

## **Phase I Ex Ante Review Findings**

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

<b>IOU</b>	PG&E
<b>Application ID</b>	A-1-W-2811
<b>Application Date</b>	8/6/2013
<b>Program ID</b>	PGE21035
<b>Program Name</b>	Agricultural Pumping Efficiency Program
<b>Program Year</b>	2013
<b>Itron Project ID</b>	X431
<b>IOU Ex Ante Savings Date</b>	7/24/2013
<b>ED Measure Name</b>	Ag Pumping
<b>Project Description</b>	Replace agricultural well pump and bowl
<b>Date of ED Review(s)</b>	10/17/2013
<b>Primary Reviewer / Firm</b>	Charles Ehrlich / Itron
<b>Review Supervisor / Firm</b>	Joseph Ball / Itron
<b>ED Project Manager</b>	██████████ / California Public Utilities Commission, Energy Division
<b>ED Policy Authorization (as needed)</b>	TBD
<b>Type of Review (Desk, On-site, Full M&amp;V, Tool)</b>	Desk Review
<b>ED Recommendation</b>	Conditionally approved maximum savings of 16,173 kWh and 1.79 kW pending submission of the post-project pump efficiency test and a discussion with the IOU and 3 <sup>rd</sup> party program implementation staff regarding eligibility requirements and program rules.

## **Measure Description**

The project is the repair of a 25 hp agricultural well pump at a citrus farm in the central valley (CZ13) involving the replacement of the impeller and bowl. The pump motor had been rewound 2 months prior to the replacement of the impeller and bowl. Water is drawn from the well and delivered to the orchard using two pumps; the second pump is a 15 hp pump that was not altered during this project.

The simple payback for this project is 4.6 years.

## **Summary of Review**

The Investor-Owned-Utility (IOU) submitted the following documents to CMPA for this Phase I review:

- Project Application dated 8/6/2013
- Certificate of Project Application dated 8/6/2013
- Invoices from the pump retrofit company dated 7/16/2013
- Pre-Project Pump Efficient Test report dated 11/22/2011
- Utility bills showing electricity usage from to 2/14/2011 to 6/4/2013

## **Ex Ante Savings Approach**

Preliminary project savings are calculated based upon the 12 months of utility billing data prior to the project implementation. According to the program eligibility rules, the pump rewind is not eligible for rebates, however; the rewind is claimed as part of this project on the Application. The 25 hp pump savings were disaggregated from the overall bill using that pump's fraction of the overall kW for the two pumps; however, the savings associated with rewinding the 25 hp motor are intermingled with the savings estimate in a manner that is difficult to isolate. Billing data suggest that both pumps are operated in tandem at all times assuming typical watering patterns for citrus (once per week, 3 to 10 hours per watering day, drip or spray application). The 2012 water year had notably lower precipitation than normal, but this does not appear to have affected pump energy usage. A pump efficiency test was conducted on November 22, 2011 – 1 year and 8 months prior to the project – but was not used to estimate project savings because no post-project pump efficiency test has been submitted.

Consistent with program rules, this application limits the maximum potential rebate to be paid to the participant pending submittal of a post-project pump efficiency report. The IOU claims savings of 16,173 kWh. The application form does not clearly state the kW reduction claim, but the application form pays a rebate of \$100 times a factor of 0.07159 kW/hp times the project's 25 hp pump for a total of 1.79 kW. The rebate of \$542.87 is less than the allowable 50% of the project costs of \$10,205.70.

### **Baseline**

The baseline for savings is the pump energy usage for the 12 months prior to the project. The pre-project pump efficiency test is not used to estimate savings except to verify pump motor horsepower. The documentation does not discuss the motor's remaining useful life, but since it had been recently rewound, it is assumed to have at least 1 year of remaining useful life. The savings is calculated as 25% of the pre-project annual energy usage and peak demand reduction is calculated as 0.07159 times the pump motor horsepower. Rebates are limited to the lesser of \$0.09 per kWh plus \$100 times the kW reduction or 50% of the costs. The documentation does not discuss the amount of water pumped per year, the typical watering schedule, the type of water delivery system, nor the type or existence of any watering control system. The post-project pump efficiency test report and a savings calculation spreadsheet were not provided. The IOU's savings calculations were re-constructed using the available information and the incentive calculator downloaded from the program website (<http://pumpefficiency.org/About/literature/APEPIncentiveCalcUtility.xls>).

### **Program Manual & Eligibility**

According to the APEP Program Policies and Procedures manual, the project meets program eligibility requirements. The program is designed to allow participants to request rebates for pump repair projects that have been completed prior to the submittal of the project application so long as a pump test contractor has performed a pump efficiency test within 2 years of the project. This is inconsistent with statewide CPUC policy that disallows like-for-like repairs and require applications to be submitted prior to the project being started.

The APEP Policies and Procedures Manual states that a program-approved pump efficiency test vendor must perform the tests, however; the online incentive application instructions (<http://pumpefficiency.org/Incentive/application.asp>) state that "these tests do NOT have to be performed by APEP participating Pump Test Companies." It is unknown if the pump testing company for this project is a program-approved vendor.

This project does not receive incentives for pump system efficiency improvements that the program rules explicitly disallow such as new wells, measures to reduce air entrainment, variable frequency drives, premium efficiency motors, and impeller adjustments. The APEP program documentation refers potential participants requesting efficiency improvements to the statewide Agricultural Calculated Incentives Program or the statewide Savings by Design program. The program previously included elements (removed in 2010) that targeted well rehabilitation and head-reduction projects. As it is currently designed, the APEP 3rd party program staff appear to be constrained to only discuss pump repairs, and not to make additional recommendations on how the pump system's overall efficiency can be improved.

The program requires that pumps be operational at the time of the repair, but the evidence to document that the pump is working does not necessarily include the utility bills. The APEP Policies and Procedures manual, page 7 states,

There are situation when the immediate 12 month's energy use before the project is not representative of normal use. This is most common when a pump has been taken out of service for efficiency problems and there is a significant lag time between then and when the project is actually started.

This reviewer questions what "efficiency problems" would be so severe as to cause the pump to be taken out of service for a significant period of time. This exception in the APEP program rules may be inconsistent with statewide CPUC policy which disallows rebates for non-functioning equipment.

It is not clear how much influence the program rebates have on the participant's decision to go forward with the repairs – or to go forward with the repairs sooner than they might otherwise in the absence of program rebates – since the application package states in uppercase letters, "YOU ARE NOT COMMITTING TO COMPLETING THE PUMP RETROFIT BY SIGNING THE APPLICATION." Clearly no rebate is paid if no work is performed, but participation requires them to perform the upgrade less than 2 years after the pre-project pump efficiency test and complete the post-project pump efficiency test within 1 year of the project. The language is inconsistent with statewide CPUC Policy to encourage early replacement and requires demonstrated program influence to claim savings for equipment that operates below current standards and/or industry standard practice. The project application does not collect information to support dual-baseline calculations such as the remaining useful life of the pump (age, condition, recent repairs).

### **Calculation Method**

This review cannot comment fully on the appropriateness of the calculation methods because the incentive calculator downloaded from the program website is "locked" and does not allow examination of the formulas. However, the calculations appear to conservatively estimate energy savings and peak demand reduction and the spreadsheet accurately implements program rules regarding estimates of maximum incentives. On the program website there is a different, more detailed tool called "pumping cost analysis" that appears to include the pump efficiency pre- and post-project results as well as the estimated acre-feet of water consumed and other parameters that would be useful for evaluating the appropriateness of the energy savings claims.

## **Review Conclusion**

Despite the many inconsistencies with statewide CPUC policies, the project appears to be consistent with the APEP Policies and Procedures Manual. Therefore, the maximum ex ante savings are conditionally approved pending submittal of a post-project pump efficiency report. The IOU claimed maximum savings of 16,173 kWh is reasonable due to the use of historical energy billing data that reflects lower usage than would be expected during years of normal precipitation and the very low overall pumping efficiency documented on the pre-project pump efficiency report (0.38). The application form does not clearly state the kW reduction claim. Referring to the APEP Policies and Procedures Manual and using the incentives calculator spreadsheet tool downloaded from the [pumpefficiency.org](http://pumpefficiency.org) website, ED calculates maximum peak demand reduction to be 7.16 kW, but the application form describes a rebate of \$100 times a factor of 0.07159 kW per horsepower times the project's 25 hp pump for a total of 1.79 kW (max). The rebate of \$542.87 is less than the allowable 50% of the project costs of \$10,205.70. The simple payback for this project is 4.6 years.

## **Summary of ED Requested Action by the IOU**

ED requests that the IOU undertake the recommended steps and submit the following information:

1. Final Application and rebate package
2. Post-project pump efficiency test report by an APEP approved pump test contractor
3. Documentation that the pre-project pump efficiency test contractor is APEP program-approved
4. Clarification from the 3<sup>rd</sup> party program implementer of which rules (P&P Manual or Online Rules) are enforced regarding the qualification of pump efficiency test vendors
5. Conference call with the IOU program and 3<sup>rd</sup> party implementation staff to discuss ways that the program can be made more consistent with statewide CPUC policies.