

RTR Appendix

Southern California Edison, Pacific Gas and Electric, Southern California Gas, and San Diego Gas and Electric (“Joint Utilities” or “Joint IOUs”) developed Responses to Recommendations (RTR) contained in the evaluation studies of the 2013-2015 Energy Efficiency Program Cycle. This Appendix contains the Responses to Recommendations in the report:

<p><i>RTR for the Impact Evaluation of 2013-14 Upstream HVAC Programs (HVAC1)</i> (DNV GL, Calmac ID #CPU0116.01, ED WO #ED_D_HVAC_1)</p>
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The RTR reports demonstrate the Joint Utilities’ plans and activities to incorporate EM&V evaluation recommendations into programs to improve performance and operations, where applicable. The Joint IOUs’ approach is consistent with the 2013-2016 Energy Division-Investor Owned Utility Energy Efficiency Evaluation, Measurement and Verification (EM&V) Plan¹ and CPUC Decision (D.) 07-09-043².

Individual RTR reports consist of a spreadsheet for each evaluation study. Recommendations were copied verbatim from each evaluation’s “Recommendations” section.³ In cases where reports do not contain a section for recommendations, the Joint IOUs attempted to identify recommendations contained within the evaluation. Responses to the recommendations were made on a statewide basis when possible, and when that was not appropriate (e.g., due to utility-specific recommendations), the Joint IOUs responded individually and clearly indicated the authorship of the response.

The Joint IOUs are proud of this opportunity to publicly demonstrate how programs are taking advantage of evaluation recommendations, while providing transparency to stakeholders on the “positive feedback loop” between program design, implementation, and evaluation. This feedback loop can also provide guidance to the evaluation community on the types and structure of recommendations that are most relevant and helpful to program managers. The Joint IOUs believe this feedback will help improve both programs and future evaluation reports.

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Page 336, “Within 60 days of public release of a final report, the program administrators will respond in writing to the final report findings and recommendations indicating what action, if any, will be taken as a result of study findings. The IOU responses will be posted on the public document website.” The Plan is available at <http://www.energydataweb.com/cpuc>.

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Attachment 7, page 4, “Within 60 days of public release, program administrators will respond in writing to the final report findings and recommendations indicating what action, if any, will be taken as a result of study findings as they relate to potential changes to the programs. Energy Division can choose to extend the 60 day limit if the administrator presents a compelling case that more time is needed and the delay will not cause any problems in the implementation schedule, and may shorten the time on a case-by-case basis if necessary to avoid delays in the schedule.”

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Recommendations may have also been made to the CPUC, the CEC, and evaluators. Responses to these recommendations will be made by Energy Division at a later time and posted separately.

Impact Evaluation

Study Title: Impact Evaluation of 2013-14 Upstream HVAC Programs (HVAC1)

Program: Upstream HVAC

Author: DNV GL

Calmac ID: CPU0116.01

ED WO: ED_D_HVAC_1

Link to Report: http://calmac.org/publications/HVAC1ImpactReportFinal_040116.pdf

Item #	Page #	Findings	Best Practice / Recommendations	Recommendation Recipient	Disposition (Accepted, Rejected, or Other)	Disposition Notes (e.g. Description of specific program change or Reason for rejection or Under further review)
1	57	All Programs: Program savings were lower than expected. The evaluation team believes one root cause is having optional efficiency criteria for full load or partial load rather than requiring both full and partial load efficiencies meet a threshold that ensures savings are above code minimum.	For program managers and designers: Set program efficiency criteria for full-load and part-load combinations. Pre-identify units that meet the criteria such that savings claims are tied back to make and model numbers collected by participating distributors.	All IOUs	Other	DEER Full-load and part-load efficiencies do not align with CEE Tiers. If IOU's are agreeing to use CEE Tiers, then only the Part-Load (SEER/under 65kBtu) or Full-Load (over 65k) apply. If both must be met, many of the CEE Tier 1 units do not qualify and many CEE Tier 2 units may only qualify for Tier 1 DEER savings. Requiring the Program to enforce both full-load and part-load efficiencies for each tier is conservative to the point of discouraging participation, and does not allow program flexibility to promote units that are built to maximize full load or part-load efficiencies. The "and" requirement creates strict tiers that do not align with HVAC product availability. In order to adequately use an EER "and" IEER requirement would require two or three efficiency combinations per tier to properly represent the wide range of high efficiency products in the market - those with high IEERs relative to EER and vice versa.
2	57	All Programs: Program savings were lower than expected. Another possible factor for low realization rates include using system performance maps that do not accurately represent the performance of the systems being installed through the program.	For program managers and designers: Work with distributors to obtain extended performance maps that can be used in future simulations. DEER updates are limited by the availability of information from manufacturers, and the upstream program may be in a better position to obtain this information. For workpaper developers and engineers: Use DEER estimates generally and focus workpaper efforts on EER and IEER combinations greater than DEER values. Detail the performance maps and additional features if any such as variable speed compressors, energy recovery ventilation, etc.	All IOUs	Accepted Conditionally	Utilities will accept based on manufacturer's willingness to provide performance maps. Manufacturers have expressed concerns around proprietary equipment design.
3	57	All Programs: Program savings were lower than expected. Another possible factor for low realization rates include issues with building types associated with Upstream claims.	For program managers and tracking data teams: Avoid building types that do not map to ex ante values. In general, the building types in tracking such as "Multiple" and "Miscellaneous" were associated with specific building types based on site visits.	All IOUs	Accept	PG&E and SCE workpapers will be incorporating a COM building type which should eliminate building types which don't match to ex ante values

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4	57-58	All Programs: Program savings were lower than expected. Another issue that may lead to inaccuracies in realization rates is using a deemed saving approach for large water cooled chillers. The same exact chiller could have highly varying savings dependent upon how it is being operated especially regarding chilled water temperatures and control approaches.	For program managers and designers: Implement a calculated savings approach for large water-cooled chillers.. Having a few calculation inputs, such as the site-specific set points and controls, could produce much more accurate estimates without adding much more work to the process.	All IOUs	Rejected	<p>For over a decade, the calculated chiller program could not engage the market to do better than a single digit marketshare participation. Experience has shown that calculated programs have low engagement because they actually add much "more work to the [application] process", discouraging applicants.</p> <p>Changing the model to a deemed upstream program increased chiller accomplishments by an order of magnitude and achieved significant market transformation impacts. Furthermore, realization rates for water-cooled chillers were 139% for kW and 98% for kWh, the highest of any upstream measure.</p> <p>The accomplishments and market transformation advantages of a deemed upstream program are evident and to require more data or the burden a calculated application would not be a benign change to the program accomplishments. Specific set point and controls information cannot be collected for an upstream program because they are not readily available to the participating distributors. Even if they could be collected, it is unclear how this additional data could be used with a deemed approach. The existing work paper models conservative average savings, in a similar manner to DEER, but uses more up to date performance data and more accurately reflects the equipment efficiencies available in the market. Requiring the collection of information unavailable to the program participants will harm the program without any clear benefits.</p>
5	58	All Programs: Program savings were lower than expected. Finally, the realization rates were profoundly affected by ex ante estimates that did not pass basic quality control steps. For example, the air-cooled chiller savings ex ante estimates were 85% of the baseline cooling end use total usage, which is impossible.	For workpaper developers and tracking data teams: Check unit energy savings estimates relative to the baseline cooling energy consumption per ton. This will improve the ability of future workpapers to check whether adjustment factors to DEER estimates produce reasonable savings. Also check that workpaper values agree with values in tracking data.	All IOUs	Rejected	<p>The workpaper savings were derived from DEER measures. The comments stated that DEER measure baseline value was 85% higher than it should be. The best way to improve this is that DEER needs to update its values and then IOUs will update their workpaper accordingly.</p>
6	58	Unitary Systems: Many Upstream unitary HVAC systems have non- functional economizers. The evaluation team found that a considerable savings potential is not being realized because many economizers for unitary systems being installed through the program are not functioning properly. Our testing occurred within two years of installation, but one-quarter of the economizers were found to not be working.	For program managers and designers: Develop methods to obtain evidence that the economizer is fully functional before dispersing the final incentive payment. Create a program required acceptance testing protocol for the technician to assure a functioning economizer that includes documenting economizer functionality with video/photographic evidence.	All IOUs	Rejected	<p>Distributors do not have access to this information. Field testing of all upstream units would be cost-prohibitive and access extremely difficult (because the end-user is not aware of the rebate).</p> <p>Photo and video documentation cannot be obtained by distributors in an upstream program. Ensuring economizers are operational two-plus years after installation is an issue for all equipment with economizers and not just those installed through upstream. Photo evidence of a working economizer at the time of installation is not necessarily proof it will be functioning in two years.</p>

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7	58	<p>Unitary Systems: Inputs for DEER estimates appear to have improved. The field-testing of 5.5- 20 ton units showed that fan performance and part-load performance curves were similar to current DEER assumptions. The current DEER update appears to have improved the accuracy of fan performance inputs for the simulations; thus, using current DEER estimates are an improvement over the estimates available to the IOUs when the 2013-14 programs began. The characterization of fan performance and part-load performance data for smaller systems, under 5.5 ton, can still benefit from additional data collection as the sample size for this evaluation was insufficient to assure the quality of the DEER assumptions.</p>	<p>For workpaper developers and evaluators: Use current DEER assumptions for deemed savings estimates for the 5.5-20-ton unitary system. Collect additional data on fan performance to accurately characterize the program population.</p>	All IOUs	Accepted Conditionally	Utilities will accept based on manufacturer's willingness to provide performance maps. Concerns around proprietary equipment design.