

## Phase I Ex Ante Review Findings

**Table Error! No text of specified style in document.-1: Project Information**

<b>IOU</b>	Pacific Gas and Electric (PG&E)
<b>Application ID</b>	IRP-3088
<b>Application Date</b>	09/03/2013
<b>Program ID</b>	PG&E 211024
<b>Program Name</b>	Industrial Refrigeration Performance Plus Program (IRPP)
<b>Program Year</b>	2013
<b>Itron Project ID</b>	X417
<b>IOU Ex Ante Savings Date</b>	10/01/2013
<b>CPUC Staff Measure Name</b>	Lighting Retrofit
<b>Project Description</b>	Replacing HID fixtures with LED and linear fluorescent fixtures
<b>Date of CPUC Staff Review(s)</b>	11/18/2013
<b>Primary Reviewer / Firm</b>	Sepideh Shahinfard / Itron
<b>Review Supervisor / Firm</b>	Leonel Campoy / Itron
<b>CPUC Staff Project Manager</b>	██████████ / California Public Utilities Commission, <del>Energy Division</del>
<b>CPUC Staff Policy Authorization (as needed)</b>	
<b>Type of Review (Desk, On-site, Full M&amp;V, Tool)</b>	Desk
<b>CPUC Staff Recommendation</b>	The ex ante savings are conditionally approved pending information regarding the “Utility Qualified” acceptance of the LED fixtures that were not found the Qualified Products Lists, correcting the second baseline for the early retirement of the HPS and MH fixtures to account for the 2013 Title 24 requirements, and either submitting adequate evidence in support of the lighting hours of use for all affected areas or revising the final savings estimates using the appropriate DEER lighting hours of use for the entire project.

## Measure Description

The project will replace High Pressure Sodium (HPS) and Metal Halide (MH) fixtures with LED Fixtures in the refrigerated warehouse and manufacturing areas of a food production facility in Climate Zone 13. PG&E indicates that the lighting fixtures operate continuously covering three work production shifts for a total of 8,760 hours per year. PG&E indicated that the fixtures cannot be turned off during the production due to safety and ongoing maintenance.

## Summary of Review

PG&E, the Investor-Owned-Utility (IOU), submitted information on during the parallel review process and the following documents on September 10, 2013 for this Phase I Ex Ante Review:

- Savings Calculation Workbooks;
- Proposed Lighting Specification Sheets;
- Pre-Implementation Review Package;
- Third Party Comments to ED's Data Request Email;
- Verification Criteria for Post-Installation Inspection; and
- Facility Schedule Documents;

The CPUC staff identified several issues during the review. First, the proposed 157 Watt Albeo Technologies HX-2ST50 and 134 Watt Coper Course-Hinds VMV11L Explosion Proof LED fixtures were not found in either the Statewide Table of Pre-Qualified LED Fixtures, the DesignLights Consortium Qualified Products List, or the Energy Star Lamps Qualified Product List. If PG&E approved the LED fixtures as a "Utility Qualified" LED fixture, CPUC staff requests that PG&E provide evidence of meeting the requirements stated in Appendix E, Section 2, of the Statewide Customized Retrofit Procedures Manual for Business, explicitly:

### *"E2: UTILITY APPROVAL PROCESS*

*Please note, DesignLights Consortium (DLC) qualification for fixtures must be completed prior to application submittal. For Fixtures/Luminaires not currently covered by an ENERGY STAR label, please utilize the DLC process found at: <http://designlights.org/solidstate.about.php>*

*Once DLC has qualified the LED fixture/luminaire, Section E1 will be updated."*

Second, the baseline used for the RUL through EUL period savings needs to reflect code requirements that are coming into effect during the period. Since PG&E elected to treat the HID fixture replacements as Early Retirement, the 2013 Title 24 lighting occupancy control requirements for warehouses that become effective on January 1, 2014 may impact the second baseline depending on the satisfactory PG&E evidence to support the pre-implementation lighting hours of use. If the lighting hours of use are proven not be 24/7 as claimed, then the

savings associated with installation of occupancy sensor controls may only be claimed for the RUL period and not for the RUL for EUL period since Title 24 mandates lighting controls. If the lighting hours of use are satisfactorily proven to be 24/7, then the 2013 Title 24 Section 130.1(c)6 requires the installation of occupancy sensor controls that automatically reduce lighting power by at least 50 percent when the areas are unoccupied in addition to the Section 130.1(c)1 requirements:

*6. Areas where partial ON/OFF occupant sensing controls are required in addition to complying with Section 130.1(c)1.*

*A. In aisle ways and open areas in warehouses, lighting shall be controlled with occupant sensing controls that automatically reduce lighting power by at least 50 percent when the areas are unoccupied. The occupant sensing controls shall independently control lighting in each aisle way, and shall not control lighting beyond the aisle way being controlled by the sensor.*

*EXCEPTION 1 to Section 130.1(c)6A: In aisle ways and open areas in warehouses in which the installed lighting power is 80 percent or less of the value allowed under the Area Category Method, occupant sensing controls shall reduce lighting power by at least 40 percent.*

CPUC staff notes that any installed self-contained lighting controls must meet the requirements of the 2012 Title 20, Section 1605.3(I)2.

PG&E claims the existing HID fixtures are 100% operational and are properly maintained. CPUC staff requires that for all ER claims, sufficient evidence be provided to support the claim. Evidence can include equipment purchase invoices and photographs of the equipment clearly showing the condition of the fixtures. In addition, CPUC staff disagrees with PG&E's RUL assessment for the existing HPS and MH fixtures. Given the extended lighting hours of use claimed for the manufacturing floor and warehouse areas, and since there was no evidence submitted in regards to the age of the existing fixtures, the existing HPS and MH fixtures have a maximum RUL of 3.1 years based on the DEER RUL default of one third of the measure EUL. Lastly, PG&E's claim of extended lighting hours of use for this application needs to be supported with either pre- and post-M&V data or screenshots of the lighting circuit schedules from the facility's Building or Energy Management Systems for all affected areas. Otherwise, CPUC guidance requires the use the appropriate DEER default lighting hours of use for all affected areas.

## **Review Conclusion**

The ex ante savings are conditionally approved pending information regarding the "Utility Qualified" acceptance of the LED fixtures that were not found the Qualified Products Lists, correcting the second baseline for the early retirement of the HPS and MH fixtures to account for the 2013 Title 24 requirements, and either submitting adequate evidence in support of the lighting hours of use for all affected areas or revising the final savings estimates using the appropriate DEER lighting hours of use for the entire project.

### **Summary of CPUC Staff Requested Action by the IOU**

CPUC staff requests that PG&E undertake the following recommended steps and submit the following information within the timeframes indicated for each item:

1. Provide by December 5, 2013 documentation supporting the qualification of the LED fixtures slated to replace the indoor T8 linear fluorescent fixtures, or revise the proposed measures to listed qualified products.
2. Upon project implementation and for the final savings claim, provide evidence of the lighting hours of use using either the Building or Energy Management System lighting control schedules or pre- and post- data monitoring, or revise the lighting operating hours using the appropriate DEER operating hours for all areas.
3. By project completion and for the final savings claim, correct the second baseline for the early retirement of the HPS and MH fixtures to account for the 2013 Title 24 requirements as outlined in the summary section of this review.
4. By project completion, submit itemized contractor invoices to support the full and incremental measure costs.
5. By project completion, submit the post-installation verification report and any measurement data taken, along with trued-up final savings estimates.

**Table 1-2 Review Findings**

Reviewed Parameter	Analysis
<p><b>Project Baseline Type</b> (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures, Major Renovation) Note: For early retirement projects only, include RUL through EUL baseline)</p>	IOU Proposal: Early Replacement
	CPUC Staff Assessment: Early Replacement is accepted pending submission of evidence to support this claim
	CPUC Staff Recommendation: Submit sufficient evidence to support the early retirement claim.
<p><b>Project Baseline Technology</b> (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)</p>	IOU Proposal: In situ for the first baseline and Title 24 for second baseline
	CPUC Staff Assessment: In situ for the first baseline and 2013 Title 24 for second baseline
	CPUC Staff Recommendation: The second baseline needs to be adjusted to reflect the requirements of the 2013 Title 24.
<p><b>Project Cost Basis</b> (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)</p>	IOU Proposal: Full Cost
	CPUC Staff Assessment: Full measure cost for the first baseline and incremental measure cost for the second baseline is required
	CPUC Staff Recommendation: Provide the incremental measure cost for the second baseline. By project completion, submit itemized contractor invoices, detailing labor and materials, to support the full and incremental measure costs.
<p><b>RUL</b> (required for early retirement projects only, otherwise N/A)</p>	IOU Proposal: 5 years
	CPUC Staff Assessment: 3.1 years
	CPUC Staff Recommendation: Until the actual lighting operating hours are adequately established, CPUC staff recommends using the claimed lighting hours of use to calculate the RUL values for the existing equipment using the DEER methodology of one third of the measure EUL. Based on the self-reported operating hours, the existing HPS and MH fixtures would have a maximum RUL of 3.1 years.
<p><b>EUL</b> (for each measure)</p>	IOU Proposal: 12.2 years
	CPUC Staff Assessment: 12.2 years
	CPUC Staff Recommendation: None

Reviewed Parameter	Analysis
<b>Savings Assumptions</b>	IOU Proposal: In situ equipment is used for the first baseline savings and lighting disposition default baseline of pulse start metal halides has been used for the second baseline savings. The Peak Coincidence Demand Factor of one was applied to the peak demand reduction for the fixtures.
	CPUC Staff Assessment: The second baseline for the HPS and MH fixtures early replacement does not account for the 2013 Title 24 requirements. The code baseline used for 400 watt MH fixtures should be revised to 400 Watt Pulse Start MH.
	CPUC Staff Recommendation: Revise the savings calculation spreadsheet to use qualified LED fixtures. Revise the 2nd baseline for the HPS and MH fixtures ER measure as outlined. If the evidence submitted to support the lighting hours of use does not indicate a high degree of certainty that the lights operate during the DEER defined peak demand period, the appropriate DEER CDF value shown be applied.
<b>Calculation Methods/Tool review</b>	IOU Proposal: Savings were calculated using an engineering spreadsheet.
	CPUC Staff Assessment: Calculation method is acceptable.
	CPUC Staff Recommendation: None
<b>Pre- or Post-Installation M&amp;V Plan</b>	IOU Proposal: The post-installation survey will verify project costs via invoices, installation of the proposed lighting systems and occupancy sensors, new equipment specifications, and will obtain at least one week of trend data to verify the lighting operating hours in areas where occupancy sensors are installed.
	CPUC Staff Assessment: A post-installation verification survey is acceptable. Adequate evidence of the pre-implementation lighting hours of use is needed for all the affected areas.
	CPUC Staff Recommendation: The data post-installation verification survey should record and report the actual lamp models installed and fixture counts as well as any lighting control additions in the as-built condition. Use the collected post-installation verification data and any measurement data to true-up the final impact estimates. Submit the verification data and report for the final ED review. Recommend data logging the lighting usage for all affected areas.
<b>Net-to-Gross Review</b>	IOU Proposal: Not Provided
	CPUC Staff Assessment: An NTG assessment is not warranted at this stage.
	CPUC Staff Recommendation: An NTG interview is not recommended at this stage.

**Table 1-3 Energy Savings Summary, Project Costs & Incentive**

<b>Description</b>	<b>IOU Ex Ante Claim</b>	<b>CPUC Staff Recommendations</b>
<b>First Year kWh Savings</b>	540,541.80	TBD
<b>First Year Peak kW Savings</b>	68.68	TBD
<b>First Year Therms Savings</b>	N/A	TBD
<b>kWh Savings (RUL Period)</b>	540,541.80	TBD
<b>Peak kW Savings (RUL Period)</b>	68.68	TBD
<b>Therms Impact (RUL Period)</b>	390,743.92	TBD
<b>kWh Savings (RUL thru EUL Period)</b>	50.06	TBD
<b>Peak kW Savings (RUL thru EUL Period)</b>	50.06	TBD
<b>Therms Savings (RUL thru EUL Period)</b>	N/A	TBD
<b>Annual Non-IOU Fuel Impact (RUL Period)</b>	N/A	TBD
<b>Annual Non-IOU Fuel Impact (RUL thru EUL Period)</b>	N/A	TBD
<b>Project Costs for Baseline #1 (RUL or EUL)</b>	Full Costs \$200,000	TBD
<b>Project Costs for Baseline #2 (EUL minus RUL period)</b>	Incremental Costs Not Provided	TBD
<b>Project Incentive Amount</b>	\$48,160.20	TBD