

Ex Ante Review Findings

Table 1-1: Project Information

IOU	Pacific Gas And Electric
Application ID	FED018
Application Date	06/27/2012
Program ID	Not Available
Program Name	California High Performance Lighting Program (CHPLP)
Program Year	2011
Itron Project ID	X163
IOU Ex Ante Savings Date	N/A
ED Measure Name	Comprehensive lighting retrofit
Project Description	The proposed project includes retrofitting the existing lighting and installing advanced lighting controls.
Date of ED Review(s)	08/13/2012
Primary Reviewer and Firm	Kumar Chittory /Itron
Review Supervisor and Firm	Leonel Campoy /Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	Conditionally approved; pending submission of items described in this review.

Measure Description

This project involves replacement and retrofit of existing linear fluorescent and metal halide fixtures. There are four energy savings measures for this project:

1. Retrofit 400 watt MH fixtures with T5HO fixtures,
2. Retrofit T8 fixtures with reduced wattage T8 lamps and ballasts,
3. Retrofit 175 watt HID dock fixtures with LED fixtures, and
4. Install advanced lighting controls.

This project has applied for financial incentives under the Comprehensive High Performance Lighting Program. The final application lists the annual energy savings as 532,542 kWh/yr with a peak demand savings of 95.22 kW and an incentive of \$76,760. The total project costs are estimated at \$251,803.

Summary of Review

The documents provided to the Energy Division (ED) for review included the following:

- Audit Report prepared by Sylvania Lighting Services,
- Specification sheets for proposed lighting equipment,
- Excel Calculation Spreadsheet, and an
- Audit Report Review by kW Engineering.

The ED review focused primarily on the audit report and verifying the calculation methodology employed in the lighting savings calculation spreadsheet. The energy savings were derived assuming that the pre-existing fixtures were the baseline in all cases. However, when more than 50% of the pre-existing fixtures are replaced in any given area, an assessment of whether the Title 24 lighting alteration requirements apply to the space should be presented and baselines should be adjusted accordingly.

The savings calculation spreadsheet includes a 45% savings factor for lighting controls installed in several areas but does not specify the pre-existing lighting controls (if any). The value of 45% Occupancy Sensor Reduction Factor is not sufficiently supported. ED recommends that the utility either provide further justification and primary supported data for the claimed reduction factor, or measure the pre- and post-occupancy to determine the actual savings and reduction factor for this application. Also, the occupancy sensor savings claims for the RUL through EUL period are dependent on the provision of other Title 24 complaint controls at the site. For RUL through EUL period, savings should be calculated using Title 24 baselines.

It is unclear whether the utility claims this lighting project as an early replacement application. If indeed the project measures are considered early retirement, then a dual-baseline treatment should be applied to the eligible early retirement measures. In that respect, a Remaining Useful Life (RUL) needs to be provided for each of the eligible early retirement measures.

For this review, the ED is requesting additional documentation to complete the ex-ante review.

Review Conclusion

Savings are conditionally approved, pending fulfillment of requested data and subsequent opportunity for ED to re-evaluate the project and the savings estimates.

Summary of ED Requested Action by the IOU

ED requests the following data to complete this ex ante review:

- Provide the age, conditions, and the Remaining Useful Life (RUL) of the pre-existing fixtures and controls, if applicable.
- If more than 50% of the fixtures are replaced in any given area and if they are treated as early replacement measures, dual-baseline treatment should be applied to the eligible measures in the calculation of savings.
- Please identify the percentage of fixtures replaced in each area. If more than 50% of the lighting fixtures have been replaced and the Title-24 lighting alteration requirements apply then also provide the maximum lighting power density for those areas as per Title-24. For the measures where Title-24 lighting alteration requirements apply, recalculate the savings based on the Title-24 recommended baseline.
- For areas where occupancy/motion sensors are to be installed, provide details on the pre-existing control type. Provide justification for the savings associated with these controls such as a work paper or DEER reference.
- Incremental costs should be provided along with the full project costs for each of the measures eligible for early replacement.

Table 1-2: Project Overview

Description	IOU Proposed Ex Ante Data	ED Recommendations
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures)	TBD	TBD
Project Cost Basis (Full Cost, Incremental Cost)	Full Cost	If the IOU claims early replacement, incremental cost should be provided.
RUL (Early retirement projects only, otherwise N/A (not applicable))	Not Provided	ED will review the RUL provided by the IOU.
EUL	Not Provided	There are four measures for this project. ED will recommend EUL for each measure based on DEER.
First Year kWh Savings	532,542	TBD – ED conditionally approves the claimed savings pending correction if the occupancy sensor savings factor cannot be justified.
First Year Peak kW Savings	95.22	TBD - ED conditionally approves the claimed savings pending correction if the occupancy sensor savings factor cannot be justified.
First Year Therms Savings	None	None
kWh Savings (RUL Period)	Not Provided	TBD
Peak kW Savings (RUL Period)	Not Provided	TBD
Therms Impact (RUL Period)	None	None
kWh Savings (EUL thru RUL Period)	Not Provided	TBD

Ex Ante Review Report

Description	IOU Proposed Ex Ante Data	ED Recommendations
Peak kW Savings (EUL thru RUL Period)	Not Provided	TBD
Therms Savings (EUL thru RUL Period)	None	None
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	N/A	N/A
Net-to-Gross Ratio	Not Available	Assessment not complete

Table 1-3: Detailed Review Findings

Reviewed Parameter	Analysis
<p>Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)</p>	<p>IOU Proposal: TBD</p>
	<p>ED Assessment: Dual-baseline treatment should be applied if the measures can be treated as early retirement.</p>
	<p>ED Recommendation: Dual-baseline treatment of eligible measures, use of the in situ equipment for the RUL period, and Title 24 baselines for the corresponding RUL through EUL period. Occupancy sensors savings for the RUL period using a 15%¹ Reduction Factor is acceptable until a final value can be substantiated through measurement. Occupancy sensor savings claims for the RUL through EUL period are dependent on the provision of other Title 24 complaint controls at the site. The savings baselines for the RUL through EUL period are the Title 24 baselines.</p>
<p>Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)</p>	<p>IOU Proposal: Appears to be full project cost.</p>
	<p>ED Assessment: If this project is treated as early retirement then both the full and incremental measure costs are required.</p>
	<p>ED recommendation: Both full and incremental measure costs should be provided.</p>
<p>RUL (required for early retirement projects only, otherwise n/a)</p>	<p>IOU Proposal: TBD</p>
	<p>ED Assessment: ED recommends dual baseline treatment of eligible early retirement measures and specification of RUL.</p>

¹ The 15% Reduction Factor is a place holder until justification and primary supported data for the claimed reduction factor is provided, or pre- and post-occupancy is measured to determine the actual savings and reduction factor for this application.

Reviewed Parameter	Analysis
	ED recommendation: An overall project average RUL should be calculated based on weight averaging the RUL estimates for each eligible measure line item.
EUL	IOU Proposal: Not provided
	ED Assessment: DEER values should be used for each measure.
	ED Recommendation: DEER values should be used for each measure.
Savings Assumptions	IOU Proposal: Savings were projected based on pre-existing fixture layout minus proposed fixture. The 45% Reduction Factor for lighting controls remains unsubstantiated at this time.
	ED Assessment: Data provided is insufficient to support savings claims. The IOU should provide sufficient information to support the claim of 45% hours of use reduction for the occupancy sensor measures. Under a dual baseline treatment for eligible measures, use of the in situ equipment for the RUL period is acceptable. For the RUL through EUL period, ED assessment is that Title 24 requirements mandate lighting controls and negate the claimed savings for occupancy sensors savings unless other types of lighting controls that meet the Title 24 requirements are also present. The lighting operating hours Reduction Factor remains an unsupported value and should be confirmed through pre- and post- measurements.
	ED Recommendation: A value of 15% for the Reduction Factor shall be used for the initial savings claim for occupancy sensors during the RUL period pending lighting logger data substantiation of the actual reduction in hours of use. For occupancy sensor savings during the RUL through EUL period, savings may be claimed provided that Title 24 compliant baseline controls are also provided.
Calculation	IOU Proposal: Savings were calculated using engineering spreadsheet

Reviewed Parameter	Analysis
Methods/Tool review	ED Assessment: The calculation formulas for occupancy sensor controls used in the supplied Excel workbook should be justified.
	ED Recommendation: Correct the occupancy sensor controls savings estimates and provide savings estimates for both the RUL and RUL through EUL time periods with the appropriate baselines outlined in this current ED review
Pre- or Post-Installation M&V Plan	IOU Proposal: The IOU has not provided an M&V plan.
	ED Assessment: None
	ED Recommendation: ED suggests that a pre-inspection inspection be conducted to gather any missing information needed to fulfill this data request. An M&V Plan should include logging of fixture operation to verify hours of use for pre- and post-installation conditions.
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: Assessment not completed
	ED Recommendation: An ex ante Net-to-Gross review may be conducted.