

Final Ex Ante Review Findings

Table 1-1: Project Information

PA	PG&E
Application ID	2K13160750
Application Date	1/2/2013
Program ID	PGE21031
Program Name	Agricultural Calculated Incentives
Program Year	2013
CPUC Project ID	X298
PA Ex Ante Savings Date	7/11/2013
Measure Name	Heat Recovery
Project Description	Installation of new blowdown heat recovery system to preheat the boiler makeup water.
Date of CPUC Staff Review	6/10/2013 & 12/21/2014
Primary Reviewer / Firm	Kunal Desai & Joseph Ball / Itron
Review Supervisor / Firm	John Hill / JJ Hirsch & Associates & Keith Rothenberg / Energy Metrics
CPUC Staff Project Manager	[REDACTED]
CPUC Staff Policy Authorization (as needed)	TBD
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
CPUC Staff Recommendation	<p>The project is accepted as a retrofit add-on project type. Final ex ante energy savings are approved at 360,727 therms per year with a 14 year EUL.</p> <p>However, CPUC staff is not satisfied with the IOU's documentation of program influence for this project. Free-ridership continues to be a concern, as this topic was discussed with the IOU during the parallel review process in July 2013. The simple payback without incentives is only 0.18 years (or 2.2 months). The IOU is required provide evidence of IOU program influence for this project. Evidence of Program influence must be uploaded to the CMPA folder for this project.</p>

Measure Description

The measure is to install blowdown heat recovery (heat exchanger) on the existing three boiler systems (installed circa 2008) and use the recovered heat to preheat the makeup water. The boiler water - which is pressurized, hot and dirty, and creates large volumes of flash steam and possible disposal problems - is blown down to control the amount of total dissolved solids (TDS) in the boiler. A new heat recovery system will reclaim large amounts of energy during this essential process.

The revised ex ante energy savings are 360,727 therms per year.

Summary of Review

Previous EAR Findings

The post-install M&V plan was discussed over a phone call with CPUC staff and agreed upon verbally; monitoring activities are listed here:

- 1) Post monitoring points: a) city water temperature (heat exchanger inlet), b) outlet temperature, c) heat exchanger flow rate, and d) flash steam flow rate
- 2) Post monitoring duration: two weeks
- 3) Post monitoring interval: 15 minutes maximum
- 4) Production Data (daily): last three years and during the two-week monitoring period
- 5) Boiler tests for the last two years

The initial claim of 13% flash steam was questioned, and subsequently reduced to 9% for the energy savings calculations.

Annual boiler tests and permitting were reviewed by CPUC staff and confirmed that the boiler had been meeting code. Boiler efficiencies were estimated to be 85%; however, the boiler flue gas tests would be done during the post-install M&V period.

During the 2013 ex ante parallel review CPUC staff discussed several items with the IOU regarding this boiler blowdown recovery project. The primary issue was that simple payback without incentive might possibly be less than one year. Significant IOU involvement is required so as not to raise the free-ridership flag on this project. CPUC staff realize that the net-to-gross aspect of this project was not documented in the Phase I show-stopper EAR, but rather discussed on two occasions during weekly CPUC Staff/IOU meetings in July 2013.

Final IOU Review Package

The Program Administrator (PA) submitted the following documents for this Final review:

- 2K13160750 IR ED Checklist

- 2K13160750 IR Review Form v1.1
- 2K13160750 IR Monitoring Results 091814
- 2K13160750 IR Monitoring Results 100614
- 2K13160750 Production Data 3 Years
- 2K13160750 Recommissioning Work
- 2K13160750 IR Boiler Efficiency Tests
- 2K13160750 IR Insp Photos 021914
- 2K13160750 IR Insp Photos 091214
- 2K13160750 IR Insp Photos 111714
- 2K13160750 Project Invoices
- 2K13160750 [Customer Name] PA Review Form v1.1 rev1
- Boiler Permits for PEI July 2013

From a gross impact perspective, the IOU's final installation review package was complete and thorough including a fully completed Show Stopper checklist. Also, the EUL for the heat exchanger was appropriately limited by the RUL of the boilers, which have 20-year EULs, to 14 years.

CPUC staff calculated a three-year normalized production rate of 148,000 gpm. Final project costs were well supported with invoices totaling \$65,200, and were properly capped at 50% of the project costs or \$32,600. After the post-install M&V and true-up, the estimated savings increased from the PA-approved values of 115,928 therms to 360,727 therms. The increase was due to an increase in the flash steam rate from 450 lbs/hr (pre-M&V) to 799 lbs/hr over the two week post-monitoring period. In addition, post-install heat recovery of 172,127 gallons per day (GPD) was 18% greater than the average, pre-retrofit value of 145,718 GPD; and the IOU normalized the energy savings analysis.

In the PA review comment boxes the IOU was forthcoming with regard to future planned cogeneration, stating that by the end of 2015, the customer plans to install a 3.6 MW cogeneration system. The majority of the steam produced (approx. 75%) is still expected to come from the boilers running on natural gas provided by PG&E. Per the current "no forecasting" policy (i.e., future increases or decreases in building load) impacts of the cogeneration system on this project were not considered in the IOU's Installation Review approved energy savings.

The only outstanding issue with this project is the likelihood of free-ridership. The simple payback without incentives is 2.2 months, while the simple payback with incentives is only five weeks. The IOU did not provide any documented program influence in the form of email correspondence or other documentation. CPUC Staff remind the IOU that TRC costs also include operating costs as part of the analysis.

Review Conclusion

The project is accepted as a retrofit add-on project type. Final ex ante energy savings are approved at 360,727 therms per year with a 14 year EUL.

CPUC staff is not satisfied with the IOU's documentation of program influence for this project. Free-ridership continues to be a concern, as this topic was discussed with the IOU during the parallel review process in July 2013. The simple payback without incentives is only 0.18 years (or 2.2 months). The IOU is required provide evidence of IOU program influence for this project. Evidence of Program influence must be uploaded to the CMPA folder for this project.

Summary of CPUC Staff Required Action by the PA

CPUC Staff require that the PA undertake the recommended steps and submit the following information:

For this project:

- Demonstrate through email correspondence or other documentation the IOU program influence for this project. Evidence of Program influence should be uploaded to the CMPA folder for this project.
- Provide the TRC cost calculation to support project cost-effectiveness.

For all future projects (submitted after receipt of this review):

- Proper IOU net-to-gross screening continues to be a problem. CPUC staff direct the IOU to initiate standardized net-to-gross screening methods and steps for all of their energy efficiency and demand response programs to ensure a judicious use of ratepayer funds.

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
	ED Assessment: Add On Measure
	ED Recommendation: None
Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)	IOU Proposal: In Situ
	ED Assessment: In Situ
	ED 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 - \$65,200
	ED Assessment: Full Cost
	ED recommendation: None
RUL (required for early retirement projects only, otherwise N/A)	IOU Proposal: N/A
	ED Assessment: N/A
	ED recommendation: N/A
EUL (for each measure)	IOU Proposal: 14 years; Boiler RUL = $(20 - 6) = 14$, Heat Exchanger EUL = 15. (Lesser of the two is 14)
	ED Assessment: Correctly limited by the RUL of the boilers
	ED Recommendation: None
Savings Assumptions	IOU Proposal: Boiler Combustion Efficiency added 2% to (to the measure 83%) to account for economizer heat recovery. The heat recovered from the blowdown heat recovery system is based on two weeks for post monitoring of feed-water flow, heat exchanger inlet and outlet temperatures, and steam flow rates to the DA tank. The post monitoring

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Reviewed Parameter	Analysis
	results were annualized using three years of daily production.
	ED Assessment: Previous assumptions replaced with post-install values in the final calculations.
	ED Recommendation: None
Calculation Methods/Tool review	IOU Proposal: A revised custom energy savings calculation spreadsheet was submitted with IR package
	ED Assessment: Calculation methodology acceptable
	ED Recommendation: None
Pre- or Post-Installation M&V Plan	IOU Proposal: Post Installation M&V plan was included in the IOU's PA package completed on 7/11/2013.
	ED Assessment: Discussed during conference call and verbally accepted.
	ED Recommendation: None
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: CPUC staff mentioned a very low simple payback (less than one year) during the project savings conditional approval (July 2013), and explained that IOU correspondences showing customer influence must be provided.
	ED Recommendation: Without any supporting documents (emails) showing long term correspondences, IOU influence remains in question on this project. And with a payback without incentive less of only 2.2 months, CPUC staff contends that this customer is a likely free-rider.

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

Description	PA Ex Ante Claim	CPUC Staff Recommendations
First Year kWh Savings	N/A	Waived
First Year Peak kW Savings	N/A	Waived
First Year Therms Savings	360,727	Accept
kWh Savings (RUL Period)	N/A	Waived
Peak kW Savings (RUL Period)	N/A	Waived
Therms Impact (RUL Period)	N/A	Waived
kWh Savings (RUL thru EUL Period)	N/A	Waived
Peak kW Savings (RUL thru EUL Period)	N/A	Waived
Therms Savings (RUL thru EUL Period)	360,727	Accept
Annual Non-PA Fuel Impact (RUL Period)	N/A	Waived
Annual Non-PA Fuel Impact (RUL thru EUL Period)	N/A	Waived
Project Costs for Baseline #1 (RUL or EUL)	\$65,200	Accept
Project Costs for Baseline #2 (EUL minus RUL period)	N/A	Waived
Project Incentive Amount	\$32,600	Accept