NP5005

Behaviour Change Via Social Sanctions and Shared Electricity

Research Questions

Does an urban co-owned solar and battery system bring about optimal resource management of a "commons" (Ostrom 1990)?

Will a home energy reporting system that shares conservation and consumption with a known group constitute "mutually vulnerable appropriators" (Cox 2010)?

Will privacy preserving group sanctions establish conservation norms?

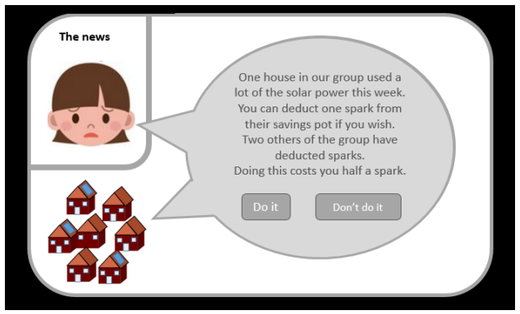

Figure 1: The in-home energy display uses an avatar to regularly solicit for group sanctions against standout (over- and under-) consumers within the group.

Methodology

Energy consumption data is presently being collected.

An in-home display (IHD) (Figure 2) has been created and is distributed to homes as a computer display of their energy consumption. Home energy use is captured from smart meters. The IHD is used to selectively display additional information such as consumption relative to the group; over-consumption of (unnamed others) and the ability to apply the social sanctions of a common pool resource (CPR) game.

Figure 2: The in-home display is connected to the smart meter as well as data sources such as the Bureau of Meteorology, PVWatts.org and other IHDs

Expected Results

It is expected that accurately showing occupants their home energy use; displaying energy saving tips; and, alerting (own home) high use will have a 10-20% reduction impact on conservation in line with other studies. However, this effect is also not expected to endure.

A commons approach to distributed energy may be a quick and inexpensive way to greatly reduce demand

Providing known-group relative reporting, as opposed to reporting relative to a consumption "ideal" should bring about greater conservation and energy awareness due to social factors. This does not go so far as direct comparisons with known others which have been shown to be effective in conservation, but with privacy implications.

Reporting the standout behavior of others such as the report that another group member has conserved, should bring about greater consumption since other studies observed emergent competitive games in known groups of energy consumers.

Finally, both issuing and receiving group sanctions (Figure 1) are predicted to drive consumption down another 10% and for consumption to stay down thereafter.

Surveys for before- and after- the study should reflect improved awareness of energy use and greater demand flexibility in line with other studies.

Multiple baselining will be used (Figure 3) wherein participants are their own controls. Interventions are introduced and repeated at different sites and times per a reinforcement schedule.

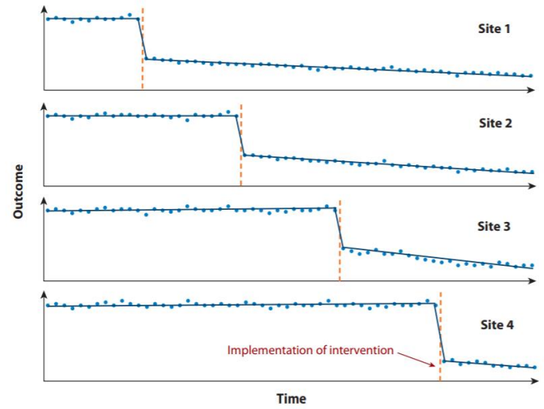

Figure 3: Multiple baselining illustration showing four different sites each with staggered interventions and resultant observable drop in the independent variable. (image with permission from Sanson-Fisher et al 2014).

Anticipated impacts

Changing the consumer concept of the electricity supply to that of a limited resource should bring about greater conservation and awareness.

Demonstrate that renewable electricity can be managed in a commons system.

Further information

http://www.lowcarbonlivingcrc.com.au/partners/research/university-melbourne

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