From Theory to Practice: Lessons Learned from an Advanced M&V Commercial Pilot

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Background

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Sponsor

• U.S. Dept of Energy
Pilot Overview

• Initiated 2017
• 28 Commercial pilot sites
• Objectives
  – How soon can we get an indication of savings?
  – How do advanced M&V savings compare to traditional estimation methods?
  – How does effort compare?
Pilot approach

Baseline period

12 months

Graph showing actual, fitting, and temperature over time from Jan 2017 to Oct 2017.
Pilot approach

- Baseline period
- Project blackout period
- Measure install date
- Project blackout period

12 months → 2 months → 1 day → 2 months (UI only)
Pilot approach
Lesson 1: Rapid feedback is possible
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Lesson 2: Project classification can help manage risk

The Good
- ±20% vs. ex-ante
- 6 projects
- 84% realization rate

The Bad
- >35% below ex-ante
- 5 projects
- 55% realization rate

The Ugly
- +253% to -184%
- 9 projects
- 5% realization rate
Lesson 3: Advanced M&V effort level is low

<table>
<thead>
<tr>
<th>Advanced M&amp;V Activity</th>
<th>Average Time per Project (hours)</th>
<th>Percent of Total Time (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Processing</td>
<td>4.2</td>
<td>70%</td>
</tr>
<tr>
<td>Modeling</td>
<td>0.1</td>
<td>2%</td>
</tr>
<tr>
<td>Collating Results</td>
<td>1.7</td>
<td>28%</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>100%</td>
</tr>
</tbody>
</table>

Expected Reductions in Effort When Scaled

- MDMS configured to provide consistent data, formatted and time-stamped as needed
- Streamlined process to allocate meters to buildings/projects and for logging key dates
- Implementers gain experience, reducing time to review savings estimates and make decisions.
- In some scenarios aggregation may reduce time spent reviewing individual project results.
- Automated tools to assist in identifying NREs, and make data-driven adjustments
Overarching Findings

• Tools and methods are ready to go
• Rapid feedback is feasible
• Project classification helps manage risk
• Advanced M&V is relatively low effort
• Data management is key (interval data and project dates)
• Time & experience needed to make judgment calls
Continuing Development

• Continue conversation on use cases for advanced M&V
• Continue R&D on non-routine events
  – Define thresholds for action
  – Build catalog of buildings’ data with documented NREs
  – Test data-driven adjustment methods on simulated & real data
• Develop methods to address uncertainty
• Assess applications for time-sensitive valuation
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