

Phase 3 Ex Ante Review Findings

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

IOU	PG&E
Application ID	2K12085717
Application Date	5/1/12
Program ID	PGE2235
Program Name	Dairy Industry Resource Advantage Program
Program Year	2012
Itron Project ID	X132
IOU Ex Ante Savings Date	4/25/12; 9/4/2012, 12/22/12
ED Measure Name	Compressed Air
Project Description	Compressed air system modifications
Date of ED Review(s)	6/5/12, 9/7/12, 12/31/12
Primary Reviewer and Firm	Keith Rothenberg/Energy Metrics
Review Supervisor and Firm	Joseph Ball/Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	Ex ante savings calculations are approved. Approved ex ante savings are the average between ED's estimate and the IOU's final estimate.

Measure Description

Install a new 200 HP Variable Frequency Drive (VFD) air compressor, compressor controls, 2 no-loss drains, a 500 gallon receiver and a four-inch distribution line to an existing compressed air plant. The new VFD compressor will be operated as the plant's "trim" air compressor.

Summary of Review

The Phase 1 Ex Ante Review was completed in June 2012 and an associated data request was sent to the IOU. A phase 2 ex ante review was completed in September 2012, conditionally approving the project pending the installation of the measures and post installation M&V to verify the project impacts. Please refer to the following four MS Word™ document files for additional background: X132 PGE 2K12085717 EAR 2012_0612 V2, X132 PGE 2K12085717 DR_2012_0613 V2, X132 PGE 2K12085717 Phase 2 EAR 2012_0910, and X132 PGE 2K12085717 DR_2012_0910.

This document represents the Phase 3 and final ex ante review for this project. On December 22, 2012 the Investor Owned Utility (IOU) submitted additional documentation for the project. ED reviewed the supplied information including the IOU's final post-installation calculations, the project application review, data provided by the IOU including 28 days of air compressor power monitoring and production data provided by the customer, compressor performance data obtained by the IOU from the air compressor manufacturer's representative and measure cost invoices.

ED's estimate of the annual savings impact is marginally greater than the IOU's final estimate. Exhibit 1 below provides a summary of the project impact claim history. ED selected this project for ex ante review in May 2012. The documentation ED received included a savings estimate indicating 132 kW demand reduction, 755,125 kWh annual savings and an estimated incentive of \$81,170. The IOU reviewer reviewed the savings calculations and revised the savings estimate to 132 kW demand reduction, 923,295 kWh annual savings and an estimated incentive of \$93,957 in July 2012. ED noted that the data used for the analysis were from 2008 and possibly no longer an accurate reflection of the compressed air system usage profile. The IOU agreed to install data loggers to collect current, pre-installation air compressor power data to use as a basis for the ex ante calculations. A revised analysis was submitted to ED in August 2012 based on the new data collected. The revised analysis indicated 76.9 kW demand reduction, 638,773 kWh annual savings and an estimated incentive of \$65,176. The analysis also included production data from the same time period. ED noted that there did not appear to be a strong correlation between the production data provided by the customer and compressor system air demand profile developed from the compressor power data. ED also noted that the compressor type used in the IOU's model did not reflect the actual compressor type that existed at the customer's facility. The IOU revised the savings calculations in September 2012. The revised analysis indicated 69.6 kW demand reduction, 592,255 kWh annual savings and an estimated incentive of \$60,264. ED conditionally approved the project to proceed to the

implementation phase and requested that the IOU collect a minimum of 28 days post installation compressor power data and production data to use in the final analysis.

The IOU's final calculations, submitted 12/22/12, estimated the impacts of the project to be 35.3 kW demand reduction and 306,220 kWh annual energy savings with an incentive of \$31,088. ED prepared a separate analysis of the project impacts and estimates the project will reduce demand by 36.3 kW and save 315,022 kWh annually. ED's estimate is within +/-20% of the IOU's final estimate and the average of the two estimates is the frozen ex ante value for this project.

Exhibit 1 Summary of the Project Impact Claim History

	kW	kWh	Incentive
IOU May 2012	132.1	755,125	\$ 81,170
IOU July 2012	132.1	923,295	\$ 93,957
IOU August 2012	76.9	638,773	\$ 65,176
IOU September 2012	69.6	592,255	\$ 60,264
IOU Post December 2012	35.3	306,220	\$ 31,088
ED Post December 2012	36.3	315,022	
ED-IOU Post	1.0	8,802	
ED/IOU % difference	2.8%	2.8%	
(ED+IOU Post)/2	35.8	310,621	

Review Conclusion

The ED approved frozen ex ante claim for this project are an annual savings impacts of 310,621 kWh and 35.8 kW. The project cost is \$120,381.

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)	Retrofit add-on	Approved
Project Cost Basis (Full Cost, Incremental Cost)	Full cost estimated to be \$120,381	Approved
RUL (Early retirement projects only, otherwise N/A (not applicable))	NA	Approved
EUL	15 years.	Approved
First Year kWh Savings	306,220	310,621
First Year Peak kW Savings	35.3	35.8
First Year Therms Savings	0	0
kWh Savings (RUL Period)	NA	NA
Peak kW Savings (RUL Period)	NA	NA
Therms Impact (RUL Period)	NA	NA
kWh Savings (EUL thru RUL Period)	306,220	310,621
Peak kW Savings (EUL thru RUL Period)	35.3	35.8
Therms Savings (EUL thru RUL Period)	0	0
Annual Non-IOU Fuel Impact (RUL Period)	NA	NA
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	NA	NA
Net-to-Gross Ratio	Not provided	Assessment not completed

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: Retrofit add-on
	ED Assessment: Correct
	ED Recommendation: Approved
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: The total cost has been provided
	ED Assessment: Correct
	ED recommendation: Approved.
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: NA
	ED Assessment: NA
	ED recommendation: None
EUL	IOU Proposal: 15years
	ED Assessment: Correct.
	ED Recommendation: Approved
Savings Assumptions	IOU Proposal: 12 days of pre installation and 28 days of post installation compressor power data from portable loggers installed by the IOU and the air compressor performance data obtained from the manufacturer’s representative were used to estimate the baseline and post installation compressed air system energy consumption. The IOU used a customized compressed air calculator to estimate the baseline and post installation compressed air system performance. Production data were obtained to estimate the annual compressed air demand profile. The production data did not show a strong correlation to the compressor power data
	ED Assessment: The approach to estimate the impacts is reasonable.
	ED Recommendation: The final impacts were calculated based on the pre and post installation M&V analysis.
Calculation Methods/Tool review	IOU Proposal: The project impacts are calculated using a customized model that was developed for specific compressed air project measures.

Reviewed Parameter	Analysis
	ED Assessment: ED has not reviewed this model in detail.
	ED Recommendation: ED will review this model in an effort separate from this project, as part of an ED Tool Review.
Pre- or Post-Installation M&V Plan	IOU Proposal: Pre-installation collected for 12 days in one minute intervals, post installation data collected for 28 days in one minute intervals.
	ED Assessment: The IOU implemented the M&V plan requested by ED.
	ED Recommendation: Approved
Net-to-Gross Review	IOU Proposal: Not addressed
	ED Assessment: Not assessed
	ED Recommendation: None