BONNEVILLE POWER ADMINISTRATION

Nonresidential Lighting Portfolio Impact Evaluation Research Plan 2022

1. OVERVIEW 2
1.1 Summary of FY2020-24 Custom and Nonresidential Lighting Impact Evaluation Activities 2
1.2 Schedule for FY2020-2024 Custom and Nonresidential Lighting Impact Evaluation Activities 3
2. NONRESIDENTIAL LIGHTING PORTFOLIO IMPACT EVALUATION RESEARCH PLAN 4
2.1 Nonresidential Lighting Portfolio Documentation/Database 4
2.2 Sample Design 4
2.3 Schedule 6
2.4 Data Collection 7
2.5 Site-Level Measure Analysis 9
2.6 Study Analysis 11
2.7 Reporting 11
APPENDIX A: SAMPLE LIST 12
APPENDIX B: UTILITY AND END USE CUSTOMER COMMUNICATION PROTOCOLS 13
B.1 Overview 13
B.2 Utility Notification and Webinar 13
B.3 Project Documentation 13
B.4 Utility Project Contact 14
B.5 Phone Surveys or Site Visits of End Users 14
B.6 Site Specific Results 15

1 OVERVIEW

This document provides a research plan to conduct an impact evaluation of Bonneville Power Administration's (BPA's) Nonresidential Lighting portfolio. A team led by Evergreen Economics (which includes Apex Analytics and SBW Consulting) is conducting this research.

BPA conducted impact evaluation planning in 2019-2020 to determine what evaluation activities have occurred previously and what evaluation needs to occur in the next four years to satisfy BPA's policy of evaluating measure savings that are equivalent to 90 percent of the energy efficiency portfolio every four years. The outcome of this effort was the 2020-2021 evaluation plan[1], which identified that the highest priority was to conduct evaluation on custom industrial and nonresidential lighting projects.

Since 2020, BPA has completed an evaluation of its custom industrial portfolio for Option 1 utilities[2], and is currently in the process of evaluating its custom industrial portfolio for Option 2 utilities.

In 2022, BPA revisited its evaluation strategy and 2020-2021 evaluation plan[3], and determined that completing an evaluation of the nonresidential lighting portfolio was still a high priority for evaluation, given that it represents the largest single share of BPA's energy efficiency portfolio and has not been evaluated since FY2012-2013. To achieve its broad impact evaluation coverage requirements, BPA has separated the portfolio into four major measure categories. The agency plans to begin one study per year on a rolling basis on a four-year cycle.

This plan provides updates to the evaluation plan, additional detail on sampling, and an updated research schedule specific to this nonresidential lighting evaluation.

1.1 SUMMARY OF FY2020-24 CUSTOM AND NONRESIDENTIAL LIGHTING IMPACT EVALUATION ACTIVITIES

Table 1 on the next page summarizes the status of the evaluations of the Custom and Nonresidential Lighting impact evaluations.

[1] Evergreen Economics. 2020. *Bonneville Power Administration 2020-2021 Evaluation Plan*. https://www.bpa.gov/-/media/Aep/energy-efficiency/evaluation-projects-studies/bpa-2020-21-impact-evaluation-plan.pdf

[2] Utilities are categorized as Option 1 or 2 for M&V purposes. For Option 1 utilities, BPA is often involved throughout the project lifecycle by providing technical support for project development, implementation, approval, and M&V. Option 2 utilities provide their own technical support including M&V and project quality control, e.g., project proposal and completion report review.

[3] BPA's FY2023-2024 evaluation strategy can be found: https://www.bpa.gov/-/media/Aep/energy-efficiency/evaluation-projects-studies/2023-2024-bpa-ee-evaluation-strategy-presentation.pdf

Table 1: Status of FY2020-2024 Custom and Nonresidential Lighting impact evaluations

Evaluation Areas	Brief Summary	Status
Custom	Rolling, engineering-based evaluation	Custom Industrial, Option 1 (*completed*) Custom Industrial, Option 2 (*in-progress*) Non-Industrial Custom (*FY2024*)
Nonresidential Lighting	Engineering-based evaluation	Nonresidential Lighting (*this document, in-progress*)

1.2 SCHEDULE FOR FY2020-2024 CUSTOM AND NONRESIDENTIAL LIGHTING IMPACT EVALUATION ACTIVITIES

Table 2 shows the major measure categories and the planned cadence of the custom and nonresidential lighting evaluations.

Table 2: Timeline of FY2020-2024 Custom and Nonresidential Lighting impact evaluations

Evaluation Activity		FY2021				FY2022				FY2023				FY2024			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Custom*	Option 1 Custom Industrial																
	Option 2 Custom Industrial																
Lighting	Nonresidential																

** Non-Industrial Custom (Option 1 and Option 2) and Energy Smart Reserve Power are planned for FY2024.*

2 NONRESIDENTIAL LIGHTING PORTFOLIO IMPACT EVALUATION RESEARCH PLAN

The goal of this evaluation is to conduct an impact evaluation of BPA's Nonresidential Lighting portfolio. The primary objectives of this evaluation are to:

- Estimate first-year kWh savings and cost-effectiveness for the Nonresidential Lighting portfolio to understand the savings performance.
- Develop recommendations as appropriate for program documentation and savings calculators that may be contributing to lower reliability of savings.

This evaluation covers both Option 1 and Option 2 utilities.[4]

2.1 NONRESIDENTIAL LIGHTING PORTFOLIO DOCUMENTATION/DATABASE

BPA maintains project files for nonresidential lighting projects for Option 1 utilities, while the Option 2 utilities maintain their own nonresidential lighting project files. In order to develop this study's sample plan, the Evergreen team requested data from BPA including summary level data for all Option 2 nonresidential lighting projects from the past fiscal year[5], and detailed project files for Option 1 utilities. The summary level data for Option 2 utilities contained additional fields that were sufficient for the sampling phase, allowing the team to develop a sample frame with BPA data without having to request population project files from Option 2 utilities. (However, the team will request detailed project files for all sampled projects from both types of utilities.)

The Evergreen team compiled the Option 1 project data and developed a database that, combined with the summary data BPA provided for Option 2 projects, we used for developing and drawing the sample.

2.2 SAMPLE DESIGN

BPA's evaluation policies have established a target for impact evaluation, striving for evaluations that attain a relative error of 10 percent at the 90 percent confidence level, with a minimum acceptable level of 80/20. The evaluation team-proposed sampling strategy targets a 90/10 confidence level and precision for the Custom and nonresidential Lighting evaluation. The sampling unit of this study is a project, defined as all Technology/Activity/Practice measures at a distinct site (as defined by utility-assigned site ID and facility address) that were invoiced at the same time.[6] Sampling for nonresidential lighting was based on a savings stratified random sample from projects that claimed savings in the previous year.

---

[4] The 2020-2021 Evaluation Plan separated this Nonresidential Lighting study into two domains, one for Option 1 and the other for Option 2 utilities. After completing the Custom Industrial evaluation for Option 1 utilities (the first study domain) and planning it for Option 2 utilities (Domain 2), the evaluation team and BPA decided to collapse the Nonresidential Lighting study domains to increase efficiency for BPA program and evaluation teams.

[5] That is, FY2022. We also requested this IS2.0 data for the last two quarters of FY2021 in the event we needed additional data to support a robust sample for the study. The IS2.0 invoice approval dates for these projects range from September 20, 2021 to October 28, 2022. The lighting calculators had completion dates ranging from September 16, 2016 to December 21, 2022. We restricted the sample frame to the most recent, complete year across the two databases, from October 1, 2021 to October 2022.

[6] For uniformity of the evaluation approach, evaluation and project resource management, and cost control, sampling is based on project.

The nonresidential lighting evaluation is focused on projects with claimed savings that were completed between Oct. 1, 2021 and Oct. 1, 2022. For Option 1 sites, we extracted the contents of the lighting calculators for all projects in the sample frame, including identifiers for the site, project and all installed measures. For Option 2 sites, the sample is based on the IS2.0 data, pulled in mid-January 2023. The sampling unit of this study is a project (i.e., all Technology/Activity/Practices [TAPs] at a site that were completed and invoiced at the same time).

The sampling will be conducted with a conventional optimum allocation stratified design based on utility type and reported kWh savings for the project. We defined an excluded stratum (i.e., stratum 0) that contains very small projects; this is the group of measures that collectively account for less than 1 percent of the savings within each utility type. Projects that represent a significant portion (more than 1,500,000 kWh) of total reported energy savings are assigned to a priority "certainty" stratum. We consider these projects necessary for the evaluation; thus, they are not subject to random selection. Moderately-sized projects were then allocated to a probabilistic strata. Between the probabilistic strata and the certainty strata, we are guaranteed a mix of project sizes.

Table 3 shows the number of nonresidential lighting projects and associated savings in our sample frame by utility type and size strata. The sample sizes shown in the table should yield a relative precision of +/- 10 percent at a 90 percent confidence level for the evaluation over the 12-month period. At the utility type level, we expect that the samples for Option 1 and Option 2 utilities should yield at least a relative precision of +/- 20 percent at a 80 percent confidence level.[7] (See Appendix A for the sample list.)

This sample of 38 projects includes 2 certainty projects and a stratified random sample of 36 additional projects.[8] The certainty sites will guarantee that the evaluation sample will cover at least 5 percent of the total nonresidential lighting savings. Based on the average savings by strata, we estimate that the full sample will cover approximately 39 percent of nonresidential lighting savings.

Our initial sample extract using this design contains 38 projects from 38 unique sites with 67 unique TAPs (i.e., distinct measures within sites), including 46 TAPs in Option 1 and 24 TAPs[9] in Option 2. The selected projects include one new construction and five projects with lighting controls.

[7] We estimate that the overall sample precision will be +/- 6% at 90%, +/- 6% at 80% for the Option 1 utility sample at 80% and +/- 8% for the Option 2 utility sample at 80%.
[8] It would be feasible to meet the relative precision target with a smaller sample if we were to stratify by project size alone (i.e., not also by utility type). The benefit of utility type stratification is that we will ensure that a wider range of projects and utilities are included in the evaluation, which will be a better representation of the domain as a whole.
[9] At this time, we do not have the detailed project files for Option 2 sites. The number of TAPs represented by the sample of 18 projects exceed 19.

Table 3: Nonresidential lighting sample design

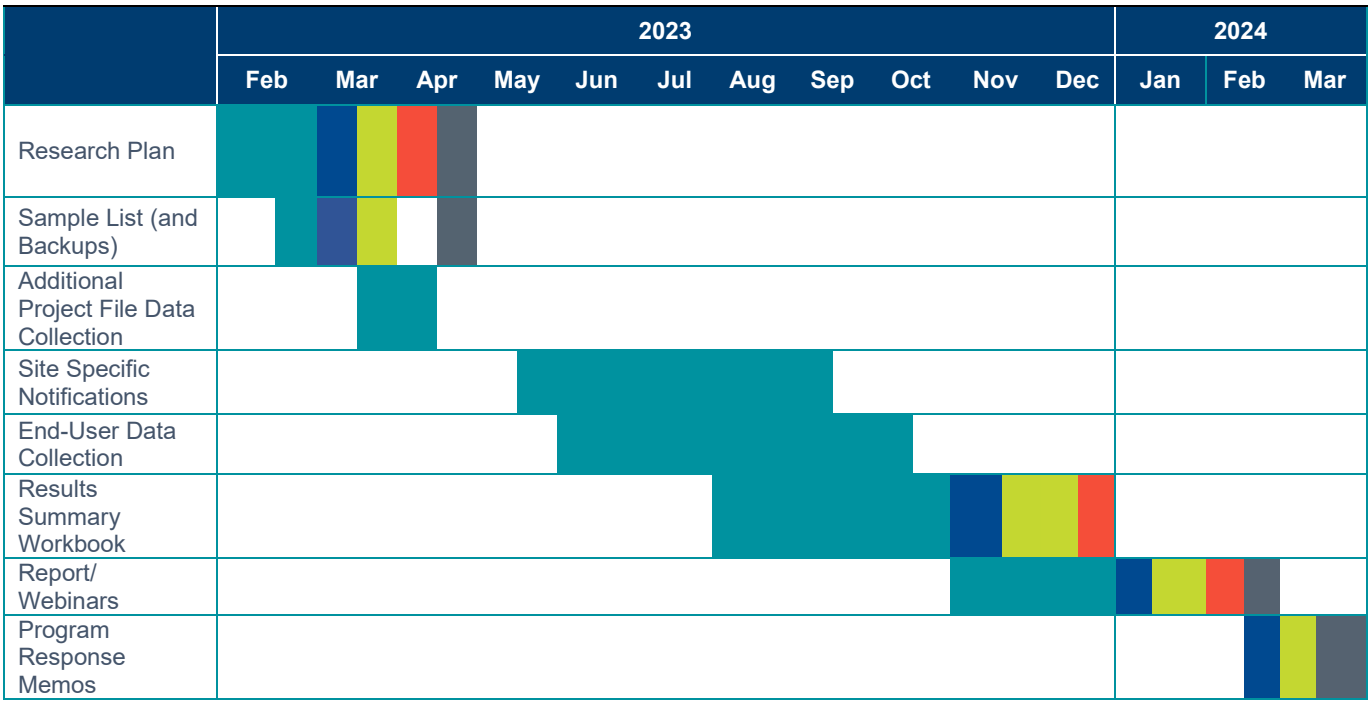
Utility Type	Strata*	Reported Savings (kWh)		Number of Reported Projects	Sample Size (Projects)
		Average	Total		
Option 1	0	3,391	610,346	180	0
	1	22,317	11,136,371	499	4
	2	106,155	11,146,229	105	4
	3	315,969	11,058,927	35	5
	4	628,682	11,316,272	18	5
	Subtotal	**54,084**	**45,268,145**	**837**	**18**
Option 2	0	3,773	113,180	30	0
	1	26,142	5,908,192	226	4
	2	112,962	5,874,016	52	4
	3	252,919	5,817,138	23	5
	4	625,285	6,252,851	10	5
	Certainty	2,006,849	4,013,697	2	2
	Subtotal	**81,572**	**27,979,074**	**343**	**20**
Total		**62,074**	**73,247,219**	**1,180**	**38**

* Stratum *0* denotes the excluded projects (based on very small savings). The *certainty* projects represent a significant portion of total reported energy savings within the domain and are considered as necessary for the evaluation and therefore are not subject to random selection.

2.3 SCHEDULE

The following schedule outlines key steps in the project, expected timelines and stakeholder reviews. The Evergreen team and BPA developed a stakeholder plan that identifies which stakeholder groups will be involved at the various stages of the evaluation, which will guide the stakeholder reviews.

Table 4: Key project steps and stakeholder reviews



Throughout the project, BPA will communicate with stakeholders through multiple approaches including ad hoc meetings, email communication, webinars, weekly announcements, and evaluation and website updates), The Evergreen team also developed utility and end user communication protocols (see Appendix B) that outline procedures for engaging with utilities and their end use customers throughout the evaluation.

2.4 DATA COLLECTION

The Evergreen team will develop procedures for data collection, adapting the procedures already developed for the recently completed evaluation of BPA's 2019-2021 custom industrial portfolio.

We will closely coordinate with BPA to notify utilities that have projects selected for the study sample and provide them with the necessary information consistent with the communication protocols developed for this study (see Appendix B). The team will develop materials for and host a utility webinar to introduce utilities to the study, notify them of upcoming data collection activities (including end-user contact protocols), and clarify roles and expectations.

The study includes collecting data from 38 sites. The Evergreen team will track and record dispositions for completed sites in an excel-based project tracker. The tracker will be updated and shared with BPA on a weekly basis and record the status of each site and relevant information about the site (e.g., utility, assigned engineer, number of contacts made, level of complexity). The tracker will support any follow-up required by BPA to ensure response by end users and utilities.

In accordance with the research plan and approved communication protocols, the team will collect data with the following methods:

- **File review.** The file review will involve extracting all project information relevant to savings estimation including measure descriptions, baseline or efficient condition inputs, reported savings values, and the final version of the M&V model.
- **Telephone/email discussion with program staff.** The program staff (BPA, utility or ESI) are another possible source of data. As needed, the team will contact them by telephone or email to obtain information needed for the evaluation that was not found in the project files.
- **Telephone/email discussion with end users.** In some cases, it may be necessary to obtain information from the end user via telephone or email contacts.
- **Site visits.** Based on the file review and discussions with project staff, the contractor may conduct in-person interviews with operation staff, review of electrical plans, inspection of control settings, review of manufacturers' specifications, one-time measurements and short-term metering to gather more information from inspection of affected systems and equipment.

The data collection for project sites (n=38) will be a mix of low, medium and high effort, based on project size and complexity. Final determination of sample size and quantity of each type will be determined once the project files are gathered and reviewed. Assumptions regarding level of effort are as follows:

- **Low Effort**: Assumes simple lighting installation (e.g., basic T8 or CFL retrofits; all exterior lighting with simple daylight controls) in a small area, and other projects with easily verifiable quantities from invoices and/or architectural plans.
- **Medium Effort**: More complex lighting installation involving multiple lighting types and/or lighting controls (e.g., timers, occupancy sensors) in medium-sized areas (up to 100,000 sq. ft.)
- **High Effort**: Highly complex lighting installations (e.g., a variety of lighting types, complex lighting controls such as daylighting dimming controls or DR controls) and/or installations covering very large areas (more than 100,000 sq. ft.)

Our general approach to evaluation data collection is to fully leverage the data collected by BPA, and the utility program staff throughout the process of developing each project and to only collect additional data from end users if needed to achieve reliable estimates of savings for the sampled measures. We will collect the necessary data as follows:

- **File review.** The file review involves extracting all project information relevant to savings estimation. This may include:
    - Measure descriptions that detail lighting systems, affected systems and determinants of savings.
    - Baseline and efficient condition inputs to the lighting calculator, trend data, cutsheets and other design documents.
    - Reported savings values to compare against tracking data.
    - The final M&V savings estimation tool, and any other critical final documents used to document reported savings.

    - Invoices, receipts, and other data to verify incremental measure costs.
    - Data and documentation relating to space use types and HVAC systems.
    - Data used to determine non-electric energy impacts.
- **Telephone/email discussion with program staff.** The utility program staff are another possible source of data. As needed, we will contact them by telephone or email to obtain information needed for the evaluation that was not found in the project files. These discussions will also inform practical strategies for minimally intrusive data collection from end users, and to clarify history and circumstances at the site.
- **Telephone/email discussion with end users.** In some cases, it may be necessary to obtain information from the end user via telephone or email contacts. Discussions may be with operations staff or vendors to gather data baseline and post-installation conditions of affected buildings, systems and equipment. When necessary, these communications will be used to plan site visits or remote data collection.
- **Site visits.** Based on the file review and discussions with program staff, we may determine that more information is needed from inspection of affected systems and equipment, in-person interviews with operation staff, review of electrical plans, inspection of control settings, review of manufacturers' specifications, and one-time measurements. For projects where site visits are not possible, we will develop a more robust data collection survey that can be administered via telephone and email with the appropriate end user and vendor staff. This may include greater reliance on file review findings, customer staff providing as-built plans and specifications, control system trend data and screen prints, or taking photos or videos and sending them to the evaluation team.
- **Affected system trend metering.** For lighting projects, if there are insufficient trend data to verify operating hours, additional metering data will be collected. In most cases, this will come from time of use light loggers and on-premise electric metering. Interval premise data may be collected from existing on-site instrumentation or from instruments installed by evaluators and on-site operations staff. Where on-site visits are not possible, we will implement a metering plan with the assistance of on-site staff. These plans will leverage existing metering and on-site staff with the skills necessary to install preconfigured data logging equipment.
- **Cost effectiveness parameters.** To estimate measure cost effectiveness, we collect data for measure life, incremental costs, non-electric energy use and non-energy benefits. We rely on data found in file reviews; these will only change if there is compelling evidence found during evaluation. We will not reach out to end users solely about cost effectiveness parameters. Other cost effectiveness parameters including discount rates, administrative costs, and avoided energy costs will use BPA-provided or, if necessary, default RTF values.

2.5 SITE-LEVEL MEASURE ANALYSIS

We will estimate savings for the sample of lighting measures as described below.

- **Review Existing BPA Lighting Calculator**: The team will base the evaluation model on the most recent version of the BPA lighting calculator. We will start by reviewing BPA's lighting calculator, to confirm the model conforms to BPA's M&V protocol and assess savings calculations to determine reliability of savings estimates. The team will also compare BPA's existing lighting calculator with the RTF lighting protocol to determine whether baseline and efficient conditions are treated in a similar fashion for various types of fixtures, lamps, and controls and report on important differences. As necessary,

we will develop an updated evaluation version of the lighting calculator for sampled sites in order to accurately represent the conditions observed during evaluation data collection.

- **Standardize Lighting Models**: While most Option 1 utilities use a version of the BPA's lighting calculator, some Option 2 utilities may use their own lighting calculators. Where these calculators differ, the team will make modifications to the inputs to align them with the updated evaluation version of BPA's most recent standard lighting calculator. This updated calculator will be the standardized site evaluation model for the lighting impact evaluation.

- **Assess Determinant Reliability and Collect Supplemental Data**: Next, we will examine installed lighting power, baseline lighting power, hours of use and HVAC interaction factors. Then the team will find the corresponding values used in the evaluation model, assess the data and/or documentation underlying those values, and determine whether we consider those values reliable. For unreliable critical determinants, we will assess what level of data collection involving the end user would be necessary to obtain reliability for that determinant (telephone/email interview, site visit or metering) and gather supplemental data as needed to support sufficiently reliable savings estimates.

- **Run the Model and Estimate Evaluated Savings:** After reliable determinant values are confirmed or obtained through data collection, the evaluation model will be run for each site and estimate site-level energy savings.

- **Treatment of Interactive Measures.** Savings achieved by one measure can affect the savings of another measure— for example, a lighting upgrade that coincides with an HVAC upgrade that affect the same spaces within a building. If the two improvements were completed at different times, this should not be an issue for this evaluation. However, an issue may arise if one or more projects are completed at the same time. Using information collected from the reporting system, project engineers and end-users, we will determine whether this occurs for any of the measures in the sample. If it does, we will obtain documentation for all the interactive measures at the end user site to determine how the M&V models accounted for the interactions. The team will identify the measure order that was assumed in estimating each measure's savings and use the same measure order to account for measure Interaction in estimating the evaluation savings.

- **Time-Based Value of Savings and Cost Effectiveness.** We will assign load shapes to individual measures using ProCost via BPA technology/activity/practice (TAP) reporting code and calculate cost effectiveness and peak savings based on the generic calculator and project-specific ProCost analyses and report on any differences. The default approach is to use the ProCost model that is associated with the Seventh Power Plan that was in effect during the program period that is being studied. The program team was also interested in cost effectiveness for the portfolio using the Eighth Power Plan.

    - **Optional cost effectiveness analysis using Eighth Power Plan ProCost models and assumptions**. If BPA desires, the evaluation team will estimate portfolio cost effectiveness using the Eighth Power Plan ProCost models and assumptions. This may be for the whole portfolio and/or for subdomains of interest (e.g., those that are included in the main report).

2.6 STUDY ANALYSIS

Once analysis is completed for each site in the sample, the team will compile site-level results to estimate the electric savings and cost-effectiveness for the portfolio using a ratio analysis. The team will estimate first-year savings for Option 1 and Option 2 subdomains, using the evaluation model results for the sample, weighted by stratum contribution to savings. Cost effectiveness will be analyzed using BPA's lighting calculator and with ProCost analysis with inputs from the Seventh Power Plan matching the sampled projects. If BPA chooses to conduct analysis using Eighth plan inputs for lighting and/or other subdomains. The results will be reported to BPA in a brief Memorandum.

Prior to portfolio analysis, the team will develop an analysis template workbook for BPA review. This workbook will serve as a template for conducting the subdomain and portfolio-level rollup calculations. The subdomain-level rollup analysis will take the evaluation results for the sample of sites, extrapolate them to the stratum and subdomain level, and ultimately calculate stratum and subdomain-level results.

After completing the analysis, the team will deliver a results workbook, including aggregated electricity savings and cost-effectiveness results for each subdomain.

Where possible, the team will show the most important drivers for sites that show deviations from a realization rate of one. The team will develop graphical results showing the realization rate and impact of each site on results and show the drivers graphically using some combination of color and shape of individual points.

2.7 REPORTING

We will prepare a report that documents the methodology, findings and recommendations of this evaluation. The report will not contain any information that could be used to identify the end users that participate in the evaluation. Further, the reports will not contain any utility-specific findings or recommendations.

The reports will be consistent with the content, transparency, and comparability guidance found in the RTF Guidelines and BPA's internal guidance on reporting and recommendations. We expect that the report will have the following structure:

1. Executive Summary
    a. Findings
    b. Recommendations
2. Introduction and Background
3. Objectives
4. Methodology
    a. Data Collection
    b. Savings Estimation
5. Findings
    a. First-Year kWh Savings
    b. Cost-effectiveness Results
    c. ECwV analysis Results
6. Recommendations
7. Technical Appendices and Data Products

APPENDIX A: SAMPLE LIST

Table 5 provides the number of distinct projects from each serving utility that we have selected for our primary sample and the number of additional backup projects. The sample is based on projects, and the primary sample is 38 projects at 38 unique sites. The backups will only be utilized if a primary contact is unavailable. Most of these customers installed multiple measures (or TAPs). Hence, the number of distinct *projects* is smaller than the number of *measures* that will be covered by the evaluation.

Table 5: Projects sampled by utility

Utility Type	Serving Utility	Number of Primary Projects / Sites	Number of Backup Projects / Sites
Option 1	Central Electric	1	0
	Clatskanie PUD	1	1
	Cowlitz County PUD	1	1
	Emerald PUD	1	0
	Flathead Electric	2	0
	City of Forest Grove	1	1
	Grays Harbor PUD	1	0
	Lakeview Light & Power	1	1
	Lewis County PUD	2	0
	Modern Electric	2	0
	Northern Wasco PUD	1	0
	Peninsula Light Company	1	0
	Port of Seattle - Seattle-Tacoma International Airport	1	0
	Springfield Utility Board	1	0
	Tillamook PUD	1	0
Option 2	Seattle City Light	8	2
	Snohomish County PUD	6	0
	Tacoma Power	6	2
	Total	**38**	**8**

APPENDIX B: UTILITY AND END USE CUSTOMER COMMUNICATION PROTOCOLS

B.1 OVERVIEW

The evaluation team will follow general protocols for each evaluation that requires the team to contact end users and utility (Option 1 and Option 2) representatives. In situations when utilities must provide data to BPA or end user customer contact is required, the following communication principles will be followed:

- Utilities with projects included in the evaluation will be notified prior to the start of evaluation activities and provided with information on samples, timelines and requirements. At that time, utilities may reach out to their customers notifying them of potential future contact by the evaluation team.
- BPA will provide opportunities for utilities to understand the details of the evaluation plan and data request.
- BPA will give utilities a reasonable timeline to collect project data, and will use escalation protocols if deadlines are missed, which may involve the BPA contracting officer's technical representative (COTR), energy efficiency representative (EER), and/or account executive (AE).
- The evaluation team will provide utilities at least one week notice before initiating any end user contact, including phone surveys and site visits.

B.2 UTILITY NOTIFICATION AND WEBINAR

Once the research plan and sample have been reviewed by the BPA evaluation team and the Commercial & Industrial lighting team, the BPA evaluation EER will notify utilities via email (copying their assigned EER) that at least one project in their territory has been selected in the primary or secondary evaluation sample). This initial email will request the primary utility contact for the evaluation and include an invitation to a BPA-hosted webinar presenting utility-specific information for the evaluation plan.

The evaluation team will provide BPA with a utility notification package with a schedule for utility notification and sample text for BPA to provide to the utilities for notification.

The evaluation team will also provide detailed information to each utility about their sampled sites through a secured file transfer protocol or other mechanism, based on utility preference.

- For **Option 1** utilities, this detail will likely include unique site ID, company name, address, lighting calculator source file name, completion date, sampled measure (specific measure, technology), and whether the site is a primary or secondary sample site.
- For **Option 2** utilities, this detail will include measure/project name, approval date, sampled measure (TAP), energy savings and BPA incentive (to aid in identification of a site and measure), and whether the site is a primary or secondary sample site.

B.3 PROJECT DOCUMENTATION

BPA provided the Evergreen team with lighting calculator project file documentation for Option 1 utilities to create a lighting project database that will be used to develop the evaluation sample.

If there are questions about the Option 1 project files, the Evergreen evaluation team will contact BPA and/or the Energy Smart Industrial (ESI) program contractor staff.

For Option 2 utility sampled projects, the Evergreen evaluation team will need to request project documentation from the utilities since BPA does not hold the complete records. Following the utility notification/webinar, the Evergreen evaluation team will email the Option 2 utility project contacts to request lighting calculator project file documentation for their sampled sites. All contacts to utilities will copy the assigned EER and the evaluation EER.

B.4 UTILITY PROJECT CONTACT

Following review of project documentation, the Evergreen evaluation team will reach out to the utility project contact to learn more about the project, on an ad hoc basis, as determined by the evaluation team. (The Evergreen team will copy the assigned EER and the evaluation EER on utility communications.) The discussion with the internal project contact will:

- Answer questions regarding the project or files.
- Obtain information needed for the evaluation that was not found in the project files.
- If end user contact is required, discussion with the utility contact will inform the evaluation team on the history of the project and circumstances at the site and will identify the least intrusive approach for obtaining data needed by the evaluation.

The evaluation team will strive to combine these requests for utilities. Any utility providing staff for interviews to the evaluation team may negotiate and execute with the evaluation team a nondisclosure agreement that meets the utility's requirements for protecting end user information. BPA's contract protects data under the language of BPA's existing contract with the evaluation firm. The evaluation team will provide a timeline for interviews (typically two weeks). The evaluation team will work with utilities individually to support its request as much as is feasible.

B.5 PHONE SURVEYS OR SITE VISITS OF END USERS

If utilizing phone surveys or site visits, the evaluation team lead engineer will email the utilities (copying the BPA evaluation lead, evaluation EER and assigned EER) at least one week prior to any end user contact, providing them with a general description of information to be collected from the site. The phone survey will collect relevant information and determine if a site visit is necessary. The feasibility of on-site visits will be at the discretion of the customer and the evaluation team. BPA will provide materials to support any advance contact they would like to make with end users, such as advance letters, email or a phone call script. BPA will also provide an FAQ of frequently asked questions to minimize any potential concerns by the end users.

Evaluation engineers will follow reasonable safety and privacy requirements set by end users. This includes safety training, personal protective equipment and health screenings. Nondisclosure agreements will be executed between the evaluation team and the end user as needed. The site visit will not proceed until all reasonable end-user requirements for an on-site visit have been met.

If end-use customers do not respond to the evaluation team lead engineer's attempts to collect additional data or schedule a phone survey or site visit, the evaluation team will take the following escalation steps:

i. If customer is nonresponsive (i.e., after more than five attempts over a four-week period), evaluator to notify the utility customer EER, copying the BPA evaluation lead and evaluation EER.

ii. Utility customer EER contacts the utility project representative (and possibly others at the utility, at their discretion) to request that they encourage the end-use customer to participate in the evaluation study.

iii. If still no response from the end-use customer, evaluation team discusses options of using a backup site, or further escalation.

iv. Final escalation step, at BPA's discretion, is for the EER to request the BPA account executive contact the utility.

B.6 SITE SPECIFIC RESULTS

If requested by a utility or utilities (such as for their own uses or in response to a request from an end user), BPA may provide site-specific results for their respective sample. The findings will be contained in an Excel workbook for each measure studied. A secure download link to the site workbooks will be emailed to utilities if they request to see the results. In the event an end user requests site-specific results from BPA or BPA's contractor(s), BPA will refer them to their utility.