

Phase I Ex Ante Review Findings

Table 1-1: Project Information

IOU	PGE
Application ID	2K13215904
Application Date	10/3/2012
Program ID	PGE21011
Program Name	Customized Retrofit
Program Year	2013
Itron Project ID	X437
IOU Ex Ante Savings Date	Not available
CPUC Staff Measure Name	Not available
Project Description	<p>The proposed measure involves replacement of one existing chiller (CH-6) with a high efficiency chiller at a telecommunication and data center facility in California CZ 03.</p> <p>The customer also proposes to replace another existing chiller (CH-5) with a high efficiency chiller under a separate incentive application (2K13215903).</p>
Date of CPUC Staff Review	1/14/2014
Primary Reviewer / Firm	C.D. Nayak / DNV GL Energy
Review Supervisor / Firm	Chris Williams / DNV GL Energy
CPUC Staff Project Manager	██████████ / California Public Utilities Commission, Energy Division
CPUC Staff Policy Authorization (as needed)	
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review
CPUC Staff Recommendation	<p>The ex ante savings are not approved. Because the second application (2K13215903) is for replacement of CH-5 at the same physical location, therefore, the entire plant operation must be reviewed to assess the total impact. For CH-6 replacement, the claimed savings should be revised consistent with project's dual baseline. Further, CPUC Staff requests that the savings calculation be revised based on the observed chiller plant load in the post-</p>

	<p>retrofit condition. Since the cooling loads can be considered reasonably equivalent for both the baseline and proposed conditions, the baseline cooling loads, chiller percentage loading, chiller power, and energy will be revised based on the post-retrofit M&V.</p>
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Measure Description

The proposed measure involves replacement of one of the existing chillers (CH-6, 410 ton, water cooled centrifugal) at a telecommunication and data center facility with a larger capacity and high efficiency chiller (650 ton, water cooled). The new chiller appears to have both inlet guide vane and variable frequency drive (VFD) as well as variable evaporator flow rate. The facility will also replace another existing chiller (CH-5, 400 ton, water cooled) with a larger capacity and high efficiency chiller (650 ton, water cooled), under a separate incentive application (2K13215903). Initially, both these retrofit projects were part of the same incentive application; however, PG&E decided to split the application into two separate applications.

The project document provides the following additional information:

“There are currently three functioning Trane model CV HF-350 chillers onsite (CH 3, 4, and 6). There is also a non-functioning chiller onsite (CH 5). The Customer loads the three chillers equally; based on the calculated building load the chillers operate at or near full load at all times. The chillers have a chilled water set point of 45°F, design condensing water temperature of 83°F, and a design chilled water flow of 1,230 gpm. The Customer will also replace the non-functioning chiller (CH-5) with a new chiller, as part of a separate incentive application.”

In the pre-project condition, the facility was operating the three chillers and they were operating at or near full load at all times. In the post-installation phase, the two new chillers (CH-6 and CH-5) will operate as the lead chillers and the remaining two chillers (CH-3 and CH-4) will remain as the backup. It appears from the project document that because the two proposed chillers will have higher rated capacities than the existing chillers being replaced, the new chillers will be able to meet the building load for most of the year, and one of the stand-by chillers will come into operation when the two new chillers are not able to meet the load.

Summary of Review

Initially, CPUC staff received very limited information on the proposed measure and description of the existing facility, chiller plant equipment & operation schedule, control set points, and baseline operating conditions. CPUC staff made a Data Request (DR) on 10/25/2013.

The Investor-Owned-Utility (IOU) submitted the following documents on 12/09/2013 for Phase I review:

- Incentive project application (only the first page);
- Pre-installation facility chiller plant photographs;
- Project and facility chiller plant descriptions;
- E-mail response from IOU technical reviewer to CPUC staff’s DR;
- Baseline and proposed chillers part-load efficiencies;
- Proposed chiller specification;

- Cost document for estimated project cost;
- Facility's monthly utility data from Mar, 2012 to Sept, 2013 (gas) and Jan, 2012 to Sept, 2013 (electric); and
- Energy savings calculation spreadsheet.

Further, PG&E provided the project application (PA) review report prepared by the IOU technical reviewer on 12/31/2013. The PA review report approves the following annual savings: 454,763.9 kWh and 57.85 kW peak demand reduction. The PA review report approves an incentive of \$73,999.59 and with a total project cost of \$596,945.65. The report further states that the claimed savings accounts for 8.2% of the facility's annual electric consumption and 17.4% of the existing chiller's annual electric consumption.

The monthly utility data provided by the IOU indicate that the annual facility energy usage for 2012 was 27.8 GWh of electricity and 405,175 Therms of natural gas. CPUC staff found that the reported natural gas (NG) consumption is unusually high considering the project site includes a telecommunication facility with a data center. CPUC staff's review of the IOU PA review report revealed that the facility has an onsite fuel cell, which contributes to very high NG consumption.

CPUC staff finds the proposed measure eligible under the IOU program guidelines. The ex-ante savings calculation used the existing chiller's rated efficiency and calculated the part-load efficiencies using a DOE 2.2 efficiency curve for the baseline annual energy estimation and similarly for the proposed part-load chiller efficiencies as the post-retrofit annual energy consumption. The submitted spreadsheet savings calculation is appropriate for this project, and has utilized near constant cooling load, which is consistent with the nature of building load. PG&E did not undertake any pre-installation M&V; it has recommended a post-installation M&V.

Review Conclusion

The ex ante savings are not approved. Because the second application (2K13215903) is for replacement of CH-5 at the same physical location, therefore, the entire plant operation must be reviewed to assess the total impact. For CH-6 replacement, the claimed savings should be revised consistent with project's dual baseline. Further, CPUC Staff requests that the savings calculation be revised based on the observed chiller plant load in the post-retrofit condition. Since the cooling loads can be considered reasonably equivalent for both the baseline and proposed conditions, the baseline cooling loads, chiller percentage loading, chiller power, and energy will be revised based on the post-retrofit M&V.

Further, it appears from the PA review report that initially, the retrofit project application included replacement of two chillers (CH-5 and CH-6), however, PG&E decided to split the application into two separate applications. As both CH-5 and CH-6 will act as the lead chillers in the proposed condition, therefore, the revision suggested for CH-6 ex-ante savings calculation also applies to CH-5. However, the baseline part-load efficiency selection may vary for CH-5 based on its vintage and because of ROB baseline.

Summary of CPUC Staff Requested Action by the IOU

CPUC Staff requests that the IOU undertake the recommended steps and submit the following information due on 01/28/2014 (or 14 days from submittal date to IOU):

1. Provide the second application (2K13215903) and all associated project files related to it. Because both applications are for the same facility, and both chillers (CH-5 and CH-6) will operate together to serve the entire building load, CPUC staff will review both applications to assess the total impact.
2. Provide a status update for the project since CPUC staff has not received any response from PG&E about this query posted in the CMPA.
3. Provide updated savings calculation and cost documentations consistent with project's dual baseline.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
<p>Project Baseline Type (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:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
<p>Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)</p>	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
<p>Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)</p>	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
<p>RUL (required for early retirement projects only, otherwise N/A)</p>	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
<p>EUL (for each measure)</p>	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
<p>Savings Assumptions</p>	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:

Reviewed Parameter	Analysis
Calculation Methods/Tool review	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
Pre- or Post-Installation M&V Plan	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
Net-to-Gross Review	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:

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

Description	IOU Ex Ante Claim	CPUC Staff Recommendations
First Year kWh Savings		
First Year Peak kW Savings		
First Year Therms Savings		
kWh Savings (RUL Period)		
Peak kW Savings (RUL Period)		
Therms Impact (RUL Period)		
kWh Savings (RUL thru EUL Period)		
Peak kW Savings (RUL thru EUL Period)		
Therms Savings (RUL thru EUL Period)		
Annual Non-IOU Fuel Impact (RUL Period)		
Annual Non-IOU Fuel Impact (RUL thru EUL Period)		
Project Costs for Baseline #1 (RUL or EUL)		
Project Costs for Baseline #2 (EUL minus RUL period)		
Project Incentive Amount		