

Thanks Pacific Gas and Electric 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 WE&T and Installation Improvement Evaluation (ODC, Calmac ID # CPU0378.01)

The RTR reports demonstrate PG&E’s plans and activities to incorporate EM&V evaluation recommendations into programs to improve performance and operations, where applicable. PG&E’s 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 PG&E 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 PG&E’s 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. PG&E believes 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: WE&T and Installation Improvement Evaluation
Program(s): WE&T
Author: Opinion Dynamics (ODC)
Calmac ID: CPU0378.01
ED WO:
Link to Report: [Report \(calmac.org\)](http://calmac.org)

MANAGEMENT APPROVAL AFTER REVIEWING ALL IOU RESPONSES		
Name		Date
PG&E	Angela McDonald	10/14/2024

Item #	Page #	Findings	Best Practice / Recommendations (Verbatim from Final Report)	Recommendation Recipient	PG&E (if applicable)	
					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.
1	45	Finding 1: While WE&T HVAC trainees generally reported positive experiences and a knowledge increase resulting from their participation, instructors found it difficult to actively engage trainees in a virtual environment. Our Installer Survey of WE&T trainees found that an overwhelming majority of participants in HVAC trainings from 2019 and 2020 felt the trainings met their expectations (95.4% and 91.3%, respectively; see Section 4.2). In addition, most participants reported an increase in level of knowledge across a range of topics relevant to residential and small commercial HVAC installation and maintenance (see Section 4.3), and reported confidence that they would be able to apply what they learned on the job (see Section 5.1). Although self-reported satisfaction and knowledge gain were relatively high among participants, instructors highlighted the challenges of finding ways to actively engage participants in the training content, particularly in virtual or hybrid trainings (see Section 4.2). Further, only one of the four HVAC trainings that our team audited as part of this evaluation included in-class assessments to help instructors understand if and how participants understood the content (see Appendix A.). Relatedly, instructors reported some difficulty understanding how much information from the training that participants retained and whether participants went on to take and ultimately pass certification exams.	Recommendation 1: We recommend that the four California IOUs draw core questions from the standardized reaction survey that Opinion Dynamics prepared (see Appendix E-III for the instrument) to cover key topics related to participant satisfaction with their training experience. IOUs currently administer exit surveys at the end of trainings. However, topics and survey length differ between IOUs (see Section 4.1). We recommend that IOUs work to administer streamlined surveys that are available to participants online immediately after completing the training. A shorter survey will reduce the burden on respondents and a standardized version will enable decision-makers to understand satisfaction with similar training offerings across the IOUs. We discuss the most critical topics to cover in this type of survey in Section 4.1 and include the complete survey instrument in Appendix E-III.	All	Accepted	PG&E will continue to explore ways to streamline post-course surveys while continuing to collect information that is important to the continuous improvement of courses and the WE&T program. PG&E will consider the core questions proposed when evaluating post-course surveys.
			Recommendation 2: Training providers should consider incorporating in-training assessments into curricula where possible to ensure that knowledge transfer is occurring among trainees and that the core concepts are understood before moving on to later topics. Training providers should also consider implementing summative assessments or tracking to help instructors understand how to better tailor their trainings to support outcomes such as higher rates of participants scheduling or passing certification exams post-training.	All	Accepted	PG&E will continue to summarize survey data and share survey feedback with instructors to help them understand they could tailor their training content and delivery to support outcomes. Where relevant and appropriate, PG&E will continue to include knowledge checks and pre- and post- assessments in on-demand trainings designed and developed by PG&E and will encourage external training providers to do the same.
2	45	Finding 2: For the trainings included in this evaluation, Opinion Dynamics identified that both instructor and trainee experiences differed between in-person and virtual trainings, and that the virtual environment posed challenges in terms of participant engagement. The four WE&T trainings we audited included few opportunities for active engagement amongst participants (see Appendix A-II). We also reviewed training materials for twelve WE&T HVAC trainings, both intended to be delivered in-person and virtually, and we found little difference between the materials and training design across delivery modes. Instructors reported preferring in-person delivery over virtual delivery because it allows more opportunities for active participation, gauging engagement and understating, and opportunities, where applicable, for “hands-on” learning. Respondents to the Installer Survey echoed similar sentiments (see Section 4.2). Participants who took the trainings in-	Recommendation 3: We recommend that training providers consider different strategies to minimize screen fatigue and maximize trainee focus and attention. Virtual trainings can be a convenient option for technicians who do not want to travel to a physical location after working a long day. It can also reduce barriers for technicians who do not have the means to get to the training site. However, training providers should consider that technicians, who already had busy and tiring days, may have trouble focusing in front of a computer screen for several hours at a time. We note that WE&T program administrators may already employ these different types of strategies in their virtual training offerings, and we recommend that IOUs continue to expand these options across their portfolios and work with third-party training providers to encourage adoption of these practices. One strategy that IOUs and training providers may consider is shortening	All	Accepted	PG&E will continue to provide instructors with resources to help them improve the quality of their adult learning courses and virtual training. PG&E will also continue to review how trainings are delivered—in-person, remote, live, on-demand, hybrid —and determine which methods make the most sense from multiple perspectives, including, but not limited to, location, time of day, travel distance, cost, student preference, instructor availability, space available, etc.

Item #	Page #	Findings	Best Practice / Recommendations (Verbatim from Final Report)	Recommendation Recipient	PG&E (if applicable)	
					Disposition	Disposition Notes
		person were more likely to be “very satisfied” than virtual/hybrid participants with the training overall, training materials, and the instructor (see Table 3).	<p>modules or sessions. We found that virtual trainings involved the same number and duration of sessions as the same training offered in-person. While the number and length of sessions in a training may be appropriate for in-person trainings, virtual trainings could involve more sessions that are shorter in duration thereby reducing screen fatigue. If adjusting the length and frequency of sessions is not possible, training providers should ensure that trainees have the opportunity to take regular breaks during virtual trainings.</p> <p>IOUs should also explore differentiating activities between in-person and virtual delivery as another strategy that can help maximize trainee focus and attention. For example, lectures may be more appropriate for in-person trainings but may present challenges for sustaining trainee attention in the virtual setting. When exploring virtual training options, WE&T program administrators should consider different technology options, or training designs, that would enable more active participant engagement. One option is to facilitate small group breakout discussions to break up lecture-style presentations. Another option is to explore software that would enable participants to complete activities or mimic repairing or installing HVAC systems.</p>			
3	46	<p>Finding 3: Technicians who we observed as part of the Behavioral Assessment had somewhat mixed results in terms of how they were able to diagnose and ultimately fix an HVAC system that was not properly functioning. As we detail in Section 5.2, we sabotaged an HVAC system so it presented with faults that a technician could see in their day-to-day jobs. We observed technicians as they diagnosed and attempted to fix the system faults once before and once after they completed a WE&T training We designed two sets of system faults—one for the pre-training and one for the post-training observations—that provided technicians with an opportunity to demonstrate the objectives of the training they completed. When compared with pre-training observations, technicians demonstrated a better understanding of HVAC systems, a more robust diagnostic process, and more success engaging with the member of our evaluation team completing the observation (i.e., mimicking their customer). As few of the technicians were able to address the system faults included in the observation, a typical residential customer would not have realized the energy savings that could have resulted in successfully addressing these issues were these actual house calls (see Section 5.2). However, their ability to more fluently discuss issues with “their customer” and connect symptoms with root causes of the faults suggest that their participation in the WE&T HVAC training would provide market benefit in their daily work experiences.</p>	<p>Recommendation 4: WE&T trainings should incorporate opportunities for hands-on demonstration of skills the training intends to develop, where appropriate. If hands-on application is not feasible (e.g., in virtual learning environments), we recommend training providers increase opportunities for participants to engage in problem-solving exercises where they are prompted to apply training content. One such example that instructors can consider is employing a case or scenario approach. Instructors could present trainees with a description of a real-world problem and ask participants to discuss appropriate diagnostic methods and potential strategies for addressing the issues presented in the scenario in smaller group settings. Training providers could also consider the use of software to simulate working directly on HVAC systems (see Recommendation 3). Another strategy is to bring HVAC equipment into the training environment to allow instructors to provide demonstrations and trainees the opportunity to practice working on real systems. We note that some of the energy centers may already have training equipment for this purpose and we encourage training administrators to continue and expand this practice to the extent possible.</p>	All	Accepted	PG&E will continue to provide instructors with resources to help them improve the quality of their adult learning courses and virtual training. PG&E will communicate to training providers the value of these improvements. PG&E will also review how trainings are delivered—in-person, remote, live, on-demand, hybrid—and determine which methods make the most sense from multiple perspectives, including, but not limited to, location, time of day, travel distance, cost, student preference, instructor availability, space available, etc.
			<p>Recommendation 5: We recommend that WE&T program staff continue to explicitly highlight the customer satisfaction benefits of training to HVAC contractors and other similar employers. Specifically, trained technicians may be more confident in their ability to ask questions of their customer and identify the root causes of the symptoms that customers experience, which may lead to better customer experiences. Additionally, addressing root causes of the issues that customers experience, rather than simply eliminating the symptoms, may lead to more efficient time at individual job sites and fewer callbacks.</p>	All	Accepted	Where applicable, PG&E will continue to work with instructors to emphasize the customer satisfaction benefits of training to HVAC contractors and other similar employers.
4	47	<p>Finding 4: Technicians work in a demanding industry that requires them to work long hours in difficult conditions. Both in our efforts to recruit technicians into the behavior assessment portion of this evaluation and post-observation interviews we found that technicians were often over-burdened by their schedules. As such, trainings held in the evenings at the end of a long workday likely do not provide the best opportunities for technicians to retain</p>	<p>Recommendation 6: WE&T program administrators should consider finding additional methods to provide training content to technicians. This may include shorter virtual training content or modules that technicians can do on their own time, reference packets or materials that may be useful to technicians in the field or working with employers to find ways to provide train-the-trainer opportunities or training content during typical work hours. We</p>	All	Accepted	PG&E will continue to provide instructors with resources to help them improve the quality of their adult learning courses and virtual training. PG&E will communicate training providers the value of these improvements, PG&E will also review how trainings are delivered—in-person, remote, live, on-demand, hybrid—and determine which methods make the most sense from multiple perspectives, including, but not limited to, location, time of day, travel

Item #	Page #	Findings	Best Practice / Recommendations (Verbatim from Final Report)	Recommendation Recipient	PG&E (if applicable)	
					Disposition	Disposition Notes
		the complex technical information provided through WE&T trainings.	note that IOUs may be employing some of these strategies to already and we recommend expanding these alternative delivery methods more broadly.			distance, cost, student preference, instructor availability, space available, etc