

Ex Ante Review Findings

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

IOU	PGE
Application ID	2K12088077
Application Date	07/25/2012
Program ID	TBD
Program Name	Energy Efficiency – Demand Response
Program Year	2012
Itron Project ID	X086
IOU Ex Ante Savings Date	TBD
ED Measure Name	Boiler Economizer
Project Description	Install a new stack gas economizer. It will recover waste heat from the flue gas to pre heat the feedwater entering the boiler.
Date of ED Review(s)	06/13/2012 & 07/25/2012
Primary Reviewer and Firm	Kunal Desai/Itron Inc
Review Supervisor and Firm	Joseph Ball/Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review
ED Recommendation	ED approves 29,245 therms for the proposed project (PGE 2K12088077).

Measure Description

The measure involves replacing the existing boiler economizer with a new more efficient economizer. The proposed economizer will recover waste heat from the flue gas to pre heat the feed water entering the boiler. The stack gas temperature is estimated to be cooled from 392°F to 273°F.

Summary of Review

The documents reviewed by ED are: Boiler efficiency calculator, Boiler combustion tests, economizer performance, CCT manual tool verification, CSO calculations, contractor installation quote, revised calculation estimations and PA approved documents. The IOU revised energy impacts for this measure from 36,557 to 41,357 Therms/year savings and the incentive is \$41,357.

The existing boiler has an 87 MMBtu/hr capacity and 81% efficiency. Steam is produced at 72,000 lb/per in the boiler. Stack temperature was measured at 392°F along with the feed water temperature at 215°F. The boiler operates 24 hours a day throughout an 80 day cycle (1,920 hours per year). No supporting documentation for operating hours is provided for ED review. Energy savings calculations in PDF version are submitted for ED review. Energy savings calculation methodology accounted for heat recovery from the stack flue gases to the boiler feed water. It was noted that heat exchanger effectiveness was not accounted for in the calculation. ED used a conservative effectiveness of 80% to revise the savings estimate.

Documentation submitted in Phase I review indicated this project as new construction. Once additional data was submitted, IOU's PA review indicated that the facility already had an existing boiler economizer. No additional information was provided for the boiler economizer in terms of age, remaining useful life and economizer capacity for ED to clarify baseline.

Calculations submitted for in Phase I review are based on field measurements and ED recommends using them. ED revised energy savings from the boiler economizer/heat recovery measure is estimated to be 29,245 Therms/year.

Review Conclusion

ED approves the adjusted savings for the proposed project (PGE 2K12088077). The final energy savings estimates for CPUC reporting purposes were modified to account for heat exchanger effectiveness in transferring heat from flue gases to the boiler feedwater. The revised energy savings from the boiler economizer/heat recovery measure is estimated to be 29,245 Therms/year.

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)	Early Replacement	Early Replacement
Project Cost Basis (Full Cost, Incremental Cost)	Full cost	Incremental cost is required if normal replacement claim is applicable.
RUL (Early retirement projects only, otherwise N/A (not applicable))	3 years (1/3 of the RUL period)	RUL period is acceptable
EUL	Not provided	10 years for non residential economizers based on DEER 2008 database
First Year kWh Savings	N/A	N/A
First Year Peak kW Savings	N/A	N/A
First Year Therms Savings	41,357	29,245
kWh Savings (RUL Period)	N/A	N/A
Peak kW Savings (RUL Period)	N/A	N/A
Therms Impact (RUL Period)	41,357	29,245
kWh Savings (RUL thru EUL Period)	N/A	N/A
Peak kW Savings (RUL thru EUL Period)	N/A	N/A
Therms Savings (RUL thru EUL Period)	41,357	0 – At the end of the RUL period, the new boiler economizer will be the technical baseline of the project thereby resulting in 0 savings.
Annual Non-IOU Fuel Impact (RUL	N/A	N/A

Description	IOU Proposed Ex Ante Data	ED Recommendations
Period)		
Annual Non-IOU Fuel Impact (RUL thru EUL Period)	N/A	N/A
Net-to-Gross Ratio	Not provided	Assessment not required

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: Early Replacement
	ED Assessment: Early Replacement claim 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: Full cost acceptable
	ED recommendation: None
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: 3 years (1/3 of the RUL period)
	ED Assessment: RUL period acceptable
	ED recommendation: None
EUL	IOU Proposal: Not Provided
	ED Assessment: 10 years for non residential economizers based on DEER 2008 database
	ED Recommendation: 10 years

Reviewed Parameter	Analysis
Savings Assumptions	IOU Proposal: Live energy savings calculation spreadsheet provided
	ED Assessment: Energy recovery calculations from stack gas temperatures did not account for heat exchanger effectiveness. Calculations submitted for in Phase I review are based on field measurements and ED recommends using them.
	ED Recommendation: ED used 80% heat exchanger effectiveness and adjusted the savings estimate accordingly. ED recommends using Phase I calculations.
Calculation Methods/Tool review	IOU Proposal: Live energy savings calculation spreadsheet provided
	ED Assessment: Energy savings methodology is acceptable. Typically “live” and fully unlocked energy savings spreadsheet is recommended for ED review. Calculations submitted for in Phase I review are based on field measurements and ED recommends using them.
	ED Recommendation: ED used 80% heat exchanger effectiveness and adjusted the savings estimate accordingly. ED recommends using Phase I calculations.
Pre- or Post-Installation M&V Plan	IOU Proposal: Not provided
	ED Assessment: Not accessed
	ED Recommendation: Conduct post-installation inspection according to program rules.
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: Net to gross interview is warranted
	ED Recommendation: A NTG interview is recommended