

Final Phase IV Ex Ante Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	2K1170141C
Application Date	09/07/2011
Program ID	PGE21262
Program Name	UC/CSU/IOU Partnership Program
Program Year	2011
Itron Project ID	X039
IOU Ex Ante Savings Date	06/20/2013
ED Measure Name	LED Lighting Retrofit
Project Description	Retrofitting various lighting fixtures including MH and HPS with LED fixtures throughout the campus as well as installing occupancy sensor on elevator fan motors
Date of ED Review(s)	06/24/13
Primary Reviewer / Firm	Sepideh Shahinfard/ Itron
Review Supervisor / Firm	Joseph Ball/ Itron
ED Project Manager	[REDACTED]
ED Policy Authorization (as needed)	
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review
ED Recommendation	The ex ante savings of 371,416.9 kWh/yr and peak demand reduction of 5.6 kW for the first baseline and 22,160.8 kWh and peak demand reduction of 3 kW for the second baseline are approved.

Measure Description

The project involves replacing T8, T12, incandescent, CFL, high pressure sodium, metal halide, and mercury vapor fixtures in several locations throughout the campus with LED and T5 fixtures. The proposed elevator LED lighting fixtures are equipped with occupancy sensors. Also, the proposed LED fixtures replacing the wall packs, pathway, west remote and EFH buildings are bi-level LED fixtures. Also, the project involves installing occupancy sensors on elevator fan motors.

The outside lighting fixtures are operating 4,100 hrs/yr. The lighting fixtures in EFH building are operating 4,094 hrs/yr. Elevator lights and fans are operating 8,760 hrs/yr.

The annual kWh and kW savings estimated for this project are 371,416.9 kWh/yr and 3 kW. The second baseline savings for the lighting retrofit in EFH building are 22,160.8 kWh/yr and 3 kW. The total project costs associated with these measures is \$335,325.60.

Summary of Review

The Investor Owned Utility (IOU) submitted the following documents for Data Request (DR) 1858 on 06/20/2013 for this Phase IV review:

- Revised savings calculation spreadsheet;
- Gym lighting memo;
- Illuminance Data Calc spreadsheet;
- Revised savings calculations for EFM building; and
- IR response

This Phase IV review focused on the information provided by the IOU in response to ED's phase III review and verifying that the post-install savings calculations are correct. As discussed in phase III ex ante review, the measures involving the replacement of compact florescent lamps do not qualify as a "custom impact" measure type as per program guidelines and IOU policy. Some of these measures are still included in lighting retrofit savings calculations of the Wall Pack lights. PG&E has correctly calculated the HVAC Interactive Effect Factors and Demand Coincidence Factors. However, these factors have not been included in final savings calculations. ED approves the PG&E claimed savings subject to adjustment of the savings estimate for ineligible measures and HVAC interactive effect and demand coincidence factor. ED also requests PG&E to obtain itemized contractor invoices for the installed measures breaking out equipment and labor costs.

Review Conclusion

The ex ante savings of 371,416.9 kWh/yr and peak demand reduction of 5.6 kW for the first baseline and 22,160.8 kWh and peak demand reduction of 3 kW for the second baseline are approved subject to the above-described adjustments.

Summary of ED Requested Action by the IOU

1. ED waives further review of this project.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
<p>Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures) Note: For early retirement projects only, include RUL through EUL baseline)</p>	IOU Proposal: Early Replacement for lighting retrofit in EFH building and Replacement on Burnout for the rest of the measures
	ED Assessment: Early Replacement for lighting retrofit in EFH building and Replacement on Burnout for the rest of the measures
	ED Recommendation: None
<p>Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)</p>	IOU Proposal: In situ equipment were used for lighting retrofit of Wall packs and West Remote as well as occupancy sensor installation on elevator fan motors. For the lighting retrofit in elevators, the baseline was upgraded to 2008 DEER baseline. 2008 Title 24 baseline was used for second baseline savings calculations in EFH building.
	ED Assessment: In situ equipment for lighting retrofit of Wall packs and West Remote as well as occupancy sensor installation on elevator fan motors. 2008 DEER baseline for lighting retrofit of elevator lights. 2008 Title 24 for second baseline savings calculations in EFH building.
	ED Recommendation: None
<p>Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)</p>	IOU Proposal: Full and Incremental cost were provided based on RS Means.
	ED Assessment: Both full project and incremental project cost apply for all of the custom measures (either Early or Normal)
	ED recommendation: Submit itemized contractor invoices for the installed measures breaking out equipment and labor costs to support the incremental measure costs.
<p>RUL (required for early retirement projects only, otherwise N/A)</p>	IOU Proposal: 5 years
	ED Assessment: 5 years
	ED recommendation: None
<p>EUL (for each measure)</p>	IOU Proposal: 14.1
	ED Assessment: 14.1
	ED Recommendation: None
<p>Savings Assumptions</p>	IOU Proposal: The savings calculation spreadsheet used existing equipment as the baseline for wall packs, West Remote, and EFH building. 2008 DEER baseline was used for lighting retrofit of elevator lights. 2008 Title 24 was used for second baseline savings calculations of EFH building. HVAC IE factors and Coincidence Demand Factors were calculated for EFH building

Reviewed Parameter	Analysis
	but not included in final savings estimates.
	ED Assessment: Baselines are correct. HVAC interactive effects and Coincidence Demand Factor should be included in final energy savings of EFH building.
	ED Recommendation: Incorporate HVAC IE and CDF factors into final savings estimates.
Calculation Methods/Tool review	IOU Proposal: Savings were calculated using an excel spreadsheet.
	ED Assessment: Calculation method is acceptable
	ED Recommendation: The spreadsheet approach is acceptable but ED revised savings calculations spreadsheet needs to be revised HVAC IE factor and peak coincidence demand factor.
Pre- or Post-Installation M&V Plan	IOU Proposal: The customer provided trend data for lighting and occupancy in the elevators for various locations and differing lengths of time. Due to the inequality of data, the EES reviewer does not believe that the data are representative of actual savings, and the EES reviewer used the recommended 15% reduction for the savings calculations.
	ED Assessment: Not assessed
	ED Recommendation: None
Net-to-Gross Review	IOU Proposal: Not Provided
	ED Assessment: Not Assessed
	ED Recommendation: TBD

Table 1-3 Energy Savings Summary

Description	IOU Ex Ante Claim	ED Recommendations
First Year kWh Savings	371,416.9	371,416.9
First Year Peak kW Savings	5.6	5.6
First Year Therms Savings	175	175
kWh Savings (RUL Period)	371,416.9	371,416.9
Peak kW Savings (RUL Period)	5.6	5.6
Therms Impact (RUL Period)	175	175
kWh Savings (RUL thru EUL Period)	22,160.8	22,160.8
Peak kW Savings (RUL thru EUL Period)	3	3

Phase IV Ex Ante Review Findings

Description	IOU Ex Ante Claim	ED Recommendations
Therms Savings (RUL thru EUL Period)	Not Provided	TBD
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (RUL thru EUL Period)	N/A	N/A