Workshop on Workforce Standards Summary

Date: May 18, 2026
Time: 1:00PM - 4:00PM PT

Overview

On May 18, 2026, the California Energy Efficiency Coordinating Committee hosted a one-day workshop on Workforce Standards to discuss challenges of the current standards and to begin considering best practices and solutions. A total of 90 individuals representing 52 organizations, including representatives of nineteen CAEECC member organizations, eight representatives of three ex-Officio members and 63 members of the public attended the workshop (see Appendix A for full list of attendees).

The workshop was facilitated by Amber Zirnhelt (Birch Road Consulting) and supported by Katie Abrams (Birch Road Consulting); Michelle Vigen Ralston, Catherine Casomar, Suhaila Sikand, and Natalie Lucas (Common Spark Consulting); Susan Rivo (Raab Associates). Special thanks to volunteer breakout facilitators Javiar Montalbo, (Marin Clean Energy (MCE)), Ellen Steiner, (E Source/Opinion Dynamics), Audrey Bragg(SoCalREN), and Bex Hausheer (The Energy Coalition (TEC)).

Workshop Purpose

To establish a common understanding of the opportunities, benefits, challenges, and perspectives of different interested parties re: applying workforce standards to energy efficiency/electrification programs.

Key Takeaways

- High Road Workforce Policy applies to both union and non union workers state-wide and needs to encompass worker well-being, benefits and health care
- Lack of consistent verification and compliance checks to ensure workforce standards are being met
- Need for further coordination across Program Administrators (PAs) and State organizations to implement and enforce the Responsible Contractor Policy and workforce standards
- Opportunity to strengthen the California Public Utilities Commission (CPUC), PA and Union coordination for contractor verification, job placement and addressing regional challenges
- Rural geographies experience gaps in contractors and access to training

- Workforce standards need to be extended to include residential projects and thresholds should be kept where they are/low to help ensure standards are met
- Importance of differentiating between contractors vs. installers/technicians as each may have different levels of credentials. D.18-10-008 applies to installers/technicians.
- Small Contractors experience barriers such as access to cash flow financing, insurance, business management support, technical assistance and training. There is a need for greater awareness and to connect contractors with resources (e.g. Rising Sun's forthcoming resource guide).
- Databases exist to support contractor verification (e.g. statewide apprenticeship database; California Advanced Lighting Controls Training Program (CALCTP) database; regional county Heating, Ventilation, and Air Conditioning (HVAC) contractor lists)
- Need for resources on all available training and credentialing offers and how contractors can access it.
- Training with structured tiers to increase certifications and competencies is key on the pathway to high-road careers, and increased regional training opportunities are needed.

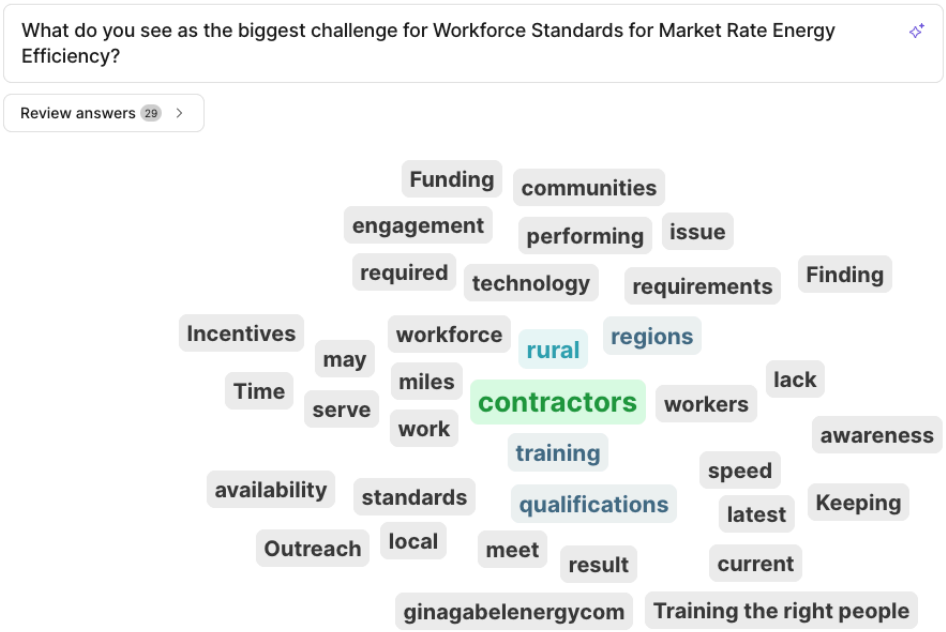
Welcome & Context Setting

Slides 1-19

Facilitator Amber Zirnhelt presented the workshop purpose, proposed meeting norms, a definition of workforce standards, background on CAEECC engagement, the nexus between codes and standards (C&S) and workforce education and training (WE&T).

Icebreaker

Question: What do you see as the biggest challenge for Workforce Standards for Market Rate Energy Efficiency?



Background Presentations on Workforce Standards

Slides 20-40

Michael Sokol (**Director of Energy Efficiency at the California Energy Commission (CEC))** presented the SB350 legislative context requiring the adoption, implementation and enforcement of a Responsible Contractor Policy for all ratepayer-funded energy efficiency programs that involve installation or maintenance work. See slides 21-28 for details.

Ellen Steiner (Vice President of Opinion Dynamics, an E Source company) provided the regulatory context of D.18-10-008 workforce standards requirements, the implementation of the standards, and evaluation reports of the standards. See slides 30-40 for details.

The two presentations were followed by Questions & Input from CAEECC Members and the Public. Workshop participants were encouraged to use Slido as verbal Q&A time was limited.

Summary of Discussion on Background Presentations

- Barriers to workforce standards and code compliance include limited data, limited understanding and verification of compliance, and enforcement issues including inconsistencies across jurisdictions, code complexity and supporting materials

- Recommendation that workforce standards include aspects of the wellbeing of the worker (e.g., family-healthcare, apprenticeship training, portability of benefits, retirement, prevailing wages, etc.)
- Information on public databases where apprenticeship status can be verified
- Information on union and non-union state-accredited apprenticeship programs
- Concerns/challenges regarding new, inexperienced, apprentices performing HVAC installations without oversight on potentially dangerous and expensive systems
- The lack of a uniform definition of advanced lighting controls creates a challenge to determining whether workforce standards should be triggered
- Clarifying dialogue on whether HVAC contractors can install heat pump water heaters (yes according to the California State License Board)
- Information on where to locate lists of certified contractors though CALCTP Certified ATT and CALCTP Certified Installer Contractors

There were over a dozen questions and comments provided in Slido. A detailed list of Questions, Responses, and Input (from Slido and verbally) are available in *Appendix B: Background Presentations Q&A and Input*

Panel Presentations

Slides 41-90

Gina Rodda (Gabel Energy) presented on the history of energy code compliance, including its complexity, existing gaps, and the organizations involved. Chris Ruch (SMW Local 104) presented on the risks of improper product installation in meeting energy goals, the differentiation between contractor and technician requirements, and highlighted existing state accredited apprenticeships programs. Charles Cormany (Efficiency First) presented contractor perspectives on the standards, including the importance of company culture and training the right people, and the need for enforcement. Audrey Bragg (SoCalREN) and Benjamin Druyon (I-REN) presented on PA experiences with the standards and contractor training with code updates. Erik Ennen (-interNational Association of Lighting Management Companies-NALMCO) presented on NALMCO-CLCP's (Certified Lighting Controls Professional's) experiences in certifying lighting technicians and the impact of workforce standards.

The six presentations were followed by Questions & Input from CAEECC Members and the Public. Workshop participants were encouraged to use Slido as verbal Q&A time was limited.

Summary of Discussion on Panel Presentations

- Clarification that the role of RENs includes compliance improvement, workforce education and training.

- Dispelling the myth that union members are only at large commercial firms; rather many are small “mom and pop” shops that do single-family residential work.
- The challenges of being a public works contractor include payment terms, increased insurance costs, regulatory costs - including certified payroll reporting and compliance overhead, invoice processing times, and access to capital
- A key value for unionized contractors, especially smaller firms, is that union training programs closely follow code updates, technology innovations, and installation requirements and deliver upskill training to contractors and technicians.
- Despite CALCTP (California Advanced Lighting Controls) training being offered in more than 20 training centers, and despite over 5,000 certified CALCTP Electrician Installers, there continue to be entire counties (especially in Hard to Reach (HTR) areas) with zero certified contractors. Some report that contractors from more populated neighboring counties serve remote areas like Inyo and Mono Counties, but others report that projects stall or never start due to contractor shortages.
- Recommendation: Include the wellbeing of the worker in workforce standards and ensure rebate programs reward contractor firms that support employees.
- Recommendation: restructure rebate eligibility to where workers are actually based, rather than a contractor's registered business address, to meaningfully expand access in underserved areas.
- Data regarding the number of active C20 licenses compared to the total number of sheet metal workers was discussed (see Appendix C).
- There is growing interest in local/regional/state agencies that support contractor training and capacity-building (e.g., local economic development agencies, Governor's Office of Business and Economic Development {GO-Biz}, etc.) to be able to increase the contractor pool that can meet workforce standards in an area.
- I-REN is developing partnerships with local counties and workforce development departments to increase the local workforce in its service area.
- Discussion about how NALMCO validates that candidates develop practical lighting controls experience beyond online training (including field application, troubleshooting, and code-based decision-making despite no electrician experience/license).

There were over a dozen questions and comments provided in Slido. A detailed list of Questions, Responses, and Input (from Slido and verbally) are available in Appendix C: Panel Presentations Q&A and Input

Breakout Discussions

Participants were divided into two rounds of breakout discussions based on pre-determined preferences. Topics for breakouts are noted below with a headline (e.g.,

key insight, key theme, proposed action item) from each breakout room discussion. Detailed notes from breakouts are included in Appendix D: Detailed Breakout Notes.

Top Challenges in Meeting Workforce Standards for HVAC/Lighting Contractors

- High-road workforce standards — proper training, fair wages, and worker wellbeing — are the most responsible use of ratepayer money and the most effective path to meeting the state's energy goals. And critically, these standards apply to all contractors, union and non-union, alike.

- Outreach to organized industries to leverage trained workforce and to educate additional contractors and technicians to meet high workforce standards, and help fill gaps in the numbers of rural contractors.

- Need for implementation of SB 350's Responsible Contractor Policy, including clarity around requirements and enforcement, and interagency partnership among CEC, CPUC, Labor and Workforce Development Agency and program administrators

Threshold Requirements

- Thresholds should remain where they are. Communication and transparency is key for contractor/installer engagement. Siloed communication across the state impacts delivery of services.
- Workforce Standards should be extended to residential projects.

Credentialing Requirements

- Needs to be overarching research of all available training and credentialing offers and how contractors can access it. Training with structured tiers to increase certifications and competencies is key on the pathway to high-road careers.
- Residential - less about a standard, more about education. Focus on determining *what* that information needs to be. Clear coordinated structure (focus on industry-determined technical competencies) but flexibility for folks to access.

Contractor Verification, the Importance of Quality Assurance and Consumer Protection

- Without enforcement/verification that actually has teeth, none of the standards will be reached.
- Require the person who is doing the work to be certified - not just the contractor.

Market Participation, Equity and Access: Who Gets Left Out

- Rural areas lack contractors. Partnerships between RENs and Unions are needed to access and train contractors.
- Time is money. Need to prioritize where the work is consistently and the amount of work. The challenge is the location and frequency of trainings:, maybe smaller and more frequent trainings are needed. Prioritize shadowing and mentorship on the job.

- Need to flip the equation and look at fostering demand, not supply. Discussed a model to create high-road jobs.
- Cost-effectiveness is a challenge.

Coordination on Contractor Requirements: Across PAs and at the State Level

- Coordination across State Organizations, PAs and Unions on alignment with workforce standards guidelines and pathways to achievement is key.
- Everyone has good intentions and we are all learning as fast as we can. Importance in reaching out to stakeholders in your area to discuss workforce needs, program designs, workforce standards. Community outreach and stakeholder engagement is key.

Wrap-up

Slides 95-99

Next Steps & Reminders

Facilitator Katie Abrams thanked speakers, panelists, breakout facilitators, and all attendees. Abrams noted that the CEC's forthcoming 2026 Integrated Energy Policy Report (IEPR) 6/30 Commissioner Workshop on Energy Equity & Environmental Justice will provide an opportunity to provide feedback on workforce issues. She requested that participants complete evaluations and reminded folks that the Appendices (slides 100-134) serves as a resource with additional background on workforce standards.

Appendix A - Attendance

Organization	Name
CAEECC Members	
3C-REN	Alejandra Tellez
BayREN	Jane Elias
CCR REN	Trevor Keith
Code Cycle	Dan Suyeyasu
Frontier Energy	Nancy Barba
I-REN	Benjamin Druyon

LGSEC	Amaury Berteaud
MCE	Alice Havenar-Daughton
NRDC	Ericka Flores
NREN	Patricia Terry
PG&E	Sebastien Csapo
SBUA	Ted Howard
SCE	Jessica Lau
SDREN	Sheena Tran
SDG&E	Stacie Risley
SMART Local 104	Christopher Ruch
SoCalGas	Mori Farid
SoCalREN	Audrey Bragg
The Energy Coalition	Rebecca Hausheer
Ex-Officio	
CARB	Julia Branco
CARB	Naseem Golestani
CEC	Owen Howlett
CEC	Michael Sokol
CEC	Yung Nguyen
CPUC	Peter Franzese
CPUC	Jessie Levine
CPUC	Pam Rittelmeyer
Other Interested Stakeholders	

AEA	Amy Dryden
AEA	Nick Dirr
California Energy Alliance	Nica Tanaka
CALMCC	Bernie Kotlier
CABEC	Susan Davison
CalEnergy Corp	Collin Weiner
CalEnergy Corp/CALCTP	Holly McAllister
CCR REN	Jordan Garbayo
CEA	Shrayas Jarkar
City of Berkeley	Alice La Pierre
E source Companies LLC	Ellen Steiner
Efficiency First California	Charles Cormany
Efficiency First California	Chandra Apperson
Emerald Cities	Donald Gilligan
Energy Solutions	Sandy Laube
Energy Solutions	Lillian Propst
Frontier Energy	Berenise Alfaro
Frontier Energy	Emily Carter
Frontier Energy	Kristin Larson
Frontier Energy	Margaret Marchant
Frontier Energy	Jessica Meylor
Frontier Energy	Timaree Nelson
Frontier Energy	Katelynn Rathbun

Gabel Energy	Gina Rodda
GRID Alternatives	Seth Yund
High Sierra Energy Network	Pam Bold
IBEW Local 569	Cristina Marquez
IBEW Local 569	Cori Schumacher
IBEW-NECA of California	Ramsay Stevens
Mantis Construction Corporation	Christopher Ajagu
MCE	Jennifer Green
MCE	Javier Montalbo
NALMCO	Erik Ennen
NREN	Jennifer Brennan
NREN	Marianne Bithell
Open Opportunities	Debbie Neely
PG&E	Josephine Buennagel
PG&E	Robert Marcial
PG&E	Jill Marver
PG&E	Antoinette Siguenza
RCF Connects	Alison LaBonte
Rising Sun Center for Opportunity	Sneha Ayyagari
Rising Sun Center for Opportunity	Julia Hatton
SDREN	Aisha Cervantes-Cissna
SDREN	Alyson Scurlock
SDREN	Amy Whitehouse

Appendix B: Background Presentations Q&A and Input

Note that the majority of the text is copied/pasted from Slido and not edited for grammar, spelling etc.

- **Sneha Ayyagari (Rising Sun):** What are some of the main barriers to code compliance?
    - **Michael Sokol (CEC):** There are a series of barriers we are working to address at present. Starting with limited data and a comprehensive understanding of compliance issues across building types, measures, and regions. Complexity of the code and supporting materials are also regularly cited as key challenges.
    - **Colin J. Weiner (CalEnergy Corp)**: Compliance and Enforcement at a Local Department of Building Inspections level.
    - **Charles Cormany (Efficiency First):** Inconsistencies from the Authority Having Jurisdiction (AHJs) - Some require full compliance paperwork (HERS) others don't even ask for the paperwork or seem to care.
- **Vince Sugrue (SMW Local 104)**: Broad question for the group - can workforce standards also include aspects of the wellbeing of the worker? I think of family-healthcare, apprenticeship training, portability of benefits, retirement, prevailing wages, etc.
    - **Nica Tanaka (California Energy Alliance)** (caenergyalliance.org): Yes
- **Christopher Ruch (SMW Local 104)**: Regarding Public Database --- Graduates of apprenticeships can be verified with a first and last name here: https://www.dir.ca.gov/databases/das/ApprenticeGradSearch.asp.
    - **Ellen Steiner (E Source, formerly Opinion Dynamics)** I am so glad to see this available!
- **Christopher Ruch (SMW Local 104)**: Current apprentice status can be verified with last name and the last 4 digits of SSN here: https://www.dir.ca.gov/das/appcertpw/appcertsearch.asp.
    - **Ellen Steiner (E Source, formerly Opinion Dynamics)**: At the time, program implementers did not ask for the last 4 digits of SSN at the time of the study and there were concerns regarding asking for this information.
- **Christopher Ruch (SMW Local 104):** In California, there are both union and non-union state-accredited apprenticeship programs. Examples of non-union apprenticeship programs include: ABC (Associated Builders and Contractors) ACTA (Associated California Trainers Association) WECA (Western Electrical Contractors Association).
    - **Ellen Steiner (E Source, formerly Opinion Dynamics):** Yes, that is correct. At the time of the study, we found no union or non-union apprenticeships accepting applicants at the CA or federal level.
        - **Fernando Ochoa-Suarez (SMW Local 105)**: The apprenticeship programs accept applicants **on a rolling basis, including during the study period**

- **Chris Ruch (SMW Local 104)**: Keep in mind apprentices are typically required to work with a journeyperson.
    - **Ellen Steiner (E Source, formerly Opinion Dynamics)**: Yes. This is similar to the CSLB rules that the licensed contractor oversees the work of installers. We have found however that the overseeing contractors are sometimes always on site and sometimes the licensed contractor is 8 hours a way.
- **Jeremy Zeedyk (Western States Council, SMW)**: Isn't it concerning that a new, inexperienced, apprentice can perform HVAC installations without oversight on potentially dangerous systems that cost ~$20,000?
    - **Ellen Steiner (E Source, formerly Opinion Dynamics)** Hi Jeremy, This is a challenge. HVAC installation contractors often deploy installers, when they can, with more experience on more complex projects.
- **Fernando Ochoa-Suarez (SMW Local 105):** Our Sheet Metal HVAC apprenticeship programs are both state and federally accredited. https://www.apprenticeship.gov/data-and-statistics/apprentices-by-state-dashboard
    - **Ellen Steiner (E Source, formerly Opinion Dynamics):** This is great!
- **Alina F. Bonto (The Energy Coalition)**: How are advanced lighting controls defined? Do occupancy sensors, motion sensors, etc fall under this definition?
    - **Collin J. Weiner (CalEnergy Corp):** Hi Alina, See below very long list: Manual Controls, Multi-level Lighting Controls, Shut-Off Controls (Motion Sensors, Time Clocks), Daylight Responsive Controls, Demand Responsive Controls, Institutional Tuning Controls, Track Lighting Current Limiters, DMX/HCL controls, and more.
    - **Ellen Steiner (E Source, formerly Opinion Dynamics):** There are many definitions depending on who you ask. In identifying projects that triggered Workforce Standards in CEDARs, we identified discrepancies in the measure descriptions provided and their relevance to lighting control measures to determine whether Workforce Standards would be triggered.
- **(For Ellen Steiner, E Source, formerly Opinion Dynamics) Cristina Marquez (IBEW Local 569)** Instead of Installer Technician-shouldn't it be an Electrician? (Slide page 34) Because in order to have the CALCTP certification one must have passed the CA State General Electrician test.
    - That is true on the lighting controls side but the challenge is we don't have a parallel CA State General HVAC test, and that's where the gap in the market is. When you look at the credential of how it's defined in the Decision, it specifically states having a CALCTP certification which requires an electrician license.
- **Alison LaBonte (RCF Connects):** Does the term HVAC in its usage here include heat pump water heating too, or just refer to air/space heating and cooling?
    - **Gina Rodda (Gabel Energy/Energy Code Ace)**: Typically HVAC does not include water heating unless used for space heating.

    - **Jeremy Zeedyk (Western States Council, SMW)**: However, HVAC technicians, especially union trained, are proficient in installing them. HPWH's have specific requirements for installation that include make-up air to limit condensation damage etc.
    - **Ellen Steiner (E Source, formerly Opinion Dynamics):** According to the California State License Board, HVAC contractors can install heat pump water heaters in addition to C-36 plumbing contractors. Estimates I have heard is 5-10% of HVAC installing HPWHs
- **Collin J. Weiner (CalEnergy Corp)**: There are two lists of certified contractors. There is a list of CALCTP Certified ATT contractors and a list of CALCTP Certified Installer Contractors which can be located on the CALCTP website at: https://calctp.org/find-contractor

Appendix C: Panel Presentations Q&A and Input

Note that the majority of the text is copied/pasted from Slido and not edited for grammar, spelling etc.

- **(For Gina Rodda, Gabel Energy/Energy Code Ace) Amaury Berteaud (LGSEC/AMBAG):** Where do you see the role of Regional Energy Network Programs on influencing the technology adoption curve? and on working with local governments around the Energy and Building code?
    - **Gina Rodda, (Gabel Energy/Energy Code Ace):** They are part of the Compliance Improvement and Workforce and Education aspects to the CPUC programs.
- **(For Christopher Ruch, SMW Local 104) Jane Elias (BayREN):** Are there apprenticeship programs for individuals working on the one-off, small, residential homes and not the non-res systems or new construction. large production housing projects?
    - **Christopher Ruch (SMW Local 104)**: That's a common misunderstanding. Many Sheet Metal Workers contractors are small "mom and pop" shops started by union members, including firms that do single-family residential work. Union contractors range from small family businesses to large commercial firms.
    - **Jeremy Zeedyk** (**Western States Council, SMW**): Yes, the Sheet Metal Locals have residential HVAC programs across the state. They have been growing their training programs through state and federal grants to grow these programs to meet the demand in California.
- **Dean Lee (SMW Local 206):** What is the cost to be a public works contractor? How much is the financial burden to contractors?
    - **Audrey Bragg, SoCalREN** (Verbal) - one of the first barriers - talking about small and micro contractors. They are paid every fiscal year, not pro-rated.

It's also the financial costs of increases to insurance limits and other regulatory compliance costs. Others include - invoice processing times, access to capital is difficult, this is why small and micro contractors don't pursue public works initially.
    - **Dean Lee (SMW Local 206):** So how much does it cost?
    - **Audrey Bragg (SoCalREN):** DIR certification costs go beyond the registration fee. We are seeing certified payroll reporting and compliance overhead are the real burden for small contractors.
- **(for Audrey Bragg?): Jeremy Zeedyk (Western States Council, SMW)**: That is the value add for mom & pop shops to work with union training programs. Union training programs work behind the scenes to follow code updates and deliver upskill training to contractors and technicians at no additional cost to the contractor.
    - **Christopher Ruch (SMW Local 104)**: Agreed. Union training centers are ongoing resources for members and contractors. They continuously offer code update classes and training on new technologies at no direct cost to members.
    - **Collin Weiner (CalEnergy Corp)**: I agree with this as well. Always the most up to date training we find for our electricians to ensure they are up to date on best available technologies, codes, and installation requirements.
- **(for Audrey Bragg, SoCalREN) Collin J. Weiner (CalEnergy Corp)**: Hi Audrey, are you aware that CALCTP is offered in more than 20 training centers, and there are more than 5000 certified CALCTP Electrician Installers?
    - **Audrey Bragg (SoCalREN)**: CALCTP maintains a qualified contractor list.e found that none of their certified contractors serve some of our HTR counties, including Inyo, Mono, and Imperial. We've had public sector projects in these rural counties struggle to move forward, or turn down work entirely, due to this shortage.
- **Fernando Ochoa-Suarez (SMW Local 105)** : Contractors based from nearby, more populated counties typically serve the Inyo and Mono (Kern) and Imperial (San Diego) counties. However, they employ workers that reside in these counties
- **Vince Sugrue (SMW Local 104)**: Broad question for the group - can workforce standards also include aspects of the wellbeing of the worker? I think of family-healthcare, apprenticeship training, portability of benefits, retirement, prevailing wages, etc.
    - **Christopher Ruch (SMW Local 104)** (Verbal) - yes, there are benefits to the community when a contractor is investing in these things - health insurance, a living wage, retiring with dignity, and a real training program they can continuously go back to. Side benefits really help with making a career - not something folks will leave after a few years. Rebate program: for the most part - they look at contractors who are doing the least the same way as contractors who are doing the most to provide support for employees. (edited)

- **(for Audrey Bragg, SoCalREN)**: **Fernando Ochoa-Suarez (SMW-Local 105)**: For Audrey - can rebate programs be restructured to account for where workers are based rather than where contractors are based? Oftentimes, they just have a PO Box as their business address. (edited)
    - **Chris Ruch (SMW Local 104):** Excellent point. HVAC technicians who are currently enrolled in or have completed a state-accredited apprenticeship, along with CalCTP-certified electricians, live and work throughout all of the counties listed.
    - **Audrey Bragg (SoCalREN)**: Restructuring rebate eligibility around where workers are actually based, rather than a contractor's registered business address, could meaningfully expand access in underserved areas.
- **(for Benjamin Druyon, I-REN) Chris Ruch (SMW Local 104)**: As of today, there are 11,350 ACTIVE C20 licenses within the state. The Bureau of Labor Statistics estimates that there are, as of its latest report, 97,490 Sheet Metal Workers within the State of California. (see https://www.bls.gov/oes/2023/may/oes472211.htm)
- **(for Benjamin Druyon, I-REN**) **Alex Lantsberg (SFECI)**: It seems to me that the impulse to avoid working with organized labor results in a contracting base that will not deliver the service levels demanded by end users.
    - **Alex Lantsberg (SFECI):** Wrote that before the sum of Ben's presentation. Just to underscore Chris's presentation, our apprenticeship programs take in based on expected future work..the tighter the connection between end users and apprenticeship programs will build a workforce.
- **(for Audrey Bragg - SoCalREN**, **Benjamin Druyon - I-REN**, **Charles Cormany - Efficiency First) Shrayas Jatkar (CA Energy Alliance**): Are there local/regional/state agencies that support contractor training and capacity-building (e.g., local economic development agencies, GO-Biz, etc.) to be able to increase the contractor pool that can meet workforce standards in an area? Are there any REN's with partnerships of this kind?
    - **Benjamin Druyon (I-REN)**: I-REN is just starting to develop and build on relationships to address this. We have established a relationship with both San Bernardino and Riverside County Workforce Development Departments to increase the local workforce.
- **(for Erik Ennen, NALMCO) Collin J Weiner (CalEnergy Corp):** - Given that CLCP relies significantly on the NEMA prerequisite courses, how does NALMCO validate that candidates develop practical lighting controls expertise beyond online training, including field application, troubleshooting, and code-based decision-making having no electrician experience/license? If CLCP candidates are primarily lighting controls programmers, how does that experience satisfy the installation credit or installation competency requirement? What kind of hands-on-field requirements are there to ensure knowledge of proper physical device installation and wiring?

- **Erik Ennen (NALMCO)** (response provided via email after the workshop): There are a number of pathways for someone to determine if they are ready or if their job description calls for the CLCP certification.

  One example could be of an apprentice lighting technician starting out in the industry. After a year or two, he could sit for the senior lighting technician certification. From there, he could move into a project management role or decide that he wants to earn the CLCP and work on new construction or retrofit applications where controls, NLC or LLLC are deployed and installed.

  Another scenario could be a journeyman electrician is asked by his employer to earn the CLCP because he wants a team that can handle new installations but also service and maintain installed systems as a service they want to provide to the industry.

  From the supplier side or distributor, the CLCP may be what distinguishes that person or that company to the industry in control system design and sales.

- (**for Ben Druyon (I-REN**): **Holly McAllister (CALCTP):** The numbers provided within the I-REN presentation for CALCTP certifications within the Inland Empire are based on CALCTP numbers for CALCTP ATT certifications. These numbers are inaccurate when referring to CALCTP installers. Those numbers have not been provided by CALCTP.
  - **Ben Druyon (I-REN)**: Thank you for that clarification, Holly.
  - **Holly McAllister (CALCTP)**: You're very welcome. Let's connect after this meeting so we can work together on these goals.

Appendix D - Detailed Breakout Notes

There were two breakout sessions and six topics across eight rooms for each session.

Below is an integrated summary combining the notes from both breakout sessions[1]. The information is organized into the six distinct overarching room topics, capturing the themes, challenges, and proposed recommendations from all 16 breakout groups.

A detailed transcript-type version is available upon request by emailing <facilitator@caeecc.org>

- Rooms 1.1, 1.2, 2.1 & 2.2 - Top Challenges in Meeting Workforce Standards for HVAC/Lighting Contractors
- Room 1.3 & 2.3 - Threshold Requirements
- Rooms 1.4 & 2.4 - Credentialing Requirements
- Room 1.5 & 2.5 - Contractor Verification, Quality Assurance, and Consumer Protection
- Rooms 1.6, 1.7 & 2.6 - Market Participation, Equity, and Access: Who Gets Left Out
- Rooms 1.8, 2.7 & 2.8 - Coordination on Contractor Requirements: Across PAs and at the State Level

Rooms 1.1, 1.2, 2.1 & 2.2 - Top Challenges in Meeting Workforce Standards for HVAC/Lighting Contractors

Key Themes

- **Accuracy, Consistency, and Re-refining Definitions:** There is a critical demand for accurate data and definitions regarding who workforce standards apply to. Stakeholders caution against defining workforce requirements as mere "minimums" and argue that existing programmatic frameworks should be expanded or reframed to lift standards higher.
- **High Road Policy, Inclusivity, and Career Paths:** True "high road" standards must remain open to both union and non-union sectors and must grow to encompass total worker wellbeing, healthcare, and retirement benefits.
- **The Enforcement Equalizer:** Equitable, consistent enforcement across all market actors is the only way to eliminate underbidding and ensure a level playing field for compliant contractors.
- **The Need for Interagency Coordination:** Overcoming deeply entrenched organizational and cross-agency silos is paramount. Stakeholders repeatedly note

[1] The summaries in appendix D were generated with Gemini based on meeting notes. The facilitation team reviewed the generated summary in detail. The summaries for Credentialing Requirements (rooms 1.4 and 2.4) were provided by the breakout facilitator without AI and are structured differently.

that separate entities are driving toward the same destination without "carpooling" on existing training infrastructure.

- **Program Administrator Knowledge Gaps:** A perceived disconnect exists between Program Administrators (PAs) and the reality of how the construction industry operates, which sometimes manifests as underlying union animus.
- **The Virtuous Cycle of Organized Labor:** Partnering with organized industry models provides PAs access to a built-in network of highly trained, skilled contractors where unions actively self-police proper pay, compliance, and training benchmarks.
- **Continuous Learning for Rapid Tech Shifts:** Because clean energy technologies evolve quickly, foundational trade knowledge must be backed by a robust continuous-learning infrastructure so workers are not deployed into the field unsupported.

Key Challenges

- **Omissions and Misleading Framing:** Initial session definitions omitted electricians, misrepresenting who lighting standards apply to and fostering confusion regarding NALMCO CLCP and CALCTP equivalencies. Advanced lighting installation legally requires a licensed electrician; a credential equivalency does not create a pathway for non-electricians to do this work.
- **Prescriptive Burden on Apprenticeships:** Programs often call out narrow, specific credential requirements that are already fully embedded or exceeded within standard apprenticeship curricula. This creates an unnecessary extra burden and inadvertently implies the gold-standard apprenticeship pathway is insufficient.
- **Inconsistent Enforcement & Finger-Pointing:** The absence of a finalized and implemented "Responsible Contractor Policy" leaves the field without a clear north star. There is a lack of clear follow-up mechanisms on the ground , and various parties continue to point fingers regarding who is ultimately accountable for enforcement.
- **Market Disparities & System Gaps:** Only about 5% of statewide projects are estimated to be covered by CPUC ratepayer-funded workforce standards, leaving the vast majority of the market completely unreached. Furthermore, verifying the five-year journey-level work experience pathway remains difficult to track and lacks clear hourly requirements.
- **Geographic Barriers:** Severe contractor shortages plague rural regions. Training facilities or qualified contractors are frequently 250 to 400 miles away ,

and current program frameworks provide no mechanism to fund these extensive travel costs.

- **The Quantity vs. Quality Paradox:** Energy programs remain heavily focused on pure project quantity rather than specialized, high-road quality installations. This often leaves mainstream actors unprepared for complex, modern building code requirements like demand control or exhaust heat specifications.
- **Tracking Constraints:** Tracing certifications down to the individual technician level is notoriously difficult in public systems. While unions can track this internally for members , public state databases require specific data inputs (such as a worker's last name and the last 4 digits of their SSN) that PAs rarely possess.
- **Fragmented Training Ecosystems:** Workforce development boards, community colleges, and trade schools all operate in isolation with highly varied curricula and inconsistent career outcomes. For instance, a rapid two-month community college course often leaves a student severely underprepared compared to multi-year tracks.
- **Hiring Hall Waitlists vs. Active Demand:** Stakeholders reject the idea of a structural workforce shortage, noting that union hiring halls have waitlists of workers they cannot place until actual jobs are developed in the market.

Proposed Recommendations

- **Mandate Pre-Program Industry Consultation:** Require Program Administrators to seek formal industry and labor advice *before* launching clean energy programs to avoid operational pitfalls.
- **Broaden and Diverse Definitions:** Reframe the foundational definition of workforce standards to capture the comprehensive array of skilled, trained certifications recognized in California policy.
- **Deploy a Preferred Contractor Tool:** Partner with industry organizations (such as CalCTP, NALMCO, and CEA) to build a preferred contractor tool that allows PAs and customers to identify who meets specific efficiency and workforce standards.
- **Build Career Scaffolds:** Stop utilizing the generic term "contractor" to cover the entire workforce; instead, explicitly delineate career scaffolds for installers, technicians, and apprentices.
- **Collaborate Directly with the CSLB:** Form partnerships with the California Contractors State License Board (CSLB) to support continuous learning updates and integrate evolving code compliance directly into contractor licensing tracks.

- **Establish an Interagency Forum:** Launch a high-level coordination forum involving commissioners and directors from all affected agencies to break down institutional silos and map out clear operational responsibilities.

- **Develop a Simple Navigation Roadmap:** Create clear, easily accessible resources and toolkits so contractors and customers can seamlessly understand what credentials are required and how to pursue them.
- **Tailor Regional Approaches:** Break away from rigid statewide frameworks; instead, hold rural-specific workforce conversations to build solutions customized for low-density areas.
- **Clarify Program Openness:** Actively message that CALCTP and mechanical/HVAC credential pathways are fully open to non-union workers, as non-union electricians make up the majority of the California workforce.
- **Empower RENs and CCAs to Lead:** Given stalled progress at the Investor-Owned Utility (IOU) and CPUC levels, Regional Energy Networks (RENs) and Community Choice Aggregators (CCAs) should step up to drive local workforce standards forward.

Rooms 1.3 & 2.3 - Threshold Requirements

Key Themes

- **Re-Evaluating Dated Thresholds:** The 2018 incentive thresholds are eight years old and must be scrutinized under a vastly changed energy landscape shaped by severe tariff and pandemic-related supply chain disruptions.
- **The "Accidental" Majority Capture:** Historical data reveals that the 2018 thresholds have been capturing the majority of all energy projects , running completely counter to the CPUC's original intention of only targeting larger, complex commercial installations.
- **Rethinking the Residential Exemption:** Residential HVAC maintains the worst installation quality in the industry —with studies showing over 50% of residential systems fail fundamental airflow and refrigerant-charge code specifications. Yet, residential projects are exempt from workforce standards such as D.18-10-008.

Key Challenges

- **Installer List and Implementation Discrepancies:** Local governments and newly formed RENs face significant hurdles establishing the programmatic relationships needed to participate. PAs frequently lack clear, comprehensive installer lists to distribute.
- **Incentive Flaws and Arbitrary Triggers:** Relying on incentive or rebate amounts as a trigger means the exact same physical project could trigger rigid workforce standards under one PA's program but skip them entirely under another's simply due to fluctuating utility rebate levels.

- **The Customer Navigation Burden:** Many utility programs place the entire burden of verifying contractor credentials on the residential customer, despite the fact that everyday consumers are entirely unsupported when trying to navigate complex bids and specialized workforce requirements.

Proposed Recommendations

- **Keep Thresholds Low and Decoupled from Inflation:** Keep project thresholds low to maintain an abundance mindset and protect project volume, as many projects are small. Stakeholders advise against automatically tying thresholds to inflation because utility rebate structures do not scale upward with inflation.
- **Pivot Triggers to Scope, Savings, or System Size:** Consider avoiding total project cost metrics, which can easily be gamed or distorted by non-lighting or HVAC scopes. Instead, base triggers cleanly on Total System Benefit (TSB), verified energy savings, or system size.
- **Differentiate Equity vs. Non-Equity Thresholds:** Implement multi-tiered trigger thresholds based on whether a project is designated as equity or non-equity to ensure disadvantaged communities safely receive targeted program benefits.
- **Eliminate the Residential Exemption:** Safely expand workforce standards into residential portfolios to ensure consumers are protected by trained technicians and to unlock localized employment opportunities.

Room 1.4 - Credentialing Requirements

Headline: Needs to be overarching research of everything out there and how contractors can access it. Residential - less about a standard, more about education. Focus on determining *what* that information needs to be. Clear coordinated structure (focus on industry-determined technical competencies) but flexibility for folks to access.

Breakout participants first provided quick introductions about the perspective they bring to the conversation and their interest or intersection with the topic of credentialing.

- **Pepper Hunziker** shared their HVAC and plumbing background, their experience with the TECH program (TECH Clean California) and background in commercial HVAC, and advocacy for folks doing the work. They mentioned the important distinction between contractor requirements vs. installers and technicians without credentials, especially around HPWH and HP HVAC.
- **Gina Rodda** introduced her role as a trainer with **Energy Code Ace**, mentioning that contractors are a challenging group since their license doesn't have ongoing requirements. She said it is a challenge for folks to have time to do training, to know the value and benefits of training, and that many folks don' t know what's required and why it's important.

- **Eric Ennen** from **NALMCO** introduced himself as representing a credentialing entity and noted Energy Code Ace as a helpful resource for contractors he works with that are coming into CA.
- **Debbie Neely** from **Oakland Opportunities** spoke about their pre-apprenticeship program for East Bay, preparing folks to get into trades. She is currently working on a program with 7 nonprofits to get HPWH and electrification into low-income homes, and working on getting contractors involved.
- **Maura Connolly** from **The Energy Coalition** noted they support some RENs and agencies going through programs, and how contractor requirements can impact incentives they provide. They are also working to develop a trade ally network with contractors.

After intros, the group dove into some of the prompts. The group discussed challenges related to credentialing, including:

- Enforcement - installers don't think they need it
- And for those that want it, it's hard to get it (costly or takes time away from a job)
- And for those that want their folks to have it, takes folks out of the field and costs
- And if you have to hire somebody new, it's even more costly
- And sometimes a requirement is particular to an advanced technology, or different technology or a specific program or contract with a program

A key theme was the distinction between:

- Contractor licenses (e.g., CSLB licenses held by businesses), and
- Worker or technician certifications held by individual installers or service technicians

Participants emphasized that California lacks consistent statewide workforce standards, especially for residential projects, where credentialing requirements are often minimal. Residential installers have an inconsistent mix of credentials, such as OSHA and EPA 608 certifications, North American Technician Excellence (NATE)CORE, HVAC Excellence, ATT and specialty heat pump credentials, and manufacturer and third-party verification certification. There were concerns that current certification programs may not be keeping pace with energy codes, emerging technologies and evolving practices.

Potential solutions included:

- Stronger enforcement of credential requirements
- Better communication about code and program expectations
- Clearer guidance on which certifications apply to specific technologies and projects
- Streamlined credential pathways that reduce overlap between programs
- Industry case studies or "flow charts" explaining certification requirements

The group also emphasized the need for stronger workforce development support, including:

- Technical competency frameworks for heat pumps, developed for industry, by industry. Specific training offerings and certifications could be offered if they are consistent with the framework, allowing flexibility with some standardization.
- Expanded free or low-cost training resources, and earlier workforce development pathways through trade schools and community colleges

Overall, participants agreed the current credentialing system is fragmented and would benefit from clearer standards, better coordination, and updated training aligned with California's decarbonization goals.

Room 2.4 - Credentialing Requirements

Headline: Current context - low enforcement with a feeling of all-or-nothing. Enforcement is needed to create a value proposition - need to support the gold standard and high-road career development. Structure tiers and steps that support increasing certifications and competencies (pre-apprenticeship training, step-wise level ups) oriented towards pathways to high-road careers. (Lower tiers and steps, not "gold standard" but can reward progress toward that, e.g., increase acceptance to apprenticeship.) Could structure incentives around levels too.

Breakout participants first provided quick introductions about the perspective they bring to the conversation and their interest or intersection with the topic of credentialing.

- **Benjamin Druyon** from **IREN** shared they are bumping into some of the certification requirements in their attempt to uphold them. He is interested in how to increase ability for those already trained to get the jobs, noting skilled workers looking for work, and how to support contractors in bidding on larger projects

- **Leti Bustamante** from **SMART (Sheet Metal, Air, Rail and Transportation Workers)** shared about their statewide union and 3 local unions, and her role writing grants to support union training programs, noting they are a resource for workers

- **Ramsay Stevens** from **IBEW-NECA** noted that the challenge is that folks are not reaching out to their unions for help identifying contractors, reps, and installers with credentials, or about training resources to help someone meet that credential.

- **Susan Davison** from **CABEC (CA Association of Building Energy Consultants)** shared about their different levels of certification: Certified Energy Analyst, Associate Energy Analyst, and Energy Code Specialist.

- **Aisha Cervantes-Cissna** from **SDREN** noted that while only IOUs are required to bake these requirements into their contracts, RENs don't but are still required to do WF standards. She was curious how RENs are conveying those requirements, especially as SDREN is preparing to launch their programs.

The discussion highlighted challenges in maintaining consistent contractor credentialing and workforce standards across the construction and HVAC industries. Participants noted that enforcement is often weak, particularly among IOU programs, which may lack the capacity or commitment to ensure contractors meet required standards. Rural commercial markets struggle with limited regional contractor networks and difficulties connecting with local unions to place workers into jobs.

A major theme was the importance of institutional and market infrastructure to support credentialing systems. Apprenticeship programs such as IBEW-NECA were cited as examples of successful models because they are jointly funded by labor and contractors and tied directly to project work, allowing apprentices to gain hands-on experience while supporting long-term career pathways and specialized trade certifications. At the same time, participants noted that traditional apprenticeship pathways can be lengthy and difficult to scale, as well as limited in capacity. This led to discussion about the need for intermediate or tiered certifications that could provide smaller "step-in" opportunities for workers entering the field. CABEC's tiered certification structure was referenced as one example.

Finally, the group discussed workforce mobility challenges, noting that it can be difficult for workers to transfer skills and credentials across industries, technologies, and sectors. Participants suggested that more flexible, stackable certification systems could help workers move more easily between emerging technologies and career pathways.

Room 1.5 & 2.5 - Contractor Verification, Quality Assurance, and Consumer Protection

Key Themes

- **Workforce Standards Promote Quality Installations:** Workforce standards, when implemented and enforced, ensure complex systems are installed and performing correctly, which leads to energy savings.
- **Verification and Training of Installers:** Work quality varies across projects, despite levels of experience. Need for technicians/electricians to have the

training (not just the contract company) and company culture to promote high quality installations.
- **Enforcement as Key:** Enforcement is critical to ensuring quality installations and will result in significant energy savings. Without enforcement, there is a challenge for contractors following the rules being underbid by contractors who skip certain requirements (e.g. Mechanical Acceptance Testing).

Key Challenges

- **Verification Challenges**: Verification can be challenging. There is also a lack of awareness about how to verify workers meet standards. There is a database for all apprenticeships state-wide (union and non-union) that requires the last name and last 4 digits of SSN. CALCTP has an online database of certified technicians and you can verify online or call or email CALCTP to verify certifications or request a certified lighting electrician.
- **HVAC Installations without Permits:** An estimated 80% to 95% of all HVAC systems are installed without a building permit. Needs to be an incentive for those who are doing quality work.
- **AHJs Limited in Capacity for Verification:** Local building inspectors and authorities having jurisdiction (AHJs) have limited capacity to focus on quality assurance and credential verification and are focused on health and safety as a first priority. Could be a role for AHJs if systems were simplified. .

Proposed Recommendations

- **Develop enforcement that has teeth:** For standards to be reached, need real enforcement (e.g., could tie rebate and incentive payouts to verified workforce standard compliance).
- **Require More Detailed Information to Verify Credentials:** Require additional information, for example names contractors they have worked for, name of apprenticeship programs, credentials and years received.
- **Utilize Existing Databases:** Leverage centralized database systems (such as the public CALCTP individual roster or DIR apprenticeship databases) to easily find qualifications. There are also websites available by county that list HVAC technicians.

Rooms 1.6, 1.7 & 2.6 - Market Participation, Equity, and Access: Who Gets Left Out

Key Themes

- **Systemic Hurdles for Diverse and Small Businesses:** Small, minority-owned, and diverse business enterprises (SBE/DBE) face disproportionate administrative hurdles navigating complex utility data collection, insurance mandates, and

compliance documentation.**Disparities Between Rural and Urban Ecosystems:** Rural market realities are vastly different from metropolitan areas. Contractors in low-density zones often have backlogs of work and do not participate in programs that require them to jump through extensive administrative hoops or travel long distances to scope a single bid.

- **The Burden of Bureaucracy on "Mom and Pop" Shops:** Small, diverse, and Small Business Enterprise (SBE)/Disadvantaged Business Enterprise (DBE) contractors struggle to absorb the operational overhead required to participate in standardized programs.
- **Market Certainty and Scale:** For workforce development to succeed—whether through union apprenticeships or a contractor adding trucks and crews to a new region—there must be long-term market predictability and consistent project demand rather than "one-off" program structures.

Key Challenges

- **Overhead and Administrative Tracking:** Small contractors lack the dedicated administrative staff that large private equity-backed firms have to handle complex data collection, verification, and paperwork.
- **Upfront Cash Flow and Capital:** Smaller firms face critical barriers regarding access to cash flow financing, insurance requirements, and general business management support.
- **Opportunity Costs of Training:** Time is money. Taking time off for accredited training, paying registration fees, or traveling long distances to credentialing programs represents a direct loss of revenue for small operations.
- **Lack of Incentive to Participate:** Because local contractors in rural regions are already backlogged with standard work, they have very little appetite or motivation to "jump through hoops" to get certified for specialized programs.
- **Geographic Densities and Logistical Constraints:** Rural jobs often fail to "pencil out" because contractors face extensive travel times to get to sites or scope bids. In some areas, programs like TECH Clean California have zero incentives paid out due to a lack of geographic density and localized deployment.
- **Programmatic Fragmentation:** Standardizing rules on a small pool of work or within a single "one-off" EE program is challenging to make business sense for contractors who can find work entirely outside of the EE framework.

Proposed Recommendations

- **Provide Upfront Financial Subsidies & Cash Flow Support:** Heavily subsidize credentialing expenses and provide access to targeted business lines, cash-flow financing, and technical assistance to help small firms absorb compliance costs.

- **Provide Holistic Business Support:** Address barriers holistically by increasing contractor awareness of existing resources and offering direct assistance for upfront cash flow, insurance, and technical business management.
- **Implement Alternative Skill Verification:** Explore alternative pathways to formal credentialing, such as learn-on-the-job models, mentorships, and contractor-shadowing programs backed by localized, on-the-job skill verification.
- **Promote Equity in Labor Standards:** Find legal and programmatic mechanisms to pay prevailing wages and support labor standards specifically within smaller firms to eliminate the financial trade-off between equity and cost-effectiveness.
- **Bring Training to the Contractors:** "Meet them where they're at" by hosting smaller, hyper-local training sessions directly within the targeted communities to eliminate contractor travel times and build localized supply.
- **Form Cross-Agency Partnerships:** Look outside traditional CPUC/CEC constructs. Partner with local economic development agencies, workforce training organizations, and labor unions to utilize existing infrastructure and build a reliable 5-year apprenticeship pipeline.
- **Universalize Standards:** Consider expanding workforce standards universally beyond just niche EE programs so that the requirements apply to the broader market context, creating a level playing field.

Rooms 1.8, 2.7 & 2.8 - Coordination on Contractor Requirements: Across PAs and at the State Level

Key Themes

- **The "Value Contractor Time" Paradigm:** Training programs fail when they ignore that "time is money" for a mom-and-pop shop. Successful initiatives must actively respect a contractor's billable hours by offering stipends or flexible schedules.
- **Data Transparency for Performance Tracking:** Contractors and PAs are operating blind without access to long-term energy data. Granular, interval meter data analysis is vital to rank contractor performance over time and move away from delayed, multi-year evaluation cycles.

Key Challenges

- **The Threat of Private Equity:** Local high-road contractors (often running lean shops of 1 to 40 employees) struggle to compete against large,

private-equity-backed firms that employ dedicated administrative teams to capture bids.

- **The Regulatory "Sticky Wicket":** Regulators face a steep challenge when attempting to mandate high-road jobs and higher labor standards, as these equity requirements drive up the upfront cost of heat pump installations, making it incredibly difficult to pass strict statutory cost-effectiveness tests.

Proposed Recommendations

- **Enact Top-Down Program Guidelines:** Establishing clear workforce pathways and guidelines should come top-down from state agencies rather than bottom-up, ensuring universal, predictable rules across all energy efficiency and electrification portfolios.
- **Deploy Mentorship, Shadowing, and Paid Stipends:** Shift funding away from shelf-bound educational materials and invest directly in hands-on mentorship programs. Implement models where newer employees are paid to shadow experienced contractors, supported by comprehensive stipends to cover their time.
- **Pay Extra for Real-Time Data Sharing:** Incentivize contractors by paying them a direct bonus or stipend for entering real-time installation data (such as refrigerant levels) directly into the PA system at the job site.
- **Offer "Cross-Jurisdictional" Edge Training:** Smaller RENs should coordinate and host technical workshops right on the borders of neighboring service territories, sharing training calendars transparently to cross-pollinate rural workforces.

Appendix E: Workshop Clarifications

As part of the breakout room discussions and comments in the workshop evaluations, several items warrant clarification. These include:

- the differentiation between contractors (often referring to the company that oversees a job) and workers (individuals who carry out the work, including technicians and electricians)
- the wide-spread availability of HVAC apprenticeship programs for both union and non-union workers within the state of California (see detailed notes below and updated slide 35)
- CALCTP certification being open to both union and non-union electricians; confirmation that CALCTP Installer certification applicants must be California

state-certified General Electricians and clarification on lighting installations being performed by licensed electricians (see detailed follow-up from CALCTP below)

Apprenticeship Programs

- An update has been made to **Slide 35** of the Opinion Dynamics presentation on workforce standards to clarify that the information provided by Opinion Dynamics was based on their reviews completed for the Workforce Standards Evaluation (2024) and that the C-20 license can be held by individuals who meet requirements.
- There are many Sheet Metal and Pipefitting HVAC apprenticeships in California that are both Division of Apprenticeship Standards (DAS) and federally approved. For a detailed list visit: https://www.dir.ca.gov/das/das.html
- Additional clarifying points on apprenticeships were provided by **Chris Ruch, SMW Local 104:**
    - Apprentice verification is publicly available on the DIR database
        - Graduates can be verified by their name (no SSN needed) https://www.dir.ca.gov/databases/das/ApprenticeGradSearch.asp
        - Current apprentices can be verified but do need a SSN - https://www.dir.ca.gov/das/appcertpw/appcertsearch.asp
    - A technician can hold a C-20 license and use it to satisfy workforce standard requirements under D.18-10-008, unless they are restricted by their organization on holding a C-20 license.
        - There are 11,350 **ACTIVE** individuals with C20 licenses within the state.
        - The Bureau of Labor Statistics estimates that there are, as of its latest report, 97,490 Sheet Metal Workers within the State of California. (*see* https://www.bls.gov/oes/2023/may/oes472211.htm)
    - California has their own state accredited apprenticeship program instead of using the federal.
    - There are non-union apprenticeships for HVAC. Apprenticeships simply mean that you are offering an accredited level of training.
        - The DIR's Division of Apprenticeship Standards reports that over the last five years, an average of 462 individuals have graduated from a Sheet Metal apprenticeship program.
            i. 55.4 on average have come from unilateral programs, making the SMW programs and their JATC's responsible for 88.1% of all graduates during that period.
                1. https://public.tableau.com/app/profile/california.apprenticeship/viz/CompletionDashboard_16301020658110/CompletionDashboard

CALCTP Clarifications

CalEnergy Corporation provided the following information to help clarify lighting requirements and CALCTP certification discussed at the CAEECC-hosted Workshop on Workforce Standards:

1. CALCTP is open to both union and non-union electricians
CALCTP certification is open to both union and non-union electricians. CALCTP is not limited to union electricians or union contractors.

2. California uses different terms for contractors and individual electricians
California uses different terminology depending on whether we are referring to the contractor/business or the individual worker.

- At the contractor level, electrical installation work is performed under a C-10 Electrical Contractor license issued by the Contractors State License Board (CSLB).
- At the individual worker level, California generally refers to certified electricians, not “licensed electricians.”
- Electrician certification requirements are administered by the California Department of Industrial Relations, Division of Labor Standards Enforcement, Electrician Certification Unit (DIR/DLSE).

For lighting installations that involve wiring, connecting, installing, altering, repairing, or maintaining electrical devices, that work should be treated as electrical work. Under DIR/DLSE requirements, individuals performing electrician work for a C-10 Electrical Contractor must hold the appropriate California electrician certification, unless they are otherwise lawfully authorized, such as a registered apprentice or electrician trainee working under the applicable DIR/DLSE requirements.

3. Nonresidential Lighting Technician certification is limited in scope
California does recognize a specific electrician certification classification called Nonresidential Lighting Technician through DIR/DLSE. That classification is tied to nonresidential lighting maintenance and retrofit installations, including installing, repairing, and maintaining nonresidential lighting while employed by a C-10 Electrical Contractor engaged in that type of work.
However, that classification should not be viewed as a blanket substitute for a certified General Electrician on all lighting projects, particularly:

- new construction projects;
- broader electrical system installations;
- new branch-circuit wiring;
- lighting-control panels;
- control wiring;

- panels, devices, and related electrical infrastructure outside the maintenance or retrofit scope.

This distinction is especially important when ratepayer-funded incentives are being provided for lighting systems on new construction projects. In those cases, the work may involve the installation of new lighting systems, lighting controls, branch-circuit wiring, control wiring, panels, devices, and related electrical infrastructure. Because the Nonresidential Lighting Technician classification is more narrowly framed around nonresidential lighting maintenance and retrofit work, it is important that projects relying on ratepayer incentives use properly certified electricians whose certification scope aligns with the work being performed.

4. CPUC Decision 18-10-008 and equivalent training programs

As it relates to CPUC Decision 18-10-008, the covered workforce standard for lighting controls requires applicable nonresidential lighting-control projects to utilize installation technicians certified by CALCTP, or another program that has been formally approved as equivalent through the California Public Utilities Commission's required process.

In evaluating any equivalent training program, it is important to ensure that the program's applicant requirements align with California's underlying requirements for electrical installation work, including:

- Contractors State License Board licensing requirements for C-10 Electrical Contractors; and
- Department of Industrial Relations / Division of Labor Standards Enforcement electrician certification requirements for individual workers.

CALCTP certification supports the CPUC workforce standard, but it does not replace the requirement that electrical installation work be performed under the appropriate CSLB C-10 Electrical Contractor license by properly certified electricians, or by individuals otherwise lawfully authorized under DIR/DLSE requirements.

A training program that does not require applicants performing lighting-control installation work to hold the appropriate California electrical certification could create a risk that ratepayer-funded projects are being installed by individuals who are not legally authorized to perform that work.

5. CALCTP Installer applicant requirements

For this reason, CALCTP requires CALCTP Installer certification applicants to be California state-certified General Electricians. This requirement is intended to ensure that CALCTP-certified installers meet both:

- the CPUC workforce standard for covered lighting-control projects; and
- California's underlying CSLB/DIR requirements for the electrical installation work being performed.

6. CALCTP Acceptance Test Technician certification

CALCTP Acceptance Test Technician certification has separate eligibility pathways. Applicants may qualify through different professional backgrounds if they meet the applicable program requirements.

However, CALCTP certification does not replace CSLB contractor licensing requirements or DIR/DLSE electrician certification requirements for performing electrical installation work.