

**CPUC Staff Ex Ante Review**

CPUC Staff Project ID Number	PGE_22_T_C_767_PRI - 03714212_Service
CMPA Directory Link	<a href="https://betaresources.info/cmpa/projects/20353">https://betaresources.info/cmpa/projects/20353</a>
PA	PGE
PA Application ID	PRJ - 03714212
PA Application Executed Date	
PA Program ID	PGE_COM_004
PA Program Name	Nexant - Advanced Energy Program - Custom Retrofit
PA Program Year	
Date of CPUC Staff Review:	3/24/2023
PA CMPA Upload Dates included in this review:	
First PA Upload	5/16/2022
Second PA Upload	6/1/2022
Third PA Upload	N/A
Fourth PA Upload	
Fifth PA Upload	
Sixth PA Upload	
Seventh PA Upload	
Eighth PA Upload	
PA Measure Description(s):	
Measure 1	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 2	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 3	Commissioning-Restore Optimize Equip Op-HVAC-EconomizerOutside Air
Measure 4	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 5	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 6	COMMISSIONING-RX RECODE CONTROLS-HVAC-SCHEDULE CHANGE
Measure 7	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 8	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 9	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 10	Commissioning-Restore Optimize Equip Op-HVAC-EconomizerOutside Air
Measure 11	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 12	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 13	COMMISSIONING-RX RECODE CONTROLS-HVAC-SCHEDULE CHANGE
Measure 14	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 15	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 16	Commissioning-Restore Optimize Equip Op-HVAC-EconomizerOutside Air
Measure 17	COMMISSIONING-RX RECODE CONTROLS-HVAC-SCHEDULE CHANGE
Measure 18	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 19	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 20	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 21	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 22	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 23	Commissioning-Restore Optimize Equip Op-HVAC-EconomizerOutside Air
Measure 24	COMMISSIONING-RX RECODE CONTROLS-HVAC-SCHEDULE CHANGE
Measure 25	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 26	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 27	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 28	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 29	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 30	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 31	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 32	Commissioning-Restore Optimize Equip Op-HVAC-EconomizerOutside Air
Measure 33	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 34	COMMISSIONING-RX RECODE CONTROLS-HVAC-SCHEDULE CHANGE
Measure 35	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 36	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 37	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 38	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 39	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 40	Commissioning-Restore Optimize Equip Op-HVAC-EconomizerOutside Air
Measure 41	COMMISSIONING-RX RECODE CONTROLS-HVAC-SCHEDULE CHANGE
Measure 42	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 43	COMMISSIONING-RX RECODE CONTROLS-HVAC-SETPOINT CHANGE
Measure 44	COMMISSIONING-RX RECODE CONTROLS-HVAC-OTHER
Measure 45	Commissioning-Restore Optimize Equip Op-HVAC-EconomizerOutside Air
PA Project Description:	Implement twelve 12 BRO HVAC Optimization measures over multiple site locations
BI-Monthly Upload kW Demand Reduction	340.9
BI-Monthly Upload Annual kWh Impacts	1,248,246.9
BI-Monthly Upload Therm Impacts	55,236.8
PA Proposed Incentive \$ (to Customer)	\$81,755.43
Project Documentation kW Demand Reduction	154.0
Project Documentation Annual kWh Impacts	981,727.1
Project Documentation Annual Therm Impacts	19,840.0
Project Documentation Incentive \$ (to Customer)	\$36,177.11
CPUC Staff Primary Reviewer Name	
CPUC Staff Primary Reviewer Firm	DNV
CPUC Staff Review Supervisor Name	
CPUC Staff Review Supervisor Firm	Quantum Energy Analytics
PA Primary Reviewer Name	
PA Primary Reviewer Firm	
CPUC Staff Project Manager	
CPUC Staff Policy Authorization (as needed)	
CPUC Staff Recommendation:	Application ready to proceed with exception(s), as noted
For rejection, action required:	N/A
M&V Review:	Post M&V Review (M&V Results and Final Calculations) Required

Action Number:	Summary of CPUC Staff Required Action by the PA:	Action Category	PA Response	CPUC Staff Response (3/24/2023)	ED Resolution
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1	Please resubmit the project for post-installation review.	Continue Document Upload	Post installation package was submitted on 01/23/23	<p>We don't agree with the verification done for EEM 1 – Static Pressure Reset for ACs/AHUs. The measure verification scatter plot provided for this measure (i.e., Figure 2 of the Post-Installation report) shows the Duct Static Pressure (DSP) range over the outside air temperature (OAT). It is unclear how this plot was used to verify measure implementation as it does not show the impact of this measure on the fan operation. We plotted measured DSP vs % fan speed and found that for most of the AHUs, the DSP were maintained fixed at varying fan speeds. Providing a range of operating DSP is not sufficient to verify this measure has resulted in any savings. Also, the PA did not provide any other documentation (e.g., EMS screenshot) to document the implemented DSP reset control logic. Providing a DSP range for post-installation period and then using the HVAC tool to estimate savings is not an appropriate verification process.</p> <p>For verifying this type of measure, the PA should explain the control logic (e.g., DSP reset based on OAT, DSP reset based on airflow, DSP reset based on terminal damper position, etc.) and provide EMS screenshots to document the control logic. This logic should be used to verify the DSP setpoints at different operating conditions and to establish the reset range along with the corresponding operating conditions. Subsequently, the measure verification should include trending of the independent parameter, actual DSP and DSP setpoint together to verify that the actual performance trends follow the implemented control logic.</p> <p>The calculations for EEM 12 – Kitchen MAU/KEF Fan VFD Control Optimization assumes a constant full speed operation while running for the baseline. Please make sure this assumption is correct.</p>
2	<p>The PA used the PG&amp;E HVAC Tool v1.4.1 to estimate savings for majority of measures. The tool does not have a way to adjust the savings based on the building occupancy and estimate savings based on inputs that are related to the HVAC system size, schedule and setpoints. To account for the occupancy change, the PA came up with some normalization factors and applied these factors directly to the savings calculated by the tool. These normalization factors are estimated based on a mix of 2019 (pre-COVID and full occupancy), and 2021 (after initial opening of offices in July 2021 and partial occupancy) occupancy and usage data as well as an assumed "new normal" operation (employees required to work from offices three days per week) since March 2022. No occupancy data was provided to support the "new normal" operation since March 2022.</p> <p>The normalization approach is not appropriate, and the PA did not fully explain the logic behind the measure specific normalization adjustments. For example, in the base case of the "EEM 1 – Static Pressure Reset for ACs/AHUs", the system mostly operated close to a maximum duct static pressure (DSP) setpoint of 1.5 in-w.g., if the base case lacked the programming that allowed the fans to push up to 1.5 in-w.g. most of the time, then the lower or higher occupancy is unlikely to have an impact on the operation of the system. The PA multiplied the savings calculated by the HVAC tool by the normalization factor estimated based on occupancy data to adjust the savings for occupancy. The PA did not explain why the percent occupancy has a direct impact on savings associated with this measure. Other measures have similar issues.</p> <p>In addition to the normalization issue, the PA did not explain whether the "new normal" operation of the HVAC system has changed since the pre-COVID operation and the initial opening after COVID. It is common for the building operators to adjust HVAC system operation (e.g., increased minimum outside air, extended HVAC on/off schedule, etc.) due to COVID. The PA did not explain the current (after March 2022) operation of the HVAC systems has changed compared to pre-COVID or 2021 period.</p> <p>Given all of these uncertainties in the calculation, we suggest the PA to use Option C with a full year of pre- and post- data to estimate savings. If Option C is not feasible, then the PA needs to clearly document the new normal (after March 2022) operation of the HVAC system, clearly explain how occupancy has an impact on savings associated with each measure and provide updated occupancy data to support any needed occupancy adjustments.</p>	Calculation method	<p>The PA discussed these issues with CPUC staff in a call on 8/4/2022.</p> <p>1. PG&amp;E/RI will check economizer operation and how it is modeled in the calculations. If it is found that the customer raised outside air minimums due to COVID, the calculations will keep the minimums the same in the baseline and proposed (using the "new normal" outside air minimum) so as to not claim any savings due to changes made out of necessity for COVID safety.</p> <p>Response: Based on review of the post-field outside air damper trend data, the outside air minimum is at 15% or lower opening, which is the same as the typical operation in the baseline. The HVAC tool use the minimal outside air percentage of 15% in the post calculation.</p> <p>2. PG&amp;E/RI will double check the appropriateness of applying the normalization factors measure by measure.</p> <p>Response: Double checked. See "Table 16 Summary of Post-Installation Measurement and Verification Plans" in the Post-Installation Report for the conclusion of applying the normalization factors measure by measure.</p> <p>3. The normalization approach as submitted in the original CPR submission will be used as the basis of the final claimed savings. It will be updated appropriately following the submitted M&amp;V plan.</p> <p>Response: The post-field normalization has been updated following the submitted M&amp;V plan and using the "new normal" badge data. See "Section 6 Post Measurement and Verification Data Analysis" in the Post-Installation Report for details.</p> <p>4. RI will attempt to create a whole building energy usage model beginning from when the customer states the "new normal" period began up to the most recent date when the model was developed prior to project implementation (this model will not include a full year of data). The whole building energy usage model will be used strictly as a means of sanity checking the savings and is not intended as the means of the final and ultimate savings claim. The savings claim will still be based on the calculation tool and approach that was originally submitted.</p> <p>a. There is no guarantee that whole building models can be created (within a reasonable effort for sanity check purposes). RI will attempt to create models that are statistically significant and will document their attempts whether successful or not.</p> <p>Response: A whole building energy usage model was not successfully created to sanity check the normalization factor because of the following:</p> <ul style="list-style-type: none"> <li>The project was fully implemented in October 2022 and hence did not have enough post install utility consumption data to accurately calculate the savings model.</li> <li>The potential modeling strategy includes a simple regression using hourly outside air temperature and occupancy (badge) data as independent variables. However, hourly badge data is not available. It is not feasible to create the model using hourly outside air temperature data with daily energy usage and daily badge data.</li> </ul>	<p>These issues were discussed with the PA and the project developer in a meeting on 8/4/2022. Please reference to meeting notes for details.</p>

Note or Instruction Number:	CPUC Staff Notes or Instructions:	Instruction Category	PA Response	CPUC Staff Response
1	The bi-monthly upload (BMU) addresses associated with several measures don't match the project files. For example, the BMU address for EEM-1, EEM-2, EEM-4, EEM-6, EEM-9, EEM-12 is listed as Address but the measures are associated with Address #2. Please make sure correct addresses are included in the next quarterly submission.	Other 1		
2	The current version of the HVAC Tool (v1.4.1) does not calculate DEER peak demand properly when the equipment operating schedule only partially overlaps the peak demand hours and when the overlapping peak hours change between the baseline and proposed cases. This issue was caught by PG&E review of the project. PG&E is working with the developer of the HVAC Tool to update the calculation methodology to correctly handle the peak demand savings calculation. This project does not receive incentive based on peak demand savings and these errors will have no impact on the incentive values. PG&E and the Technical Reviewer are conditionally approving the pre-install kW savings with the caveat that the HVAC Tool will be updated for post-install and the peak demand will be recalculated.	Calculation tool		

CPUC Staff Recommendation Definitions	
CPUC Staff Recommendation	Definition
Application ready to proceed without exception	The PA will continue to upload application documents to the CMPA directory through the implementation and claims phases of the project. The PA may proceed to approve the project without waiting for CPUC Staff response. A project is waived from further review at the post-installation stage by CPUC staff, but the PA is responsible for post-installation (IR) review. There will not be conditional approval.
Application ready to proceed with exception(s), as noted	<p>The PA must make revisions or changes as noted in CPUC Staff's review comments before signed agreement with customer. The PA will continue to upload application documents to the CMPA directory through the implementation and claims phases of the project. The PA may proceed to approve the project without waiting for CPUC Staff response. If CPUC Staff decides to perform IR review of a project, CPUC Staff will notify the PA. The scope will be limited to determine if the project was carried out consistent with the application and notes provided during pre-installation review and to obtain information pertaining to whether the eligibility criteria or metrics should be revised.</p> <p>Unless the scope of work presented in project application has changed at IR review, the project will not be reviewed again in the areas specified below. Scope change is defined by substantial changes include significant modifications to the proposed equipment type, size, quantity, configuration, the expansion of a project to include additional retrofits, or the splitting of a project into multiple phases. The following areas will not be reviewed again by CPUC Staff:</p> <ul style="list-style-type: none"> <li>• Calculation Tool</li> <li>• Calculation Methodology</li> <li>• M&amp;V Plan</li> <li>• Baseline</li> <li>• Eligibility</li> <li>• EUI/RUL</li> <li>• Measure Type</li> <li>• Program Influence</li> </ul>
Application rejected.	<p>The application is rejected as submitted. The PA shall promptly inform the applicant as to the reasons why the project was rejected and the specific recommendations for the conditions under which the project would be approved. CPUC Staff shall provide the reasons for the rejection or request for modification, including each basis as to why the project is rejected, or modification is requested. In addition, CPUC Staff shall provide specific recommendations for the conditions under which the project would be approved.</p> <p>If any party to the project is unsatisfied with the Commission's directions for the project, a dispute resolution process may be initiated by that party. The Commission shall adopt rules for the conduct of the dispute resolution process. – Section 381.2 (g) (3) (F)</p>
Advisory.	The PA is not formally required to follow instructions or recommendations given in an Advisory review. However, issues found will affect ESPI scoring and may come up again in Ex-Post review.