Welcome

Conservation Applied Research & Development (CARD) Webinar

February 20, 2020
Pay-for-Performance Utility Programs
Pay-for Performance Utility Programs

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Webinar Basics

• Attendees in listen-only mode
• Type questions into Q&A box
• Send to “All Panelists”
• Questions addressed at end
• Webinar recorded & archived
• Slide set will also be available

Send Questions to All Panelists

Type Questions in Q&A box

Additional WebEx Controls at Bottom of Your Screen

Q&A on right side of WebEx panel
• Purpose to help Minnesota utilities achieve 1.5% energy savings goal by:
  • Identifying new technologies or strategies to maximize energy savings;
  • Improving effectiveness of energy conservation programs;
  • Documenting CO₂ reductions from energy conservation programs.

  [Minnesota Statutes §216B.241, Subd. 1e]

• Utility may reach its energy savings goal
  • Directly through its Conservation Improvement Program (CIP)
  • Indirectly through energy codes, appliance standards, behavior, and other market transformation programs
CARD RFP Spending by Sector thru FY2019

RFP Summary
• 10 Funding Cycles
• 472 proposals
• 121 projects funded
• $27.4 million in research

CARD RFP Projects by Sectors thru FY2019

- Commercial (41), 38.3%
- Residential 1-4 unit (18), 17.5%
- Industrial (11), 10.0%
- Multifamily 5+ unit (5), 5.0%
- Agricultural (6), 5.0%
- Multi-sector (26), 24.2%
Commercial Whole-Building Pay for Performance Program Opportunity in Minnesota

Project and Final Report Overview

Megan Hoye | Project Manager

Team: Di Sui, Brady Steigauf, Rabi Vandergon, Jenny Edwards

February | 2020
Thank you!

Peer Review Team

Sheryl Carter
Director, Power Sector, Clean Energy & Climate | NRDC

Merrian Borgeson
Senior Scientist, Climate & Clean Energy Program | NRDC

Poppy Storm
Founder & Director of Innovation | 2050 Institute
Project Purpose & Scope

Purpose
To assess whether whole-building, pay for performance would be a market-accepted utility offering in Minnesota.

• Identify interested customer segments
• Explore barriers and opportunities

Project Scope
• Commercial target markets part of the exploration
• Commercial buildings only – existing & new
• All types of savings (equipment, operational, behavioral)
• Focused on incentives direct to customer
Project Framing

Need for this Study:

1. An approach that can help contribute to the MN 1.5% energy savings goal
   - Help achieve deeper or new savings
   - Help achieve savings more efficiently than they are being achieved today

1. Potential for utilities to value energy efficiency as a resource
   - Today energy efficiency is considered in resource planning, but not treated on equal footing as generation resources
   - Are utilities thinking ahead about the value of actual energy savings more than deemed energy savings?

2. Advanced metering infrastructure (AMI) roll-out to commercial customers has already started.
   - How can this technology be leveraged to deliver more customer benefits?
Data Streams

Emphasis on quantitative data

Qualitative Data
- Literature Review
- Interviews
- Focus Group
- Survey

Quantitative Data
- Historic Pre & Post Energy Use
- Rebate Data

Minnesota customers only

10 Buildings
2 Buildings (case studies)
## Data Collected

<table>
<thead>
<tr>
<th>Interviews Conducted &amp; Surveys Completed</th>
<th>Quantity of Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota Customer Interviews <em>(public and private facilities)</em></td>
<td>10</td>
</tr>
<tr>
<td>Minnesota Focus Group Attendees</td>
<td>10</td>
</tr>
<tr>
<td>National Pay for Performance Expert Interviews</td>
<td>11</td>
</tr>
<tr>
<td>Minnesota Developer or Architect Interviews</td>
<td>3</td>
</tr>
<tr>
<td>Key Minnesota Energy Efficiency Service Providers Interviews</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL COUNT OF INTERVIEWEES</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>
Data Analysis & Evaluation Methodology

- **Qualitative data evaluation:**
  - Weighed barriers and benefits - customer and utility perspective
  - Assessed target market segments and channels for implementation

- **Quantitative data analysis:**
  - **Existing buildings:** compared energy improvements broadly to actual energy use to identify non-suitable customer types
  - **New construction:** compared design EUI to actual EUI to identify non-suitable types of new construction customer types
  - **Existing building case studies (2):**
    - Gathered energy rebate and estimated savings data (deemed lifetime savings)
    - IPMVP Option C applied to determine verified savings (3 year metered savings)
    - Compared savings potential (energy and dollars)
Takeaways are needles in the haystack
Key Takeaways

National Observations

• PfP programs in other markets are seeing mixed results of getting at deeper savings, yet existing building and new construction offerings are expanding.
• At the national level, aggregator model is most prevalent (not the focus of this study).

Minnesota Utility Input

• Advanced metering is coming. Some utilities expressed interest in capturing meter-based energy savings for the purpose of resource & distribution planning.
• The risk of customer satisfaction can be higher than simply the cost of developing a program.
Key Takeaways

Minnesota Customer Input

- High-performing and high-potential commercial customers showed interest in PfP, especially when connected to technical assistance.
- Customers expressed that reducing project payback by 6 months or more would be motivating to them (risk vs. reward).

Minnesota Barriers

- M&V methodologies continue to be reported as too costly or onerous for cost-effective application (near-term).
- Currently there is no clear pathway for HOW utilities to capture meter-based energy savings; How might this co-exist with deemed savings?
What is Pay-for-Performance?
An incentive mechanism that is based on **actual energy savings** versus **anticipated energy savings**, such as deemed savings.
Whole-Building *Pay for Performance* Elements

Whole-Building Pay for Performance Elements

Three Benefits:

• Whole-building scope aligns with customer perspective

• Performance-based approach (meter-based) incentivizes operators/occupants

• Meter-based approach can measure actual conservation and DR resources
Program Characteristics Vary

- **Performance Period:** 1 year, 3 years, 5 years, 20 years (re-enroll)
- **Incentive Design:**
  - Frequency – quarterly or annually
  - Split of performance vs. upfront
  - Incentive rate – different than custom
  - Tiered incentive – price signal for deeper savings
- **Transparency Platform:** most pay-for-performance programs today provide performance visibility through “Green Button” type app; more detailed transparency can help increase operator and equipment installer accountability.
- **Eligibility Requirements:** some utilities require an upfront study to help estimated anticipated savings and the study must show savings of 5% to 20% of total building energy use to participate
- **Meter Technology:** most utilities have advanced metering (AMI), but not all
National Observations

- Literature review
- Interviews
- Program implementer survey

Data Sources

Key Building & Development Trends

1. Increasing customer value to time-based, meter-based savings (e.g. TOU rates)
2. Buildings are getting more complicated
3. Outcome-based codes, energy design assist., and benchmarking programs increasing – all focused on whole-building, meter-based performance
4. More measure-agnostic programs

Deloitte Center for Financial Services analysis.
Drivers & Target Markets in Other States

Drivers
• Higher rates increase the desire for customer “choice” & motivated by bill savings
• High-performance customers that want another “choice”, help meeting corporate sustainability goals
• Energy Service Company requesting from utility or need to increase this market
• Climate policy (want deeper conservation savings)

Target Markets
• **Existing buildings:** large customers (SF or load), non-24/7
• **New construction:** broader participation requirements
• Minimum savings target sometimes required

Source: BDCnetwork.com & Med City Beat
Lessons Learned

- Program marketing and recruitment a challenge
  - Early program uptake is slow
  - Hard to make program easy to understand
- Multiple programs are not fully leveraging behavioral science strategies to motivate and trigger building operator action
  - Lack high-touch engagement
  - Lack well integrated performance tools (e.g. dashboards, BAS integration)
- In most cases, new construction programs are more cost-effective than existing building programs
- Some markets see incentives direct to a contractor as the most effective PfP model, others see customer and provider opportunities – find the best leverage point (who are the actors and deciders?)
Minnesota Observations

- Interviews
- Focus group
- Literature and policy review
- Data analysis and evaluation

Customer Interests

- **Building operators** – across the board operators were interested in piloting a PfP offering; interested in operational recommendations based on actual performance
- **Building portfolio managers** – looking for ways to bring more value to owner and to reduce operating costs; willing to take some risk to do this; innovation can be valued
- **Building owners** – businesses are interested in a culture of performance more broadly than energy; want operators to know energy targets and measure against them
- **Architects** – can help them differentiate when designing high-performance buildings
Focus Group Discussion

Customer Interests (Continued)

Cumulative cash flows (Upfront rebate only)  
Cumulative cash flows (BAU today)
Cumulative cash flows (Conservative performance)
Cumulative cash flows (Moderate performance)
Cumulative cash flows (Aggressive performance)
Cumulative cash flows (Worst Case Performance)

Reduce payback by 6 months or more
Pay for Performance Barriers

Customer Concerns

- **Building operators** – Want help quantifying rebate risk; Some concern for incentives being too delayed (more so in the private sector)
- **Building owners/managers** – Would like a tool to help identify when to participate
- **Architects** – Loss of upfront rebates can hurt project design budget

Utility Concerns & Interests

- Interested in a path towards time-based energy savings (demand)
- Concerned about cost-effectiveness of this approach
  - Measurement and verification costs
  - Low energy costs
  - Separate treatment of asset & behavioral savings discourages whole-building approach
- Do not want to eat away at averaging approach of deemed savings
Analysis of Concerns

• Avoiding concerns through market segmentation & screening
  • Customer selection is key – provide screening and fitness testing
  • About 15% of large commercial customers may be a good fit*

• Target market customers overlap with district energy
  • Customer engagement partnerships helpful to reach these customers

• Cost-effective M&V approaches
  • Could start testing in new construction market where more cost-effective
  • Increase program benefits – EE, demand savings, & non-energy benefits

• Accounting challenges
  • A tension between valuing whole-building savings and “netting out” capital improvements (measure-based, calculated savings)

Source: Efficiency Vermont (Consortium for Energy Efficiency, 2018)
Key Market Segments

Direct Incentives to Customers

• **Target Market A:** Large, high-performing existing buildings
• **Target Market B:** New construction and major renovation projects (small to large), engaged through the developer

Incentives thru 2\textsuperscript{nd} or 3\textsuperscript{rd} Parties

• **Target Market C:** Moderate and small commercial buildings through commercial property portfolio managers
• **Target Market D:** Third-party providers for key energy efficiency programs
Market Channels

The team evaluated existing programs and services in the marketplace as delivery channels.

**Ranking Criteria:**
1. Deeper saving potential
2. Customer engagement strategies already in place
3. Ability to integrate performance targets
4. Monthly M&V conducive
5. Potential to Influence Peak kW (already doing, reasonable addition)

### Existing Program Pairing Opportunities
**Near-Term and Long-Term**

1. High-performance New Construction
2. Energy Service Company Services
3. Ongoing monitoring or Operational Efficiency
4. Benchmarking Programs
5. Building Operator Training
6. Custom Efficiency (programs that require a study)
## Energy Savings Potential

- State-wide potential based on existing programs and channels that could be leveraged

<table>
<thead>
<tr>
<th>Market/Approach</th>
<th>Electric Savings (MMBtu)</th>
<th>Natural Gas Savings (MMBtu)</th>
<th>Total Energy Savings (MMBtu)</th>
<th>Potential for Peak kW Reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Market A</td>
<td>76,700</td>
<td>54,500</td>
<td>131,200</td>
<td>X</td>
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<tr>
<td>Target Market B</td>
<td>16,000</td>
<td>8,700</td>
<td>24,700</td>
<td>X</td>
</tr>
<tr>
<td>Target Market C</td>
<td>13,500</td>
<td>9,500</td>
<td>23,000</td>
<td>X</td>
</tr>
<tr>
<td>Target Market D</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>X</td>
</tr>
<tr>
<td>TOTAL</td>
<td>106,200</td>
<td>72,700</td>
<td>178,900</td>
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</table>
Customer Benefit: Case Study A

- Ongoing customer technical assistance important
- Re-enrollment potentially key (get at lifetime of savings, asset and other)
- Screening tool to help customers meet performance

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Deemed Energy Savings (Incentive rates applied to)</th>
<th>Meter-Based</th>
<th>Low Incentives: $0.01/kWh &amp; $0.3/Dt</th>
<th>Moderate Incentives: $0.02/kWh &amp; $1.5/Dt</th>
<th>High Incentives: $0.025/kWh &amp; $5/Dt</th>
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</thead>
<tbody>
<tr>
<td>Case Study: DeLaSalle High School</td>
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<td></td>
<td></td>
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<tr>
<td>Electricity (kWh)</td>
<td>117,177</td>
<td>$ 11,653</td>
<td>626</td>
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<tr>
<td>Natural Gas (Dk)</td>
<td>3,238</td>
<td>$ 3,101</td>
<td>1,579</td>
<td>$ 790</td>
<td>$ 2,369</td>
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<tr>
<td>1x Participation</td>
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<td>$ 14,754</td>
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<td>$ (13,958.51)</td>
<td>$ (12,372.93)</td>
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<tr>
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<td></td>
<td></td>
<td>$ (13,314)</td>
<td>$ (7,609.93)</td>
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</tbody>
</table>
Customer Benefit: Case Study B

- Potential for increased customer benefit ($)
- Actively managed office buildings well suited
- Incentive design will determine customer value

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Deemed Energy Savings</th>
<th>Meter-Based Energy Savings (Incentive rates applied to)</th>
<th>Total Energy Savings (Incentive rates applied to)</th>
<th>Low Incentives: $0.01/kWh &amp; $0.3/Dt</th>
<th>Moderate Incentives: $0.02/kWh &amp; $1.5/Dt</th>
<th>High Incentives: $0.025/kWh &amp; $5/Dt</th>
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<tbody>
<tr>
<td>Electricity (kWh)</td>
<td>362,944 $ 31,646</td>
<td>$18,585</td>
<td>$37,170</td>
<td>$46,463</td>
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<tr>
<td>Natural Gas (Dt)</td>
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<td>$2,414</td>
<td>$12,069</td>
<td>$40,228</td>
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<td>1x Participation</td>
<td>$ 32,791</td>
<td>$ (11,792)</td>
<td>$ 16,484</td>
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<tr>
<td>3x Participation</td>
<td>$ 30,206</td>
<td>$ 114,926</td>
<td>$ 227,283</td>
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</table>

Case Study: Butler Square (Office)
Recommendations

• **Recommendation 1:** Host a broad discussion on the value of measured, meter-based savings.

• **Recommendation 2:** Develop a whole-building pay for performance method for claiming energy savings to support measured-savings in the growing context of AMI.

• **Recommendation 3:** Adopt a measurement and verification protocol that targets new construction buildings

• **Recommendation 4:** Implement a whole-building pay-for-performance pilot program with one or more utilities to demonstrate that high-performing large commercial customers
THANK you!

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Questions?

Pay-for-Performance Utility Programs

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Send us your questions using WebEx Q&A box
CARD Project Resources

For Reports use CARD Search Quick Link

For Webinars use CARD Webinars & Videos Quick Link

For Other research documents use CARD Fact Sheets, Guidelines & Tools Quick Link

Webinar Recording & White Paper available in couple months

R&D Web Page (https://mn.gov/commerce/industries/energy/utilities/cip/applied-research-development/)
Thanks for Participating!

Upcoming CARD Webinars:

• **April 1** – Understanding Market Barriers & Opportunities for ccASHPs
• **May 27** - Economic Impact of CIP
• **TBD** - Reconsidering Cooling Loads in Minnesota

Commerce Division of Energy Resources e-mail list sign-up

If you have questions or feedback on the CARD program contact:
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