

Ex Ante Review and Prospective Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	2K1278686C
Application Date	1/13/2011 (PG&E Approved 2/22/2012)
Program ID	TBD
Program Name	2010-12 UC/CSU/IOU Partnership Program
Program Year	2012
Itron Project ID	PGE 2K1278686C
IOU Ex Ante Savings Date	TBD
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.
Date of ED Review(s)	10/11/2012
Primary Reviewer and Firm	Charles Ehrlich, Itron, Inc.
Review Supervisor and Firm	Kris Bradley, Itron, Inc.
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review with pre-installation on-site verification.
ED Recommendation	Conditionally Approved, pending fulfillment of final data requests regarding dual baseline calculations.

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 [REDACTED] suggested that the projects were not subject to Early Application 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

This EAR was initiated based upon the review of the following files provided by the IOU:

2K1278686C Att 1 - PA Approved Energy Savings Calculations_B.pdf
2K1278686C Att 2 - PA Approved Energy Savings Calculations_L.pdf
2K1278686C [REDACTED] Application.pdf
2K1278686C [REDACTED] Ltg PA Review - J1316 56 (217.msg
2K1278686C [REDACTED] Ltg. PA Package.pdf
2K1278686C [REDACTED] Ltg. PA Review Form v1.4.xls
Application Acknowledgement - [REDACTED] Retrofit - [REDACTED].msg
[REDACTED] 1-10-11.xls
Form B - Retrofit Application [REDACTED].xls
[REDACTED] 1-10-12.xls
[REDACTED] Management Team Approvals - 2 22.msg
[REDACTED] Savings Summary

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.

Review Conclusion

Although this project consists in predominantly deemed measures which are included in DEER, PG&E requests a custom calculated incentive approach. Generally this may be acceptable when site-specific parameters for a custom project are different from assumptions used for deemed savings, for example, operating hours. The proposed project intends to replace incandescent lamps for which the remaining useful life of the lamp is less than one year, and the proposed "keyless" a.k.a. screw-in CFL is not permanent. Therefore, the measures involving the replacement of incandescent lamps do not qualify as a "custom impact" measure type as per program guidelines and IOU policy. Title-24 controls and lighting power density requirements are not triggered because fewer than 50% of the pre-existing fixtures are being replaced, rewired, or moved. The documentation confirms that the pre-existing conditions are more energy

efficient than T-24 requirements and that the proposed measures are more efficient than the pre-existing conditions. Since the scope of the project does not trigger the 2008 Title 24 Section 139 Alterations requirements, the baseline equipment—in most cases—is the pre-existing fixtures and any controls that are added are any applicable code requirements for the Remaining Useful Life of the current fixtures.

The project sponsor states that the useful life of the pre-existing fixtures could be extended "indefinitely" with current campus lighting maintenance practices. PG&E proposes a dual-baseline approach for calculating savings using the pre-existing T-12 electronically ballasted fixtures as the baseline during the RUL period. For the RUL through EUL period, the IOU proposes to use the efficiency of second generation T-8 fixtures with electronic ballasts as the baseline. While the calculations of the EUL-RUL period have not yet been submitted, this approach is acceptable. The RUL may be stipulated as 1/3rd the life of the newly installed measures as per DEER, provided the program influenced the customer to replace measures sooner than end of life replacement. The default RUL is to be used when better evidence of the RUL of existing equipment cannot be established. This stipulated calculation approach is not applicable to T-12 lamp and ballast replacements because Federal regulations that went into effect on July 1, 2012 prohibit the manufacture of T-12 lamps, therefore; any future lamp replacements will require both the lamp and ballast to be replaced. Thus, the RUL is limited to the remaining life of the T-12 lamp. For this project, lighting power density calculations for the RUL through EUL period are not being requested because the 2008 T-24 lighting power density requirements are not significantly more stringent than the 2005 standards for the building and room types prevalent in this project.

A detailed review of the lighting audit worksheet shows minor discrepancies in the baseline and proposed fixture wattages amounting to an over-estimation of savings less than 1.1% (██████████) and 3.3% (██████████). Conditionally-approved savings have been adjusted using the DEER default wattage for the baseline and proposed fixtures and lamps in most cases. In addition the baseline wattage for screw-in "keyless" Compact Fluorescent fixtures has been removed to meet custom impact program requirements further reducing savings by 4.3% (██████████) and 8.9% (██████████). The total reduction in savings is 5.3% and 12% for ██████████ and ██████████, respectively and 7.9% overall.

Finally, the calculation of impacts for ██████████ hall includes a small number of occupancy sensors without specification of a coincidence factor for the pre-existing conditions. Whether the fixture is equipped with a manual switch or otherwise, there is an unknown coincidence factor associated with the operating conditions of that fixture. The claimed 0.68 demand coincidence factor may be appropriate for the new occupancy sensor but the table does not indicate the site-specific coincidence factor for the pre-existing system. The demand reduction associated with these occupancy sensors was removed pending the completion of on-site measurement and verification activities, if the IOU wishes to claim demand reduction.

This project is conditionally approved.

Summary of ED Requested Action by the IOU

Please submit final, corrected savings with dual baseline calculations upon completion of the project. Also, please describe the cogeneration plant operating mode to assess the HVAC interactive effect.

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 – ██████████ T12: 1.8 years – ██████████ T8: 5.0 years – ██████████ T12: 1.7 years – ██████████
EUL	16 years	DEER or 16 years max
First Year kWh Savings	140,970 kWh – ██████████ 92,074 kWh – ██████████ 233,044 kWh – Total	133,542 kWh – ██████████ 81,094 kWh – ██████████ 214,636 kWh – Total
First Year Peak kW Savings	41.0 kW – ██████████ 38.6 kW – ██████████	36.79 kW – ██████████ 24.15 kW – ██████████

Description	IOU Proposed Ex Ante Data	ED Recommendations
	79.6 kW – Total	60.94 kW – Total
First Year Therms Savings	TBD	– 0.015 (DEER Interactive Factor) ¹
kWh Savings (RUL Period)	140,970 kWh – ██████ 92,074 kWh – ██████ 233,044 kWh – Total	133,542 kWh – ██████ 81,094 kWh – ██████ 214,636 kWh – Total
Peak kW Savings (RUL Period)	41.0 kW – ██████ 38.6 kW – ██████ 79.6 kW – Total	36.79 kW – ██████ 24.15 kW – ██████ 60.94 kW – Total
Therms Impact (RUL Period)	TBD	TBD (DEER Interactive Factor) ²
kWh Savings (EUL thru RUL Period)	TBD (2nd Gen T-8 w/elect. ballast baseline)	TBD (2nd Gen T-8 w/elect. ballast baseline acceptable)
Peak kW Savings (EUL thru RUL Period)	TBD (2nd Gen T-8 w/elect. ballast baseline)	TBD (2nd Gen T-8 w/elect. ballast baseline acceptable)
Therms Savings (EUL thru RUL Period)	TBD	TBD (DEER Interactive Factor) ³
Annual Non-IOU Fuel Impact (RUL Period)	N/A	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

¹ ED needs to know the operating strategy of the cogen facility to determine if interactive heating load increases will result in greater natural gas usage. If the cogen facility is operated in heating load following mode, then interactive effects will cause an increase in natural gas usage, whereas if the cogen facility is operating at maximum capacity for electricity generating output and rejecting excess heat, then there may not be interactive effects related to increase in heating loads.

² See footnote #1

³ See footnote #1

Description	IOU Proposed Ex Ante Data	ED Recommendations
		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
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: TBD
	ED Assessment: TBD
	ED Recommendation: TBD
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: TBD
	ED Assessment: TBD
	ED recommendation: TBD
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: TBD
	ED Assessment: TBD
	ED recommendation: TBD
EUL	IOU Proposal: TBD
	ED Assessment: TBD
	ED Recommendation: TBD
Savings Assumptions	IOU Proposal: TBD
	ED Assessment: TBD
	ED Recommendation: TBD

Reviewed Parameter	Analysis
Calculation Methods/Tool review	IOU Proposal: TBD
	ED Assessment: TBD
	ED Recommendation: TBD
Pre- or Post-Installation M&V Plan	IOU Proposal: TBD
	ED Assessment: TBD
	ED Recommendation: TBD
Net-to-Gross Review	IOU Proposal: TBD
	ED Assessment: N/A
	ED Recommendation: Not required