

Final Phase IV Ex Ante Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	2K1278686C – X069
Application Date	1/13/2011 (PG&E Approved 2/22/2012)
Program ID	PGE21262
Program Name	2010-12 UC/CSU/IOU Partnership Program
Program Year	2012
Itron Project ID	PGE 2K1278686C
IOU Ex Ante Savings Date	10/8/2012
ED Measure Name	Custom Lighting Retrofit
Project Description	The project consists of a lighting retrofit in two adjacent laboratory/classroom buildings involving lamp and ballast changeouts and some fixture replacements amounting to less than 50% of the total fixture count. Installed fixture counts were revised downward because some laboratory facilities were off-limits due to sensitive scientific experiments in progress.
Date of ED Review(s)	10/11/2012 & 4/23/2013
Primary Reviewer and Firm	Charles Ehrlich, Itron, Inc.
Review Supervisor and Firm	Kris Bradley & Charles Ehrlich, Itron, Inc.
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review with pre-installation on-site verification.
ED Recommendation	Savings approved at 197,926 kWh and 56.39 kW.

Measure Description and Project Background

Originally the scope of the project appeared to include a garage lighting retrofit which has been removed from the scope. An initial review of the laboratory/classroom projects at Buildings L and B suggested that the projects were not subject to Ex Ante Review because the project appeared to contain only deemed measures. After an exchange of correspondences ED was informed that the IOU wishes to pursue a custom calculated approach.

The project includes a lighting retrofit in two adjacent laboratory/classroom buildings involving lamp and ballast changeouts and some fixture replacements amounting to less than 50% of the total fixture count. The predominant measure involves retrofitting fixtures containing F34T12 (32Watt) lamps and electronic ballasts with 28W T-8 lamps and (new) electronic ballasts or in some cases, new fixtures. The remaining measures are a diverse collection of fixture, lamp, and ballast types which the IOU documented in their pre-installation audit worksheet. A site visit on October 26, 2012 confirmed that the project had not begun and that a sample of fixture types matched the documentation.

Summary of Review

Previous EAR Phases (I, II, and III) included PG&E responses. This Phase IV EAR was initiated based upon the review of the following additional or revised files provided by the IOU:

- 2K1278686C Att 1 - IR Approved Calcs Building B (rev1).xls
- 2K1278686C Att 2 - IR Approved Calcs Building L (rev1).xls
- 2K1278686C Att 3 IR Building B and L Savings r2.xls
- 2K1278686C Att 4 - Invoices.pdf
- 2K1278686C Att 5 - Campus Cogen Influence.pdf
- 2K1278686C Att 6 IR Campus Building B and L r2.xls

The filenames have changed to accommodate Windows filesystem character length limits and to obscure customer identity. The project sponsor has been responsive to data requests that have led to an adjustment of the baseline type from new construction to early retirement. This is the appropriate baseline type because: a.) the scope of work does not include gut rehab, b.) includes **replacement** of fewer than 50% the fixtures, and c.) the pre-existing fixtures are well-maintained, suitable for retrofit installation, and in good working order. In the latest response, the IOU provided dual baseline calculations.

Review Conclusion

Final ED-approved energy savings is 197,926 kWh and 56.39 kW.

Facility Impacts (RUL)	Demand Reduction (kW)	Energy Savings (kWh)
Building B	34.17	123,336.4
Building L	22.22	74,590.0
Total Project Impacts	56.39	197,926.4

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)	Early Replacement	Early Replacement
Project Cost Basis (Full Cost, Incremental Cost)	Full Cost	Full Cost
RUL (Early retirement projects only, otherwise N/A (not applicable))	1/3 of EUL	2.8 years overall based upon 1/3 of EUL of the ballast for T8s or 1/3 of the EUL of the lamp for T12s, weighted by savings. T8: 4.9 years – Building B T12: 1.8 years – Building B T8: 5.0 years – Building L T12: 1.7 years – Building L
EUL	16 years	DEER or 16 years max
First Year kWh Savings	123,336.4 kWh – Bldg B 74,590.0 kWh – Bldg L 197,926.4 kWh – Total	123,336.4 kWh – Bldg B 74,590.0 kWh – Bldg L 197,926.4 kWh – Total
First Year Peak kW Savings	34.17 kW – Building B 22.22 kW – Building L 56.39 kW – Total	34.17 kW – Building B 22.22 kW – Building L 56.39 kW – Total
First Year Therms Savings	TBD	– 0.015 (DEER Interactive Factor)
kWh Savings (RUL Period)	123,336.4 kWh – Bldg B 74,590.0 kWh – Bldg L 197,926.4 kWh – Total	123,336.4 kWh – Bldg B 74,590.0 kWh – Bldg L 197,926.4 kWh – Total
Peak kW Savings (RUL Period)	34.17 kW – Building B 22.22 kW – Building L 56.39 kW – Total	34.17 kW – Building B 22.22 kW – Building L 56.39 kW – Total
Therms Impact (RUL Period)	None specified.	Use -0.015 factor times energy savings

Description	IOU Proposed Ex Ante Data	ED Recommendations
kWh Savings (EUL thru RUL Period)	115,954.4 kWh – Bldg B 70,525.0 kWh – Bldg L 186,479.4 kWh – Total	115,954.4 kWh – Bldg B 70,525.0 kWh – Bldg L 186,479.4 kWh – Total
Peak kW Savings (EUL thru RUL Period)	31.50 kW – Building B 21.14 kW – Building L 52.64 kW – Total	31.50 kW – Building B 21.14 kW – Building L 52.64 kW – Total
Therms Savings (EUL thru RUL Period)	Not specified	DEER Interactive Factor
Annual Non-IOU Fuel Impact (RUL Period)	N/A	Customer facility has cogeneration but purchases natural gas and electricity from the IOU vastly in excess of generation. Slight increases in heating energy use due to reduction in lighting energy use will not significantly impact the overall energy use of the campus.
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	N/A	N/A
Net-to-Gross Ratio	Not provided	NTG assessment not required

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: Dual baseline savings using the pre-existing fixtures for the RUL period and 2nd Gen T-8 w/electronic ballast for the EUL-RUL period.</p>
	<p>ED Assessment: This approach, while a simplification, addresses the fact that the pre-existing T-12 fixtures were obsolete and the fact that facility maintenance practices could have kept the pre-existing fixtures in good operating conditions for many years and the fact that the fixtures can accommodate readily available electronic ballasts with upgraded lamps.</p>
	<p>ED Recommendation: None</p>
<p>Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)</p>	<p>IOU Proposal: Full Cost</p>
	<p>ED Assessment: Full Cost</p>
	<p>ED recommendation: None</p>
<p>RUL (required for early retirement projects only, otherwise n/a)</p>	<p>IOU Proposal: 1/3 of EUL</p>
	<p>ED Assessment: The 1/3 of EUL calculation approach is inappropriate because the extended burn hours of the lamps reduces lamp life significantly as compared to the DEER methods. Instead, RUL should be based upon 1/3 of the life of a T12 lamp operating at the number of hours specified for each area type, weighted by the savings for each fixture.</p>
	<p>ED recommendation: None</p>
<p>EUL</p>	<p>IOU Proposal: 16 years</p>
	<p>ED Assessment: DEER or 16 years max</p>
	<p>ED Recommendation: None</p>
<p>Savings Assumptions</p>	<p>IOU Proposal: Hours of use are greater than DEER up to 8760 hours per year in some areas.</p>
	<p>ED Assessment: The facility is widely known to operate nearly continuously to accommodate scientific experiments without regard to the campus operating schedule.</p>

Ex Ante Review and Lower Rigor Findings Report Template

Reviewed Parameter	Analysis
	ED Recommendation: None
Calculation Methods/Tool review	IOU Proposal: Spreadsheet calculation approach on an area and fixture-specific basis.
	ED Assessment: The revised dual baseline savings calculation is appropriate.
	ED Recommendation: None
Pre- or Post-Installation M&V Plan	IOU Proposal: Pre and Post-installation site visit and true-up by implementation contractor. No data logging to verify hours of use.
	ED Assessment: The level of care used to determine and verify the fixture counts and lamp/ballast types was appropriate.
	ED Recommendation: None
Net-to-Gross Review	IOU Proposal: Not specified.
	ED Assessment: Standard NTG factors per custom impact program
	ED Recommendation: Not required