DSM Program Evaluation and its Benefits

Developing Optimal Deployment Strategies

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Presentation Agenda

• Types of Analysis
• Why Looking at Consumer Characteristics is Important When Evaluating DSM Programs
• Value Proposition in Customizing Deployment Strategy for Consumer Characteristics
• Key Elements and Steps for Optimal Deployments
## Evaluation versus Settlement

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Settlement</th>
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<tbody>
<tr>
<td>Able to use all information available at end of year or season</td>
<td>Must be operable on a short time horizon (people want their money)</td>
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<tr>
<td>Methods can be more complex and focused on accuracy and providing information to utility decision-makers</td>
<td>Need for understandability and transparency since financial payment or penalties based on calculations</td>
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<tr>
<td>Interested in program performance and key drivers rather than “truth” for each participant</td>
<td>Applies to each individual consumer</td>
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Ex Ante versus Ex Post

• Ex Ante Estimates
  – What energy/demand response do we estimate will happen?
  – Engineering-based estimates (deemed savings)

• Ex Post Estimates
  – What energy/demand response do we estimate did happen?
  – Data-based estimates using interval data, monthly use data, survey responses, climate data
Evaluation Types for DR

Guidance and Recommendations for Ex Post Impact Evaluation of Event-Based DR

Day Matching Methods

- Easily implemented
- Tend to be biased and less accurate
- Cannot easily incorporate key drivers of impacts
- No statistical testing of results
- More susceptible to gaming
- Constrained by program features such as “pre cooling”

Regression Methods

- More complex
- *Able to incorporate key drivers of impacts*
- Not biased and more accurate
- Statistical testing of results
- Able to incorporate all available information
Day Matching Methods

- Can exclude high or low days within a “Look back window”
- “Morning” adjustments or climate adjustments possible

![Diagram: Day Matching Similar Event Day Usage]

- **Average similar day use**
Regression Methods

- Compare hourly expected demand to actual demand
- Expected demand is a function of climate changes, event, participant characteristics, etc…
Why Are Key Drivers Important?

Cumulative Distribution of Average Event Load Reduction (by Customer)

- Almost half provide no load reductions.
- About 1/3 of participants provide load reductions greater than 0.2 kW.
- About 1 in 10 participants provide load reductions greater than 1.0 kW.
Assume a System of Three Consumers

- Jane has the motivation to change behavior, Joe has the ability to change behavior, Jill has neither.
Translate Evaluation Results to Strategic Deployment Plan

- Evaluation results can help predict consumer behavior changes
Potential Value Proposition

Reallocate marketing resources from Jill to Joe

Expected Value

Joe: $40.00
Jill: $10.00
Jane: $20.00

Incremental Marketing Cost

($10.00)
($20.00)
Value of DSM Program

Customized strategy increases chances of Joe participating and decreases chances of Jane leading to less waste and higher benefits

<table>
<thead>
<tr>
<th>Consumer Type</th>
<th>Expected Value (no customized strategy)</th>
<th>Expected Value (customized strategy)</th>
</tr>
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<tbody>
<tr>
<td>“Joe” Consumers</td>
<td>$124,321</td>
<td>$372,963</td>
</tr>
<tr>
<td>“Jill” Consumers</td>
<td>$(8,999)</td>
<td>$(1,800)</td>
</tr>
<tr>
<td>“Jane” Consumers</td>
<td>$3,833</td>
<td>$3,833</td>
</tr>
<tr>
<td>Total Value</td>
<td>$119,155</td>
<td>$374,996</td>
</tr>
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Assume a 10,000 member system comprised of:
- 1/3 “Joe’s”
- 1/3 “Jill’s”
- 1/3 “Jane’s”
Key Elements

Pilot Phase
- Run Pilot
- Survey Participants
- Analyze Demand Impact

Rollout Phase
- Report on System Segmentation
- Plan Strategic Rollout

Census
Suggested Steps for DSM

1. Pilot program with multiple marketing strategies
2. Survey participants
3. Demand/energy impact analysis of pilot
   - Or… use impact analysis of neighbors and industry (e.g. CRN Smart Grid Grant results when available)
4. Census or other data gathering of system
5. Segmentation and optimized roll-out strategy
   - Target low-hanging fruit and maximize program ROI
   - Manage customer perceptions, expectations, and word-of-mouth
Questions?

Thank You!

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