

Phase III Final Ex Ante Review Findings

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

IOU	PG&E
Application ID	2K13171187
Application Date	4/8/2013
Program ID	PGE21021
Program Name	Industrial Calculated Incentives
Program Year	2013
Itron Project ID	X338
IOU Ex Ante Savings Date	7/29/2013
CPUC Staff Measure Name	Insulation of steam, and hot & chilled water pipe joints and valves
Project Description	The natural gas energy savings portion of the project involves insulating steam & hot water bare pipe surfaces including valves, fittings, traps and condensate return. For electrical energy savings, insulation is also being added to chilled water pipes, fittings and valves.
Date of CPUC Staff Review	5/13/2013 & 9/30/2013 & 12/13/2013
Primary Reviewer / Firm	Kunal Desai/Itron
Review Supervisor / Firm	Joseph Ball/Itron
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	Final ex ante savings are approved at the IOU-revised values of 5,693 kWh and 28,860 therms (and 0 peak kW), however, with a NTG score of 0.18, the project does not appear cost effective.

Measure Description

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Summary of Review

Pacific Gas & Electric (PGE) submitted the following documents to the Energy Division (ED) in response to the Phase II review:

- 2K13171187_XXXXXX_Correspondence_IR.zip
- 2k13171187_2013 IR_Review_XXXXXX.xlsm
- 2k13171187_XXXXXX_Savings Calculations_Post.xlsx
- 2k13171187_XXXXXX Inspection_11.11.13_Temperature readings.xlsx
- 2k13171187_DOME-286E-OCT-2013.pdf

In the Phase I ex ante review (5/13/2013), CPUC staff asked PGE to demonstrate that the proposed pipes and joints are mounted more than 7 feet in height measured vertically from the floor or are farther than 15 inches measured horizontally from stairways, ramps or fixed ladders.

The NTG interview was conducted on 5/28/2013 which followed news that the customer might not be able to receive incentives due to OSHA code baseline requirement. The NTG interview was inadvertently omitted from the phase II EAR disposition, but was included in this phase III final. This customer is clearly a free-rider with a calculated free-ridership score of 0.82.

On 10/8/2013, in response to the phase I EAR data request, PGE submitted a revised list of 39 items which was outside of the OSHA regulation. PGE's original list had 139 items and their site visit determined that 100 of those items were disqualified due to OSHA requirement. Insulation details were provided in the 3Eplus PDF. M&V plan was also submitted by PGE which listed only some verification activities. During the phase II review (9/30/2013) CPUC staff noted these major reductions in qualifying insulation locations, and conditionally approved the project as long as more rigorous post-install M&V was conducted that included collecting surface temperatures.

In this phase III review, NAIMA 3EPlus simulations were not revised and instead the energy savings summary spreadsheet calculation was revised, however, the IOU responded with a defense of their 75% boiler conversion factor claim without any proof. CPUC staff rejects the argument that larger steam systems always have lower combustion efficiencies, based on 40 year-old or greater boiler in SCG ex post evaluations that operate in the 82-84% measured combustion efficiency. **If the IOU does not want to use the 80% CPUC staff-recommended**

default, then CPUC staff will need documented evidence, such as results from a boiler combustion efficiency test (flue gas analysis) or a submitted copy of the results from the most recent annual boiler test that includes boiler model numbers and testing dates.

As for the thermal improvement of the chilled water pipes an assumed chiller efficiency of 0.90 kW/ton was used in in the revised calculations; CPUC staff deems this as an acceptable default.

Due to the urgency of this project (as requested by the IOU), CPUC will let this one go. In the future, CPUC staff will require documented evidence and will reject unsupported default assumptions when CPUC staff-recommended default assumptions were not implemented.

The same insulation that was previously proposed - 1” thick on hot and cold water pipes and 2” thick on steam pipe valves – were verified to be installed. Invoices documented all project costs. The insulation surface temperatures taken during inspection are within the expected ranges. The project baseline was corrected, and an EUL of 8 years was provided by PG&E.

Between the original CMPA project data submission and this third post-install review PGE revised their original energy savings and incentive estimates as shown in the table below.

Description	Phase I IOU Ex Ante Claim	Phase II IOU Ex Ante Claim	Phase III IOU Ex Ante Claim
First Year kWh Savings	34,583	6,923	5,693
First Year Peak kW Savings	0	0	0
First Year Therms Savings	370,837	34,454	28,860
Project Incentive Amount	\$224,112	\$35,077	\$27,210

Review Conclusion

It is noted that staff-recommended default assumptions were not implemented. Considering the urgency and expediency of this review (as requested by the IOU), CPUC staff will let go of non-compliance of previous CPUC boiler efficiency directive. However, **in the future staff will require documented evidence of boiler efficiency, not unsupported default assumptions.**

Final ex ante savings are approved at the IOU-revised values of 5,693 kWh and 28,860 therms (and 0 peak kW), however, with a free-ridership score of 0.82, the project does not appear cost effective.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
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)	IOU Proposal: Add on Measure
	CPUC Staff Assessment: Add on Measure for hot surfaces. Normal replacement for chilled water pipes.
	CPUC Staff Recommendation: Same as above
Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)	IOU Proposal: Bare valves, joints and pipes beyond the OSHA safety code location limits, 7' or greater for horizontal pipes.
	CPUC Staff Assessment: Accept
	CPUC Staff Recommendation: None
Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)	IOU Proposal: Full cost for measures that do not have to meet the OSHA requirement; incremental cost for measures that must comply with the OSHA requirement.
	CPUC Staff Assessment: This is what was directed from phase II EAR. Accepted
	CPUC Staff Recommendation: None
RUL (required for early retirement projects only, otherwise N/A)	IOU Proposal: N/A
	CPUC Staff Assessment: N/A
	CPUC Staff Recommendation: N/A
EUL (for each measure)	IOU Proposal: An EUL of 8 years from the "RCx Project Submittal Guidelines, Version 2.0 Jan 15, 2013" for Commissioning-RCx Repair Hardware-HVAC-Hydronic Equipment/Insulation, Measure Code CCC13 can be used for this project.
	CPUC Staff Assessment: 8 years is accepted
	CPUC Staff Recommendation: None
Savings Assumptions	IOU Proposal: A CPUC staff requested revision of the boiler efficiency from 75% to 80% was not done. An assumed chiller efficiency of 0.90 kW/ton was

Reviewed Parameter	Analysis
	<p>used.</p> <p>CPUC Staff Assessment: In phase II EAR CPUC staff recommended the use of 80% boiler combustion efficiency, however, the IOU defended the 75% without supporting evidence such as a flue gas analysis test or a copy of test results from the most recent annual boiler test at the facility. The actual chiller efficiency was not used but an acceptable 0.90 kW/ton was used as a default.</p> <p>CPUC Staff Recommendation: In the future for projects like these, ED recommends that PGE provide documentation to support the boiler efficiency claim of 75% or use an ED recommended value of 80% in the final savings estimate. Additionally similar evidence should be provided for the actual measured chiller efficiency (in kW/ton or COP) or a 0.90 kW/ton can be used as a CPUC staff-accepted default.</p>
<p>Calculation Methods/Tool review</p>	<p>IOU Proposal: NAIMA 3EPlus software was used to calculate the energy savings.</p> <p>CPUC Staff Assessment: Accept</p> <p>CPUC Staff Recommendation: None</p>
<p>Pre- or Post-Installation M&V Plan</p>	<p>IOU Proposal: M&V plan provided and completed during post-install inspection that included previously recommended spot temperature measurements</p> <p>CPUC Staff Assessment: Accepted</p> <p>CPUC Staff Recommendation: None</p>
<p>Net-to-Gross Review</p>	<p>IOU Proposal: Not provided</p> <p>CPUC Staff Assessment: This company applied for a rebate to help reduce the costs of installing steam valve and fitting insulation in maintenance areas and equipment rooms (unoccupied areas). The energy engineer who championed this project first noticed that several valves up on roof that were not insulated. With the high temperatures of these pipes and valves, he felt it would be a great opportunity to improve energy efficiency. These pipe valves are in unoccupied areas / maintenance areas.</p> <p>Recently, he was informed that the CPUC had not approved the rebate for this project because there is an OSHA requirement that any pipe 7 ft. or less from the floor that gets to 140 degrees or hotter must be insulated. Because of this requirement, the company has been told that PG&E won't pay out a rebate. The respondent plans to continue to go ahead with this project because they are required to meet the OSHA regulation, but is not happy that a rebate will not be paid.</p> <p>When asked about the important factors that helped him decide to go forward with this project, the respondent said reduced energy costs and safety. When asked to rank various factors that affected his decision to install the valve</p>

Reviewed Parameter	Analysis
	<p>insulation, the most important ones were: recommendation/assistance by program staff (8), previous experience with the measure (9) and program (due to the engineering assistance provided by staff) (9), plant safety (10), and compliance with OSHA regulations (10). The respondents originally stated that the rebate was important (8), but since no rebate is being provided, this rating has been revised to N/A.</p> <p>The respondent was asked to allocate 10 points across program and non-program factors in deciding to install this equipment – he gave 2 points to the program and 8 points to other factors.</p> <p>Project Economics: The cost of the project was approximately \$410,000 and based on the energy savings, the project meets the ROI threshold of the company even without the rebate. The respondent noted that for larger projects, such as this one, the project must pay back within 5 years and this one would do so even without the rebate. According to the respondent however, the rebate dollars could have been used for other energy projects that now will not go forward. This is what was most concerning to the respondent.</p>
	<p>CPUC Staff Recommendation: NTGR = 0.18</p>

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

Description	IOU Ex Ante Claim	CPUC Staff Recommendations
First Year kWh Savings	5,693	Accepted
First Year Peak kW Savings	0	Accepted
First Year Therms Savings	28,860	Accepted
kWh Savings (RUL Period)	N/A	N/A
Peak kW Savings (RUL Period)	N/A	N/A
Therms Impact (RUL Period)	N/A	N/A
kWh Savings (RUL thru EUL Period)	5,693	Accepted
Peak kW Savings (RUL thru EUL Period)	0	Accepted
Therms Savings (RUL thru EUL Period)	28,860	Accepted
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (RUL thru EUL Period)	N/A	N/A
Project Costs for Baseline #1 (RUL or EUL)	\$59,729.00	Accepted
Project Costs for Baseline #2 (EUL minus RUL period)	\$59,729.00	Accepted
Project Incentive Amount	\$27,210.25	Accepted