consumption and 17% of electric consumption for people who heat with gas, and 13% of electric consumption for electric only customers. This data indicates the participants saved both electric and gas energy as a result of the HEHC program.

## **Customers Think they are Saving Money**

About half of customers think they are saving energy and money on their utility bills. When customers were asked if they were saving money as a result of the actions they took, 50% said they were saving, 30% did not think they were saving, and 20% were not sure. When customers were asked how much they were saving, responses ranged from a few dollars a month to a high of \$100 per month with an average of \$23.12.

## **Customers are Using the Audit Report and Educational Materials**

Another way of measuring program impact is to look at how many times customers have used or referred back to their audit report. If customers do not look at the audit report there is a lower probability that they will implement the actions. If customers look at the audit report and refer back to it, then this typically means there is an interest in the information contained in the report and a higher probability that the information will be used. When we asked customers to tell us how many times they have looked at or referred back to the report, responses ranged from zero to 45 times. The average was 2.6 times, indicating that the audit report is used as an energy management tool 2 to 3 times over the 6 months to 2-year period following the audit. This reflects repeated use of the audit report and infers that the audit report is used as an energy management or bill reduction tool.

When we asked about the weatherization and insulation brochure handed out during the audit, 57% said that they recall having received it. Among the 57% who recall the brochure, 69% said they looked at or read the brochure and 60% thought the brochure provided them with information that was useful in their efforts to save money and energy.

## **Customers Gained Knowledge on how to Save Energy**

A strong majority of surveyed customers (74%) said they know more about saving energy as a result of the audit. Seventeen percent said they knew much more, 57% said somewhat more, 24% about the same, and 1% said they know somewhat less.

All customers surveyed were asked the most important things they learned from the audit. Two-hundred and eight specific responses were generated. Comments received included 17 general comments on learning how to save energy. Twelve comments indicated that the most important thing learned was that the home was already energy efficient. Twelve comments were on the use and value of household insulation and 8 comments on caulking and weather-stripping. The remaining 159 responses varied widely, and were mostly about specific energy efficient saving measures, behaviors, and techniques specifically about their home.

## **The Audit Helped Customers to Take Actions Sooner**

Likewise, 73% said the audit and report helped them take action sooner. Eleven-percent said that the energy audit helped them to take action much sooner, 62% somewhat sooner, 25% about the same, and 1% said the audit made them take actions later than they would have without the audit.

## **Ninety-four percent of Recommendations were not Considered before the Audit**

One of the most important findings from the customer survey pertains to the ability of the audit to advise customers on what they can do to save energy and reduce their bill that they were not considering prior to the audit. Survey results indicate that most all of the measures recommended during the audit and presented in the audit report were not being considered by the customers prior to the audit. Out of 1161 measures recommended in the audits that we examined through the survey, 1096 had not been under consideration prior to the audit. This suggests that only 5.7% of the actions recommended were considered before the audit. Among the 5.7% of the measures that customer had thought about prior to the audit, ten were on hot water pipe insulation, nine on caulking and sealing windows, and six on both furnace replacement and CFL's. All the remaining measures recommended in the audit report were not being considered by the customer prior to the audit, indicating that almost all of the actions installed by the customers were as a direct result of their inclusion in the audit report. It is unlikely that more than 5.7% of the installed measures would have been installed without the HEHC program.

## **Most would not have Taken the Program if there would have been a Charge**

Thirty-six percent said they still would have scheduled the audit if there were a fee. Thirty-nine percent said they would not, and the remaining 25% did not know. Forty-one respondents provided a value for the most they would expect to pay for the audit service. The range was between \$10 and \$100 with an average of \$36.10. Only 2 respondents out of 7 (29%) who had been living in their home for more than 20 years said they would expect to pay over \$25 for the service. But, 19 of 32 (60%), of respondents residing in their home for less than 20 years, said they would expect to pay more than \$25 for this service.

A similar demographic pattern exists for the "least customers would expect to pay" for the service. Forty-four respondents provided an amount for the least they would expect to pay for this service. The range was from \$0 to \$50, with an average value of \$7.16.

## **Willingness to Pay is not Correlated to Education or Income**

Willingness to participate if there was a fee for the service was split equally between three categories; yes, no, and don't know. This distribution roughly holds within all education and income categories. However, people with graduate degrees and who are willing to pay for the service would pay about twice what others would expect to pay, indicating that people with more education are ready to pay more than others.

Linear regression models were separately applied to both "total household income" and "level of education" as independent variables. Attempts were made to positively correlate these variables in two separate models to the dependent variable of "the most a survey respondent would expect to pay for the audit service." Positive relationships, in both models were weak and difficult to demonstrate. The R-squared values were 0.041 for the household income model and 0.026 for the level of education model. Neither relationship is statistically significant, indicating that customers with higher income or higher educational levels may not be willing to pay more for the audit service except for those with graduate degrees.



## Program Satisfaction

Interviews with program managers and field staff indicate that customers were somewhat satisfied to very satisfied with the HEHC program. Program managers indicated that there were very few customer complaints about the program and the “couple” of complaints that had come in were related to scheduling the audit.

When customers were asked about their satisfaction with the program, participant scores indicate that they are very satisfied. On a 0 to 10 scale, with 10 being extremely satisfied, the average score was 8.87 (see Table 3).

**Table 3 Overall satisfaction scores**

| Program component   | Ave. | % < 8 |
|---|------|-------|
| Rate the ease of signing up for the program.  | 9.38 | 3.6%  |
| Rate the convenience of scheduling the audit.   | 9.24 | 4.2%  |
| Rate clarity and ease of understanding the audit report.                              | 9.10 | 6.7%  |
| Rate the completeness of the audit report.  | 9.06 | 4.9%  |
| Rate the knowledge of the energy specialists.   | 8.96 | 7.8%  |
| Rate review and discussion of audit's recommendations.                                | 8.83 | 11.6% |
| Rate the quality and completeness of the inspection.                                  | 8.82 | 12.7% |
| Rate the practicality / usefulness of audit recommendations.                          | 8.24 | 26.2% |
| Rate how beneficial pricing information was on contractor vs. do-it-yourself projects | 8.18 | 29.6% |
| Overall Average (un-weighted)   | 8.87 | 11.9% |

Satisfaction with specific program features was also strong, ranging from 8.2 to 9.4 on the 0 to 10 scale. These scores indicate very good customer satisfaction rates. However, a close look at the distribution of the satisfaction scores can help identify areas where the program can concentrate improvements. When measuring satisfaction on a 0 to 10 scale, scores of less than 8 typically indicate some level of dissatisfaction with one or more aspects of the program. Table 3 includes the percent of customers providing a score of less than 8 for each of the measurement categories. This information indicates that program improvement efforts can be concentrated in the pricing information, the practicality of the audit recommendations, the quality and completeness of the inspection, and the review and discussion of the audit recommendations. Finally, all measures of customer satisfaction, with both the program and Cinergy in general, appear to have no correlation to level of education, length of time in the home, or total household income of the participant.

Only 34% of the customers remembered using or looking at the pricing information (see Table 4). Despite this, the 34% who used the information scored satisfaction at 8.2. Furthermore (of the people who remember looking at or using the pricing information), over 70% used the information to decide what actions to take and to determine which actions they should do themselves. These figures indicate that while most people did not remember or use the pricing information, for those that did, it was a very important decision tool.

**Table 4 Use of pricing information**

| Question (N = 140)   | Yes | No  | DK / NS |
|--|-----|-----|---------|
| Did you look at or use the cost estimates on contractors vs. do-it-yourself? | 34% | 53% | 13%     |

**Table 5 How pricing information was used**

| Question (N = 48)  | Yes | No  | DK / NS |
|--|-----|-----|---------|
| Did you use the cost estimates to decide which actions to take?                | 71% | 25% | 4%      |
| Did you use the cost estimates to decide which actions to do yourself?         | 72% | 26% | 2%      |
| Did you use the cost estimates to decide which actions a contractor should do? | 64% | 30% | 6%      |

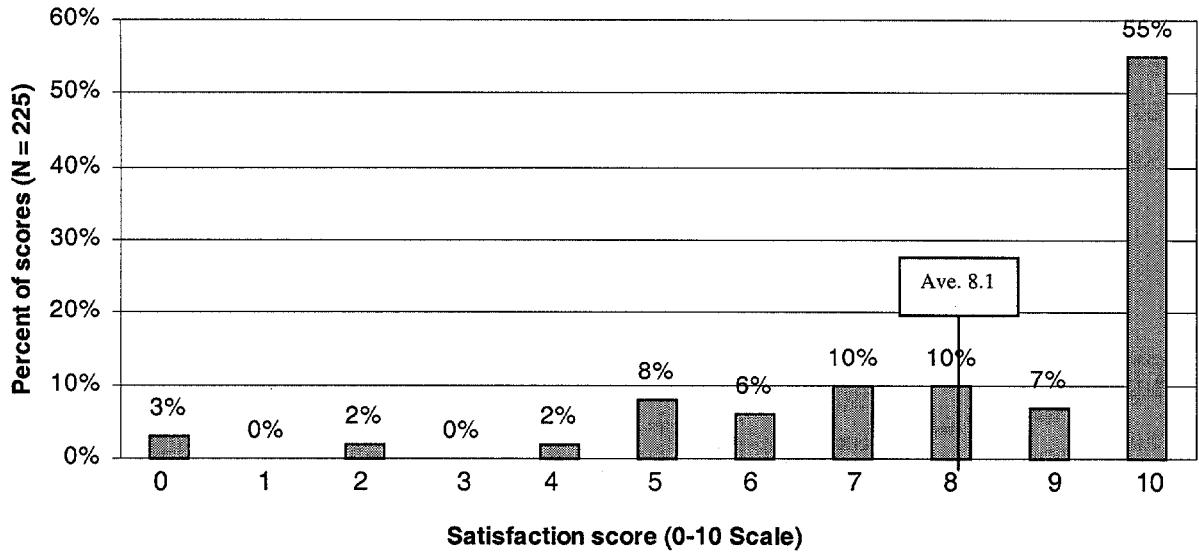
The scores on the practicality of the audit recommendations may be as a result of recommendations that had little to do with saving energy or money but instead focused on non-energy related personal behaviors and environmental issues. These scores may be improved by focusing the report on the things that matter to the customer, rather than having non-energy related recommendations included in the report. The auditor can ask the customer what information the customer would like to have included in their report and provide a customer-specific report that excludes information in which the customer is not interested. This will give the customer a role in the formation of the report, increasing both the usefulness of the report as well as customer satisfaction with the report.

The scores on the completeness of the audit may be associated with the general nature of the audit in that it is primarily a walk-through audit, using few analytical tools or equipment testing procedures.

The scores associated with the review and discussion of the audit recommendations show that for some customers there is a difference between the audit presentation and discussion and the expectations of the customer. These customers are wondering about the aspects of the audit that they have expected, but which were not included. It is highly likely that each of the areas of lower satisfaction are related in that they all deal with the presentation to the customer and the interaction between the auditor, the report and the customer's expectations.

### **Satisfaction with Energy Savings**

When customers were asked to rate their satisfaction with the energy savings, 52% were able to provide a satisfaction score and the remainder were not sure or could not score their satisfaction. Some who were unsure because they could not directly attributes changes in their monthly bills with actions they had taken and other factors. For those who did respond, satisfaction with the savings averaging 8.1 on a 10-point scale (see Figure 3) indicating customers are generally satisfied with the savings they have achieved (see Table 8).



**Figure 3 Customer satisfaction with energy savings**

## Demographics

Ninety-seven percent of HEHC participants owned their house, compared to 84% of non-participants. On average, participants have lived in the home for 11.27 years at the time of the survey. Sixty-five percent of participants were employed (56% full time, 9% part time), 7% unemployed, 27% retired / disabled, and 1% refused to answer the question. This compares to an employment rate of 65% in the Cincinnati area non-participant category and slightly less than Cinergy non-participants at 71%. Twenty-nine percent of Cincinnati area non-participants were retired and 23% of Cinergy non-participants were retired. Only 1% of both non-participant groups were unemployed (see Table 6). Participants were unemployed at a higher rate (7%). But this may be because of the difference in the way the demographic questions were asked between the HEHC survey and Cinergy's customer surveys of non-participants.

**Table 6 Employment status of participants vs. non-participants**

| Respondent type                  | Employed | Unemployed | Retired / Disabled |
|----------------------------------|----------|------------|--------------------|
| Participant                      | 65%      | 7%         | 27%                |
| Cincinnati area non-participant* | 65%      | 1%         | 29%                |
| Cinergy non-participant**        | 71%      | 1%         | 23%                |

\* Cinergy customers living in the 513 area code of Cincinnati

\*\* All Cinergy customers

In addition to the person taking the survey, at least 47% of participants had 1 or more adults in the house employed either full time or part time. Ninety-four percent of the 47% had just one other adult employed full time, in addition to the participant, while 6% had 2 other full time adults in the house. Fifteen of the 140 respondents indicated the presence of other adults that were employed part time. All but one of these homes had only one other part time adult. Only one respondent indicated that another adult in the house was unemployed. Lastly, twenty of the homes indicated the presence of one retired adult in the home other than the respondent.

The predominant gender of participants was female (60%). Inversely, 60% of non-participants in the Cinergy survey were male. Seventy-percent of participants and overall non-participants were married and 68% of non-participants in the Cincinnati area are married. Of the remaining folks in all three demographic categories; 9% to 10% are divorced, 10% to 11% widowed, and 1% to 2% refused to answer. Nine percent of people in the three categories have never been married.

Survey respondents are most likely to come from professional, technical, sales, or executive / managerial positions. This strongly suggests that people taking part in the audit program are people who are also responsible for performance in the work place as well as energy performance in the home. These are people who are accustomed to getting things done at work and at home.

The majority of participants (55%) have a college degree. Thirteen percent are post-graduates. Only 19% said they had a "high school or less" education and 24% had some college (see Table 7). This data indicates that program participants are highly educated and therefor may more fully understand the relationship between energy consumption, efficiency actions, and utility bills.

**Table 7 Level of education**

| Highest level of education completed by respondent (N = 142) | Participant | Cincinnati-area non-participant | Overall non-participant |
|--|-------------|---------------------------------|-------------------------|
| High School or less  | 19%         | 39%                             | 47%                     |
| Some college   | 24%         | 24%                             | 25%                     |
| College grad.  | 42%         | 25%                             | 18%                     |
| Post graduate  | 13%         | 9%                              | 7%                      |
| Refused to answer  | 3%          | 3%                              | 3%                      |

Participants earn more income than both non-participant categories with almost 50% of participating household earning more than \$50,000 a year (see Table 8).

**Table 8 Household income for 1997**

| Total household income (N = 109) | Participant | Cincinnati-area non-participant | Overall non-participant |
|----------------------------------|-------------|---------------------------------|-------------------------|
| < 20k                            | 12%         | 12%                             | 15%                     |
| 20-30k                           | 12%         | 13%                             | 14%                     |
| 30-40k                           | 14%         | 13%                             | 14%                     |
| 40-50k                           | 13%         | 12%                             | 14%                     |
| 50-75k                           | 23%         | 18%                             | 15%                     |
| 75-100k                          | 12%         | 3%                              | 4%                      |
| > 100k                           | 14%         | 5%                              | 4%                      |

## **Recommended Changes**

### **Audit Report**

The audit report was found to be very well planned and presented with graphics that help customers understand the measures and expected savings from their implementation. However, there is information contained on the audit report that is not directly associated with natural gas or electric consumption and may act to dilute the benefits of the energy efficiency measures presented in the audit report. This needs to be carefully examined from the customers' perspective. The audit report should contain information the customer would like to see and should exclude information of little interest to the customer. It may be possible for Cinergy to work with HDMC to tailor the audit report to the customers' interests. If a customer wants the transportation, environmental, or cold water saving recommendations, then they can be included in the report. If not, they can be excluded and the audit report can focus on the things that matter to the customer. This will also help separate HEHC customer into market segments for future operations.

### **Customers Recommendations**

Respondents reported 134 things that Cinergy could do to help people take actions sooner rather than later. First, the most common recommendation (26%) was to provide; measure funding, financing, subsidies, rebates, or bill credits that would allow the customer to overcome the financial barriers associated with implementing the recommended actions. Customers who complained about the lack of financing or incentives to install measures may not have been aware of Cinergy's "QuickCredit" Program for major measures. Second, 13% of people specifically suggested a contractor referral or product recommendation list to help them identify whom to contact to arrange for measure installations. These customers need assistance in identifying who can help them with the recommended measures. Third, advertisements and reminders were suggested 13% of the time, indicating that some customers think more promotion and prodding are needed. Fourth, 7% of comments related to the need for more education and demonstration or evidence of energy savings, indicating that case studies and examples may serve a purpose. Last of all, 3% of the people specifically wanted step-by-step instructions on how to install minor measures, another 5% wanted Cinergy to install minor measures directly, and several more wanted more diagnostic equipment used during the audit.

Respondents reported 46 things that could have been provided during the audit that would help them understand their energy usage better. And, similar to the above recommendations on getting people to take actions sooner, 9% thought Cinergy should directly install minor measures during the audit. Another 9% wanted step-by-step instructions on how to install measures. Seven percent wanted a product referral list and another 4% wanted a contractor referral list.

Respondents also provided 32 recommendations for changes to the delivery of the program. Sixteen percent of people said to target only older homes and 22% said to advertise the program more in general.

## **Customer Reported Dislikes**

A total of 64 items were mentioned that customers disliked about the program. Eleven-percent complained the audit was too long and 5% complained that it was too short and cursory, indicating a balance between the two comments. Five-percent complained about the lack of direct installations or installation assistance, lack of step-by-step measure instructions, or poor paybacks in some measures. Three-percent commented on the broad scope of the audit. These comments indicate that the audit may need to be more focused on energy saving measures or impacts that directly benefit them.

## **Changes to the Program Resulting from this Evaluation**

To date, 3 major changes to the HEHC have resulted from this evaluation. First, the addition of new notebook computers and bubble jet printers, for audit field staff, has reduced audit generation time by 75% and increased report quality. Second, cellular phones were issued to field staff and this has greatly enhanced communications and the timeliness of re-scheduled appointments. Third, audits have been expanded to include Saturday appointments to better accommodate customer schedules.

## **Summary Conclusion**

Customers mainly heard about the program through the targeted mailings. Customer satisfaction was high in regards to the quality and completeness of the audit, review of the audit report, and the knowledge of the auditor. Customer satisfaction levels with signing up for and scheduling the audits was also high.

Participants implemented 39% of the recommended actions within 6 months to 2 years after the audit and another 11% were still planned on being taken. Only 23% of actions the customer said they did not plan on taking and the customer did not know what they would do with the remaining 27% of recommended actions. The majority (80%) of actions were taken by the customer. Minor measures are implemented at triple the rate (52%) of major measures (at 18%).

Half of all customers think they are saving money on their bill as a result of the audit and 30% did not think they are saving. The average amount saved was estimated by the customer at \$23.12 per month. Customer satisfaction with the savings was good and the audit report was referred back to an average 2.6 times.

A strong majority of audited customers said they know more about saving energy as a result of the audit and that the audit helped them take actions sooner. It is unlikely that more than 5.7% of the measures would have been install if it were not for the HEHC service. Customers liked mostly that the program was free, that the auditor was both courteous and professional, and the on-site computer print-out of the audit report. Satisfaction with specific program features were very high and customer satisfaction with Cinergy was good.

Customer recommended changes included the addition of; financial mechanisms to help accomplish recommendations, contractor and product referral lists, post-audit follow-up reminders, demonstration of savings, and step-by step instructions on how to install measures.

**Table 8 Energy efficient measures summary table**

| Measure*                           | Times Recommended | % taken    | Future plans | Ave. # Months after audit | Satisfaction score | Self       | Hired      | Other     |
|------------------------------------|-------------------|------------|--------------|---------------------------|--------------------|------------|------------|-----------|
| turn hot water temp down           | 39                | 100%       | 3%           | 0.8                       | 7.7                | 87%        | 3%         | 10%       |
| use proper size stove burners      | 8                 | 100%       | 13%          | 0.0                       | 10.0               | 100%       | 0%         | 0%        |
| use drapes to save energy          | 4                 | 100%       |              | 0.0                       | 10.0               | 100%       | 0%         | 0%        |
| don't leave hygiene water on       | 3                 | 100%       |              | 0.0                       | 10.0               | 100%       | 0%         | 0%        |
| clean burner plates                | 2                 | 100%       |              | 0.0                       |                    | 100%       | 0%         | 0%        |
| use cool-down dryer cycle          | 2                 | 100%       |              | 0.0                       |                    | 100%       | 0%         | 0%        |
| microwave for cooking/warming      | 2                 | 100%       |              |                           | 7.0                | 100%       | 0%         | 0%        |
| replace AC system                  | 1                 | 100%       |              |                           |                    | 0%         | 100%       | 0%        |
| remove window AC in winter         | 9                 | 78%        |              | 3.0                       | 7.8                | 71%        | 29%        | 0%        |
| recycle when possible              | 20                | 75%        |              | 0.0                       | 9.8                | 100%       | 0%         | 0%        |
| setup AC thermostat                | 18                | 72%        |              | 1.2                       | 8.0                | 100%       | 0%         | 0%        |
| setback your heating thermostat    | 49                | 67%        | 2%           | 0.6                       | 8.3                | 97%        | 3%         | 0%        |
| install insulated door(s)          | 5                 | 60%        |              | 0.0                       | 9.3                | 50%        | 50%        | 0%        |
| seal window air leaks              | 57                | 54%        | 12%          | 1.8                       | 8.9                | 69%        | 23%        | 8%        |
| seal door air leaks                | 63                | 52%        | 19%          | 2.1                       | 8.4                | 87%        | 6%         | 6%        |
| annual heating service/maint       | 28                | 50%        | 7%           | 2.7                       | 7.4                | 23%        | 77%        | 0%        |
| limit shower length                | 4                 | 50%        |              | 0.0                       |                    | 100%       | 0%         | 0%        |
| hand wash small dish loads         | 2                 | 50%        |              | 0.0                       |                    | 100%       | 0%         | 0%        |
| pool pump on timer                 | 2                 | 50%        |              |                           | 8.0                | 100%       | 0%         | 0%        |
| repair window                      | 2                 | 50%        |              | 3.0                       | 4.0                | 100%       | 0%         | 0%        |
| use efficient lighting systems     | 113               | 45%        | 13%          | 1.9                       | 7.0                | 96%        | 4%         | 0%        |
| replace incandescent lights        | 20                | 45%        | 5%           | 2.0                       | 7.7                | 100%       | 0%         | 0%        |
| low-flow shower head               | 37                | 41%        | 14%          | 0.4                       | 8.3                | 83%        | 8%         | 8%        |
| Insulate DHW pipes                 | 109               | 39%        | 19%          | 3.4                       | 8.5                | 74%        | 21%        | 5%        |
| reduce fireplace flue loss         | 24                | 33%        |              | 1.7                       | 8.2                | 86%        | 14%        | 0%        |
| annual AC service/maint            | 6                 | 33%        | 17%          |                           | 10.0               | 0%         | 100%       | 0%        |
| replace hot water heater           | 10                | 30%        | 10%          | 0.0                       | 10.0               | 33%        | 67%        | 0%        |
| bathroom flow restrictor           | 36                | 28%        | 3%           | 1.5                       | 9.0                | 43%        | 57%        | 0%        |
| outlet gaskets                     | 25                | 28%        | 2%           | 1.8                       | 8.0                | 100%       | 0%         | 0%        |
| insulate & seal duct               | 55                | 27%        | 11%          | 1.6                       | 8.1                | 67%        | 25%        | 8%        |
| storm windows                      | 39                | 26%        | 5%           | 3.0                       | 8.5                | 56%        | 33%        | 11%       |
| replace furnace                    | 20                | 25%        | 2%           | 11.7                      | 10.0               | 0%         | 100%       | 0%        |
| self-clean stove after cooking     | 4                 | 25%        |              | 0.2                       |                    | 100%       | 0%         | 0%        |
| kitchen flow restrictor            | 40                | 23%        | 5%           | 0.9                       | 10.0               | 60%        | 40%        | 0%        |
| Insulate hot water heater          | 27                | 22%        | 15%          | 3.0                       | 7.0                | 100%       | 0%         | 0%        |
| intermittent ignition device       | 26                | 19%        | 8%           | 6.0                       | 9.5                | 0%         | 100%       | 0%        |
| insulate walls where possible      | 26                | 19%        | 12%          |                           | 8.0                | 40%        | 20%        | 40%       |
| flue vent damper                   | 16                | 19%        | 6%           | 11.0                      |                    | 40%        | 60%        | 0%        |
| seal/insulate attic hatch          | 24                | 17%        | 25%          | 0.0                       | 7.3                | 100%       | 0%         | 0%        |
| disconnect 2nd refridge            | 51                | 16%        | 4%           | 1.0                       | 6.8                | 100%       | 0%         | 0%        |
| increase attic insulation          | 37                | 16%        | 27%          | 0.7                       | 8.3                | 67%        | 33%        | 0%        |
| storm door(s)                      | 32                | 16%        | 16%          |                           | 7.7                | 75%        | 25%        | 0%        |
| replace toilet                     | 13                | 15%        | 8%           | 3.0                       | 6.0                | 100%       | 0%         | 0%        |
| Replace windows dual-pane-low-E    | 29                | 10%        | 7%           | 2.0                       | 9.0                | 50%        | 50%        | 0%        |
| insulate exterior walls & barriers | 8                 | 0%         |              |                           |                    |            |            |           |
| insulate foundation header area    | 4                 | 0%         | 25%          |                           |                    |            |            |           |
| adjust gas flame                   | 2                 | 0%         |              |                           |                    |            |            |           |
| <b>Total number or Average %</b>   | <b>1161</b>       | <b>39%</b> | <b>11%</b>   | <b>1.7</b>                | <b>8.1</b>         | <b>80%</b> | <b>17%</b> | <b>4%</b> |

\* The following measures were recommended each one time and not implemented: close fireplace flue(s), interior foundation insulation, plastic on inside of windows, thermal shading on windows, Insulating space htg water pipes, plant deciduous shade trees, put lights on timer or photocell, and replace freezer.