B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

BPA NONRESIDENTIAL LIGHTING IMPACT EVALUATION

December 5, 2024

Agenda

01 Background

02 Methodology

03 Findings

04 Program Response

05 Next Steps and Q&A

01
Background

Teams

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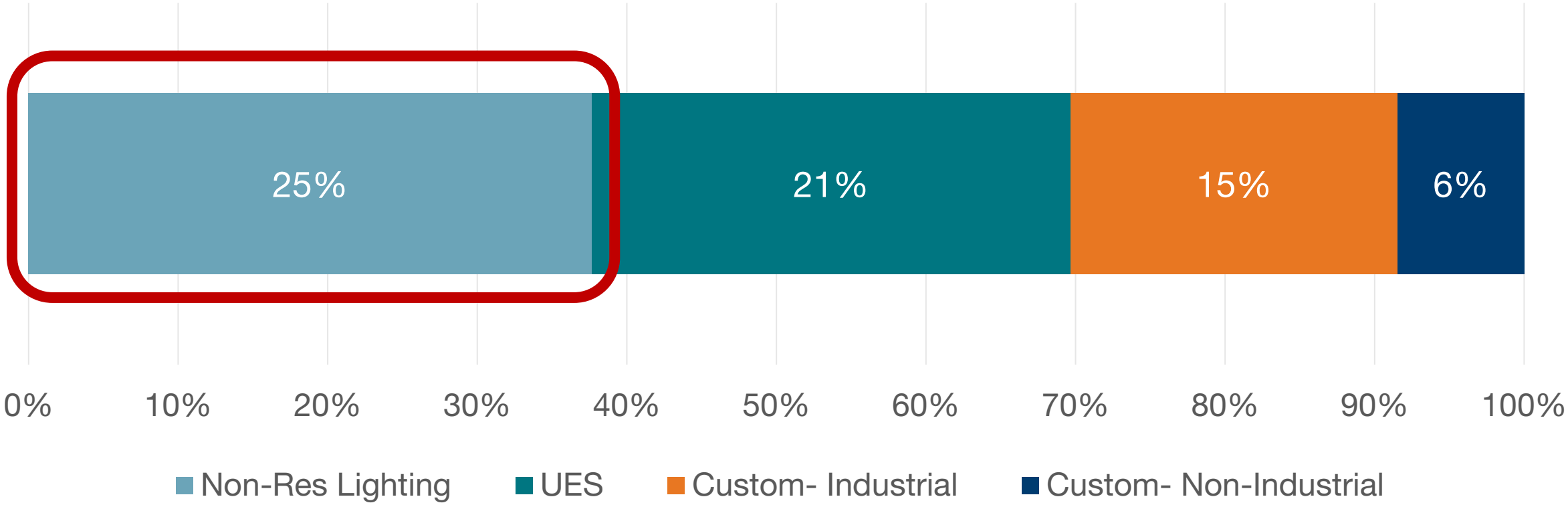
How We Got Here

- **July: Final report** posted to BPA website
- **October: New Evaluation Lead** hired
- **December: Results webinar** held

2020-2021 Portfolio Savings: By Measure Type

Lighting calculators are the largest single share of the portfolio, followed by UES and Industrial Custom Projects.



*Non-Industrial includes commercial, agricultural and residential projects.

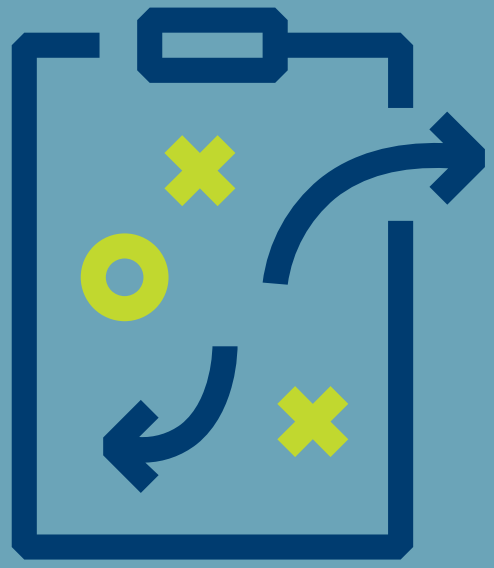
Nonresidential Lighting Evaluation Objectives

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 Option 1 v. Option 2 utility and project size
- BPA strives for 90/10 on studies, minimum of 80/20
- This study achieved 90/4 (n=38 projects)

Nonresidential Lighting Study Sample

Utility Type	Size Strata	Reported Savings (kWh)	Number of Reported Projects	Sample Size (Projects)
Option 1	0	610,346	180	0
	1	11,136,371	499	4
	2	11,146,229	105	5
	3	11,058,927	35	5
	4	11,316,272	18	5
	Subtotal	45,268,145	837	18
Option 2	0	113,180	30	0
	1	5,908,192	226	4
	2	5,874,016	52	4
	3	5,817,138	23	5
	4	6,252,851	10	5
	Certainty	4,013,697	2	2
	Subtotal	27,979,074	343	20
Total		**73,247,219**	**1,180**	**38**

Data Collection Process

File Review

Project Engineer
Phone/email

End Use Customer
Phone/email; where necessary, site visits (27 virtual,11 in-person)

Additional Data
Metering/billing data/weather data

Site-specific data to support analysis

Analysis Process

Review existing BPA lighting calculator

Assess model inputs and incorporate supplemental data if needed

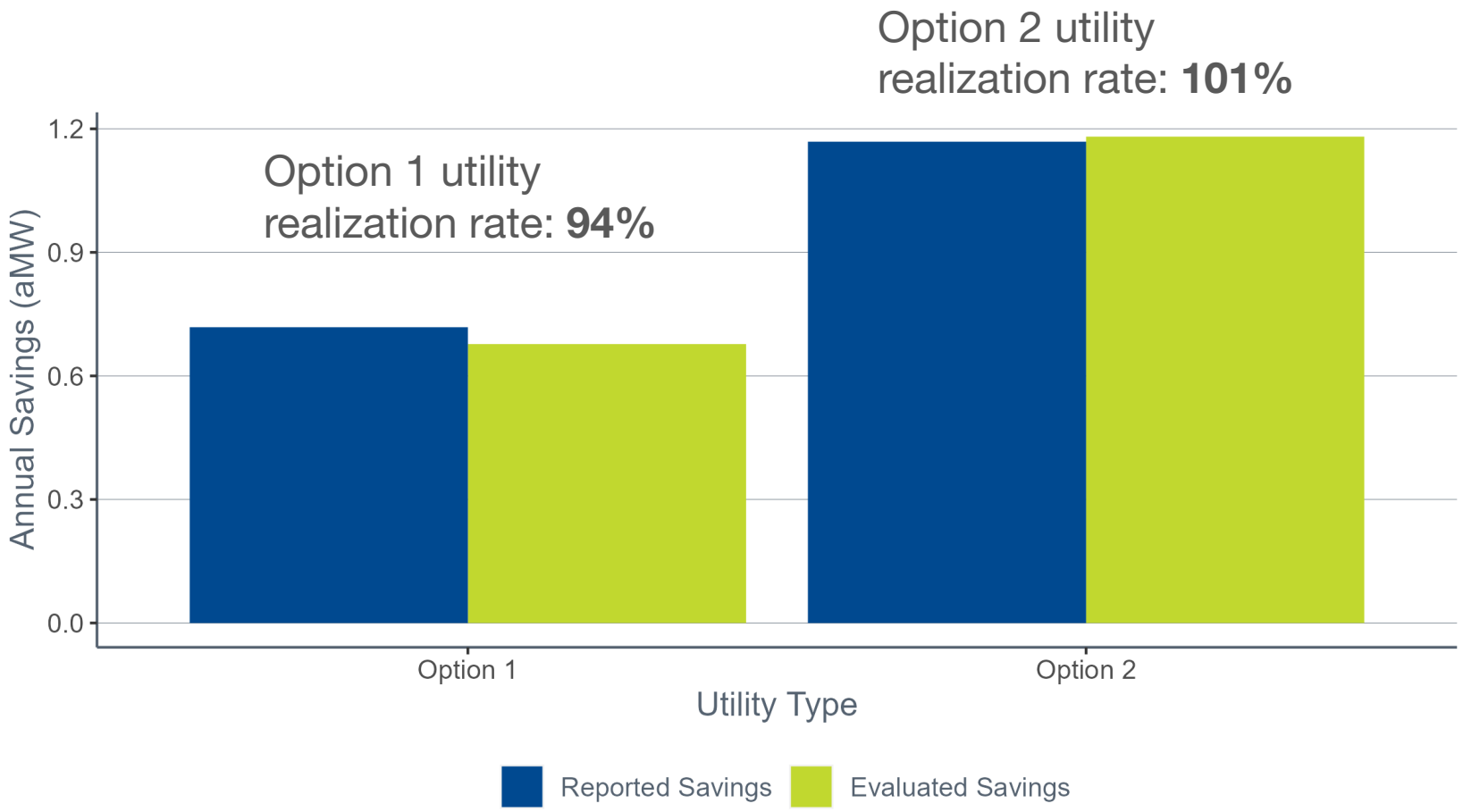
Run the model and estimate site level savings

Extrapolate site savings to nonresidential lighting portfolio

03
Findings

Evaluated First Year Savings

Evaluated first-year savings by utility type compared to reported savings



Evaluated savings were slightly lower than reported savings for Option 1 sites while they were slightly higher than reported for Option 2 sites.

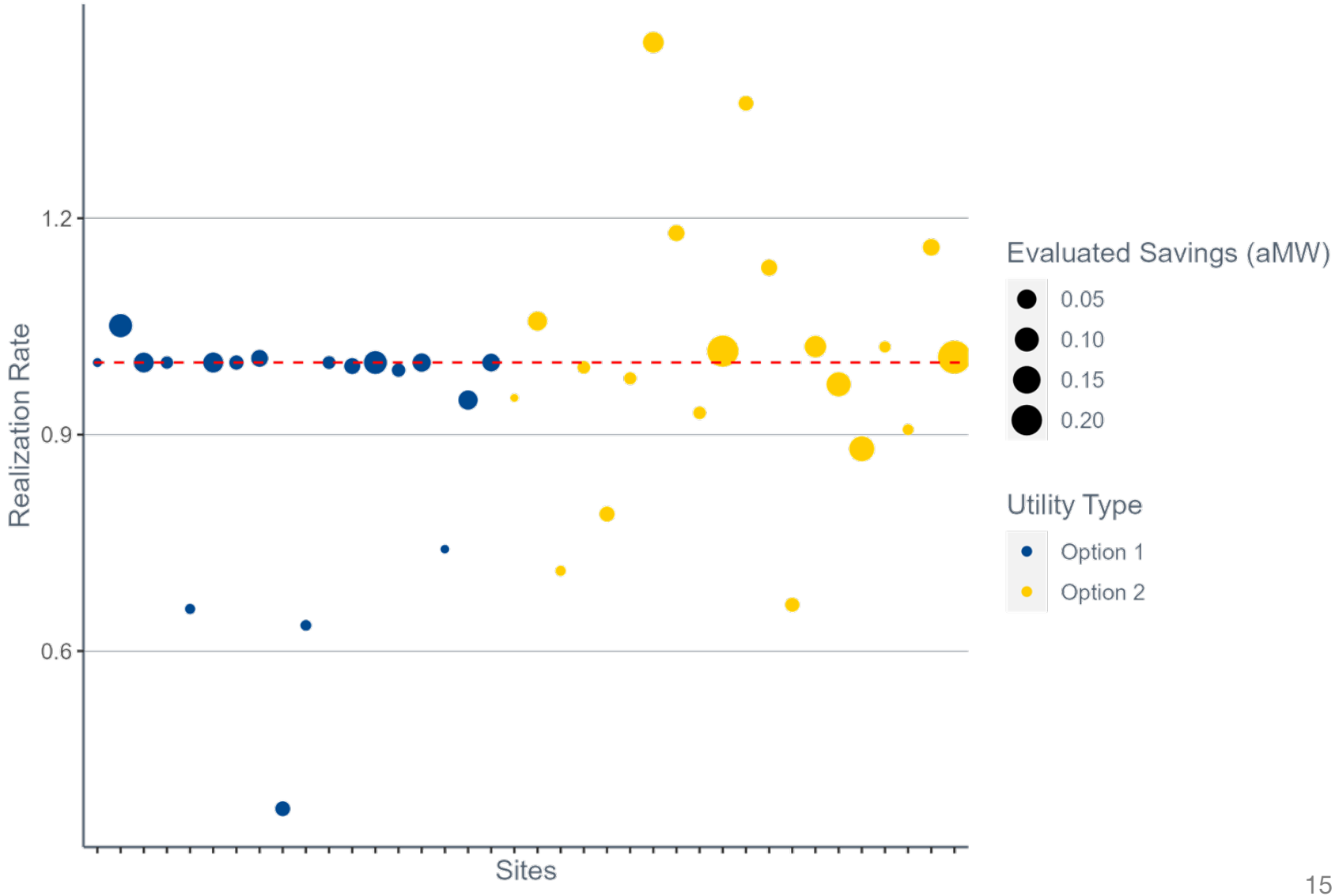
The overall realization rate was 98 percent.

Realization rate: the ratio of evaluation savings to reported savings

Realization Rates by Project

Project measure-level realization rates

Results at the project measure level varied, with realization rates ranging from 0.4 to 1.4.



Key Drivers of Savings Differences

Negative Impact on Realization Rate

- Miscount of delamping measures
- Use of a customized HVAC interactive measure that was too high

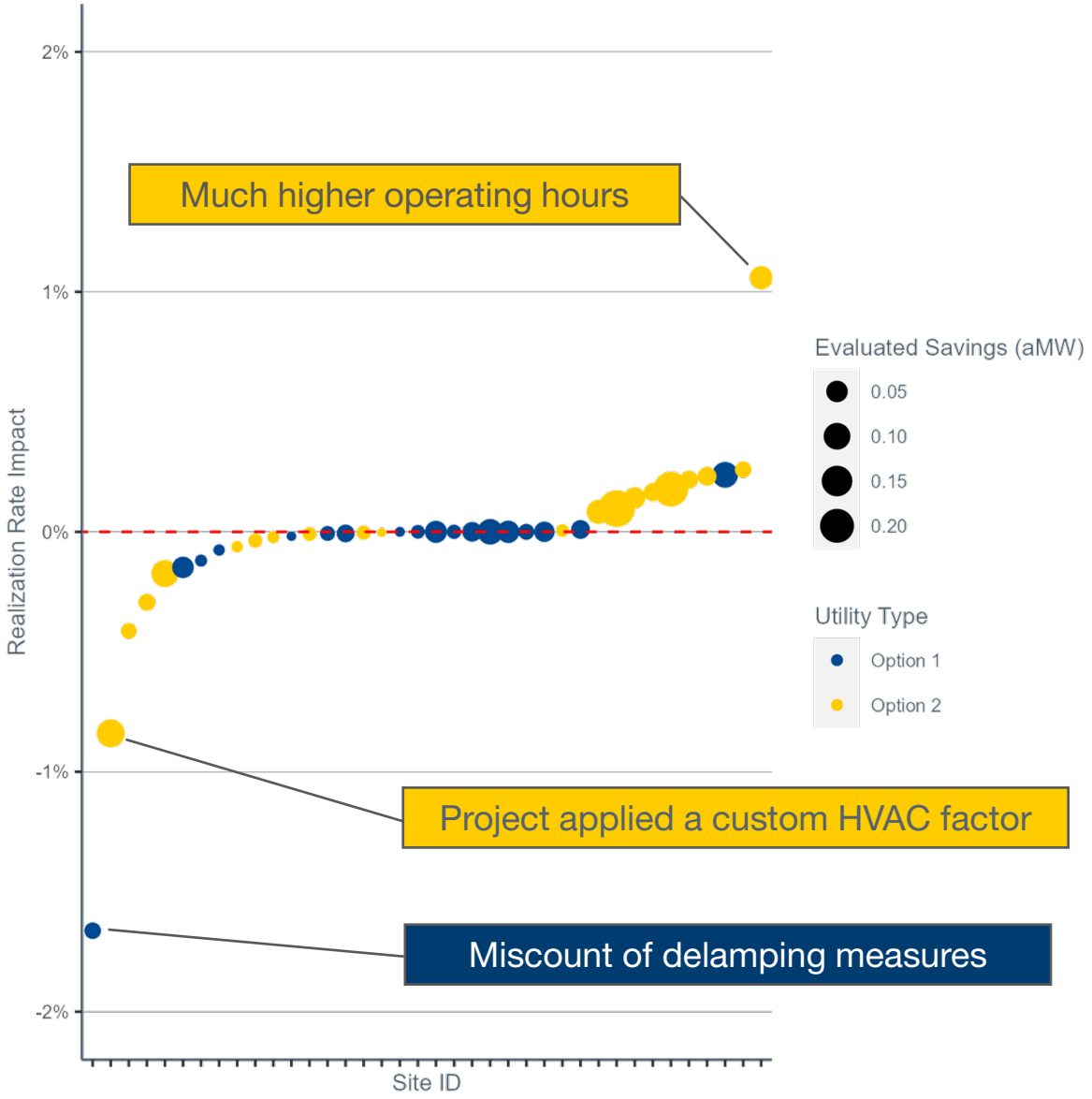
Positive Impact on Realization Rate

- Higher operating hours than reported at a large site

Project Measure Impact on Realization Rates

Project measure impact map

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



Cost Effectiveness Results

- Nonresidential lighting projects are cost effective
- Ratio of Benefits to Costs is 1.99 ($1.99 in benefits for every $1 spent)

Key Findings and Recommendations

Overall realization rate was 98 percent.

Key Finding	Recommendation
Option 2 utilities systematically report savings 1.5% higher than Option 1 utilities as a result of using a higher busbar factor.	BPA should consider updating its policy and processes regarding busbar factors to ensure consistent and fair reporting across Option 1 and 2 utilities.
Indoor agriculture lighting does not fit with typical lighting use cases and requires different treatment than other lighting measures.	BPA should consider reclassifying indoor agricultural lighting so savings are calculated correctly.

Additional Findings and Considerations

Key Finding	Considerations
Gas heating penalties are not reported in Option 2 project documentation, and both Option 1 and Option 2 utilities are not publishing gas heating penalties in end use customer project proposals.	BPA and utilities should consider publishing their estimated gas penalties and cost impact up front along with the estimated electric savings in the project proposal to better inform the end user.
The BPA lighting calculator introduces uncertainty in wattage calculations for some lighting types.	BPA should consider updating its lighting calculator to offer more flexibility in wattage reporting.

04
Program Response

Response to Key Findings

Key Finding	Response
Overall Realization Rate was 98%	BPA is encouraged by this finding which demonstrates that the current approaches to reviewing projects for accuracy are largely effective.
Key drivers of variance in realization rate were operating hours, HVAC interactive effects, and lamp counts	BPA will continue to conduct strategic oversight to minimize the impact of these variances at the portfolio level.

Response to Key Findings

Key Finding	Response
Nonresidential lighting projects are cost effective: Ratio of Benefits to Costs is 1.99.	BPA is encouraged by this finding using 7th Power Plan inputs. Additional attention is being paid to ensure costs and maintenance savings are appropriately accounted for since the avoided cost from the 2021 Power Plan is significantly lower.
Gas heating penalties are not reported consistently and are not published in end use customer project proposals.	While relatively small in impact, a true accounting of project economics will include the heating penalty. BPA will investigate opportunity to update tools and processes accordingly.

Response to Key Findings

Key Finding	Response
Option 2 utilities systematically report savings 1.5% higher than Option 1 utilities as a result of using a higher busbar factor.	This discrepancy is the result of different methodologies prescribed for custom projects vs. those using the BPA Non-residential Lighting Calculator. BPA will investigate the opportunity to align these processes.
Indoor agriculture lighting does not fit with typical lighting use cases and requires different treatment than other lighting measures.	BPA will shift indoor agricultural lighting to the custom projects process to better account for the unique variables compared to lighting for human visibility.

05

Q&A

Thank You!

Utilities

Program Participants

Program Team