Strategies and Motives of Engagement in a DSM Automated Cycling Experiment



Joana M. Abreu, Ph.D.

BECC 2013



Once upon a time...

A electricity retailer and a technology company teamed to deliver electricity feedback to a small residential community

- The program had two main objectives
 - Obj. 1 Deploy the technology to 23% of the residential clients
 - Obj. 2 Curtailment of 0.3kWh per client
- The specific characteristics of this case study are:
 - Co-op: Every year, profits are shared with clients
 - Small service area: 1,885 clients of which 88% are residential
 - Very low penetration of Internet (less than 20%)
 - High unemployment



Everyday...

- Clients were invited to <u>start saving electricity immediately</u> by opting in into the program
 - In-home display
 - web portal to monitor and learn about their electricity use
 - Accessible by smart phone, computer, ipad
- A power outlet would enable direct control or scheduling of selected appliances
- Do it yourself











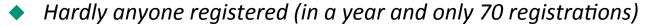
Clamp

Transmitter

Hub

Power Plug

Display







But then!

7 months before the end of the program we changed the design of the program

- Opt out design
- Target clients became residential clients with registered phone numbers
- Appointments scheduled by local people with same cultural references
 - Random list of clients with registered phone numbers (1250 clients)
 - Standardized procedures: scripts: for making phone calls, for configuring the equipment, to respond to the questions of clients
 - We trained a team of two installers
 - Online reporting tool allowed project management to keep track of events and local team to record progress
 - We offered internet to those clients without internet

But then!

- After the first month we delivered a workshop to clear misperceptions
- Trusted messengers: trusted members of the community
 - Discuss what they do with the technology
 - Cases were presented in their own words and through their perspectives
 - **Directly addressed the issues:** privacy, security, control
 - The workshop had a very positive impact on the success of enrollment

Achieved 38% enrollment rate: 402 families by December

Because of that... We moved ahead!

- Investigate the impact of economic incentives on the participation in a utility controlled DR experiment
 - Power outlet was required to be connected to a specific domestic appliance
 - Hub was required to be connected to a modem
- Three randomly distributed groups:
 - Control: 135
 - Economic Incentive (EI) Group: 134
 - With out (EI) Group: 133
- Text sent before DSM event (power off for two hours, everyday, for 7 days).
 - Normative component: join your neighbors
 - Altruistic component: Help your Community and your Co-op
 - A reminder of the lottery for the EIG









So, finally... We found that

- There was no difference in the number of smart outlets response between (EI)G and w/o EIG
 - Statistically proved that it was not by chance that, for the period of the experiment, the power outlet of treatment groups was more frequently connected than control
 - significant difference between groups: ANOVA Welch's F(2, 115.283) = 13.145, p < 0.000
 - Significant difference between Control and Treatments (Anova Games-Howel $p<0.000; \alpha=0.05$)
 - No statistically significant difference between Treatment (ANOVA Games-Howel p<0.846 ; α =0.05)
- Persistence during the week was higher for W/O (EI)G
- **EIG curtailed more load!** (EIG: in average 0.065 kWh/day curtailment; W/O EIG in average 0.044 kWh/day curtailment)



The end

We had to adapt the objectives of the program to real conditions and adapt the message and means of communication to the local values and frames.

Thank you...

Contacts:

Joana Abreu | jabreu@fraunhofer.org

Tel.: 857-389-4801

