Evaluation of the Year 2 CL&P Pilot Customer Behavior Program (R2)

FINAL REPORT

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Submitted by:

NMR Group, Inc.

Tetra Tech

Oversight Evaluation Contractor:

Lisa Skumatz, Skumatz Economic Research Associates,

Scott Dimetrosky, Apex Analytics, Lori Lewis, AEC

50-2 Howard Street, Somerville, MA 02144
Phone: (617) 284-6230 Fax: (617) 284-6239
www.nmrgroupinc.com

Abstract

This report summarizes the results of a process evaluation and an impact evaluation of Year 2 of the Home Energy Reports (HERs) Pilot Program, implemented for Connecticut Light and Power (CL&P) by OPower. The evaluation team comprised NMR Group, Inc. (NMR) and subcontractor Tetra Tech. The evaluation covers the following:

- Persistence of savings for a subset of Year 1 participants who stopped receiving HER feedback reports in either summer of 2011 or the spring of 2012. Year 1 participants were selected as high-energy-use participants (with use of 1,600 kWh/month, more than double that of the typical CL&P customer). Their savings were estimated in a Year 1 report[1] and found that the Year 1 participants saved an average of 1.72% yielding an annual savings of 9,288 MWh.
- Energy savings impacts for the sample of "Year 2" HER participants, comprising Year 1 high energy use participants who continued receiving HER reports (i.e., the "Extension" sample) and newly selected Year 2 average energy use participants (i.e., the "Expansion" sample). The average-use Expansion sample was selected to represent more "average" energy use for CL&P customers (their use was 700 kWh per month which is identical to the average CL&P customer's monthly usage).
- Participant engagement with, reactions to, and satisfaction with the HERs program.

The results show that the participant household receiving HERs during Year 2 of the program (i.e., both high-use Extension and average-use Expansion) achieved an average savings 1.82%, yielding savings of 4.254 MWh during the program year.

- Savings Results for Year 2: High-use participant (i.e., Extension) saved 2.31% while average-use participants (i.e., average-use Expansion participants) saved 1.17%, yielding savings of 3,487 MWh and 977 MWh, respectively.
- Persistence of savings: Year 1 participant that stopped receiving reports continued to save electricity through at least July 2013, but the savings appeared to be diminishing over time. Based on the savings exhibited by a majority of the persistence treatment group, the evidence suggests that the program should assume a persistence savings rate for high-use households of 2% for one year following receipt of the last report.
- Cost per savings: Assessing the ratio of program expenditures to savings demonstrated that high-use participants achieved ratios of three cents per kWh (i.e., $0.03/kWh), while the ratio for average-use households was four times higher (i.e., $0.13/kWh). This finding has implications for program average-use Expansion and transferability of the savings results sector-wide.

[1] For a summary of the Year 1 survey and findings, see "CL&P Home Energy Report Pilot Program—Follow-up Survey Key Findings," Memo to Kim Oswald, CEEB Project Manager from Tetra Tech, Inc. and NMR Group, Inc., April 24, 2012.

- HER Report Usefulness: According to the process evaluation results, households did not find the specific energy-savings tips included in the HER feedback reports to be highly memorable or useful; instead, the participants found the report itself to be most useful for reminding them to behave in an energy-efficient way. Participants exhibited a dichotomous reaction to the neighbor comparison. They did not trust the neighbor comparison—mostly because they misunderstood it—but also named the neighbor comparison as the most useful aspect of the report.
- Use of Web / Electronic Resource s for Energy Efficiency: Very few participants use either the program website or the CL&P website to learn more about energy efficiency (7%, one-half of whom register), even though the vast majority of participants regularly use the Internet to pay bills, engage in social media, and send emails.

Research planned for 2014 will estimate the persistence savings rate for average-use participants. The evaluators note, however, that the implementer controlled the selection of both the treatment and control group used to arrive at these evaluation findings. In the future, the EEB may want to fund a study in which evaluators chose the control group, using standards practices in the field for selecting matched non-participant control groups, and potentially require this treatment for all future evaluations.

The team concludes the report with a series of recommendations that stem from these high priority findings.

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Executive Summary

This report summarizes the results of a process evaluation and an impact evaluation of Year 2 of the Home Energy Reports (HERs) Pilot Program, implemented for Connecticut Light and Power (CL&P) by OPower. NMR Group, Inc. (NMR) and subcontractor Tetra Tech performed the evaluation activities; they are referred to collectively as the team.[2] The evaluation covers the second year of the program, but includes comparisons to Year 1 results and explores how long savings persist after households[3] stop receiving reports.

Program Description

CL&P and program implementer OPower administered a behavior pilot program for the purposes of achieving residential electricity savings,[4] and providing value to their customers through the delivery of two-page (printed on front and back) report.[5] These reports present the treatment group with feedback on their electricity use and compare that use to a group of similar households referred to as "neighbors."[6] They also provide lists of energy-saving tips that differ from year to year.

One of the critical characteristics of the HERs program is its reliance on an experimental design. The implementer identified a study group of CL&P residential customers and then randomly assigned each of the study group households to either a treatment group that received HERs in the mail or to a control group that did not receive the HERs. The pilot program uses an "opt-out" design, where customers assigned to the treatment group automatically receive reports, but have the option to contact program representatives to opt-out of the HERs program if desired.

This report evaluates the second year of the HERs pilot program. In Year 2, CL&P and OPower sent HERs to two customer groups: 1) High-use Extension group comprising 8,000 Year 1 monthly treatment group households who received reports for another year, and 2) Expansion or average-use group comprising 10,000 newly selected households who all exhibited pre-program electricity use similar to the average CL&P customer (i.e., about 700 kWh per month).

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[2] The team wishes to Dr. Hunt Allcott, an Assistant Professor of Economics at New York University and a Faculty Research Fellow at the National Bureau of Economic Research, for his useful insights and advice on this project.

[3] The report refers to "households" rather than "participants" for two reasons: 1) strictly speaking in an experiment design members of both the treatment and the control groups are "participants;" and 2) it avoids confusion when speaking about participants in other programs (especially HES and HES-IE) addressed in the process evaluation.

[4] Because CL&P is an electric utility, the HERs targets electricity savings. However, the tips may also affect energy-savings more generally. Likewise, this report often references energy savings unless explicitly addressing estimates of electricity savings.

[5] Appendix B presents an example HERs.

[6] OPower defines "neighbors" as approximately 100 occupied, nearby homes that are similar in size to the treatment home and pay the same rate code as the treatment home.

Study Objectives and Methods

Study Objectives

The objectives of the Year 2 Pilot Program evaluation stem from the program design and seek to understand whether responses to HERs vary for high-use and average-use customers and how long savings persist after high-use households stop receiving HERs.[7] The detailed objectives include the following:

- Estimate the program-induced electricity savings for all households in the treatment group and for households in the following treatment sub-groups and time period:
  - *"Extension"* (high-use) treatment group recipients continued from Year 1
  - *"Expansion"* (average-use) treatment group added in Year 2
  - All-electric heat households
  - Summer and winter months
- Explore how long savings persisted after discontinued Year 1 households stop receiving reports
- Year 2 Process Assessment
  - Treatment Group Survey
  - "Average" customer focus groups

Methods

The evaluation team used three different methods to inform the study objectives:

1. Telephone survey with high-use Extension and average-use Expansion households
2. Focus groups with average-use Expansion households[8]
3. Billing analysis of Year 1 households (high-use Extension and Discontinued) and Year 2 average-use Expansion households

Telephone Survey. The evaluation team conducted quantitative telephone interviews between July 2, 2013 and August 13, 2013 with 304 residential households who received HERs monthly from late July or early August 2012 through March 2013. The survey included independent samples of 152 high electricity-use Extension households who had received reports in the Year 1 program as well as 152 average electricity-use Expansion households who were receiving HERs for the first time. The response rate was 9.5%, with survey length and outside influences such as CL&P's "do not call" list and a recent surge in calls encouraging customers to switch their

[7] The EEB Evaluation Consultants have recommended an evaluation study in 2014 that would track savings persistence for average-use customers.

[8] The evaluation team conducted focus groups with average-use Expansion households in the first year of the pilot program, and reported results from this evaluation activity in the Year 1 report ("Evaluation of the Year 1 CL&P Pilot Customer Behavior Program," March 4, 2013 submitted to Connecticut Energy Efficiency Board and Connecticut Light and Power by NMR Group, Inc., Tetra Tech, and Hunt Allcott).

electricity suppliers helping to explain the lower-than-desired rate (see Section 1.3.1 and Appendix D for more detail).

The survey focused on the following issues:

- Engagement with the program
- Barriers to engaging the program
- Evidence of behavioral change
- Satisfaction with the program

Focus Groups. The evaluation team conducted three focus groups on February 26 to 27, 2013 in Stamford and Farmington, Connecticut. The 21 attendees lived within a 15-mile radius of the facilities in Stamford or Farmington, were aware they were receiving HERs, and received an incentive of either $85 (Farmington) or $100 (Stamford) (see Section 1.3.2 for more detail).

The primary objectives of the focus group discussions were to:

- Identify households' evaluations of the HER Program and HERs
- Usefulness of the HER information for their household
- Levels of readership and engagement with the HERs
- Ideas for changes in the program that could increase engagement and satisfaction

Billing Analysis. The team relied on billing analyses to assess the electricity savings induced by the program and the persistence of savings after households stop receiving reports. Section 1.3.3 provides more detail on data cleaning, preparation, and billing analysis procedures. Note that the implementer selected both the treatment and control groups; as discussed below and in the full report, future research designs should consider evaluator selection of the control group in order to increase the independence of the evaluation results.

Key Findings

The team presents the most critical findings in this executive summary, providing links to related sections of the report. However, the team urges readers to explore the results in the main body of the report (Section 2) for more detailed discussion of these and other findings.

Treatment Group Experiences

The telephone survey and focus group yielded the following critical findings.

- **Awareness of the program and readership of the HERs is high**. Over 90% of surveyed respondents in this opt-out program recalled receiving the reports, and at least one person read the whole report in more than one-half of households.[9] Among

[9] Survey questions asked the respondent to report on readership of the HERs, reaction to the information, and energy-saving behavior on behalf of the household. Except where noted explicitly, the survey did not gather the

households who at least skim the report, 65% looked at all of the reports they received. A small portion, less than one percent, of households ignored the report and did not read it at all. High-use Extension and average-use Expansion households displayed similar levels of awareness and readership.

- **Households maintain readership of the HERs over time**. Nearly three-quarters of households reported reading the reports at similar levels at the time of the survey as when they started receiving them (about one year earlier). Among households that did change their readership, average-use Expansion households were more likely to read the reports at the time of the survey compared to the start of the program. High-use Extension households, if their readership changed, were slightly less likely to read the reports over time, although they have received the reports for a longer time period than the average-use Expansion households have.
- **Households find the HERs useful overall but no single element is most important**. About 75% of households felt that the information provided in the HERs was very or somewhat useful, but no single aspect of the reports stands out as especially useful. When asked to select the "most useful" information in the report, about one-third referred to the neighbor comparison; one-fifth cited the energy-saving tips as the most useful. Another 20% of respondents, however, indicated that no one aspect of the report is most useful. Average-use households held more positive views of the HERs than high-use households, and, although small, the differences are statistically significant.
- **The HERs keep energy conservation "top of mind."** As discussed more in various places in Section 2.1 (e.g., Section 2.1.4), while survey respondents could not always identify how HERs prompted specific actions, survey respondents and focus group attendees acknowledged the reports made them think about their choices. Regularly receiving the HERs reminded households of the importance of energy conservation behaviors and shaped the framework in which they made decisions about equipment purchases or practices around their homes.
- **The HERs can make energy efficiency part of the household conversation.** Getting everyone in a household "on board" with efficient practices can be a significant challenge. Survey respondents explained that they have used the HERs as objective evidence of the household's energy use and to encourage more efficient behavior among other members of the home.
- **Households express frustration with the lack of specific recommendations or details on the underlying sources of their high consumption**. As addressed throughout Section 2 (e.g., Section 2.1.4), qualitative responses to survey questions and focus group discussions pointed out that the reports and their comparisons identify a problem but do not provide a solution. Households state energy-saving tips are generic; they lack

reactions or behaviors of each household member. The terms "households" and "respondents" are used interchangeably to refer to the persons who were interviewed.

specificity or applicability to a household. HERs fail to help households understand what appliances or practices in their homes are using the most electricity.

- **Average-use households hold more positive opinions about the program.** High-use households attribute more effects of the program to their actions. Average-use households rate the HER program higher on subjective measures—satisfaction, usefulness, likelihood of recommending the program to others, and perceived relevance and importance of the energy-saving tips. High-use households more often follow-up on a specific tip, discuss ways to save energy with household members, and indicate the program has "probably" or "definitely" helped reduce energy use.
- **Energy-saving behavior patterns differ for high-use and average-use households.** High-use households more often make home improvements or invest in new, energy-efficient appliances or equipment. Average-use households are significantly more likely to practice energy-efficient habits, such as turning off lights, unplugging chargers, or using direct lighting. Two likely sources of these differences include: 1) That high-use households have received reports for a longer period of time, and 2) That high-use households have higher incomes, on average, than average-use households so they may find it easier to afford purchasing new appliances and equipment.
- **Engagement with the program website is low.** Less than one-half of households are aware of the HER website and 7% have visited the website. Only a slightly higher percentage of households have visited the CL&P website to look for ways to save energy (12%). However, access to the Internet is not a significant barrier for most respondents: the overwhelming majority use email, make on-line purchases, or bank on-line. Rather, they are not aware of the program's on-line resources and lack a compelling reason to use them. Any program redesign that seeks to focus on web-based report delivery will need to combat a persistent lack of interest in using websites to learn about energy efficiency.
- **Households desire comparisons that are more transparent and standardized.** Survey respondents and focus group attendees feel the HERs would be more helpful for them if performance metrics compared their own usage over time rather than comparison with neighbors. Neighbor comparisons should be more clearly standardized, for example, by comparing households with the same number of occupants or itemized by type of equipment.

Electricity Savings Attributable to the Program

The billing analysis suggests that Year 2 treatment households achieved electricity savings of about 1.82%; this translates into 0.64 kWh per day or 233 kWh per year for each household, or 4,254 MWh across the entire program (Table ES-1). The team also tested for differences in savings between the high-use Extension and average-use Expansion samples. One would expect the achieved *numerical* savings to differ for these two groups because their pre-program electricity use also differed, but the impact on the *percentage* of savings remained unknown before the evaluation. The analyses revealed that the percentage of electricity savings differed

significantly between high-use Extension households and average-use Expansion households, with high-use Extension households saving about 2.31% and average-use Expansion households about 1.17%[10]. Note that the electricity savings achieved by the high-use Extension group in Year 2 were comparable to those achieved by all Year 1 monthly report recipients—of which they are a subset—in the Year 1 study (i.e., 2.17%), suggesting that savings remain relatively constant over time in households with prolonged program exposure. Due to a mixture of pre-program electricity use and differences in achieved savings, the high-use Extension households saved an average of 433 kWh per year (3,487 MWh program savings), while the average Expansion household saved 96 kWh per year (977 MWh program savings). A Wald test (see discussion in Appendix A) concludes that the two models differ significantly.

Table ES-1: Estimated Average Electricity Savings during Year 2

Sample Used	Total	High-use Extension HH	Average-use Expansion HH
Daily Electricity Savings (kWh)	0.64	1.19	0.26
Upper Bound 90% CI	0.74	1.45	0.37
Lower Bound 90% CI	0.53	0.93	0.16
Total kWh Electricity Savings/Household	233	433	96
Total MWh savings (program)[a]	4,253.50	3,487.41	976.54
Percent Savings	1.82%	2.31%	1.17%
Treatment Sample Size	18,264	8,047	10,217
Control Sample Size	19,421	9,035	10,242
Explained Variance	88%	69%	56%

[a] Because the High-use Extension and Average-use Expansion results come from separate models, so the total electricity savings results reported here cannot be duplicated through simple arithmetic.

[10] The average monthly pre-treatment usage was 709 kWh for the Expansion households and 1,660 kWh for the Extension households.

For reasons discussed in more detail in the main body of the report (see Section 1.3.3 and Section 2.2.2), the team also explored savings for various sub-groups. Table ES-2 summarizes the most critical of these results, presenting the daily savings, percent savings, and sample sizes for each model. The full report includes additional information on additional models, definitions of the groups, confidence intervals, total annual savings per household, and explained variance. These results suggest the following:

- Households with the highest use in the Year 2 treatment group (i.e., the highest users within the high-use Extension group) achieved a greater percentage of savings (2.49%) than typical high-use households (2.34%).
- High-use Extension households who did not pay the all-electric rate (these customers have all electric appliances in the home) saved more (2.71%) than those households that did pay the all-electric rate (1.27%)—a shift from the Year 1 findings likely explained by the characteristics of the Extension sample compared to the whole Year 1 sample.
- Finally average-use expansion households paying the all-electric rate saved more (1.29%) than average-use Expansion households not paying this rate (1.16%). A Wald test confirms that each pair of models differs significantly.

Table ES-2: Estimated Average Electricity Savings for Treatment Sub-groups

Treatment Sub-group	Daily Savings (kWh)	Percent Savings	Treatment Sample Size	Control Sample Size
High-use Extension Typical Use	1.14	2.34%	7,637	8,950
High-use Extension Outlying use	2.50	2.49%	406	440
High-use Extension Electric Rate Code	0.67	1.27%	2,250	2,464
High-use Extension Non-electric Rate Code	1.38	2.71%	5,797	6,571
Average-use Expansion Electric Rate Code	0.32	1.29%	924	947
Average-use Expansion Non-electric Rate Code	0.26	1.16%	9,293	9,295

Persistence of Savings

In addition to exploring electricity savings during the treatment period, the team also examined how long savings persist after treatment households stop receiving report. They explored savings persistence through two types of analyses:

1. Persistence of savings among high-use Extension households between their last Year 1 report and their first Year 2 report (six months)—what the team refers to as the "hiatus" period
2. Persistence of savings for all permanently discontinued Year 1 households

The results of the first analysis indicate that the high-use Extension sample continued to achieve savings comparable to their Year 1 savings (1.97% during Year 1 and 2.17% during the hiatus) during the entire hiatus period. Monthly variations in savings, which ranged from 2.04% to 2.32%, reflect natural fluctuations in electricity use.

The results of the second analysis point to continued electricity savings for the discontinued treatment sub-groups from Year 1; note that implementer assigned the discontinued sub-groups, not the evaluation team. In particular, the discontinued monthly (the Year 1 group that received monthly reports during the first year of the study), persistence (the Year 1 group that received monthly reports during the first eight months of the first year of the study), and quarterly (the Year 1 group that received reports once every three months for the first year of the study) treatment groups each continued to achieve statistically significant savings between April 2012 and July 2013. Overall, the discontinued monthly group saved about 3.70% during Year 2 of the program while the persistence and quarterly groups saved about 1.86% and 2.06% respectively. However, the team cautions that the characteristics of the discontinued monthly treatment group may have inflated its estimated savings (see Section 2.3.2). Given the stability in savings for the persistence and quarterly groups as well as the High-use Extension group during the hiatus period, the team believes that it is more likely that the discontinued monthly group also achieved savings in the 2.0% range over the entire time period.

Looking at the persistence of electricity savings for each month after the cessation of reports, the results suggest that households that received reports for a year—either monthly or quarterly—still regularly exhibited statistically significant savings 15 months after receiving their first report, although the savings appeared to be diminishing over time. In contrast, households that received monthly reports for only eight months in Year 1 not only saw savings diminish, but they also tended to become non-significant over time (see Section 2.3.2).

Ratio of Program Expenditures to Savings

The team obtained the Year 1 and Year 2 budgets to calculate ratios of program expenditures to savings for Year 1 and Year 2 of the program that covers the period when the participants were receiving reports (Table ES-3) as well as the ratios of program expenditures for saving that also encompasses a year of persistence savings (actual persistence savings for the discontinued groups and "hypothetical"[11] savings for the High-use Extension and average-use Expansion groups) (Table ES-4). The computations show that cost per kWh savings was between two and three cents for the high use customer groups, and about 13 cents for the "average" use customers.

The expenditure to savings ratio was:

- $0.03 for the combined Year 1 and Year 2 programs while participants were receiving reports.
- $0.02 for discontinued Year 1 persistence households and hypothetical persistence savings for the average-use Expansion and High-use Extension households.
- $0.02 for individual study groups stood at for all discontinued Year 1 households, with the ratio being calculated as Year 1 budget for these subgroups divided by Year 1 savings and persistence savings.
- $0.03 for High-use Extension households including their combined Year 1 and Year 2 budget divided by the combined Year 1 and Year 2 savings for this group.
- $0.02 for High-use Extension households including their combined Year 1 and Year 2 budget divided by the combined Year 1 and Year 2 savings for this group and including a year of hypothetical persistence savings.

In contrast, the ratio among the average-use Expansion households was only $0.13, much higher than for the other groups; the calculation included their Year 2 program budget and their Year 2 savings—including a year of hypothetical persistence savings halves the ratio to $0.07. The lower expenditures to savings ratio for the High-use Extension households reinforces the finding that the greatest savings are possible when the program focuses on high energy usage households, raising questions about whether the program will achieve acceptable savings per expenditure if expanded to all CL&P households.

[11] The Year 2 Extension and Expansion groups' persistence savings are hypothetical because they received reports during Year 2 of the program, but the team has not yet performed a billing data beyond the end of the Year 2 program period. The groups' persistence savings are an assumption of what their energy savings would be for a year after they had stopped receiving reports. However, the current evaluation plan calls for a billing analysis in the Summer of 2014 to assess actual persistence of savings for Year 2 households.

Table ES-3 and Table ES-4 also show the kWh savings for all treatment groups in the study. Including Year 1 active treatment groups, Year 2 active treatment groups, and the persistence of savings among the discontinued treatment groups in Year 2, the program has saved 17,849,721 kWh, 16,872,181 of which has come from high energy usage households.

Table ES-3: Energy Savings per Dollar Expenditure While Participants Were Receiving HERS

Sub-Treatment Group	kWh Savings Year 1	kWh Savings Year 2	Program Expenditures	Rate of Expenditures to Savings	Sample Size
High-use Extension	3,343,680	3,487,410	$201,131	$0.03	8,047
Monthly Discontinued	464,400	--	$13,932	$0.02	1,127
Persistence Discontinued	1,578,960	--	$47,368	$0.02	3,697
Quarterly Discontinued	3,900,960	--	$117,026	$0.02	9,096
Average-use Expansion	--	977,540	$128,319	$0.13	10,217
TOTAL	9,288,000	4,464,950	$406,954	$0.02	23,088

[a] The program did not track expenditures by Extension, Monthly Discontinued, Persistence Discontinued, Quarterly Discontinued, and Expansion groups, so the team applied the proportion of sample that was in either group to estimate the budget associated with each group.

Table ES-4: Energy Savings per Dollar Expenditure Including Persistence Savings [a]

Sub-Treatment Group	kWh Savings Year 1	kWh Savings Year 2	kWh Persistence Savings	Program Expenditures	Rate of Expenditures to Savings	Sample Size
High-use Extension	3,343,680	3,487,410	3,019,402	$201,131	$0.02	8,047
Monthly Discontinued	464,400	--	329,084	$13,932	$0.02	1,127
Persistence Discontinued	1,578,960	--	1,012,054	$47,368	$0.02	3,697
Quarterly Discontinued	3,900,960	--	2,755,633	$117,026	$0.02	9,096
Average-use Expansion	--	977,540	977,540	$128,319	$0.07	10,217
TOTAL	9,288,000	4,464,950	8,093,713	$406,954	$0.02	23,088

[a] Persistence has only been calculated for the discontinued participant groups. The persistence savings for the High-use Extension and average-use Expansion group is hypothetical and was calculated as 2% savings for the High-use Extension group since it is logical to expect the high-use Extension persistence savings to be similar to the high use discontinued groups persistence savings. The team has no information on how the average-use Expansion group savings will persist so their hypothetical persistence savings are identical to their Year 2 savings.

[b] The program did not track expenditures by High-use Extension, Monthly Discontinued, Persistence Discontinued, Quarterly Discontinued, and average-use Expansion groups, so the team applied the proportion of sample that was in either group to estimate the budget associated with each group.

Conclusions and Recommendations

CL&P and OPower designed the Year 2 study to determine whether the HERs program model achieves the same percentage of savings for the average CL&P residential electricity customer as it does for the high-use customers. The analyses in this report suggest the following conclusions regarding this issue:

- Savings: The program design achieves statistically significant savings (1.82%) for both high-use and average-use customers, but high-use households achieve statistically higher percent savings (2.31%) than average-use households (1.17%).
- Lower savings for "average" use households: Differences in pre-program electricity use and the percent savings means that CL&P can expect high-use households to achieve 350% more electricity savings as measured in kWh than average-use households.
- Persistence: The analyses also demonstrate that high-use treatment households from the Year 1 study group continued to save electricity long after they stopped receiving reports. Households demonstrated average savings of about 2% through July 2013, a period of 15 months for the discontinued monthly and quarterly treatment groups and almost two years for the discontinued persistence treatment group.

- Ratio of Expenditures and Savings: Computing the ratio of expenditures to electricity savings showed that the program achieves a more desirable ratio when focusing on high energy use households. This finding draws into question whether the ratio of expenditures to savings would be adequately high if CL&P opened the program to all households.
- Demand Savings: Calculating the demand savings based on MA inputs gave evidence that high-use expansion households likely had demand savings around 428 kW and that average-use extension households likely had demand savings between 273 kW and 73 kW.

Why does the program produce greater impacts for high-use customers? The process evaluation points to a few possible explanations. High-use households would be more likely to receive reports telling them that their use is higher than their "neighbors;" if the "feedback is effective," theory holds, this would tend to motivate the households to take actions to reduce use. Average-use households would be less likely to receive the message that their use was higher than that of their neighbors.

In addition, high-use households are generally wealthier than average use households, and may be better able to afford measures that produce deeper savings. In addition, high-use households simply have more to lose. Small changes made in a home with lots of electricity to save will likely yield larger savings than similar changes made in a home with less electricity to save.

The report also yields interesting results about how households react to the report. Perhaps the most important is the contradictory reaction to the neighbor comparison: treatment households generally distrusted the comparison (mainly because they misunderstood it), but they also cited it as the most useful part of the report. This usefulness manifested in a very objective way; the program design induces statistically significant electricity savings. This contradictory reaction to—and proven effectiveness of—the neighbor comparison could create a public relations problem for CL&P. That is, treatment households may get annoyed with the Company for what these households view as an inaccurate comparison, but this annoying aspect of the report also yields substantial electricity savings for the Company, which in turn also reduces demand and grid congestion as well as lowering greenhouse gas emissions.

The findings also highlight a second important reaction to the reports; they served to keep energy savings "top of mind." Thus, while treatment households may have griped that the tips are things that "everyone already knows," the reports served as a little reminder to take those actions on a regular basis. The persistence savings, moreover, suggest that, with enough reminders, these actions become habits; when households see their electricity use creeping back up, they turn back to those behaviors that help to lower that use, even if it is by just a few kWh per month.

A final critical question for the Year 2 evaluation involved how frequently treatment households used the program website and what that use entailed. The team found that only a minority of households even recognized that the website existed, and fewer than one-in-ten treatment

households had visited the website. Some households felt the paper HERs report gave them all the information they wanted, so they did not see a need to visit the website. Ironically, households that did not find the paper HERs useful also saw no need to visit the website, as they assumed the information would be equally unhelpful to them. It is also the case that only a few households visited the CL&P website for information on energy efficiency. In short, if CL&P and OPower want to redesign the program to be web-based rather than paper-based, they will need to combat a persistent lack of interest in using websites to learn about energy efficiency. Certainly households looking for a specific energy-using product may search the Internet for product reviews and pricing, but most households seem less interested in using websites to discover general tips on ways they can save energy.[12]

[12] Other evaluations of behavior modification programs with a similar design also find low engagement with a program's web portal, creation of a web account, or utilization of a program's on-line resources to understand and reduce household energy use. See "Massachusetts Three Year Cross-Cutting Behavioral Program Evaluation Integrated Report," July 2012, Prepared for Massachusetts Energy Efficiency Advisory Council and Behavioral Research Team by Opinion Dynamics Corporation with Navigant Consulting; "Program Year 1 (2011-2012) EM&V Report for the Residential Energy Efficiency Benchmarking Program," December 21, 2012, Prepared for Progress Energy Carolinas by Navigant Consulting; "Home Energy Reports Program, Program Year 2012 Evaluation Report," May 12, 2013, Prepared for AEP Ohio by Navigant Consulting; "Final Annual Report to the Pennsylvania Public Utility Commission For the Period June 2012 through May 2013, Program Year 4," November 15, 2013, Prepared by ADM Associates, Tetra Tech, NMR Group, and Pennsylvania Power Company.

These critical findings on electricity savings, persistence of savings, reactions to reports, and use of the website lead to the following recommendations:

Recommendation 1: Given the strong evidence for program savings during the treatment period and well after the cessation of reports, the team recommends that CL&P calculate program savings for* high-use households *to include the savings achieved during treatment period plus another 2.0% for at least one year after the households stop receiving reports. The evidence actually supports claiming savings for 15 months to two years after report cessation, but the team recommends the more conservative period of a year due to the pattern of diminishing savings over time. Still, the team recognizes that a strong argument can be made for extending the period beyond one year after the cessation of reports for customers that will no longer be involved in the program, and CL&P and the EEB should consider the strengths and weaknesses of a longer persistence period when calculating program savings. The Year 1 discontinued groups could continue to be observed with another billing analysis a year after the end of the Year 2 program period to examine whether savings persisted among high users after more than a year of not getting reports. *This recommendation applies only to high-use households; research planned for 2014 will provide more insights into the persistence of savings for average-use households*.

Recommendation 2: The HERs program results in lower (i.e. more desirable) expenditures to savings ratios for high-use households than for average-use households. This suggests that expanding the program to all households may not achieve desirable expenditures to savings ratios. However, additional program goals may justify expansion to all households. The team stresses that the program will remain the most cost effective if it targets high-use households, but this creates social equity concerns, as these households tend to be wealthier and enjoy higher socioeconomic status than the typical CL&P customer. While alternative program designs may result in lower budgets and economies of scale than achieved in these two Pilot studies, the results strongly suggest that the CL&P and the EEB must carefully weigh social equity concerns with the savings to be achieved with rate payer funds. Note that Recommendation 5 below addresses the possibility of using a web-based study design.

Recommendation 3: Future evaluations should be responsible for developing their own control group for estimating savings from the program. The implementer selects the treatment and control groups, and the team stresses that the data point to random allocation of these groups. Yet, the random allocation cannot be confirmed or tested with certainty. The evaluation design and independence could be improved if the evaluators compared estimates of electricity savings based on the implementer control group and an evaluator-selected control group that matched the treatment group. The team notes, however, that the

matching process can sometimes be quite involved and require somewhat substantial resources (e.g., labor hours, computing resources, etc.) to carry out.[13]

Recommendation 4: Given its integral role in inducing energy-saving behavior, the neighbor comparison should remain a critical component of the program design. However, CL&P and OPower should also *consider* revising the report to make the definition of "neighbors" more prominent. The team makes careful use of the word "consider" in the previous sentence because it recognizes two facts. First, the current report format includes the definition *in plain sight directly below the neighbor comparison*, but the font size relegates it to "fine print" that is overlooked by many recipients. Second, clarifying the definition of "neighbors" may also reduce the competitive reaction that households have to the comparison that leads them to take energy-savings actions. In short, perhaps CL&P and OPower could experiment with ways of continuing to promote the competitive spirit created by the neighbor comparison in a way that is more conducive to positive customer relations.

Recommendation 5: CL&P should be hesitant to move to a web-based design unless they have a strong plan in place to convince households to visit the website initially and then to continue to engage the website on a regular basis. The most difficult component of a web-based program design will likely be convincing households to visit the website and create an account. The team anticipates that the program would need to move from an "opt-out" to an "opt-in" design *unless CL&P already has email addresses for substantial numbers of its residential customers*.[14] The need for email addresses reflects the reality of the current design—the papers reports have not induced use of the website, so it is unlikely that a "welcome letter" will work any better. In contrast, the ability to follow an embedded email link could increase use of the website. If CL&P lacks large numbers of email addresses for its residential customers, an opt-in design could take advantage of social media (Twitter, Facebook, etc.) to encourage interested households to sign-up at the website.[15] Finally, a web- or email-based approach would almost certainly be cost effective, but the biased sample could result in electricity savings that differ radically from the current program design. In short, the savings reported here could not be generalized to a web- or email-based design, be that design opt-in or opt-out.

[13] For examples of behavior studies that selected control groups: "Some Insights on Matching Methods in Estimating Energy Savings for an Opt-In, Behavioral-Based Energy Efficiency Program" presented by Provencher et al, IEPEC 2013, Chicago, IL.
"Control Group Wars-There's More Than One Way to Win the Battle" presented by Hanna, D. and Marrin, K., IEPEC 2013, Chicago, IL.

[14] If it does have email address for substantial numbers of customers, CL&P could deliver opt-out reports via email, although SPAM filters could become problematic, sending the reports to the trash box rather than the inbox.

[15] Note that UI tried this approach a few years ago with little success; however, it may be that use of social media has become more common and CL&P may want to try the approach again.

1 Introduction

This report summarizes the results of a process evaluation and an impact evaluation of Year 2 of the Home Energy Reports (HERs) Pilot Program, implemented for Connecticut Light and Power (CL&P) by OPower. NMR Group, Inc. (NMR) and subcontractor Tetra Tech performed the evaluation activities; they are referred to collectively as the team.[16] The evaluation covers the second year of the program, but includes comparisons to Year 1 results and explores how long savings persist after households[17] stop receiving reports.

1.1 Program Description

CL&P and program implementer OPower administered a behavior pilot program for the purposes of achieving residential electricity use savings, and providing value to their customers through the delivery of HERs. These reports present the treatment group with feedback on their electricity use and compare that use to a group of similar households referred to as "neighbors."

The HER is a two-page (printed on front and back) report, branded with the CL&P and Connecticut Energy Efficiency Fund (CEEF) logos. The HER shows households their electricity consumption for the previous month and the previous 12 months and compares their usage to the neighbor comparison group. The usage for the neighbor comparison group is further divided into the "most efficient neighbors (the 20 percent of the neighbor group with the lowest electricity usage) and the "average of all neighbors." The HERs may periodically have varying introductions (e.g. rank out of 100 neighbors). On the back of every HER, the implementer lists energy-saving tips; these differ from month to month.

One of the critical characteristics of the HERs program is its reliance on an experimental design. Using data provided by CL&P, OPower reports that it identified a study group of CL&P residential customers and then randomly assigned each of the study group households to either a treatment group that received HERs in the mail or to a control group that did not receive the HERs. The evaluation team was not given the opportunity to review or confirm the random allocation, although tests for pre-program electricity use suggest that the allocation was random. The pilot program uses an "opt-out" design, where customers assigned to the treatment group automatically receive reports, but have the option to contact program representatives to opt-out of the HERs program if desired.

Table 1-1 summarizes the study designs for the Year 1 and Year 2 Pilot Program. Although the overall experimental approach remained the same between the two years, the characteristics of

[16] The team wishes to Dr. Hunt Allcott, an Assistant Professor of Economics at New York University and a Faculty Research Fellow at the National Bureau of Economic Research, for his useful insights and advice on this project.

[17] The report refers to "households" rather than "participants" for two reasons: 1) strictly speaking in an experiment design members of both the treatment and the control groups are "participants;" and 2) it avoids confusion when speaking about participants in other programs (especially HES and HES-IE) addressed in the process evaluation.

the households receiving reports differed substantially. In particular, prior to the program nearly every Year 1 participant used substantially more electricity than the average CL&P household (1,600 kWh per month vs. 700 kWh per month, respectively). The Year 1 Pilot Study, therefore, provided the Energy Efficiency Board (EEB) and CL&P with a strong understanding of the program effects on high-use customers only. In Year 2, CL&P and OPower revised the program to provide information on average-use customers by sending reports to two distinct treatment groups: 1) an High-use Extension group comprising 8,000 Year 1 monthly treatment group households who received reports for another year (with a few month hiatus described more below), and 2) an average-use Expansion or average-use group comprising 10,000 newly selected households who all exhibited pre-program electricity use similar to the average CL&P customer (i.e., about 700 kWh per month). The Year 2 program also dropped the quarterly and monthly sub-treatment groups; instead all treatment group households received monthly reports.

Table 1-1: HERs Year 1 and Year 2 Program Designs

Program Component	Year 1	Year 2
Study Group Size	48,000	67,000
Control Group Size	24,000	34,500 (Year 1 control group n=24,000) (Year 2 control group n=10,500)
Active Treatment Group Size	24,000	18,000
Discontinued Treatment Group Size[a]	0	16,000
Pre-program usage type	High users only	High-use Year 1 Extension (continued) (n=8,000) Average-use Year 2 Expansion (new) n=10,000)
Quarterly Sub-treatment Group	Yes	No
Persistence Sub-treatment Group	Yes	No[b]

[a] Comprising all recipients from Year 1 who did not receive reports in Year 2.

[b] The program design did not include persistence sub-treatment groups, but the evaluation design does examine persistence of savings for Year 1 households that no longer received reports in Year 2.

Because the HERs program relies on opt-out, CL&P and the implementer notify households that they will be receiving these reports with a "Welcome Letter." The average-use Expansion sample received this letter with their first HER, while the high-use Extension sample received a postcard notifying them of their continued inclusion in the HER program. Both the letters and postcards were branded with CEEF and CL&P logos and provided an introduction to and "Frequently Asked Questions" about the HER and the Program. Examples of a HER, a Year 2 average use welcome letter, and a Year 1 postcard are provided in Appendix B.

1.2 Study Objectives

The objectives of the Year 2 Pilot Program evaluation stem from the program design and seek to understand whether responses to HERs vary for high-use and average-use customers and how

long savings persist after high-use households stop receiving HERs.[18] The detailed objectives include the following:

- Estimate the program-induced electricity savings for all households in the treatment group and for households in the following treatment sub-groups and time periods:
  - Extension (high-use) treatment group recipients continued from Year 1
  - Expansion (average-use) treatment group added in Year 2
  - Households that pay the all-electric rate code
  - Summer and winter months
- Determine how long savings persisted after discontinued Year 1 households stop receiving reports
- Conduct a Year 2 Process Assessment
  - Treatment Group Survey
  - "Average" customer focus groups

1.3 Methods

The evaluation team used three different methods to inform the study objectives:

1. Telephone survey with high-use Extension and average-use Expansion households
2. Focus groups with average-use Expansion households
3. Billing analysis of Year 1 households (High-use Extension and Discontinued) and Year 2 average-use Expansion households

1.3.1 Telephone Survey

The evaluation team conducted quantitative telephone interviews between July 2 and August 13, 2013 with 304 residential households who received HERs monthly from late July or early August 2012 through March 2013. The survey included independent samples of high electricity-use Extension households who had received reports in the Year 1 program as well as average electricity-use Expansion households who were receiving HERs for the first time.

The survey focused on the following issues:

- **Engagement with the program.** The HER program is an auto-enroll program with which treatment group households have not actively enrolled. Therefore, an objective of the survey was to assess whether treatment households were aware of the program and read the HERs that were delivered to their homes. Other measures of engagement included reported usefulness of the information, perceived relevance of the energy-saving tips, and use of on-line resources provided by the program.

[18] The EEB Evaluation Consultants have recommended an evaluation study in 2014 that would track savings persistence for average-use customers.

- **Barriers to engaging the program.** To identify program barriers, the evaluators examined such issues as the respondents' reactions to the HERs, changes in readership over time, and whether they pursued additional information; the survey included open-ended questions eliciting more information on these topics.
- **Evidence of behavioral change.** The telephone survey provides information on self-reported respondent behavior related to energy use, information that provides context to the electricity-savings analyses also described in this report. Evaluators asked several questions related to this topic. Do treatment households take steps to reduce their energy use as a result of the HERs? Do they follow-through on energy-saving ideas presented in the HERs? Do household members discuss energy conservation and the ways they can reduce the household's energy use?
- **Satisfaction with the program.** The team examined respondents' satisfaction with the HERs as well as self-reported attribution as to whether the program had helped reduce their energy-use. Responses to open-ended questions pointed to ways the respondents believed the program could improve.

Sampling and Survey Methodology. The evaluators conducted a Year 2 survey with 304 households that receive the HERs. Of these households, 152 were Year 1 high energy users ("high-use") and 152 were Year 2 average energy users ("average-use"). Respondents completed telephone interviews between July 2, 2013 and August 13, 2013. The evaluators mailed advance letters to sampled households shortly before calling began for those particular households—July 5, July 22, July 29, and August 6. The team mailed advance letters in four waves to coordinate with sample management and the release of sample replicates.

Table 1-2 summarizes the response and cooperation rates. Overall, the response rate was 9.5% and the cooperation rate was 19%, with an 8.2% response and 16.4% cooperation rate from high-use Extension households and an 11.2% response rate and 22.6% cooperation rate from the average-use Expansion households. The team selected a total of 3,342 households into the survey sample (1,946 High-use Extension, 1,396 average-use Expansion) with a small percentage of each determined to be ineligible. The final dispositions are based on the eligible sample (response rate) or the eligible sample for which contact information was available (cooperation rate).

Table 1-2: Response and Cooperation Rates

	High-use Extension	Average-use Expansion	Total
Starting Sample Size	*1,946*	*1,396*	*3,342*
Ineligible Sample – no longer a CL&P customer, deceased, or business line	24	9	33
Eligible Sample	*1,922*	*1,387*	*3,309*
Do not contact – flagged by CL&P	825	579	1,404
Refusal	106	84	190
Incompletes (partial interviews)	55	50	105
Invalid phone numbers	138	117	255
Language barrier, incapable, not available	8	10	18
Active Sample[a]	632	390	1,022
Does not recall HERs (terminated)[b]	5	4	9
Completed surveys	152	152	304
Response rate[c]	8.2%	11.2%	9.5%
Cooperation Rate[d]	16.4%	22.6%	19.0%

[a] Interviewers made an average of 4.3 contacts per active case to attempt to complete the interview.

[b] These nine individuals did not recall receiving the HERs, even after the interviewer described the reports to them; the team terminated the interview after determining that these respondents did not recall the reports, as they could not answer questions about HERs readership or energy-saving behavior induced by the program.

[c] Number of completed surveys and does not recall HERs divided by eligible sample size.

[d] Number of completed surveys and does not recall HERs divided by eligible sample minus do not contact and invalid phone numbers.

Several factors contributed to lower response rates. The survey was relatively long, especially for a data collection effort that did not offer an incentive and drew from an auto-enrolled sample. Thus, the potential respondents lacked the strong relationship that participants in self-enrolled programs often have with a program. The Year 2 survey was over 20 minutes long on average, and this length represents a reduction of five minutes after the first week of data collection prompted revisions to shorten the questionnaire. In contrast, the Year 1 survey was about 15 minutes long, on average.[19,20]

[19] The changes in length reflected the desire to answer research questions about the impact of the HERs on energy-related behavior, both short-term and long-term.

Evaluation reports typically give cursory attention to the demographic characteristics of respondents. However, this report highlights these characteristics because they differ—sometimes statistically—between the high-use Extension and average-use Expansion households and may help to explain some of the results discussed later. Table 1-3 presents a summary of these demographic characteristics. Most respondents own their home (96%), live in a single family residence (90%), have a home built between before 1970 (53.5%), and have a college degree or higher (55.8%). More than one-third had 2012 household income that exceeded $100,000 (36.1%). Yet, numerous statistically significant differences arise when comparing the two populations. Generally, High-use Extension households were younger, more highly educated, wealthier, and lived in newer homes. The report references these factors when addressing survey and electricity savings reports in sections that follow.

Table 1-3: Key Demographic Characteristics

Characteristic	Response	High-use Extension	Average-use Expansion	Total	ACS
Households with children < 18 years old	Yes	32.9%	19.7%*	25.8%	NA
	Sample Size	152	152	304	NA
Households with residents 65+	Yes	34.9%	46.1%*	40.9%	14.3%
	Sample Size	152	152	304	NA
Number of people living in household year-round	Mean	3.0	2.4	2.7	
	Sample Size	152	149	301	
Own or rent home	Own	97.4%	94.6%	95.9%	68.3%
	Sample Size	152	148	300	NA
Type of home	Single family residence	90.8%	89.4%	90.0%	
	Sample Size	152	151	303	
Year home built	Before 1970	44.1%	61.8%*	53.5%	NA
	Sample Size	152	149	301	NA
Electric heating	Percent mentioned	39.5%	18.4%	28.1%	15.1%

[20] A number of outside factors also contributed to the low response rate. First, of the customer records provided by CL&P to define the survey population, more than 40% of treatment households were flagged as "do not contact" (825 high-use customers and 579 average-use customers). The "do not contact" households were eligible for sample selection but, because the HERs is an auto-enrolled program, the team respected their request and did not call them for the survey. In addition, the CL&P service territory is one in which customers can select their electricity supplier, and potential and actual survey respondents told us that this has created a highly competitive sales environment. Periodic debriefings with interviewers revealed that survey respondents frequently told them that they often received calls encouraging them to switch suppliers and offering various introductory offers as incentives. Not surprisingly, many respondents stop listening as soon as they are told "I'm calling on behalf of…," leaving the interviewer with a slim chance of differentiating a program evaluation study from a sales contact. Mailing advance letters to sampled households on CL&P letterhead and signed by a CL&P representative, as this study did, can help allay households' concerns and enhance recognition that this is a research study rather than a sales call. Coordination with the customer call center and providing customer service representatives with information about the study (e.g., timeline, description, evaluation contractors) may also be useful.

	Sample Size	152	152	304	
# bedrooms in home	Mean	3.5	3.1	3.3	NA
	Sample Size	151	151	302	
Education	Four-year college Degree or higher	64.0%	48.6%*	55.8%	35.4%
	Sample Size	150	148	298	
2012 household income	$100,000 or more	49.0%	25.2%*	36.1%	33.3%
	Sample Size	149	151	300	NA

* Statistically different from High-use Extension group at the 90% confidence level

1.3.2 Focus Groups

The evaluation team conducted three focus groups on February 26 and February 27, 2013 in Stamford and Farmington, Connecticut. Working with two local focus group facilities, the team recruited focus group attendees from a sample of average-use Expansion households who lived within a 15-mile radius of the facilities in Stamford or Farmington. The recruitment screener asked if household members were aware they were receiving HERs, and only individuals who indicated that they were aware of the HERs took part in the focus groups. The recruitment data from the focus group facilities indicated that of the 150 treatment households contacted by phone, a total of five recruitment interviews (3%) were terminated because the households did not recall receiving the HERs.

The primary objectives of the focus group discussions were to:

- Identify attendees' evaluations of the HER Program and HERs
- Usefulness of the HER information for their household
- Levels of readership and engagement with the HERs
- Ideas for changes in the program that could increase engagement and satisfaction

The team offered individuals $100 incentive to attend the focus group discussion in Stamford and $85 to participate in the Farmington focus group discussions, with the differences reflecting the cost-of-living in the two areas and the difficulty of traveling to the facilities during rush hour traffic. A total of 21 people attended the three focus group discussions: seven in Stamford and eight and six in Farmington at the 6pm and 8pm focus group discussions, respectively. Across all three focus group discussions, 14 attendees were male and seven were female, which largely reflects the name on the electricity bill. Based on observation, attendees appeared to cover all age groups from early 20s to 70 years of age and older.

The focus group discussions lasted for 90 minutes. No observers from CL&P, the EEB, the Department of Energy and Environmental Protection (DEEP), or the Public Utilities Regulatory Authority (PURA) attended the focus groups.

1.3.3 Billing Analysis

The team relied on billing analyses to assess the electricity savings induced by the program and the persistence of savings after households stop receiving reports. The team engaged in various data preparation steps prior to performing the statistical analyses.

Billing Analysis Data Preparation. The billing analysis relied on data obtained from three different sources: 1) CL&P, 2) OPower, and 3) the National Climate Data Center (NCDC) website (Table 1-4).[21] CL&P provided flags for households who had contacted CL&P to opt out of the program. CL&P also included rate codes, so the team could determine all-electric rate paying households, and flags for whether service had been disconnected.

OPower provided the billing data used in this analysis, making certain to include electricity account numbers for matching to other data files (e.g., Year 1 data) and providing the data in formats as requested by the evaluation team, although the data delivery occurred six weeks later than the team requested. These data included monthly electricity use per service account for both the HERs treatment group and control group as well as the meter read dates from January 1, 2010 through July 31, 2013. OPower also sent data on treatment, control group, and sub-treatment group assignments (i.e., average use, High-use Extension, quarterly, monthly, and persistence samples). Data sent by OPower also showed the date that they mailed the first report to each treatment household. As with the billing data, OPower also provided the supporting data in the formats requested.

Weather data came from four regional stations in Connecticut (Figure 1-1). Using GIS, the team created a map and assigned service account zip codes to the nearest of the four weather stations. The areas in white are served by municipal utilities and the United Illuminating Company. Also, the Igor Sikorsky Memorial Airport is outside of the CL&P service territory, but it still is the closest weather station to many of the CL&P towns located in the southwest corner of the state. For each region, the team calculated average monthly temperature, total monthly heating degree days, and total monthly cooling degree days from daily data available from the NCDC website for December 2009 through July 2013 and included the heating and cooling degree days as a control for the impact model.

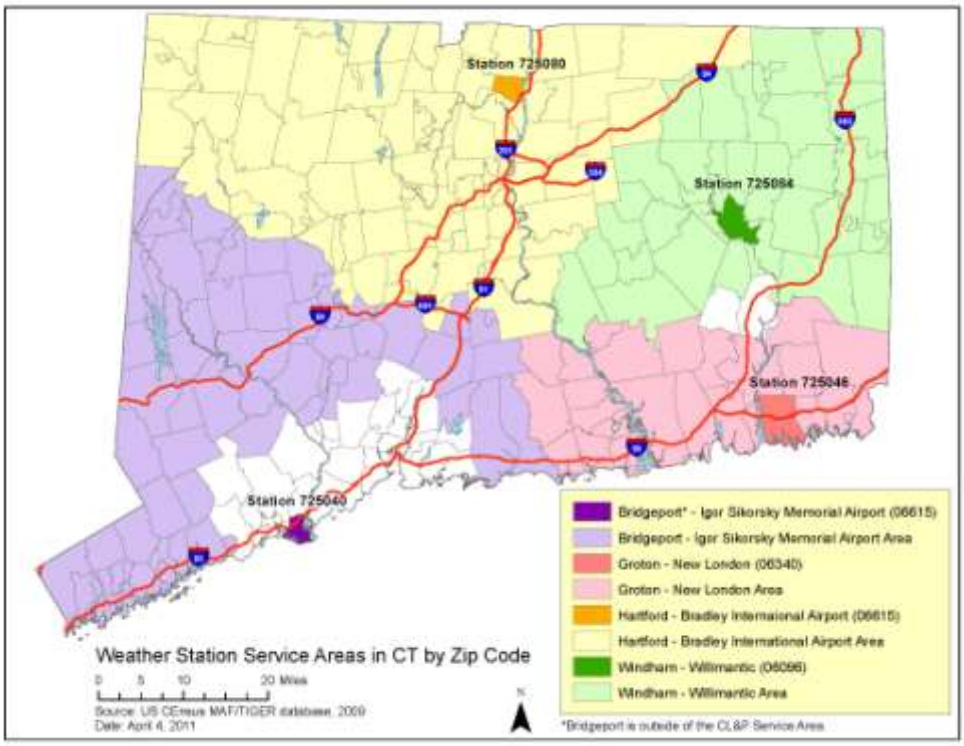
Table 1-4: Billing Analysis Data Sources

CL&P	OPOWER	NCDC
Flag for treatment households who opted out of program[a]	Monthly billing data in kWh, presented as total usage and daily average usage	Average daily temperature for four major weather stations in Connecticut
Flag for service disconnection	Meter read date	Heating Degree Days (HDD), calculated from the average daily temperature data
Rate codes to identify all-electric rate customers	Date of first report	Cooling Degree Days (CDD), calculated from the average daily temperature data
	Assignment to treatment and control as well as any sub-treatment group	

[a] Opt-out households have been retained in the analysis.

[21] Accessed at http://www7.ncdc.noaa.gov/CDO/cdoselect.cmd?datasetabbv=GSOD&countryabbv=&georegionabbv=

Figure 1-1: Weather Station Assignment



The team needed to remove some households from the analysis for various reasons. The greatest number of cases was excluded because they did not have billing data for the full pre-program time period. Most of the remaining removals were households that had their service disconnected prior to July1, 2012 (for the average-use Expansion group) or January 1, 2011 (for the high-use discontinued and High-use Extension groups), accounting for most of the remaining removals. The team also excluded households from the analysis because they lacked a unique billing account. In total, this process reduced the number of records from 69,400 to 67,594, with 917 records removed from the treatment group and 889 from the control group. The final database included household characteristics, monthly billing data, and monthly regional weather data. Table 1-5 summarizes the final sample sizes used in the analysis as well as the overall and monthly electricity use for the households across the study period.

Table 1-5: Total Pre-Program Electricity Usage for Households Included in Analysis[a]

	Households	Total Usage (kWh)	Average Overall Usage (kWh)	Average Monthly Use (kWh)
Average-use Expansion Treatment Group	10,217	86,803,632	8,496	708
Average-use Expansion Control Group	10,242	87,138,936	8,508	709
High-use Extension Treatment Group	8,047	159,330,600	19,800	1,650
High-use Extension Control Group	9,035	179,218,260	19,836	1,653
Discontinued Treatment Group	15,519	309,697,164	19,956	1,663
Discontinued Monthly	1,670	33,446,760	20,028	1,669
Discontinued Persistence	3,979	79,261,680	19,920	1,660
Discontinued Quarterly	9,856	196,804,608	19,968	1,664
Discontinued Control Group[b]	24,268	481,671,264	19,848	1,654

[a] These data reflect the period from January 2010 through December 2010 for the high-use Extension and Discontinued groups and August 2011 through July 2012 for the average-use Expansion groups.

[b] Encompasses all Year 1 control group households including the high-use Extension control group. The high-use Extension control group households have never received a report and should be statistically similar to the other control group households from Year 1.

Table 1-6: Distribution of Pre-Program Electricity Usage for Households around the Group Mean

	Total Group Households	Group Households within 90% of Pre-usage Mean	Average Monthly Use (kWh)	90% Usage Range
Average-use Expansion Treatment Group	10,217	9,195	708	476 to 1,024
Average-use Expansion Control Group	10,242	9,218	709	475 to 1,028
High-use Extension Treatment Group	8,047	7,242	1,650	1,167 to 2,755
High-use Extension Control Group	9,035	8,131	1,653	1,164 to 2,751
Discontinued Treatment Group	15,519	13,967	1,663	1,163 to 2,793
Discontinued Monthly	1,670	1,503	1,669	1,159 to 2,853
Discontinued Persistence	3,979	3,581	1,660	1,164 to 2,739
Discontinued Quarterly	9,856	8,870	1,664	1,163 to 2,806
Discontinued Control Group	24,268	21,841	1,654	1,162 to 2,742

Overall Program Savings Estimation Procedure. The team utilized customer electricity bills to determine whether the program had successfully resulted in behavior change and long term reduction of energy use. The team estimated energy savings and the persistence of savings through the use of billing analysis. NMR prepared a dataset containing billing, program, rate code, and weather data and then analyzed the data in STATA, a widely used statistical analysis software package. The billing analysis relies on a statistical technique known as ordinary least squares (OLS) robust regression, which is resistant to any imbalances in pre-program use between treatment and control groups and also to data point outliers; thus, OLS ensures that the method does not over-estimate or underestimate treatment effects.

Similar to the Year 1 study, the evaluators decided to use OLS. They applied this approach because it limits the impact of missing data (including inadequate post and pre-treatment electricity-use information as well as households lacking treatment/control assignments) were not evenly distributed between the treatment and control group households. This created an imbalance in the dataset, and robust OLS addresses such imbalances. It was also prudent for the team to continue to use the same method used in the Year1 analysis to ensure comparability of the results over time.[22] We include the estimating equation below:

[22] Academic researchers such as Hunt Allcott continue to refine and update their modeling approaches; the team and EEB evaluation consultant considered using some of these updated approaches, but this would have limited comparability to prior results. In the end, we chose comparability over model refinement.

Estimated Average Electricity Savings=β_0(Avg. Post-Treatment Electricity Use)+ β_1(Dichotomous Treatment)+ β_2 (Avg. Pre-Treatment Electricity Use)+ β_3 (Dichotomous Electric Heat)+ β_4 (Heating Degree Days)+ β_5 (Cooling Degree Days)

All results have also been multiplied by negative one (-1.0) for ease of interpretation; this step converts a measure of decreased use—a negative number—to a measure of savings—a positive number.

In order to use the billing analysis to understand electricity savings for specific time periods and sub-groups, the team divided the treatment and control groups into various sub-groups by restricting the data by time period or characteristic of interest. Specific time periods were created by restricting the analysis to summer or winter months, and sub-groups were defined for households paying the all-electric rate and for being a high electricity user among the high-use Extension and average-use Expansion groups. In the persistence analysis, the team also noted the frequency (i.e., monthly or quarterly) that discontinued treatment households had received reports in the Year 1 program.

Even though nearly all Year 1 households used more electricity than the typical CL&P household, the Year 1 study found that households with the very highest electricity use had a higher rate of electricity savings and saved more absolute electricity, on average, than did the other high-use households in the Year 1 treatment group. The Year 2 work plan also called for an analysis of variation in savings by pre-program use, this time exploring differences from **within** the high-use Extension and average-use Expansion households. The team identified the "outlying" households from within the high-use Extension and average-use Expansion households based on pre-program electricity use by calculating the pre-treatment mean usage for the group of interest (either high-use Extension households or average-use Expansion households) and assigning any household using more than two standard deviations of the mean as outlying households within their respective groups.

Table 1-7 shows the average daily electricity use among the typical-use households and the outlying households within both the high-use Extension and average-use Expansion groups. The total high-use Extension group has an average daily usage of 51 kWh, and 16,589 high-use Extension households' daily electricity use did not exceed two standard deviations from this group mean. In contrast, 834 outlying high-use Extension households did use more than two standard deviations from the group mean (i.e., they used more than 91 kWh per day). The average-use Expansion group had an overall mean daily usage of 22 kWh; 20,433 of the average use households utilized less than 35 kWh (two standard deviations from the mean) daily, while 567 outlying average-use Expansion households used more than 35 kWh daily. It is worth noting that the typical high-use Extension household used 35% more electricity each day than the outlying average-use Expansion household.

Table 1-7: Average Electricity Pre-program Electricity Usage by High and Average Use Sub-groups

Sub-group	High-use Extension		Average-use Expansion HH	
	Typical Use	Outlying Use	Typical Use	Outlying Use
Daily Average kWh	51.58	110.83	22.78	38.03
Sample Size	16,589	834	20,433	567

To assess the persistence of savings for the Year 1 treatment groups that had stopped receiving reports (i.e., the discontinued group), the team modeled savings for the Year 1 treatment groups through July 2013. The team reports savings for the Year 1 persistent group, who stopped receiving reports in late summer 2011 as well as the Year 1 quarterly group and the Year 1 discontinued monthly group, both of which stopped receiving reports no later than March 2012. The team was also able to explore savings for the high-use Extension group households during the HERs hiatus that took place in the spring and early summer of 2012 between final receipt of the Year 1 report and first receipt of the Year 2 report.

2 Key Findings

The team presents the results of these three evaluation methods below, dividing the results among those related to treatment group experiences with the program (gathered through the telephone survey and focus groups), those related to Year 2 program savings (billing analysis of Year 2 treatment households), and those related to the persistence of savings (billing analysis of households that stopped receiving reports either temporarily or permanently).

2.1 Treatment Group Experiences with the Program

2.1.1 Level of Awareness and Customer Engagement with the HERs

Awareness and readership of the HERs are important indicators of whether, and how effectively, feedback programs can encourage energy-saving behavior. As described earlier, households are auto-enrolled in the program. In other words, without signing-up or expressing interest, treatment households receive a welcome letter or postcard explaining the program followed by monthly two-page HERs. Treatment group engagement—awareness and readership of the reports—is a necessary condition for the program to shape behavior.

Over 90% of respondents in the high-use Extension and average-use Expansion treatment groups said that they were aware of receiving the HERs; they also reported high levels of readership (Table 2-1). In about 58% of households, at least one person read "the whole report," and someone read "certain parts of the report" in another 18%. About one-quarter of all respondents skimmed the report or glanced at it quickly, with significantly more high-use respondents doing so. Most of the telephone interviews occurred with the person in the household who read the reports (91% overall), particularly among the high-use Extension households (94% compared to 88% of average-use Expansion households).

Table 2-1: HER Recall and Readership[a]

Characteristic	Response	High-use Extension	Average-use Expansion	Total
Recall receiving HERs	Yes	91.7%	92.3%	92.0%
	No	8.3%	7.7%	8.0%
	Sample Size[b]	157	156	313
What household does with reports	No one reads it - we ignore it	0.7%	0.7%	0.7%
	Someone skims it or just glances at it quickly	27.1%*	21.5%	24.1%
	Someone reads certain parts of the report	15.3%	19.4%*	17.5%
	Someone reads the whole report	56.9%	58.3%	57.7%
	Sample Size	144	144	288
R personally reads report	Yes	93.7%*	88.1%	90.7%
	No	6.3%	11.9%*	9.3%
	Sample Size	143	143	286

[a] Note: Totals may not sum to 100% due to rounding error.
[b] Includes respondents terminated after noting they did not recall the HERs.

* Statistically different at the 0.05 level.

Two survey measures indicate that most respondents remain engaged with the program over time. Asked how their readership of the HERs changed between the time they received their first report to the time of the survey, most households reported a consistent level of attention. As shown in Table 2-2, almost three-quarters of respondents said they were just as likely to read the reports near the end of the program year (at the time of the survey) as when they first started receiving the reports. If readership changed, it was slightly more likely to increase over time rather than decrease, but only among average-use Expansion households.

Table 2-2: HERs Readership Over Time[a]

	High-use Extension	Average-use Expansion	Total
More likely to read the report now	12.6%	18.2%*	15.6%
Less likely to read the report now	14.0%*	8.4%	11.0%
About the same	73.4%	73.4%	73.4%
Sample Size	143	143	286

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

A majority of households have read "all of the reports" and 85% have read most of the reports (at least "more than half") (Table 2-3). Average-use Expansion households are more likely to have read all of the reports (69% compared with 60% of high-use households). Taken together, the results shown in Table 2-2 and Table 2-3 suggest that long-term receipt of the HERs, such as that experienced by the high-use Extension sample, may be associated with slightly declining levels of or less consistent engagement with the program's primary means of encouraging behavioral change.

Table 2-3: Number of Reports Read[a]

	High-use Extension	Average-use Expansion	Total
All of the reports	59.6%	69.2%*	64.8%
More than half	24.1%*	17.5%	20.5%
About half of the reports	11.3%*	6.3%	8.6%
Less than half	3.5%	3.5%	3.5%
One or two of the reports	1.4%	3.5%*	2.5%
Sample Size	141	143	284

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

Responses to follow-up questions suggest that engagement tends to increase among households that want to understand their energy usage, find ways to reduce their energy costs, or identify the potential effects of changes they have made. As the following responses show, households were more likely to read the report now than initially:

> *"Because our usage is high and we are trying to cut back."*
>
> *"Because I would like to know how I'm doing with energy consumption and then I would like to improve on that."*
>
> *"Because I adjust my usage based on the report and see the impact it's had."*
>
> *"I am very interested in it, the rising cost of energy, trying to conserve as much energy as we can. [I'm] more likely to read [the report] to find out if [our energy usage] is going down because it was for a bit."*

Treatment households less likely to read the reports over time expressed concerns about the accuracy of the information and became discouraged or lose interest because the information was the same each month. Some typical statement included:

> *"[I'm less likely to read the reports now] because I feel it's wrong. The report doesn't consider my situation, [that is] a person who is always home all the time who uses air conditioning and cooks. My neighbors work all day and cook outside using propane.*

> *"I don't feel [the report] is accurate. I feel like I do my part of saving energy, and they claim that I am not as good as my neighbors on the reports. They should give me some information on this report on how they come up with the [neighbor comparison] information.*
>
> *"It's uninteresting; it basically says the same thing all time."*
>
> *"It has the same trend the whole time. I know exactly how much energy I use [and] it doesn't concern me."*

In spite of the survey findings that a majority of treatment households read the reports and that engagement is consistent over time, the focus group discussions suggest that readership may be cursory or selective. Most focus group attendees indicated that they glanced only at specific parts of the report. At least two individuals became aware of the HERs and paid attention only after realizing that they had received several reports:

> *"I really didn't get very far into it most of the time. For the most part, I think I had kind of gotten as far as the front page and said, 'oh, good, I'm doing good' and just put it aside. I did enjoy getting it, but I didn't go very far into it. It was all more just like quick look, 'get your information in a very quick look', because, as someone else [in the focus group] mentioned, who has time to read these things? "*
>
> *"I didn't read them. I just looked at my ranking and said, okay, you know move on."*
>
> *"When I first got it I was a little surprised, you know. When I first opened it, there was no warning like, in advance, you're going to be getting these reports"*
>
> *"I looked at [the report] really quickly and then I put it in a pile, okay, I'll come back to that. And then I realized over the next coming weeks that they were accumulating. I don't know how often I'd been getting them. It seems like I've got six or seven of them in a paperclip area right now that's in my 'go back to and read pile'."*

While most focus group attendees disposed of the paper reports after reading them, two individuals had saved all of their copies and planned to review them.

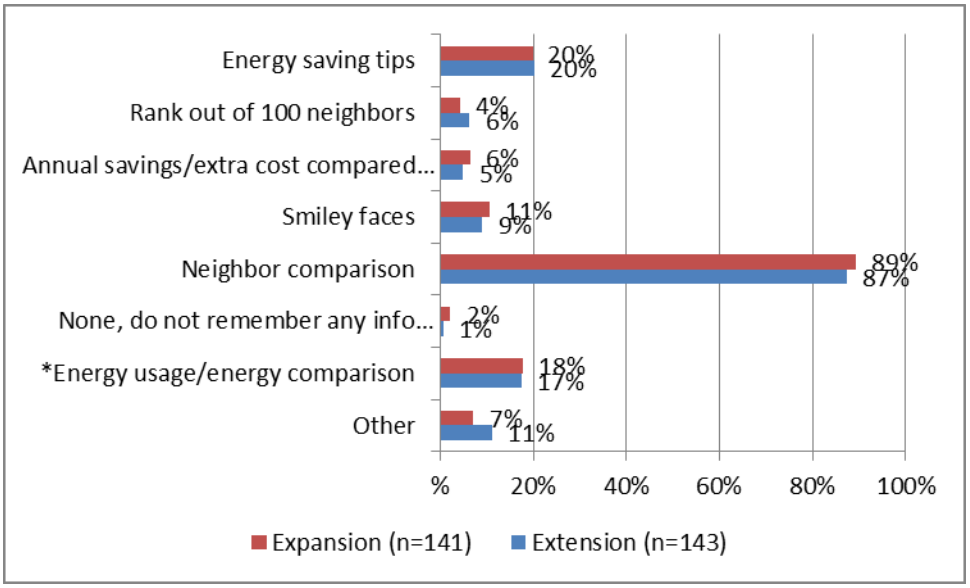
2.1.2 Recall of Information in the HERs

The survey asked what information respondents remember from the HERs to ascertain what aspects of the reports they retain or are "top of mind" (unaided recall). Analysis of these questions suggest that respondents can describe the main elements or general focus of the HERs, but the content of the reports—what a household can do to save energy or by how much they should target energy savings—may not resonate strongly with the treatment group or is not easily vocalized weeks or months after they have received a report[23].

[23] There was at least a four-month gap between the receipt of the last HER report in March and administration of the follow-up survey, which started July 2, 2013. However, participants' attention to the reports may have changed over

When asked what information they remember from the HERs, almost 90% of households mentioned the neighbor comparison, 20% named the energy-saving tips, and 18% referred generally to energy usage or comparison of energy usage (Figure 2-1).[24]. Less than 2% of households did not remember, or could not describe, any information from the report. Neither the types of information recalled nor the proportion of respondents remembering different types of information differs significantly between the high-use Extension and average-use Expansion respondents.

Figure 2-1: Information Recall from Report



Various aspects of the program and report design make it unsurprising that almost all survey respondents—as well as focus group attendees—mentioned the neighbor comparison when asked to name specific things they remembered from the reports (as shown in Figure 2-1). The neighbor comparison is the most prominent element in the report. It appears at the top of the first page of the report, follows a consistent format, and is included in every report. Other elements of the report, such as the household's rank out of 100 energy-efficient neighbors, 12-month neighbor comparison, or comparison of a household's energy use with its own energy-use at an earlier time are included in some, but not all, reports and do not always appear in the same location on the report. In addition, the welcome letter explaining the program to customers highlights the neighbor comparison as an important tool to assess a household's energy-use and lists "comparison to neighbors" in the first of three bullet points describing the HERs. Like the neighbor comparison, the energy-saving tips also appear in every report and follow a consistent format, but only one in five respondents mentioned the tips when asked what they recall about

time as well; it is possible their closest reading of the report dates to almost a year earlier when the first reports were delivered in July or August 2012.

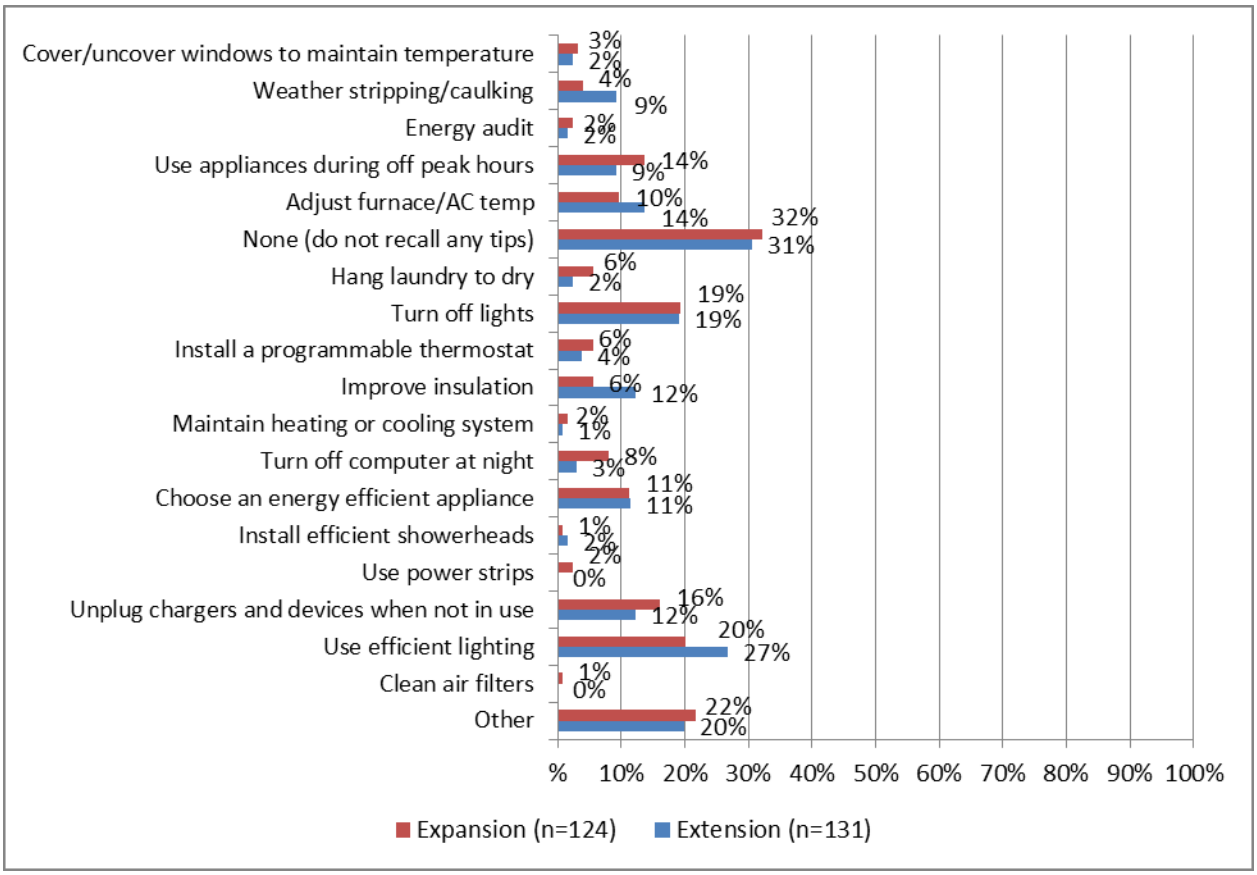
[24] This was a multiple response question. Interviewers probed "anything else" following each answer before proceeding to the next question.

the report. A roughly similar proportion (18%) of answers would be coded generally as "energy usage" or "energy comparison." Yet, citing "neighbor comparison" or phrases that can be categorized as energy usage/comparison are generally descriptive of the program as a whole and would not require careful reading of the reports over the program year.

Recall of report information is similar for subgroups of respondents based on their level of readership. Most respondents could recall something about the report, but the information they did remember remained generic and broadly descriptive. Among respondents who only skimmed or read certain parts of the reports, over 90% mentioned the neighbor comparison or information about energy usage or an energy comparison. Only 11% recalled the energy-saving tips (14% average use, 8% high-use, $p < .05$). Even respondents who "read the whole report" mentioned the energy-saving tips about one in four times (30% high-use, 24% average-use, $p < .05$).

Separately, the survey asked respondents to describe an energy-saving tip they remember from the HERs.[25] A dozen different tips were named. However, the most common response category was "none." About 30% of respondents did not recall or could not describe an energy-saving tip from the report. Respondents most often mentioned using efficient lighting, turning off lights, unplugging chargers and devices when not in use, and choosing energy-efficient appliances (10% to 23% of responses). Readership—not membership in the high-use Extension or average-use Expansion treatment groups, which also captures length of time receiving reports—associated most closely with differences in ability to recall an energy-saving tip. When the analysis is limited to respondents who "read the whole report," 19% could not describe a tip they learned about from the HER. Among respondents who skimmed or read certain parts of the report, almost one-half did not recall a tip (44% high-use, 52% average-use).

Figure 2-2: Tips Remembered About in the HERs



[25] The survey question asked respondents to describe tips they remember from the HERs (unprompted by a list of response categories). It was not possible to assess specific messaging in the HERs or recall of specific tips, because the program implementer does not share household-specific information on which tips are presented or how often.

2.1.3 Usefulness of Information in the HERs

The survey briefly described, and asked respondents to rate the usefulness of, each of the main elements of the HERs. The majority of respondents judged the reports to be useful; almost one-fourth of respondents judged the reports to be "very useful," and 47% rated the reports as "somewhat useful" (Table 2-4). Importantly, when the team limits the analysis to households in which someone "reads the entire report," more than one-third found the reports to be, overall, "very useful" and almost all (90%) had a generally positive assessment of either "somewhat" or "very useful." However, no single element of the HERs stands out as especially useful. The usefulness responses exhibit similar patterns across most of the components in the HERs. About 20% to 25% rated each component as "very useful," and most of the remaining respondents rated each of these components as "somewhat useful."

Although the differences are small, average-use Expansion households found the information in the HERs more useful than high-use Extension households. A slightly larger share of average-use Expansion households rated the different types of information outlined in Table 2-4 as "very useful," and they were less likely than high-use Extension households to assign lower ratings of "not very useful" or "not at all useful." The largest differences between the high-use Extension and average-use Expansion groups occur for the household's "overall score or smiley face," annual energy savings, "rank out of 100 neighbors," and the energy-saving tips.

Table 2-4: Usefulness of the HER Components[a]

Characteristic	Response	High-use Extension	Average-use Expansion	Reads Entire Report	Total
Comparison of Household Energy Use to Neighbors	Very useful	22.4%	24.6%*	32.0%	23.6%
	Somewhat useful	46.2%	47.2%	47.5%	46.7%
	Not very useful	17.5%*	14.1%	13.2%	15.7%
	Not at all useful	13.3%	14.1%	6.7%	13.7%
	Don't recall seeing this information	0.7%	0.0%	0.6%	0.3%
	Sample Size	143	142	166	285
Overall Score of how Household is Doing; Smiley Faces	Very useful	16.1%	21.8%*	24.4%	19.2%
	Somewhat useful	51.0%	51.4%	55.8%	51.2%
	Not very useful	16.1%*	12.0%	12.6%	13.9%
	Not at all useful	12.6%	14.1%*	6.7%	13.4%
	Don't recall seeing this information	4.2%*	0.7%	0.6%	2.3%
	Sample Size	143	142	166	285

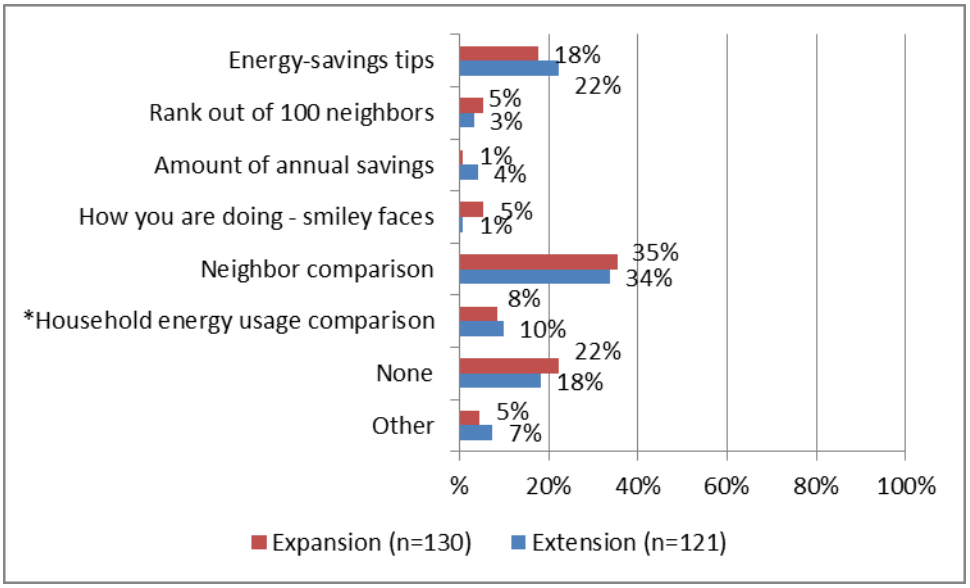
Characteristic	Response	High-use Extension	Average-use Expansion	Reads Entire Report	Total
Amount of Household's Annual energy Savings Compared to Neighbors	Very useful	23.2%	26.1%*	34.0%	24.8%
	Somewhat useful	36.6%	41.5%*	40.7%	39.3%
	Not very useful	20.4%*	15.5%	14.1%	17.8%
	Not at all useful	16.9%	16.9%	9.6%	16.9%
	Don't recall seeing this information	2.8%*	0.0%	1.7%	1.3%
	Sample Size	142	142	165	284
Household's Rank out of 100 Neighbors	Very useful	17.6%	22.5%*	28.1%	20.3%
	Somewhat useful	43.0%	48.6%*	48.6%	46.0%
	Not very useful	19.0%*	11.3%	11.4%	14.8%
	Not at all useful	15.5%	14.8%	8.9%	15.1%
	Don't recall seeing this information	4.9%*	2.8%	2.9%	3.8%
	Sample Size	142	142	165	284
Tips or Suggestions for Saving Energy	Very useful	24.1%	27.3%*	35.4%	25.8%
	Somewhat useful	45.4%*	38.5%	43.5%	41.6%
	Not very useful	18.4%	18.2%	13.1%	18.3%
	Not at all useful	9.9%	11.2%*	6.1%	10.6%
	Don't recall seeing this information	2.1%	4.9%*	2.0%	3.6%
	Sample Size	141	143	165	284
Overall Usefulness of HERs	Very useful	24.3%	25.0%	36.2%	24.7%
	Somewhat useful	46.5%	50.7%*	53.7%	48.8%
	Not very useful	18.8%*	13.9%	6.6%	16.1%
	Not at all useful	10.4%	10.4%	3.5%	10.4%
	Sample Size	144	144	166	288

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

When asked to choose what information in the HER is most useful, households appear to revert to what they remember from the report—35% cited the neighbor comparison and 20% mentioned the energy-saving tips (Figure 2-3). Twenty percent of respondents indicated that no single element of the HERs was most useful. Average-use Expansion households were significantly more likely to identify the neighbor comparison or the numeric indicators (overall score, rank out of 100 neighbors) as most useful, while high-use Extension respondents more often pointed to the energy-saving tips as most useful. In spite of their generally more positive ratings of the HERs, a larger proportion of average-use Expansion respondents could not identify information in the HERs that is singularly useful (22% compared to 18% of high-use Extension respondents).

Figure 2-3: Most Useful Information from the HERs



2.1.4 Understanding Opinions on the Usefulness of the HERs

Survey respondents who found the HERs useful explained that the reports kept them focused on saving energy and could help get all members of the household on-board with conservation efforts. Some illustrative examples include the following:[26]

> *"It heightens our awareness. We wouldn't be thinking about it without the report."*
>
> *"It helps me become more conscious and feel like the energy conservation methods we have taken have been effective but also there is more we could do."*
>
> *"It kind of keeps me in line. If I'm doing something, like I forget to turn a light out at night. "*

[26] Quoted excerpts in this section are verbatim responses to question A21.

> *"It helps me bring it to other members of the family to see what we're using and to remind the teenagers to turn off the TVs and things like that. Unplugging their chargers. I have one teenager in college and I can see the difference when he is here to when he's not."*
>
> *"I use it to show other people in the house that we are using more energy than our neighbors."*
>
> *"It is an interesting benchmark on how we are doing. It simulates conversations on how we might save energy."*

Focus group attendees held similar views about the usefulness of the reports. Even individuals who did not read the HERs closely noted *"I don't think I do anything special because of this report, but I think it is a kick in the pants every month not to slip."* Unlike the respondents in the survey, however, focus group attendees seldom shared information from the HERs with their families or used them as tool to "get everyone on board." In most instances, the focus group attendee was the only person in the household who read the reports.

Survey respondents and focus group attendees felt the HERs effectively pointed out a problem but did not offer practical solutions. In some instances, the lack of practicality involved energy saving suggestions perceived to be too generic or that did not help the household diagnose its specific problems and potential solutions. Other treatment households felt the HERs pointed to a solution that required larger investments or changes that were not feasible given the age or structure of the home. Survey respondents reported:

> *"There are not enough suggestions that are very specific enough for my household. The home energy audit was very useful. The only thing [the reports] are telling me is that I'm not off the scale with my neighbors, but that's not particularly useful."*
>
> *"I don't know how to go about what I can do to change it around [here] without a lot of expenses. We live very modestly. I've always been told it's the hot water heater that makes ours so expensive, don't know how to change it without changing everything around, which would be expensive. If I knew how to do something less expensive, then fine. But everything comes with a dollar sign."*
>
> *"I felt like I wanted more detail. I don't know why the readings are what they are. It's useful to see that I was higher than my neighbors, but I can't do much about it if I don't know why."*
>
> *"What we need is other ways to save energy. We are already doing all they have told us and we still use more energy than our neighbors."*
>
> *"It really doesn't give me much information at all. It just says I'm using more than my neighbors. It doesn't tell me how much more or why."*

Focus group attendees held similar views. For example:

"They put your nose on the problem, but then it sort of stops."

"I have looked at some of [the tips] at the beginning, but they are pretty generic. It's not anything that I didn't already know."

"I felt that the material [energy-saving tips] that we get is a little too, what's the word, it's like it's dumbed-down a little bit." Another respondent agreed, *"I would agree with that, dumbed-down a little bit, but I also think everybody here has already done all of these tips, or heard them a million times. What I am looking for is something a little bit more sophisticated."*

"For many years, I was the only one in the house, and even though I was gone all day, the bills were still on the high side, and I just wondered, why are they so high? You don't get any explanations on there, or I didn't see any, about suggestions on how to make it better. I'm thinking, if it so high, tell me how to reduce it, you know. Give me a hand here. But there is nothing there."

***Participant**: You know, I don't see what I could do differently. I don't cook a lot, I don't use the oven a lot, I don't, I try not to do washes, but I was like that before. **Moderator**: Has this made you think about it more? **Participant**: I always thought about my bill. The money that comes out of my pocket makes me think, and I've always wondered why my bills went from extreme, but this hasn't answered that.*

Focus group attendees indicated that their engagement with the HERs decreased over time if they found the reports disappointing. Attendees in each of the three focus groups looked at the energy-saving tips in the first two or three HERs they received, but no longer paid attention to the tips in subsequent HERs because they did not expect to find useful advice or ideas they had not already implemented.

Survey respondents and focus group attendees also expressed concerns about the accuracy and validity of the neighbor comparison. Concerns about comparability and a misunderstanding of what comprises the neighbor group can undermine the effectiveness of the HERs. Attendees observed differences between their home and others in their neighborhood that reasonably affect energy use, and, as a result, they discounted the information in the HERs:

"Because there are big differences between our house and our neighbors. We have an in-ground pool and a hot tub, and I know my neighbors do not have those. It is like comparing apples and oranges."

"Most of my neighbors are weekenders. Comparing my house to my neighbors is not a good comparison because I'm here 24/7 where my neighbors are only here on weekends. "

"Everybody has a different lifestyle so the [neighbor] comparison doesn't really work."

> *"I am unsure how accurate the comparison is. I talk to my neighbors and tell them I'm always the one. I don't understand why I'm the highest when my neighbors say they're doing the same things."*
>
> *"I'm not exactly certain that we're comparing apples to apples. I'm not sure if all my neighbors have central air conditioning, or as old a central air conditioning unit as I have."*
>
> *"The comparisons are totally irrelevant. The comparison of my neighbors fails to take into account anything that affects energy use. Are they new houses or are they old houses like mine. Do they have teenagers like I do?"*
>
> *"It's inaccurate how efficient a household is in comparison to its neighbors. It should tell you how large the household is. There are tiny houses and very big houses so there is a big difference between them and now much energy the houses are using. They need to have some common unit of measurement between all the houses."*

Focus group attendees had strong positive or negative reactions to the neighbor comparisons that were not always revealed by the shorter open-ended questions in the telephone survey. Two or three attendees in each focus group indicated the HERs sparked a "competitive spirit," motivating them to try to maintain a favorable status in comparison to their neighbors. In this respect, the HERs appear to be successful at motivating recipients to consider their household electricity consumption and to consider how to increase their energy-saving behavior. In the words of one participant *"I enjoyed getting it because I had a sense of competition with it. I felt like I want to do better because it's kind of, it's ranking you among your neighbors. So I kind of enjoyed the competitive feeling, because I am conscious of what I use, what energy I use. And so it felt like I was being rewarded in some way for my effort."*

In contrast, the neighbor comparison discouraged other attendees, making them less inclined to read the reports or more apt to discredit the information. In each of the Farmington focus groups, two attendees indicated they had stopped paying attention to the HERs because they knew their rating would be "More than Average" and did not see how they could improve their standing among the neighbor comparison group. Other attendees likened the HERs to receiving a "bad report card." For these households, the HER comparison with their "neighbors" appeared to produce a sense of frustration or futility, since they did not understand why their household was using more than others. This increased the chances of these households disengaging from the HER Program and paying less attention to the HERs.

The availability of a home energy audit did not offer participants the potential solution or clarifying information they were seeking. Five participants across the three focus groups had participated in a home energy audit recently. One individual was aware of, and considering a

home energy audit and another had completed an audit a few years earlier and did not feel another audit was necessary.[27] While the individual who was planning to have a home energy audit expressed hope that it would provide the specificity and clarity he was seeking, participants who had completed an audit were puzzled to receive "average" efficiency scores on the HERs.

Whether motivated or not by the neighbor comparison, focus group attendees felt the HERs program did not explain the comparison group clearly. Most focus group attendees indicated the comparison with neighbors was the primary focal point of the HERs for them. However, only two people among the total of 21 attendees recalled noticing the description of the neighbor comparison group, even though it appears on the HERs directly below the neighbor comparison (see example in Appendix B). Nearly all attendees reported they did not know who they were being compared to. Many assumed that the term "neighbors" referred to houses in the immediate vicinity not those that are "nearby" and "similar in size." Similar to the survey respondents, this misunderstanding caused many attendees to comment on the differences between their households and those of their neighbors. As on participant noted:

> *"I think there are such different circumstances that, you know, there are people that are home all day. I had my husband in hospice for a year, and I had a lot more electricity usage with machines and what not during that period. I just think there are large families, small families. I don't know that it really means much when you are compared with everyone else (in your neighborhood)."*

As the comments shown above illustrate, treatment households may interpret the neighbor comparison group as including their immediate neighbors—that is, people they may know, can observe, or might speak to as they go about their daily lives at or near their homes. While the implementer define the neighbor group as "approximately 100 occupied, nearby homes that are similar in size to yours" and specify a comparable square footage parenthetically (e.g., "(avg 1,796 sq ft)"), the terms "neighbors" and "neighborhood" encourage a commonly understood and culturally-embedded idea that neighbors are the people around us, the homes we can see and easily walk to from our own home. The welcome letter from CL&P also employed imagery of a "neighborhood" as the comparison group (i.e., "learn how your energy use compares to similar-sized home in your neighborhood that use electricity," emphasis added, see Appendix B.)

2.1.5 Reactions to Energy-saving Tips

A majority of respondents (83%) agreed that the energy-saving suggestions in the HERs were relevant for households such as their own, and that the tips, if followed, could reduce their energy use (Table 2-5). Fewer households, but still more than one-half (54%), agreed that the HERs were important tools for managing their energy use or tracking their progress over time. In a seeming contradiction, three-quarters of respondents also agreed that most of the energy-saving

[27] Most participants were unaware that a home energy audit was available or believed it was too expensive, citing costs of $75 to $200. Several admitted that they had not looked into having an audit for several years.

tips were "things everyone already knows," but the excerpted responses from the survey and the focus groups summarized earlier suggest another explanation: the HERs may present information that is widely known and available yet still useful because the report focuses attention on energy use and the impact of everyday activities. In the words of one respondent, the "reports keep me on my toes."

Average-use Expansion households generally held more favorable views of the energy-saving tips than high-use Extension households. A larger proportion of average-use Expansion households agreed or strongly agreed that the tips were relevant, that the HER was an important tool to find ways to reduce energy, and that the tips were helpful in using less energy. Similarly, average-use Expansion households tended to disagree that the energy-saving tips were things everyone already knew, although the differences were small (three to four percentage points).[28]

Table 2-5: Agreement with Statements Describing the HERs[a]

Characteristic	Response	High-use Extension	Average-use Expansion	Total
Energy efficient tips in HERs are relevant for households like mine	Strongly agree	29.8%	32.6%*	31.3%
	Somewhat agree	50.4%	53.2%*	51.9%
	Somewhat disagree	10.6%*	8.5%	9.5%
	Strongly disagree	9.2%*	5.7%	7.3%
	Sample Size	141	141	282
HER is one of the most important tools available to household to find ways to reduce energy	Strongly agree	15.6%	19.0%*	17.4%
	Somewhat agree	37.8%	35.7%	36.7%
	Somewhat disagree	17.8%	28.6%*	23.4%
	Strongly disagree	28.9%*	16.7%	22.5%
	Sample Size	45	42	87
Most of the energy efficiency tips in the HERs are things everyone already knows Used information in HER to find ways household can use less energy	Strongly agree	27.1%	26.2%	26.7%
	Somewhat agree	48.6%*	46.8%	47.6%
	Somewhat disagree	18.6%	23.4%*	21.2%
	Strongly disagree	5.7%*	3.5%	4.5%
	Sample Size	140	141	281
Used information in HER to find ways household can use less energy	Strongly agree	28.9%*	19.0%	23.8%
	Somewhat agree	31.1%	33.3%	32.3%
	Somewhat disagree	13.3%	26.2%*	20.0%
	Strongly disagree	26.7%*	21.4%	23.9%

[28] The number of questions in the agree/disagree battery was reduced from six to three after data collection began to reduce survey length and respondent burden. Therefore, three of the items reported in Table 11 have fewer cases available for analysis.

Characteristic	Response	High-use Extension	Average-use Expansion	Total
	Sample Size	45	42	87
Most energy efficiency tips in HERs would help household use a lot less energy	Strongly agree	19.3%	25.0%*	22.4%
	Somewhat agree	42.1%*	36.4%	39.1%
	Somewhat disagree	23.6%	27.1%*	25.5%
	Strongly disagree	15.0%*	11.4%	13.1%
	Sample Size	140	140	280
Use the HER to track household's progress in reducing energy use	Strongly agree	26.7%*	19.0%	22.7%
	Somewhat agree	31.1%	38.1%*	34.8%
	Somewhat disagree	15.6%	21.4%*	18.6%
	Strongly disagree	26.7%*	21.4%	23.9%
	Sample Size	45	42	87

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

2.1.6 Action Taken as a Result of the HERs

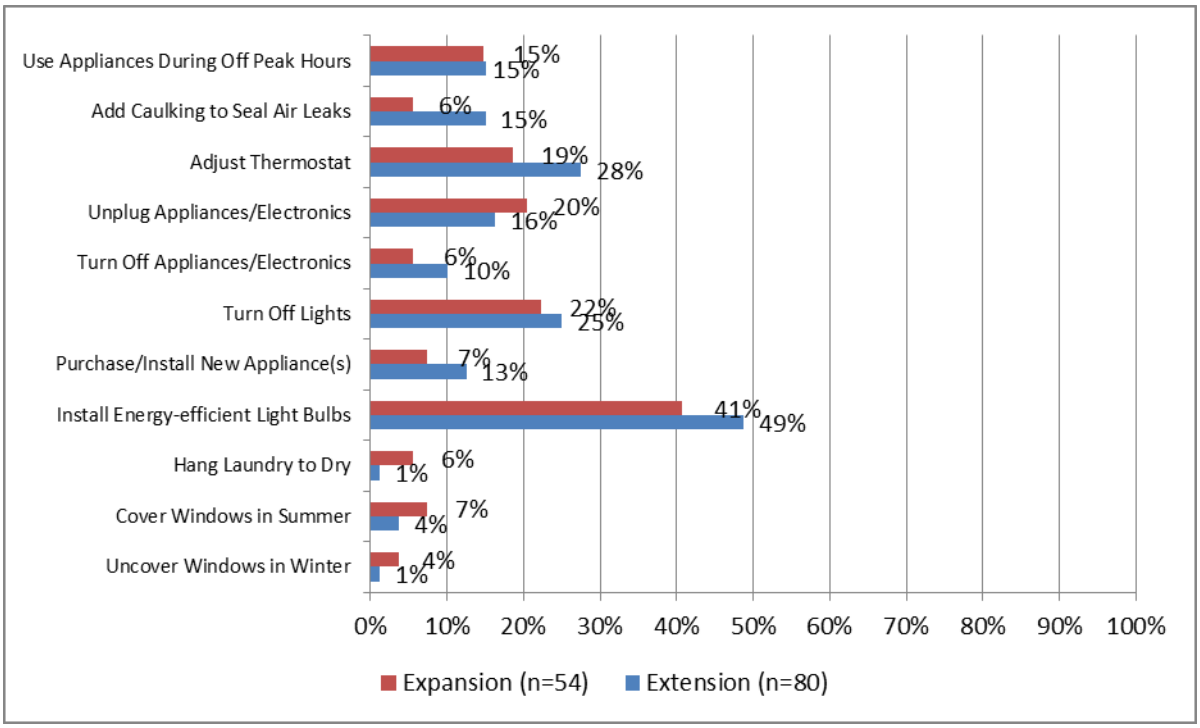
Few focus group attendees identified specific actions they had taken as a result of the reports, but most generally acknowledged that the information shaped their thinking. While it was difficult to attribute specific energy-saving actions to the HERs, receiving the reports established a more conservation-focused framework for decisions or behaviors. For example, an attendee who recently purchased energy-efficient lighting said *"I think [the HER] just keeps it more in the forefront of your mind than by itself making you do something. Like the LED lights, I don't think I got them because of this report, but in that whole frame of thinking, I got them."*

The telephone survey gathered information on three types of energy-related actions to gauge more systematically the impact of the HERs on self-reported behavior. Telephone interviewers asked whether households had tried any of the energy-saving tips, whether energy-efficiency was a topic of discussion in their home, and how often the respondents had taken energy-saving actions or practiced energy-efficient habits around their homes.

Follow-through on Energy-saving Tips. Almost 60% of respondents have tried energy-saving ideas presented in the reports, with a significantly larger proportion of high-use Extension households following-up on the tips (70% compared with 50% of average-use Expansion households). Greater follow-through on the tips among high-use Extension households likely reflects their longer treatment exposure (i.e., they have received HERs for about two years) providing them more opportunity to use one or more of the tips.

The most frequently reported tips included everyday practices or habits as well as purchases of new equipment (Figure 2-4). Almost one-half of high-use Extension households installed energy-efficient light bulbs, and about 10% purchased or installed new energy-efficient appliances. One in ten high-use Extension households added caulking around windows and doors or insulation in wall sockets and light switches to seal air leaks. In addition, households reported making changes to their everyday behaviors, including turning off lights in rooms when not in use, turning off or unplugging appliances and electronics, adjusting thermostats, and using appliances during off-peak hours. Households also reduced the temperature on their hot water heaters, wrapped the hot water heater, used timers on interior or exterior lights, and stopped their use of a second refrigerator or spare freezer. Uncovering or covering windows in the daytime according to season and hanging laundry to dry were mentioned less often overall, but significantly larger percentages of average-use Expansion households engaged in these practices.

Figure 2-4: HER Tips Respondents have Tried



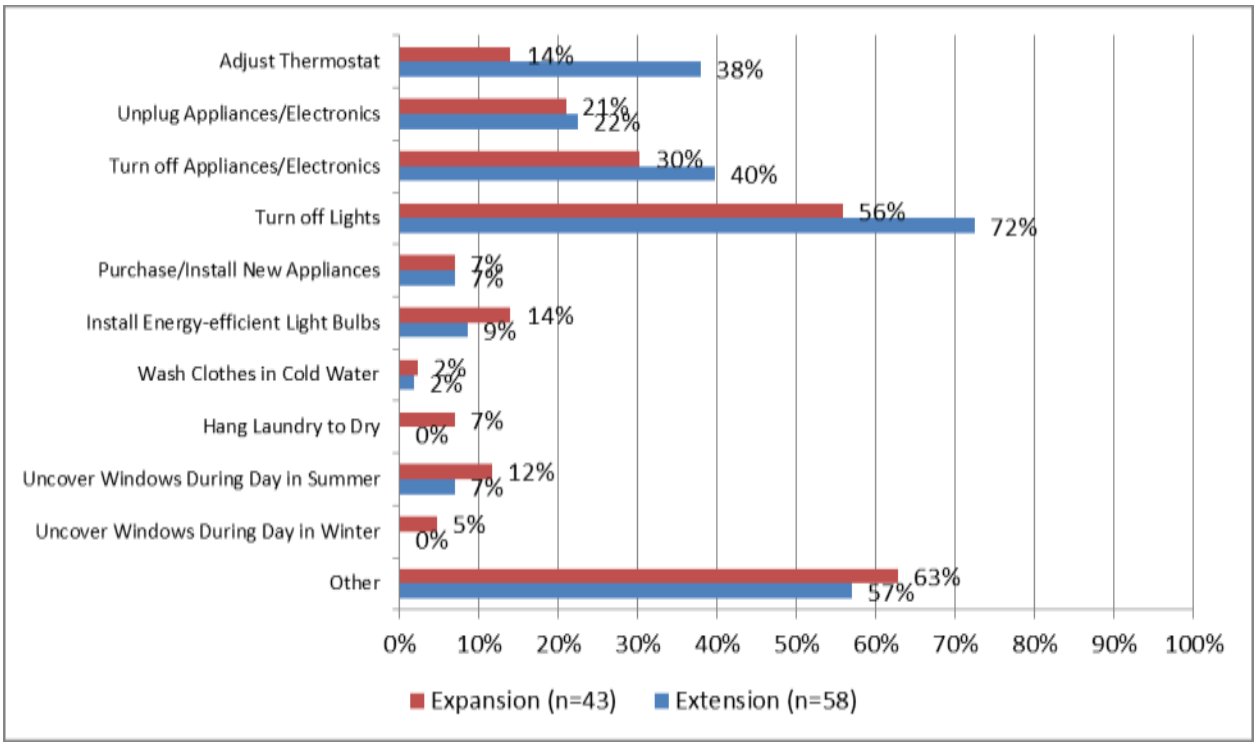
Household Discussions about Savings Energy. About one-third of survey respondents "get together with household members from time to time and talk informally about ways to save energy." High-use Extension households reported doing so significantly more than average-use Expansion households did (38% vs. 29%). Among households that talked about ways to save energy, the most-frequently discussed topics for both treatment groups involved everyday practices or habits. For example, households most often discussed turning off lights, appliances, or electronics when not in use; unplugging chargers and other devices; and adjusting the thermostat (Figure 2-5). Almost three-quarters of high-use Extension households focused on turning off lights, and roughly 40% talked about turning off appliances and adjusting the

thermostat as ways to save energy. High-use Extension and average-use Expansion households reported discussing unplugging chargers and electronics as ways to save energy in nearly equal percentages (about one in five households). Respondents' emphasis on everyday behaviors, rather than purchasing or installing new equipment, dovetails with comments presented earlier about the usefulness of the HERs—they serve to remind families about every day, simple ways to save energy and help get everyone "on-board" with conservation efforts.

About 60% of responses about household discussions about energy savings did not fall into a specific category or tie back directly to tips mentioned in the HERs (Figure 2-5). Some of the diverse "other" responses mentioned included the following:

- Close doors and windows when the air conditioner or furnace are running; being careful not to have outside doors open too long, using the home's outside door rather than garage door to exit the home
- Run appliances during off-peak hours (e.g., dishwasher, clothes washer)
- Run only full loads in dishwasher or clothes washer
- Being more "frugal" with respect to turning on air conditioner, wearing sweaters or layers in winter rather than turning up thermostat
- Use timers on lights or on the television in the evening
- Conserve water use by taking shorter showers, installing low-flow showerheads or low-flow/dual-flush toilets
- Adding insulation to rooms or attics and weather-stripping to doors and windows.

Figure 2-5: Energy-saving Topics Household Discuss



Energy-saving Actions and Habits. The survey gathered information on two types of energy-saving behaviors—actions that a household might do periodically or only once or twice (e.g., seasonal maintenance or investment in new equipment), and how often they engaged in everyday conservation practices (e.g., unplugging chargers, running the dishwasher only when full).

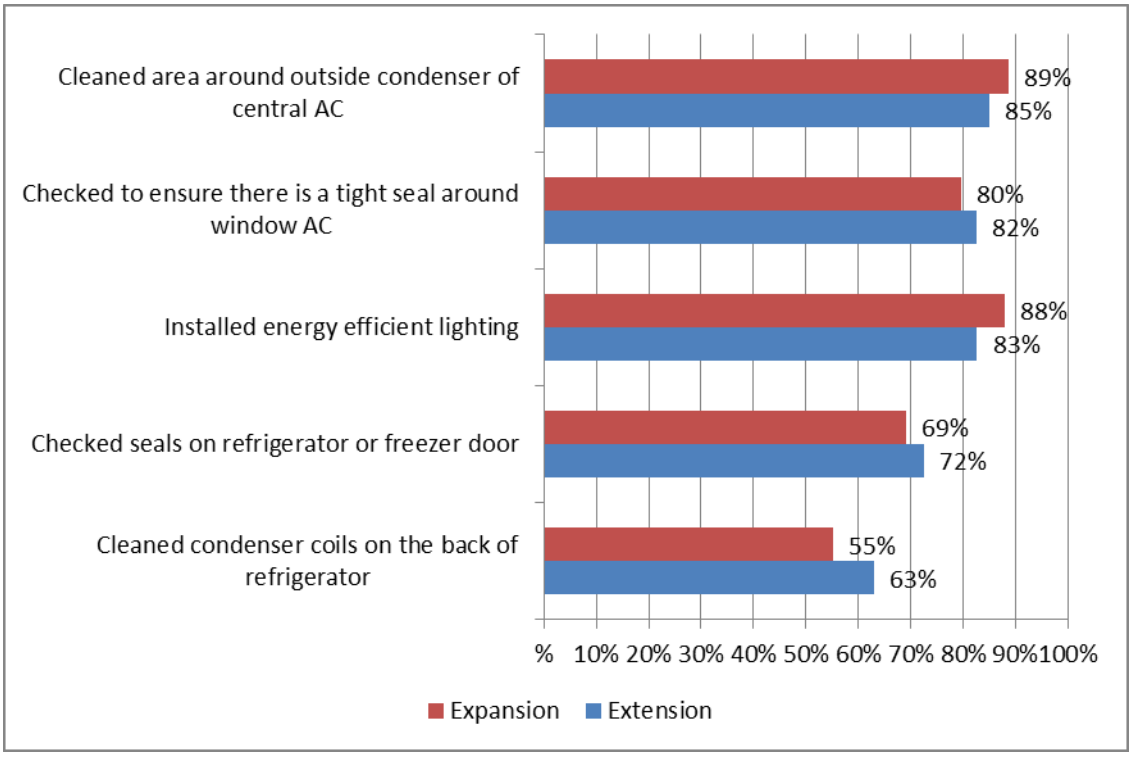
A majority of households answering these particular questions had taken many of the periodic or occasional energy-saving actions (Figure 2-6).[29] Almost 60% or more had performed maintenance on equipment or appliances, such as cleaning condenser coils on refrigerators, clearing areas around a central air conditioner, and checking seals on refrigerators or window air conditioning units. Over 80% had installed energy-efficient lighting, and 62% had improved shading on windows to reduce heat in the summer months. A substantial number of respondents—from roughly one-third to nearly one-half—had made more significant investments in their homes to improve energy efficiency within the past two years (Figure 2-7).[30] These included improving insulation, installing programmable thermostats, and purchasing a new, energy-efficient clothes washer.

[29] The team did not ask all respondents these questions, and not all respondents answered each question. The number of high-use Extension respondents ranged from 57 to 98 and average-use Expansion respondents ranged from 44 to 107, depending on the number of "don't know" responses and refusals. The team asked questions regarding air conditioning only to respondents who previously indicated they had this technology.

[30] The number of Extension respondents ranged from 79 to 97 and Expansion respondents ranged from 85 to 106, depending on the number of "don't know" responses and refusals.

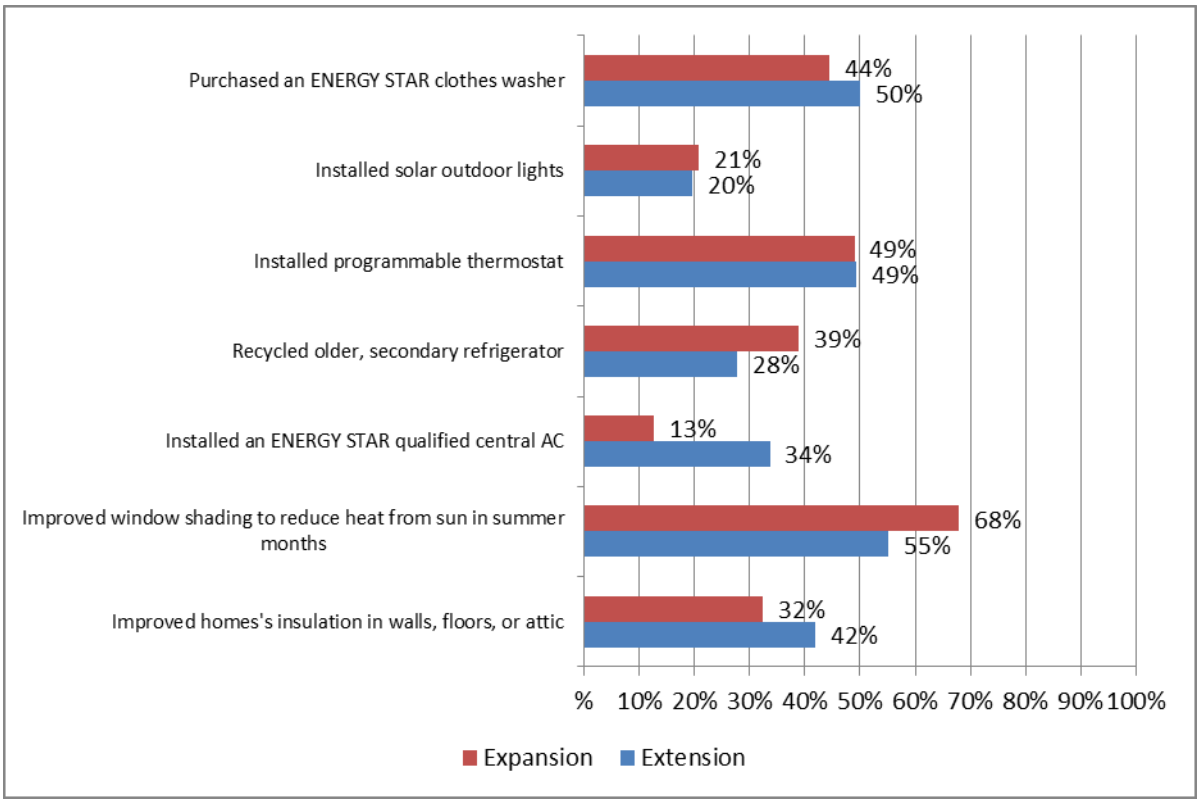
High-use Extension households were significantly more likely than average-use Expansion households to complete home improvements or purchases. For example, high-use Extension households more often improved insulation, and purchased a new energy-efficient central air conditioner or clothes washer. These differences may reflect the greater length of program exposure for high-use Extension households, but this group also has more economic resources, on average, to invest in home improvements or new purchases (see demographic characteristics in Table 1-3).

Figure 2-6: Energy Reduction Activity Since August 2012[a]



[a] Sample size varied as described in footnote 29.

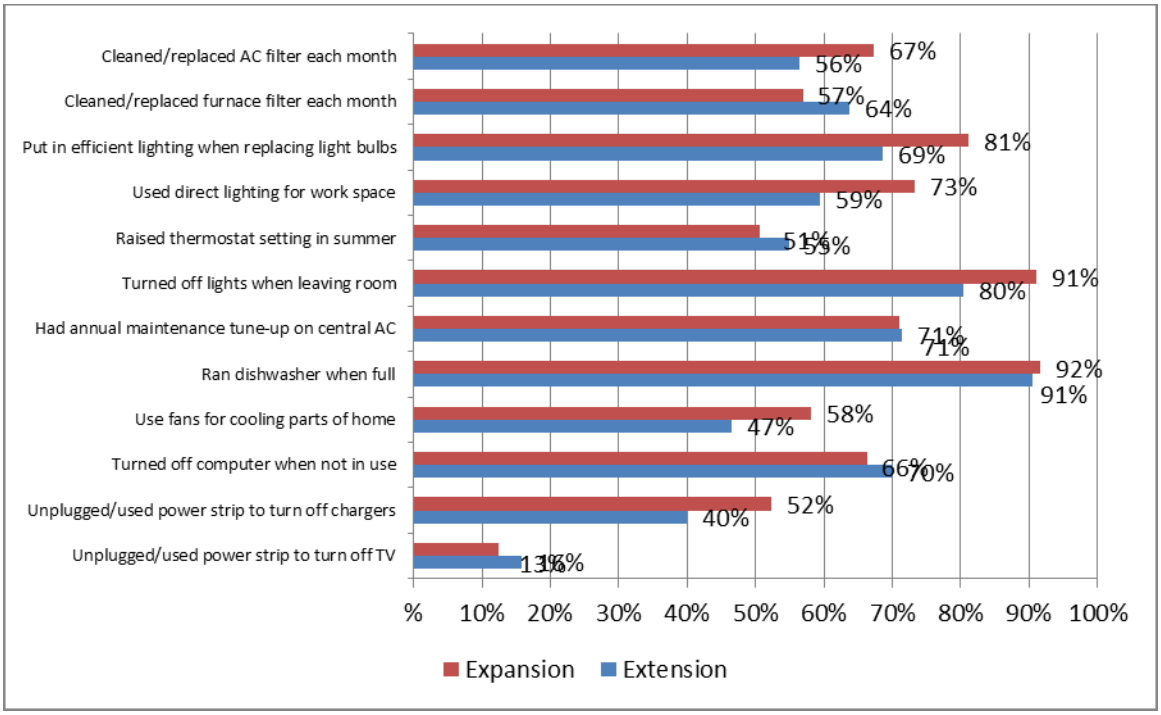
Figure 2-7: Energy Reduction Activity in Past Two Years[a]



[a] Sample size varied as described in 30

As shown in Figure 2-8, average-use Expansion households were significantly more likely to practice energy-efficient habits around their homes on a regular basis. While a few exceptions exist, average-use Expansion households more regularly unplugged or used power strips to turn off chargers, turned off lights when leaving a room, used fans for cooling their homes, used fans for cooling parts of their homes, used direct lighting, and installed efficient light bulbs as replacements. The treatment groups reported being equally likely (or unlikely) to unplug their TVs when not in use, run dishwashers only when full, and adjust thermostat settings in the summer.

Figure 2-8: In the Past Month, How Often Completed Activity – Percent Indicated Always or Most of the Time



2.1.7 Satisfaction with the Program and its Perceived Impact

The telephone survey gathered three measures of satisfaction with the program—a satisfaction rating, the likelihood of recommending the program to someone else, and the degree to which participants attributed reduced energy use to the program. The last of these is a less subjective indicator of whether the program is on the right track: treatment households may not like aspects of the program, but they may nevertheless recognize that it was helpful for promoting energy conservation. Still, the indicators rely on self-reported impressions of energy use; the electricity savings analysis (Section 2.2) measures the program-induced savings in a more systematic manner.

Survey respondents reported average satisfaction with the program. When asked to rate their satisfaction on a five-point scale, with one being very unsatisfied and five being very satisfied, most respondents assigned a rating of three (33% overall). While average satisfaction (a score of three) was the most common response among average-use Expansion households, they were also more likely to be "very satisfied" with the program than high-use Extension households. In contrast, 24% of high-use Extension households assigned the lowest satisfaction scores (one or two) compared to 15% of average-use Expansion households.

Table 2-6: Satisfaction with the HER Program[a]

	High-use Extension	Average-use Expansion	Overall
1 - Very unsatisfied	11.8%*	8.4%	10.0%
2	11.8%*	6.3%	8.8%
3	29.9%	35.0%*	32.6%
4	31.3%*	26.6%	28.7%
5 - Very satisfied	15.3%	23.8%*	19.8%
Sample Size	144	143	287

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

Similar to the average satisfaction ratings, a majority of respondents (67%) said they would likely recommend the program to a friend or relative but a sizeable minority (33%) would not (Table 2-7). Again, average-use Expansion households expressed more positive views: 71% would be at least somewhat likely to recommend the program compared to 61% of high-use Extension households.

Table 2-7: Likelihood of Recommending the HER Program to a Friend or Relative[a]

	High-use Extension	Average-use Expansion	Overall
Very likely	25.0%	31.0%*	28.3%
Somewhat likely	36.8%	40.7%*	38.9%
Somewhat unlikely	18.8%*	12.4%	15.3%
Very unlikely	19.4%*	15.9%	17.5%
Sample Size	144	145	289

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

More than one-half high-use Extension households believed the program had helped them reduce their energy use and, in spite of their shorter exposure to the HERs, almost 45% percent of average-use Expansion households attributed an effect to the program. Thus, while the high-use Extension households tend to have more negative views of the program (e.g., lower satisfaction, less positive ratings of HER elements), they still believed it helped them to save electricity—a finding supported by the electricity-savings analyses to follow. The seeming contradiction may stem from high-use Extension respondents' longer program exposure. They have had more opportunity to follow-up on energy saving tips and have observed reductions in their electricity consumption, but they have also received more reports. The reports, over a longer timeframe, may raise expectations, offer fewer "new" ideas, or reveal little change in a household's efficiency scores in spite of their efforts.

Table 2-8: HER Program Helped Household Reduce Energy Use[a]

	High-use Extension	Average-use Expansion	Overall
Definitely yes	17.5%*	14.0%	15.6%
Probably yes	35.0%*	30.8%	32.7%
Probably no	27.3%	37.8%*	32.9%
Definitely no	20.3%*	17.5%	18.8%
Sample Size	143	143	286

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

2.1.8 Extending the Reach of the HERs: On-line Resources, Information Gaps, and Areas to Improve

The telephone surveys and focus groups also touched on other issues related to the HERs program, namely the use of on-line resources such as the Program and CL&P websites, information gaps, and program improvements suggested by the respondents.

Engaging the program on-line. To increase engagement with the program and promote energy-saving behavior, the program implementer encourages households to visit the HER website where they can access additional resources, create an account or profile, and track progress toward energy savings. By creating an account and providing more information about their energy use, households may receive tips more tailored to their use. However, very few treatment households have engaged the program on-line. Less than one-half of households (39%) recalled seeing a link to the website on the report, and only 7% visited the website (20 respondents; 11 high-use Extension, nine average-use Expansion). There is little evidence that this small group of respondents use the HER website to track their energy savings. Typically, they visited the site only once and fewer than ten of the 20 respondents created an on-line account.[31]

[31] About one-half of focus group attendees recalled the HER website, but only one participant across the three groups had visited the site.

Low uptake of the HER website may reflect a general disinclination to search for information about energy efficiency (Table 2-9). A similarly small proportion of respondents visited the CL&P website to look for ways to save energy (12% overall) and the average number of visits for the 21 people who sent to the website since January 2013 was 2.3. As explained more below (Table 2-9), the majority of respondents regularly use on-line resources, so lack of comfort using the Internet cannot explain this result.

Table 2-9: Website Use

Characteristic	Response	High-use Extension	Average-use Expansion	Total
Recall Seeing Link to Website on HER to Track Energy Use	Yes	36.8%	41.0%*	39.1%
	No/don't know	63.2%*	59.0%	60.9%
	Sample size	144	144	288
Visited HER website	Yes	8.3%*	6.3%	7.2%
	No	89.6%	90.3%	90.0%
	I don't have/don't use Internet	2.1%	3.5%*	2.8%
	Sample size	144	144	288
# times visited the HER website to look for ways to save energy	Mean	0.8	1.6	1.2
	Sample size	12	9	21
Set-up an online account for HER program	Yes	41.7%	50.0%*	45.3%
	No	58.3%*	50.0%	54.7%
	Sample size	12	8	20
Since August 2012, visited general CL&P website	Yes	10.1%	12.8%*	11.6%
	No	89.9%*	87.2%	88.4%
	Sample size	149	148	297
Since January 2013, # times visited CL&P website	Mean	2.5	2.3	2.3
	Sample size	63.2%	59.0%	60.9%
Visited HER website and set-up an on-line account for HER program	Yes	3.5%	3.2%	3.3%
	Sample size	144	144	288

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

Lack of awareness is a primary factor hindering greater use of the HER website. Nearly one-quarter of respondents (24%) have not visited the site because they were not aware of it—more evidence that readers focused on just a few key elements since the implementer lists the website on each report (Table 2-10). Another 15% of respondents do not have a computer or do not use the Internet. However, lack of time or a compelling reason to visit the website affected the behavior of many other respondents—over one-third are simply "too busy" or "not interested" in pursuing more information about saving energy.

Table 2-10: Main Reason Respondents have Not Visited the HER Website

	High-use Extension	Average-use Expansion	Overall
Do not have computer/do not have Internet	13.2%	19.4%*	16.6%
Not interested in information about saving energy	9.9%	15.3%*	12.9%
Too busy, do not have time to study websites	26.4%	31.5%*	29.2%
Other	7.4%*	4.8%	6.0%
Not aware of website	29.8%*	21.8%	25.4%
Do not think it would be useful	13.2%*	7.3%	10.0%
Sample Size	121	124	245

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different than the high-use Extension sample at the 0.05 level.

Neither positive nor negative feelings about the HERs induced higher use of on-line resources. For example, households satisfied with the program said that the paper report met their needs:

> *"We have gotten the information we needed out of the graph and statement [i.e., paper HER] and don't need anymore."*
>
> *"I have all the information from the [paper] reports that I will use."*
>
> *"I think the [paper] report had enough information for me already."*

Households that did not find the paper HERs useful were also disinclined to search on-line for better information or resources that that might address their concerns or questions:

> *"I found the reports so useless to me. I can't imagine the website to be any more useful."*
>
> *"I don't find the [paper] report useful so why would I go to the website."*
>
> *"I did not think it would be any different than what I got at home [in the mail]."*

More often, households simply did not feel they had a compelling reason for to visit the website. The idea of visiting the HER website "just hadn't occurred" to them. Comments such as the following were typical of many households:

> *"I don't know. I just haven't."*
>
> *"I hadn't thought about it."*
>
> *"[I] just haven't done it. No real reason."*

"I really couldn't say."

In order to determine if lack of access to a computer or failure to use the Internet underlies low use of the program website, the team also asked survey respondents about use of other on-line resources. As mentioned above (Table 2-10) a noticeable fraction of respondents did not have a computer or did not use the Internet, and the proportion without computer or Internet access was greater among the average-use respondents (19% compared with 13% of high-use respondents) However, the majority of respondents showed a high level of engagement with on-line resources (Table 2-11). Additional questions measured relatively passive use of the Internet or exchanges that can be limited to family and friends (e.g., visiting news sites, sending/receiving email) as well as activity that requires providing confidential or financially sensitive information (e.g., on-line banking, purchasing things). Evidence from these survey responses suggest that the vast majority of respondents could be reached through on-line resources: about one-half either pay their CL&P bill or other bills on-line, 64% bank on-line, and 70% have made on-line purchases. Only 10% of respondents indicated they had not done any of the five Internet activities the survey asked about during the past month. Across all measures of respondent Internet use and access to computers or computer technology, high-use Extension respondents were significantly more likely to engage in the activity and to own or have access to the equipment. This likely reflects their relatively younger age and elevated income and education levels.

Table 2-11: General Internet Usage among Respondents

Characteristic	Response	High-use Extension	Average-use Expansion	Total
Activity Performed on Internet	Visited social media website	56.6%*	46.7%	51.3%
	Purchased things	78.9%*	64.0%	70.9%
	Visited new sites	63.8%*	56.7%	60.0%
	Read or sent email	90.8%*	83.3%	86.8%
	Banked online	67.1%*	60.7%	63.7%
	Performed at least one of these online tasks	93.4%	86.7%	89.8%
	Sample Size	152	150	302
In past month, number of bills paid online	0 bills	31.3%	45.6%*	38.9%
	1 or 2 bills	8.0%*	6.1%	7.0%
	3 or more bills	60.7%*	48.3%	54.1%
	Sample Size	150	147	297
Typically pay CL&P bill online	Yes	55.0%*	39.7%	46.9%
	No	45.0%	60.3%*	53.1%
	Sample Size	151	146	297
Have a smartphone	Yes	64.5%*	44.7%	53.9%
	No	35.5%	55.3%*	46.1%
	Sample Size	152	150	302

[a] Note: Totals may not sum to 100% due to rounding error.

* Statistically different at the 0.05 level.

Areas for improvement. Survey respondents and focus group attendees shared ways they felt the HERs could be more useful for them. This section draws upon responses to open-ended questions asking what, if anything, would make the HERs more useful, why respondents would not recommend the program to a friend or relative, the reasons for their usefulness rating, and why they would not try the energy-saving tips.

Many comments suggested that the reports effectively identified a problem but did not offer practical or applicable solutions. Treatment households quickly became aware of their energy use, but the HERs did not provide guidance on how to reduce energy consumption, how best to focus their time and resources, and what progress they were making towards a goal. These types of remarks cluster into three topics.

1. Households stated the energy-saving tips were too general. They did not find the suggestions to be sufficiently customized to their situation or specific enough to determine what actions would yield the most improvement.

   "I wish the recommendations were less generic. They are too broad."

   "More useful tips. Something that is not so common."

   "Much more specific to my house or new or upcoming products that would help me reduce home energy use."

   "Very specific energy savings tips for my household, a customized energy savings program. I don't want to have to go to the website to do this."

2. For some households, knowing which types of equipment or appliances use the most energy would provide the type of information that would help them diagnose and address their energy usage.

   "[It would be helpful to get] a listing of those items that consume a [larger] percentage of your [electricity] usage. What percent of our use is from fridge, dehumidifier, lighting."

   "[It would be helpful to see] indications of calculations of savings in consumption of different types of appliances and different types of [energy] efficiencies of appliance. So, if you've got a 6amp dehumidifier versus a 13amp dehumidifier, what is the impact of that [on your electricity usage]."

3. One of the most common suggestions for improving the program focused on providing a more transparent standardization of data. In addition to the neighbor comparisons, households expressed interest in graphs or performance metrics compared against a benchmark so they could make sense of their energy use relative to their behavior and household composition. Examples mentioned included comparing energy use data by time, housing type, household size, or the amount and type of household equipment.

"A better 'how I am doing month to month,' as opposed to what my neighbors are doing."

"As I said before, a comparison of size and number of occupants."

"Comparing the month of December 2012 to December 2013. Seeing it year to year because [you use] different appliances at different times of the year."

"If it showed in the same graph that shows me versus neighbors, if in that same graph they showed me versus my own previous monthly use. If it was possible to show exactly where that energy usage was coming from, that would also be helpful."

"It makes more sense to me to compare my own electric use from month to month, on my bill, and from year to year. That means more to me, because I can see more of my usage. I can't control what my neighbors are doing." (focus group participant)

Customizing energy-saving tips and increasing the transparency of what constitutes the comparison groups may address concerns from households who read the HERs and paid attention to their energy use. Qualitative data gathered from respondents not engaged with the program or who did not find it useful suggest two broad sets of challenges for extending the reach of the program.

1. Some households equate "affordability" with "efficiency," or at least "efficient enough." Since they can afford to pay their energy bills, there is no need to try to reduce their energy use.[32]

   "We use what we need when we need it. We don't really care about saving energy because we don't really use that much and the electric bill isn't very high."

   "Because I can afford to pay the bills and I use as much energy as I want."

   "You're saying that I should use less energy and I'm saying that I'm satisfied with the amount of energy I'm using because it's not excessive. As the tips come in, I would need to review them. If there is further advice or suggestions, I will read them if they fit our needs."

   "The amount of electricity I'm paying now is appropriate and I have no problem with it."

2. Energy efficiency and the importance of reducing energy use is not part of typical conversations: Households generally do not discuss energy use with friends or family. The topic simply does not "come up," and, notably, it may be impolite to bring it up. When asked why they would not recommend the HERs to friends or family, households explained:

   "I just don't think it would come up in conversation."

[32] Excerpted text from responses to the question "What are the main reasons that you probably will not try any of the energy efficiency tips?"

"Because it is not what we talk about with relatives and friends."

"I can't see myself in that conversation. That wouldn't be a guy I would hang out with."

"Because I don't think everyone is as interested as I am. Most people who are not on a strict budget just take their utilities for granted. I can't afford to take it for granted but I don't want to preach to my neighbors."

"I do not know how each individual will look at the report, and I don't know how they'll view it. I do not like to impose myself on somebody else."

2.1.9 Comparison with Year 1 Survey Findings

In this section, the team compares results from the Year 2 follow-up survey with those from a similar survey conducted in Year 1 of the program. There are important differences between the surveys that can affect comparisons. The team limits comparisons only to those questions that remained similar across both surveys. Still, some differences may remain in the results due to survey design.

First, all households in the Year 1 treatment group—and hence the survey—were high-electricity use households. They received HERs starting in February 2011, and the team conducted the survey eleven months later (December 20, 2011 to February 9, 2012). As described in the Section 1.1, the implementer randomly assigned Year 1 treatment households to receive the HERs monthly or quarterly. The Year 1 survey included 156 monthly recipients and 142 quarterly recipients; the team tabulated most of the results by frequency of reports, although they observed few significant differences between the groups.[33] Because they are a subsample of Year 1 monthly treatment households—but not survey respondents[34]—one would expect the responses of Year 2 high-use Extension sample to be more similar to those of Year 1 monthly sample.

This report compares Year 1 and Year 2 households in terms of the following:

- Level of awareness and customer engagement with the HERs
- Perceived usefulness of the HERs
- Level of customer satisfaction with the reports
- Energy saving activities and behaviors

[33] For a summary of the Year 1 survey and findings, see "CL&P Home Energy Report Pilot Program—Follow-up Survey Key Findings," Memo to Kim Oswald, CEEB Project Manager from Tetra Tech, Inc. and NMR Group, Inc., April 24, 2012.

[34] The team excluded Year 1 telephone survey respondents from the Year 2 survey effort. Therefore, high-use Extension customers in the Year 2 survey had not been previously surveyed in Year 1.

Recall and readership of the HERs. Table 2-12 shows there are few differences between Year 1 and Year 2 households in their recall of the program or their readership of the HERs. There is overwhelming recall of the reports in both survey years and across all types of participating households. The level of readership is also similar. In Year 1 and again in Year 2, "someone reads the whole report" in about 58%of households. Readership among average-use households in Year 2 is very similar to the monthly Year 1 households with about 20% skimming or glancing at the report quickly and 18% to 19% "reading certain parts of the report." The Year 2 high-use households, who have been participating in the program longer, show a slight decline in readership with a larger proportion only skimming the reports (27%).

Table 2-12: Recall and Readership of the HERs, by Program Year[a,b]

HER Recall and Readership	Year 1		Year 2		
	Monthly (n=155)	Quarterly (n=142)	High-use Extension (n=144)	Average-use Expansion (n=144)	Overall (n=288)
Recall receiving HERs	*97.4%*	*93.5%*	*95.4%*	*96.0%*	*95.7%*
Household characterization of reading HERs					
Someone reads the whole report	*57.7%*	*58.1%*	*56.9%*	*58.3%*	*57.7%*
Someone skims it or just glances at it quickly	*20.1%*	*14.7%*	*27.1%*	*21.5%*	*24.1%*
Someone reads certain parts of the report	*18.1%*	*25.6%*	*15.3%*	*19.4%*	*17.5%*
No one reads it - we ignore it	4.0%	1.6%	0.7%	0.7%	0.7%
Types of information remembered from HER					
*Neighbor comparison**	*75.8%*	*76.0%*	*87.4%*	*89.4%*	*88.5%*
Other	13.3%	11.4%	11.2%	7.1%	9.0%
How you are doing, Smiley Faces	*10.9%*	*8.5%*	*9.1%*	*10.6%*	*9.9%*
Rank out of 100 Neighbors	*9.4%*	*9.6%*	*6.3%*	*4.3%*	*5.2%*
*Energy-saving tips**	*8.6%*	*12.5%*	*20.3%*	*19.9%*	*20.1%*
Amount of annual savings	3.1%	9.6%	4.9%	6.4%	5.7%
Energy usage/energy comparison	n/a	n/a	17.5%	17.7%	17.6%
None	2.3%	3.3%	0.7%	2.1%	1.5%

[a] Note: Totals may not sum to 100% due to rounding error.

[b] Italicized rows represent some of the key findings as highlighted in the paragraph above the table.

* Statistically different than the Year 2 sample at the 0.05 level.

Year 2 respondents recalled fewer categories of specific information included in the HERs than Year 1 respondents did (Table 2-12). In both survey years, the vast majority of respondents cited the neighbor comparison; however, in Year 1, three-quarters of households mentioned the neighbor comparison, while in Year 2 almost 90% of households did. Approximately 10% or more Year 1 respondents also named the smiley faces, rank of 100 neighbors, and energy-saving

tips. Among Year 2 households the energy-saving tips (20%), a general "energy usage/energy comparison" information (17%), and the smiley faces (10%) also garnered numerous responses.

Perceived usefulness of the HERs. Year 1 and Year 2 households most often selected the neighbor comparison as the most useful information in the HERs (Table 2-16). Year 1 households who received HERs monthly were most likely to indicate the neighbor comparison as the most useful element; for all other groups about one-third selected the neighbor comparison. Year 2 households identified the energy-saving tips as the most useful information in a higher proportion than Year 1 households, particularly high-use Extension customers who have received HERs for a longer time. In both surveys, about 17% to 22% could not identify one element of the HER as especially useful.

Table 2-13: Perceived Usefulness of HERs, by Program Year

HER Usefulness	Year 1		Year 2		
	Monthly (n=155)	Quarterly (n=142)	High-use Extension (n=121)	Average-use Expansion (n=130)	Overall (n=251)
What elements customers identified as most useful from HERs					
Neighbor comparison	44.3%	34.6%	33.9%	35.4%	34.7%
How you are doing - smiley faces	n/a	n/a	0.8%	5.4%	3.4%
Amount of annual savings	n/a	n/a	4.1%	0.8%	2.3%
Rank out of 100 neighbors	n/a	n/a	3.3%	5.4%	4.5%
None	17.2%	18.7%	18.2%	22.3%	20.5%
Energy saving tips	14.8%	13.1%	22.3%	17.7%	19.7%
Household energy usage comparison	n/a	n/a	18.2%	22.3%*	20.5%
Other	21.3%	12.1%	7.4%	4.6%	5.9%

* Statistically different from high-use Extension sample at the 0.05 level.

Engagement with on-line resources. Engagement with the HER website was consistently low in Year 1 and Year 2 (Table 2-14). Between 36% and 40% of households remembered seeing the name or link to the HER website on the report, but very few had visited the website at the time of the surveys. Likewise, few respondents in either program year visited the CL&P website for energy-efficiency information. The results from both years clearly suggest that treatment households—and perhaps all customers—do not seek information about energy efficiency from websites, at least not those websites related to the program or to CL&P.

Table 2-14: Website Use, by Program Year

HER Pilot Website Use	Year 1		Year 2		
	Monthly (n=155)	Quarterly (n=142)	High-use Extension (n=144)	Average-use Expansion (n=144)	Overall (n=288)
HER Website					
Recall HER website link on HER	36.1%	39.8%	36.8%	41.0%	39.1%
Visited www.clpenergyreports.com	9.6%	14.0%	8.3%	6.3%	7.2%
Total number of customers setup online account (count)	3	0	5	4	9
CL&P Website					
Visited www.cl-p.com for energy efficiency information (since Jan 2011)	12.9%	20.0%	10.1%	12.8%	11.6%

Satisfaction with the program. Year 2 households voiced higher levels of satisfaction with the program than Year 1 households (Table 2-15). In Year 1, about 40% of households said they were satisfied with the program, assigning a score of four or five on a scale from one to five where one is "very unsatisfied" and five is "very satisfied." In Year 2 about 50% of households said they were satisfied with the program. About 60% of monthly high-use households—Year 1 respondents and Year 2 high-use Extension respondents—indicated that they would recommend the program to someone else; this stands in contrast to the 70% of Year 2 average-use Expansion respondents who said they would recommend the program.

Duration in the program, rather than level of electricity consumption, appeared to shape households' attribution of energy-use reduction to the program. When asked if the HERs helped the household reduce energy use, more than one-half of Year 2 average-use Expansion households and Year 1 households in both monthly and quarterly groups reported that the program probably had not reduced their energy use. The Year 2 high-use Extension households gave the program slightly more credit for helping to reduce their energy use; more than one-half indicating the HERs "probably" or "definitely" helped. Nonetheless, more than two years after their introduction to the HERs, 47% of high-use households reported that the program was not helpful in reducing their energy use. Again, these responses reflect the attribution that survey respondents assign to the program, but the electricity-savings analysis that follows provides a more objective perspective on whether or not the program has resulted in energy savings.

Table 2-15: Recall and Readership of the HERs, by Program Year[a]

HER Pilot Satisfaction	Year 1		Year 2		
	Monthly (n=155)	Quarterly (n=142)	High-use Extension (n=143)	Average-use Expansion (n=143)	Overall (n=286)
Rating of 4 or 5 on 5-point scale	38.7%	41.1%	46.6%	50.4%	48.5%
Likelihood of recommending HERs (somewhat or very likely)	59.9%	68.0%	61.8%	71.7%	67.2%
Perception that HERs helped household reduce energy use					
Definitely yes	12.9%	15.6%	17.5%	14.0%	15.6%
Probably yes	32.0%	26.6%	35.0%	30.8%	32.7%
Probably no	23.1%	28.1%	27.3%	37.8%	32.9%
Definitely no	32.0%	29.7%	20.3%	17.5%	18.8%

[a] Note: Totals may not sum to 100% due to rounding error.

2.2 Savings Attributable to the Program

The main purpose of the impact evaluation was to estimate the electricity savings resulting from Year 2 of the HERs program among the newly added average-use Expansion study group and the high-use Extension study group that had also received reports in Year 1 of the program. The

impact evaluation also explores the influence of other factors, such as weather, time of year, and household characteristics on the savings achieved. The team relied on billing analysis to estimate these impacts. Specifically the team performed an analysis of electricity use—based on actual or estimated meter reads—as billed to the study group households. Statistical controls also serve to estimate savings for sub-groups, namely pre-program electricity use, for summer and winter months, and whether or not the household pays the all-electric rate code.[35]

In the results that follow, the tables list the estimated average treatment effects for the entire study group (comprising both treatment [including opt-out] and control households) as well as for the specific sub-groups of interest. The study period under question ran from January 2010 through July 2013, with data from 2010 serving as the pre-treatment period for the high-use Extension group, June 2011 through June 2012 as the pre-treatment period for the average-use Expansion group, and July 2012 through July 2013 serving as the post-treatment period. The Year 1 Final Report presents the estimated savings for all Year 1 treatment households—including the high-use Extension households continued in the Year 2 study—for January 2011 through early 2012.[36]

All of the results presented in the tables that follow achieve statistical significant at the $p>0.1$ level unless indicated otherwise.

2.2.1 Overall Year 2 Treatment Group Savings

Table 2-16 shows the electricity savings of the treatment group when compared to the control group for the entire Year 2 study group as well as for the high-use Extension households and average-use Expansion households. Year 2 of the HERs program successfully induced statistically significant electricity savings in both sub-groups. Over the Year 2 study period, the entire treatment group—average-use Expansion and high-use Extension households together—saved an average of 0.64 kWh daily when compared to the control group. This indicates that during the second year of the program the treatment group used 1.82% less electricity than the control group.

The team also examined the savings from the high-use Extension treatment households and the average-use Expansion treatment households separately. The results indicate that the high-use Extension treatment group used 1.19 kWh (2.31%) less electricity per day than the control group while the average-use Expansion treatment group used 0.26 kWh (1.17%) less electricity daily. One would expect the average-use Expansion group savings to be numerically smaller than the high-use Extension savings, as the average pre-treatment electricity use for average-use

[35] The team also employed additional control variables (e.g., weather) to increase the precision of the estimate. The estimating equation can be found in the methods section.

[36] As monthly report recipients, the Year 1 study results suggest that the Extension sample households saved about 2.0% during the Year 1 study period that ran from approximately January 2011 through March 2012. The Extension group experienced a report hiatus during the spring and early summer of 2012. For more detail see NMR, Tetra Tech, and Hunt Allcott. 2013. *Evaluation of the Year 1 CL&P Pilot Customer Behavior Program*. Delivered to the Connecticut Energy Efficiency Board on March 4, 2013.

Expansion households was 709 kWh compared to 1,660 kWh for the high-use Extension households. However, the fact that the **percentage** of savings differs suggests that the program affects high-use Extension and average-use Expansion households differently. Note the achieved program electricity savings were 4,254 MWh for the entire Year 2 study group, or 3,487 MWh for high-use Extension households and 977 MWh for average-use Expansion households. Comparing results between the average-use Expansion and high-use Extension models using a Wald Test shows that the electricity savings differed significantly between the two household groups (see Appendix A for more on the Wald Test).

Table 2-16: Estimated Average Electricity Savings during Year 2

Sample Used	Total	High-use Extension HH	Average-use Expansion HH
Daily Electricity Savings (kWh)	0.64	1.19	0.26
Upper Bound 90% CI	0.74	1.45	0.37
Lower Bound 90% CI	0.53	0.93	0.16
Total kWh Electricity Savings/Household	232.89	433.38	95.58
Total MWh savings (program)[a]	4,253.50	3,487.41	976.54
Percent Savings	1.82%	2.31%	1.17%
Treatment Sample Size	18,264	8,047	10,217
Control Sample Size	19,421	9,035	10,242
Explained Variance (R-squared)	88%	69%	56%

[a] Because the high-use Extension and average-use Expansion results come from separate models, so the total electricity savings results reported here cannot be duplicated through simple arithmetic.

The average-use Expansion households' electricity savings reflect their first year of program participation while the high-use Extension households are in their second year of program participation. It is appropriate to look at the high-use households' first year electricity savings as a comparison to the average-use households' first year electricity savings. The high-use households who received reports monthly for the duration of the first year of the program saved 1.07 kWh daily, or another way-saved 2.17% more energy than did the control group during their first year of program participation. A high-use monthly treatment household saved over four times as much energy during their first year of program participation than did the average-use treatment household during their first year of program participation. The first year average-use energy households saved 1.17% more energy compared to the control group which is almost half of the 2.17% savings the first year monthly high-use energy household saved during their first year of program participation.

2.2.2 Savings for Treatment Sub-groups

The team further examined the high-use Extension and average-use Expansion groups to understand if the program affected outlying households within each group differently. As described above in the methods section, the team divided each study group into two sub-groups

based on their pre-treatment electricity use and labeled the groups typical use or outlying use. The sub-group labels refer to the usage of the sub-group within the larger high-use Extension or average-use Expansion groups, and it is important to remember that both the high-use Extension typical and outlying households have mean electricity usage that is well above all households in the average-use Expansion group as well as CL&P's average residential customer.

The results demonstrate statistically significant savings (significant at the p>.01 level) across three of the four usage sub-groups Table 2-17) as well as between the sub-groups, indicating that savings were significant within sub-groups (except the Outlying average-use Expansion households) as well as differences in savings when compared to other sub-groups. Specifically, the typical high-use Extension treatment group household saved 416 kWh over the course of the study period while the average outlying high-use Extension treatment household saved 913 kWh during Year 2. The typical average-use Expansion treatment household saved around 93 kWh over the course of Year 2, an amount that is nearly identical to the savings for the entire average sub-group (see Table 2-16 for comparison) while the outlying average-use Expansion treatment group did not save a statistically significant amount of electricity, perhaps due to the small sample size for the group given the relatively small effect size (i.e. savings amount) among a small sample size. These findings confirm the conclusions from the Year 1 study that HERs are generally most successful at inducing electricity savings among high-use households—with the highest users achieving the largest daily kWh savings.

Table 2-17: Estimated Average Electricity Savings among Typical and Outlying Households

Sample Used	High-use Extension HH		Average-use Expansion HH	
	Typical Use	Outlying Use	Typical Use	Outlying Use
Daily Electricity Savings (kWh)	1.14	2.50	0.26	0.52*
Upper Bound 90% CI	1.39	4.61	0.36	1.53
Lower Bound 90% CI	0.89	0.39	0.15	-0.50
Total kWh Electricity Savings Per Household	416.29	913.31	93.47	188.84
Percent Savings	2.34%	2.49%	1.16%	1.53%
Treatment Sample Size	7,637	406	9,952	265
Control Sample Size	8,950	440	9,948	294
Explained Variance	54%	50%	54%	10%

*Not significant at the p>.01 level.

The evaluators also examined savings by the utility rate paid by the study households in order to further understand the source of electricity savings from the HERs program. The Wald test revealed that the savings rates differ significantly across the models Among the high-use Extension treatment group households paying the all-electric rate code saved 1.27% more electricity compared to the control group while the non-all-electric rate code sub-group saved 2.71% more electricity than the control. This pattern stands in contrast to the Year 1 findings in which the all-electric rate households achieved greater electricity savings than households not paying the all-electric rate. A possible reason for the shift in Year 2 of the electric rate households not generating the largest amount of energy savings, is that the Year 2 high-use Extension study group is a subset of the Year 1 study group, and the behavior of the Year 2 high-use Extension study group may not be identical to the whole Year 1 study group, meaning that making direct comparisons between Year 1 savings and Year 2 high-use Extensions should be done with caution. The savings achieved by average-use Expansion treatment all-electric rate households and other rate code households was in line with the Year 1 electric and non-electric study groups in that the all-electric group saved more (0.32 kWh per day) than the non-all-electric group (0.26 kWh per day). Although the program was successful in inducing savings among both all-electric and non-all-electric treatment groups, the team cannot conclude that the Year 2 program was consistently more successful among the treatment group that paid the all-electric rate.

Table 2-18: Estimated Average Electricity Savings among Electric and Non-Electric Households

Sample Used	High-use Extension HH		Average-use Expansion HH	
	Electric	Non-Electric	Electric	Non-Electric
Daily Electricity Savings (kWh)	0.67	1.38	0.32	0.26
Upper Bound 90% CI	1.15	1.68	0.73	0.37
Lower Bound 90% CI	0.18	1.08	0	0.15
Total kWh Electricity Savings Per Household	243.23	504.11	117.06	93.99
Percent Savings	1.27%	2.71%	1.29%	1.16%
Treatment Sample Size	2,250	5,797	924	9,293
Control Sample Size	2,464	6,571	947	9,295
Treatment Pre-program Monthly Usage (kWh)	1,850	1,596	652	709
Control Pre-program Monthly Usage (kWh)	1,836	1,580	658	712
Explained Variance	65%	71%	44%	57%

Table 2-19 examines the savings achieved by both study groups in summer (July and August) and winter (December through March) months. The team found that both the high-use Extension and average-use Expansion treatment households saved more electricity in winter months, achieving savings of 1.46 kWh and 0.43 kWh per day, respectively. Treatment households in both the high-use Extension and average-use Expansion study groups also saved significant amounts of electricity during the summer months—an average of 1.37 kWh daily in the summer for the high-use Extension treatment group and average of 0.40 kWh daily for the average-use Expansion treatment group. Though the savings within groups were significant the savings between groups were not.

Table 2-19: Estimated Average Seasonal Electricity Savings

Sample Used	High-use Extension HH		Average-use Expansion HH	
	Summer	Winter	Summer	Winter
Daily Electricity Savings (kWh)	1.37	1.46	0.40	0.43
Upper Bound 90% CI	1.69	1.81	0.57	0.58
Lower Bound 90% CI	1.04	1.12	0.22	0.28
Total kWh Electricity Savings Per Household	84.76	178.62	24.71	52.28
Percent Savings	2.24%	2.58%	1.26%	1.78%
Treatment Sample Size	8,041	7,949	9,666	10,068
Control Sample Size	9,031	8,914	9,740	10,090
Explained Variance	80%	76%	68%	60%

2.3 Persistence of Savings after Year 1 Report Cessation

Nearly all studies of behavioral programs based on the same model as the HERs have demonstrated that the programs induce electricity savings during the treatment period. Fewer studies, however, have traced the long-term persistence of savings after households cease receiving reports; even fewer have traced persistence based on different treatment exposures. The evaluators explored the issue of savings persistence through two different analyses:

- Examining how high-use Extension group savings persisted during a "hiatus" in receiving report in the Spring of 2012
- Examining the persistence of savings for monthly and quarterly households and those households that received monthly reports for only eight months—what the study design called the "persistence group."

The team stresses that these results apply only to Year 1 households, all of whom use considerably more energy than the average CL&P household. Research planned for 2014 will examine the persistence in savings the average-use households in the Year 2 average-use Expansion group.

2.3.1 Persistence of Savings for High-use Extension Households during Program Hiatus

The Program implementers began Year 2 of the program four months after the end of Year 1. This four month program hiatus provided the evaluation team with a unique opportunity to look at electricity savings for the high-use Extension treatment group during the hiatus. The evaluators examined persistence of savings among the high-use Extension group for Year 1 overall, the individual hiatus months, and Year 2 overall. This served to identify any differences in treatment effect during the periods of active treatment compared the hiatus (Table 2-20).

Looking at the differences between the active treatment periods and the hiatus period, the high-use Extension treatment group saw their numerical electricity savings, measured as kWh per day, remain fairly stable during the hiatus in April through July 2012. Specifically, the Year 1 daily average electricity savings is 0.97 kWh in Year 1 while the hiatus daily average electricity savings were 0.99 kWh; in Year 2, this same group saved about 1.19 kWh per day. Percentage-wise, the savings remained about 2.0% for all three time periods, with monthly fluctuations likely reflecting seasonal (the hiatus took place largely in the spring months) and other natural variations in electricity use.

Table 2-20: Estimated Average Electricity Savings among the High-use Extension Group during the Hiatus between Year 1 and Year 2 of the Program

	Year 1	April thru July 2012	April 2012	May 2012	June 2012	July 2012	Year 2
	Received Reports	No Reports	No Reports	No Reports	No Reports	No Reports	Received Reports
High-use Extension Treatment Effect	0.97	0.99	0.91	0.89	0.96	1.21	1.19
Percent Savings	1.96%	2.17%	2.27%	2.32%	2.16%	2.04%	2.31%
Treatment Sample Size[a]	8,071	7,674	8,052	8,031	8,030	8,073	7,637
Control Sample Size[a]	8,160	9,404	8,000	8,217	8,973	8,872	8,950
Explained Variance	84%	71%	44%	57%	71%	77%	69%

[a] The sample size varies because the team did not always have billing data for each household for every month.

2.3.2 Persistence of Savings for Discontinued Year 1 Households

During Year 2 of the HERs program the team investigated the persistence of savings for the Year 1 study group that was discontinued in Year 2 of the program. The discontinued treatment group was initially divided into three sub-groups: a monthly treatment group that received reports for the duration of Year1, the persistence treatment group that received reports for the first eight months of Year 1, and the quarterly treatment group that received reports every three months for the duration of Year 1. In the evaluation of the persistence treatment group savings for Year 1 the team found that the persistence group saved a significant amount of electricity from September

2011 through March 2012 (the six months after they stopped receiving reports) but their savings diminished over time. In fact, looking at monthly savings, the persistence group demonstrated no significant electricity savings in the fifth month after they stopped receiving reports[37]. The Year 2 evaluation continued this exploration of the persistence of savings but this time looked also at what happened to the savings of monthly and quarterly report recipients after they stop receiving reports after a full year of exposure to HERs. A major difference in the Year 2 persistence evaluation and the Year 1 persistence evaluation is the make-up of the discontinued monthly treatment group. Specifically, the discontinued monthly treatment group in Year 2 was a sub-sample (selected by the implementer) of the Year 1 monthly group and, though the groups were originally one, when the Year 1 monthly group was split into two groups the groups no longer had the same energy usage.

The team employed a similar method in Year 2 to the one used in the Year 1 evaluation. It observed whether the three discontinued treatment groups saved electricity during the whole of the Year 2 study period as well as in month-to-month increments from the time program Year 1 ended (the implementer delivered the final Year 1 reports in March of 2012). Because they have never received a report, the team decided to use all Year 1 control group households as the discontinued control group in order to limit any unintentional biases that may exist between Year 1 discontinued and Year 2 high-use Extension control households.

Table 2-21 shows that all discontinued treatment groups continued to exhibit statistically significant electricity savings between April 2012 and July 2013: compared to the control group, the discontinued monthly treatment groups saved 3.70% more electricity, the discontinued persistence treatment group saved 1.86% more electricity (recall they stopped receiving reports in August 2011), and the discontinued quarterly treatment group saved 2.06%. Although the team believes the savings for the discontinued monthly treatment group could be exaggerated (see discussion that follows directly below), the preponderance of evidence points to strong persistence of savings. The results suggest that treatment households continue to adopt energy-savings measures or behaviors that lead to persistent program savings long after they have stopped receiving reports. The nature of the Year 2 persistence group seems to be the source of differences; this discontinued monthly groups' post-treatment energy usage was lower than the Year 1 monthly group energy usage (Table 2-23) indicating that the nature of the sample's energy use has changed. This change means that the team cannot draw exact parallels between the Year 1 monthly savings and the Year 2 discontinued monthly saving as we were able to do during Year 1 of the evaluation because the Year 1 persistence and monthly groups never changed.

[37] Full Year 1 persistence group savings can be found in "Evaluation of Year1 of the CL&P Pilot Customer Behavior Program" at http://energizect.com/sites/default/files/DRAFT%20CLP%20Behavioral%20Year%201%20Program%20Report%20013113.pdf

Table 2-21: Estimated Average Electricity Savings among the Discontinued Group after Report Cessation (April 2012 through July 2013)

	Year 1[a]	Year 2
Discontinued Monthly Treatment Effect	1.07 (2.17%)	1.49 (3.70%)
Discontinued Persistence Treatment Effect	0.52 (1.06%)	0.75 (1.86%)
Discontinued Quarterly Treatment Effect	0.72 (1.45%)	0.83 (2.06%)
Sample Size	47,296	35,573
Explained Variance	80%	69%

[a] Year 1 results refer to the filed Year 1 savings in Year 1 Behavioral Evaluation. The Year 1 findings include the original discontinued monthly treatment group (made up of the groups labeled discontinued and extension in the Year 2 evaluation) and comparison between the Year 1 and Year 2 discontinued monthly treatment groups should be done with caution.

To delve into more detail about the persistent savings of the discontinued treatment groups, the team also examined the persistence of savings for each month after the cessation of Year 1 reports (Table 2-22 and Figure 2-9). The purpose of this analysis was to search for how long savings persist after households stop receiving reports.

Turning first to the persistence group (i.e., those who stopped receiving monthly reports in August 2011), the Year 1 evaluation found that savings for this group diminished over time. However, the Year 1 analysis ended in March 2012. The Year 2 evaluation, in contrast, tracks savings for April 2012 through July 2013. When looking at additional months for this Year 2 evaluation, the team continued to find evidence of generally decreasing savings—often to statistically non-significant levels—for the persistence group (the group that only received reports for a portion of the Year 1 period), although the results do exhibit monthly variations in savings rates.

The team would like to approach the savings for the individual month results with prudence, as any single month carries a great deal of statistical "noise," Using multiple months of data in a model has the benefit of reducing such noise because the results take more data into account which serves to smooth what could be random monthly variations. Using a single month of data does not permit this smoothing and is the likely reason we see a good deal of variation in savings from month to month. The long-term savings for the discontinued quarterly and monthly groups exhibited some similarities and differences to the persistence group. Specifically, like the persistence group, the discontinued quarterly and monthly groups generally exhibited declining savings over time, albeit with some monthly and seasonal variations. In contrast to the persistence group, the savings for the quarterly and monthly groups remained statistically significant for each month between April 2012 and July 2013. In short, while the savings may have been diminishing, the program appears to have created some longer-lasting energy-saving behavior among the subset of Year 1 treatment households who received report for an entire year. These savings may not continue forever, but they persisted for 15 months after the

households stopped receiving reports. Thus, the team concludes that a full year of treatment—and not eight months—may be necessary to induce long-term persistence in savings

The team must also address one final element of the results in Table 2-21, Table 2-22 and Figure 2-9. At first glance it appears that the discontinued monthly control group saved not only a greater percentage of electricity than the discontinued persistence and quarterly treatment groups but even more than high-use monthly report households saved during Year 1 of the program (i.e., 2.17%) or high-use Extension households saved during Year 2 of the program (i.e., 2.31%). However, the team cautions against the conclusion that the discontinued monthly treatment households save more electricity *after* they stop receiving reports because the electricity use of the discontinued monthly treatment group seems to diverge from the original Year 1 monthly treatment group. This divergence stems from differences between households selected for the Year 2 high-use Extension group and the discontinued monthly treatment group. Table 2-23 displays the difference in daily energy use among the Year 1 sub-groups 1 for the hiatus period. The mean electric use of the discontinued monthly households fell below that of all three other groups, including the Year 2 high-use Extension sample. These differences appear to have inflated the estimates of electricity savings for the discontinued monthly group. Given the preponderance of evidence the savings among high-use households hover around 2.0%, the team believes it is likely that the typical high-use household that has received a year of reports will persist in saving about 2.0% after they stop receiving reports.

One final note: recall that these savings apply only to high-use households and not to average-use households such as those in the Year 2 average-use Expansion group. The team will explore the persistence of savings for average-use households in 2014.

Table 2-22: Estimated Average Electricity Savings among the Discontinued Group by Month during Year 2

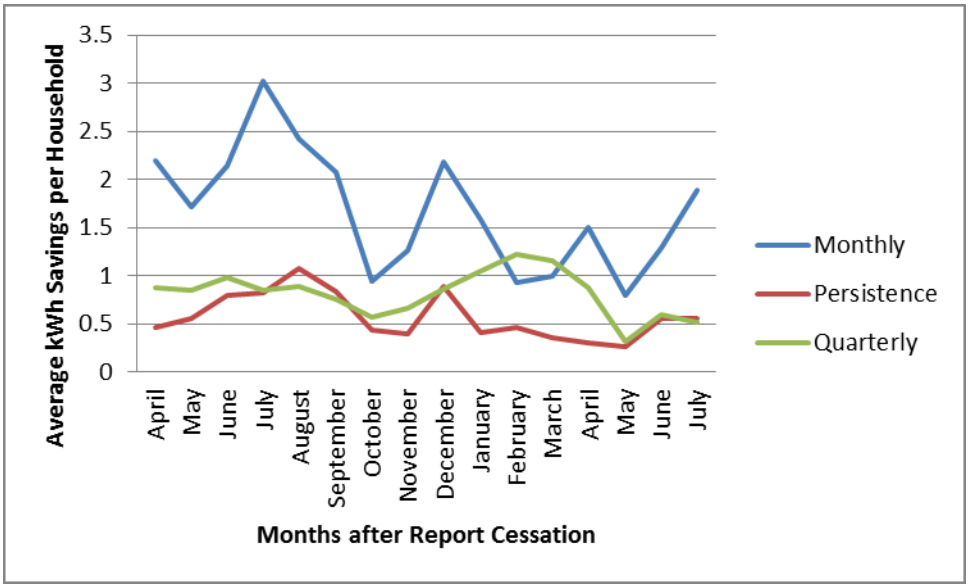
	Discontinued Monthly Treatment Effect-Daily kWh	Discontinued Persistence Treatment Effect-Daily kWh	Discontinued Quarterly Treatment Effect-Daily kWh	Sample Size	Explained Variance
April 2012	2.20 (5.52%)	0.46* (1.16%)	0.88 (2.20%)	34,692	54%
May 2012	1.72 (4.53%)	0.56 (1.47%)	0.85 (2.25%)	34,420	55%
June 2012	2.14 (4.83%)	0.79 (1.78%)	0.98 (2.22%)	35,909	69%
July 2012	3.02 (5.09%)	0.82 (1.38%)	0.85 (1.44%)	35,573	76%
August 2012	2.42 (3.96%)	1.08 (1.77%)	0.89 (1.46%)	35,375	77%
September 2012	2.08 (4.06%)	0.84 (1.64%)	0.75 (1.46%)	33,846	76%
October 2012	0.94 (2.42%)	0.43 (1.10%)	0.57 (1.45%)	34,767	65%
November 2012	1.26 (3.09%)	0.40 (0.98%)	0.66 (1.62%)	32,606	56%
December 2012	2.18 (4.19%)	0.89 (1.70%)	0.86 (1.66%)	29,856	64%
January 2013	1.58 (2.71%)	0.41* (0.69%)	1.05 (1.79%)	35,375	71%
February 2013	0.93* (1.54%)	0.46* (0.76%)	1.22 (2.00%)	31,419	76%
March 2013	0.99 (1.81%)	0.36* (0.65%)	1.15 (2.11%)	34,312	68%
April 2013	1.50 (3.24%)	0.30* (0.66%)	0.88 (1.89%)	34,102	53%
May 2013	0.79 (2.14%)	0.26* (0.72%)	0.31 (0.83%)	32,351	49%
June 2013	1.29 (2.89%)	0.55 (1.22%)	0.60 (1.34%)	33,787	64%
July 2013	1.89 (3.04%)	0.56* (0.90%)	0.52 (0.84%)	33,524	72%

*Indicates effect is not statistically significant.

Table 2-23: Sub-group Daily Energy Usage during the Hiatus between Year 1 and Year 2 of the Program

Daily kWh Usage	April 2012	May 2012	June 2012	July 2012
High-use Extension Treatment Group	39.49	37.22	43.52	58.71
Discontinued Monthly Treatment Group	38.15	36.10	42.12	57.30
Discontinued Persistence Treatment Group	39.72	37.33	43.08	57.64
Discontinued Quarterly Treatment Group	39.21	37.25	43.56	58.81
Control Group	40.08	38.08	44.32	59.57

Figure 2-9: Estimated Average Electricity Savings After the Cessation of Treatment for the Year 1 Sub-groups



2.4 Ratio of Program Expenditures to Savings

Using the Year 1 and Year 2 budgets, the team calculated ratios of program expenditures to savings for Year 1 and Year 2 of the program that covers the period when the participants were receiving reports (Table 2-24) as well as the ratios of program expenditures for savings that also encompasses a year of persistence savings (actual persistence savings for the discontinued groups and "hypothetical"[38] savings for the high-use Extension and average-use Expansion groups) (Table 2-25). The computations show that cost per kWh savings were between two and three cents for the high use customer groups, and about 13 cents for the "average" use customers. More detail is provided below.

The total expenditures to savings ratio was $0.03 for the combined Year 1 and Year 2 programs while the participants were receiving reports (Table 2-24). Working under a hypothetical scenario that includes a year of persistence savings in the calculations, the team took persistence savings for discontinued Year 1 households and hypothetical persistence savings for the average-use Expansion and high-use Extension households into account the total expenditures to saving ratio drops to $0.02 (Table 2-25). The ratios for individual study groups stood at $0.02 for all discontinued Year 1 households, with the ratio being calculated as Year 1 budget for these subgroups divided by Year 1 savings and persistence savings. The ratio for high-use Extension

[38] The Year 2 Extension and Expansion groups' persistence savings are hypothetical because they received reports during Year 2 of the program, but the team has not yet performed a billing data beyond the end of the Year 2 program period. The groups' persistence savings are an assumption of what their energy savings would be for a year after they had stopped receiving reports. However, the current evaluation plan calls for a billing analysis in the Summer of 2014 to assess actual persistence of savings for Year 2 households.

households was $0.03, calculated as their combined Year 1 and Year 2 budget divided by the combined Year 1 and Year 2 savings for this group. When the team included a year of hypothetical persistence savings the ratio drops to $0.02.

In contrast, the ratio among the average-use Expansion households was only $0.13, much higher than for the other groups; the calculation included their Year 2 program budget and their Year 2 savings—including a year of hypothetical persistence savings halves the ratio to $0.07. The lower expenditures to savings ratio for the high-use Extension households reinforces the finding that the greatest savings are possible when the program focuses on high energy usage households, raising questions about whether the program will achieve acceptable savings per expenditure if expanded to all CL&P households.

Table 2-24 and Table 2-25 also shows the kWh savings for all treatment groups in the study. Including Year 1 active treatment groups, Year 2 active treatment groups, and the persistence of savings among the discontinued treatment groups in Year 2, the program has saved 17,849,721 kWh, 16,872,181 of which has come from high energy usage households.

Table 2-24: Energy Savings per Dollar Expenditure While Participants Were Receiving HERs

Sub-Treatment Group	kWh Savings Year 1	kWh Savings Year 2	Program Expenditures	Rate of Expenditures to Savings	Sample Size
High-use Extension	3,343,680	3,487,410	$201,131	$0.03	8,047
Monthly Discontinued	464,400	--	$13,932	$0.03	1,127
Persistence Discontinued	1,578,960	--	$47,368	$0.03	3,697
Quarterly Discontinued	3,900,960	--	$117,026	$0.03	9,096
Average-use Expansion	--	977,540	$128,319	$0.13	10,217
TOTAL	9,288,000	4,464,950	$406,954	$0.03	23,088

[a] The program did not track expenditures by Extension, Monthly Discontinued, Persistence Discontinued, Quarterly Discontinued, and Expansion groups, so the team applied the proportion of sample that was in either group to estimate the budget associated with each group.

Table 2-25: Energy Savings per Dollar Expenditure Including Persistence Savings [a]

Sub-Treatment Group	kWh Savings Year 1	kWh Savings Year 2	kWh Persistence Savings	Program Expenditures	Rate of Expenditures to Savings	Sample Size
High-use Extension	3,343,680	3,487,410	3,019,402	$201,131	$0.02	8,047
Monthly Discontinued	464,400	--	329,084	$13,932	$0.02	1,127
Persistence Discontinued	1,578,960	--	1,012,054	$47,368	$0.02	3,697
Quarterly Discontinued	3,900,960	--	2,755,633	$117,026	$0.02	9,096
Average-use Expansion	--	977,540	977,540	$128,319	$0.07	10,217
TOTAL	9,288,000	4,464,950	8,093,713	$406,954	$0.02	23,088

[a] Persistence has only been calculated for the discontinued participant groups. The persistence savings for the Extension and Expansion group is hypothetical and was calculated as 2% savings for the Extension group since it is logical to expect the high-use Extension persistence savings to be similar to the high use discontinued groups persistence savings. The team has no information on how the average-use Expansion group savings will persist so their hypothetical persistence savings are identical to their Year 2 savings.

[b] The program did not track expenditures by Extension, Monthly Discontinued, Persistence Discontinued, Quarterly Discontinued, and Expansion groups, so the team applied the proportion of sample that was in either group to estimate the budget associated with each group.

2.5 Demand Savings Based on High, Medium, and Low Scenarios

In an effort to include 2013 demand savings in this evaluation the team looked to the CL&P TRM for behavioral program inputs to calculate demand savings, but these were not yet available. In the absence of CL&P specific deemed savings values, the team decided to use MA deemed savings inputs. The MA inputs are based on load and peak values shared by CL&P, but also consider MA behavioral program-specific inputs that we are not able to compare to CL&P's values. Because the MA values are a good, but not perfect, fit for CL&P, the team is presenting three sets of demand savings each for the high-use extension households and for average-use expansion households: high, medium, and low scenario savings. The team also recommends interpreting the reported demand savings (Table 2-26) as guidelines and not exact values and suggests that if CL&P continues with the Program that they develop their own demand modeling inputs based on CL&P behavioral savings during peak periods. It was not possible to create the appropriate demand inputs during this evaluation because the data were based on monthly bills and not hourly energy usage.

Table 2-26 list these parameters and display the demand savings for 2013. The savings for high-use Extension households were:

- 428 kW in the high scenario;

- 215 in the mid scenario; and
- 57 kW in the low scenario.

The savings for the average-use Expansion households were:

- 544 kW in the high scenario;
- 273 kW in the mid scenario; and
- 73 kW in the low scenario.

The team cannot recommend using these values because of the lack of comparability between the MA deemed inputs and the actual CL&P program inputs. Because the Program has such a successful impact on the high-use Extension households it is likely that their demand savings are close to the high scenario savings of 428 kW. The program did not have the same impact across treatment groups and was less successful among the average-use expansion group making it likely that their demand savings fall somewhere between the mid and low scenario values (273 kW and 73 kW).

Table 2-26: Demand Savings based on MA Deemed Values

	High-use Extension			Average-use Expansion		
	High Scenario	**Mid Scenario**	**Low Scenario**	**High Scenario**	**Mid Scenario**	**Low Scenario**
Sample Size	8,047	8,047	8,047	10,217	10,217	10,217
Change Factor[a]	0.0532	0.0267	0.0071	0.0532	0.0267	0.0071
Savings, ΔkW	428	215	57	544	273	73

[a] The change factors come from the 2013-2015 MA TRM (p. 23) and are based on MA Behavioral program results and were calculated using the Demand Impact Model.

3 Conclusions and Recommendations

CL&P and OPower designed the Year 2 study to determine whether the HERs program model achieves the same percentage of savings for the average CL&P residential electricity customer as it does for the high-use customers. The analyses in this report suggest the following conclusions regarding this issue:

- Savings: The program design achieves statistically significant savings (1.82%) for both high-use and average-use customers, but high-use households achieve statistically higher percent savings (2.31%) than average-use households (1.17%).
- Lower savings for "average" use households: Differences in pre-program electricity use and the percent savings means that CL&P can expect high-use households to achieve 350% more electricity savings as measured in kWh than average-use households.
- Persistence: The analyses also demonstrate that high-use treatment households from the Year 1 study group continued to save electricity long after they stopped receiving reports. Households demonstrated average savings of about 2% through July 2013, a period of 15 months for the discontinued monthly and quarterly treatment groups and almost two years for the discontinued persistence treatment group.
- Ratio of Expenditures and Savings: Computing the ratio of expenditures to electricity savings showed that the program achieves a more desirable ratio when focusing on high energy use households. This finding draws into question whether the ratio of expenditures to savings would be adequately high if CL&P opened the program to all households.
- Demand Savings: Calculating the demand savings based on MA inputs gave evidence that high-use expansion households likely had demand savings around 428 kW and that average-use extension households likely had demand savings between 273 kW and 73 kW.

Why does the program produce greater impacts for high-use customers? The process evaluation points to a few possible explanations. High-use households would be more likely to receive reports telling them that their use is higher than their "neighbors;" if the "feedback is effective," theory holds, this would tend to motivate the households to take actions to reduce use. Average-use households would be less likely to receive the message that their use was higher than that of their neighbors.

In addition, high-use are generally wealthier than average-use households, and may be better able to afford measures that produce deeper savings than average-use households. In addition high-use households simply have more to lose. Small changes made in a home with lots of electricity to save will likely yield larger energy savings than similar changes made in a home with less electricity to save.

The analyses also demonstrate that high-use treatment households from the Year 1 study group continued to save electricity long after they stopped receiving reports. Households demonstrated

average savings of about 2% through July 2013, a period of 15 months for the discontinued monthly and quarterly treatment groups and almost two years for the discontinued persistence treatment group. Thus, the evidence suggests that treatment households internalized the behaviors adopted during the treatment period, resulting in long-term savings that go beyond just the program period.

Computing the ratio of expenditures to electricity savings showed that the program achieves a more desirable ratio when focusing on high energy use households. This finding draws into question whether the ratio of expenditures to savings would be adequately high if CL&P opened the program to all households.

The report also yields interesting results about how households react to the report. Perhaps the most important is the contradictory reaction to the neighbor comparison: treatment households generally distrusted the comparison (mainly because they misunderstood it), but they also cited it as the most useful part of the report. This usefulness manifested in a very objective way; the program design induces statistically significant electricity savings. This contradictory reaction to—and proven effectiveness of—the neighbor comparison could create a public relations problem for CL&P. That is, treatment households may get annoyed with the Company for what these households view as an inaccurate comparison, but this annoying aspect of the report also yields substantial electricity savings for the Company, which in turn also reduces demand and grid congestion as well as lowering greenhouse gas emissions.

The findings also highlight a second important reaction to the reports; they served to keep energy savings "top of mind." Thus, while treatment households may have griped that the tips are things that "everyone already knows," the reports served as a little reminder to take those actions on a regular basis. The persistence savings, moreover, suggest that, with enough reminders, these actions become habits; when households see their electricity use creeping back up, they turn back to those behaviors that help to lower that use, even if it is by just a few kWh per month.

A final critical question for the Year 2 evaluation involved how frequently treatment households used the program website and what that use entailed. The team found that only a minority of households even recognized that the website existed, and fewer than one-in-ten treatment households had visited the website. Households that enjoyed the paper HERs felt the report gave them all the information they wanted, so they did not see a need to visit the website. Ironically, households that did not find the paper HERs useful also saw no need to visit the website, as they assumed the information would be equally useless to them. It is also the case that only a few households visited the CL&P website for information on energy efficiency. In short, if CL&P and OPower want to redesign the program to be web-based rather than paper-based, they will need to combat a persistent lack of interest in using websites to learn about energy efficiency. Certainly households looking for a specific energy-using product may search the Internet for product reviews and pricing, but most households seem less interested in using websites to discover general tips on ways they can save energy.

These critical findings on electricity savings, persistence of savings, reactions to reports, and use of the website lead to the following recommendations:

Recommendation 1: Given the strong evidence for program savings during the treatment period and well after the cessation of reports, the team recommends that CL&P calculate program savings for* high-use households *to include the savings achieved during treatment period plus another 2.0% for at least one year after the households stop receiving reports. The evidence actually supports claiming savings for 15 months to two years after report cessation, but the team recommends the more conservative period of a year due to the pattern of diminishing savings over time. Still, the team recognizes that a strong argument can be made for extending the period beyond one year, and CL&P and the EEB should consider the strengths and weaknesses of a longer persistence period when calculating program savings. The Year 1 discontinued groups could continue to be observed with another billing analysis a year after the end of the Year 2 program period to examine whether savings persisted among high users after more than a year of not getting reports. *This recommendation applies only to high-use households; research planned for 2014 will provide more insights into the persistence of savings for average-use households*.

Recommendation 2: The HERs program results in lower (i.e. more desirable) expenditures to savings ratios for high-use households than for average-use households. This suggests that expanding the program to all households may not achieve desirable expenditures to savings ratios. However, additional program goals may justify expansion to all households. The team stresses that the program will remain the most cost effective if it targets high-use households, but this creates social equity concerns, as these households tend to be wealthier and enjoy higher socioeconomic status than the typical CL&P customer. While alternative program designs may result in lower budgets and economies of scale than achieved in these two Pilot studies, the results strongly suggest that the CL&P and the EEB must carefully weigh social equity concerns with the savings to be achieved with rate payer funds. Note that Recommendation 5 below addresses the possibility of using a web-based study design.

Recommendation 3: Future evaluations should be responsible for developing their own control group for estimating savings from the program. The implementer selects the treatment and control groups, and the team stresses that the data point to random allocation of these groups. Yet, the random allocation cannot be confirmed or tested with certainty. The evaluation design and independence could be improved if the evaluators compared estimates of electricity savings based on the implementer control group and an evaluator-selected control group that matched the treatment group. The team notes, however, that the matching process can sometimes be quite involved and require somewhat substantial resources (e.g., labor hours, computing resources, etc.) to carry out.[39]

Recommendation 4: Given its integral role in inducing energy-saving behavior, the neighbor comparison should remain a critical component of the program design. However, CL&P and OPower should also *consider* revising the report to make the definition of "neighbors" more prominent. The team makes careful use of the word "consider" in the previous sentence because it recognizes two facts. First, the current report format includes the definition *in plain sight directly below the neighbor comparison*, but the font size must relegate it to "fine print" overlooked by most recipients. Second, clarifying the definition of "neighbors" may also reduce the competitive reaction that households have to the comparison that leads them to take energy-savings actions. In short, perhaps CL&P and OPower could experiment with ways of continuing to promote the competitive spirit created by the neighbor comparison in a way that is more conducive to positive customer relations.

[39] For examples of behavior studies that selected control groups: "Some Insights on Matching Methods in Estimating Energy Savings for an Opt-In, Behavioral-Based Energy Efficiency Program" presented by Provencher et al, IEPEC 2013, Chicago, IL.
"Control Group Wars-There's More Than One Way to Win the Battle" presented by Hanna, D. and Marrin, K., IEPEC 2013, Chicago, IL.

Recommendation 5: CL&P should be hesitant to move to a web-based design unless they have a strong plan in place to convince households to visit the website initially and then to continue to engage the website on a regular basis. The most difficult component of a web-based program design will likely be convincing households to visit the website and create an account. The team anticipates that the program would need to move from an "opt-out" to an "opt-in" design *unless CL&P already has email addresses for substantial numbers of its residential customers*.[40] The need for email addresses reflects the reality of the current design—the papers reports have not induced use of the website, so it is unlikely that a "welcome letter" will work any better. In contrast, the ability to follow an embedded email link could increase use of the website. If CL&P lacks large numbers of email addresses for its residential customers, an opt-in design could take advantage of social media (Twitter, Facebook, etc.) to encourage interested households to sign-up at the website.[41] Finally, a web- or email-based approach would almost certainly be cost effective, but the biased sample could result in electricity savings that differ radically from the current program design. In short, the savings reported here could not be generalized to a web- or email-based design, be that design opt-in or opt-out.

[40] If it does have email address for substantial numbers of customers, CL&P could deliver opt-out reports via email, although SPAM filters could become problematic, sending the reports to the trash box rather than the inbox.
[41] Note that UI tried this approach a few years ago with little success; however, it may be that use of social media has become more common and CL&P may want to try the approach again.

Appendix A Detailed Demographic Characteristics

Table 1-3 above summarizes demographic characteristics of the survey respondents. Table A-1 below presents the more detailed results for these same characteristics.

Table A-1: Detailed Demographic Characteristics

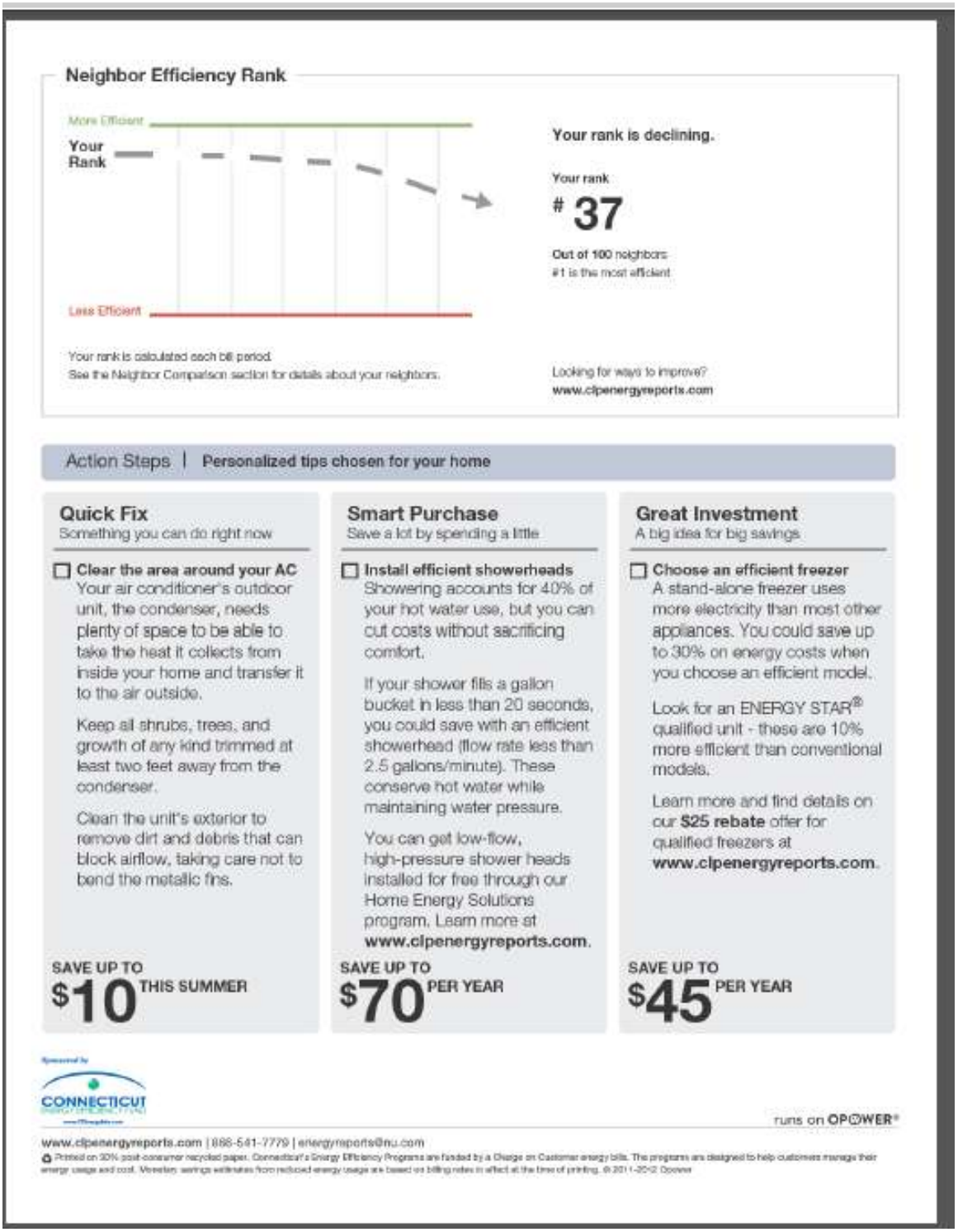
Characteristic	Response	High-use Extension	Average-use Expansion	Total
Households with children	No	67.1%	80.3%	74.2%
	Yes	32.9%	19.7%	25.8%
	Sample Size	152	152	304
Households with residents 65+	No	65.1%	53.9%	59.1%
	Yes	34.9%	46.1%	40.9%
	Sample Size	152	152	304
Number of people living in household year-round	Mean	3.0	2.4	2.7
	Sample Size	152	149	301
Own or rent home	Own	97.4%	94.6%	95.9%
	Rent	2.6%	5.4%	4.1%
	Sample Size	152	148	300
Type of home	Single family residence	90.8%	89.4%	90.0%
	Duplex or two family residence	3.3%	2.0%	2.6%
	Apartment or condo with 2-4 units	2.0%	2.0%	2.0%
	Apartment or condo with more than 4 units	3.3%	3.3%	3.3%
	Townhouse	0.7%	3.3%	2.1%
	Sample Size	152	151	303
Year home built	Before 1930	11.2%	13.4%	12.4%
	1931-1950	6.6%	10.1%	8.4%
	1951-1970	26.3%	38.3%	32.7%
	1971-1990	34.2%	24.8%	29.2%
	1991 to present	21.7%	13.4%	17.3%
	Sample Size	152	149	301
Electric heating	No	60.5%	81.6%	71.9%
	Yes	39.5%	18.4%	28.1%
	Sample Size	152	152	304
# bedrooms in home	Mean	3.5	3.1	3.3
	Sample Size	151	151	302
Education	< high school or high school graduate	13.3%	25.7%	19.9%
	Two-year college, trade or technical school	10.7%	13.5%	12.2%
	Some college	12.0%	12.2%	12.1%
	Four-year college degree*	23.3%	18.9%	21.0%
	Some grad school or grad degree*	40.7%	29.7%	34.8%
	Sample Size	150	148	298

Characteristic	Response	High-use Extension	Average-use Expansion	Total
2012 household income	Refused	25.5%	28.5%	27.1%
	Less than $50,000	8.1%	14.6%	11.6%
	$50,000-$75,000	5.4%	17.2%	11.8%
	$75,000-$100,000	12.1%	14.6%	13.4%
	$100,000 or more*	49.0%	25.2%	36.1%
	Sample Size	149	151	300

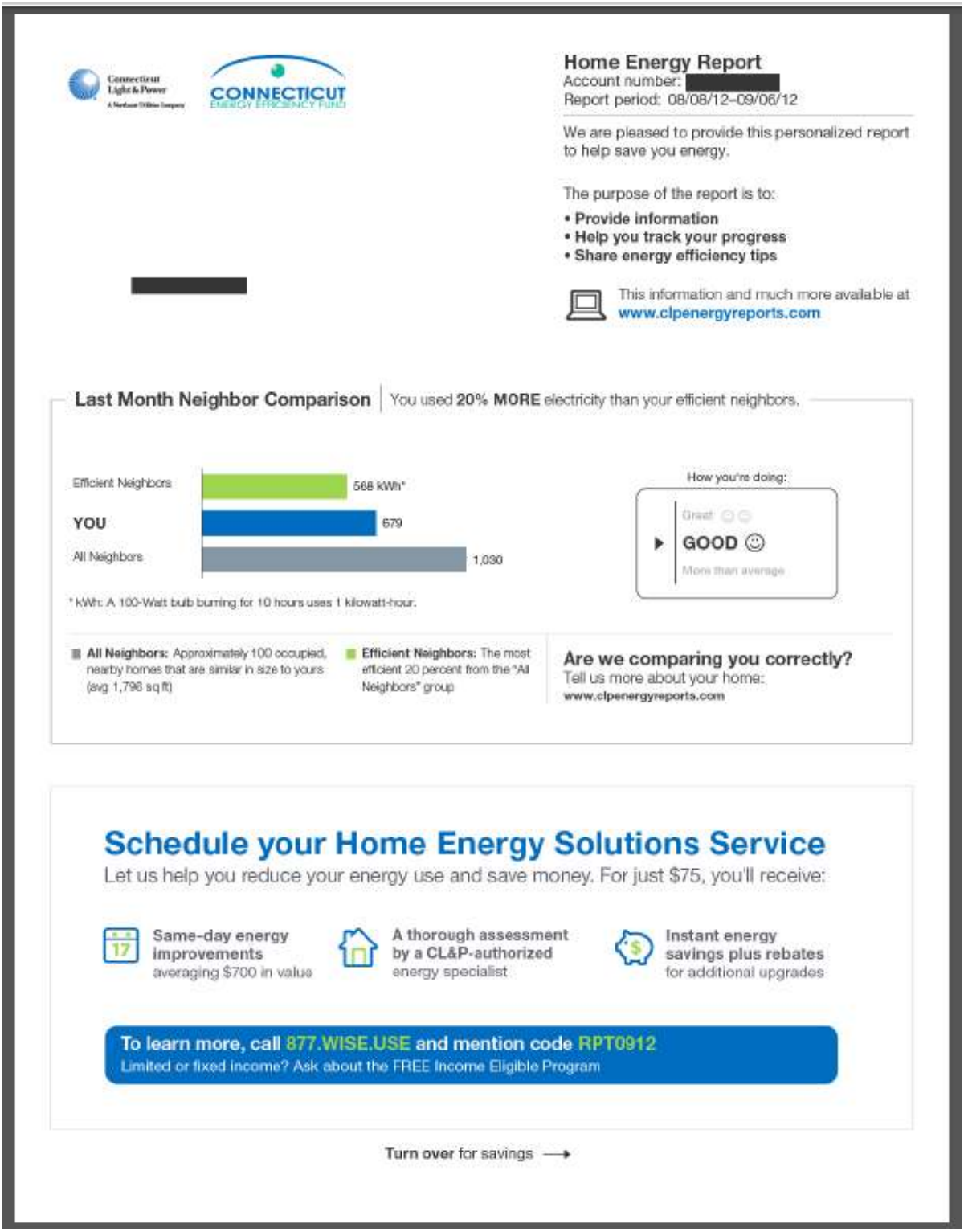
Appendix B OPower Welcome Letter and HERs Examples

B.1 Example of Home Energy Reports

B.1.1 August 2012



B.1.2 September 2012



Connecticut Light & Power

CONNECTICUT ENERGY EFFICIENCY FUND

Home Energy Report

Account number: [redacted]
Report period: 08/08/12–09/06/12

We are pleased to provide this personalized report to help save you energy.

The purpose of the report is to:

- **Provide information**
- **Help you track your progress**
- **Share energy efficiency tips**

This information and much more available at **www.clpenergyreports.com**

[redacted]

Last Month Neighbor Comparison

You used **20% MORE** electricity than your efficient neighbors.

How you're doing:

Great

GOOD ☺

More than average

* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

All Neighbors: Approximately 100 occupied, nearby homes that are similar in size to yours (avg 1,796 sq ft)

Efficient Neighbors: The most efficient 20 percent from the "All Neighbors" group

Are we comparing you correctly?
Tell us more about your home:
www.clpenergyreports.com

Schedule your Home Energy Solutions Service

Let us help you reduce your energy use and save money. For just $75, you'll receive:

Same-day energy improvements averaging $700 in value

A thorough assessment by a CL&P-authorized energy specialist

Instant energy savings plus rebates for additional upgrades

To learn more, call 877.WISE.USE and mention code RPT0912
Limited or fixed income? Ask about the FREE Income Eligible Program

Turn over for savings →

Last 12 Months Neighbor Comparison

You used **1% MORE** electricity than your efficient neighbors.

Action Steps | Personalized tips chosen for your home

Quick Fix
Something you can do right now

☐ **Turn off your computer at night**
Turning your computer off at night could save you up to a third of its energy costs.

The U.S. Department of Energy has verified that rebooting will not negatively affect your computer's lifespan. Machines that run constantly are actually more likely to wear out their fans — a costly part to repair.

Save even more by plugging your computer, monitor, and printer into one power strip and turning the strip off when you go to bed.

SAVE UP TO **$105** PER YEAR

Quick Fix
Something you can do right now

☐ **Recycle your second refrigerator**
Refrigerators from the year 2000 and earlier use 40% more energy than today's most efficient units.

If you have a spare refrigerator or freezer, you probably pay more to run it than your primary one, even if you don't often need to use it.

Rearrange your main refrigerator to maximize space and recycle your extra one for instant energy savings.

SAVE UP TO **$100** PER YEAR

Great Investment
A big idea for big savings

☐ **Replace your old washing machine**
Clothes washers use a significant amount of energy. When purchasing a new washer, look for an ENERGY STAR® qualified model to save on energy and water costs.

Visit **TopTenUSA.org/CT** to find the perfect washing machine for your home.

Learn more and find details on our **$50 rebate offer** for new, qualified clothes washers at **www.clpenergyreports.com**.

SAVE UP TO **$35** PER YEAR

Sponsored by CONNECTICUT

runs on OPOWER®

www.clpenergyreports.com | 866-541-7779 | energyreports@nu.com

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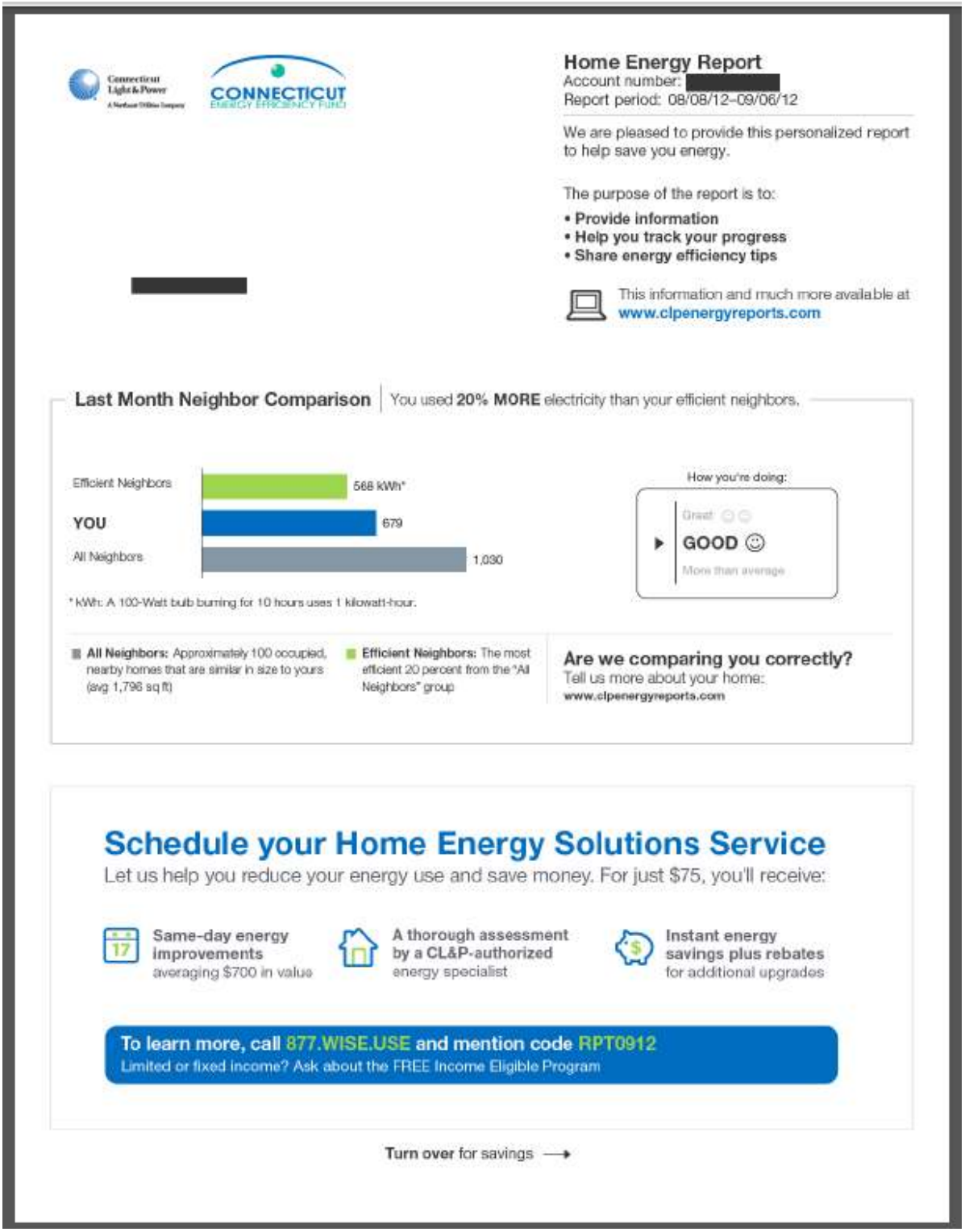


Connecticut Light & Power
CONNECTICUT ENERGY EFFICIENCY FUND

Home Energy Report

Account number: [redacted]
Report period: 08/08/12–09/06/12

We are pleased to provide this personalized report to help save you energy.

The purpose of the report is to:

- **Provide information**
- **Help you track your progress**
- **Share energy efficiency tips**

This information and much more available at **www.clpenergyreports.com**

[redacted]

Last Month Neighbor Comparison

You used **20% MORE** electricity than your efficient neighbors.

How you're doing:

Great
GOOD
More than average

* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

All Neighbors: Approximately 100 occupied, nearby homes that are similar in size to yours (avg 1,796 sq ft)

Efficient Neighbors: The most efficient 20 percent from the "All Neighbors" group

Are we comparing you correctly?
Tell us more about your home:
www.clpenergyreports.com

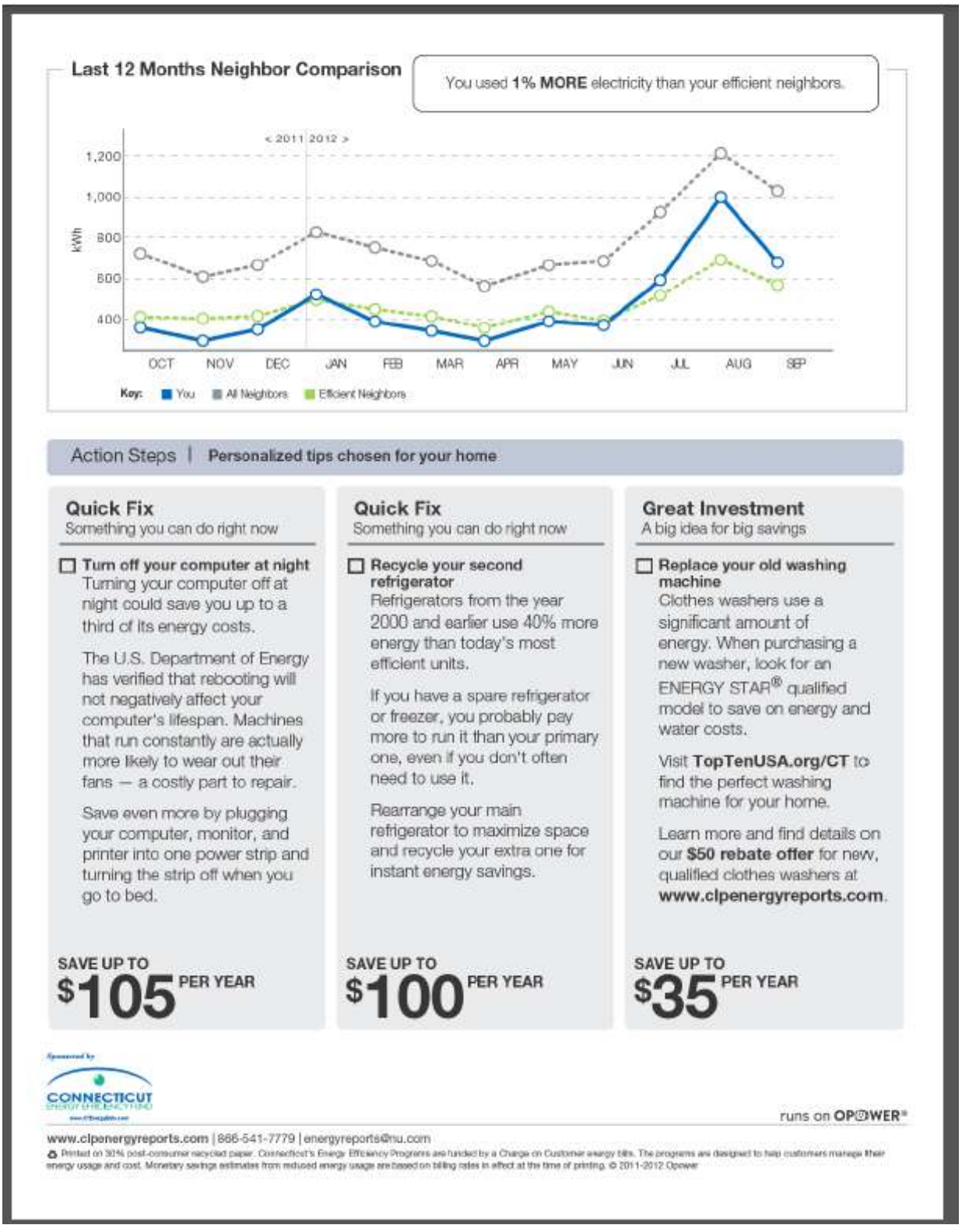
Schedule your Home Energy Solutions Service

Let us help you reduce your energy use and save money. For just $75, you'll receive:

- **Same-day energy improvements** averaging $700 in value
- **A thorough assessment by a CL&P-authorized** energy specialist
- **Instant energy savings plus rebates** for additional upgrades

To learn more, call 877.WISE.USE and mention code RPT0912
Limited or fixed income? Ask about the FREE Income Eligible Program

Turn over for savings →



B.1.3 October 2012

Connecticut Light & Power
A Northeast Utilities Company

CONNECTICUT ENERGY EFFICIENCY FUND

Home Energy Report

Account number: [redacted]
Report period: 09/07/12–10/04/12

We are pleased to provide this personalized report to help save you energy.

The purpose of the report is to:

- **Provide information**
- **Help you track your progress**
- **Share energy efficiency tips**

This information and much more available at **www.clpenergyreports.com**

[redacted]

Last Month Neighbor Comparison

You used **4% LESS** electricity than your efficient neighbors.

How you're doing:

GREAT ☺☺

Good ☺

More than average

* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

All Neighbors: Approximately 100 occupied, nearby homes that are similar in size to yours (avg. 1,796 sq ft)

Efficient Neighbors: The most efficient 20 percent from the "All Neighbors" group

Are we comparing you correctly?
Tell us more about your home:
www.clpenergyreports.com

Last 12 Months Neighbor Comparison

You used **1% MORE** electricity than your efficient neighbors.

Turn over for savings →

Personal Comparison

How you're doing compared to last year:

So far this year, you used **13% MORE** electricity than last year.

Looking for ways to save? Visit **www.clpenergyreports.com**

* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

Action Steps | Personalized tips chosen for your home

Quick Fix
Something you can do right now

☐ **Turn off lights when not needed**
Lights left on in empty rooms waste energy. Remember to turn them off when you leave an area.

Once you get into the habit, turning off unused lights is effortless. To help you get there, try leaving eye-catching reminders next to your light switches and doorways.

Get other household members involved, too. Even young children can help save energy by turning lights off.

SAVE UP TO $30 PER YEAR

Quick Fix
Something you can do right now

☐ **Avoid over-drying clothes**
Hang drying is the most energy-efficient approach to drying clothes, but it may not be feasible all the time. By using your clothes dryer efficiently, you can still save money.

If your dryer has a moisture sensor, use it to prevent over-drying. For additional savings, dry your towels and other heavy items in a load separate from lighter-weight clothes.

Finally, remember to clean the lint filter after every load to improve air circulation.

SAVE UP TO $25 PER YEAR

Great Investment
A big idea for big savings

☐ **Choose an efficient dishwasher**
New ENERGY STAR® qualified dishwashers use at least 10% less energy than conventional machines.

In addition to the ENERGY STAR label, look for an "air dry" setting that allows you to turn off the heat dry function. Also look for a "light" or "energy saving" cycle to use when your dishes are only slightly dirty.

Remember, efficient dishwashers do double duty on savings because they also reduce your water bill.

SAVE UP TO $15 PER YEAR

Sponsored by CONNECTICUT ENERGY EFFICIENCY FUND

runs on OPOWER®

www.clpenergyreports.com | 866-541-7779 | energyreports@nu.com


Connecticut Light & Power
CONNECTICUT ENERGY EFFICIENCY FUND
Home Energy Report
Account number: [redacted]
Report period: 09/07/12–10/04/12
We are pleased to provide this personalized report to help save you energy.
The purpose of the report is to:
• Provide information
• Help you track your progress
• Share energy efficiency tips
This information and much more available at www.clpenergyreports.com
[redacted]
Last Month Neighbor Comparison
You used 4% LESS electricity than your efficient neighbors.
YOU
373 kWh*
Efficient Neighbors
389
All Neighbors
641
* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.
How you're doing:
GREAT
Good
More than average
All Neighbors: Approximately 100 occupied, nearby homes that are similar in size to yours (avg. 1,796 sq ft)
Efficient Neighbors: The most efficient 20 percent from the "All Neighbors" group
Are we comparing you correctly?
Tell us more about your home:
www.clpenergyreports.com
Last 12 Months Neighbor Comparison
You used 1% MORE electricity than your efficient neighbors.
< 2011 2012 >
1,200
1,000
800
600
400
kWh
NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT
Key: You All Neighbors Efficient Neighbors
Turn over for savings

Personal Comparison

How you're doing compared to last year:

So far this year, you used **13% MORE** electricity than last year.

Looking for ways to save? Visit **www.clpenergyreports.com**

* kWh: A 100-Watt bulb burning for 10 hours uses 1 kilowatt-hour.

Action Steps | Personalized tips chosen for your home

Quick Fix
Something you can do right now

☐ **Turn off lights when not needed**
Lights left on in empty rooms waste energy. Remember to turn them off when you leave an area.

Once you get into the habit, turning off unused lights is effortless. To help you get there, try leaving eye-catching reminders next to your light switches and doorways.

Get other household members involved, too. Even young children can help save energy by turning lights off.

SAVE UP TO $30 PER YEAR

Quick Fix
Something you can do right now

☐ **Avoid over-drying clothes**
Hang drying is the most energy-efficient approach to drying clothes, but it may not be feasible all the time. By using your clothes dryer efficiently, you can still save money.

If your dryer has a moisture sensor, use it to prevent over-drying. For additional savings, dry your towels and other heavy items in a load separate from lighter-weight clothes.

Finally, remember to clean the lint filter after every load to improve air circulation.

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Great Investment
A big idea for big savings

☐ **Choose an efficient dishwasher**
New ENERGY STAR® qualified dishwashers use at least 10% less energy than conventional machines.

In addition to the ENERGY STAR label, look for an "air dry" setting that allows you to turn off the heat dry function. Also look for a "light" or "energy saving" cycle to use when your dishes are only slightly dirty.

Remember, efficient dishwashers do double duty on savings because they also reduce your water bill.

SAVE UP TO $15 PER YEAR

Sponsored by CONNECTICUT

runs on OPOWER®

www.clpenergyreports.com | 866-541-7779 | energyreports@nu.com

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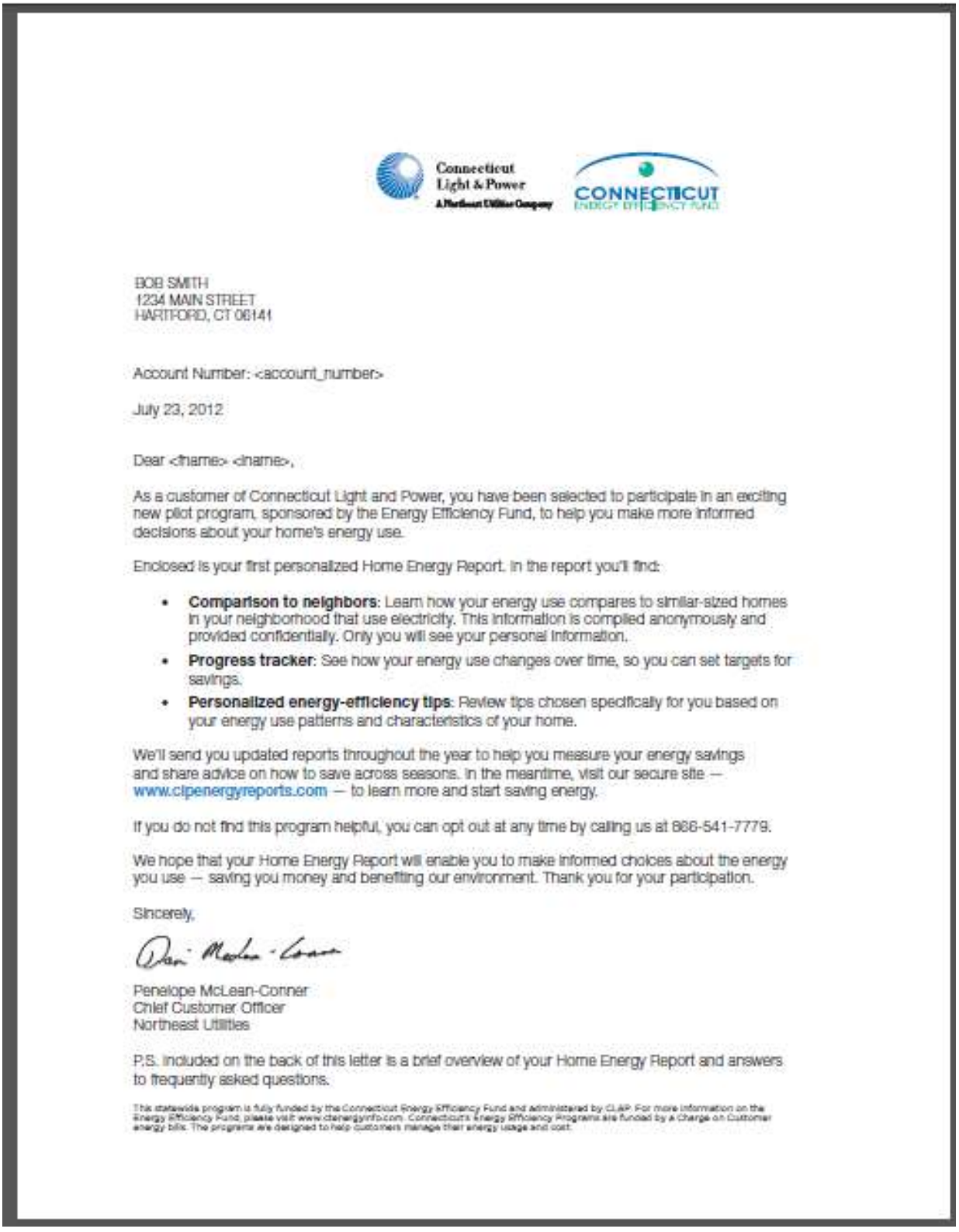
B.2 Example Welcome Letter



Connecticut Light & Power
A Northeast Utilities Company

CONNECTICUT ENERGY EFFICIENCY FUND

BOB SMITH
1234 MAIN STREET
HARTFORD, CT 06141

Account Number: <account_number>

July 23, 2012

Dear <fname> <lname>,

As a customer of Connecticut Light and Power, you have been selected to participate in an exciting new pilot program, sponsored by the Energy Efficiency Fund, to help you make more informed decisions about your home's energy use.

Enclosed is your first personalized Home Energy Report. In the report you'll find:

- **Comparison to neighbors**: Learn how your energy use compares to similar-sized homes in your neighborhood that use electricity. This information is compiled anonymously and provided confidentially. Only you will see your personal information.
- **Progress tracker**: See how your energy use changes over time, so you can set targets for savings.
- **Personalized energy-efficiency tips**: Review tips chosen specifically for you based on your energy use patterns and characteristics of your home.

We'll send you updated reports throughout the year to help you measure your energy savings and share advice on how to save across seasons. In the meantime, visit our secure site — www.clpenergyreports.com — to learn more and start saving energy.

If you do not find this program helpful, you can opt out at any time by calling us at 866-541-7779.

We hope that your Home Energy Report will enable you to make informed choices about the energy you use — saving you money and benefiting our environment. Thank you for your participation.

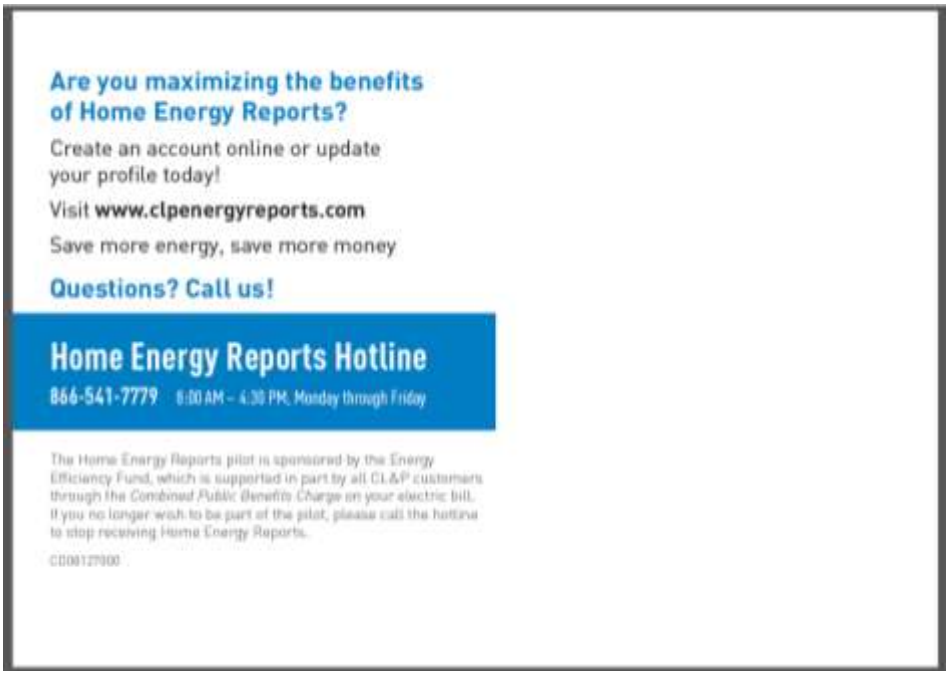
Sincerely,

Penelope McLean-Conner
Chief Customer Officer
Northeast Utilities

P.S. Included on the back of this letter is a brief overview of your Home Energy Report and answers to frequently asked questions.

This statewide program is fully funded by the Connecticut Energy Efficiency Fund and administered by CL&P. For more information on the Energy Efficiency Fund, please visit www.ctenergyinfo.com. Connecticut's Energy Efficiency Programs are funded by a Charge on Customer energy bills. The programs are designed to help customers manage their energy usage and cost.

B.3 Example Extension Postcard



Appendix C Survey and Focus Group Protocols

C.1 Telephone Survey Questionnaire

Introduction to HER Follow Up Telephone Survey

Hello, my name is [interviewer name], and I'm calling on behalf of Connecticut Light and Power. May I speak with [named respondent]?

1 Yes

2 No [If named respondent is not available: ask for another adult who is most involved in managing their household's energy use]

I'm with Tetra Tech, an independent research firm. We are talking with customers of Connecticut Light and Power to understand their views on energy use and conservation. You may have received a letter regarding this. I'm not selling anything; I'd just like to talk about your household's energy use. Your responses will be kept confidential and your name will not be revealed to anyone. For quality assurance, these calls are recorded.

(Why are you conducting this study?) Studies like this will help Connecticut Light and Power better understand customers' needs and to design their energy conservation programs accordingly.

(How did you get my name or number?) Your name and phone number were provided by Connecticut Light and Power. You were one of 600 customers randomly selected for this study.

(How long will this call take?) This survey should take about 20 minutes. IF THIS IS NOT A GOOD TIME, SET UP A CALL BACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-454-5070.

(Are you trying to sell me something?) This is not a sales call; we would simply like to learn about your household's experiences with energy use and conservation. Your responses will be kept confidential. If you would like to talk with someone at Connecticut Light and Power regarding this work, please call Customer Service Center at (800) 286-2000 or (860)947-2000 in the Hartford Meriden area.

Recall, Readership, and Evaluation of Home Energy Reports

A1 Our records indicate that you are currently receiving Home Energy Reports through a Program sponsored by Connecticut Light and Power and the Connecticut Energy Efficiency Fund. Is that correct? [SELECT ONE]

1 Yes [SKIP TO A3]

2 No

A2 [If Year=2, show "You would have received a letter last July or August, as well as a one-page report each month telling you about your electricity use." If Year=1, show "You would have received reports for about a year, starting in 2011. The reports would have stopped for a few months and then started again in the Summer of 2012."] Do you remember receiving [If Year=2, show "the letter or"] the monthly Home Energy Reports? [SELECT ONE]

1 Yes

2 No [Thank and → skip to Fintro; record as separate disposition]

A3 The Home Energy Reports Program provides a monthly report from Connecticut Light and Power showing your household's energy use and a comparison with some of your neighbors. Do you remember receiving any of these reports since [If Year=2, show "late July or August 2012" If Year=1, show "January 2011"]? [SELECT ONE]

1 Yes

2 No [SKIP TO B9]

D Don't know [SKIP TO B9]

R Refused [SKIP TO B9]

A4 When you receive the Home Energy Report in the mail, which of the following best describes what you do with the report? No one in the household reads the report; someone skims or glances at it quickly; someone reads certain parts of the report; or someone reads the whole report.

1 No one reads it - we ignore it

2 Someone skims it or just glances at it quickly

3 Someone reads certain parts of the report

4 Someone reads the whole report

D Don't know [SKIP TO A20]

R Refused [SKIP TO A20]

A5 [If A4=2,3,4] Do you personally read the Home Energy Report?

1 Yes

2 No

D Don't know

R Refused

A6 [IF A4 EQ 1] What are the main reasons no one reads the reports?

[DO NOT READ. CHECK ALL THAT APPLY; ASK "ANYTHING ELSE" UNTIL R SAYS "NO"]

1	Do not remember receiving the reports	[SKIP TO A20]
2	Too busy to read the reports	[SKIP TO A20]
3	Information in the reports is not useful	[SKIP TO A20]
4	Do not believe the information in the report	[SKIP TO A20]
5	Other (Specify)	[SKIP TO A20]
D	Don't know	[SKIP TO A20]
R	Refused	[SKIP TO A20]

A7 Think back to when you first started receiving the Home Energy Reports [If Year=1, show "about two years ago "If Year=2, show "last summer"]. Compared to when you first started receiving the reports, are you or someone in your household more likely to read the report now, less likely to read the report now, or is it about the same?

1	More likely to read the report now	
2	Less likely to read the report now	
3	About the same	[SKIP TO A9]
D	Don't know	[SKIP TO A9]
R	Refused	[SKIP TO A9]

Deleted A8 on July 10, 2013 based on client approval

A8 Why are you [if a7=1, show "more," if A7=2, show "less"] likely to read the report now than when you first started receiving them?

[ENTER RESPONSE VERBATIM]

A9 Since you started receiving the Home Energy Reports [If Year=1, show "about two years ago" If Year=2, show "last summer"], how many reports have you or someone in your household read? Would you say all of the reports, more than half, about half of the reports, less than half, or one or two of the reports?

[IF NECESSARY: By read, I mean look at the energy use charts, the tips on ways to save energy, or other parts of the report.]

[Probe: Your best estimate would be helpful.]

1 All of the reports
2 More than half
3 About half of the reports
4 Less than half
5 One or two of the reports
D Don't know
R Refused

A10 What types of information, if any, do you remember from the Home Energy Reports for your household?

[DO NOT READ, SELECT ALL THAT APPLY. PROBE WITH "ANYTHING ELSE?" UNTIL R SAYS "NO"]

1 None - don't remember any information from report
2 Neighbor comparison
3 How you are doing - Smiley faces and label "Great, Good, Average"
4 Amount of annual savings/extra cost compared to neighbors
5 Your rank out of 100 neighbors
6 Energy-savings tips
7 Other [SPECIFY]
D Don't know
R Refused [SKIP TO A20]

A11 [SKIP IF A10 EQ 2] Do you recall seeing a comparison of your household's energy use compared to a group of your neighbors in your Home Energy Reports? [SELECT ONE]

1 Yes

2 No

D Don't know

R Refused

A12 [IF A10 EQ 2 OR A11 EQ 1] Is that a comparison of your household's energy use with your neighbors' energy use during the last month, over the last 12 months, or both?

1 Last month

2 Last 12 months

3 Both

D Don't know

R Refused

A13 [IF A10 EQ 1 AND A11 NE 1, SKIP TO A20] Please tell me if each of the following types of information is very useful, somewhat useful, not very useful, or not at all useful.

A14 The comparison of your household's energy use compared to neighbors—that is, a group of households like yours.

[REPEAT AS NEEDED:Is it very useful, somewhat useful, not very useful, or not at all useful?]

1 Very useful

2 Somewhat useful

3 Not very useful

4 Not at all useful

5 Don't recall seeing this information

D Don't know

R Refused

A15 The overall score on how your household is doing—that is, the Smiley faces and labels "Great, Good, and Average"

[REPEAT AS NEEDED:Is it very useful, somewhat useful, not very useful, or not at all useful?]

1 Very useful

2 Somewhat useful

3 Not very useful

4 Not at all useful

5 Don't recall seeing this information

D Don't know

R Refused

A16 The amount of your household's annual energy savings or extra energy costs compared to neighbors

[REPEAT AS NEEDED:Is it very useful, somewhat useful, not very useful, or not at all useful?]

1 Very useful

2 Somewhat useful

3 Not very useful

4 Not at all useful

5 Don't recall seeing this information

D Don't know

R Refused

A17 Your household's rank out of 100 neighbors

[REPEAT AS NEEDED:Is it very useful, somewhat useful, not very useful, or not at all useful?]

1 Very useful
2 Somewhat useful
3 Not very useful
4 Not at all useful
5 Don't recall seeing this information
D Don't know
R Refused

A18 Tips or suggestions for saving energy

[REPEAT AS NEEDED:Is it very useful, somewhat useful, not very useful, or not at all useful?]

1 Very useful
2 Somewhat useful
3 Not very useful
4 Not at all useful
5 Don't recall seeing this information
D Don't know
R Refused

A19 What information, if any, from the Home Energy Reports do you find MOST useful for your household? [DO NOT READ]

1 Neighbor comparison
2 How you are doing - Smiley faces and label "Great, Good, Average"
3 Amount of annual savings/extra cost compared to neighbors
4 Your rank out of 100 neighbors
5 Energy-savings tips
6 Other [SPECIFY]
7 None

D Don't know

R Refused

A19a [If A19=1] Is that last month's neighbor comparison, the 12 month comparison, or both?

1 Last month's neighbor comparison

2 12 month neighbor comparison

3 Both

D Don't know

R Refused

A20 Overall, would you say the Home Energy Report is very useful, somewhat useful, not very useful, or not at all useful? [SELECT ONE]

1 Very useful

2 Somewhat useful

3 Not very useful

4 Not at all useful

D Don't know

R Refused

A21 Why do you say that?

[RECORD RESPONSE VERBATIM]

Deleted A22 and A23 on July 10, 2013 based on client approval

A22 How easy is it to understand the information that is presented in the Home Energy Report? Would you say it is very easy to understand, somewhat easy to understand, somewhat difficult to understand, or very difficult to understand? [SELECT ONE]

1 Very easy to understand

2 Somewhat easy to understand

3 Somewhat difficult to understand

4 Very difficult to understand

D Don't know

R Refused

A23 [IF A22 EQ 3 OR 4] Can you tell me more about why the reports are difficult to understand?

[RECORD RESPONSE VERBATIM]

A24 Can you give me examples of energy saving tips that you learned about specifically from the Home Energy Reports? [DO NOT READ; SELECT ALL THAT APPLY]

1 Clean air filters
2 Use efficient lighting (e.g. CFLs, LEDs)
3 Unplug chargers and devices when not in use
4 Use power strips
5 Install efficient showerheads
6 Choose an energy efficient appliance (e.g. freezer, clothes washer, clothes dryer, dishwasher)
7 Turn off your computer at night
8 Maintain your heating or cooling system
9 Improve insulation
10 Install a programmable thermostat
11 Turn off lights
12 Hang laundry to dry
13 Other (Specify)
14 Don't know
15 Refused
16 None – do not recall specific tips

A25 Please tell me if you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with each of the following statements.

A26 The energy efficiency tips in the Home Energy Reports are relevant for households like mine.

[REPEAT AS NEEDED: Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?]

1 Strongly agree

2 Somewhat agree

3 Somewhat disagree

4 Strongly disagree

D Don't know

R Refused

A27 The Home Energy Report is one of the most important tools available to my household for finding ways to reduce our energy use.

[REPEAT AS NEEDED: Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?]

1 Strongly agree

2 Somewhat agree

3 Somewhat disagree

4 Strongly disagree

D Don't know

R Refused

A28 Most of the energy efficiency tips in the Home Energy Reports are things everyone already knows.

[REPEAT AS NEEDED: Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?]

1 Strongly agree

2 Somewhat agree

3 Somewhat disagree

4 Strongly disagree

D Don't know

R Refused

A29 I have used information in the Home Energy Report to find specific ways my household can use less energy.

[REPEAT AS NEEDED: Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?]

1 Strongly agree
2 Somewhat agree
3 Somewhat disagree
4 Strongly disagree
D Don't know
R Refused

A30 Most of the energy efficiency tips in the Home Energy Reports would help my household use a lot less energy.

[REPEAT AS NEEDED: Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?]

1 Strongly agree
2 Somewhat agree
3 Somewhat disagree
4 Strongly disagree
D Don't know
R Refused

A31 I use the Home Energy Report to track my household's progress in reducing our energy use.

[REPEAT AS NEEDED: Do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree?]

1 Strongly agree
2 Somewhat agree
3 Somewhat disagree
4 Strongly disagree
D Don't know
R Refused

Use of CL&P Home Energy Reports Website and General CL&P Website

B1 Do you remember seeing a link to a website on your Home Energy Report where you can find additional information about your energy use and energy efficiency tips and set up an online account to track your progress in saving energy?

1 Yes

2 No

D Don't know

R Refused

B2 Have you visited the website *clpenergyreports.com*, using the link that is shown on your Home Energy Reports?

1 Yes [SKIP TO B4]

2 No

3 I don't have/don't use Internet [SKIP TO C1]

D Don't know [SKIP TO B9]

R Refused [SKIP TO B9]

B3 [IF B2 EQ 2] What is the main reason you have not visited the website? [DO NOT READ]

1 Do not use computer/do not use Internet [SKIP TO B9]
2 Not interested in information about saving energy [SKIP TO B9]
3 Too busy, do not have time to study websites [SKIP TO B9]
4 Other (Specify) [SKIP TO B9]
5 Not aware of website [SKIP TO B9]
D Don't know [SKIP TO B9]
R Refused [SKIP TO B9]

B4 How easy or difficult was the website to use? Would you say it was very easy to use, somewhat easy to use, somewhat difficult to use, or very difficult to use?

1 Very easy to use

2 Somewhat easy to use

3 Somewhat difficult to use

4 Very difficult to use

D Don't know

R Refused

B5 How helpful was the information available at this website? Was it very helpful, somewhat helpful, somewhat unhelpful, or very unhelpful?

1 Very helpful

2 Somewhat helpful

3 Somewhat unhelpful

4 Very unhelpful

D Don't know

R Refused

B6 Since January 2013, how many times have you visited the Home Energy Report website to look for ways to save energy? [Probe: Your best estimate is fine.]

__ # times visited the HER website

D Don't know

R Refused

B7 Have you set up an online account for the Home Energy Reports Program, at the website *clpenergyreports.com*? [SELECT ONE]

1 Yes

2 No

D Don't know

R Refused

B8 [IF B7 EQ 2] What is the main reason you have not set up an online account for the program? [DO NOT READ]

1	Do not have computer/do not have Internet access	[SKIP TO B9]
2	Do not use on-line accounts for things like this	[SKIP TO B9]
3	Too busy, do not have time for more on-line accounts	[SKIP TO B9]
4	Other (Specify)	[SKIP TO B9]
D	Don't know	[SKIP TO B9]
R	Refused	

B9 Since August 2012, have you visited the general CL&P website *cl-p.com* to look for ways to save energy in your home? [SELECT ONE]

1	Yes	
2	No	[SKIP TO C1]

B10 Since January 2013, about how many times have you visited the CL&P website to look for ways to save energy?

__	# times visited the CL&P website
D	Don't know
R	Refused

B11 How easy or difficult was the website to use? Would you say it was very easy to use, somewhat easy to use, somewhat difficult to use, or very difficult to use?

1	Very easy to use
2	Somewhat easy to use
3	Somewhat difficult to use
4	Very difficult to use
D	Don't know
R	Refused

B12 How helpful was the information available at this website for your household? Was it very helpful, somewhat helpful, somewhat unhelpful, or very unhelpful?

1 Very helpful

2 Somewhat helpful

3 Somewhat unhelpful

4 Very unhelpful

D Don't know

R Refused

[SKIP TO D6 IF A3=No, Don't know, or Refused]

Satisfaction with HER Program and Suggestions for Improvement

C1 , Has the Home Energy Reports program helped your household reduce your electricity use? Would you say definitely yes, probably yes, probably no, or definitely no?

1 Definitely yes

2 Probably yes

3 Probably no

4 Definitely no

D Don't know

R Refused

C2 If the Home Energy Reports were available to all CL&P customers, how likely is it that you would recommend them to a friend or relative? Would you say you are: very likely, somewhat likely, somewhat unlikely, or very unlikely? [SELECT ONE]

1 Very likely

2 Somewhat likely

3 Somewhat unlikely

4 Very unlikely

D Don't know

R Refused

C3 [If C2=3,4] Why are you [C2 response] to recommend the Home Energy Reports?

[ENTER RESPONSE VERBATIM]

C4 Overall, on a scale from 1 to 5, where 1 equals Very Unsatisfied and 5 equals Very Satisfied, how satisfied are you with your household's participation in the Home Energy Reports Program? [SELECT ONE]

1 Very unsatisfied

2

3

4

5 Very satisfied

D Don't know

R Refused

C5 What, if anything, would you like to see in the overall Home Energy Reports Program to make it more useful for your household? [OPEN-END RECORD VERBATIM]

Actions Taken or Anticipate Taking

D1 Since you started receiving the Home Energy Reports [If Year=1, show "about two years ago" If Year=2, show "last summer"], have you tried any of the energy saving tips or suggestions that were described in the reports?

1 Yes

2 No

D Don't know

R Refused

D2 [IF D1 EQ 1] Which ones? [PROBE: Anything else until R says no; DO NOT READ, select all that apply]

1 Raise blinds or uncover windows during day in winter
2 Close blinds or cover windows during day in summer
3 Hang laundry to dry
4 Wash clothes in cold water
5 Install energy-efficient light bulbs
6 Purchase/install new appliance(s)
7 Turn off lights
8 Turn off appliances/electronics
9 Unplug appliances/electronics
10 Adjust thermostat – lower temperature in the winter or higher temperature in summer
11 Other (specify)
12 Don't know
13 Refused
14 Add caulking to seal air leaks
15 Use appliances during off peak hours (in the evening)

D3 [IF D1 EQ 2 or D] Do you think you will try any of the suggested energy efficiency tips in the Home Energy Reports in the next few months?

1 Yes
2 No
D Don't know
R Refused

D4 [IF D3 EQ 1] Which ones? [PROBE: Anything else until R says no; select all that apply; DO NOT READ]

1 Raise blinds or uncover windows during day in winter
2 Close blinds or cover windows during day in summer
3 Hang laundry to dry
4 Wash clothes in cold water
5 Install energy-efficient light bulbs
6 Purchase/install energy efficient/ENERGY STAR appliance(s)
7 Turn off lights
8 Turn off appliances/electronics
9 Unplug appliances/electronics
10 Adjust thermostat – lower temperature in the winter or higher temperature in summer

11 Other (specify)
D Don't know
R Refused
14 Add caulking to seal air leaks
15 Use appliances during off peak hours (in the evening)

D5 [IF D3 EQ 2] What are the main reasons that you probably will not try any of the energy efficiency tips? [DO NOT READ; SELECT ALL THAT APPLY]

1 Tips will not save much energy
2 Tips are not relevant to my household
3 Don't understand the tips
4 Not sure how to obtain or install recommended devices
5 Tips require expensive repairs or purchases
6 Other (specify)
7 Don't know
8 Refused
9 Done everything can think of/already doing tips
10 Can afford bill/money is not an issue

D6 Do members of your household get together informally from time to time to talk about things you can do to save energy? [SELECT ONE]

1 Yes
2 No
D Don't know
R Refused

D7 [IF D6 EQ 1] What are some of the things your household has talked about doing to reduce the amount of energy you use? [DO NOT READ; SELECT ALL THAT APPLY]

1 Raise blinds or uncover windows during day in winter
2 Close blinds or cover windows during day in summer
3 Hang laundry to dry
4 Wash clothes in cold water
5 Install energy-efficient light bulbs
6 Purchase/install new appliance(s)
7 Turn off lights
8 Turn off appliances/electronics
9 Unplug appliances/electronics
10 Adjust thermostat – lower temperature in the winter or higher temperature in summer
11 Other (specify)
D Don't know

R Refused

D8 Now, thinking about all of the things you could do in your household to conserve energy, would you say you have done – everything you can think of, most things, a few things, or nothing? [SELECT ONE]

1 Everything you can think of

2 Most things

3 A few things

4 Nothing

D Don't know

R Refused

D9 [If D8 = 2, 3, 4, D] Have any of the following have made it difficult for your household to do things to save energy? [READ LIST; Select all that apply; rotate options 1-4]

1 The **cost** of doing things to save energy
2 Finding a contractor to do the work
3 Knowing what to do
4 Finding the **time** to do things to save energy
5 Getting **everyone** in the household to save energy (e.g., spouse, kids)
6 Is there anything else that is keeping your household from doing things to save energy [Specify]
D Don't know
R Refused

D11 For each of the following activities, please tell me if you have done this in your home since August 2012?

D12 Cleaned the condenser coils on the back of your refrigerator

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not since August 2012

D Don't know

R Refused

D13 Checked the seals on your refrigerator or freezer door

1 Yes
2 No
3 IF VOLUNTEERED: Yes, but not since August 2012
D Don't know
R Refused

D14 Installed energy efficient lighting

1 Yes
2 No
3 IF VOLUNTEERED: Yes, but not since August 2012
D Don't know
R Refused

D15 Checked to ensure there is a tight seal around window air conditioners

1 Yes
2 No
3 IF VOLUNTEERED: Yes, but not since August 2012
4 N/A do not have window air conditioners
D Don't know
R Refused

D16 Cleaned the area around the outside condenser of your central air conditioner

1 Yes
2 No
3 IF VOLUNTEERED: Yes, but not since August 2012
4 N/A – do not have a central air conditioner
D Don't know
R Refused

D17 For the next questions, please think about the **past two years**. During the past **two years**, have you done any of the following activities to use less energy in your home?

Improved your home's insulation in the walls, floors, or the attic

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not in the past two years

D Don't know

R Refused

D18 Improved window shading to reduce heat from sun in summer months

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not in the past two years

D Don't know

R Refused

D19 Installed an ENERGY STAR qualified central air conditioner

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not in the past two years

D Don't know

R Refused

D20 Recycled your older, secondary refrigerator

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not in the past two years

4 N/A: Do not have a secondary refrigerator

D Don't know

R Refused

D21 Installed a programmable thermostat in your home

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not in the past two years

D Don't know

R Refused

D22 Installed solar outdoor lights

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not in the past two years

D Don't know

R Refused

D23 Purchased an ENERGY STAR® clothes washer for your home

1 Yes

2 No

3 IF VOLUNTEERED: Yes, but not in the past two years

D Don't know

R Refused

D24 In the past month, how often did you unplug or use a power strip to turn off your TV when not in use? Was it always, most of the time, sometimes, rarely, or never?

1 Always
2 Most of the time
3 Sometimes
4 Rarely
5 Never
6 N/A
D Don't know
R Refused

D25 In the past month, how often did you unplug or use a power strip to turn off chargers, such as a cell phone charger?

[REPEAT AS NEEDED: Was it always, most of the time, sometimes, rarely, or never?]

1 Always
2 Most of the time
3 Sometimes
4 Rarely
5 Never
6 N/A
D Don't know
R Refused

D26 In the past month, how often did you turn off your computer at night or when not in use?

[REPEAT AS NEEDED: Was it always, most of the time, sometimes, rarely, or never?]

1 Always
2 Most of the time
3 Sometimes
4 Rarely
5 Never
6 N/A
D Don't know
R Refused

D27-36We often hear that it is difficult to get everyone in a household to remember to do the everyday things that could reduce their energy use. Many people just never get into the habit of doing these things. For each of the following habits, please tell me how often the people in your household have done this during the past month. Was it always, most of the time, sometimes, rarely, or never?

Habits	Always	Most of the time	Sometimes	Rarely	Never	NA	DK
Use fans for cooling parts of your home	□		□	□		□	
Hang your laundry to dry	□		□	□		□	
Reduce hot water use when using your dishwasher by running full loads	□		□	□		□	
[If D16≠4] Have annual maintenance tune ups for your central air conditioner	□		□	□		□	
Turn off lights when you leave a room	□		□	□		□	
[If D16≠4 Raise the temperature setting on your air conditioner in the summer	□		□	□		□	
Use direct lighting for work spaces	□		□	□		□	
Put in more efficient lighting when replacing light bulbs, such as CFLs or LEDs	□		□	□		□	
Clean or replace your furnace filter each month during the heating season	□		□	□		□	
[If D16≠4] Clean or replace your central air conditioning filter each month during the cooling season							

Bill Awareness

EINTRO The next questions ask about your monthly electric bill from Connecticut Light and Power, NOT the Home Energy Reports.

E1 Do you receive a paper copy of your CL&P bill each month or do you receive your bill electronically?

1 Paper Copy

2 Electronic Bill [SKIP TO E6]

D Don't know

R Refused

Deleted E2 and E3 on July 10, 2013 based on client approval

E2 On your monthly CL&P bill, do you recall seeing any information about your household's electricity use, other than the meter readings, the various charges, and the total amount you owe for the previous month's electricity use?

1 Yes

2 No [SKIP TO E4]

D Don't know [SKIP TO E4]

R Refused [SKIP TO E4]

E3 What information do you remember seeing on your monthly CL&P bill?

[OPEN END]

E4 On your monthly CL&P electric bill, do you recall seeing a small graph on the top left side of the second page that shows how much electricity you used last month and the previous 12 months?

1 Yes

2 No [SKIP TO FINTRO]

D Don't know [SKIP TO FINTRO]

R Refused [SKIP TO FINTRO]

E5 How often do you look at the graph on your CL&P bill? Would you say you look at this graph every month, most months, only some months, rarely, or never?

1 Every month

2 Most months

3 Only some months

4 Rarely

5 Never

D Don't know

R Refused

Deleted E5a on July 10, 2013 based on client approval

E5a [IF E5 = 1,2,OR 3] Why do you read this graph (INSERT FREQUENCY – every month, most months, or some months)?

[DO NOT READ RESPONSE CATEGORIES, SELECT ALL THAT APPLY.]

1 To keep track of my electric usage

2 I want to see if my electric usage changes

3 Other [SPECIFY]

4 Don't know

5 Refused

[IF E1 EQ 1 (PAPER COPY USERS) or E1=Don't know, or E1=Refused, SKIP TO FINTRO]

Deleted E6 and E7on July 10, 2013 based on client approval

E6 When viewing your electronic bill, do you recall seeing any information about your household's electricity use, other than the meter readings, the various charges, and the total amount you owe for the previous month's electricity use?

1 Yes

2 No [SKIP TO E8]

D Don't know [SKIP TO E8]

R Refused [SKIP TO E8]

E7 What information you remember seeing on your monthly CL&P bill?

[OPEN END]

E8 On your monthly electronic CL&P electric bill, do you recall seeing a small graph that shows how much electricity you used last month and the previous 12 months?

1 Yes

2 No [SKIP TO FINTRO]

D Don't know [SKIP TO FINTRO]

R Refused [SKIP TO FINTRO]

E9 How often do you look at the graph showing the amount of electricity you used during the last month and the previous months? Would you say you look at this graph every month, most months, only some months, rarely, or never?

1 Every month

2 Most months

3 Only some months

4 Rarely [SKIP TO FINTRO]

5 Never [SKIP TO FINTRO]

D Don't know [SKIP TO FINTRO]

R Refused [SKIP TO FINTRO]

Deleted E10 on July 10, 2013 based on client approval

E10 Why do you read this graph < insert frequency from E9 > ?

[DO NOT READ, SELECT ALL THAT APPLY]

1 To keep track of my electric usage

2 I want to see if my electric usage changes

3 Other (specify)

D Don't know

R Refused

Household and Respondent Characteristics

The last few questions ask about you and your household. All of your responses will be kept completely confidential.

F1 I'm going to read a list of activities that people might do on the internet. Tell me whether you have done these in the past month. [READ LIST; Select all that apply]

1 Visited social media websites, such as Facebook or Twitter
2 Purchased things online
3 Visited news sites, such as online newspapers or CNN
4 Read or sent email
5 Banked online
6 None of the above

F2 People often use the internet to pay bills. In the past month, how many bills have you paid online? Would you say 0 bills, 1 bill, 2 bills, or 3 or more bills?

0 0 bills
1 1 bill
2 2 bills
3 3 or more bills
D Don't know
R Refused

F3 Do you usually pay your CL&P energy bill on-line?

1 Yes
2 No
D Don't know
R Refused

F4 Do you have a smartphone—one that gives you access to email and the internet, such as an iPhone, Android, or Blackberry?

1 Yes
2 No
D Don't know
R Refused

F5 Including yourself, how many people currently live in your home year-round? Please do not include anyone who is just visiting or any children who are away at school or in the military.

_____ People living in home year-round
D Don't know
R Refused

F6 [IF F5=1] Which of the following best describes your age? [READ LIST, SELECT ONE]

1 Less than 18 years old

2 18-24 years old

3 25-34 years old

4 35-44 years old

5 45-54 years old

6 55-64 years old

7 65 or older

D [Do not read] Don't know

R [Do not read] Refused

F7 [IF F5 > 1] Including yourself, how many people currently living in your home year-round are in the following age groups? [READ LIST, SELECT ONE]

_____ Less than 18 years old

_____ 18-24 years old

_____ 25-34 years old

_____ 35-44 years old

_____ 45-54 years old

_____ 55-64 years old

_____ 65 or older

F8 Do you own or rent your home? [SELECT ONE]

1 Own

2 Rent

D Don’t know

R Refused

F9 What type of home do you live in? Is it a single-family residence, a duplex or two-family residence, an apartment of condo with two to four units, an apartment or condo with more than four units, a townhouse, a mobile home, or something else?

1 Single family residence
2 Duplex or two family residence
3 Apartment or condo with 2-4 units/families
4 Apartment or condo with more than 4 units/families
5 Townhouse
6 Mobile home
7 Other [Specify]
D Don't know
R Refused

Note: Added text “electric furnace” on August 1, 2013

F10 Does your home have: [READ LIST, SELECT ALL THAT APPLY]

1 Electric heating or electric furnace
2 Electric dryer
3 Electric hot water heater
4 Electric stove or range
5 Hot tub
6 [Do not read] None

F11 In approximately what year was your home built? [READ LIST, SELECT ONE]

1 Before 1900
2 1900 to 1930
3 1931 to 1950
4 1951 to 1970
5 1971 to 1990
6 1991 to present
D [Do not read] Don't know
R [Do not read] Refused

F12 How many bedrooms are in your home?

_____ Total bedrooms

D Don't know

R Refused

F13 What is the highest level of education you have completed? Is it less than high school, some high school, high school graduate or equivalent, two-year college degree or trade school or technical degree, some college, four-year college degree, some graduate school, or graduate degree? [SELECT ONE]

1 Less than high school

2 Some high school

3 High school graduate or equivalent (e.g., GED)

4 Two-year college degree or trade or technical school

5 Some college

6 Four-year college degree

7 Some graduate school

8 Graduate degree

9 Other (specify)

D Don't know

R Refused

F14 Including income from jobs, pensions, government programs, and other sources of income, which of the following categories best describes your total household income from all sources in 2012, before taxes? Was it…? [READ LIST, SELECT ONE]

1 Less than $20,000 per year

2 $20,000 - $50,000

3 $50,000 - $75,000

4 $75,000 - $100,000

5 $100,000 - $150,000

6 $150,000 - $200,000

7 $200,000 or more

D [Do not read] Don't know

R [Do not read] Refused

F15 Thank you. Those are all the questions I have. Do you have any comments that you would like to add?

1 Yes [SPECIFY]

2 No

F16 [DO NOT READ] Is respondent male or female?

1 Female

2 Male

C.2 Focus Group Recruit Script

RECRUIT SCRIPT

Hello, I'm [caller's name] from [FOCUS GROUP FACILITY]. May I please speak to [participant name]? Is there someone else in your home who is familiar with your household's energy use?

1 If available, continue with script
2 If not available, ask if there is a better time to contact and reschedule call. If no, thank and terminate

Connecticut Light and Power and the Connecticut Energy Efficiency Fund are inviting customers in the [Farmington/Stamford] area take part in a focus group discussion to discuss the Home Energy Reports that households have been receiving.

[If needed] Let me assure you we are not trying to sell you anything.

[If needed] A trained moderator will lead a group discussion with households receiving the Home Energy Reports.

1. Our records show that you are currently receiving Home Energy Reports through a program sponsored by CL&P and the Connecticut Energy Efficiency Fund. The Home Energy Reports provide a monthly report showing your household's energy use and a comparison with some of your neighbors.

   Do you recall receiving a report like that?

   1 Yes [Continue]

   2 No/DK "Is there anyone else, 18 years of age or older, at your household who might be more familiar with the Home Energy Reports your household has been receiving?"

1 Yes [Ask to speak to that person and restart at Question 1]

2 No [Thank and terminate]

2. Are you the person who is *most* familiar with Home Energy Reports for your household?

1 Yes [Continue]

2 No Who is the person in your household who is most familiar with the Home Energy Reports? [Ask to speak to that person and restart at Question 1]

[This next question is designed to screen individuals for their ability to articulate their thoughts and openly discuss]

3. How would you describe your interest and understanding of how your household uses energy?
[IF RESPONSE IS ONE WORD OR VERY SHORT, PROBE: Can you say a little more about that?]

[If response is very brief (one or two words) or respondent is not able to articulate their thoughts, they may not be a good fit for the focus group discussion. Politely thank them and end the call by saying something like "We really appreciate taking the time to talk with us tonight. Thank you.]

[If response is reasonably articulated – <u>whether or not it indicates an interest and understanding of their household energy use</u> -- continue with Invitation below.]

Invitation:

I would like to invite you to participate in this discussion on [DATE]. We are offering $100 and refreshments to those who can join us for the 90 minute discussion. Does this sound like something you could participate in?

1 Yes

2 No [If they are not interested thank you for your time. End call]

[If they agree] Thank you. The focus group will be about 90 minutes long and is going to be held at [Focus group facility] [If needed: INSERT DIRECTIONS] on [DATE]. Will [TIME] work for you?

1 Yes

2 No [Thank and terminate]

May I get your e-mail address and preferred phone number so I can send a reminder to you when we get closer to the actual date?

Name: _____

Preferred Phone Number: _____

Email: _____

Date contacted: _____

Please feel free to contact me if you have any questions prior to the focus group. [Provide facility phone number] Thank you again for you time and we look forward to getting your feedback on the program.

[Provide directions and details about parking in the confirmation message.]

C.3 Focus Group Guide

[Note: In this document, we use HER to refer to Home Energy Reports. During the discussion, the full name will be used. This document is not meant to be read verbatim, but to serve as guide to the discussion. The Focus Group Moderator will bring copies of a Home Energy Report to handout to participants for discussion]

I. Moderator Introduction (5 minutes)

Welcome & Brief Introduction: Welcome….As you may remember from the invitation call, CL&P and the Connecticut Energy Efficiency Fund are interested in your feedback from the Home Energy Reports (the "Reports") you have been receiving over the past year.

Confidentiality: The results of the discussion will be aggregated with results from other focus group discussions to develop a report for CL&P and the Connecticut Energy Efficiency Fund. Specific names will not be attributed to any comments made and results from this group will be included with results from other groups in the report, so what you tell me tonight will remain confidential.

No Right or Wrong Answers: There are not any 'right' or 'wrong' answers for the questions we will discuss tonight. I don't work for CL&P or the EEF, so nothing you say will hurt my feelings or make me feel better. I want to get your honest responses to the questions I ask during this discussion. If you have a different opinion than someone else in the group, I want to hear it. I want to hear the full range of opinions and there is no need to reach an agreement or a consensus for any of the questions.

Recording: We will record the session (audio and video), but let me assure you it will be used only for internal purposes. I do have [NUMBER] colleagues (indicate behind the glass) who will be listening in and taking notes. This is to help us capture all your input.

Rules: Please talk one at a time. When more than one person is talking, we can't get all of the information you are providing. We want to hear from everyone, so I might ask you

to hold that idea for a moment, so I can hear from someone else. Please be patient and we will give you a chance to say whatever you have to contribute. Please mute cell phones. The discussion will last about 90 minutes.

Participant HERs: If you brought your own Home Energy Report, please put them away for the entire discussion tonight.

Logistics: Availability of refreshments and food; directions to restrooms, any questions before we begin?

II. Participant Warm-up (5 minutes)

1. As we go around the table, please tell us your first name and something about yourself

III. Customer Awareness of Pilot Program, Design, and Materials (10 minutes)

A. Initial Awareness and First HERs

1. Think back, when did you first become aware that you were receiving Home Energy Reports?

2. What did you think when you received the first HER?

    a. What did you do with the first HER you received (ignore, toss, quick read, keep, etc.)? [If not mentioned, probe for recall of a tri-fold introduction accompanying the first HER.}

    b. Did you have any questions about the report or the information in the report? [Probe for any actions participants have taken to answer the questions and what they 'found out.']

    c. What does your household do with the HERs now when you receive them?

IV. Customer Use and Satisfaction with HERs (25 minutes)

A. Pen and Paper Exercise (remind participants there are no "right" or "wrong" answers for this exercise and we want them to know it is all right if they don't do much with the Home Energy Reports. Ask Participants to record their first name only, as we will collect them after the discussion).

1. Hand out exercise and ask respondents to take a few minutes to write down answers to following 3 questions:

    a. What, if anything, is the first thing you look at when you receive a Home Energy Report? [If you don't look at the HERs at all, please indicate this].

b. Has receiving the Home Energy Reports had any effect on everyday behaviors by your household so that you use less energy? If no, please let us know why not. If yes, please describe what changes you've made.

c. Has receiving the Home Energy Reports had any effect on purchases for your household to help you save energy? If no, please let us know why not. If yes, please tell us how your purchases have changed or if you bought specific items because of the reports.

B. Describe household's level of readership of HERs [NOTE: Begin discussion again]

1. Does anyone in your household read any part of the HER? [IF YES] Who in your household reads the Home Energy Report? Do the people in your household discuss the energy information provided?

2. [If they read it] How do they read it – read entire report, read specific parts, glance/skim, ignore,

3. Do you share any of the information from the report with others in household who don't read the report? [IF YES, who was it shared with and how was it shared?]

C. Recall of report content (not showing report yet) [Topics in this section may already be discussed – Discuss tip recall if not mentioned]

1. When you think of the Home Energy Report, what's the first thing that comes to mind?

2. How interesting is the report? When the report arrives, is it something you look at right away or is it something you set aside and look at it later?

3. What types of information from the report do you recall?

4. What types of information provided are most interesting? Most surprising?

5. What kinds of energy saving tips or advice do you recall from the Home Energy Report? [PROBE: How helpful are the energy-saving tips and information about how to reduce your electricity use? What is it about those tips or suggestions that made them most helpful to you?

6. Do you recall seeing information about a website for the Home Energy Reports? Not the general CL&P website, but one that is specifically for the Home Energy Reports. Has anyone visited the website? [IF YES, ask when they visited the website and what did they look for and find?]

a. [Probe to see if anyone is aware that they can set up an account on the UI HER website and get more information and energy saving tips that are specifically tailored to your household]

b. If you could get information that is more tailored to your household by setting up an on-line account on the Home Energy Reports website, how likely would you be to do this?

D. **Discuss example Home Energy Report**

[HAND OUT COPY OF REPORT TO PARTICIPANTS – note to participants that this report may be structured slightly differently from your own. Remind participants to focus on this report, rather than their own]

What does this HER tell you about this household? [IF NEEDED, PROBE: How is this household doing compared to last year? How is this household doing compared to their neighbors? What could they do to decrease electricity use?]

a. Do you notice any types of information on this example HER that you have not noticed on the HER you receive?

b. [IF NEIGHBOR COMPARISON IS MENTIONED] How do you feel about the neighbor comparison on your HER?

8. How many of you have received at least one rating of "More than average" (no smiley faces)? How many of you received at least one "Great" rating (2 smiley faces?) Do you tend to have any questions after reading the report? [IF PARTICIPANTS DON'T HAVE ANY QUESTIONS ABOUT CONTENT, ASK:

a. Can someone explain what the bar graph (Last Month Neighbor Comparison) tells us about this household's electricity use?]

b. Ask for someone else to interpret the line graph (last 12 months Neighbor Comparison).

10. Has anyone noticed another organization, besides CL&P, who is sponsoring the Home Energy Reports? [IF no one has noticed the CEEF logo, point out the logo and ask if anyone has heard about or is familiar with the Connecticut Energy Efficiency Fund. [If some people noticed the CEEF logo, ask them to explain what they know about CEEF].

V. Response to the HER Energy Use Information and Tips (25 minutes)

Discuss specific energy saving actions taken

1. How many of you have done one or more things to reduce electricity use in your household?

   a. What changes have you made?
   b. [IF PARTICIPANT MENTIONS HAVING DONE SOMETHING] What convinced you to do those things? [Probe to see if participants attribute a part or all of their energy efficiency actions to the HER]

   c. [IF HAVEN'T DONE ANYTHING] Was there any particular reason you haven't done things to save energy? ?

2. Are there any everyday energy-savings behaviors that you plan to do in the near future?

3. What about purchases? Are you planning any energy-saving purchases in the near future?

   a. Follow-up: How did you get the idea or come to decide to do these things? To make these purchases? [Probe for role of HER in planned energy saving behavior and purchases]

4. What kinds of things might encourage you to do more to reduce your electricity use? [IF NOT MENTIONED, PROBE:]

   a. What other types of information might convince you to take actions?

   b. Are there changes to the HER reports that might motivate you to take actions?

VI. Suggestions for Improving HER Satisfaction and Customer Benefit (10 minutes)

A. How could the Home Energy Reports be of more use to your household? [IF NEEDED, PROBE:]

1. What additional energy use information or comparisons?

2. Are there any changes you would like to see in the way the information is presented?

3. How useful are the energy-saving tips for your household?

4. Are there any other types of information that would improve report's usefulness (info other programs, rebates, potential savings)?

VII. Wrap Up (5 minutes)

A. Last Questions for Discussion [Around the room]

a. If you could tell CL&P one thing or give CL&P one piece of advice, what's the most important thing you'd like to tell CL&P regarding the Home Energy Reports program.

b. Does anyone have any last questions or comments?

Thank you for sharing your opinions and taking the time to participate, your input is greatly appreciated. And don't forget to pick up your incentive on your way out.