



Encouraging the use of programmable thermostats

Research Objective

Fraunhofer USA, Inc. teamed up with the Albany Housing Authority and New York State Energy Research Development Authority (NYSERDA) to investigate strategies that would encourage low-income residents in duplex apartments to use programmed thermostat settings to save energy.



Background

The pilot implemented a random trial design to evaluate the effects of providing households with custom-programming thermostat setbacks. Strategies to influence using programmed setting schedules at night and when no one was home included cooperation, reciprocity, reminders, and signed commitment agreements. Effects were assessed using temperature sensors that provided indoor temperature data, gas meter readings, and household surveys during the 2014–2015 heating season in Albany, NY.

Pilot Description

The Albany Housing Authority replaced outdated thermostats with programmable models in all apartments prior to the start of the study. Temperature sensors were installed next to the thermostats to provide ambient temperature data.

Fraunhofer Inc. conducted in-person interviews with residents to gather information about their everyday schedules and temperature preferences. Two-thirds received programmed schedules based on interview feedback. Prompts were placed next to the thermometers as reminders to return to programmed settings if their schedules were interrupted over the course of the study. Half of those households were asked to agree to maintain their settings by signing a commitment statement. The remaining residents (the control group) were only provided thermostats with manufacturer instructions on how to program setback schedules themselves.

Findings

Although most residents interrupted their schedules during the first three days, many with custom-programmed thermostats returned to their schedules as prompted.

Surprisingly, residents who did not sign a commitment statement most consistently maintained their settings and used 1.8 percent less energy through the study period compared to the control group. Residents who signed the commitment used 1.1 percent less energy.

The results further indicated that providing residents thermostats without custom pre-programmed settings and reminder prompts does not promote use of setback schedules.

Next Steps

This pilot focused on promoting the use of programmed settings and did not attempt to influence temperature setback schedules. Future research should consider encouraging households to use 7-10 °F setbacks at night or when no one is home to investigate greater energy reduction potential.



Visit NYSERDA's Behavior Research page nyserdera.ny.gov/behavior-research for more information.