NAVIGANT

Bonneville
POWER ADMINISTRATION

Impact Evaluation of FY2015 Residential Lighting UES Measures

February 2017

Why Evaluation

What do we all want?

Energy efficiency programs that save customers money and energy.

To be trustworthy stewards of their money.

Evaluation

What did we achieve?

How do we improve?

Impact Evaluation

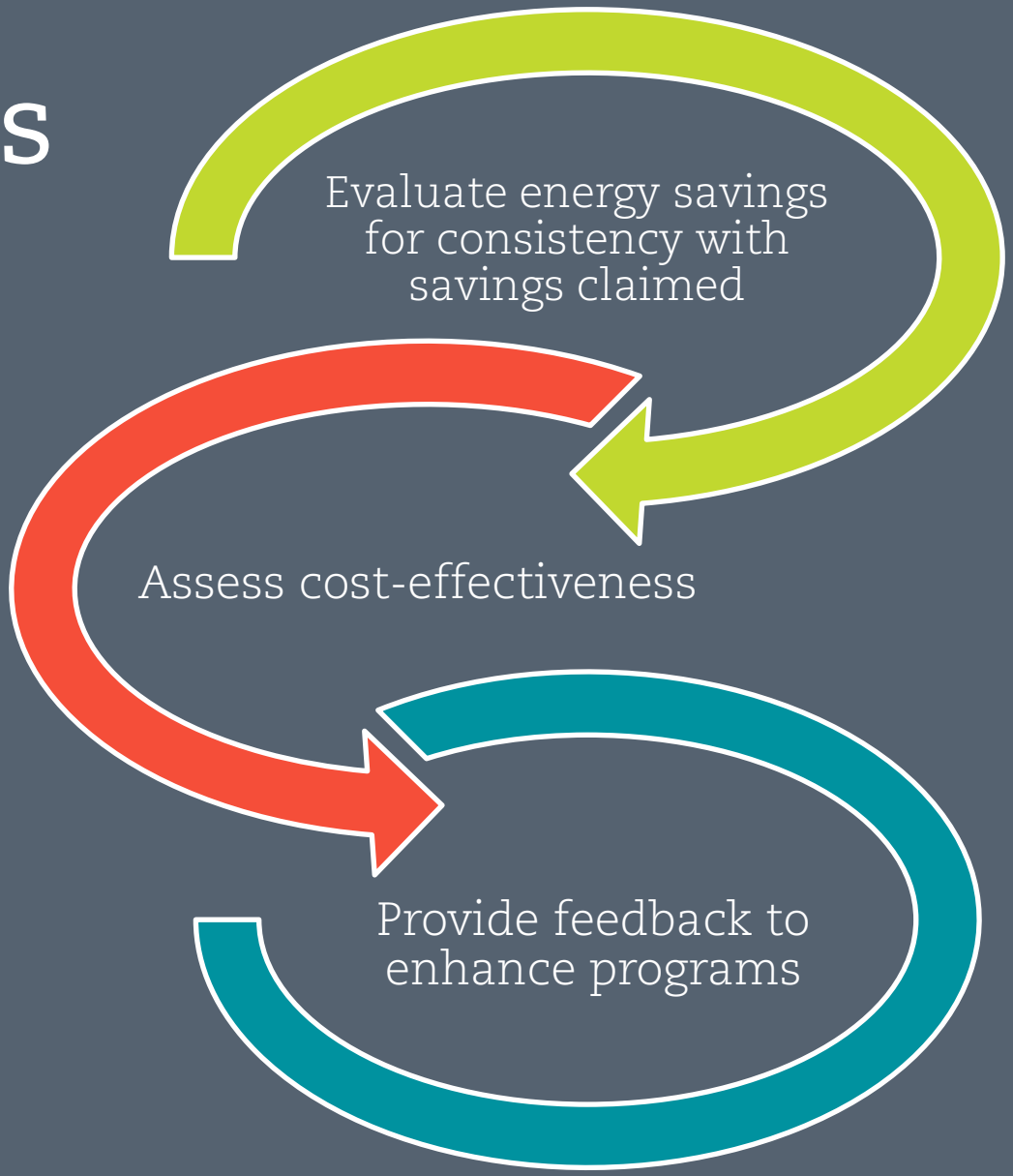
Savings reliability with independent verification

+

Program improvement opportunities

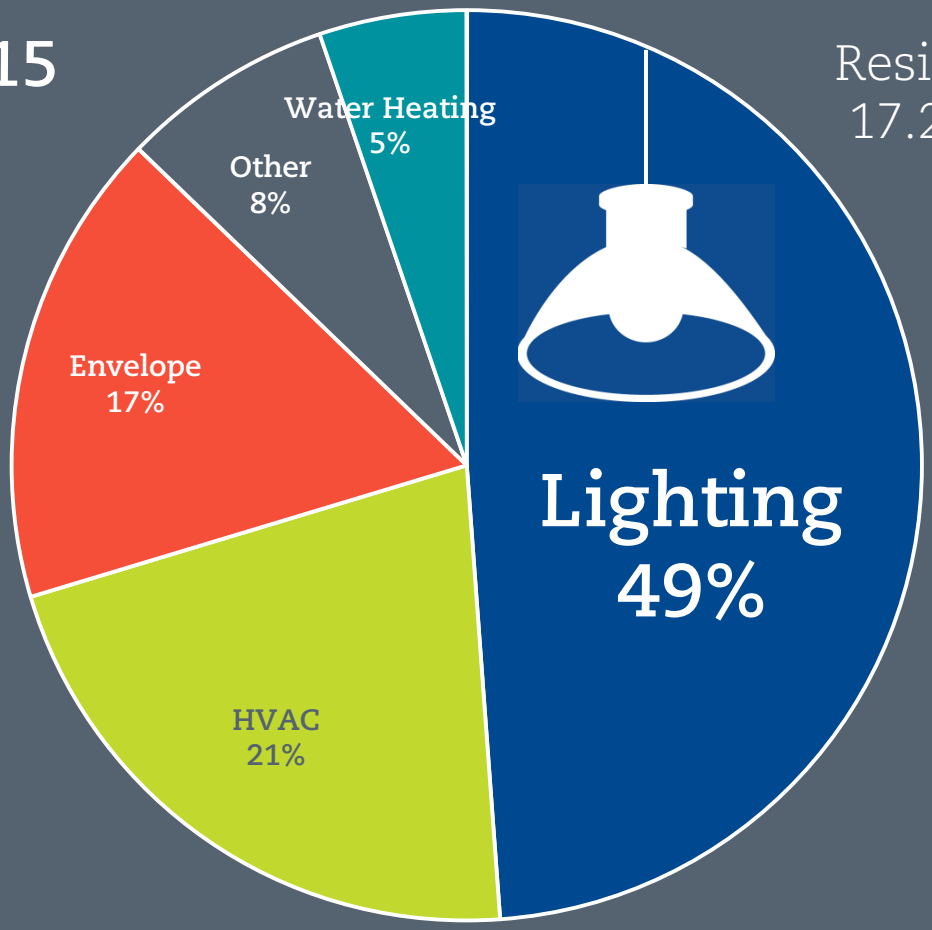
FY2015 Lighting Evaluation Background

Objectives


Evaluate energy savings for consistency with savings claimed
Assess cost-effectiveness
Provide feedback to enhance programs

Largest Contributor to UES

FY2015



Residential
17.2 aMW

Commercial
1.0 aMW*

Ag/Industrial
1.1 aMW**

Source: Summarized from BPA's IS2.0 database, accessed 3/18/2016
** Savings from Energy Smart Grocers deemed measures are not included in this summary.*
*** Ag/Industrial value does not include savings achieved through the Scientific Irrigation Scheduling measure.*

Streams of Savings

Utility Reported

Utility-Run

Utility efficiency programs

Simple Steps

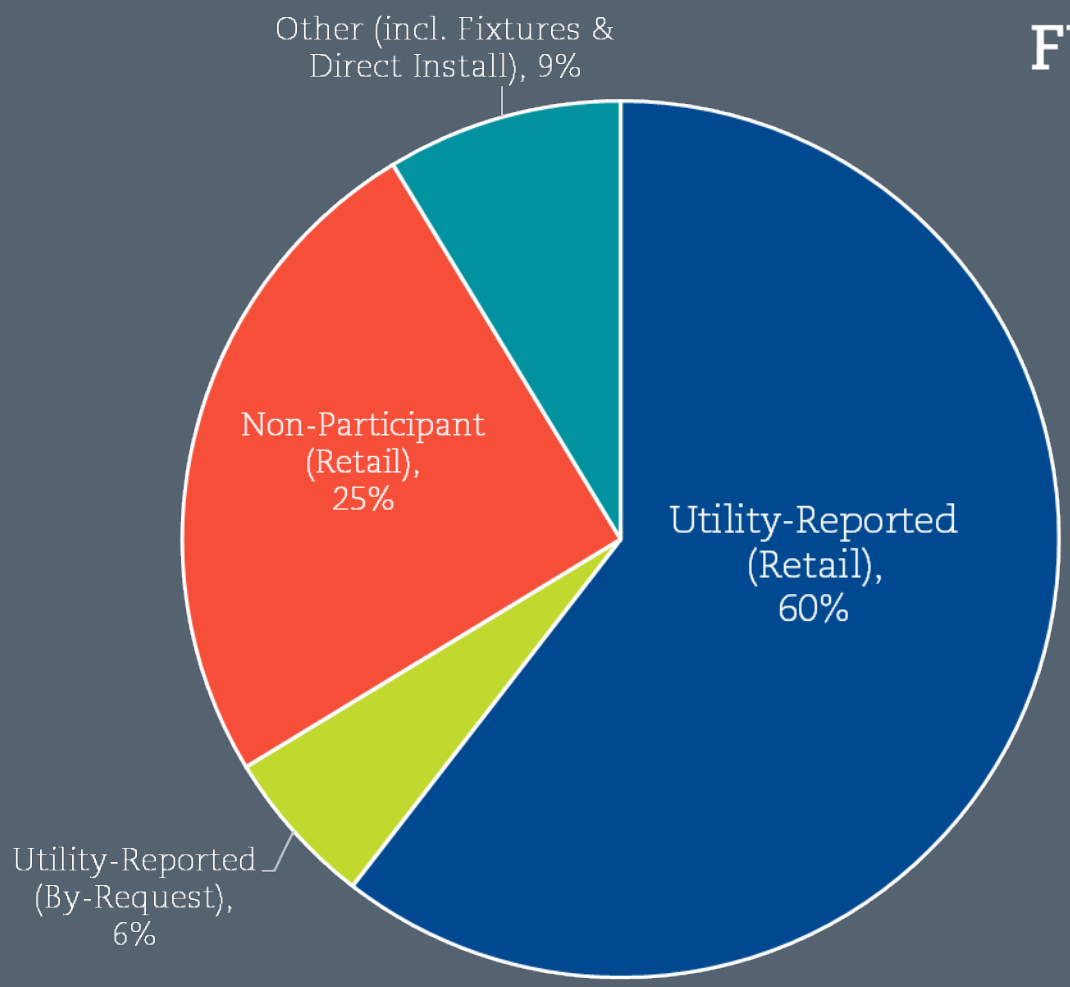
Utilities participating in Simple Steps

Non-Participant

Simple Steps measures not tied to a reporting utility

The sample population included 0.66 aMW of reported participant savings, 0.159 aMW of non-participant savings and 0.818 aMW of savings from utility-run programs in FY2015. The use of identical RefNos between Simple Steps and utility-run programs makes a portfolio-level breakdown of savings impossible to calculate.

Savings Breakdown by Stream



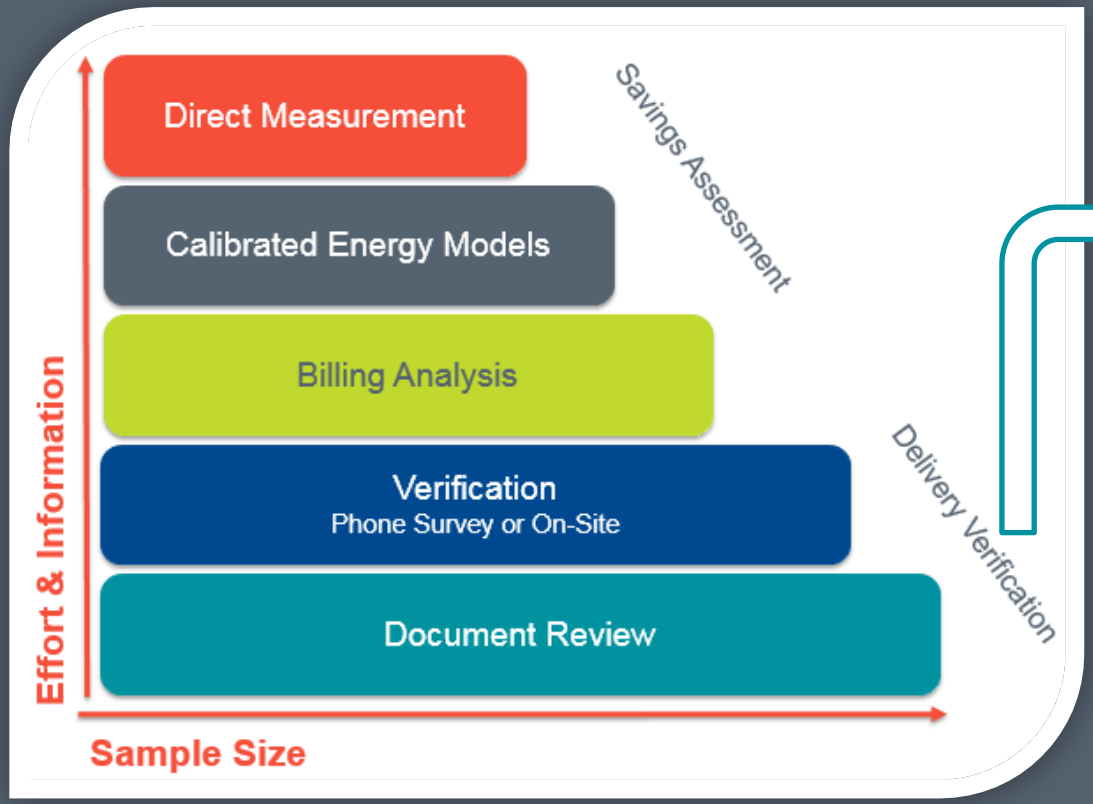
FY2015 Total
8.4 aMW

'Utility-reported' includes both Simple Step participant and utility-run program measures.

Source: Summarized from BPA's IS2.0 database, accessed 3/18/2016

Evaluation Approach

Proven Measures Allow for Delivery Verification



Res Lighting Measure Status	Fraction of Savings
Proven	95%
BPA Qualified (CFL Fixtures)	5%

Delivery Verification Requirements

Source: RTF, First Batch of DV Requirements, May 2015

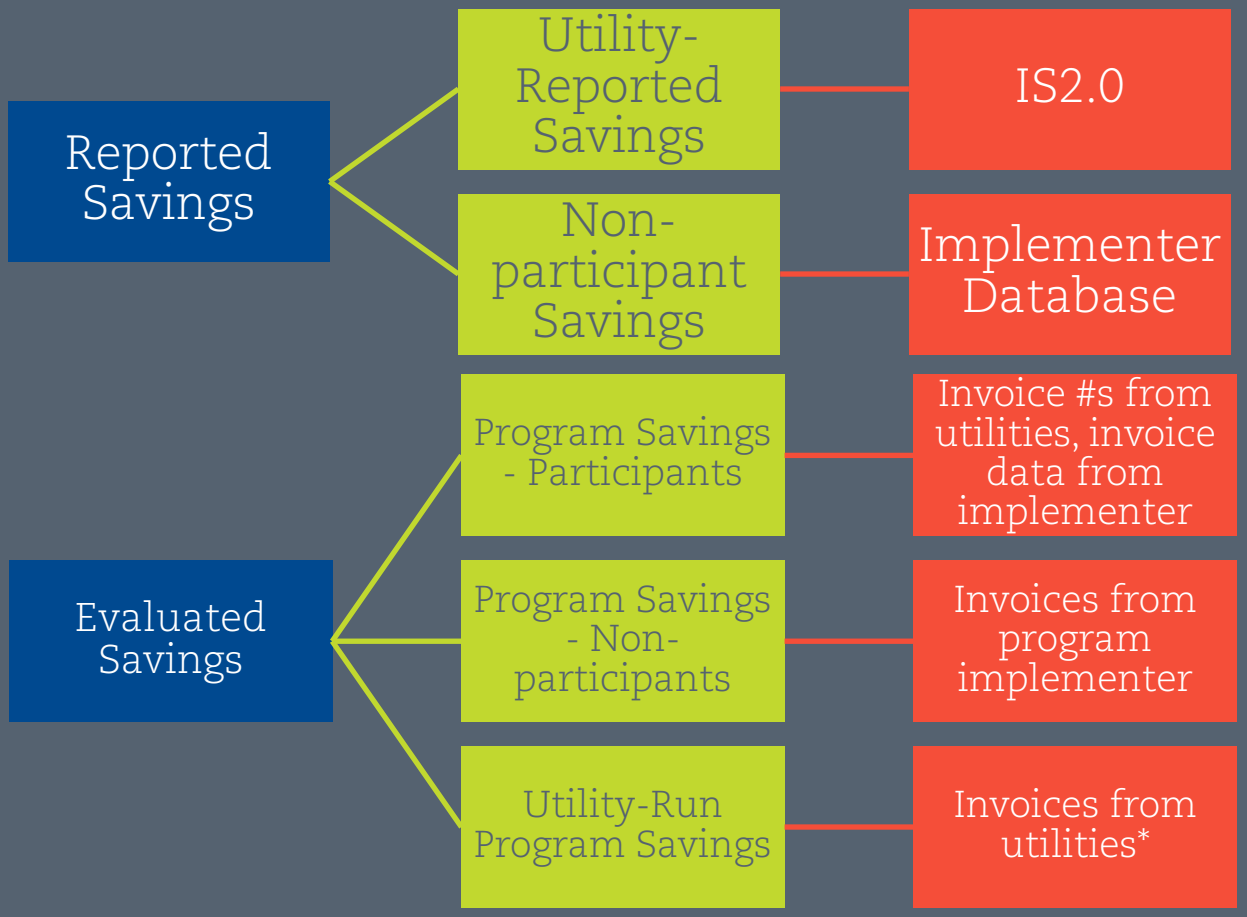
Sample Design

Two-stage cluster design to minimize utility burden and achieve target confidence.

Measure Group	Utilities (FY2015)	Reported Projects* (FY2015)	FY2015 Reported Savings (aMW)	Sampled Utilities**	Sampled Projects*	Sampled Savings (aMW)	% of Total FY2015 Savings Sampled
Retail	55	3,194	5.09	7	70	0.55	11%
By-Request	43	337	0.49	6	40	0.34	68%

**Line items in IS2.0*
***Some utilities were sample for both Retail and By-Request projects. 9 total utilities are included in this sample.*
Note: The evaluation team also collected data for a small sample of Direct Install and Fixtures projects to inform future evaluation planning.
Source: Navigant

Data Sources



**Some utility programs were run by the same third party implementer as the Simple Steps program. For those utilities, the third party implementer provided invoices directly to the evaluation team.*
Source: Navigant

Verification Approach

Verified

No discrepancies between the project documentation and the reported savings

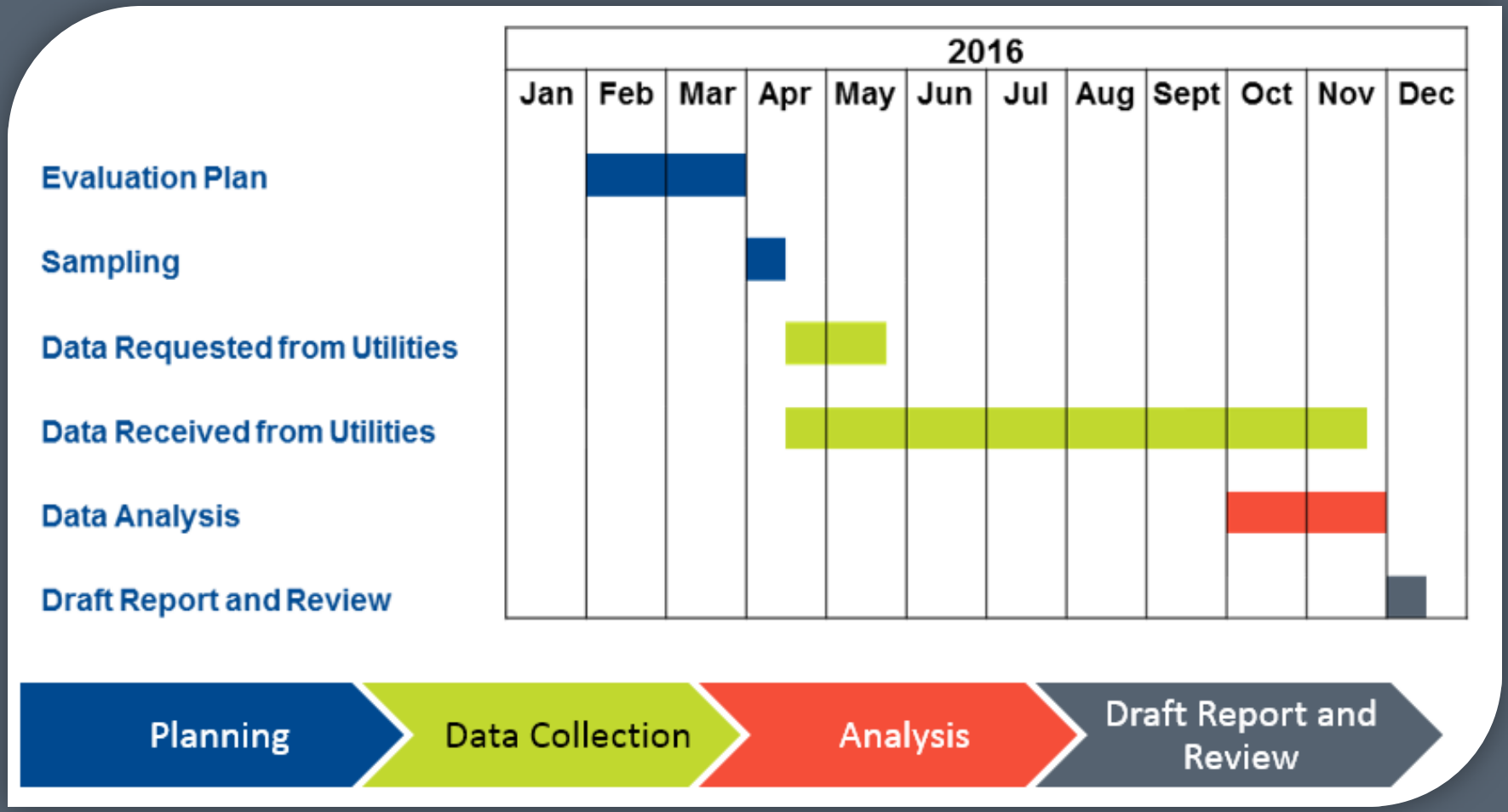
Revised

Project documentation revealed incorrect UES reported, evaluation revised to the appropriate UES value

No Savings

Required data was missing in the project documentation, team assigned zero savings

Data Collection Timeline



Realization Rate

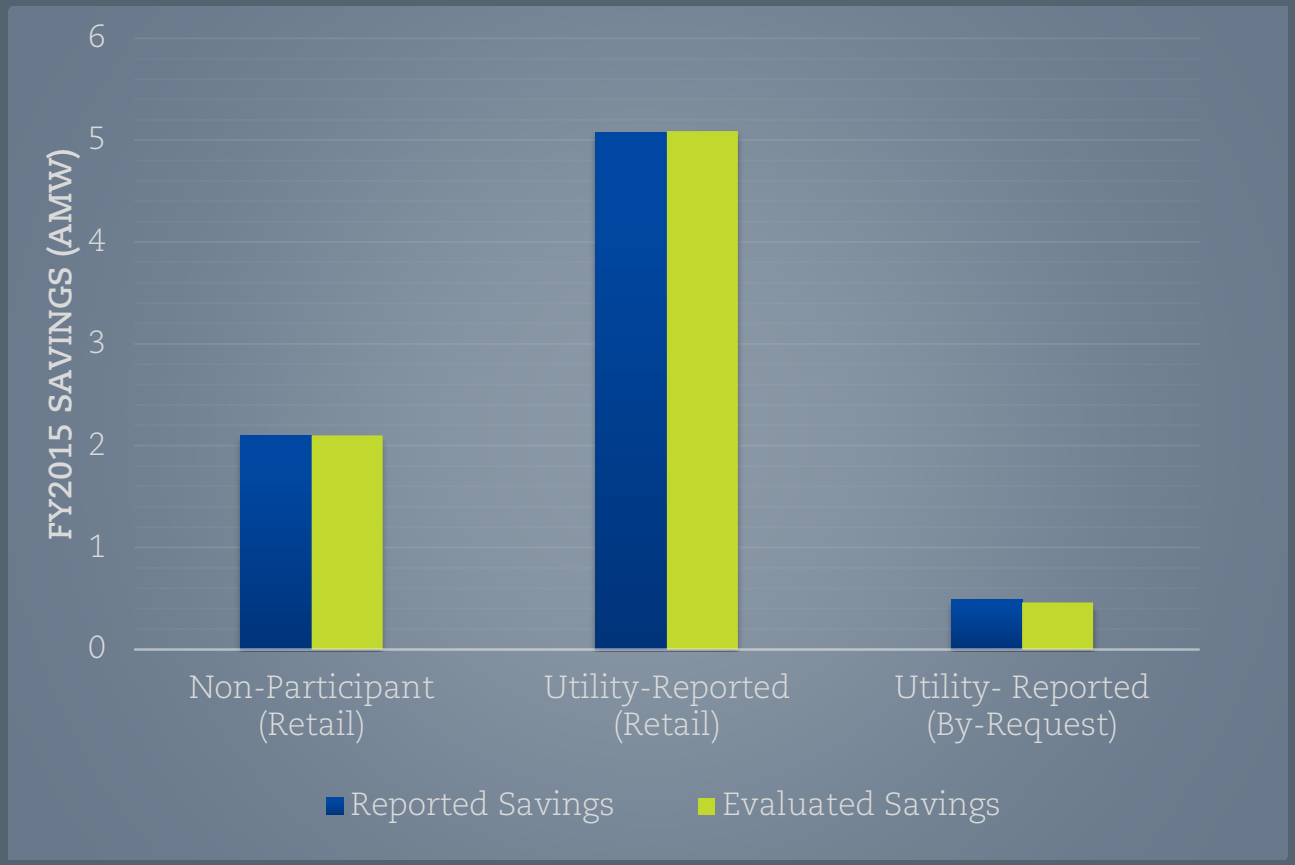
$$\frac{\text{Evaluated Savings}}{\text{Reported Savings}} = \text{Realization Rate}$$

Realization rates greater than 1 mean that we found ***more savings*** than was reported

Realization rates less than 1 mean ***fewer savings*** were found

Results

Evaluation Verified Reported Savings



Source: Navigant

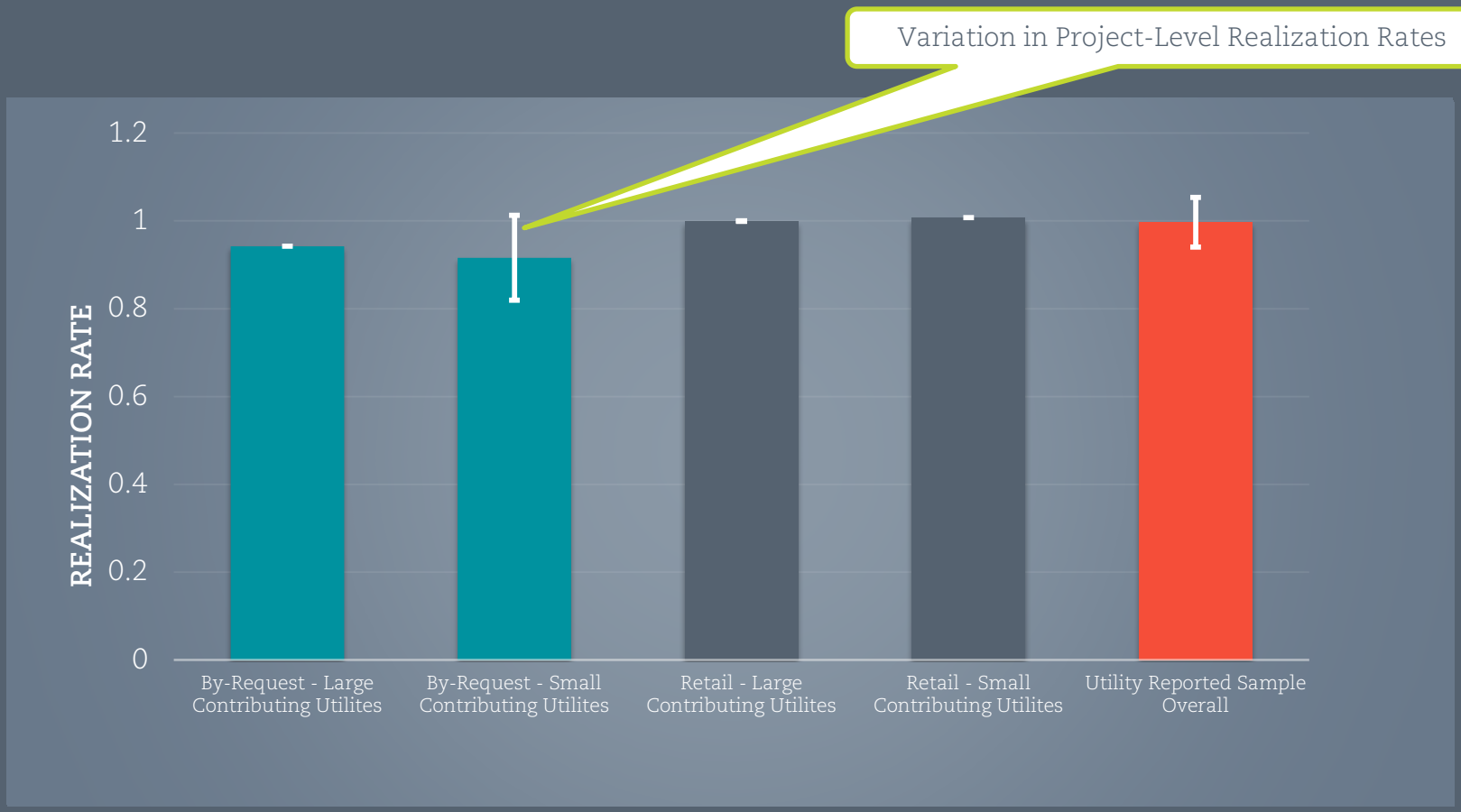
Project documentation aligns very closely to reported data for Retail and By-Request measures

Detailed Results

Delivery Mechanism	Reported Savings (aMW)	Evaluated Savings (aMW)*	Population-Level Realization Rate
Non-Participant (Retail Only)	2.10	2.10	1.00
Utility-Reported	5.58	5.55	0.995
Retail	5.08	5.09	1.002
By-Request	0.49	0.46	0.929
Total Savings	7.68	7.65	N/A**

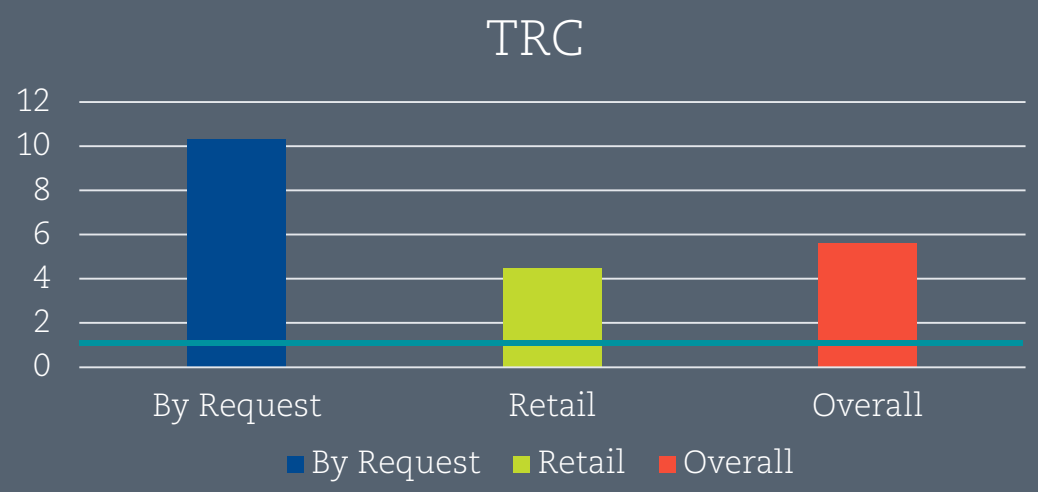
**Savings from Fixture and Direct Install measures not included because a statistically significant sample was not drawn. The evaluation team reviewed these measures solely to inform future evaluations.*
***Participant and Non-Participant realization rates cannot be aggregated because of different sampling mechanisms.*
Source: Navigant

By-Request Shows Variation but has Minimal Impact Overall



Note: Excludes non-participant savings. Those projects were sampled separately and had a realization rate of 1 with no variation.
Source: Navigant

Savings Were Cost Effective



Measure Group	Present Value of Benefits	Present Value of Costs	Total Resource Benefit/Cost Ratio
Retail	$6,773,640	$1,494,617	4.5
By-Request	$3,480,865	$336,918	10.3
Total	$10,254,505	$1,831,535	5.6

Note: Non-participant savings not included in cost-effectiveness analysis.
Source: ProCost analysis using 7th Power Plan inputs

Findings

Nearly All Reported Savings Accounted For in Project Documentation!

Retail Measures. Project documentation was consistent with reported savings

Simple Steps program. Implementer has streamlined mapping and maintains comprehensive data

By-Request measures. Project documentation included a few instances of miscategorized measures (RefNos) and a few missing invoices

Few By-Request Projects Reported Incorrect RefNos

Incorrect Reference Number assignments generally indicated a bulb with a different lumen range than documentation verified

Half of sampled utilities with By-Request measures required RefNo corrections

3.5% of total By-Request sampled savings required RefNo corrections

Minimal impact at Portfolio level, as total By-Request savings are relatively low

Data Collection Difficulties

Took a long time

One utility took 7 months to provide data.

A few utilities gave us data in 3 days!

Difficult to trace

Some utilities made bulk purchases that did not map easily or at all to IS2.0 line items.

Inconsistency

Utilities did not have a consistent method or format of keeping records.

Note: Missing documentation accounted for 0.25% of the total By-Request sampled savings.

Recommendations for Continued Improvement

Distinguish SS and Non-SS Measures

IS2.0 uses the same RefNos for SS and non-SS measures →

Create unique RefNos for Simple Steps and outside programs measures

Streamline Utility-Run Program Data

Copy third-party implementer process →

Use standard file (such as a distribution log) to make mapping easier

Evaluation Considerations: Direct Install and Fixtures

Document Review Possible for SS Fixture Measures

Document review may satisfy Delivery Verification for Simple Steps Fixture measures →

CFL Fixtures are BPA Qualified measures so document review would not count as impact evaluation

Track install location for DI Measures

Installed Location is a Delivery Verification requirement Direct Install measures →

Add location field to IS2.0 so that DI Measures can be evaluated via document review

BPA Response

BPA Evaluation Take

- Evaluation highlights great documentation of lighting measures
- Simple Steps program documentation particularly strong
- Evaluation timeliness affected by data collection timeline
- Evaluation test of delivery-verification approach. Opportunities to collaborate with COTRs in future

Program Response

Distinguish Simple Steps and Utility-Run Program Measures

- *We plan to create separate and unique retail lighting measures for Simple Steps and utility-run programs*

Streamline data collection and reporting

- *We understand opportunities to exist*
- *Balance utility effort and evaluation needs*
- *Will review Simple Steps distribution log to determine if we recommend a change*

Include Location for Direct Install Forms

- *We plan to adjust the distribution log for location in direct install lighting measures*

Thank you!

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