

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 and beyond. This Appendix contains the Responses to Recommendations in the report:

RTR for the Impact Evaluation of Water Heating Measures: Residential Sector—Program Year 2019 (EM&V Group A) (DNV GL, NMR Group; Calmac ID #CPU0233.01, ED WO #GroupA_Res_2_Y3)

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 CPUC Decision (D.) 07-09-043¹ and the Energy Division-Investor Owned Utility Energy Efficiency Evaluation, Measurement and Verification (EM&V) Plan² for 2013 and beyond.

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 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.”

² 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>.

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: Impact Evaluation of Water Heating Measures: Residential Sector—Program Year 2019 (EM&V Group A)
Program: Residential
Author: DNV GL, NMR Group
Calmac ID: CPU0233.01
ED WO: GroupA_Res_2_Y3
Link to Report: http://www.calmac.org/publications/CPUC_Group_A_Report_Water_Heating_PY_2019_Final_CALMAC.pdf

				PG&E (if applicable)		SCE (if applicable)		SCG (if applicable)		SDG&E (if applicable)		
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			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	4.3	The single-family market is moving towards tankless systems, but fuel substitution is uncommon.	As fuel switching and electrification of water heating ramps up pursuant to PY2021 Decision 19-08-009, we recommend: <ul style="list-style-type: none">gross impact evaluation that factors in the mix of baseline technologies for each program technology.future research using customer surveys to monitor the fuel-conversion trend from gas to electric heat pump water heaters.	CPUC, All PAs	Accepted	PG&E agrees that, in future impact evaluations, CPUC impact evaluators should take into consideration that program participants will be replacing different water heating technologies when they install tankless systems. Specifically, some households will be replacing electric storage, some gas storage, and possibly some may even be replacing less-efficient tankless storage units). Each of these types of hot water heating systems will require its own baseline. Currently PG&E is participating in several electrification studies to monitor customer attitudes, trends and practices related to electrification. PG&E supports research to determine customer interest in converting from a natural gas to heat pump water heater. When appropriate, we will include the necessary survey questions to collect this data or communicate this best practice to a third-party implementer leading a program. When PG&E adopts fuel switching water heating measures, it will incorporate these recommendations into program design.	Accepted	Mixed fuel baselines can facilitate the deployment of traditional Upstream and Midstream programs by IOU to accelerate the heat pump water heater market. However, electric measure cases should still be available for Downstream or Midstream approaches that collect base case data. The gross impact evaluation and future research can also consider how incentives for gas water heaters disincentivize fuel substitution. Competing gas incentives can be a significant factor to installer and customer decision-making, affecting how the market adopts fuel switching and electrification of water heating.	Other	This recommendation is not applicable to SoCalGas.	Other	This recommendation suggests future EM&V roadmap planning and more forward-looking recommendation based on trends associated with Figure 1-3 (page 8) Impact Evaluation of Water Heating Measures. Currently, SCE, is the lead IOU developing deemed residential water heating fuel substitution measures packages within the eTRM ecosystem. SDG&E as of late 2020, has awarded third-party contracts for multi-family sector and in the process of soliciting RFP for local residential programs, as well. And will continue to collaborate closely with third parties on the growing trend associated with all fuel substitution measures.
2	4.3	Almost three-fourths of program water heater installations in PY2019 were natural gas	Program must consider the increased measure life of tankless gas water heaters that will	CPUC, All PAs	Accepted	PG&E agrees with this recommendation and believes that the immediate reduction in energy usage	Other	SCE recognizes the increasing market share of gas tankless water	Other	This recommendation is not applicable to SoCalGas.	Other	SDG&E and its third-party implementers are collaborating closely to meet electrification and carbon

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		tankless water heaters.	reduce and delay the opportunities for fuel substitution initiated due to equipment failure. It may be necessary to consider replacing recent tankless gas installations before they reach the end of their effective useful life, given that these systems are expected to last until 2040 and this is by when the state aims to be carbon neutral.			achieved through the adoption of more efficient tankless gas water heating technology will serve as an important first step in raising customer awareness of new water heating products and in the immediate reduction of GHG emissions.		heaters and agrees that early replacement of gas tankless water will be necessary. However, given the lack of awareness of heat pump water heaters among installation contractors and customers at this time, programs should focus on existing equipment that is at or near end-of-life. The high percentage of program gas water heater installations is an example of how incentives for gas water heating create significant barriers to fuel substitution. Early retirement of gas installations with fuel substitution heat pump water heater measures will require the elimination of gas incentives to reduce conflicting messages to installers and customers.				goals set by California regulators while maintaining balance in meeting the annual business advice letter (ABAL) requirement and annual DEER Resolution, set by the CPUC Energy Division. Additionally, CPUC Decision 19-08-009 Rulemaking 13-11-005 "Decision Modifying the Energy Efficiency Three-Prong Test Related to Fuel Substitution" recently passed in August 2019. Since then, SCE has developed new residential water heating fuel substitution workpaper SWWH025 in response and who impact has yet to be determine. Other CPUC proceedings such as the Self-Generation Incentive Program (SGIP) are in the process of rolling out electric heat pump water heating (HPWH) measures that are likely outside the scope of this evaluation and RTR.
3	4.3	Over half the participants who installed heat pumps were unaware of the technology prior to starting their project (52%). Nearly three-fourth (72%) of non-participants were unaware of heat pump water heaters, and the primary reason for not wanting to install heat pump water heaters was unfamiliarity with the technology (48%).	To overcome barriers to electrification, programs should focus on educating customers on efficient electric water-heater technologies and their operating costs.	CPUC ED, All PAs	Accepted	PG&E concurs that customer education is a critical first step in participation in energy efficiency programs. PG&E's website contains information on savings achievable using heat pump water heaters (ex. http://www.energyhouse-calls.com/newsletter/how-to-save-on-your-water-heating-bill/) as well as training webinars (ex. https://pge.doe-bosaas.com/learn/course/external/view/webinar/761/ImplementingHeatPumpsWaterHeater-inReplacementScenariosWhyTheyMakeSense). PG&E will continue to educate customers about heat pump water heaters through its website, via different electronic messaging, and using our various WE&T channels.	Accepted	SCE plans to augment its existing Workforce Education & Training (WE&T) efforts to include building electrification training (e.g., technologies, design, and installation). Next, SCE plans to leverage planned training under the Technology and Equipment for Clean Heating (TECH) Initiative and Self Generation Incentive Program (SGIP) heat pump water heater. The findings support the need to eliminate support for competing marketing for gas water heating if fuel substitution heat pump water heat measures are expected to significantly support CA's greenhouse gas (GHG) emissions targets for existing buildings.	Other	Not applicable to SoCalGas	Accepted	SDG&E will take the recommendation and share it with its program implementer. SDG&E staff meet and collaborate with third-party implementer staff regularly to discuss these types of recommendations to overcome barriers to electrification.
4	4.3	Nearly one-fifth (19%) of heat pump adopters indicated that they had to undertake an electrical panel upgrade. The cost to	We recommend revisiting the cost-benefit analysis for this measure in order to account for these customer barriers	CPUC ED, All PAs	Accepted	PG&E's Emerging Technology and Demand Response groups are funding a Midstream HPWH Study to better understand the barriers to HPWH selection/installation	Other	SCE to evaluate facilitating additional incentives to support fuel switching and electrification of water heater infrastructure cost, particularly electrical panel upgrade.	Other	Not applicable to SoCalGas	Other	The CPUC Energy Division ex-ante team review all deemed workpaper submissions and clear guidance has been given to IOU/PAs regarding customer electrical

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		replace an electrical panel averages \$1,138, with a typical range of \$498 and \$1,781.	and potential additional program costs to overcome the same fully. They should address often-hidden costs such as panel upgrades with additional education and incentives to customers and the contractors that serve them.			and to develop strategies to overcome the challenges. PG&E's EM&V group is currently funding a service panel upgrade study to better understand costs, the factors that influence the costs, and how the processes can be improved. PG&E is the only U.S. utility serving gas customers to formally voice its support for a statewide all-electric new construction standard in code requirements. PG&E will communicate these recommendations to its third-party implementers who control program design. Much of the time, program design is driven by cost effectiveness requirements and hidden costs and cost effectiveness limitations are substantial barriers.						panel upgrades. Such guidance is stated within interim approved statewide workpaper SWWH025. Per CPUC Decision 19-08-00913, building infrastructure costs which include panel upgrades or gas line installations/upgrades required to facilitate these fuel substitution measures shall be collected for all downstream and direct install measures. SDG&E will continue to collaborate with third-party implementors and CPUC staff on how to best address electrical panel upgrade cost while balancing a cost effectiveness program.
5	4.4	Four-fifths (80%) of non-participants' water heaters were conventional storage, the least efficient type of water heater. One-quarter (25%) of non-participants' water heaters were more than 10 years old and would soon reach the end of their useful life.	There is ample opportunity to achieve energy savings by encouraging customers to replace conventional storage water heaters with more efficient types.	CPUC ED, All PAs	Accepted	PG&E agrees that getting customers to save natural gas now by replacing inefficient storage gas water heaters now with more efficient gas systems will result in saving energy. PG&E will consider this recommendation and communicate this to third-party implementers who adopt fuel-switching water heating measures and define program design. PG&E will continue to promote HPWH's through its residential programs, Energy Savings Assistance program, trainings, Marketplace, and other leveragable opportunities.	Accepted	SCE agrees that programs should focus on existing conventional water heaters that are at or near the end of their useful life.	Accepted	The downstream storage and tankless water heater program offered by SoCalGas provides rebates and savings opportunities for customers to replace their inefficient storage water heater units with a more efficient Energy Star certified storage water heater or tankless water heater unit. SoCalGas will continue to encourage customers through education to consider early re-placement of existing water heater units	Accepted	SDG&E will take the recommendation and share it with its program implementer. SDG&E staff meet and collaborate with third-party implementer staff regularly to discuss these types of recommendations to achieve ample energy savings.
6a	4.4	Results indicate that increasing incentives could encourage mass market adoption of high efficiency water heaters in single-family homes.	Programs should consider sliding scale incentives based on income eligibility to ensure that program influence is high and free-ridership is minimized.	CPUC ED, All PAs	Other	Low-income customers are already treated by the Energy Savings Assistance Program whereby a subset of its CARE low-income customer premises is treated each year with multiple measures appropriate for a given premise. Approximately 40% of PG&E's customers are eligible for its CARE/ESA Program. Where applicable, PG&E or its third-party implementers will take	Other	SCE agrees that sliding scale incentives should be considered for Equity and Market Support programs as they are not bound by cost effectiveness.	Accepted	Downstream rebate amounts have been adjusted, within workpaper limits, for storage water waters and tankless water heaters to accommodate for the increased cost and to influence energy efficiency and early replacement of these units.	Other	SDG&E will take the recommendation and share it with its program implementer. SDG&E staff meet and collaborate with third-party implementer staff regularly to discuss these types of recommendations.

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						this recommendation into consideration for future program design.						
6b	4.4	A majority of non-participants indicate they search on the web or go to PA websites for information on new water heaters.	Optimize PA websites to increase visibility of efficient water-heater technologies and available rebates in search engine results. Programs should offer both instant and mail-in rebate options and ensure that these appear in ENERGYSTAR.gov's rebate finder.	All PAs	Other	PG&E agrees that optimizing the visibility of water heater rebates is an important component to customers being able to search and easily find information on efficient water heater technologies. A search engine search for "rebates" and "PG&E" brings up PG&E's rebates and its rebate catalog as the first search engine result. PG&E will continue to promote HPWH's through its residential programs, Energy Savings Assistance Program, trainings, Marketplace, and other leverageable opportunities. In 2022, the Statewide Plug Load and Appliance program will become the primary channel for residential rebates. PG&E expects the lead IOU to ensure that the third-party search engines and PA websites are fully optimized for customer consumption. PG&E is unable to offer instant rebates due to the inherent issue of not being able to track instances of double dipping. Additionally, during Covid, PG&E ended its mail-in rebate process. For the time being, PG&E no longer offers mail-in rebate options in the effort to streamline and consolidate the rebate application process for customers.	Accepted	SCE routinely ensures that its incentives are listed on the ENERGY STAR website.	Accepted	Information on water heating technologies is available through the utility website as well as the utility Marketplace. SoCalGas will work with the SW team on instant rebates through the SW mid-stream program and will continue to promote water heater downstream opportunities where available.	Accepted	SDG&E will take the recommendation and share it with its program implementer. SDG&E staff meet and collaborate with third-party implementer staff regularly to discuss these types of recommendations.
7	4.4	Fifty percent of non-participants indicated that contractor recommendations are a key source of information when considering purchase of a new water heater and 20% indicated personal recommendations were their only source of information when considering purchase of a new water heater.	Programs should leverage contractors as a key channel to market efficient water heaters to customers given that 50% indicated that contractor recommendations are a key source of information when considering purchase of a new water heater. The contractor channel is especially important for the 20% of the market that indicated personal recommendations were their only source of infor-	All PAs	Accepted	PG&E is currently conducting research to better understand how to better promote HPWH through the midstream channels—distributors, contractors, retailers, and government agencies. Educational collateral is being developed for the use of these midstream roles.	Accepted	SCE plans to augment its existing Workforce Education & Training (WE&T) efforts to include building electrification training (e.g., technologies, design, and installation). Next, SCE plans to leverage planned training under the Technology and Equipment for Clean Heating (TECH) Initiative and Self Generation Incentive Program (SGIP) heat pump water heater.	Accepted	SoCalGas will continue to outreach to the water heater manufacturers and their contractor base to educate on the benefits of purchasing an energy efficient water heater either through burn out or early replacement. SoCalGas will also continue to educate contractors on available water heater rebates that can help reduce the purchase cost of a more energy efficient or assist in selling a more energy efficient unit to their customer.	Accepted	SDG&E will take the recommendation and share it with its program implementer. SDG&E staff meet and collaborate with third-party implementer staff regularly to discuss these types of recommendations.

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			mation when considering purchase of a new water heater. We recommend use of customer testimonials and strengthening trade ally networks to deliver PA programs that encourage adoption of energy efficient water heaters.									
8	4.4	The most important factor in deciding to claim a rebate for energy efficient equipment (cited by 81% of non-participants) was that the equipment did not require any changes to the home. Heat pump water heaters require up to seven feet of vertical clearance, 1,000 cubic feet of uncooled space, and a nearby drain to discharge the condensate. The most common reason why non-participants did not want to install solar water heaters was not having solar panels and not planning to install them (38% of non-participants).	Consider customizing marketing for different water heater technologies. Heat Pump Water Heaters: Describe the easiest way to accommodate the unique requirements of a heat pump water heater. Solar PV: Target customers who already have solar PV panels installed. Tankless and Condensing Gas: Emphasize that these technologies do not require any changes to the home in marketing messaging.	CPUC ED, All PAs	Accepted	PG&E accepts this recommendation in the effort to address market fragmentation. Where applicable, PG&E may consider using disaggregation data at the appliance level to better target customers who would benefit from different water heating technologies.	Other	SCE agrees that customer segmentation and targeting will facilitate heat pump water heater adoption. However, new "retrofit ready" heat pump water heaters are expected to enter the market soon and expected to help mitigate the need for electrical panel upgrades. Additionally, new heat pump water heater models require less ventilation space and/or can be vented into the attic. Emphasizing that Tankless and Condensing Gas water heaters are technologies that do not require any changes to the home in marketing messaging will increase barriers to fuel substitution heat pump water heater measures. Instead, consider focusing marketing on how to properly install heat pump water heaters to achieve the best performance that exceeds energy efficiency and GHG emissions of other gas water heating options.	Accepted	SoCalGas will look at fine tuning messaging and marketing materials to educate and prepare customers for future purchases of high efficiency storage and/or tankless water heater units either through burn out or early replacement.	Accepted	SDG&E will take the recommendation and share it with its program implementer. SDG&E staff meet and collaborate with third-party implementer staff regularly to discuss these types of recommendations.