

Residential Electricity Feedback
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The Residential Feedback Study, in partnership with the University of Waterloo, took place from May to November 2006, and involved sending 106 households in Milton weekly information, or feedback, about their homes' unique electricity consumption levels and patterns. In addition, the feedback included information such as an estimated breakdown of each home's specific appliance consumption levels, conservation tips, and, towards the end of the study, information regarding the air pollution and greenhouse gas impacts of each home's electricity use. Examples of what this weekly feedback looked like can be found at <http://www.fes.uwaterloo.ca/research/greenpower/projects/documents/JenniferRobinson-BECCFeedbackPoster-6Nov2007.pdf>

The feedback itself was provided from July to October 2006, and through an analysis of the consumption data from these months relative to the same baseline period in 2005, an idea of the effect that the feedback had on on-peak and total electricity consumption levels was determined. (The data were "weather-adjusted" to take into account the weather differences between the two years that may have affected electricity consumption.) In addition to the consumption data, pre- and post-feedback survey responses were compared to assess any differences in attitudes about conservation-related issues that may have occurred due to the feedback.

Considering the electricity consumption data, there were some isolated instances where the feedback appeared to be effective. For example, it appears that by the month of October, the feedback was effective in helping people shift their consumption from on-peak times. However, contrary to expectations, it also appears that, for some months, the feedback may have encouraged an increase in total monthly consumption.

Overall, however, comparing both the electricity consumption data and the changes in attitudinal responses derived from the survey data, it appears that the feedback did not have a large impact in terms of either encouraging shifting electricity-use from on-peak time or encouraging overall conservation. That is not to say that the feedback recipients did not shift or, in some cases, conserve – on average, all feedback recipients shifted their electricity use away from on-peak periods to a greater extent in 2006 as compared to 2005. It is just that the control groups (that is, a similar group of customers who did not receive the feedback) did, too, meaning the feedback likely did not provide any significant additional value. One potential reason for this is that it is likely the feedback recipients, who were selected from the survey respondents, were fairly good conservers to begin with. Also, given that the homes were on time-of-use pricing, most people had already shifted some of their on-peak electricity use.

However, considering customer opinions about the feedback, another perspective emerges. From the 44 feedback recipients who responded to the post-feedback survey:

- 89% thought the feedback was useful overall
- 91% thought it was presented in a way that was clear and easy to understand
- 82% thought the feedback would make them more likely to try to conserve

- 89% said they would have liked to have continued receiving the feedback
- 64% said they took action because of the feedback, and
- 48% said they thought it was useful in helping to reduce their electricity bill.

In terms of the type of information that was most useful to customers, the charts and quick-reference graphics that reported consumption levels, both in terms of dollars and kilowatt-hours, were the most used. Other features, such as household-specific appliance consumption charts and conservation tips, appeared to be less useful to customers.

Some of the feedback also contained information about the air pollution (e.g. sulphur dioxide and nitrogen oxide levels) and greenhouse gas emissions (e.g. carbon dioxide levels) associated with each home's electricity consumption levels. This type of information was found to be less useful or meaningful to the feedback recipients, which may have been related to the format in which it was presented, as just over half of the respondents thought the information was not clear or easy to understand. Despite this, however, when asked overall if the information presented made households more aware of air quality and/or climate change issues relating to electricity consumption, approximately 67% indicated that it did.

Overall this study shows that weekly feedback was well-received by the participants, but it also raises questions about this type of feedback's usefulness in encouraging shifting and overall electricity conservation. The study has, however, shed light on other, potentially more useful types of feedback. For example, 79% of the feedback recipients indicated they would be interested in an "in-home display", which is a monitor that could provide, among other features, instantaneous information regarding a household's electricity use. This relates to the other research that is currently happening at Milton Hydro with the Smart-Home Energy Conservation System, a web-based graphical interface that allows users to view and control their homes' appliance consumption level, among other features. See www.fes.uwaterloo.ca/research/greenpower/projects/smart.html to find out more about this program.

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