Next Generation Behavior Change Programs
Targeted and Sustained Energy Use Reduction Through Behavior Change

SWEEP Conference
November 21, 2014

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Today’s discussion

- Opower in the Southwest
- Lessons in engaging energy consumers
- Next generation behavioral programs:
  - Low Income
  - Small and Medium Business
  - Behavioral Demand Response
  - Segmentation to Drive Program Participation
Opower: A Customer Engagement Platform

Opower Today
- **52M+ Households** on the Platform
- **40%** of US household data under management
- **550+ employees** in Washington, San Francisco, London, Tokyo and Singapore

Our Results
- **5.2 TWh** of energy savings
- **$580M** in bill savings back to customers
- An efficiency resource in **32 states**
- ~5% decrease in energy use at peak
Opower in the Region
Delivering energy savings throughout the region

Cumulative Program Impact

- **570,000 HH** served with Home Energy Reports and growing
- **249.5 GWh** electric savings
- **2.4 MM therm** gas savings
- **$23.4 MM** in customer bill savings
- **356 MM lbs. of CO2** abated

IOU Partners

- Arizona Public Service
- PNM
- Rocky Mountain Power (UT)
- Tucson Electric Power (AZ)
- UniSource Energy Corporation (AZ)
- Xcel Energy (CO, NM)

Municipal Utility Partners

- City of Fort Collins
- Loveland Water and Power
Behavior Change in the Region

One of seven strategies for maintaining high levels of savings


Regarding savings potential

"Behavior change: Residential. Assume Home Energy Reports are provided to all customers by 2020 either in paper or electronic form with 2 percent savings on average; savings maintained over time if the reports start prior to 2020.

**Total savings in 2020 = 180 GWh per year.**

"Behavior change: Business. Assume Business Energy Reports, SEM and other strategies to improve O&M practices are provided to all businesses by 2020 with 1 percent savings on average; savings maintained over time. **Total savings in 2020 = 200 GWh per year.**"

**Total from all seven strategies: 1630 GWh per year**
Helping utilities achieve demand side management and company goals

**Sustained EE**

% kWh savings across programs

- 1.5% to 3.0%

**Peak savings**

Avg. hourly kW reduction per household

- Peak: 5% kW reduction

**Customer sentiment**

5% avg. increase

**Digital engagement**

Email open rates

- 3-5x cross-industry average

**Customer acquisition**

Participation lift in EE programs

- Average lift: 60%

**Smart Meter acceptance**

15% avg. increase

- Customer understanding and acceptance of Smart Meters
What is a behavioral view of human behavior?

**Standard view**
We’re rational and self-optimizing agents

- Most of our decisions are made **cognitively and deliberatively**
- Attention is an abundant resource
- Deep reservoir of willpower

**Behavioral view**
We are swayed by a multitude of other factors

- Most our of decisions are made **emotionally and automatically** based on top-of-mind thoughts
- Attention is a scarce resource
- Shallow reservoir of willpower

We take shortcuts.
Standard week

+$3 late fee
How to engage energy customers
Opower’s 5 principles

1. Design for how people actually behave
2. Assume people don’t care
3. Always lead to action
4. Aim for lasting relationships
5. Build for everyone... who receives a utility bill
Design for how people *actually* behave

*Use social norms*

We don’t like to be abnormal.

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"With three kids, my wife and I definitely care about saving money and energy.

The reports showed us that it’s actually not that difficult. We have a programmable thermostat that we set to 78°F when we’re home and set even higher when we’re away or asleep. Also, we started hanging our clothes to dry instead of using the dryer and replaced all of our lights with CFL bulbs."

*Bob S.*
UtilityCo Customer

Find more great ways to save energy at UtilityCo.com/customers.
Tactics

➔ Always pair data with insight
➔ Expose personalization
➔ Don’t make people work to understand
➔ Use familiar mental models

Did you know? Last summer about 32% of your overall electricity consumption went to cooling your home.
Build for everyone
Understand users & channels
Build for everyone

Market to different segments to achieve the same result

Energy savings are in your hands.
You wouldn’t leave your windows open while the heater is running – but leaks in your home could still be wasting energy and money. With a free home assessment from UtilityCo, a local energy expert will help identify ways to stop energy leaks, from insulating your home to upgrading your heating system.

Call XXX-XXX-XXXX or visit UtilityCo.com/Assessment for a free appointment today.

Small changes add up to big savings – but only if you take the first step.

Is your home wasteful?
An assessment from a local expert will tell you if your heating system or appliances are wasting energy or costing you extra money. You’ll also learn about opportunities to upgrade and insulate your home – so both you and your budget can stay comfortable.

Signing up is easy. Visit UtilityCo.com/Assessment or call 888-555-2700 to check your eligibility and schedule your assessment.
Beyond Home Energy Reports: The Next Stage of Energy Savings for Opower
Low-income: Opower’s program designed to combine efficiency and engagement

Core program elements

- Tailored Home Energy Reports
- Low Income Likely Identification
- Rate and Energy Education
- Targeted Messaging and Delivery

Additional program elements

- Alerts and Multi-Lingual Outreach
- Community and Kit Partners
Low-income: Once engaged, customers save at high rates

- Low income customers delivered almost identical savings across 5 Opower programs.

- They were equally likely to consume more, less, and the same as non-low-income customers.

- Of customers that received home energy reports, a higher rate of low income households participated in each type of efficiency action than non-low-income (Navigant 2012).
SMB: Driving savings through engagement

**Proactive reporting**
Tailored insights & tips by business type

**Intro communications**
Reach the person responsible for energy use

**Data acquisition & validation**
Get personal to grab attention

**Efficiency Collateral**
Enlist employees and customers

**Web & Email**
Encourage deeper engagement

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Our Utility Partners

nationalgrid  XcelEnergy  PSE
Behavioral Demand Response: Deployed to 1M Homes, 3 Utilities, 3 ISO’s

Peak day notification
- Targeted communication
- Channel of choice
- Opt-out program design

Personalized adjustments
- Large-scale engagement
- Access to more load
- Highly accurate EM&V

Post-event feedback
- Immediate feedback
- Highly personalized results
- Ongoing encouragement
Snapshot of a BDR event

**Pre-Event (July 21)**

- **3:00 PM:** Event Called
- **5:00 PM:** Kicked off IVR and Email generation
- **7:00 PM:** All comms delivered
- **3:20 PM:** Event confirmed
- **5:10 PM:** First comms delivered

**Post-Event (July 23)**

- **12:50 PM:** AMI data imported
- **3:00 PM:** Comms generated and 1st batch delivered
- **5:00 PM:** All emails and IVR delivered
- **2:00 PM:** Calculation jobs kicked off

**Peak Event (July 22)**
BDR Result
Large scale peak savings **without** a device or price
Performance across 10 events, 3 utilities

- Average Reduction: 2.85%
- Max Reduction: 5.04%

» Highly scalable results across 3 separate utilities
» 40%-60% the cost of traditional DR measures
BDR Result

Additional peak savings with devices and rates

Passive savers: 5%

Engaged savers: 15%+

» System-wide load reduction of ~5%
» 23% average savings for HHs with direct load control devices
» Savings per HH grew with each successive event
» Will deploy to all residential HHs in BGE territory in 2015
BDR Result

Consistent percentage peak reduction across events

Electricity Reduction during each Peak Event

<table>
<thead>
<tr>
<th>Event</th>
<th>NE Utility</th>
<th>CA Utility</th>
<th>MW Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event 1</td>
<td>2.08%</td>
<td>4.1%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Event 2</td>
<td>2.0%</td>
<td>4.3%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Event 3</td>
<td>3.6%</td>
<td>3.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Event 4</td>
<td>3.4%</td>
<td></td>
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</tr>
</tbody>
</table>
BDR Result

Load impact closely correlated with temperature

\[ y = 0.0024x - 0.1692 \]

\[ R^2 = 0.9031 \]
BDR Result

EE savings persist outside peak events

1.0% energy savings
9.3–11.6 kWh / HH
Consistent across 3 deployments
Statistically significant at >95% confidence
Can Demand Response be engaging?

- BDR: 78%
- PTR (BGE): 74%
- HERs: 68%
- Ice Cream: 75%
- The Beach: 64%

GWP ENERGY RESULT #7thmost efficient household #didourpart doyourpart @ Glendale, California

Andrea Arvanigian: According to Glendale water & power, I'm the 6th best at saving energy out of 100 of my peers. 'A' student for life! #overachiever

Leah borillo: GWP ENERGY RESULT #7thmost efficient household #didourpart doyourpart @ Glendale, California
Big Data: Trouble making sense of the data

Q: How would you grade your utility’s preparedness to manage the smart grid/smart meter data influx?

A: Percentage who said completely prepared: 17% (2013)

Source: Oracle
Big data: Difficulty creating value for customers

CASE IN POINT: Utilityco’s pricing program

77% of UtilityCo customers would benefit from a CPP rate

1.5% of UtilityCo’s customers enrolled in CPP Rate

$37M spent to enroll the first 22k customers
Segmentation: Using energy data for customer targeting

**Action**
- Energy usage profile
- Digital activity levels
- Energy efficiency actions

**Demographics & Psychographics**
- Age, income, etc.
- Prizm information, survey feedback, etc.

Does your utility have customer segmentation in place today?
What data is it based on?
Segmentation: AMI “archetypes”

**Example Weekday Archetypes**
*812,000 customers across 3 utilities*

- **Late Afternoon Peakers**
- **Evening Users**
- **Coffee Makers**
- **Night Owls**
- **Morning Glory**
Late Afternoon Peakers

Hour of Day
Behavioral Demand Response

UtilityCo

Please join your neighbors in reducing energy use on Wednesday afternoon, August 18th from 2–7pm.

⚠️ You used MORE than similar homes on the last peak day.

Last peak day: Wednesday, June 12th 2–7pm

<table>
<thead>
<tr>
<th>Efficient Neighbors</th>
<th>2 kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Neighbors</td>
<td>5 kWh</td>
</tr>
<tr>
<td>YOU</td>
<td>10 kWh</td>
</tr>
</tbody>
</table>

This is an alert from UtilCo: Tomorrow, Wednesday, July 10th is a peak day. From 2 PM to 7 PM join UtilCo customers by reducing your electric use. Simple ways to save on peak days include postponing dishwashing and other large appliance use until the peak day is over. Thank you for helping us save! To opt out of phone alerts, press 9.
Coffee Makers
Load Curves drive improved personalization

Insights presented as “home profile”

- Help drive acceptance of neighbor comparison
- Recommendations tailored to profile type
Thank you!