Welcome

Conservation Applied Research & Development (CARD) Webinar

May 27, 2020
Economic Impacts of Minnesota’s Conservation Improvement Program
Economic Impacts of Minnesota’s Conservation Improvement Program

Mary Sue Lobenstein
R&D Program Administrator
MN Department of Commerce
marysue.Lobenstein@state.mn.us

Adam Zoet
Energy Planning Director
MN Department of Commerce
adam.zoet@state.mn.us

Amalia Hicks, Ph.D.
Principal
Cadmus Group
amalia.hicks@cadmusgroup.com

Alex Chamberlain
Senior Analyst
Cadmus Group
alex.chamberlain@cadmusgroup.com
Webinar Basics

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

Q&A on right side of WebEx panel
Type Questions in Q&A box
Send Questions to All Panelists
Additional WebEx Controls at Bottom of Your Screen
• 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
Agenda

Study Objectives and Background
Economic Impact Analysis – Methodology and Results
Cost-Effectiveness – Methodology and Results
Conclusions and Recommendations
Study Objectives

- Economic Impacts (2013-18 CIP program years)
- Cost-Effectiveness (2018)
- Share Findings
Timeline
Conservation Improvement Program and related events/studies

- CIP programming begins (1980)
- Low-income provisions added (1989)
- Next Generation Energy Act (2007)
- Energy efficiency efforts ramp up; MN moves from spending goal to savings goal (2010)
Data Sources

Specific to Minnesota
Net Economic Impacts
2013-2018 CIP Investments
Economic Impacts Scope

Model scenarios
1. Overall
2. Low-income & general programs
3. Electric & natural gas portfolios
4. IOU, coop, and muni portfolios

2013-2018 CIP Investments
Energy savings thru 2042
General Methodology

Develop Inputs
• Spending Changes
• Positive and negative impacts

Modeling
• Economic model
• Year-over-year inputs and outputs
• Comprehensive economic and demographic effects

Analyze Outputs
• Key Indicators: jobs, value add, income
• Order of magnitude
• Directional
Changes in Methodology

• Transitioned modeling software from IMPLAN to REMI

• Updated assumptions for industries affected by CIP investment

• Compared different scenarios (fuel type, utility type, etc.)

• Included IOU shared savings performance incentives
Changes Induced by CIP
Relative to Minnesota economy without CIP

(Have your questions ready!)
## Net Economic Impacts (Fixed 2018$)

### 2013-18 CIP Investment

### Cumulative Impacts through 2042

<table>
<thead>
<tr>
<th>Employment (Jobs)</th>
<th>Labor Force (Individuals)</th>
<th>Output</th>
<th>GDP (Value Added)</th>
<th>Disposable Personal Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.7 K</td>
<td>49.1 K</td>
<td>$10.9 billion</td>
<td>$5.4 billion</td>
<td>$5.0 billion</td>
</tr>
</tbody>
</table>

### Impacts Normalized for Spending

<table>
<thead>
<tr>
<th>Employment/ $1MM</th>
<th>Labor Force/ $1MM</th>
<th>Output ROI</th>
<th>GDP (Value Added) ROI</th>
<th>Disposable Personal Income ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>29</td>
<td>$6.40</td>
<td>$3.14</td>
<td>$2.93</td>
</tr>
</tbody>
</table>
CIP investments create employment gains that persist for 10 to 15 years.

For example, gains from 2013-18 investments peak around 2030.

Additional investment in 2019 would push peak out to 2031 or farther.
## Net Impacts by Fuel Type

Normalized by program spending

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Employment/ $1MM</th>
<th>Labor Force/ $1MM</th>
<th>Output ROI</th>
<th>GDP (Value Added) ROI</th>
<th>Disposable Personal Income ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>28</td>
<td>29</td>
<td>$6.40</td>
<td>$3.14</td>
<td>$2.93</td>
</tr>
<tr>
<td>Electric</td>
<td>26</td>
<td>27</td>
<td>$6.11</td>
<td>$2.88</td>
<td>$2.86</td>
</tr>
<tr>
<td>Gas</td>
<td>32</td>
<td>31</td>
<td>$6.54</td>
<td>$3.68</td>
<td>$3.11</td>
</tr>
</tbody>
</table>

- Gas portfolio is 27% of CIP investment (pie chart)
- Economic impacts by fuel type contrasts with the cost-effectiveness results. While both are cost-effective, gas portfolio is slightly less cost-effective than electric.
Net Impacts by Utility Type

Normalized by program spending

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Employment/ $1MM</th>
<th>Labor Force/ $1MM</th>
<th>Output ROI</th>
<th>GDP (Value Added) ROI</th>
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<tbody>
<tr>
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<td>28</td>
<td>29</td>
<td>$6.40</td>
<td>$3.14</td>
<td>$2.93</td>
</tr>
<tr>
<td>IOU</td>
<td>27</td>
<td>27</td>
<td>$6.15</td>
<td>$3.08</td>
<td>$2.71</td>
</tr>
<tr>
<td>Muni</td>
<td>44</td>
<td>52</td>
<td>$11.87</td>
<td>$5.73</td>
<td>$6.18</td>
</tr>
<tr>
<td>Coop</td>
<td>24</td>
<td>26</td>
<td>$4.54</td>
<td>$1.73</td>
<td>$2.45</td>
</tr>
</tbody>
</table>

- MUNIs had lowest total CIP spending from 2013-2018 but produce the strongest impacts per million in spending.
- MUNIs spent the least per participant and reported the highest energy savings per dollar spent.
- IOUs spent the most (pie chart).
### Net Impacts by Income Type

Normalized by program spending

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Employment/ $1MM</th>
<th>Labor Force/ $1MM</th>
<th>Output ROI</th>
<th>GDP (Value Added) ROI</th>
<th>Disposable Personal Income ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>28</td>
<td>29</td>
<td>$6.40</td>
<td>$3.14</td>
<td>$2.93</td>
</tr>
<tr>
<td>General</td>
<td></td>
<td>30</td>
<td>$6.72</td>
<td>$3.31</td>
<td>$3.10</td>
</tr>
<tr>
<td>Low Income</td>
<td>0</td>
<td>(5)</td>
<td>($1.43)</td>
<td>($0.90)</td>
<td>($1.27)</td>
</tr>
</tbody>
</table>

- **Overall CIP portfolio has strong positive economic impacts**
- **General programs are responsible for those benefits**
- **Low-Income programs <4% of CIP Spending**
- **Analysis does not capture all low-income program benefits (reduced collections, avoided shutoffs)**
- **Low-Income population served by both types of programs**

[Graph showing cumulative net GDP]
Pause for Q&A

Type questions into Webex Q&A panel and send them to “All Panelists.”
Cost-Effectiveness

2018 CIP Investments
## Cost-Effectiveness

Four tests used in Minnesota

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Societal Cost Test (SCT)</strong></td>
<td>Benefits and costs from multiple perspectives</td>
</tr>
<tr>
<td></td>
<td>Primary test in Minnesota</td>
</tr>
<tr>
<td><strong>Utility Cost Test (UCT)</strong></td>
<td>Benefits and costs from utility perspective</td>
</tr>
<tr>
<td></td>
<td>Used to calculate performance incentives</td>
</tr>
<tr>
<td><strong>Participant Cost Test (PCT)</strong></td>
<td>Benefits and costs from participant perspective</td>
</tr>
<tr>
<td></td>
<td>Informs appropriate participant incentive levels</td>
</tr>
<tr>
<td><strong>Rate Impacts Measure (RIM)</strong></td>
<td>For informational purposes (not recommended)</td>
</tr>
<tr>
<td></td>
<td>Can help indicate changes to retail rates</td>
</tr>
</tbody>
</table>
## 2018 Electric Portfolio

Does not include economic impacts and shareholder incentives

<table>
<thead>
<tr>
<th>Societal Cost Test (SCT)</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,054,013,191</td>
<td>$379,007,405</td>
<td>$675,005,786</td>
<td>2.78</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant Cost Test (PCT)</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,086,737,327</td>
<td>$298,734,095</td>
<td>$788,003,232</td>
<td>3.64</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Utility Cost Test (UCT)</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$616,844,421</td>
<td>$171,818,759</td>
<td>$445,025,663</td>
<td>3.59</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate Impacts Test (RIM)</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$616,844,421</td>
<td>$1,112,058,567</td>
<td>$(495,214,145)</td>
<td>0.55</td>
<td></td>
</tr>
</tbody>
</table>

- **CIP Portfolio 2018**: Ratio 2.78
- **Xcel Energy 2018**: Ratio 1.98

Xcel Energy

CIP Portfolio

2018
2018 Gas Portfolio

Does not include economic impacts and shareholder incentives

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Societal Cost Test (SCT)</strong></td>
<td>$306,002,613</td>
<td>$173,275,185</td>
<td>$132,727,429</td>
<td>1.77</td>
</tr>
<tr>
<td><strong>Participant Cost Test (PCT)</strong></td>
<td>$331,934,044</td>
<td>$139,867,946</td>
<td>$192,066,099</td>
<td>2.37</td>
</tr>
<tr>
<td><strong>Utility Cost Test (UCT)</strong></td>
<td>$175,417,222</td>
<td>$64,716,914</td>
<td>$110,700,308</td>
<td>2.71</td>
</tr>
<tr>
<td><strong>Rate Impacts Test (RIM)</strong></td>
<td>$175,417,222</td>
<td>$339,944,699</td>
<td>($164,527,477)</td>
<td>0.52</td>
</tr>
</tbody>
</table>

CIP Portfolio 2018: 1.77
CenterPoint 2018 Actual: 1.84

Utility Cost Test (UCT): 2.71
Participant Cost Test (PCT): 2.37
Societal Cost Test (SCT): 1.77
Rate Impacts Test (RIM): 0.52

CIP Portfolio 2018: 2.71
CenterPoint 2018 Actual: 3.88
Enhanced CE Rationale

Includes DSM performance incentive and economic impacts

Recommendation: Shareholder incentives are cost: SCT, UCT, RIM

Recommendation: economic impacts as SCT benefit
• Wisconsin enhanced CE includes net economic impacts (value added)
• Economic benefits improve WI 2015-16 portfolio TRC from 3.24 to 4.77
### Enhanced CE – 2018 Portfolio

#### Societal Cost Test (SCT)

<table>
<thead>
<tr>
<th>CE Type</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard CE</td>
<td>$1,360,015,805</td>
<td>$552,282,589</td>
<td>$807,733,215</td>
<td>2.46</td>
</tr>
<tr>
<td>Enhanced CE</td>
<td>$2,266,721,128</td>
<td>$604,524,149</td>
<td>$1,662,196,978</td>
<td>3.75</td>
</tr>
</tbody>
</table>

106% increase in net benefits  
52% increase to SCT ratio

#### Utility Cost Test (UCT)

<table>
<thead>
<tr>
<th>CE Type</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard CE</td>
<td>$792,261,644</td>
<td>$236,535,673</td>
<td>$555,725,971</td>
<td>3.35</td>
</tr>
<tr>
<td>Enhanced CE</td>
<td>$792,261,644</td>
<td>$288,777,233</td>
<td>$503,484,411</td>
<td>2.74</td>
</tr>
</tbody>
</table>

9% decrease in net benefits  
18% decrease to UCT ratio

#### Rate Impacts Test (RIM)

<table>
<thead>
<tr>
<th>CE Type</th>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard CE</td>
<td>$792,261,644</td>
<td>$1,452,003,266</td>
<td>($659,741,622)</td>
<td>0.55</td>
</tr>
<tr>
<td>Enhanced CE</td>
<td>$792,261,644</td>
<td>$1,503,244,826</td>
<td>($711,983,182)</td>
<td>0.53</td>
</tr>
</tbody>
</table>

8% decrease in net benefits  
3% decrease in RIM ratio

#### Participant Cost Test (PCT)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs</th>
<th>Net Benefits</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,418,671,371</td>
<td>$438,602,040</td>
<td>$980,069,331</td>
<td>3.23</td>
</tr>
</tbody>
</table>

No change
Pause for Q&A

Type questions into Webex Q&A panel and send them to “All Panelists.”
Conclusions and Recommendations

CIP provides net positive benefits that persist for long after the EE installations are completed

- To avoid potential economic contraction in future, continue funding CIP
- To better understand the true benefits of the low-income programs, commission a study to quantify non-energy benefits that can be incorporated into future economic impact analysis

CIP can support programming for low-income customers while still greatly benefitting state economy

Statewide, CIP is very cost-effective

- Consider the appropriate level of risk-taking in terms of emerging technologies or new program designs
Thank You
$146 Million Boost to GDP from Emissions Reductions

50,000 Local Jobs Added

Each Dollar Spent on CIP Generates $3.75 in Benefits to Society

$11 Billion in New Economic Activity

Extra $900 in the Wallet of Each Minnesotan
Economic Impacts of Minnesota’s Conservation Improvement Program

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Contact Information
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 & Final Report 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:

- TBD – Reconsidering Cooling Loads in Minnesota (Center for Energy and the Environment)
- TBD – Residential Energy Baseline and Market Characterization Study (Slipstream)
- TBD – Commercial Energy Baseline and Market Study Characterization Study (Slipstream)

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

If you have questions or feedback on the CARD program contact:
Mary Sue Lobenstein
R&D Program Administrator
marysue.Lobenstein@state.mn.us
651-539-1872