C&I Custom Program Impact Evaluation

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Agenda

- Evaluation objectives and program participation
- Data collection approach and methodology
- Impact Evaluation Results
- Cost Benefit Analysis Results
- Key Findings

Evaluation Objectives

Quantify and verify energy and demand savings

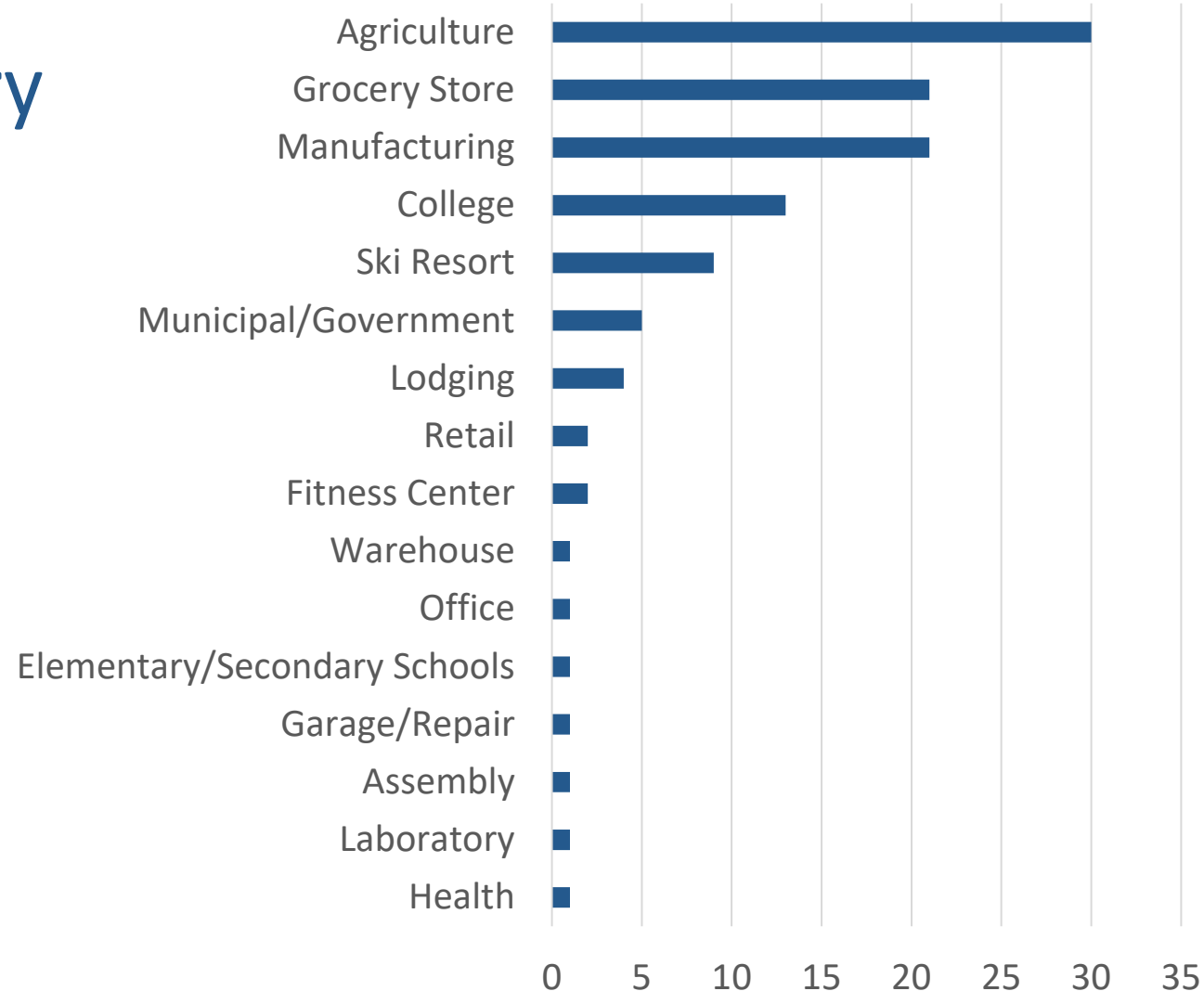
- Gross Impact Evaluation
- Net Impact Evaluation
- End-use level Impacts Analysis

Analyze program cost-effectiveness

- Primary Benefit Cost Test (PBCT)
- Program Administrator Cost (PAC) Test

Participation Summary

- A total of 114 individual measures were incentivized through the program for 101 unique enrollments/projects from July 1, 2019, to June 30, 2022.
- Agriculture, Grocery Stores, and Manufacturing were the most common facility types by measure.



Examples of Projects

Attic Kiln with Heat Recovery Coils
(Lumber processing facility)

High Efficiency Snow Guns
(Ski resort)

Horticultural Lighting
(Indoor agricultural facility)

Participation Summary by Sub-program

Participant Summary		Ex Ante Savings by Fuel Type				
Sub-Program	# of Measures	Ex Ante kWh	Ex Ante W kW	Ex Ante S kW	Ex Ante NG (therms)	Ex Ante Unregulated (MMBtu)
Small Custom Program - Electric	79	14,170,329	2,090.88	1,778.10	(13,731)	86
Small Custom Program - Natural Gas	13	(71,540)	(12.22)	(3.22)	124,686	-
Small Custom Program - Unregulated Fuels	9	(23,528)	(8.00)	(1.00)	-	7,384
Large Custom Program - Electric	6	10,348,280	850.80	981.10	(1,294)	-
Large Custom Program - Natural Gas	3	(754,099)	(87.00)	(87.00)	500,602	-
Small Custom Program - Thermal	3	(59,849)	(7.16)	(3.56)	-	29,473
Large Custom Program - Unregulated Fuels	1	-	-	-	-	59,597
Total	**114**	**23,609,593**	**2,827.30**	**2,664.42**	**610,263**	**96,540**

Data Collection Approach

High Rigor	• Engineering Desk Review • Onsite Verification or Provided Site Metering from Customer
Basic Rigor	• Engineering Desk Review • Phone Verification

Data Collection Strategy

Program Data	Approach		Total
Sub-Program Category	Basic	High	
Electric			
Large	3	3	6
Small	69	10	79
Natural Gas			
Large	-	3	3
Small	11	2	13
Thermal			
Small	3	-	3
Unregulated Fuels			
Large	-	1	1
Small	9	-	9
Total Project Measures	95	19	114
Unique Enrollments	91	10	101

Data Collection Activities

- Program Tracking Data Review
- In-depth Interview with Delivery Team
- Project Documentation Review and Site-specific Evaluation Plans
- Engineering Desk Reviews
- Participant Phone Surveys and Net-to-gross Surveys
- Onsite Verification and M&V – **High Rigor Sites Only**
- In-depth Interviews with Site Contacts – **High Rigor Sites Only**

Impact Analysis Methodology

- Gross Impact Evaluation
  - COVID-19, atypical operations, nonroutine events
  - Major reasons for adjustment
  - Gross Realization Rate
- Net Impact Evaluation
  - Free Ridership
  - Participant Spillover
- End-use Level Impacts Analysis

GRR = Verified Impacts / Tracked Impacts

NTGR = 1 – free ridership + spillover

Net-to-Gross Methodology

- Based on survey questions asked of participants during phone interviews
  - Interviews with engineers allowed for real-time consistency checks
- Calculated NTG consistent with past impact evaluations.
  - Free ridership: Average of Intent and Influence scores. Scores range between 0 and 1 for each participant.
  - Spillover: Calculated based on self-reports to a series of survey questions and follow-up with engineers

All-Encompassing - Gross Impact Analysis Results

	Electric Savings (kWh)	Winter Demand Savings (W kW)	Summer Demand Savings (S kW)	Natural Gas Savings (therms)	Unregulated Savings (MMBtu)
Total Program Ex Ante Gross Savings	23,609,593	2,827.30	2,664.42	610,263	96,540
Program Realization Rate	102%	136%	101%	93%	101%
Total Program Verified Gross Savings	**24,111,758**	**3,837.52**	**2,691.10**	**565,444**	**97,321**

Exclusions Removed - Gross Impact Analysis Results

	Electric Savings (kWh)	Winter Demand Savings (W kW)	Summer Demand Savings (S kW)	Natural Gas Savings (therms)	Unregulated Savings (MMBtu)
Total Program Ex Ante Gross Savings	20,989,457	2,384.50	2,644.92	610,263	96,540
Program Realization Rate	98%	99%	101%	93%	101%
Total Program Verified Gross Savings	**20,608,308**	**2,364.13**	**2,680.14**	**565,444**	**97,321**

- Five enrollments were determined to be unrepresentative of the program and were removed for the final impact results. This leads to a more conservative savings estimate than leaving these enrollments in the evaluation.
  - Four were efficient snowmaking equipment projects at ski resorts that did not have winter demand savings calculated in the original analysis.
  - One was an efficient snowmaking equipment project at a manufacturing facility that had major operational changes.

Net-to-gross Results

# of Participants	Free ridership	Spillover	NTG Ratio
67	0.0923	0.0365	94.42%

	Electric Savings (kWh)	Winter Demand Savings (W kW)	Summer Demand Savings (S kW)	Natural Gas Savings (therms)	Unregulated Fuels (MMBtu)
Total Program Verified Gross Savings	20,608,308	2,364.13	2,680.14	565,444	97,321
NTG Ratio	94.42%	94.42%	94.42%	94.42%	94.42%
Total Program Verified Net Savings	**19,458,365**	**2,232.21**	**2,530.59**	**533,892**	**91,891**

Indoor Agriculture Lighting

	Annual Energy Savings (kWh)	Annual Winter Demand Savings (W kW)	Annual Summer Demand Savings (S kW)	Annual Energy Savings NG (therms)	Annual Energy Savings Unregulated Fuels (MMBtu)
Total Program Ex Ante Gross Savings	4,584,781	797.68	864.86	(13,731)	(230)
Program Realization Rate	103%	95%	98%	130%	101%
Total Program Verified Gross Savings	4,701,692	754.60	844.22	(17,836)	(233)
NTG Ratio	94.42%	94.42%	94.42%	94.42%	94.42%
Total Verified Net Savings	**4,439,337**	**712.50**	**797.11**	**(16,841)**	**(220)**

Cost Benefit Results

- The evaluators used two cost benefit tests to verify the Program cost effectiveness
  - Primary Benefit Cost Test (PBCT)
  - Program Administrator Cost (PAC) test
- Both tests show the program to be cost-effective both in the Avoided Cost sets
  - AESC 2018 includes values for Maine T&D and was the avoided cost set active at the time the evaluated measures were implemented
  - AESC 2021 also includes Maine T&D values as well as a value for the Cost of Carbon. It is the current avoided cost set that would be used today

Avoided Cost Scenario	PBCT	PAC
AESC 2018	4.01	5.00
AESC 2021	8.19	9.76

C&I Custom Program Adjustment Factors

Program	Energy RR	Demand RR	Free ridership	Spillover
C&I Custom Program Adjustment Factors	98.18%	99.87%	9.23%	3.65%

Key Findings

- Findings:
  - Near 100% or over 100% overall realization rates for all impacts
    - Sufficient project documentation for robust calculations
  - The two most common reasons for adjustment were:
    - Hours of Use Adjustments
    - Calculation or Engineering Errors

Q&A