

## **Ex Ante Review Findings**

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

<b>IOU</b>	PGE
<b>Application ID</b>	HIEEP 1247-02
<b>Application Date</b>	6/20/2012
<b>Program ID</b>	PGE2223
<b>Program Name</b>	Heavy Industry Energy Efficiency Program
<b>Program Year</b>	2012
<b>Itron Project ID</b>	X164
<b>IOU Ex Ante Savings Date</b>	TBD
<b>ED Measure Name</b>	Lighting Improvement
<b>Project Description</b>	Linear fluorescent lighting retrofit
<b>Date of ED Review(s)</b>	8/30/2012
<b>Primary Reviewer and Firm</b>	Phani Pagadala/Itron
<b>Review Supervisor and Firm</b>	Joseph Ball/Itron
<b>Type of Review (Desk, On-site, Full M&amp;V, Tool)</b>	Desk Review
<b>ED Recommendation</b>	Conditional approval subject to post-installation M&V and savings true up

## **Measure Description**

The proposed project will replace the following lamps and fixtures at the facility:

- (254) existing 400 Watt Metal Halide (MH) fixtures in the production areas of the plant with (254) 6-lamp 48" 226 Watt T-8 fixtures with integrated motion sensors. It is expected that the installation of the motion sensors results in a 45% runtime reduction.
- (573) existing 32 Watt T8 lamps with (573) 28 Watt T8 lamps in the maintenance shops and offices with the addition of dedicated motion sensors to the fixtures. The installation of motion sensors is expected to reduce the fixture runtime by 30%.
- (26) 1000 Watt exterior MH fixtures with (26) 750 Watt Pulse Start Metal Halide (PSMH) fixtures and (20) 1000 Watt exterior MH fixtures with (20) 400 Watt MH fixtures. No information on pre- and post-installation fixture controls, if any (e.g. timers, photocells, etc.), was provided within the project documentation.

The existing production area, maintenance shop and office lighting was reported as operating for 8,760 hours per year. The exterior fixtures were listed as being in operation of 5,110 hours per year.

As per the project documentation, the annual energy savings estimated for the lighting efficiency improvement are 636,640 kWh with an additional 263,391 kWh due to controls, for a total of 900,031 kWh. The anticipated peak demand reduction due to lighting is 60.94 kW with an additional 30.07 kW savings due to controls, for a total of 91.01 peak kW savings. The project implementation cost is \$88,286 with an estimated incentive of \$44,143.

## **Summary of Review**

As part of this ex ante review, ED assessed the PCIP, which described the pre- and post-installation conditions and methodologies used for impact estimation. Also included was the signed application form. It must be noted that the PCIP did not include complete project details or the savings calculations spreadsheet. However, the calculation spreadsheet with additional details on the project including fixture counts, locations, etc. was provided after a phone conversation with the IOU representatives.

The project's energy savings estimates were calculated based on reduced fixture wattages, which were taken from PG&E's Customized Retrofit Incentive (CRI) Program and the projected hours of operation for the post-installation operating conditions. The IOU 3<sup>rd</sup> party implementer (TPI) intend to carry out post-install verification activities.

During follow-up conversations with the IOU representatives and the TPI, ED investigated the feasibility of pre- and post-installation M&V activities. The TPI indicated that due to safety and security concerns, the participant was reluctant to carry out any M&V activities.

The ED believes that the savings due to the motion sensors for the new lighting maybe overestimated and need to be substantiated by actual measured data. In order for the IOU to claim impacts resulting from the controls installation, ED recommends panel level monitoring of the post-installation lighting fixtures for at least two weeks to accurately estimate the savings. ED also recommends monitoring of the baseline lighting fixtures for determination of actual connected loads and operating hours.

If the aforementioned M&V activities are not viable at all, the ED recommends that the lighting efficiency improvement savings alone be claimed and incentivized. However, these need to be adjusted for any variations in the fixture operating schedule. In one of the correspondences from the TPI, there is evidence that the facility might not operate continuously or 8,760 hours per year. An email from the customer representative stated that the facility was ramping up production with additional Sunday shifts to meet the demand, which calls into question the 8,760 hours of plant operation. Hence, ED requests that the IOU/TPI provide the actual annual operating schedule for the facility lighting in order to accurately estimate the savings resulting from the lighting efficiency improvements.

It must also be noted that the simple payback period in the calculation spreadsheet, both with and without incentives, was less than one year. ED requests the IOU to provide actual costs, where available.

### **Review Conclusion**

ED conditionally approves the savings for the proposed project and requests an opportunity to review the savings estimates after one of the following recommendations is carried out:

1) Validate the savings estimates resulting from the motion sensor installation by performing panel level measurements for a period of at least two weeks for a sample of fixtures across different usage areas, to meet 90/20 (CV of 0.5). If this option is chosen, ED requests that the IOU provide the M&V plan for review,

OR

2) Claim energy savings *only* for lighting efficiency improvements (not controls) and utilize the actual annual operating schedule.

### **Summary of ED Requested Action by the IOU**

ED requests that the IOU submit the following by **9/19/12**:

- Provide a response to ED recommendations.

In addition, ED requests that the IOU submit the following documentation after post-install M&V is completed:

- Submit revised savings calculations for true-up, and

- Provide the project’s actual measure costs.

**Table 1-2: Project Overview**

Description	IOU Proposed Ex Ante Data	ED Recommendations
<b>Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures)</b>	Early Replacement	Early Replacement confirmed with the TPI. In-situ fixtures as the RUL baseline and the as-installed (post case) fixtures as the after RUL thru EUL period baseline may apply.
<b>Project Cost Basis (Full Cost, Incremental Cost)</b>	Full cost of \$88,286 as listed in the project documentation	TBD; ED recommends that the IOU submit the actual installed measure costs, as available
<b>RUL (Early retirement projects only, otherwise N/A (not applicable))</b>	5 years per the TPI	No change recommended
<b>EUL</b>	None provided	15 years based on DEER estimates.
<b>First Year kWh Savings</b>	900,031 kWh in the calculation spreadsheet	TBD; pending post-installation M&V true-up
<b>First Year Peak kW Savings</b>	91.01 kW	TBD; pending post-installation M&V true-up
<b>First Year Therms Savings</b>	N/A	N/A
<b>kWh Savings (RUL Period)</b>	900,031 kWh in the calculation spreadsheet	TBD; pending post-installation M&V true-up
<b>Peak kW Savings (RUL Period)</b>	91.01 kW	TBD; pending post-installation M&V true-up
<b>Therms Impact (RUL Period)</b>	N/A	N/A
<b>kWh Savings (EUL thru RUL Period)</b>	Not provided	TBD; pending post-installation M&V true-up
<b>Peak kW Savings (EUL thru RUL Period)</b>	Not provided	TBD; pending post-installation M&V true-up
<b>Therms Savings (EUL thru RUL Period)</b>	N/A	N/A
<b>Annual Non-IOU Fuel Impact (RUL Period)</b>	N/A	N/A
<b>Annual Non-IOU Fuel Impact (EUL</b>	N/A	N/A

Description	IOU Proposed Ex Ante Data	ED Recommendations
thru RUL Period)		
<b>Net-to-Gross Ratio</b>	Not available	None recommended

**Table 1-3: Detailed Review Findings**

Reviewed Parameter	Analysis
<b>Project Gross Savings Baseline</b> (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Use of existing (in situ) lighting fixtures
	ED Assessment: Early replacement of existing fixtures. The TPI confirmed an RUL of 5 years, which is one-third of the measure EUL. The as-installed (post case) fixtures would be the technical baseline at the end of the RUL period, thereby negating the gross impacts after the 5 year RUL period.
	ED Recommendation: RUL period: in-situ fixtures; RUL thru EUL period: as-installed (post case) fixtures
<b>Project Cost Basis</b> (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Appears to be full project cost
	ED Assessment: Use of actual measure costs, when available, will yield accurate incentive and payback estimates.
	ED recommendation: Please provide actual measure costs, when available.
<b>RUL</b> (required for early retirement projects only, otherwise n/a)	IOU Proposal: 5 years
	ED Assessment: 5 year RUL was confirmed with the TPI
	ED recommendation: No change recommended
<b>EUL</b>	IOU Proposal: No information provided
	ED Assessment: DEER 2008 shows 15 year EUL
	ED Recommendation: 15 years
<b>Savings Assumptions</b>	IOU Proposal: For estimating the fixture power, the TPI calculations utilized the standard fixture wattage tables. The baseline hours of operation were listed as being 8,760 hours per year for the production areas of the plant and 5,110 hours per year for the exterior lighting fixtures. The post-installation runtime reduction due to occupancy sensing controls was estimated at 45% for the production area lighting and 30% for the maintenance and office area lighting.
	ED Assessment: ED accepts the IOU proposal of utilizing standard fixture

<b>Reviewed Parameter</b>	<b>Analysis</b>
	<p>wattage tables.</p> <p>As per one of the customer’s emails to the TPI, the operating hours claim does not appear to be substantiated and ED request further clarification on this matter.</p> <p>The motion sensor savings seem to have been overestimated and ED believes that actual measurements may help validate the runtime reduction and improve the accuracy of the savings estimates.</p>
	<p>ED Recommendation:</p> <p>ED recommends the use of post-install M&amp;V data in order to claim savings for the controls measures.</p> <p>Alternatively, ED recommends that the IOU claim savings for lighting efficiency improvements using actual facility operating hours.</p>
<b>Calculation Methods/Tool review</b>	IOU Proposal: Spreadsheet based calculations
	ED Assessment: Calculation methodology used is acceptable.
	ED Recommendation: ED recommends the use post-installation M&V data to true-up savings, as the IOU plans.
<b>Pre- or Post-Installation M&amp;V Plan</b>	IOU Proposal: A post-installation verification plan was provided within the PCIP by the IOU TPI.
	<p>ED Assessment: ED approves the IOU submitted verification plan but with the following additions:</p> <ul style="list-style-type: none"> <li>- Verification of the annual operating hours</li> <li>- Panel level measurements, for a period of at least two weeks, to validate the savings estimates resulting from the motion sensors</li> </ul>
	ED Recommendation: ED recommends execution of the revised M&V plan with an opportunity to review the plan. ED also requests an opportunity to review the savings estimates after completion of the post-installation M&V.
<b>Net-to-Gross Review</b>	IOU Proposal: None
	ED Assessment: Not addressed
	ED Recommendation: None at this time