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:

RTR for the 2015 Custom Impact Evaluation Industrial, Agricultural, and Large Commercial (Itron, Calmac ID #CPU0154.01, ED WO #ED_I_IALC_5)

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) Plan[1] and CPUC Decision (D.) 07-09-043[2].

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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1 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.

2 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."

3 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.

Response to Recommendations (RTR) in Impact, Process, and Market Assessment Studies

Study Title: 2015 Custom Impact Evaluation Industrial, Agricultural, and Large Commercial
Program: IALC
Author: Itron
Calmac ID: CPU0154.01
ED WO: ED_I_IALC_5
Link to Report: http://www.calmac.org/publications/IALC_2015_Custom_Report_Final.pdf
http://www.calmac.org/publications/IALC_2015_Custom_Appendices_Final_050517.pdf

Note: Unique recommendations that have not appeared in previous evaluation reports are marked with a double asterisk (**).

					PG&E (if applicable)		SCE (if applicable)		SCG (if applicable)		SDG&E (if applicable)	
Item #	**Page #**	**Findings**	**Best Practice / Recommendations (Verbatim from Final Report)**	**Recommendation Recipient**	**Disposition**	**Disposition Notes**	**Disposition**	**Disposition Notes**	**Disposition**	**Disposition Notes**	**Disposition**	**Disposition Notes**
				If incorrect, please indicate and redirect in notes.	Choose: Accepted, Rejected, or Other	Examples: Describe specific program change, give reason for rejection, or indicate that it's under further review.	Choose: Accepted, Rejected, or Other	Examples: Describe specific program change, give reason for rejection, or indicate that it's under further review.	Choose: Accepted, Rejected, or Other	Examples: Describe specific program change, give reason for rejection, or indicate that it's under further review.	Choose: Accepted, Rejected, or Other	Examples: Describe specific program change, give reason for rejection, or indicate that it's under further review.
1	7.1.1	Out of 148 M&V points, 30 projects, or 20 percent of the sample, had a GRR of zero or lower.	PAs should improve program eligibility requirements, manuals, training, and quality control procedures in order to screen out ineligible projects. A more thorough PA review of ex-ante documentation for eligibility and program rules is needed. Screening should focus on the following issues identified in Chapter 4: improved attention to ISP determinations and their effective dates, assurance that impacts are realized on the grid where on-site generation is present, removal of projects that involve like-for-like replacements, and demonstration that qualifying program measures exceed code-based energy efficiency requirements associated with original construction or subsequent upgrades.	All IOUs	Accepted	In 2015, the Custom Implementation Team (CIT) was formed. It was designed to systematically review custom projects based on pre-selected criteria to ensure quality, consistency and adherence to PG&E and CPUC guidelines. CIT began to develop a method of pre-review work early in 2016 to screen for eligibility, influence, measure classification and baselines. In late 2016, CIT implemented a pre-review of all (except MLC, DI) Custom projects screening for eligibility, influence, measure classification and baselines.	Accepted	As of 2016 we have a pre-screen checklist in place which ensures project compliance to these factors.	Accepted	SoCalGas strives to improve its eligibility documentation and plans to revisit its documentation, specifically its eligibility questionnaire and project history form that was developed in October 2014. Starting in Q1 2017, SoCalGas updated its training materials and hosted training that covers how to screen out ineligible projects. SoCalGas continuously improves its screening of eligible projects by applying filters to its application process. SoCalGas has increased project scrutiny by pulling in all stakeholders to examine and inform project development early in the process. SoCalGas also has a pre-application audit with its customer where SoCalGas visits the customer sites to verify energy savings and encourages the customer to participate in the highest energy savings projects. For on-site generation, SoCalGas' eligibility questionnaire identifies sites with on-site generation. For those sites, SoCalGas has an in-depth program and engineering review process to determine the qualifying fuel is being saved. Also, the Track 2 Working Group	Accepted	SDGE since 2016 has improved its project validation review procedures through the process of assigning the project to an internal SDGE Engineer to more thoroughly review the perspective custom project. Additionally by August of 2017 SDGE will be implementing a new Engineering project database which will improve the engineering review process from the assigned project engineer and the quality control engineer.

										(T2WG) is developing preponderance of evidence requirements for program influence and ER baseline determination. SoCalGas will adjust program policies and procedures accordingly.		
2	7.1.1		Regarding eligibility, the PAs should clearly document the energy efficiency action that is being performed and ensure that program rules are followed. Projects should have an identifiable and documented case for energy efficiency claims and application documentation should adequately explain how a given project saves energy.	All IOUs	Accepted	In 2017, CIT is planning to create a common technical reviewer pre/post installation template that addresses, among other things, customer documentation and evidence for eligibility of each measure. CIT will be reviewing template worksheet from the Final Site Report entitled "Project Eligibility." Using this template ensures that PG&E is looking at the same criteria as CPUC/ED.	Accepted	As of 2017, all projects utilize a project feasibility study which requires this information.	Accepted	SoCalGas' projects are vetted at several points in the process and documentation is based on the normal sequence of the project.	Accepted	All projects must meet program criteria prior to being assigned to an internal SDGE engineer. Additionally SDGE engineering will be implementing a new project engineering database software in August of 2017 which will institute additional project scrutiny by the assigned engineer and the quality control engineer to more thoroughly detail how a project saves energy.
3	7.1.1		PAs should screen measures for eligibility, including removal of maintenance measures and assurance that projects meet program eligibility performance thresholds.	All IOUs	Accepted	In late 2016, CIT has implemented a pre-review of all (except MLC, DI) Custom projects screening for eligibility, Influence, measure classification and baselines.	Accepted	As of 2017 we pre-screen all calculated projects during which field engineering validates this information.	Other	This recommendation is not applicable. Based on D.16-08-019, maintenance measures will become eligible for energy savings under the Behavioral, Retrocommissioning and Operational *(BRO)* baseline.	Accepted	The assigned internal SDGE project engineer itemizes primary drivers for EE projects and the repairs are a reviewed checked item within our Free rider screening form.
4	7.1.1		The PAs should adjust the set of qualifying measures/technologies that are eligible for incentives and annually review the list of qualifying measures for each program to eliminate eligibility for those that became standard practice.	All IOUs	Accepted	In 2017, CIT is updating our eligible measures on PG&E's internal Wiki site. We have started to grow eligible measures during our pre-review of Custom projects.	Accepted	A technical meeting has been in place that looks at measure management and eligibility on a weekly basis.	Accepted	SoCalGas seeks to actively promote technologies that are less-adopted, cutting edge, or emerging technologies. SoCalGas is working with Statewide partners to identify ISP measures collaboratively with Codes & Standards. *ISP is currently a topic in T2WG, and SoCalGas will implement direction which emerges from that forum.*	Accepted	The list of Industry Standard Practice studies is maintained on the Non-DEER CMPA website. SDGE engineering references the ISP list to update them for potential measures that would be recognized as ISP measures.
5	7.1.1		The PAs should carefully review each of the 30 FSRs listed in Section 4.4.2, Table 4-6, to identify the specific reasons that led to zero or negative savings, and use those lessons learned to improve related project practices. An array of different factors led to very low site-level GRRs, but some common reasons include: like-for-like replacement of equipment, improper application of ISP, improper application or interpretation of code requirements, baseline	All IOUs	Accepted	In 2017, CIT has provided Ex-Post training to our Implementers, technical reviewers, and internal engineers on the lessons learned from the 2015 Ex Post evaluation. CIT & ATS as well as key stakeholders were involved in in-depth review and meeting with the CPUP-ED and their 2015 IALC custom impact evaluation consultants to discuss the zero saver projects. In-depth review will eventually cover all 42 FSRs, as there are lessons to be learned in all. There were only 9 zero savers in PG&E--and unfortunately we do not have access to the other IOUs Zero Savers. We suggest that we confer with the other IOUs to understand what, if anything, was learned in their reviews of the 2015	Accepted	As of 2017 we pre-screen all calculated projects during which field engineering validates this information.	Accepted	As the FSRs are posted, the SoCalGas team reviews it and implements the specific responses as appropriate. *Some recommendations will take time before they are fully realized in Ex Post since there is a lag from when an FSR is provided and projects in the existing program pipeline.*	Accepted	All custom projects are assigned to internal SDGE engineering staff to review and as such the results of 2015 Ex Post evaluation will also be reviewed for lessons learn to the internal SDGE engineering staff so that they could improve their project reviewing skill sets.

			specifications that do not meet post-installation service requirements and conditions, calculations that include errors, lack of validation of equipment specifications and modeled performance, and failure to apply the non-regressive baseline rule.			FSRs that could apply to our own custom projects.						
6	7.1.1		The PAs should make greater efforts to address the same types of projects that received low GRRs in this evaluation, given the significant downward effect that these projects had on the resulting lifecycle ex-post gross savings estimates.	All IOUs	Accepted	Since 2013, PG&E's EM&V team has communicated to the custom team on Ex Post lessons learned. CIT has started quarterly meetings with our EM&V team to address lessons learned. As mentioned above, we provided training to our stakeholders on lessons learned from the 2015 Ex Post evaluation. There is a table in Appendix D of the 2015 impact evaluation that highlights projects that are subject to past EAR dispositions.	Accepted	SCE has implemented enhanced QA and QC elements related to customized projects. For QA, SCE utilizes CPUC directives to document, operationalize, communicate, and train stakeholders in updated requirements that are aligned with the ex ante review process. For QC, SCE has implemented a checklist used for custom projects that is used to catch common errors during the project development and review processes.	Accepted	SoCalGas will establish internal stakeholder engagement to review the low GRRs and ex-post gross savings estimate and identify and implement appropriate corrective actions.	Accepted	Since late 2016 SDGE EM&V team has developed improved communication process to communicate lessons learned from the increased levels of engagement from the Ex Post Commission team and the 2015 Ex Post evaluations.
7	7.1.1	There were a number of cases where ISP or code-based baseline determination rendered a project ineligible.	The PA's project eligibility treatment suggests that the PA's internal communication and coordination efforts for disseminating, implementing and overseeing implementation of CPUC guidance should be improved.	All IOUs	Accepted	First, PG&E's EM&V team has communicated the evaluation findings to custom stakeholders at PG&E and its 3P contractors via custom trainings and internal communications. In addition, PG&E is developing solutions to the fixing the convoluted problems found, including the following: 1. PG&E ISP/PD lead has been proactively collaborating with the EAR team regularly to perform ISP studies and provided stakeholder trainings, leading statewide IUOs' effort in ISP investigations and sharing lessons learned; 2. We have discovered that the existing ISP guide authorized by CPUC is insufficient in providing clear guidance on ISP concept, purpose, or process for various customer- or site-specific projects, and have actively proposed and implemented solutions to clarify convoluted issues on ISP, baseline and influence; 3. PG&E staff has developed Project Development protocol and trainings to address the procedural and knowledge gaps related to this issue.	Accepted	A bi-weekly meeting is in placed to support these efforts and disseminate the internally and externally to all stakeholders.	Accepted	SoCalGas is updating training procedures to include all implementers and consultants who address custom project eligibility.	Accepted	Given that SDGE's custom engineering staff reviews 100% of all the custom projects that come through the custom program, the communication on CPUC guidance is consistently disseminated to the entire staff of engineers and those same engineers also participate on the weekly calls with the Commission to learn current CPUC guidance.
8	7.1.1		To improve project eligibility screening the PAs should ensure that incented measures exceed the ISP / code baseline. As such, it is important	All IOUs	Accepted	PG&E ISP/PD lead has: a) proactively been collaborating with the EAR team to perform ISP studies; b) provided stakeholder trainings; c) leading statewide IUOs' effort in ISP investigations; and d) sharing lessons learned.	Accepted	As of 2017 we pre-screen all calculated projects during which field engineering validates this information.	Accepted	*SoCalGas agrees with this.* ISP is currently a topic in T2WG, and SoCalGas will implement direction that emerges from that forum.	Accepted	SDGE engineers are aware of notifications of ISP and code baseline updates from the Commission given that they communicate and collaborate with the CPUC ExAnte team on a

			that the PAs spend adequate time documenting the appropriate project type and project baseline when establishing eligibility. The PAs should examine Appendix F, which includes a list of every project where the evaluation overturned the PA specified project type or baseline type.			In addition, since 2016 PG&E has added a QC screening of every custom project by the CIT. Finally, the CIT and EE EM&V team will review in-depth the findings in Appendix F of the 2015 IALC report.						weekly basis. Furthermore the recommendation of reviewing the Appendix F will also be reviewed by SDGE engineers to further update their knowledge based on the ExPost 2015 evaluations.
9	7.1.1		**PAs should push participating customers to higher levels of efficiency in order to build in a savings buffer above ISP/code/non-regressive baselines and thereby have greater assurance of project eligibility and achievement of ex-ante saving claims.	All IOUs	Other	PG&E heavily advocates for energy efficiency measures above ISP/code/baseline with its various customer touchpoints including the use of strategic account managers, energy efficiency marketing campaigns, and 3P vendors who actively recruit customers for custom projects. PG&E has adopted actions that provide for a) Incentives that improves the cost-effectiveness and increases the attractiveness of the EE option; b) Validation of technical aspects and energy savings by PG&E engineering and its consultants; c) Endorsement of vendor claims for the EE option; and d) promotion of vendor stocking of more EE equipment and market effects. Impact evaluations focus mostly on the effect of the EE monetary incentive as the other impact of the PG&E interventions are harder to assess. This can lead to underestimation of the impact of PG&E's interventions. PG&E EE EM&V team has continuously advocated for a review of the methods used to assess the impact of all the PG&E interventions. We welcome further collaboration to that effect so that future programs can optimize the mix of their offerings for maximum incremental EE uptake by customers.	Accepted	Higher "targeted" incentive category which pays a higher incentive rate to push deeper saving measures. SCE also offers a Comprehensive Bonus for projects with deeper integrated savings across categories.	Accepted	*SoCalGas agrees and this recommendation is consistent with current SoCalGas' best practice where applicable*. SoCalGas is updating training procedures to include all implementers and consultants who address custom project eligibility. ISP is currently a topic in T2WG, and SoCalGas will implement and train on direction that emerges.	Other	Since 2015 SDGE custom program has restructured its approach by assigning an internal engineer early in the custom project process to facilitate early engagement with the customer, to ensure that the energy efficiency measures discussed for the perspective project have the best potential for deeper energy savings.
10	7.1.2	For the majority of projects included in the evaluation gross impact sample the ex-post evaluation used a different model or adjusted the PA ex-ante model. Furthermore, the evaluators used different inputs and assumptions for the majority of projects in the sample. In some cases, the PA did not properly take into	PAs should continue to review and improve impact methods and models through review of evaluation results, industry best practices, and collaboration with the CPUC's ex-ante review process. The PAs and their subcontractors should review the methods and models used in this evaluation for projects that were identified	All IOUs	Other	PG&E staff has developed a multi-pronged approach to the improvement of savings estimation methods and models. Through the development of a centralized and streamlined review process, projects are screened for pre-selected criteria based on feedback in prior Impact Evaluations and more specifically, Project Development protocol and trainings to address the procedural and knowledge gaps related to this issue.	Accepted	A comprehensive training has been developed for delivery channels to address these issues.	Accepted	This recommendation is consistent with current SoCalGas' best practice. SoCalGas continues to work with CPUC's ex ante review process on modeling approaches; SoCalGas also works with the ex post team to provide comments as the process is ongoing.	Other	Once again, all projects that are submitted to the custom program within SDGE are reviewed 100% by assigned internal SDGE engineers. In turn when a project has an associated third-party implementer, the project associated to that third-party implementer is submitted to our internal engineers for review and our internal SDGE engineer shares ExAnte and ExPost guidance with that third-party program participant, thus educating them on the updated CPUC guidance which may have resulted in reduced savings

		account key factors that may impact the savings such as weather/seasonality/production normalization. Generally, models needed to be adjusted because the PAs did not properly account for CPUC policy and guidance, previous EAR guidance, and standard evaluation practices.	as needing improvements to ex-ante calculation approaches. PAs should continue to improve their modeling approaches through systematic review and assessment of approaches developed and used internally, by third parties, by professional organizations, and by programs in other jurisdictions. CPUC guidelines should be followed, including the estimation of savings when non-IOU supplied energy sources are used, such as performing hourly net grid impact analysis. In addition, the PAs should continue to work closely and collaboratively with the CPUC's ex-ante review process to assess and agree on modeling approaches based on the results of ex-post evaluation and ongoing ex-ante review.									for the projects they are submitting. Most importantly to the updating and re-educating process is that our internal SDGE engineers are actively monitoring and applying revisions to the projects that are submitted to the custom program under the basis of updated and current direction of the CPUC ExAnte and ExPost commission departments.
11	7.1.2		The evaluation team recommends that the PAs provide their implementers and/or customers with the most current, standardized or CPUC-approved calculation tools. Calculations should be developed using proven tools.	All IOUs	Accepted	PG&E is utilizing a media Wiki system to help organize the approved standard tools and communicate correct tools and versions. For example, when "Steam Trap" is searched, the page for the steam trap tool will pop up. The page contains the SoCalGas approved steam trap tool, the dispositions, and notes on the measure sunset schedules. In Q2 2016, PG&E also created a Standard Calculations and Tools Committee, which is broken into 9 groups; Boilers/Steam Generators, Compressed Air, Data Centers, HVAC, Lighting, Petroleum, Pumping Systems, Refrigeration, and Water/Wastewater Treatment. Each group has a lead field engineer and lead ATS engineer assigned who are in charge of identifying needs for additional standardized tools, maintaining existing tools, and ensuring uniform calculation methodology in their segment.	Accepted	All approved tools are listed in SCE Calculated Guidelines and/or are integrated into SCE's online application tool.	Accepted	This recommendation is consistent with current SoCalGas' best practice. Every 3-5 years, SoCalGas has performed a tools review and ensures implementers are aware of the current tool location.	Accepted	SDGE continues to offer workshops at our Energy Innovation Center on "Tools and Tips for Estimating Energy Efficiency Seminar" twice per year for contractors/customers/engineers. The workshop discusses common tools used for energy savings evaluation and provides some example calculations. The presentation is continually updated using current analysis tools and procedures.
12	7.1.2		Further, the PAs should include in each application file the live, unlocked, non-password	All IOUs	Accepted	From Q4 2015-Q3 2016, PG&E CIT verified that calculations were live, and spreadsheets were not locked	Other	This is already a requirement for the SCE program based on the Calculated Guidelines.	Accepted	This recommendation is consistent with current SoCalGas' best practice.	Accepted	SDGE engineers have been providing live and unlocked non-password protected spreadsheet models since Q3 of 2015. We will continue to provide

			protected spreadsheet models. The PAs should ensure the final model is stored in each file and record key model inputs and outputs, documented using data or observed conditions.			prior to assigning pre-installation review projects to technical reviewers. Now the check is done by the technical reviewers when they begin their review.						the need unlocked models and inputs and outputs for the custom projects that SDGE engineers review.
13	7.1.2		PAs should carefully review ex-ante savings claims, inputs, and calculation methods. Ex-ante savings estimates and calculation methods should be more thoroughly reviewed and approved by PA technical staff prior to finalization of incentives and savings claims. These reviews by knowledgeable technical staff can help ensure reliable and accurate impact estimation.	All IOUs	Accepted	PG&E sends all custom projects for pre and post installation review to technical reviewers.	Accepted	SCE has a two-tier technical review on all calculated projects. SCE Field Engineering is the first tier, and we have independent third parties that evaluate the projects as tier 2.	Accepted	This recommendation is consistent with current SoCalGas' best practice.	Accepted	Custom projects that are incentivized by SDGE are assigned to a separate internal SDGE engineer who is responsible and accountable for the analysis performed on the assigned project. There is also a separate Quality Control senior engineer who reviews the project results that the assigned project engineer submitted. This process ensures there are checks and balances in the review and is performed on 100% of our custom projects that are incentivized by the program.
14	7.1.2		PAs should conduct periodic due diligence to ensure programs adhere to PA and CPUC impact estimation policies, guidelines, and best practices. Given the multitude of non-utility and utility programs, the PAs should consider interventions such as increased training and project scrutiny to ensure the most accurate savings claims consistent with eligibility, baseline and program rules. In addition, the PAs should continue to work collaboratively with the CPUC's ex-ante review process and look for ways to leverage lessons learned from that process to implement their own internal ex-ante review of third party programs.	All IOUs	Accepted	Beginning Q4 2015, CIT began performing policy reviews on all pre-installation projects prior to technical review assignment. The eligibility review previously focused on rulebook compliance, with a format that enabled quickly flagging possible issues for technical reviewers to follow up on. In Q3 2016, reviews expanded in scope by allocating additional time for CIT to push back on project developers on persisting issues of baseline selection, measure type, and influence. Review findings are attached in the project files and documented in the Wiki. For example, an industrial wastewater VFD project was rejected during CIT review in Q1 2017, and additional notes were added in the section about "SCE's Wastewater Treatment Plant Pumps VFD" study highlighting that industrial customers were included in that study's scope. Project reviews and dispositions are searchable in the wiki and available to PG&E project developers and Technical Reviewers. Third party implementers currently do not have wiki access, and the current work around is to send pdf copies of content.	Accepted	SCE has a two-tier technical review on all calculated projects. SCE Field Engineering is the first tier, and we have independent third parties that evaluate the projects as tier 2.	Accepted	SoCalGas continuously evaluates its calculated program. The results inform program process improvements. SoCalGas has increased project scrutiny by pulling in stakeholders to examine and inform project development throughout the process.	Accepted	As stated in the question above with regard to SDGE's custom engineering practices, the projects that come through the custom programs either originating from self-sponsoring customers or third-party implementers all get assigned to internal SDGE engineers for review and are then validated by a separate SDGE senior quality control engineer to ensure that the projects are reviewed thoroughly and calculated appropriately. The entire SDGE engineering department participates and collaborates with both the Commission ExAnte and ExPost group, in an effort to continual improve and update our engineering practices, this has been the practice since 2015.
15	7.1.2		**The PAs should prioritize M&V reviews for all large projects. Based on	All IOUs	Accepted	CIT provided M&V training in June 2016, outlining Commission staff M&V guidance. In Q4 2016, for larger	Accepted	SCE already has a multi-tiered approach to project rigor depending on size. >100,000kWh already receive full	Accepted	SoCalGas develops M&V plans for all large projects over 200,000 therms. In	Accepted	Since 2016, the number of projects that have associated M&V requirements to support the savings claim

			the distribution of custom projects by size observed in 2015 a census of large projects in strata 1-3 ranges by PA from just a handful or projects to less than 50, and represents roughly 40 to 60 percent of ex-ante savings claims. The purpose would be to ensure that CPUC M&V standards are being met for the treatment and documentation of program ex-ante savings. This would reduce risk to ex-ante claims, and should focus on proper baseline documentation, appropriate eligibility screening, CPUC-approved M&V planning and implementation, and the development of robust and accurate savings estimation models and results.			projects (> $200,000 in incentives), CIT implemented a post-QA/QC review which includes M&V checks - including measurement points, measurement period, measurement interval, measurement equipment, system diagrams and discussion of measurement equipment accuracy & uncertainty. CIT policy reviews address baseline selection for all project sizes during pre-installation review.		rigor.		addition, SoCalGas has a tiered Installation Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms.		have increased in the custom program offerings. SDGE will continue to support improved M&V requirements for large scale project in an effort to support the projects savings claims.
16	7.1.2		**For certain applications, such as where the baseline is represented by the pre-existing equipment and pre- to post- installation conditions are stable, PA use of an IPMVP Option B or C regression model may be preferable to other calculation- based approaches. Regression models should also account for all non-routine adjustments, as facilities often undergo changes unrelated to program efficiency-based improvements, and savings estimates should be normalized for production and weather differences. It is also critical that the measure- impacted accounts be properly identified and used in regression models. Regressions may serve to better bound the savings and may also be used as a	All IOUs	Accepted	These comments have been added to the PGE wiki page on regressions.	Accepted	As part of the SCE technical review process, when appropriate and necessary, it is normal practice to request applicants to normalize regression models for weather and/or production data. For those projects that utilize a statistical model to estimate energy savings impacts, SCE will continue to review the appropriate metrics to determine the level of uncertainty (i.e. an R squared value be 0.7 or greater). The duration of post retrofit data collection period are generally tiered by the level of savings and calculation methodology adopted. These periods are typically a PA approved and defined based on the nature of the energy efficiency measure (EEM) with durations lasting from a minimum of 1-2 week, for low impact, constant load or low variance measures and up to 2-6 months or a 1 year for high impact, variable load, or high variability measures. Interval data is highly dependent on the nature of the EEM and expected variance. When appropriate and necessary, daily, hourly and sub-hourly	Accepted	When applicable, SoCalGas prefers to use IPMVP Option A and B for commercial and industrial custom projects. SoCalGas typically accounts for non-routine adjustments and assumption inaccuracies in our post-installation analysis. SoCalGas often finds Option C difficult to implement in practice for commercial and industrial production facilities due to the additional variable of “need for utilities” at any particular point in time. This is often difficult to account for without customer making capital-intensive investments in measurement infrastructure.	Accepted	These comments have been disseminated to the entire SDGE engineering staff and will be utilized as part of their updated knowledge of operation pertaining to CPUC guidance.

			sanity check of results derived using other calculation approaches.					data points have been collected to characterize existing conditions of projects.				
			• **Regression models should be informed by longer duration trend data whenever feasible.						Accepted	SoCalGas attempts to get 1-3 years of pre-installation data and at least 3 months of gas assumptions post-installation data.		
			• **For regression models involving both energy consumption data and production data (i.e., energy intensity), a variety of models should be attempted using differing time intervals, such as daily versus hourly, in order to identify model-based estimates with the best fit regression curve.						Accepted	SoCalGas agrees and it should be based on the engineer's discretion, project applicability, and appropriate use of program funds.		
			• **Where regression models are used the R squared values should be 0.70 or higher and the CV(RMSE) values should be lower than 15 to 20%.						Accepted	SoCalGas agrees that it is preferable to have statistically robust values.		
17	7.1.2		**For NRNC whole-building projects the PAs should use the non-compliance mode to estimate savings and compliance mode to demonstrate project eligibility.	All IOUs	Accepted	This has been a PG&E requirement since Q3 2016.	Accepted	See attachment, "Whole Building Approach—Calculation Guidelines."	Accepted	Along with the statewide Savings by Design team, SoCalGas is in the process of *reviewing the use of an energy usage intensity (EUI) model*, which will incorporate the non-compliance mode and compliance mode.	Accepted	This has been a SDGE requirement since Q3 of 2016.
18	7.1.2		**The PAs should review all modeling weaknesses and areas for improvement noted in Section 4.5.	All IOUs	Accepted	CIT will assign ATS and field engineer segment leads to communicate the ex-post review findings for projects related to their segment by adding all feedback to their respective wiki pages. Wiki pages on EE measures are currently directed towards project developers and technical reviewers as the first place to go to learn about a technology, find standard tools, and check eligibility guidance. We incorporate the ex-post review findings to those pages.	Accepted	As of 2017 we pre-screen all calculated projects during which field engineering validates this information.	Accepted	This recommendation is consistent with current SoCalGas' best practice.	Accepted	SDGE has spent some time developing an engineering review software called Nexant to capture commission and reviewer recommendations, so that subsequent project submission will incorporate the recommendations.
19	7.1.2	Key inputs and observations, when available, based on ex-ante field verification, installation reports and M&V, were	**The PAs should calibrate models and true-up savings based upon post-installation data, such as equipment usage profiles, equipment specifi-	All IOUs	Accepted	CIT provided M&V training in June 2016, outlining Commission staff M&V guidance. In Q4 2016, for larger projects (> $200,000 in incentives), CIT implemented a post-QA/QC re-	Other	Project data is verified and calibrated pre- and post-installation by applicants and is verified by contracted third party reviewers.	Accepted	Since January 2015, this recommendation is consistent with current SoCalGas' best practice. SoCalGas applies M&V reviews for all large projects over 200,000 therms. In addition, SoCalGas has a tiered Installa-	Accepted	SDGE internal Quality Control engineering review will include confirmation of inclusion of Ex-Ante field data when we perform the custom Project Application reviews, Installation Re-

		sometimes not subsequently incorporated within the ex-ante impact models.	cations, production records and model inputs. The PAs should also make better use of available post- installation M&V data, including measured usage data and model inputs such as temperature settings and equipment operating schedules. Metering, EMS and SCADA data should be used to confirm or derive model inputs, such as operating conditions, and to calibrate models.			view which includes M&V checks - including measurement points, measurement period, measurement interval, measurement equipment, system diagrams and discussion of measurement equipment accuracy & uncertainty. CIT has recently clarified in the Custom Rulebook and in the Statewide manual that savings estimates must be trued up with post-installation data. While we accept this recommendation in principle and are striving to improve the use of data to improve savings estimates, we can't wait for long-term data collection (i.e. 1 year or more) to adjust the calculations. To delay incentive payments for long periods could cause reduced program participation.				tion Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms.		views and post M&V Operating Reviews for all of the projects that come through the program.
			• **Calculated savings should be based on robust data sets representing longer-term and stable operation of equipment and systems. PAs should collect appropriate trend data that demonstrate typical operation, and ensure that M&V data used to estimate ex-ante savings estimates properly account for variation in weather, seasonality, equipment performance and production schedules/operations. Where variability is present, PAs should wait to claim savings until a more confident savings estimate, based on typical operation, has been developed.						Accepted	SoCalGas agrees that it is preferable to have a steady state operation. In the event that it is not possible, SoCalGas will use the best data available for analysis.		
			• **For pump efficiency improvement projects, historical energy usage and production data should be used to derive estimates of kWh/acre-foot and OPE.						Other	For pump efficiency improvement projects, SoCalGas suggest energy usage and production data should be used to *derive* estimates of therms/acre-foot/100 foot of lift.		
			• **PAs should encourage participating customers to collect and retain data for purposes of conducting project-level M&V, es-						Accepted	SoCalGas develops M&V plans for all large projects over 200,000 therms. In addition, SoCalGas has a tiered Installation Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms.		

			pecially where instrumentation is available.										
			• **In the absence of trend data PAs should alternatively use manufacturer equipment specifications to inform calculation inputs.						Accepted	SoCalGas agrees that design values may be useful for placeholder calculations, design before and after versus measure before and after. This is consistent with Resolution E-4818.		
			• **Where M&V data collection is infeasible or impractical, inputs and assumptions should be based on conservative assumptions.						Accepted	SoCalGas agrees that nominal values are preferred over up-to-values.		
			• **PA models should use custom rather than deemed variables in calculations where inconsistencies exist between project conditions and assumptions that define the deemed calculation approach.						Rejected	SoCalGas models are based on case-by-case situation. Some deemed values may be used as a proxy when measurements or design details are not readily available. At the time, SoCalGas will true-up the savings.		
20	7.1.2		Regarding peak demand analysis, adopt CPUC protocols and procedures as they relate to the DEER-based California climate zone peak period definition. Peak impact estimates should reflect loads during the California climate zone three-day period. Calibration considerations noted above apply also to peak, including the use of post-installation M&V power data that best represents the coincident peak period.	All IOUs	Accepted	PG&E incorporated two sections in the Custom Rulebook that provides Commission staff guidance for: Using DEER Coincident Diversity Factors (CDF) methodologies, Section 4.8; and Using DEER peak demand period, Section 4.9.	Other	This is already a requirement for the SCE program based on the Calculated Guidelines.	Other	This is not applicable.	Accepted	Since SDGE has limited climate zones and smart meters, SDGE tries when possible to use peak values from meter data for DEER hours.
21	7.1.3	There was generally good agreement on project baseline when comparing PA and evaluator selections (72 percent agreement across all PAs and projects). However, there was less agreement surrounding project type designations (58 percent agreement), which should be	Increase efforts to ensure conformance with CPUC baseline policies and make a greater effort to examine existing equipment RUL. The PAs should mount a concerted effort to adopt baseline specification practices in conformance with Decision 11-07-030 and CPUC policy. Conformance with these	All IOUs	Accepted	CIT regularly instructs and reminds custom project stakeholders to follow CPUC guidelines and requirements. For example, CIT sent this 6/9/2017 Energy Insight reminder to over 120 internal and external project developers and reviewers to avoid two non-qualifying project risks: *1) The proposed baseline is regressive because the proposed equipment is about as efficient as some of the same or similar existing equipment in this facility and possibly an affiliate facility. 2) The*	Other	While SCE remains focused on improving baseline selection and usage for projects for existing projects, recent and upcoming policy stemming from AB 802 implementation such as D. 16-08-019 and Res. 4818 alter the scope of baseline eligibility from the D.11-07-030 guidance cited in this recommendation. Hence, the baseline specification practices for new projects are being developed for the newer policies.	Accepted	SoCalGas accepts this recommendation and will implement consistently with E-4818 and the results of T2WG.	Accepted	SDG&E is currently in the process of reviewing past decisions, resolutions, guidance documents and other resources to create a "snapshot" of CPUC guidance and directives as they exist today. Priority is being given to measure application type, baseline condition, and EUL/RUL determinations, which will serve to address Findings 21 - 25. Any apparent "misalignments" between Commission documentation and other resources will be noted, and SDG&E will work with

		used as a determining factor for proper baseline selection. Add-on, new construction and ROB projects were the most commonly overturned project types across all PAs, followed by ER.	guidelines and accurate specification and documentation of project baseline type, such as early retirement, normal replacement, replace on burnout, system optimization, new construction, and add-on measures would eliminate many of these issues. The PAs should amend program rules to eliminate incentive eligibility for measures that are not more efficient than code or ISP (or what would otherwise be required to meet performance requirements). Careful consideration must be given to avoid regressive baselines (baselines that are less efficient than current operations), as well as properly validating that installed measures do not entail like- for-like replacements from an efficiency perspective. If the efficiency of the pre-existing equipment is higher than the otherwise accepted replacement equipment baseline, then the PAs should select the pre-existing equipment as the baseline.			*incentive justification is not quantitative or convincing for all key stakeholders.* Thus the proposed project does not qualify for a custom incentive. To mitigate these non-qualifying project risks, a decision analysis like the following example may aid in vetting or refining future incentive opportunities before, during or after each customer meeting or site visit: 1) Identify, analyze, prioritize and explain the feasible measures and options. 2) Explain each proposed measure, classification, EUL, existing equipment RUL if applicable, baseline, energy and cost impacts and benefits, and any other impact or benefit such as capacity expansion, or improved productivity, operability or reliability, or water savings or waste reduction. 3) Verify measure compliance with the 7/2013 CPUC Energy Efficiency Policy Manual, 4/30/2014 CPUC Industry Standard Practice Guide, 7/16/2014 CPUC Early Retirement Using Preponderance of Evidence, 2016 California Title 20 Appliance Efficiency Regulations, 2016 California Title 24 Building Energy Efficiency Standards and any other pertinent regulatory, customer or industry criteria. 4) To qualify for a custom incentive, the proposed equipment must be noticeably more innovative and efficient than the baseline equipment. Because the baseline must not be regressive, the proposed equipment must not be less efficient than any same or similar existing equipment in this facility and possibly an affiliated facility. The incremental cost must be positive and the minimum EUL is one year. 5) Explain the customer criteria for implementing the proposed equipment now or later with or without an incentive. The incentive justification must be quantitative and convincing for all key stakeholders.					the energy Division to resolve. SDG&E's Engineering Services group has begun meeting weekly to review items of general concern, including the Commission's guidance and directives, in order to improve our internal ex ante review process.
22	7.1.3		PA remaining useful life (RUL) documentation in project application files should be a continued area of focus. For appropriate selection of baseline, RUL assessment is needed for all projects except capacity expan-	All IOUs	Accepted	CIT regularly instructs and reminds custom project stakeholders to follow CPUC guidelines and requirements. For example, CIT sent a 5/26/2017 Energy Insight instruction to over 120 internal and external project developers and reviewers for estimating chiller project savings with DEER data. CIT sent this follow-up 6/15/2017 Energy Insight response to a chiller project	Other	This is already a requirement. SCE defaults to 1/3 EUL if no documentation can be provided.	Accepted	SoCalGas accepts this recommendation and will implement consistently with E-4818 and the results of T2WG.	Accepted	SDG&E is currently in the process of reviewing past decisions, resolutions, guidance documents and other resources to create a "snapshot" of CPUC guidance and directives as they exist today. Priority is being given to measure application type, baseline condition, and EUL/RUL determinations, which will serve to address

			sion and new construction projects. For example, RUL assessment of add-on projects is used to examine the expected remaining life of the host equipment, for the purposes of setting EUL for the add-on measure. RUL is also needed to establish ROB and NR determination. For all early replacement (ER) projects, the PAs should provide and clearly document the RUL of the pre- existing equipment, in order to establish whether or not the removed system would fail. The PAs should carefully review the evidence collected to estimate the RUL for all early retirement applications. The PAs must also conduct appropriate due diligence to ensure that for an ER project the current removed system would be able to meet the service requirements of the newly installed program equipment and that failure of the replaced equipment is not imminent.			pre-review request by a 3rd-party contractor: Implementer Engineer: I developed this preliminary DEER savings estimate of 1,472 kWh/yr and 0.46 kW savings for the proposed 600 ton VFD chiller retrofit in the Biotech Manufacturing facility in the South Bay. –CIT Engineer. 1) Implementer Estimated 0.557 kW/ton ARI Rating for existing 600 ton Trane One-Speed Chiller. 2) View 2016 Title 24 Building Energy Efficiency Standards, Table 110.2-D Water Chilling Packages – Minimum Efficiency Requirements for Water Cooled, Electrically Operated, > or = 600 ton Centrifugal Chiller: 3) Title 24 Path A, 0.560 kW/ton One-Speed Chiller Minimum Efficiency. 4) Title 24 Path B, 0.585 kW/ton VFD Chiller Minimum Efficiency. 5) Estimated 0.582 kW/ton VFD Chiller ARI Rating = (0.557)*(0.585/0.560) 6) Log in to DEER Resources with DEER username and 2008 password. 7) Download DEER READI database, currently version 2.4.7. 8) View DEER 2017 Data for Liquid Chilling Equipment – Water-Cooled Centrifugal Chiller; PG&E; Existing Manufacturing Biotech (MBT) Building; Climate Zone 4; for Early Retirement, Replace on Burnout & New Construction Applications; NE-HVAC-Chlr-WtrCldCentChlr-Conv-1Cmp-gte600tons-0.497kwpton-0.284IPLV-VarSpd-CndRlf: 9) DEER 0.497 kW/ton VFD Chiller Measure. 10) DEER 0.585 kW/ton VFD Chiller Baseline. 11) DEER Whole Building Impacts for VFD Chiller: 68.9 kWh/ton-yr savings and 0.0213 kW/ton savings. 12) Estimated 1,472 kWh/yr DEER savings for proposed VFD Chiller Retrofit = (600 tons)*(68.9 kWh/ton-yr savings)*[(0.585 kW/ton DEER Baseline - 0.582 kW/ton VFD Chiller Retrofit)/(0.585 kW/ton DEER Baseline - 0.497 kW/ton DEER Measure)]. 13) Estimated 0.46 kW DEER savings for proposed VFD Chiller Retrofit = (600 tons)*(0.0213 kW/ton savings)*[(0.585 kW/ton DEER Baseline - 0.582 kW/ton VFD Chiller Retrofit)/(0.585 kW/ton DEER Baseline - 0.497 kW/ton DEER Measure)]. 14) The attached Word file with this Energy Insight chatter includes screenshots of the above DEER 2017 Data. 15) The July 2013, Version 5, CPUC					Findings 21 - 25. Any apparent “misalignments” between Com-mission documentation and other resources will be noted, and SDG&E will work with the energy Division to resolve. SDG&E’s Engineering Services group has begun meeting weekly to review items of general concern, including the Commission’s guidance and directives, in order to improve our internal ex ante review process.

						Energy Efficiency Policy Manual states: "When possible and practical custom measure and project calculation methodologies shall be based upon Database Energy Efficiency Resources (DEER) methodologies as frozen for 2008 DEER version 2008.2.05 or upon methodologies documented within the most current Energy Division reviewed and approved IOU non-DEER deemed workpapers." 15) The 10/16/2014 CPUC Decision 14-10-046 states: "We direct (again) PAs to use the latest-available DEER values, and to ensure that their implementers do the same."						
23	7.1.3		Clearly identify project event in terms of natural replacement, replace on burnout, early replacement, new construction, add- on equipment, and system optimization, and set the appropriate baseline accordingly. Realistic baselines based on code, current industry standard practices, or pre-existing equipment (with an associated RUL) should be clearly identified, supported and documented. If a claim is made for program-induced early retirement of functioning equipment, claims should include documentation of the remaining useful life (RUL) of the equipment replaced and the baseline used for the post-RUL period.	All IOUs	Accepted	The PG&E CIT group has delivered training to project developers in 2016 and in 2017 on proper determination of measure type and baseline. In addition, CIT reviews every custom project submittal (since 2016) for eligibility, influence, measure type and baseline determination. This centralized policy review is improving the quality and accuracy in measure type and baseline determination. Prior to 2016, these project parameters were being reviewed by technical reviewers, both internal and external, and this led to a review approach that was not as consistent or uniform.	Accepted	This is already a requirement for the SCE program based on the Calculated Guidelines.	Accepted	SoCalGas accepts this recommendation and will implement consistently with E-4818 and the results of T2WG.	Accepted	SDG&E is currently in the process of reviewing past decisions, resolutions, guidance documents and other resources to create a "snapshot" of CPUC guidance and directives as they exist today. Priority is being given to measure application type, baseline condition, and EUL/RUL determinations, which will serve to address Findings 21 - 25. Any apparent "misalignments" between Com-mission documentation and other resources will be noted, and SDG&E will work with the energy Division to resolve. SDG&E's Engineering Services group has begun meeting weekly to review items of general concern, including the Commission's guidance and directives, in order to improve our internal ex ante review process.
24	7.1.3		Disseminate information on baseline selection to ensure best practices across program staff, implementers and customers. The PAs should provide their program staff, implementers and customers with the most current industry standard practice (ISP) studies and the CPUC's guidance documentation. This will help better align the PA's baseline selection with the	All IOUs	Accepted	Completed ISP studies are available to all stakeholders on PG&E's Energy Insight platform and Sharepoint site. Since mid-2015 PG&E has put in place a dedicated program manager, Tim Xu, to archive, manage, update, conduct, and communicate with Commission staff on all ISP studies. Information on measure type determination and baseline selection was developed in 2017 in the form of an online training course which was shared with all PG&E project developers and implementers so that they can train their staff on current commission staff	Other	SCE agrees with the spirit, intent, and outcomes contained within this recommendation. However, any conformance with realizing such outcomes will be done in alignment with direction in an expected Resolution related to Track 2 Work Group efforts on ISP applicability and process.	Accepted	PAs will provide program staff, implementers and customers with the most current industry standard practice (ISP) studies and the CPUC's guidance documentation. SoCalGas is updating training procedures to include all implementers and consultants who address custom project eligibility. ISP is currently a topic in T2WG, and SoCalGas will implement and train on direction that emerges.	Accepted	SDG&E is currently in the process of reviewing past decisions, resolutions, guidance documents and other resources to create a "snapshot" of CPUC guidance and directives as they exist today. Priority is being given to measure application type, baseline condition, and EUL/RUL determinations, which will serve to address Findings 21 - 25. Any apparent "misalignments" between Com-mission documentation and other resources will be noted, and SDG&E will work with the energy Division to resolve. SDG&E's Engineering Services group has begun meeting weekly to review

			CPUC's directives. Furthermore, PAs should conduct independent research for the purposes of identifying project-level ISP baseline and provide a comprehensive narrative backed up by data that correctly identifies ISP.			guidance.						items of general concern, including the Commission's guidance and directives, in order to improve our internal ex ante review process.
25	7.1.3		**Appropriate interpretation and application of code requirements is needed, including the need to consider and possibly examine a broad array of codes and requirements that may be relevant for a given project. During the last decade of evaluations in California, baselines have been defined using local codes, regional codes, state codes and federal codes, spanning energy-based requirements, safety requirements, and air or water/wastewater quality requirements, as well as facility service and functionality requirements. During application review the PAs should carefully consider all relevant code requirements and update ISP and other baseline determinations for relevant measures.	All IOUs	Accepted	Often codes are not explicit enough and their application is subject to interpretation and clarification. PG&E has since mid-2015, made all stakeholders aware of applicable codes other than Title 24 and Title 20, through annual in-person trainings and periodic webinars. The Custom Rulebook also provides clarification to some of these issues. In addition, since CIT has centralized policy review of all custom applications, a more consistent review of projects with consideration of other applicable codes, is being performed.	Accepted	This is a new requirement that is part of our pre-screening process.	Accepted	SoCalGas accepts this recommendation.	Accepted	SDG&E is currently in the process of reviewing past decisions, resolutions, guidance documents and other resources to create a "snapshot" of CPUC guidance and directives as they exist today. Priority is being given to measure application type, baseline condition, and EUL/RUL determinations, which will serve to address Findings 21 - 25. Any apparent "misalignments" between Com-mission documentation and other resources will be noted, and SDG&E will work with the energy Division to resolve. SDG&E's Engineering Services group has begun meeting weekly to review items of general concern, including the Commission's guidance and directives, in order to improve our internal ex ante review process.
26	7.1.3	Choosing a proper baseline requires systematic examination of a number of factors. Evaluation efforts led to a number of cases where PA baseline selection was overturned.	The PAs need to do a better job of ensuring that baseline equipment specifications are capable of meeting post-installation operating requirements, that the baseline selected is consistent with the project type, and that regressive baseline considerations are examined. The evaluation team recommends that for all capacity expansion projects, the PAs ensure that the baseline equipment meet the post-install operating and production capacities. In-situ equipment	All IOUs	Accepted	Since 2016 CIT has incorporated in the annual in-person trainings and webinars specific topics on measure types, proper baselines, applicable codes, and ISP. PG&E also emphasized that capacity expansion invalidates the early retirement claim in our recent 2017 in-person training. Centralized CIT policy review ensures in a more consistent manner that baseline equipment is capable of meeting post-installation operating requirements.	Accepted	This is a new requirement that is part of our pre-screening process.	Accepted	SoCalGas accepts this recommendation.	Accepted	As mentioned in the responses to 21 - 25 above, SDG&E's Engineering Services group is currently compiling and documenting current Commission guidance and directions pertaining to baseline selection and qualification, including measure-level baseline guidance provided in Resolution E-4818. This documentation will address the determination and selection of the applicable Standard Practice, including Industry Standard Practice and pertinent company/site standard practices. Commission policy and program-specific baseline designations will also be covered. A weekly/bi-weekly forum has already been established to review Commission guidance

			(unless it is above code or ISP) is an invalid baseline to calculate energy savings for normal replacement (NR), replace-on-burnout (ROB), capacity expansion and new construction (NC) projects.									and directives.
27	7.1.3		**PAs should demonstrate the availability of selected baseline equipment when establishing ISP. Ordinarily this would include obtaining quotes for available new, less efficient, but functionally equivalent equipment (baseline). A careful examination is warranted to establish design options that are available to the customer, and to establish that the program-supported equipment solution is a legitimate high efficiency action. PAs should demonstrate that baseline equipment selected represent a feasible option, given facility constraints and production needs.	All IOUs	Accepted	Although this has been a policy requirement much longer, the enforcement of this requirement has been more consistent since 2016 - for project developers to provide technically and functionally viable option(s) to the selected EE measure. CIT will continue to enforce the requirement.	Accepted	It has been a requirement since 2016.	Accepted	ISP is currently a topic in T2WG, and SoCalGas will implement and train on direction that emerges.	Accepted	As mentioned in the responses to 21 - 25 above, SDG&E's Engineering Services group is currently compiling and documenting current Commission guidance and directions pertaining to baseline selection and qualification, including measure-level baseline guidance provided in Resolution E-4818. This documentation will address the determination and selection of the applicable Standard Practice, including Industry Standard Practice and pertinent company/site standard practices. Commission policy and program-specific baseline designations will also be covered. A weekly/bi-weekly forum has already been established to review Commission guidance and directives.
28	7.1.3		**Where applicable, the PAs need to carefully investigate and document the age, condition and functionality of existing equipment and operations, and use these to establish proper baselines. Furthermore, when baseline conditions are defined by the pre-existing systems the PAs should utilize measured data to define those conditions where possible, select a representative baseline period, and thoroughly document the pre-existing conditions for the purposes of establishing baseline. This is also relevant for ER claims. For ER claims preponderance of evidence should be used to accept	All IOUs	Accepted	PG&E has incorporated Commission staff guidance in our Rulebook on ISP/Baselines, measure eligibility, and M&V. Also, in late 2016, for larger projects (> $200,000 in incentives), CIT implemented a post-QA/QC review which includes M&C checks - including measurement points, measurement period, measurement interval, measurement equipment, system diagrams and discussion of measurement equipment accuracy & uncertainty.	Accepted	This is an existing requirement.	Accepted	T2WG is developing preponderance of evidence requirements for program influence and ER baseline determination. SoCalGas will adjust our program policies and procedures accordingly.	Accepted	Project documentation requirements will be identified and associated with each engineering value (i.e., EUL, equipment vintage, POE, measure cost, etc.), and included within SDG&E guidance summary document. Regressive baseline considerations will be included with baseline selection and qualification guidance section. A weekly/bi-weekly forum has already been established to review Commission guidance and directives.

			or reject program induced early retirement. Existing equipment efficiency levels are needed to address regressive baseline policy.									
29	7.1.4	Evaluated operating conditions were often found to be different than described in program project documentation. Per evaluation guidelines, measures are evaluated as-found, and the ex-post savings analyses were performed for the as- observed/verified conditions, including backcasting where relevant to inform current operations, and did not include any forecasting. The evaluation found that all PAs did not make adequate use of ex-ante data to inform operating conditions. For SDG&E operating conditions accounted for about one-third of all downward adjustments to ex-ante claims, but was less important for the other PAs.	Increase focus on: a) accuracy of operating conditions, b) use of pre- and post-installation data and information, and c) keeping project documentation and tracking claims up to date with field information. The PAs should ensure the use of site- specific inputs whenever possible. This includes use of trend data to generate performance curves and estimate power consumption. Also, assumptions used should reflect conservative values supported by strong evidence from secondary sources.	All IOUs	Accepted	See comments for Item # 19 (report page 7.1.2). PG&E has been requiring longer (>2 weeks) M&V on weather dependent and seasonal projects. The M&V has to be done during a relevant time period and goes beyond steady operating state. Project developers are required to true-up savings calculations with M&V data.	Accepted	This is an existing requirement.	Accepted	SoCalGas accepts this recommendation.	Accepted	SDGE will increase the level of investigative questions pertaining to post installation operating conditions for use when interviewing the customer. Additionally noting potential changes to operating conditions resulting from EE measures installed. Also as noted earlier, since 2016 SDGE engineering staff has increased the level of M&V requests associated to custom projects in support of project savings validations based on submitted and verified M&V post installation results.
			PAs should increase the use and improve incorporation of, data collection and monitoring to ensure a meaningful and accurate set of inputs or assumptions surrounding operations. Post-retrofit inspections should fully incorporate verification of measures, proper installation and operation, and any observed or otherwise known changes or deficiencies. PA staff should check that pre-installation and post-installation reports are well organized and complete, with measure counts, changes in operation, efficiency values, and operating parameters.						Accepted	SoCalGas applies M&V reviews for all large projects over 200,000 therms. In addition, SoCalGas has a tiered Installation Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms.		
30	7.1.4		The PAs should ensure that savings calculations are based on actual equipment-use schedules and reflect any changes to the post-installation operating parameters	All IOUs	Accepted	See comments for Item # 19 (report page 7.1.2). PG&E has been requiring longer (>2 weeks) M&V on weather dependent and seasonal projects. The M&V has to be done during a relevant time period and goes beyond steady operating state. Project developers	Accepted	This is already a requirement for the SCE program based on the Calculated Guidelines.	Accepted	SoCalGas develops M&V plans for all large projects over 200,000 therms. In addition, SoCalGas has a tiered Installation Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms.	Accepted	Since 2016, internal SDGE engineers have increased the request for additional M&V data as part of their custom project review process, when appropriate. Additionally, the assigned SDGE engineer review is also reviewed by a senior quality control

			(such as flow rates, temperatures and set points, system pressures, production rates, and power measurements). The PAs should always include a quality control check on equipment operating hours, operational parameters and production levels, and ensure that data used to derive operating profiles is adequately representative of all operating conditions.			are required to true-up savings calculations with M&V data.						SDGE engineer for accuracy and relevance as well on all of the custom projects that are incentivized through the custom program.
			Consideration should be given to selecting an appropriate and representative time period to use for data collection and savings determination. For example, operating hours used in calculations should reflect observed conditions via verification and M&V. Additional due diligence in this area is needed when loads are variable, including projects with seasonal variation in production and operations. Increased use of selective parameter measurement using uncertainty analysis and short-term monitoring is also recommended.						Accepted	SoCalGas develops M&V plans for all large projects over 200,000 therms. In addition, SoCalGas has a tiered Installation Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms.		
31	7.1.4		Another key issue is that evaluators discover that the production period used in updating ex- ante savings after equipment installation is often too short (one week or less) and not typical of the production or operating variations that the equipment will be subject to over the course of a year. To help mitigate this issue, the PAs should wait for measure operation to stabilize and become typical prior to truing-up the ex-ante models and making a savings claim.	All IOUs	Accepted	PG&E has incorporated Commission staff guidance in our Rulebook on M&V. M&V guidance is provided for a detailed M&V plan--including measurement period, measurement interval, measurement equipment, system diagrams and discussion of measurement equipment accuracy & uncertainty, impact of variable loads--and use of post operating data. PG&E strives to require these M&V plan elements, but recognizes that it is not always practical to implement every aspect of an M&V due to ongoing changes in facilities during the course of project implementation. In cases where a deviation from the M&V plan is found, PG&E works with project technical reviewer to determine whether sufficient information was	Accepted	We require longer metering periods for larger projects.	Accepted	SoCalGas develops M&V plans for all large projects over 200,000 therms. In addition, SoCalGas has a tiered Installation Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms. SoCalGas accepts this recommendation.	Accepted	Since 2016 SDGE engineering staff has increased the level of M&V requests associated to custom calculated projects in support of project saving validations based on more M&V post installation results.

						collected.						
32	7.1.4		As stated in previous evaluation cycles, the PAs should use longer-term pre- and post-installation M&V activities and true-up the savings estimates to reflect observed measure operation. The PAs should also normalize for production fluctuations (and other variables like weather where applicable) between pre- and post-installation periods.	All IOUs	Accepted	PG&E has been requiring longer (>2 weeks) M&V on weather dependent and seasonal projects. The M&V has to be done during a relevant time period and goes beyond steady operating state. Project developers are required to true-up savings calculations with M&V data.	Accepted/ Other	M&V and trending savings are done at a project size basis. Projects that exceed 100,000kWh receive longer M&V periods and at times are required to receive delayed payments. Due to cost restraints, small projects (less than 25,000kWh) do not receive the same level of scrutiny.	Accepted	SoCalGas develops M&V plans for all large projects over 200,000 therms. In addition, SoCalGas has a tiered Installation Review (IR), which is a measurement and verification process for projects saving less than 200,000 therms. SoCalGas accepts this recommendation.	Accepted	SDGE has been requiring longer (>2 weeks) M&V on weather dependent and seasonal projects. The M&V has to be done during relevant time period and goes beyond steady operating state. Project developers are required to true-up savings calculations with M&V data that is provided as stated in the M&V plan.
			In some cases, PAs should delay claiming energy savings for projects if the installation is not complete or if operations are very unstable or unrepresentative of expected ex-post conditions. The PAs should also ensure that savings estimates are always updated in the project documentation and tracking systems when operation conditions are found to have significantly changed.						Accepted	This recommendation is consistent with current SoCalGas' best practice.		
			**Measures such as agricultural pumps require lengthier trend data sources, given that operations can be greatly affected by weather, including drought conditions, and water availability.						Accepted	This recommendation is consistent with current SoCalGas' best practice.		
33	7.1.4		For projects entailing the use of simulation models, models should be re-run after the equipment is commissioned and building loads represent steady state operation.	All IOUs	Accepted	PG&E fully accepts that savings for all custom projects should be revised at post-installation based on observed conditions, including those that use simulation models. For new construction Savings By Design projects, PG&E currently does adjust, to some degree, the simulation models to reflect observed conditions, but this practice may not be consistent across project developers and reviewers. With the SBD program moving to Statewide Administration, PG&E will recommend to the new Statewide Program Administrator that a process requirement be established to ensure that	Other	We do not intend on implementing due to current customer commitment concerns, but we will discuss this possibility as a Statewide level for possible future implementation.	Accepted	This recommendation is consistent with current SoCalGas' best practice.	Accepted	SDGE fully accepts that savings for all custom projects should be revised at post-installation based on observed conditions, including those that use simulation models. For new construction Savings By Design projects, SDGE currently does adjust and reconcile the initial building models to account for the observed conditions noted during the inspection.
			**For new construction projects associated with either tenant improvements or new buildings, PAs should wait to file claims once the project is fully built out and occupied. A certificate of occupancy can be used to inform the timing of						Accepted	For Non-Residential New Construction, SoCalGas waits to claim energy savings once the project is fully built.		

			claims. CPUC evaluation guidance is to model savings based on the as-found conditions.			savings be based on the post-installation as-found conditions.						
34	7.1.4		PAs should ensure incorporation of needed aspects of pre- and post-installation review, as specifically related to operating conditions, into program manuals by addendum and in their next revisions. PAs should delineate expectations for post- retrofit inspection paperwork and require inspectors to identify, collect and record pertinent measure operating parameters, as well as quantities in both pre-installation and post-installation efforts. PAs should consider holding multiple trainings, regularly (e.g., quarterly), with internal staff, implementers, and PA technical reviewers, to ensure improvement and enhanced documentation. Examples of thorough, complete pre- and post-installation reports could be provided in order to set standards for acceptable data collection and reporting, and thereby work to ensure comprehensive and consistent M&V practices well beyond a cursory verification that new equipment was present at a given site.	All IOUs	Accepted	CIT provided M&V training in June 2016, outlining Commission staff M&V guidance. In late 2016, for larger projects (> $200,000 in incentives), CIT implemented a post-QA/QC review which includes M&C checks - including measurement points, measurement period, measurement interval, measurement equipment, system diagrams and discussion of measurement equipment accuracy & uncertainty.	Other	SCE conducts weekly conference calls and quarterly training sessions with contracted reviewers to ensure they are up to date on policies, procedures, etc. Also, all approved tools are listed in SCE Calculated Guidelines and/or are integrated into SCE's online application tool.	Accepted	This is consistent with current practices. The rigor of this activity will scale with the size of the *project and* SoCalGas continuously updates and trains on the Program.	Accepted	SDGE internal engineers conduct lengthy workshops at our Energy Innovation Center on "Tools and Tips for Estimating Energy Efficiency" projects twice per year for contractors, customers and engineers. During these seminars the SDGE engineers explain and show examples of calculation methodologies to instruct perspective program participants to acknowledge and learn how to properly account for project savings using various means (i.e. spreadsheet calculations, modeling calculation, etc.). The SDGE engineers also discuss the different project scenarios where M&V data will be required to support their project EE savings claims, all in support of teaching perspective custom program participants the necessary requirements to improve project submissions and the associated EE savings calculations.
35	7.1.5	Both the Chapter 4 gross impact and Chapter 6 PPA results, including trends from recent evaluations, generally do not point to PA improvement. Project ex-ante treatment shows a lack of attention to CPUC guidance, decisions, previous evaluation results, ex-ante review-based directives, and adequate use of	It is recommended that a statewide document, similar to the PPA form, be developed for use by all PAs for custom claims. The project practices assessment (PPA) forms developed by the evaluation team provide a very structured and methodical way of examining energy efficiency measure claims. The PAs go through a similar process	All IOUs	Accepted	PG&E proposes to use the Final Site Report PPA forms as a template for a statewide evaluation template, PG&E welcomes the opportunity to work with the evaluation team to develop a statewide template similar to the Final Site Report PPA forms.	Accepted	As of 2017, all projects utilize a project feasibility study which requires this information.	Accepted	SoCalGas will consider this suggestion and work with other PA to develop common forms for custom projects as applicable.	Accepted	With the soon to be integrated Nexant custom engineering review database tool in August of 2017, SDGE is looking to leverage the more detailed review checks and balances between the internal SDGE assigned engineering and the quality control senior engineer to improve the project submissions and calculated reviews that the custom program incentivizes throughout the year. We can also look to formalize a scoring criteria structure to see if that can be developed in conjunction with this new

		documentation and data-derived calculation methods and inputs. Even some of the largest projects demonstrate a lack of due diligence.	but perhaps in a less systematic way, and improvements to forms and processes should have a positive outcome on results. In addition to the form itself, Appendix E provides detailed descriptions of PPA scoring criteria that will help PAs ensure they are adequately capturing and documenting the relevant information. The evaluation team believes that this approach will help PAs improve their GRRs and documentation, especially through more careful consideration of first-order factors affecting project eligibility and project baselines.									engineering tool.
36	7.2	Program influence was low in many cases for a number of different reasons. In some cases, program claims were made on a number of projects that customers initiated primarily for non-energy savings reasons and for which no alternative was ever considered. There were also instances where incentives were provided to firms that were already very advanced in their adoptions of energy efficiency, such as water/wastewater plants, and companies with established energy efficiency procurement policies or mandates, including national chain and big box stores.	Adopt procedures to identify and affect projects with low program influence. The PAs should carefully review projects during the project development stage for potential issues associated with a high likelihood of very low program influence. This process should provide timely feedback to program implementers regarding the estimated level of program influence. This would afford implementers an opportunity to influence projects found to have low program attribution by encouraging project decision makers to adjust the project scope to higher efficiency levels, where warranted.	All IOUs	Accepted	Effective 1/31/2017, CIT implemented an "CIT Early Policy Review" process whereby internal and external project developers can submit preliminary project information in the early project development stage. The requested information includes a project description, influence documentation, measure type determination, and proposed baseline. This information is requested for an early review before the project developer and the customer have invested time and resources in the project to develop calculations or collect pre-installation M&V data, and hopefully before expectations have been set regarding eligibility and incentive level. CIT reviews this basic project information and provides feedback to the project developer to either help in the project development or to direct the project developer to not pursue the project. Projects that demonstrate very low or no program influence are rejected by CIT. That said, this recommendation can be counter-productive in achieving market transformation--the ultimate purpose behind offering incentives. For a sector to adopt efficient technologies, diffusion of innovation theory tells us that we need a critical mass of early adopters to drive the wider adopt of newer technologies--	Accepted	As of 2017 we pre-screen all calculated projects during which field engineering validates this information.	Accepted	Projects are vetted at several points in the process. First, by the Account Executive, then in collaboration between stakeholders (AE, Programs, Technical Assistance), and finally in a formal review of eligibility and technical aspects in the Project Feasbility Study stage. Those check points are part of current process. *SoCalGas is reviewing its current process of project development and will work with stakeholders to better screen instances of freeridership.*	Accepted	Since 2015, SDGE adjusted its custom programs process so that very early in the process a project would be assigned to an internal SDGE engineer in order to facilitate early project engagement and support improved program influence whereby the assigned project engineer could more thoroughly discuss, develop and recommend higher levels of energy efficiency to be considered with the projects coming through the custom programs.

						the economic barrier is not alone in preventing greater adoption. The analysis and verification of a technology option by a utility incentive program provides assurances to a customer that the technology is a viable and legitimate choice--customers trust our technical expertise to develop and or validate measure savings estimates, vendors designs, and results. As a result of this validation, the customer is more apt to adopt that technology than if they only heard economic arguments raised by a technology vendor acting alone. PG&E believes that the criteria for NTG and free-ridership determination should be re-examined with this in mind.						
37	7.2		Adjust the set of technologies that are eligible for incentives. Periodically review the list of qualifying measures for each program and eliminate eligibility for those that have become standard practice. At a minimum, such reviews should take place annually. Measures that are already likely or very likely to be typically installed should not qualify for incentives.	All IOUs	Accepted	The Statewide Customized Offering Procedures Manual for Business includes a list of eligible measures. PG&E's CIT does not own this document or manage updates, but since 2016, CIT reviews the list eligible and ineligible measures at least annually. In addition, PG&E has been developing an information Wiki over the past year which also includes pages dedicated to specific efficiency measures. In addition to providing background and technical information about the measure, the wiki indicates the conditions under which the measure is eligible and is updated when the measure becomes ineligible. Content about specific efficiency measures is growing as more users create pages. As CIT performs initial project screening of custom projects and are exposed to new measures, new measure pages are added to the wiki.	Other	Qualifying technologies and incentives levels are reviewed as part of a weekly meeting. The Calculated programs also have had a minimum project/incentive submission level in place for several years.	Accepted	SoCalGas seeks to actively promote technologies that are *less* adopted, cutting edge, or emerging technologies. SoCalGas is working with Statewide partners to identify ISP measures collaboratively with Codes & Standards. SoCalGas is working with statewide ex ante review partners to identify ISP measures. ISP is currently a topic in T2WG, and SoCalGas will implement direction that emerges from that forum.	Accepted	SDGE internal custom engineers with program staff have recently been reviewing custom measures to ensure their eligibility and compliance with CEDERS, they will also update list of eligible technologies and specific qualifications incorporated in archived ISP studies.
			Although identification of such measures can be difficult in practice in the industrial sector, a number of such measures can be identified through investigation of industry practices (for example, interviews with manufacturers, distributors, retailers, and designers), analysis of sales data, and review of evaluation results. In determining which measures to retain and which to eliminate, a balance must be struck between reducing free ridership and avoiding significant lost opportunities. Ideally, sub-technology niche markets can be selected for the program that are less well estab-						Accepted	SoCalGas accepts this recommendation and will implement per direction from T2WG.		

			lished, but where substantial technical potential still lies.									
			In addition, program implementers should actively highlight and promote technologies that are less well-adopted, cutting edge, or emerging technologies. Such measures are much less likely to be prone to high free ridership.						Accepted	SoCalGas seeks to actively promote technologies that are *less adopted*, cutting edge, or emerging technologies. SoCalGas is working with Statewide partners to identify ISP measures collaboratively with Codes & Standards.		
			Another option is to use a comprehensive rather than a prescriptive approach to discourage free ridership. For example, for water-wastewater plants, implementing a comprehensive new construction approach and requiring the project to reach a minimum savings threshold (such as 15 percent) is less likely to be prone to high free ridership than a measure-level approach.						Accepted	SoCalGas accepts this recommendation.		
38	7.2		Adopt procedures to limit known free riders by upselling to higher efficiency levels, multi-measure solutions and continuous energy improvement. One way to accomplish this is to conduct screening for high free ridership on a project-by-project basis. In cases where likely high free ridership is found, the program implementer should encourage such customers to move to a higher level of efficiency or encourage a bundled retrofit to ensure deeper savings. Either of these options could result in funding a project that would not have been implemented absent the program. Another option is for the program to set the threshold for incentive eligibility higher	All IOUs	Accepted	Effective 1/31/2017, CIT implemented an "CIT Early Policy Review" process whereby internal and external project developers can submit preliminary project information in the early project development stage. The requested information includes a project description, influence documentation, measure type determination, and proposed baseline. This information is requested for an early review before the project developer and the customer have invested time and resources in the project to develop calculations or collect pre-installation M&V data, and hopefully before expectations have been set regarding eligibility and incentive level. CIT reviews this basic project information and provides feedback to the project developer to either help in the project development or to direct the project developer to not pursue the project. Projects that demonstrate very low or no program influence are rejected by CIT. In addition to this new process, which	Accepted	Higher "targeted" incentive category which pays a higher incentive rate to push deeper saving measures. SCE also offers a Comprehensive Bonus for projects with deeper integrated savings across categories. We are also considering raising the minimum project threshold.	Accepted	This recommendation is consistent with current SoCalGas' best practice.	Accepted	SDGE will revise our existing Free Rider Screening form to include bulleted recommendations not already included in existing form. In addition, the new internal engineering project database application Nexant which will be implemented in August of 2017 will contain numerous checks and balances between the assigned project engineer and the quality control engineer where by a perspective project will have more detailed project questions for the assigned engineer to address regarding project specifics and will support improve early engagement for projects coming into the program.

			across-the-board so that all such projects will need to meet a higher efficiency threshold to qualify.			identifies projects with low program influence early in a project's development, the Free Rider Screening Form and a set of instructions for its use are currently being revised to improve the quality of the assessment. That said, this recommendation can be counter-productive in achieving market transformation--the ultimate purpose behind offering incentives. For a sector to adopt efficient technologies, diffusion of innovation theory tells us that we need a critical mass of early adopters to drive the wider adopt of newer technologies--the economic barrier is not alone in preventing greater adoption. The analysis and verification of a technology option by a utility incentive program provides assurances to a customer that the technology is a viable and legitimate choice--customers trust our technical expertise to develop and or validate measure savings estimates, vendors designs, and results. As a result of this validation, the customer is more apt to adopt that technology than if they only heard economic arguments raised by a technology vendor acting alone. PG&E believes that the criteria for NTG and free-ridership determination should be re-examined with this in mind.					
			One way to assess the rate of free ridership likely on a given project is to critically examine the key reasons behind the project before the incentive is approved. For example: • Has the project already been included in the capital or operating budget? Has the equipment already been ordered or installed? • Is the measure one that the company or other comparable companies in the same industry/segment routinely installs as a standard practice? Is the measure installed in other locations, without co-funding by incentives? Is the measure potentially ISP? • Is the project being done primarily, or in part, to comply with regulatory mandates (such as environmental regulations)? • Are the project economics already compelling without incentives? Is the rebate large enough as a share of incremental costs to make a difference in whether or not the project is implemented? • Is the company in a market segment that is ahead of the curve on energy efficiency technology installations? Is it part of a national chain that already has					Accepted	SoCalGas is in the process of developing a new project eligibility questionnaire which will include some of the suggested questions. SoCalGas also anticipates guidance from the T2WG which will also inform ways to better assess program influence and limit free ridership.		

			a mandate to install the proposed technology? • Does the proposed measure have substantial non- energy benefits? Is it largely being considered for non-energy reasons (such as automation of a manual process, improved product quality, reduced labor costs, or increased production)? • Is there a fungible efficiency element of the project, that is, is the equipment available only at a single bundled efficiency level, e.g., as could be the case with a highly specialized piece of process equipment? Related to this, if efficiency level is a malleable attribute of the project, were the costs and benefits of different levels of efficiency considered and quantified? By conducting a brief interview regarding these issues before the incentive is approved, the implementer can better assess the likely degree of free ridership and may be able to then decide if the project should be excluded or substantially rescoped to a higher efficiency level.									

SOUTHERN CALIFORNIA EDISON®

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Whole Building Approach- Calculation Guidelines

By Ryan McFadyen, P.E. and Thomas Lor,

P.E. Updated June 23, 2016

Savings By Design Simulation Protocol Matrix

Savings By Design whole building approach projects require a Title 24 compliance simulation and a specialized non-compliance Savings By Design simulation. Construct the four models according to the Savings By Design protocol matrix. The attributes of the four simulations are outlined in the table below.

SBD Simulation Protocol Matrix

	Compliance Simulation		Non-Compliance Simulation	
	Baseline	**Proposed**	**Baseline**	**Proposed**
Weather Data	CEC CZ	CEC CZ	CEC CZ	CEC CZ
HVAC System Type	Per Title 24	Per Plans	Per Title 24	Per Plans/As Built
Equipment Efficiencies	Per Title 24	Per Plans	Per Title 24	Per Plans/As Built
Schedules	Per Title 24	Per Title 24	Estimated/Actual	Estimated/Actual
Artificial Loads*	Per Title 24	Per Title 24	Per Plans	Per Plans/As Built
LPD in Conditioned Spaces	Per Title 24	Per Plans	Per Title 24	Per Plans/As Built
Envelope	Per Title 24	Per Plans	Per Title 24	Per Plans/As Built
Run Period Calendar Year	2009	2009	2009	2009
Demand Definition	n/a	n/a	DEER Peak	DEER Peak
Reporting	UTIL-1	UTIL-1	UTIL-1	UTIL-1

***All internal loads not including lighting**

Baseline Modeling Details and Assumptions

Populate the Baseline Modeling Details and Assumptions report with all relevant model inputs used in both the compliance and non-compliance models. Be as specific as possible, ensuring that all system types, equipment loads, lighting loads, artificial loads, envelope constructions, and schedules are supported with appropriate code citations and supplemental documentation.

UTIL-1 Template

Complete the manual inputs on the UTIL-1 tab. The UTIL-1 should automatically calculate the results for your project once the manual inputs are entered.