

FLORIDA STATE UNIVERSITY

Investigating the Effect of Appliance Interface Design on Energy-use Behavior

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Description: The primary objective of this research project is to identify the behavioral factors that contribute to energy in/efficiency in the home. In particular, this project was designed to (a) examine current state-of the science on behavioral factors that affect energy efficiency, (b) report on the efficiency of typical energy consuming technology used in the home as well as existing programs designed to improve efficiency, and (b) investigate the types of human-technology interactions and other behavioral factors that lead to in/efficient energy use. To achieve these objectives this project uses laboratory-based experimental and field-based methods to (i) identify interface-design factors that constrain individuals to behave in locally optimal but globally sub-optimal ways, and (ii) survey how cognitive, technological, and motivational behavioral issues affect use in the home environment.

Budget: \$163,949

Universities: Florida State University

Progress Summary

Original Objectives for Current Reporting Period

The primary objectives for the current reporting period were to identify the existing energy efficiency initiatives (Task 3), produce the first part of an online design review/guide (Task 4), seek human subjects approval and identify households for inclusion in research (Task 5), and to pilot the cognitive task analysis (CTA)/inventory procedures (Task 6).

Progress Made Towards Objectives During Reporting Period

Compilation of the information necessary for Task 3 (identify the existing energy efficiency initiatives) was completed in the prior reporting period. Due to the revision of the project budget, tasks 4 (Design Review) and 9 (Online Recommendations) have now been integrated and replaced by a new task (Task 10), which involves producing an online project and data summary/design recommendations (to be produced by Dec 31). Information from Task 3 will be incorporated into this online guide.

Two applications for use of humans as participants in research (part of Task 5) were submitted to, and approved by, the Florida State University Institutional Review Board. These included an application for a survey of behavioral and technology factors influencing energy efficiency (part of original Task 6, see below), and one for experimental research examining the design-related and behavioral factors that constrain use and efficiency (a new task added to this project—Task 11—described below).

Tasks 6 (pilot CTA), 7 (data collection using CTA), and 8 (data analysis of CTA) originally consisted of three primary sources of data: Survey, Interview, and Inventory data. Due to the revision of the project budget, only the survey component of the CTA (which now includes some household inventory data) will be collected. This information, together with the laboratory-based experimental data (Task 11), will enable us to provide a detailed report of human-technology (i.e., cognitive, behavioral and

design-related) factors that constrain and influence energy in/efficiency. The (online) survey (Task 6) has now been fully developed and piloted. This survey takes approximately 1 hr to complete and obtains the following information from participants: Household demographics, technology use audit, device feedback, consumption feedback, energy savings behaviors, conceptions and misconceptions. Advertisements for participants in the survey have been distributed throughout the locale and/or published in regional newspapers, and internal mechanisms have been established for remunerating human participants for completing the survey. Two experimental data sets (Task 11) have also been partially collected (11a—the effects of access cost on efficiency; 11b—the effects of feedback and time pressure on efficiency) and, based on the data, a follow-on study is in development for one of these experiments (11a).