

Custom Industrial Impact Evaluation Results for Option 2 Utilities



May 11, 2023



Agenda

01 Background

02 Methodology

03 Findings

04 Questions and Next Steps

01

Background

Teams

BPA Core Team

Hanna Lee

Planning and Evaluation

Melissa Podeszwa
Dena Hilde

Energy Efficiency
Representatives

Michele Francisco

Marketing Specialist

Bonneville
POWER ADMINISTRATION



Contractor Team



Lauren Gage

Justin Spencer
Joe Van Clock
Caitie Nelson



Steve Grover

Tami Rasmussen

Ted Helvoigt
Kayla Kirksey
Ingo Bensch
Sarah Monohon



Mike Baker

Santiago Rodríguez-Anderson



This study is focused on Option 2 utilities

**The report for Option 1 utilities was
completed in July 2022**

Custom Industrial Impact Evaluation Objectives



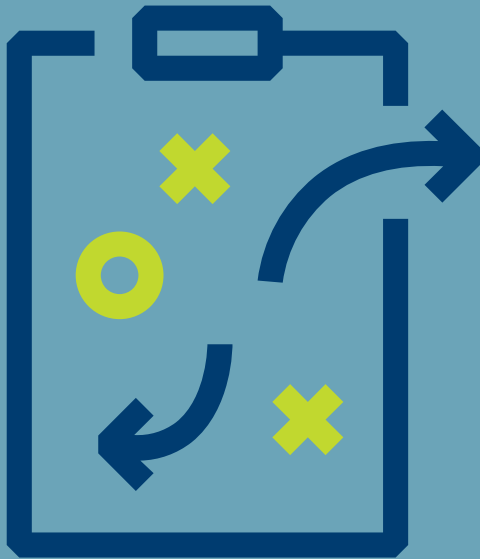
Estimate first-year savings and cost-effectiveness

Develop recommendations to improve reliability of savings

02

Methodology

Sampling Strategy

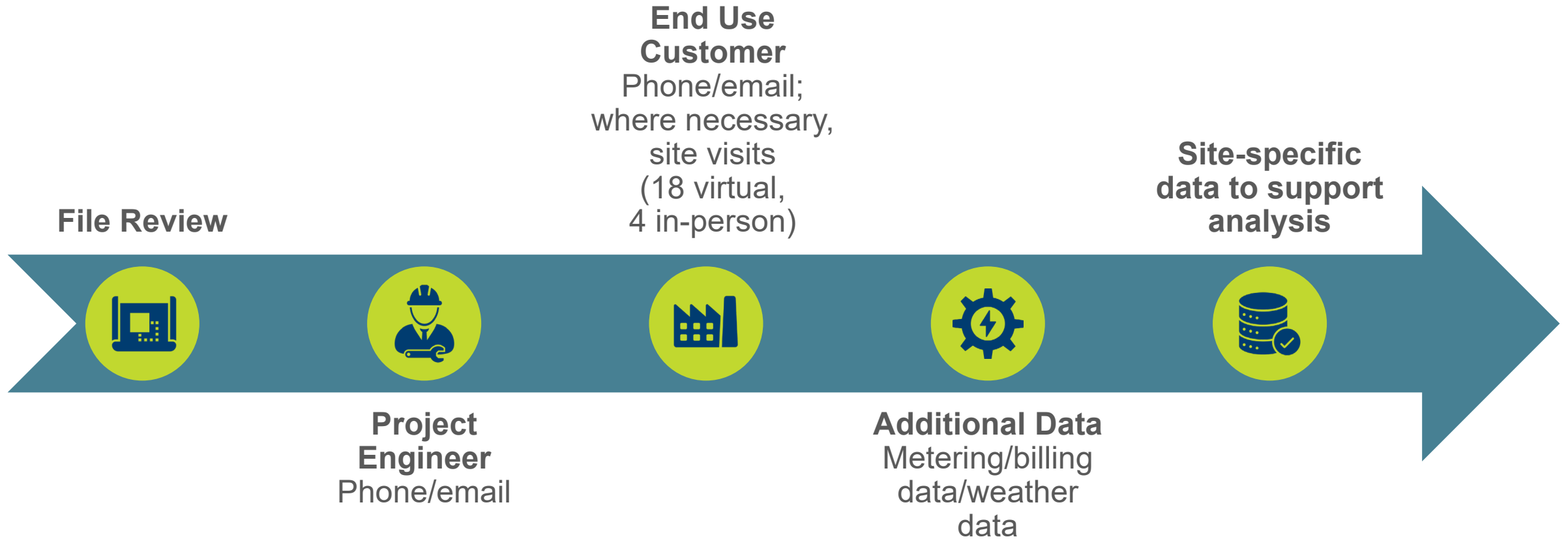


- Sampling unit: measure (TAP) for a single project at a distinct site
- Sample stratified by project size
- BPA strives for 90/10 on studies, minimum of 80/20
- This study achieved 90/2 (n=22)

Option 2 Custom Industrial Sample

End Use	Reported Savings	Number of Reported Measures	Sample Size (Measures)
Compressed Air	4,222,456	9	6
HVAC	657,271	4	3
Motors/Drives	431,588	5	3
Process Loads	2,812,584	5	5
Refrigeration	447,530	5	4
Water Heating	326,635	1	1
Total	8,898,065	29	22

Data Collection Process



Analysis Process



**Review M&V
Model**



**Collect
Supplemental
Data**



Run Model



**Estimate Site
Level Savings**



**Extrapolate
Site Results
to Option 2
Custom
Industrial
Population**



Additional Analyses



**Engineering Calculations
with Verification (ECwV)**



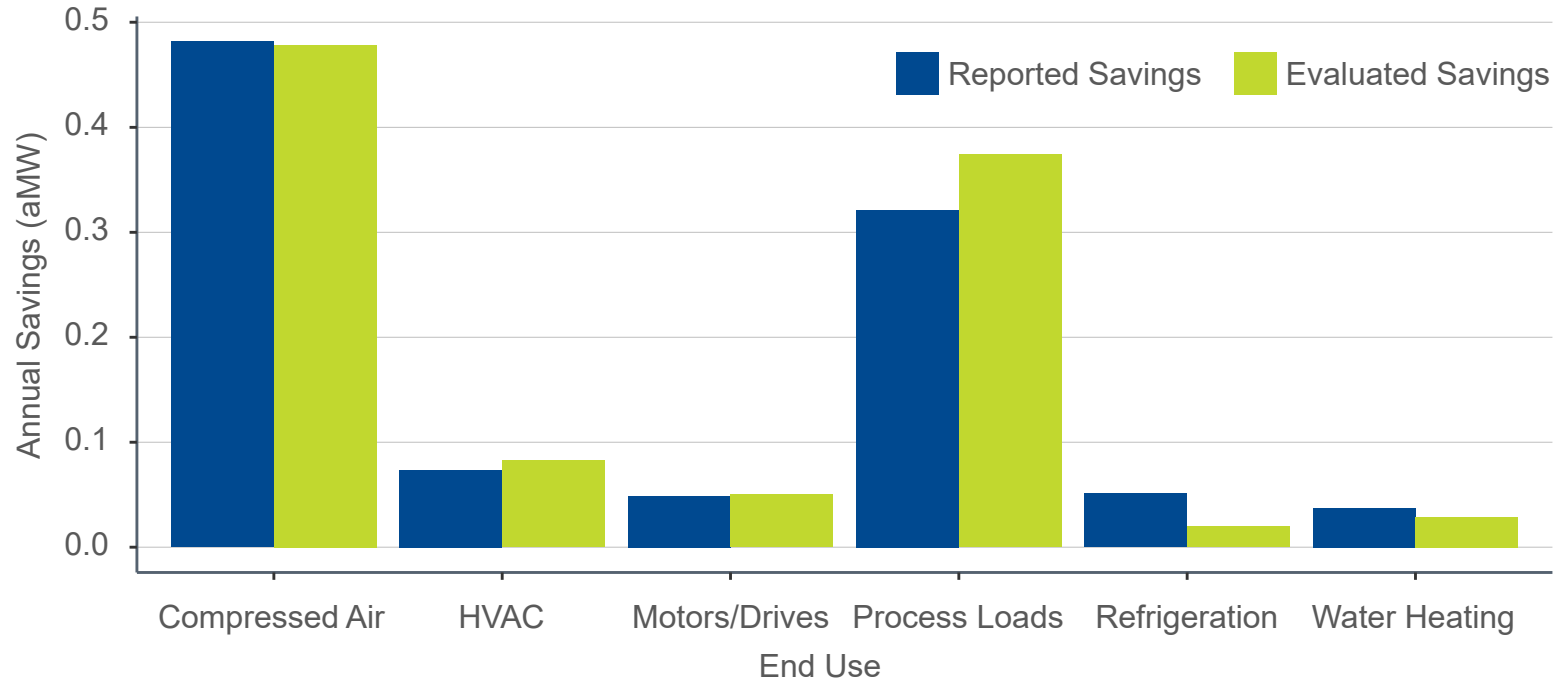
**Cost
Effectiveness**

03

Findings

Evaluated First Year Savings

Evaluated first-year savings by end use compared to reported savings by end use



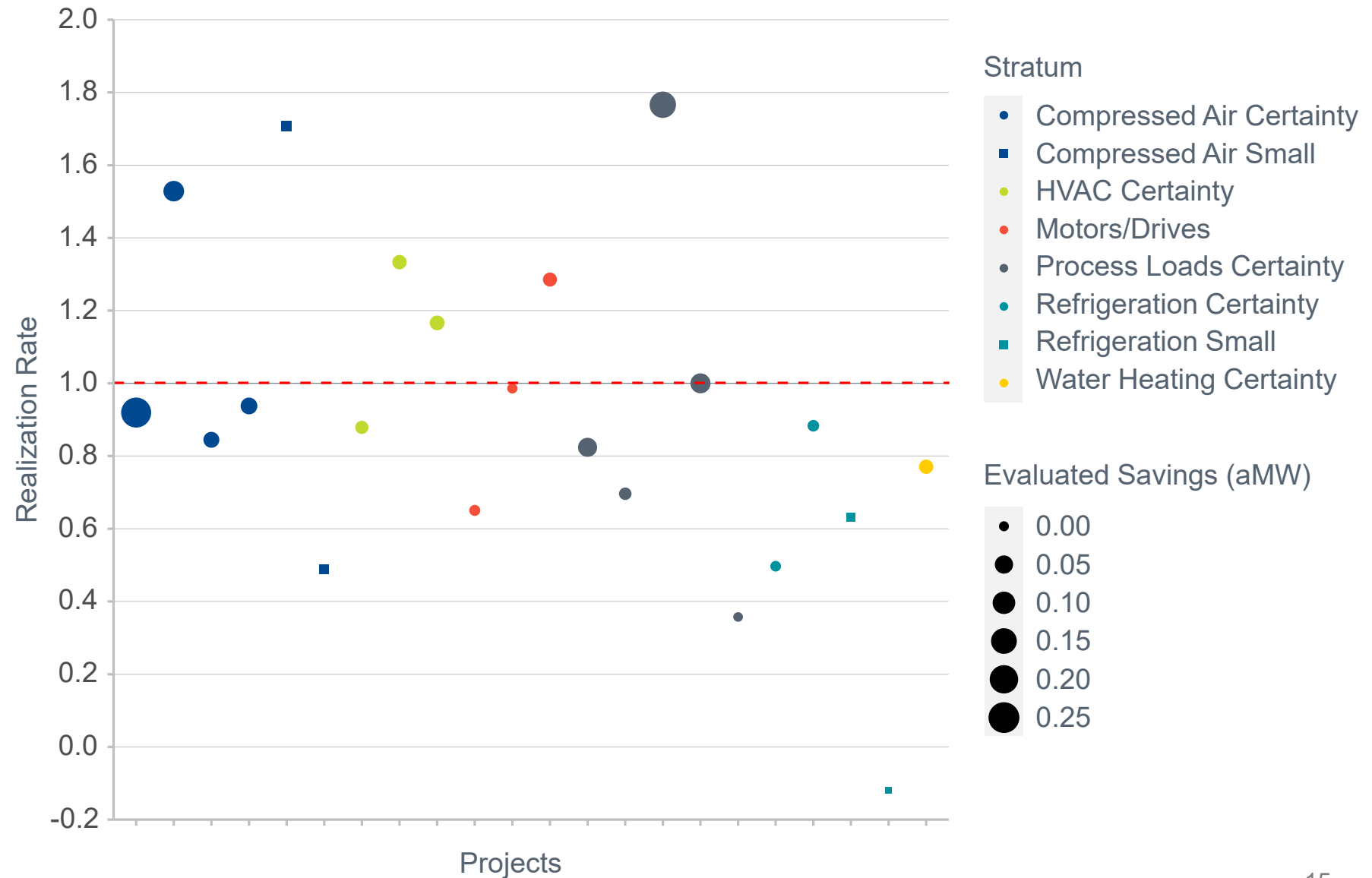
End Use	Realization Rate
Compressed Air	99%
HVAC	112%
Motors/Drives	103%
Process Loads	116%
Refrigeration	38%
Water Heating	77%
Total	102%

Evaluated savings were lower than reported savings for refrigeration and water heating, while the estimated savings for process loads and HVAC were higher than reported. Compressed air and motors/drives were close to the same as reported savings.

Realization Rates by Project

Project measure-level realization rates

Results at the project measure level were highly variable, with realization rates ranging from -0.2 to 1.8.



Key Drivers of Savings Differences



Negative Impact on Realization Rate

- Evaluation used logged kW instead of amps
- Removal of strip curtains
- Differences in observed operating conditions



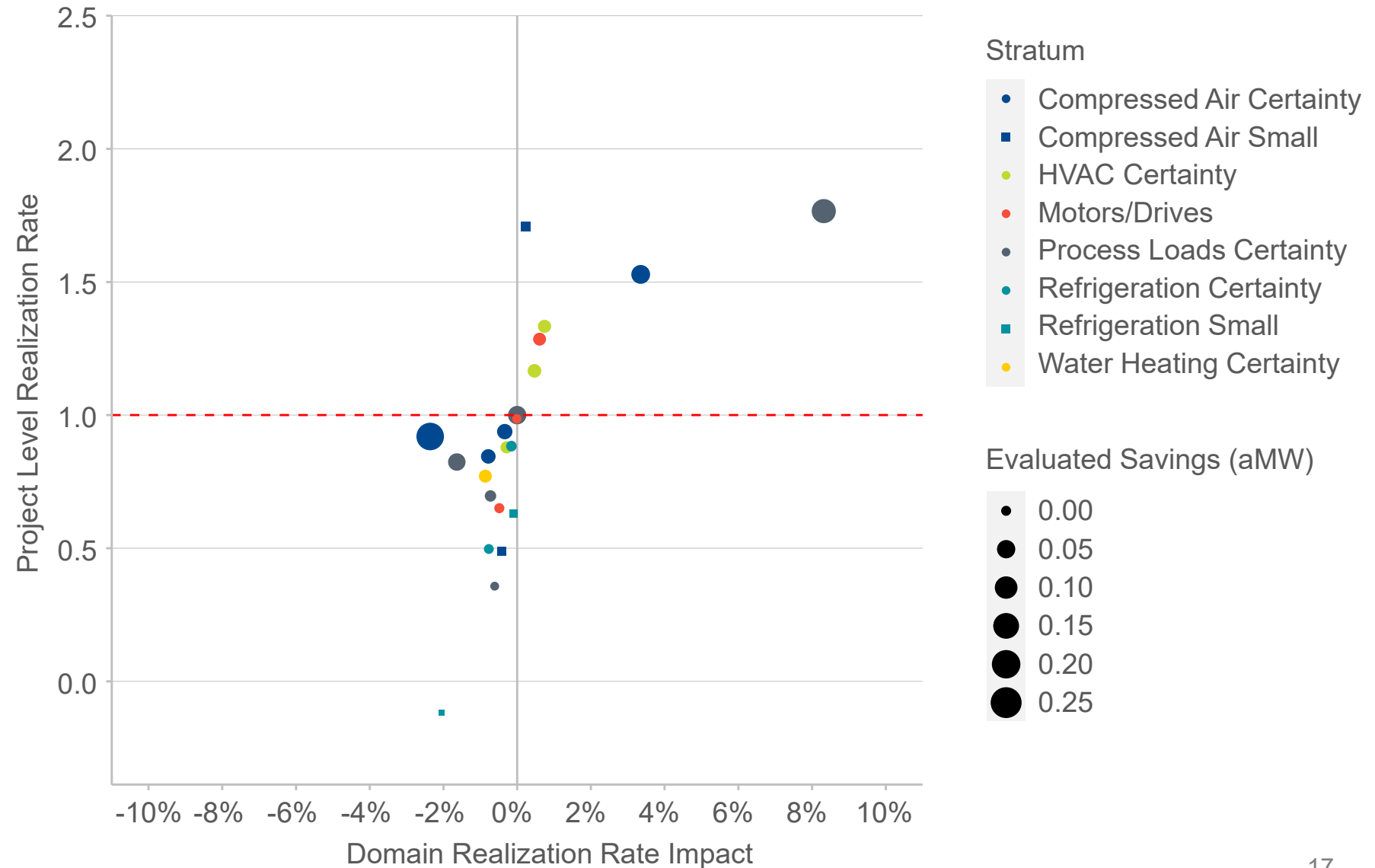
Positive Impact on Realization Rate

- Use of a fixed power factor instead of actual operation
- Use of a deemed savings value that was lower than collected data

Project Measure Impact on Realization Rates

Project measure impact map

There is a lot of variation in realization rates, with little correlation by size of project





Cost Effectiveness Results

- Custom Industrial projects for Option 2 Utilities are highly cost effective
- Ratio of Benefits to Costs is 4.9 (\$4.89 in benefits for every \$1 spent)



COVID-19 Impacts on Savings

- Evaluators collected information on any adjustments to facility operations due to COVID-19
- There were few adjustments made

Key Findings and Recommendations

Overall realization rate was 102%, with high variability.

Key Finding

BPA M&V protocols were generally followed, but savings were not always estimated for the first year post implementation.

Some energy models are not consistent with regional Custom Project practices.

Small and medium-sized projects showed similar results in evaluated results using the BPA ECwV protocol or high-rigor M&V methods.

Recommendation

BPA should clarify requirements for the basis year of savings in the BPA implementation manual.

BPA should offer training and access for Option 2 utilities to BPA's solutions for common measures.

BPA should consider applying ECwV to a wider size range of projects and promote the use of ECwV to Option 2 utilities as a vetted M&V approach for smaller projects.

Evaluation Considerations

Key Finding

COVID-19 did not have a substantive impact on evaluated savings.

The evaluation results do not differ substantially by end use and the realized sampling precision was much better than expected.

Recommendation

It is not necessary to collect a second set of results that attempt to factor in the impacts of COVID-19 on realized savings.

The sample size could be lower and the end use stratification could be dropped.

04

Questions / Next Steps

What's Coming Up Next



Final report posted to BPA website

*BPA response to recommendations
(Memo addressing the evaluation findings,
recommendations and BPA plans for change)*

Thank You!



Utilities



Program Participants



Program Team