

## **Phase III Ex Ante Review Findings**

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

<b>IOU</b>	Pacific Gas and Electric
<b>Application ID</b>	1365-01
<b>Application Date</b>	5/14/2012
<b>Program ID</b>	PGE2223
<b>Program Name</b>	Heavy Industrial Energy efficiency Program
<b>Program Year</b>	2012
<b>Itron Project ID</b>	X120
<b>IOU Ex Ante Savings Date</b>	Not available
<b>ED Measure Name</b>	Chiller Replacement
<b>Project Description</b>	Replace Air cooled Chiller system with Water cooled chiller system
<b>Date of ED Review(s)</b>	07/16/2012 & 08/29/12 & 03/07/2013
<b>Primary Reviewer and Firm</b>	Kunal Desai / 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>	ED approves frozen ex ante savings of 2,139,465 kWh and 146 kW

## **Measure Description**

The measure proposes to replace two existing (165 tons each) air-cooled chillers, four (4) chiller pumps (10 hp, 25 hp, 40 hp, 40 hp), heat exchangers, two (2) cooling towers (135 tons each), three (3) cooling tower pumps with two (2) water cooled chillers (300 tons each), two (2) cooling towers (1200 tons each), and five (5) pumps (40 hp, 15 hp, 25 hp, 30 hp, 15 hp).

## **Summary of Review**

Documents provided for review included the following: Revised live energy savings calculation spreadsheet, a data response word document, project invoices, incremental cost calculation in spreadsheet format.

IOU also submitted post installation M&V energy savings calculations for ED review. ED's ex ante calculation review suggested many changes to the ex ante calculations. The primary issue was that the load on the chiller plant was significantly different between pre and post evaluations. ED asked IOU to revise and resubmit the calculations and also provide incremental cost for the project. IOU resubmitted the calculations on January 14<sup>th</sup>, 2013 with revised energy savings estimates of 2,233,509 kWh. In this post installation phase II review, ED noted that the primary concern was addressed but noted that the ex ante analysis incorrectly estimated the load on the chiller plant when free cooling via the cooling tower was available. This issue was discussed over a conference call with PGE and the third party implementer. PGE and the third party implementer agreed that this was a relatively minor (~5%) reduction and requested ED to provide the final frozen ex ante estimate. ED revised the savings estimate from 2,233,509 kWh to 2,139,465 kWh based on a 4.2% reduction.

IOU's calculated incremental cost for the project is \$980,000. Although, no invoices or other supporting documentation were submitted to justify actual internal labor cost. The internal labor cost for the project was estimated to be 1/3 of the actual installed cost. ED suggests that in the future RS Means or other labor cost calculation method be used to calculate incremental labor cost for the project. The estimated project incentive is \$335,558.

## **Review Conclusion**

ED approves frozen ex ante savings of 2,139,465 kWh and 146.3 kW

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>	Capacity Expansion	Capacity expansion
<b>Project Cost Basis (Full Cost, Incremental Cost)</b>	Incremental cost – \$980,000	Incremental cost acceptable
<b>RUL (Early retirement projects only, otherwise N/A (not applicable))</b>	N/A	N/A
<b>EUL</b>	20 years	20 years for new chillers per DEER 2008
<b>First Year kWh Savings</b>	3,067,259	2,139,465
<b>First Year Peak kW Savings</b>	465.02	146.3
<b>First Year Therms Savings</b>	N/A	N/A
<b>kWh Savings (RUL Period)</b>	N/A	N/A
<b>Peak kW Savings (RUL Period)</b>	N/A	N/A
<b>Therms Impact (RUL Period)</b>	N/A	N/A
<b>kWh Savings (EUL thru RUL Period)</b>	3,067,259	2,139,465
<b>Peak kW Savings (EUL thru RUL Period)</b>	465.02	146
<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 thru RUL Period)</b>	N/A	N/A

<b>Description</b>	<b>IOU Proposed Ex Ante Data</b>	<b>ED Recommendations</b>
<b>Net-to-Gross Ratio</b>	Not provided	0.75

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

<b>Reviewed Parameter</b>	<b>Analysis</b>
<b>Project Gross Savings Baseline</b> (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Capacity expansion
	ED Assessment: Capacity expansion baseline claim is acceptable
	ED recommendation: None
<b>Project Cost Basis</b> (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Incremental Cost estimate of \$980,000 submitted
	ED Assessment: No invoice or supporting documentation was submitted to justify actual internal labor cost. The internal labor cost for the project was estimated to 1/3 of the actual installed cost.
	ED recommendation: ED suggests that in the future RS Means or other labor cost calculation method be used to calculate incremental labor cost for the project
<b>RUL</b> (required for early retirement projects only, otherwise n/a)	IOU Proposal: RUL for Chillers (9 years), pumps (4 years), Cooling tower (7 years), CWP (7 years)
	ED Assessment: Capacity expansion baseline.
	ED recommendation: None
<b>EUL</b>	IOU Proposal: 20 years
	ED Assessment: 20 years for chillers per DEER 2008 database.
	ED Recommendation: None
<b>Savings Assumptions</b>	IOU proposal: Live energy savings calculation spreadsheets submitted for ED review. Facility operating hours (8,708 hours per year) were estimated using BIN method.
	ED Assessment: Instead of bin method use facility logs, trends, or SCADA system to obtain operating hours.
	ED Recommendation: Use actual facility operating hours to true up the savings estimate.
<b>Calculation Methods/Tool review</b>	IOU proposal: Live energy savings calculation spreadsheets submitted for ED review
	ED Assessment: The post installation M&V analysis incorrectly estimated the load on the chiller plant when free cooling via the cooling

Reviewed Parameter	Analysis
	<p>tower was available. ED’s analysis anticipated the savings to be reduced by 5% based on this error.</p> <p>ED Recommendation: ED revised the load on the chiller plant when free cooling via the cooling tower was available and used this in the final savings calculation.</p>
<p><b>Pre- or Post-Installation M&amp;V Plan</b></p>	<p>IOU Proposal: Post installation M&amp;V plan submitted</p> <p>ED Assessment: ED suggests conducting post installation M&amp;V for 2 weeks in summer and 2 weeks in winter. This M&amp;V strategy will help account for seasonal load variations at the facility. The IOU did not conduct two weeks of summer post installation M&amp;V</p> <p>ED Recommendation: Two weeks of summer post installation M&amp;V should have been conducted to capture load variation. Production information from the previous year was used to adjust the baseline.</p>
<p><b>Net-to-Gross Review</b></p>	<p>IOU Proposal: Not provided</p> <p>ED Assessment: This customer replaced their air cooled chiller system with a water-cooled chiller system. In selecting this equipment, their primary motivations were to save energy and to take advantage of the program incentive. Their existing equipment could have continued to run a few more years, so it was not critical to replace it immediately. They planned to increase their capacity - to double the existing system – so absent the program and incentive, they would continue to run the old equipment until the capacity increase was implemented.</p> <p>ED Recommendation: NTGR calculated to be 0.75. Important program factors included the program rebate (10/10), technical information provided by a program vendor (10/10) and payback with the rebate (8/10). Important non-program factors included previous experience with the measure (8/10) and improved product quality (10/10).</p>