

Phase 1 Ex Ante Review Findings

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

IOU	Pacific Gas and Electric
Application ID	1085-01.1
Application Date	07/16/2012
Program ID	Not available
Program Name	Monitoring Based Commissioning Program 2010 - 2012
Program Year	2012
Itron Project ID	X-139
IOU Ex Ante Savings Date	Not available
ED Measure Name	Boiler Replacement
Project Description	Install a new finned-tube feedwater economizer on the new low NOx boiler
Date of ED Review(s)	07/16/2012
Primary Reviewer and Firm	Kunal Desai / Itron
Review Supervisor and Firm	Joseph Ball / Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review
ED Recommendation	Unable to verify the ex ante impact estimates, pending fulfillment of requested data and the subsequent opportunity for ED to re-evaluate the project savings.

Measure Description

The measure proposes to replace two existing boilers with one reconditioned, low NOx boiler to meet new NOx regulations, Boiler 2 (30,000 PPH) will be replaced with a new 70,000 PPH boiler and existing Boiler 1 (40,000 PPH) will be used as a backup boiler. The new 70,000 PPH boiler is proposed to be installed with a new finned-tube feedwater economizer to improve its combustion efficiency and thereby resulting in gas savings. Installation of the economizer boosts the boiler efficiency from 78 % to 83.5 % and helps the project comply with Title 20 baseline combustion efficiency of 80%. The natural gas savings for this project are a result of the economizer installation only.

Summary of Review

Documents provided for review included the following: Energy Audit Report, PG&E third party review report and DOE boiler efficiency pdf.

The proposed boiler in this case is new to the facility; 'Live' energy savings calculation spreadsheets were not submitted for ED review. The baseline boiler efficiency was calculated as 79%, based on the Title-20 standard of 80.0%, minus 1.0% due to radiative and conductive heat transfer losses. The Title-20 standard was supposedly used because the proposed boiler had an average combustion efficiency of 78.1%, which is less than the Title-20 standards. The proposed retrofit of Boiler 1 is the installation of a reconditioned boiler that has lower efficiency than the existing boiler. However, the facility decided to install a feedwater economizer to improve the combustion efficiency above the code requirements. Therefore, the Title-20 efficiency standards take precedence in evaluating the eligible gas savings for this boiler replacement. The facility gas billing history for the past two years was analyzed by an IOU third party contractor to establish the baseline gas usage and boiler load. The boiler operation was estimated at 4,000 hours per year but no supporting data was submitted for ED review.

The post installation conditions expect the heating load on the boilers to remain the same. No project quotes were available for review in the documentation though the project report provides the measure cost at \$80,000. The estimated project incentive is \$40,000 with a savings estimate of 108,000 therms/ yr

Review Conclusion

Unable to verify project savings, pending fulfillment of requested data and subsequent opportunity for ED to re-evaluate the project savings.

Summary of ED Requested Action by the IOU

In order to complete an ex ante review the ED recommends that the IOU submit the following documentation due on **08/01/2012** (14 days from submittal date to IOU):

1. Provide live and fully functional energy savings calculations.
2. Provide the remaining useful life (RUL) of the existing boilers, Manufacturer data of the boilers and effective useful life (EUL) estimates for the new boiler.
3. Provide project cost estimates provided by contractor if available. Provide incremental measure cost for the project.
4. Boiler retrofit is performed to meet the BAAQMD requirements. Provide supporting data that demonstrates the baseline and the proposed solutions are in compliance with the 2013 BAAQMD requirements. Provide facility NOx emissions data for the existing boilers and the NOx rating for the new boilers.
5. Calculations are referred to as having used a hypothetical boiler with adjusted baseline efficiency and the proposed boiler is supposed to have efficiency per the DOE Tip sheet, implying a new boiler is being installed not a reconditioned one. Please explain the algorithm behind the calculations.

Table 1-2: Project Overview

Description	IOU Proposed Ex Ante Data	ED Recommendations
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures)	Not explicitly provided, but inferred from the energy audit report as normal replacement	Normal Replacement
Project Cost Basis (Full Cost, Incremental Cost)	Full cost – \$80,000	Incremental cost should be provided for normal replacement measures
RUL (Early retirement projects only, otherwise N/A (not applicable))	Not provided	TBD; provide RUL of existing boilers.
EUL	Not provided	20 years for non residential boilers per DEER 2008
First Year kWh Savings	N/A	TBD
First Year Peak kW Savings	N/A	TBD
First Year Therms Savings	108,000 Therms/yr	TBD; provide live energy savings calculation spreadsheets for ED review
kWh Savings (RUL Period)	N/A	TBD
Peak kW Savings (RUL Period)	N/A	TBD
Therms Impact (RUL Period)	108,000 Therms/yr	TBD; provide live energy savings calculation spreadsheets for ED review
kWh Savings (EUL thru RUL Period)	N/A	TBD
Peak kW Savings (EUL thru RUL Period)	N/A	TBD

Description	IOU Proposed Ex Ante Data	ED Recommendations
Therms Savings (EUL thru RUL Period)	TBD	TBD
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	N/A	N/A
Net-to-Gross Ratio	Not provided	TBD; A NTG assessment may be warranted

Table 1-3: Detailed Review Findings

Reviewed Parameter	Analysis
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Not explicitly provided, but inferred from the energy audit report as normal replacement
	ED Assessment: Title 20 code was used as baseline for energy efficiency. Normal replacement baseline is acceptable
	ED recommendation; None
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Full cost
	ED Assessment: Incremental cost should be provided for normal replacement measures
	ED recommendation: Provide incremental measure costs.
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: Not provided
	ED Assessment: Cannot be assessed without existing equipment condition and RUL
	ED recommendation: Provide RUL and condition of existing equipment
EUL	IOU Proposal: Not provided
	ED Assessment: Not accessed
	ED Recommendation: 20 years for non residential boilers per DEER 2008 database.
Savings Assumptions	IOU proposal: Live energy savings calculation spreadsheet not provided for ED review
	ED Assessment: 4,000 operating hours per year was assumed. No supporting documentation was provided to verify the claim.
	ED Recommendation: Provide trends to verify operating hours; provide live energy savings calculating spreadsheet for ED review.
Calculation Methods/Tool review	IOU proposal: Live energy savings calculation spreadsheets were not provided for ED review

Reviewed Parameter	Analysis
	ED Assessment: 4,000 operating hours per year was assumed. No supporting documentation was provided to verify the claim.
	ED Recommendation: Provide trends to verify operating hours. Provide live energy savings calculating spreadsheet for ED review.
Pre- or Post-Installation M&V Plan	IOU Proposal: M&V plan submitted
	ED Assessment: IOU to conduct onsite inspection to verify proper installation and operation of the measure. Post installation measurement and verification to verify the installed energy savings is also intended to be carried out by the IOU contractor.
	ED Recommendation: None
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: An ex ante interview may be warranted
	ED Recommendation: Conduct ex ante savings interview