

Assessing Lifetime Savings from Customer Engagement Programs in Illinois



Customer Engagement Programs

- Customer Engagement Programs (CEPs):
 - Inform customers
 - Motivate customers
 - More than a “behavior change” program
- CEP evaluation uses bill analysis
 - SEE Action / LBNL paper (Todd et al. 2012) contains guidelines



Recent C3 Residential Savings Results

- Consistent online savings of 5-6% per participant
 - CUB Energy Saver: **5.82%** (Integral Analytics)
 - CUB Energy Saver: **6.01%** (Prof. Matthew Harding of Stanford)
 - Western Mass Saves: **5.70%** (Opinion Dynamics & Navigant)
- Online participation generates the greatest energy savings
 - “Customers who utilized the online portal (activated) save more than passive customers” (Opinion Dynamics & Navigant)
 - “As savings are strongly [correlated] with online engagement, further efforts should be made to bring participants to the site more frequently” (Integral Analytics)

CEP Savings Are Generated both by Technology and by Behavior Change

- CEP participants take two types of energy-saving actions
 - (1) behavior change
 - (2) technology measures
- Behavior change requires continued customer action to generate a savings impact
 - Example: closing blinds in the summer to reduce cooling costs
- A technology measure will continue generating savings without continued customer action
 - Example: replacing an older A/C unit with a more efficient model



CEP Savings Are Generated both by Technology and by Behavior Change

- Across states and within the evaluation community, consensus that CEPs generate technology-based savings
- Based on available evidence up to half of CEP savings are technology-based
 - 49% (C3 data in Illinois)
 - 33% (Navigant study for CPUC)
- Other examples
 - Arkansas TRM Version 2.0
 - SCE work paper on Online Audit tool
 - SEE Action / LBNL paper

Framework for Assessing CEP Measure Life and Lifetime Savings

- Address the “evaluation double-standard”
 - E.g., an efficient air conditioner installed due to a rebate program and an efficient air conditioner installed due to a CEP generate the same savings with the same life
- Leverage available data sets and develop new data sets
 - Survey data
 - Purchase tracking
 - Engagement metrics
 - Other information with insight into the actions participants take to save energy and the proportion of CEP savings that are technology-based
- Use appropriate assumptions
 - E.g., one-year life for behavior change savings
 - Measure life for technology savings from CEPs according to the TRM



CEP Measure Life In the ICC's Procurement Plan

- C3 objected to one-year measure life
- ComEd updated TRC test in response
 - Used the C3 data on participants' actions
 - Analyzed CEP cost-effectiveness separately for behavior change and technology measures
 - Prevented double-counting

C3's CUB Energy Saver Program in Illinois




- CUB Energy Saver launched in June 2009
 - Currently available to any ComEd residential customer
 - More than 22,000 customers have signed up online to date
 - Approximately 6% savings per online participant
- Personalized savings recommendations
 - “No cost,” “low cost,” and “home investment” actions to save energy
- Reward points
 - Redeemable for gift cards or discounts at popular retailers
 - Granted to customers who have saved energy

C3's CUB Energy Saver Program in Illinois

3,253 Points Balance \$105 Money Saved Profile Logout

CUB Energy Saver

Ways to Save Usage Analysis Rewards Learn Community

	Your Actions ?	Estimated Yearly Savings
All	 Replace Your Home Lights With CFLs I did it	\$86
Most Popular	 Replace Your Single Pane Windows I did it	\$86
No Cost	 Reduce Air Leakage I did it	\$47
Low Cost		
Home Investment		

My Actions (21)



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CUB Energy Saver

Ways to Save Usage Analysis Rewards Learn Community

Ways to save > Replace Your Single Pane Windows

Replace Your Single Pane Windows I did it



Windows can let in a lot of unnecessary heat in the summer and cold in the winter. Double pane windows are considerably more efficient than single pane windows. They let in the same amount of light, but are better at keeping your home comfortable and they reduce the amount of air conditioning and heating needed. And if you can find energy star certified double pane windows, even better. So keep the harsh elements from seeping through your windows - upgrade to double pane today!

Settings

I will replace frame single pane windows with double pane windows in my house. I normally set target room temperatures to degrees F in the summer. I blinds with the windows. The new windows have low-E coating and the frame type will be . My house has the following window areas for each direction: square feet for north, for east, for west, and for south. Energy efficiency ratio (EER) of my AC is BTU/Wh. My thermostat setting during the winter is .

Estimated Yearly Savings

\$86 dollars
Money

773 kWh
Electricity

1,259 lbs
Carbon

Estimated Cost

\$500 dollars

Estimated Payback Period



C3's CUB Energy Saver Program in Illinois

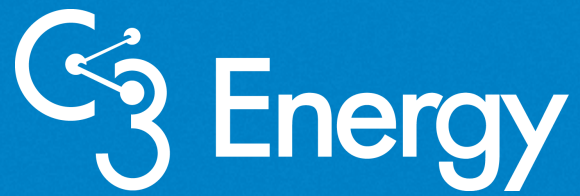
- Energy Saver web portal provides insight on the sources of energy savings

	% of Actions	% of Savings
Behavior	71%	51%
Technology	29%	49%

Conclusion

- CEPs generate energy savings from both behavior change and technology measures
- Insight into actions needed to assess proper measure life
- Important to enable consistent and accurate calculation of cost-effectiveness and savings impact
- Stakeholder feedback welcome





Thank You!



Example Method for Calculating Lifetime Savings from a CEP

- The following equations demonstrate one method for calculating lifetime savings from a CEP

- Lifetime savings from technology measures, $LS_T = \sum_{m=1}^n \left(S^V \times \frac{S_m^{R,T}}{S^R} \times EUL_m \right)$

- Lifetime savings from behavior change, $LS_B = \left(S^V \times \frac{S^{R,B}}{S^R} \right)$

- **Total lifetime savings = $LS_T + LS_B$**

- S^V = total verified annual energy savings (based on experimental/quasi-experimental bill analysis)
- S^R = total savings from customer-reported actions (technology and behavior)
- $S_m^{R,T}$ = savings from customer-reported technology measure, m
- EUL_m = estimated useful life (from elsewhere in TRM) for technology measure, m
- $S^{R,B}$ = savings from customer-reported behavior change



Example Scenario

- Suppose the CUB Energy Saver web portal recommends 4 energy-saving actions:
 - Closing blinds in the summer (behavior change)
 - Raising thermostat temperature in summer, or lowering in winter (behavior change)
 - Replacing an air conditioner with a more efficient unit (technology measure)
 - Installing smartstrips (technology measure)
- The portal tracks the number of participants who report taking each action
- C3 software estimates the savings from each action based on participant-specific information
- These data can be plugged into the lifetime savings formula
- Other data needed: verified annual energy savings (from independent evaluation) and measure life for each technology action (look up in TRM)



Example Data

Participant	Action	Type	Est. Savings (kWh/yr)
A	Blinds	Behav.	268
A	Smartstrip	Tech.	255
B	Thermostat temp.	Behav.	99
B	Smartstrip	Tech.	246
C	Blinds	Behav.	302
C	Smartstrip	Tech.	252
C	Thermostat temp.	Behav.	93
D	A/C replace	Tech.	192
D	Smartstrip	Tech.	299
D	Blinds	Behav.	279
D	Thermostat temp.	Behav.	112
E	Thermostat temp.	Behav.	98

Action	Savings (kWh/yr)	% of Total
A/C replace	192	8%
Smartstrip	1,052	42%



Example Calculations

- Assume verified annual energy savings (S^V) = 2,000 MWh
- From the example program data we know savings from behavior as a share of total reported savings ($S^{R,B} / S^R$) = 50%
 - Lifetime savings from behavior change, $LS_B = 2,000 \text{ MWh} \times 50\% = 1,000 \text{ MWh}$
- From the example program data we know savings from the A/C replacement technology measure as a share of total reported savings [$(S^{R,T}_{A/C \text{ replace}}) / S^R$] = 8%
 - Assume EUL of an efficient A/C unit = 4 years (per draft TRM)
- Similarly, [$(S^{R,T}_{\text{smartstrip}}) / S^R$] = 42%
 - Assume EUL of a smartstrip is also 4 years (per draft TRM)
- Lifetime savings from technology measures, $LS_T = 2,000 \text{ MWh} \times 8\% \times 4 + 2,000 \text{ MWh} \times 42\% \times 4 = 4,000 \text{ MWh}$
- **Total lifetime savings = 1,000 MWh (from behavior) + 4,000 MWh (from technology) = 5,000 MWh**



Visual Depiction of CEP Lifetime Savings

