Ex Ante Review Findings

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

IOU	Pacific Gas And Electric
Application ID	NC0119468
Application Date	10/23/2011
Program ID	Not Available
Program Name	Savings By Design
Program Year	2011
Itron Project ID	X118
IOU Ex Ante Savings Date	NA
ED Measure Name	There are four energy savings measures for this new construction project. 1. High Efficiency Lighting & Lighting Controls 2. High Efficiency Rooftop Units 3. Air-side Economizer for Small Units 4. Demand control ventilation and Supply air reset strategy
Project Description	The scope of this project was a major tenant improvement at a high-tech facility. The proposed remodel includes energy efficient lighting and space cooling beyond Title 24 requirements
Date of ED Review(s)	07/23/12
Primary Reviewer and Firm	Amit Kanungo/DNV KEMA
Review Supervisor and Firm	Keith Rothenberg/Energy Metrics
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	Conditionally approved subject to revision of the eQUEST model based on post field findings

Measure Description

This project is a remodel of a [redacted] square foot office building at a high-tech facility. The proposed energy efficiency measures include replacing internal lighting with high efficiency lighting, installing occupancy and daylight sensors, installing high efficiency HVAC roof top units, with economizers on the one smaller capacity AC unit and installing supply air temperature reset and demand control ventilation system. The customer applied for an incentive under the Savings by Design program and used the system approach to calculate the incentives for the implemented measures.

The final application lists an annual energy savings of 69,278 kWh/yr, demand kW savings of 18.3 kW and annual gas savings of 439 therms with an incentive of $8,121.00.

Summary of Review

Documents provided for review include the following:

- Signed final application and e-mail correspondence
- Detailed project scope
- eQuest model in electronic format
- eQuest energy savings report in an excel spreadsheet
- Final Energy savings report
- Title-24 electrical and mechanical compliance forms

The claimed savings for the implemented measures are estimated based on an eQuest model. The eQuest model has been provided for ED's review. The final energy savings report in the project file provides the efficiency (EER) of the roof top units and LPD of the installed lighting system. The report also identifies the one smaller capacity 3 ton AC unit that is proposed to have economizer~~s~~ installed and shows the proposed implementation of demand controlled ventilation and supply air reset strategy.

ED's review primarily focused on reviewing the energy savings report, verifying the eligibility of the installed energy efficiency measures under the Savings by Design program rules and reviewing the eQuest model to confirm the energy savings measures of this project.

The first energy savings measure proposed is to install high efficiency lighting in [redacted] of the office area of the building. The affected office area was divided into [redacted] of office area (offices>250 ft^2) with an installed LPD of 0.3 Watt/ft^2, 1,819 ft^2 lobby area with an installed LPD of 0.5 Watt/ft^2 and the rest 584 ft^2 of other areas that included corridor, restrooms, stairs, and support areas with an installed LPD of 0.3 Watt/ft^2. The proposed LPDs are better than Title-24

allowed lighting power (watt/ft2), therefore this measure is eligible. Part of this lighting measure also includes installing multilevel occupancy sensors in the corridor, restrooms, stairs, and support area and in the lobby and daylight sensors in north perimeters of the building. According to Title 24, (Title-24, 131(c), 2,C), automatic daylight controls are not required if the primary side-lit daylight area is less than 2,500 square feet. The total side-lit daylight area for this project is 540 square feet. Therefore, this measure is eligible for incentive.

The proposed HVAC system included installation of four high efficiency roof top units, economizers on smaller capacity packaged AC units and installation of direct digital controls (DDC) to implement SAT reset and DCV strategies. All four installed roof top units have efficiencies (3-60 ton units with EER:-10.8 and 1- 3 ton unit with 13.0 EER) better than Title-24. Therefore, this measure is eligible. According to 2008 Title-24, HVAC units with a mechanical cooling capacity greater than 75,000 Btu/hr shall include an economizer. Therefore, the smaller capacity AC unit (3 ton) with air side economizers is eligible for incentives. Also, SAT reset is not a mandatory measure under Title-24, so supply air reset measure is eligible for incentive.

ED believes that DCV is viable as an energy savings measure for a building or part of a building which has high occupant density (more than 25 people per 1,000 sq. ft.), and where the occupant density varies throughout the day. This office building does not have a high density occupancy (less than 25 people per 1,000 sq. ft. Therefore, there may little energy savings associated with the DCV measure.

ED's review of the eQUEST model revealed that a baseline Title-24 lighting power density of 0.945 Watt/ft2 was used throughout the building, whereas this value should have been used only for the [redacted] lighting replacement in the office areas. The remainder of the area that is not part of the above mentioned office area should have used the actual LPD of the that area.

The above issues were discussed with the implementer through an e-mail correspondence and the following responses were received.

- The implementer agrees that the expected energy savings for the DCV measure are very small and the implementer will conduct a post installation inspection to review the energy savings during the "Post-Construction Field Verification" (PCFV) phase. If appropriate, the implementer will revise the model based on the post field findings.
- According to the implementer there was no information available about the actual lighting of the non-affected areas. Since the lighting for these areas are not part of the project scope, implementer has used standard Title-24 LPD value of 1.1 watt/ft2 for these areas for the energy savings calculations. This lighting load will have a small impact on overall savings for this project. There may be a possible 2-3 % change in energy savings if the actual LPD would have been entered into the eQUEST model instead of the standard 1.1 Watt/ft2.

Review Conclusion

This project is conditionally approved. ED recommends IOU perform a post inspection for this project and primarily, collect the LPD of the affected areas and verify the installation of lighting controls associated with this lighting, that the IOU review and document the building lighting scheduled hours of operation, verify the efficiency of the HVAC units and building occupancy schedules. All of the above parameters should be used in the final post installation true-up eQUEST model to revise energy savings estimate for this project. Provide the final post installation eQUEST model and supporting documentation to ED for review and approval.

Summary of ED Requested Action by the IOU

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)	New Construction	New Construction
Project Cost Basis (Full Cost, Incremental Cost)	Incremental Cost	Incremental cost is appropriate for new construction projects
RUL (Early retirement projects only, otherwise N/A (not applicable))	Not applicable	Not applicable
EUL	Not provided	Consult DEER 2008 for the EULs
First Year kWh Savings	69,278	69,278
First Year Peak kW Savings	18.3	18.3
First Year Therms Savings	461	461
kWh Savings (RUL Period)	N/A	N/A
Peak kW Savings (RUL Period)	N/A	N/A
Therms Impact (RUL Period)	N/A	N/A
kWh Savings (EUL thru RUL Period)	69,278	69,278
Peak kW Savings (EUL thru RUL Period)	18.3	18.3
Therms Savings (EUL thru RUL Period)	461	461
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	N/A	N/A

Description	IOU Proposed Ex Ante Data	ED Recommendations
Net-to-Gross Ratio	Not provided	Assessment not completed, but may be warranted

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: Title-24 New construction baseline
	ED Assessment: Title-24 standard is appropriate baseline for this project
	ED Recommendation: No change
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Both measure cost and Incremental cost were provided for the installed measures
	ED Assessment: Incremental cost is appropriate for new construction projects
	ED recommendation: No change
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: N/A
	ED Assessment: N/A
	ED recommendation: N/A
EUL	IOU Proposal: Not Provided
	ED Assessment: Consult DEER 2008 for the EULs
	ED Recommendation: According to DEER 15 years for HVAC units, 8 years for occupancy sensors, 11 years for lighting fixtures and 15 years for DCV and SAT reset as these two measures are part of HVAC controls
Savings Assumptions	IOU Proposal: Energy savings analysis for this project was performed with eQUEST model
	ED Assessment: The input parameters used in the baseline eQUEST model were based on Title-24 building energy efficiency standards. Parametric runs were created for all the proposed measures to estimate the savings for this project.

Reviewed Parameter	Analysis
	ED Recommendation: Savings methodology is appropriate for this project. However, ED recommends to revise the eQUEST model based on the post M&V
Calculation Methods/Tool review	IOU Proposal: eQUEST energy modeling tool was used to estimate the savings for this project
	ED Assessment: eQUEST is the appropriate modeling tool for new construction projects
	ED Recommendation: No change
Pre- or Post-Installation M&V Plan	IOU Proposal: No M&V plan was provided
	ED Assessment: Post M&V is required for this project
	ED Recommendation: ED recommends to perform post measurement and verification and revise the eQUEST model based on the post field findings
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: A NTG assessment may be warranted
	ED Recommendation: a NTG interview is recommended