

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 Exterior Lighting Standard Practice Baseline and Work Paper Support—
Final Report*** (TRC, Calmac ID #SCE0426.01)

The RTR reports demonstrate the Joint Utilities’ plans and activities to incorporate EM&V evaluation recommendations into programs to improve performance and operations, where applicable. The Joint IOUs’ approach is consistent with the 2013-2016 Energy Division-Investor Owned Utility Energy Efficiency Evaluation, Measurement and Verification (EM&V) Plan¹ and CPUC Decision (D.) 07-09-043².

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

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

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: Exterior Lighting Standard Practice Baseline and Work Paper Support—Final Report
Program: NR Lighting
Author: TRC
Calmac ID: SCE0426.01
ED WO: 2163
Link to Report: http://www.calmac.org/publications/TRC_-_SCE_Ext_Lighting_SP_and_WP_Support_Final_Report.pdf

Item #	Page #	Findings	Best Practice / Recommendations (Verbatim from Final Report)	Recommendation Recipient	PG&E (if applicable)		SCE (if applicable)		SDG&E (if applicable)	
					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.
1a	67-69	<ul style="list-style-type: none"> LEDs dominate current exterior fixture sales in California. TRC's best point estimate is that LEDs comprise 94% of current exterior fixture sales for NC and retrofits. Market actors surveyed predicted that by 2020 and 2023, their fraction of exterior sales for NC and retrofits that will be LEDs will be 98% and 99% respectively. DLC Standard fixtures are most the prevalent among current exterior fixture sales and installations. TRC's best point estimate is 58% DLC Standard, 31% DLC Premium, and 10% not DLC listed across all exterior fixtures. TRC found no consistent trends in pricing other than that the price will increase 	<p>The CPUC should revisit the approach of the IMC calculation for retrofit fixture projects, so it reflects a mix of fixture and lamp replacements to better model a customer's decision. The IMC calculation in current IOU work papers for fixtures assumes that the base case is a standard practice fixture. Based on our findings, a standard practice fixture would be an LED, with an efficacy that depends on the product category and output. However, that IMC calculation does not reflect a customer's decisions. The typical choice facing the customer is to maintain the existing system by replacing failed lamps with the old technology, or to conduct a retrofit with LED fixtures. TRC calculated an example to investigate how the IMC would change if the base case assumed a blend of maintenance (cost for incumbent technology lamp replacements) and retrofits (cost for LED fixtures). For high-output pole-mounted fixtures, a base case that assumes a blend of HID lamps and LED fixtures has an estimated cost of \$145, which would yield an IMC of \$813. The current IMC methodology in work papers assumes that the base measure is a standard practice fixture—found here to be</p>	CPUC						

		<p>as the light output increases.</p> <ul style="list-style-type: none"> • While the model predicts that LEDs are slowly replacing incumbent technologies, HID technologies will dominate electricity use through 2023. • Many data sources indicate that commercial customers choose to maintain their existing exterior lighting system—i.e., replace failed lamps, ballasts, and fixtures, instead of retrofit the entire system. • The primary reason why customers choose to maintain—instead of retrofit—their exterior lighting systems is cost. 	<p>an LED fixture with an average price of \$1,000, which yields a negative IMC: -\$42. The negative IMC is one reason that IOUs are not incentivizing many exterior lighting product categories. Adjusting the IMC to assume that the base case is a blend of incumbent technology lamps and LED fixtures would better reflect a customer's decision and significantly increase IMC results.</p>							
1b			<p>The CPUC or IOUs should conduct a follow-up IMC study to further explore pricing of exterior LED fixtures, and how these are likely to change in the future. This study found significant variation in pricing among LED fixtures, but it was beyond the scope of this study to identify why certain product types carried higher prices. In addition, the price projections in this study have high uncertainty, since even the direction of LED fixture prices (up or down) was uncertain in the literature. TRC recommends that an IMC study explore:</p> <ol style="list-style-type: none"> 1. Current pricing trends, including investigating why some products carry higher prices than others, and 2. The impact of different forces on future pricing, including the declining costs of LED technology, additional costs due to new LED features and how to account for differences in features among fixtures, and the impacts of tariffs. 	All IOUs and CPUC	Other	<p>The IOUs commissioned LED Pricing Studies (conducted by Navigant) in 2015 and 2018, the objectives of which included (1) identifying the range of current prices for categories including LED exterior lighting, (2) determining what factors significantly influence LED price, (3) developing an incremental cost estimate relative to baseline technologies, and (4) to determine how, and at what rate LED prices ranges are anticipated to change. These studies provided some indication of pricing drivers including lumen output, followed by manufacturer, DLC qualification, and CRI. Efficacy was not one of the significant price determining characteristics.</p> <p>While PG&E agrees that determining pricing drivers is important, we do not believe an additional study would yield substantive insights beyond the results of the Navigant LED Pricing studies. Rather, PG&E recommends following the impacts of DLC's proposed addition of quality metrics into its Technical Requirements and continue to focus on driving for LED quality, per D.12-11-015 OP30.</p>	Accepted	<p>The Research Roadmap shows our increased focus on market studies to support program offerings. This recommended study fits into the research program for nonresidential workpaper support and should be one of the first studies we contract for this year.</p> <p>We can also leverage the PG&E Lighting Market Characterization Study which includes the determination of quality standards. This may give some insight to the variance in costs as well.</p> <p>For the future programs we need to look for several external drivers such as government price hikes/taxes, added features etc. to determine how the manufacturers react to the cost competitiveness and quality in terms of pricing. We should be looking at drivers such as cost competitiveness in relation to the saturation of market and how manufacturers determine pricing for different sales zones.</p>	Accepted	<p>The research road map should include factors such as efficacy, definition of top half quality (as defined by CPUC per D.12-11-015 OP30), lighting controls interoperability, DLC and non DLC QPL, customer type by NAICS code (government, municipality, commercial, industrial), historical and projection to 2023 segmentation. Top manufacturers of LED and manufacturing practices. The overall market saturation and uptake of LED Lamp kits for outdoor lighting system for DLC and non-DLC QPL.</p>
1c			<p>In addition, TRC recommends additional research to determine exterior lighting retrofit rates. The result could be used as an input in the calculation of a blended lamp/fixture base case in the IMC and improve the accuracy of models of installed exterior lighting stock.</p>	All IOUs and CPUC	Accepted	<p>PG&E agrees that it is valuable to determine the rate of HID and linear replacement lamp retrofits vs. full-fixture retrofits for exterior lighting as it would help to support the assertion made in PG&E's proposed workpaper update (PGECOLTG151 R9) for a blended Normal Replacement (NR) baseline mix more accurately reflecting customers' purchasing scenarios.</p>	Accepted	<p>SCE agrees and sees this study fitting into our market studies program.</p> <p>This research may help determine the baseline mixes for cost and savings calculations based on customer choice and existing technology displacement in the market. Further the shifting costs may reflect change in customer choice from retrofit kits and fixtures or vice versa. We need to know the trend of shift based on pricing and situations such as financial feasibility from customer's standpoint to determine what assumptions for baseline calculations.</p>	Accepted	<p>Recommend that the research roadmap also consider the creation of bin cost data based on DEER 2019-2020 measures definitions, for proposed wattage and equivalent service baseline wattage, this would assist both the IOUs/PA and CPUC ex-ante consultants in future DEER updates.</p>
1d			<p>In conclusion, while TRC found that LEDs are standard practice, TRC recommends that IOU</p>	All IOUs	Other	<p>While PG&E acknowledges that first costs continue to be a barrier for customers to overcome for LED retrofits, there are other</p>	Accepted	<p>SCE agrees and looks forward to integrating new and upcoming research to support better lighting offerings.</p>	Accepted	<p>SDG&E agrees with taking a deeper dive into customer intervention and barriers to LED fixture adoption/installation versus maintaining</p>

			<p>intervention continue for existing exterior lighting projects. IOU incentives and education will help customers overcome the first-cost barrier of performing an LED retrofit, rather than choosing to maintain the existing system. This intervention would help accelerate the shift of existing stock from HIDs and fluorescents to LEDs, generating significant energy savings.</p>			<p>intervention strategies, including financing and codes & standards, that may be more cost effective to accelerate the shift to LEDs. PG&E will continue to support intervention strategies as long as it is cost effective to do so.</p>		<p>SCE agrees on the point and suggests determining barriers other than cost (customer preference on lighting technologies) to improve the shift from existing system replacements to newer technologies. Also, this may inform future programs in determining different strategies of offering such as package of controls and fixtures/retrofit kits/lenses or code compliance programs.</p>		<p>existing lighting systems. SDG&E would like at least two-three types of questionnaires based on SurveyMonkey (or other web-based interface), one survey to address market barriers to adoption, a second survey based on free-ridership and previous program participation, and a third survey based on timing, decision-makers, budget, and gatekeepers.</p>
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