

Technology to the Rescue? The Potential and Pitfalls of Feedback in Residential Energy Conservation

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Feedback is promoted as a promising strategy for energy conservation (e.g. Darby, 2006; Fischer, 2008) and dozens of devices providing feedback have emerged on the market in recent years. However, these products have not yet taken a strong hold in the marketplace and policymakers are increasingly looking to behavioral scientists for guidance (Wilson & Dowlatabadi, 2007). Using survey data collected in Winter 2010, I will discuss key findings about the promises and pitfalls of providing feedback to energy users.

Data was collected in the form of a 15-minute online survey; respondents were recruited via multiple web strategies (email, Facebook, list serves, and Craigslist). 836 individuals filled out the survey, including 86 who reported using feedback. Questions asked about awareness and impressions of feedback devices, experiences using feedback, perceived benefits and barriers of using feedback, and willingness to pay for energy feedback. Questions addressed during analysis including the following:

Who is currently using feedback devices?

Analysis comparing feedback users to non-users among survey respondents found several demographic differences, including gender, age, marital status, income, and home ownership. Results also indicated that feedback users were more environmentally motivated to conserve than non-users, but less financially motivated, despite rating higher in price consciousness (e.g. paying attention to one's bill).

Was the technology released too soon?

Multiple software and hardware issues were mentioned by respondents, including difficulties with installation, low voltage detection, and difficulty interpreting displays. Peters and

McRae (2009) assert that product reliability is key to wide spread dissemination--if a product does not undergo reliability testing prior to market release, early adopters may have poor experiences, negatively impacting public opinion and eventual wide-scale adoption.

To disaggregate or not to disaggregate?

A primary complaint across multiple feedback types related to a lack of comprehensive information. Users of appliance-specific feedback expressed a desire for household-level data and vice versa. An easy solution would seem to be to provide both, but whole-home systems may provide excess information, overwhelming users and rendering them unable or unwilling to interact with the system at all.

Is there a larger market for feedback?

Questions on barriers to adoption indicate cause for both hope and concern. When non-users were asked to give reasons why they had not used feedback, nearly half (44%) stated they did not know such devices existed, suggesting that increased awareness could significantly impact adoption (several even mentioned an increased interest in feedback due to the survey itself).

However, over 20% responded that they either already conserved energy or did not see a point to energy feedback. In addition, when asked about willingness to pay, only 10% said they would pay \$50 or more and 17% said they were not willing to pay for energy feedback.

What's next for feedback?

Responses showed great interest in "smart devices" and feedback devices integrated with the smart grid. Since reports estimate spending as much as \$200 billion by 2015 on the smart

grid (Fox, Gohn, & Wheelock, 2009), this is definitely a key area for potential growth.

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