



Opower, Inc.
1515 N. Courthouse Rd, 8th Floor
Arlington, VA 22201

February 19, 2013

Opower Comments on the Draft Evaluation of Year 1 of the CL&P Customer Behavior Program

Opower, a leading behavioral energy efficiency and smart grid software company, is the vendor that implemented the home energy reports (HERs) program with Connecticut Light & Power (CL&P). Opower currently works with over eighty utilities across six countries to empower over fifteen million households to save energy. We have analyzed energy data on more than 40 million households in the performance of these services. Opower's impact has been verified independently by over twenty independent evaluations – including the first year of Opower's programs with CL&P and United Illuminating Company (UIC) in Connecticut.^{1,2}

Opower appreciates the opportunity to comment on this draft evaluation of Year 1 of the CL&P Pilot Customer Behavior Program. Through this report, NMR, Tetra Tech, and Hunt Allcott have provided thoughtful and rigorous analysis of Opower's program. We value the information provided by the treatment households, and look forward to taking these insights into account when designing future programs. The program's success in achieving "substantial electricity savings" is consistent with our own reporting, and demonstrates the significant savings potential of behavioral efficiency in Connecticut. We will draw on experience designing, implementing, and reporting on this program in providing four comments on this evaluation:

1. **Impact:** Impact findings should specifically identify the 51% increase in participation in the Connecticut Home Energy Solutions program demonstrated by HER recipients.
2. **Persistence:** Post-treatment persistence analysis should note that households were suspended prior to achieving full savings potential, which could accelerate decay of savings.
3. **Process survey:** Analysis of survey results should reference attribution bias as part of an explanation for the difference between impact and reported energy-saving actions.
4. **Focus groups:** It is inappropriate to properly evaluate HERs post-receipt using focus groups.

Impact

This program achieved electricity savings of 1.7%, which equates to 388 kWh saved per home annually, and 9,288 MWh in total energy savings. At an average retail cost of energy of \$0.19 in Connecticut, this represents \$1.77 million in bill savings for Connecticut families. Further, impact was achieved across households with high, medium and low usage in the sample population.

The analysis of home energy reporting impact also shows that Opower lifted participation in Home Energy Solutions by 51%. This lift is particularly promising for the Connecticut Department of Energy and Environmental Protection's stated goal of delivering "deeper efficiency gains."³ Given the importance of deeper savings in Connecticut, the evaluation should highlight this finding in its report.

The analysis also shows approximately 2% of treatment households signed up for the web portal. In the context of the 388 kWh per home saved, this is not indicative of the level of engagement achieved by the program. This sign-up rate is consistent with similar deployments, which utilize a standalone website requiring users to create a new user name and password to access, and do not leverage proactive email to drive customers to this web portal. This approach creates significant barriers to customer adoption. Opower's experience shows that email and integrated web experiences remove barriers to entry, and motivate more participants to access online content.

These savings and lift rates are comparable to the first year of other efficiency programs, and suggest successful engagement with Connecticut families. Opower appreciates Connecticut's investment in behavioral efficiency, and looks forward to tailoring this program to further improve program lift and impact results.

Persistence

This evaluation compares usage for a group suspended after receiving monthly reports for six months to households that continue to receive reports. This analysis shows that savings persist for a few months after suspension, but dissipate by the fifth month. The decay of savings over time is generally consistent with results of other post-treatment persistence analyses of Opower electric programs.⁴

Though these post-treatment persistence results are consistent with other programs, performing such a test after only running the program for six months can create a limited analysis. Opower's savings ramp over time—oftentimes through the first two years or more of the program—so suspending the program after six months results in the program ramping down prior to approaching its savings potential. Though further analysis is needed to prove any theory on savings persistence, Opower's hypothesis is that the longer the program is run the longer the post-treatment savings will likely persist.

Process survey

The process survey shows that at least 98% of households read or skim at least parts of the report, at least 92% found the reports very or somewhat easy to understand, and 54% more households are either satisfied or very satisfied with the program than dissatisfied or very dissatisfied. Additionally, approximately 60% recalled specific information from the reports. In combination with the impact analysis, the process survey shows that households were engaged by the program and took actions to save.

The evaluation also finds that many customers were unable to remember tips from the reports, and concludes that this signals "moderate" rather than significant engagement. Opower notes there is a disparity between this finding and the impact evaluation results. Robust savings of 388 kWh annually suggest that households are taking more action than they are reporting through surveys and focus groups. A possible explanation for this disparity is attribution bias – the propensity of survey respondents to inaccurately attribute actions to causes or motivations.⁵ Attribution bias can help explain why participants may respond to a survey in a way that reflects less engagement than impact results indicate. The evaluation should note this possible explanation for the disparity between survey results and impact.

Focus groups

Opower appreciates and values the feedback and recommendations provided by treatment group households and the evaluators. Reflecting our commitment to responding to these recommendations, Opower has already taken steps to address concerns, including language that more clearly explains neighbor comparisons on the reports and directions for correcting an inaccurate comparison. In the future, we will work with our utility partners to further consider program design changes, as appropriate, in an effort to continue to increase customer satisfaction with the program while expanding on the substantial electricity savings already realized by this program.

Opower does, however, have two methodological comments related to the focus groups. First, focus groups are effective tools for evaluating participant opinions of entirely new content or content that everyone is likely to have experienced consistently and frequently – either new or pervasive experiences.⁶ Post-receipt assessment of home energy reporting does not fall into any of these categories. Further, focus groups have a tendency to polarize customer opinions, which is good for understanding possible extreme reactions to a new product or ad campaign. But this aspect of focus groups also makes them ineffective at assessing general attitudes. As such, focus groups are ineffective tools for assessing post-receipt attitudes of home energy reporting.

Second, the evaluation inappropriately generalizes conclusions drawn from notes rather than transcripts. The use of administrator notes rather than transcripts can introduce bias to analysis of focus groups, which can in turn limit the validity of conclusions.⁷ Further, it is methodologically inappropriate to generalize conclusions from these focus groups to the broader population.⁸

Indicative of this limitation of focus groups is the considerable divergence between quantitative survey and impact results and those drawn from the focus groups. In short, the quantitative analyses show significant engagement and satisfaction, while the focus groups suggest less satisfaction and engagement. This divergence suggests the limited extent to which focus groups can be used as instruments to draw general conclusions about attitudes toward the program. The evaluation should incorporate these caveats into its analysis of the focus groups so any conclusions are placed in appropriate context.

Conclusion

This impact and process evaluation verifies the successful achievement of “substantial electricity savings” and significant engagement with and impact of the CL&P Pilot Customer Behavior Program. Though Opower has a few relatively minor recommendations for placing the evaluation in appropriate context, the evaluation generally performs a robust analysis of Opower’s impact and engagement with CL&P customers. Opower’s lift in HES participation in particular is a finding that should inform program design.

In comments on May 9, 2012 to the Energy Efficiency Board, Opower estimated statewide potential impact of 494 GWh in energy savings, \$96 million in bill savings, and 23,000 households off the grid over a three-year program cycle. The robust savings that this impact evaluation verifies is further demonstration of the vast potential for behavioral savings in Connecticut.

Endnotes

¹ For a sample of these, see the following: (i) Davis, Matt, May 2011. "Behavior and Energy Savings: Evidence from a Series of Experimental Interventions." *Environmental Defense Fund*; (ii) Cooney, Kevin, February 2011. "Evaluation Report: OPOWER SMUD Pilot Year 2." *Navigant Consulting*; (iii) Todd, Annika, Steven Schiller, and Charles Goldman, October 2011.¹ "Analysis of PSE's Pilot Energy Conservation Project: "Home Energy Reports." *Lawrence Berkeley National Laboratory*; (iv) Ivanov, Chris, July 2010. "Measurement and Verification Report of OPOWER Energy Efficiency Pilot Program." *Power System Engineering*; (v) Macke, Rich, June 2010. "Measurement and Verification Report of Lake Country's OPOWER Energy Efficiency Pilot Program." *Power System Engineering*; (vi) Allcott, Hunt and Sendhil Mullainathan, March 2010. "Behavior and Energy Policy." *Science*, Vol. 327; (vii) Allcott, Hunt, February 2010. "Social Norms and Energy Conservation." *Working Paper, Massachusetts Institute of Technology's Center for Energy and Environmental Policy Research*; (viii) Ayres, Ian, et al., September 2009. "Evidence From Two Large Field Experiments That Peer Comparison Feedback Can Reduce Residential Energy Usage." *NBER Working Paper*; (ix) Klos, Mary, September 2009. "Impact Evaluation of OPOWER SMUD Pilot Study." *Summit Blue Consulting, LLC*; (x) October 2010. "Puget Sound Energy's Home Energy Reports Program." *KEMA*

² Faruqui, Ahmad, Lessem, Neil, and Chip Russell, September 2012, "Impact Evaluation of Opower's Home Energy Reporting Program for Two Connecticut Utilities," *The Brattle Group*

³ "2012 Comprehensive Energy Strategy for Connecticut," October 2012, *Connecticut Department of Energy and Environmental Protection*, p. 2

⁴ For example, see: "Puget Sound Energy's Home Energy Reports Program: Three Year Impact, Behavioral and Process Evaluation," April 2012, *KEMA*, or "Impact & Persistence Evaluation Report: Sacramento Municipal Utility District Home Energy Report Program," November 2012, *Integral Analytics*

⁵ For example, see: (i) Cialdini, Robert, and Wesley Schultz, 2004. "Understanding and Motivating Energy Conservation via Social Norms." *Arizona State and California State Universities*; (ii) Nisbett, Richard E and Timothy Wilson, 1977. "Telling more than we can know: verbal report on mental processes," *Psychological Review*, Vol 84(3), 231-259; (iii) Goethals, G. R. and R. F. Reckman, 1973. Goethals, "The perception of consistency in attitudes," *Journal of Experimental Social Psychology*, 9, 491-501; and (iv) Filiberto, David, Wilson-Wright, Lisa, and Hoefgen, Lynn, 2011. "Mission Control, We Have a Problem: Questioning the Reliability and Validity of On-site Data." *NMR Group, Inc.*

⁶ See, for example: Creswell, John W., 1998, "Qualitative Inquiry and Research Design: Choosing Among Five Traditions," *Sage Publications, Inc.*, Thousand Oaks, California

⁷ See, for example: Berg, Bruce L., 2001, "Qualitative Research Methods for the Social Sciences," *Allyn & Bacon*, 4th edition

⁸ *Ibid.*