

Phase 2 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
ED Measure Name	Compressed Air
Project Description	Compressed air system modifications
Date of ED Review(s)	6/5/12, 9/7/12
Primary Reviewer and Firm	Keith Rothenberg/Energy Metrics
Review Supervisor and Firm	Leonel Campoy/Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	Ex ante savings estimates are conditionally approved, pending post-installation measurement and verification (M&V) and fulfillment of the data request for more information.

Measure Description

Install a new 200 HP Variable Frequency Drive (VFD) air compressor, compressor controls, 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

ED selected this project for ex ante review in May 2012. The Phase 1 Ex Ante Review was completed in June 2012 and an associated data request was sent to the IOU. Please refer to the following two MS Word™ document files for additional background: X132 PGE 2K12085717 EAR 2012_0612 V2 and X132 PGE 2K12085717 DR_2012_0613 V2.

This document represents the Phase 2 Ex Ante Review for this project. The Investor Owned Utility (IOU) submitted additional documentation following the receipt of the Phase 1 review. ED reviewed the supplied information including the IOU's draft and final pre-installation calculations, the project application, the project application review, data provided by the IOU including 12 days of air compressor power monitoring and production data provided by the customer, and compressor performance data obtained by the IOU from the air compressor manufacturer's representative. ED performed independent calculations to estimate the project baseline. ED calculations verify the IOU's proposed performance baseline for the project.

The incentive application documents an annual savings impact of 592,255 kWh, peak demand reduction of 69.6 kW with an incentive amount of \$60,264. The estimated project cost is \$175,000.

Review Conclusion

The ex ante baseline compressed air system performance estimated by the IOU (24.2 kW/100 ACFM) is conditionally approved. The post-installation compressed air system performance, estimated as 17.2 kW/100 ACFM by the IOU, will be verified by the post-installation M&V. The final ex ante savings estimate will be calculated based upon the post-installation M&V.

The ex ante savings for this project will be calculated using the average pre- and post- project compressed air system efficiency (kW/100 CFM), calculated from pre- and post-measurements, to determine system efficiency improvements associated with the project. The annual air demand profile will be used to estimate the annual savings impacts. The compressed air demand reduction measure (installation of no-loss drains) will be accounted for separately.

The compressed air demand estimated from the pre-installation data collected by the IOU did not show a strong correlation to the production data provided by the customer. ED will continue to work with the IOU to create a method to estimate the annual compressed air usage profile for this customer to use in the final savings estimate for the project. ED recommends that the post-installation data collection period be increased to 28 days and include production data in smaller time increments if available from the customer. The customer provided daily production data for

the pre installation period. The use of either hourly production data or data by shift may provide a better correlation to the compressed air demand and should be requested for analysis.

In addition, a question remains regarding the baseline operating pressure for the compressed air system. ED requests that the customer provide a minimum of seven days of compressed air system pressure data prior to commencing this project, and also monitor the compressed air system pressure during the full post-installation monitoring period. The baseline air compressor performance may be adjusted if the pre-installation compressed air system monitoring indicates a significant difference in the actual operating pressure versus what is assumed in the pre-installation calculations (120 psig). The ex ante values for this project will not be frozen until the project M&V is completed.

Summary of ED Requested Action by the IOU

ED requests that the IOU submit the following documentation as it becomes available and take the recommended actions for the ex ante review to be completed in an expeditious manner:

1. Submit a detailed M&V plan for this project. The IOU will continue to work with ED to finalize the M&V plan.
2. Provide seven (7) days of pre-installation compressed air system pressure monitored upstream of the compressed air dryers if possible, or at the receiver.
3. Recommend to the customer the installation of either a compressed air flow meter or a tap in the main distribution line in an appropriate location to allow a temporary meter to be installed for post-installation air flow measurements.
4. Provide 28 days of post-installation data for the compressed air system including compressor kW and system pressure measured at the same point as for the pre-installation measurement. Provide the compressed air flow measurements if possible.
5. Provide 28 days of post-installation production data, either hourly production data or data by shift, for the facility.
6. Provide the specifications for the new air compressor.
7. Submit the post-installation inspection report.
8. Provide final cost documentation.

ED is likely to ask for further clarifications and additional information as the details of this project become more clearly defined. ED requests that the IOU:

1. Keep ED informed of the progress and next steps on this project.
2. Inform ED of any future site visits including the post-installation inspection, with sufficient lead time, in case it chooses to send a representative on-site.
3. Provide sufficient opportunity for ED to review the requested data, analysis and calculations prior to the freezing of ex ante savings impacts for this project.

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 \$175,000	Full cost basis approved. Provide project cost documentation at the completion of the project.
RUL (Early retirement projects only, otherwise N/A (not applicable))	NA	Approved
EUL	15 years.	Approved
First Year kWh Savings	592,255	TBD
First Year Peak kW Savings	69.6	TBD
First Year Therms Savings	0	TBD
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)	592,255	TBD
Peak kW Savings (EUL thru RUL Period)	69.6	TBD
Therms Savings (EUL thru RUL Period)	0	TBD
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 estimated cost has been provided
	ED Assessment: Correct
	ED recommendation: Provide final cost documentation.
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 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 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.
	ED Assessment: The approach to estimate the impacts is reasonable.
	ED Recommendation: The final impacts will be 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.
Pre- or Post-Installation M&V Plan	IOU Proposal: Post installation data proposed to be collected. Details not provided.
	ED Assessment: A more detailed M&V plan is required.
	<p>ED Recommendation:</p> <ol style="list-style-type: none"> 1. 7 days pre installation compressed air system pressure monitored upstream of the air dryers if possible, or at the receiver. 2. Recommend that the customer install a compressed air flow meter or a tap to allow a temporary meter to be installed for post installation air flow measurements. 3. 28 days of post installation data for the compressed air system including compressor kW and system pressure measured at the same point as for the pre installation measurement. Provide compressed air flow measurements if possible.
Net-to-Gross Review	IOU Proposal: Not addressed
	ED Assessment: TBD
	ED Recommendation: TBD