

ET Summit 2024

Presented by



Online Workforce Education and Training

One of the Answers to California HVACR Energy
Efficiency

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- **Introduction**

- **I'm Chris Compton, Founder and Owner of HVACRedu.net**

- **46 Years in the HVACR industry**

- **30 Years Teaching HVACR**

- **Launched HVACRedu.net in 1997 with an AP Sloan Director's Grant**

HVACRedu.net is the only accredited online HVACR technical program



Client Base

- National and Local Contractors
- Facility Physical Plant Crews
- Federal and State Agencies
 - GSA Advantage Vendor
- Utility Energy Efficiency Programs
- Apprenticeship Programs in 20+ States
- Programs for HVACR Technicians
- Certification Programs
 - NATE
 - HVAC Excellence



California CPUC WET program beginning 2010



Award winning **ItsAboutQ.net** Program

This Is What I What I Want to Talk About!

Disclosure:

This is not meant to be a shameless plug but rather a presentation on what an online/on-demand program has accomplished to boost the California HVACR Technical Workforce towards performing quality work which will ultimately increase energy efficiency of HVACR systems in the State.

California CPUC Sponsored Online/On-Demand WET program beginning 2010



Award winning **ItsAboutQ.net** Program

Over the past 2 decades HVACR Technology has advanced rapidly due to Digital Technology. The same Digital Technology has advanced Work Force Education and Training providing access for anytime/anywhere learning for HVACR Technicians.

- **Current program offerings include 2500 hours of HVACR technical content**
 - **Entry-Level Fundamentals to Advanced Technologies**
 - **20,154 Completions in California logged in 2023**
 - **70%+ Students are from Disadvantaged zip codes**
 - **Fulfilling some CA economic development initiatives**
 - **Developed Hundreds of NATE & HVAC Excellence Certified Technicians**
 - **Thousands of Hours of Advanced Technology Delivered to CA Workforce**
 - **Brings top tier national HVACR educators to the learners**



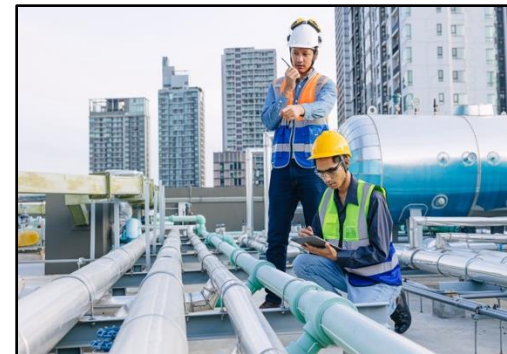
Programs Offered to California HVACR Workforce

- **Certified Technician Programs**
 - NATE
 - HVAC Excellence
 - Spanish NATE
- **Advanced Programs**
 - Building Automation Systems
 - Metasys Tech
 - Commercial Refrigeration Systems
 - CO2 Refrigeration Systems
 - Rack Tech
 - Chiller Mechanic
 - Boiler Tech
 - Water Treatment for HVACR Systems
 - HVACR Apprenticeship
 - Mini-Splits



Scope of HVACR Technical Workforce in the US

- No reliable workforce numbers from the US or State DOL
 - There are multiple categories that involve HVACR technology
 - Many career paths are not indexed to HVACR occupation but require the same training
- Examples
 - Boiler Makers
 - Facility Engineers
 - Multi-Family Housing Maintenance
 - Hotel Maintenance
 - Plant Maintenance



Scope of HVACR Technical Programs in the US

- **1400 Private and Public Post Secondary Programs**
 - **Certificate Programs - (2 Semesters / 750 – 1200 Hours)**
 - **AAS - (4 Semesters / 3 Semesters Technical / 1 Semester Gen Ed)**
 - **Successful programs have a Ratio of 50/50% mix Classroom & Lab**
- **US programs generate 30,000 entry-level technicians annually**
- **350 High School Introductory Programs**
 - **Unknown how many go into the trade from High School**
- **Non-Union Apprenticeship 3-5 Years / 432Hrs. - 720 Hrs. + 6,000 to 10,000 OJL**
- **Union apprenticeship programs**
 - **4-5 years / 576 to 720 training + 8000 to 10000 OJL**

Scope of HVACR Technical Programs in the US

- The HVACR workforce needing the same HVACR training is found in two primary areas:
 - Contractor Technicians
 - Facilities Technicians. (Often overlooked)
- Educated estimate is 40-50% of the existing workforce has had no formal training.
 - Well respected experts believe the percentage is even higher
- Current state of entry-level CC & Private HVACR technology training programs
 - No national standardized curriculum & lack of consistency in curriculum
- Conventional programs don't have enough TIME to get beyond the fundamentals
 - Fundamentals is the MOST IMPORTANT portion of HVACR technical training!

Scope of HVACR Technical Programs in California

- In 2022 US DOL reports 38,380 HVAC Mechanics and Installers in California
 - The educated estimate is 200,000+ in California

California Community College HVACR Technical Programs

- 26 Schools offered at least one section of HVACR instruction in the 2022-2023 school year
- State data says there are 4,500 students enrolled in CC HVACR programs at any point in time
- Largest concern is not enrollments but availability of qualified Instructors & Student retention to completion

California Accredited Private HVACR Technical Schools

- 18 HVACR programs state-wide

California Union HVACR Apprenticeship (UA)

- Approximately 1500 apprentices statewide

Typical HVACR Technician Career Track Post Completing Program

- Normal career track for a HVACR technician IF they have completed formal training
 - It takes time to get their feet on the ground and a level of experience that makes a difference in their energy efficiency performance with HVACR systems.
 - Typically spend 2-5+ years working in the trade before identifying a distinct career track

Typical Career Track for Those That Did Not Attend a Formal Training Program

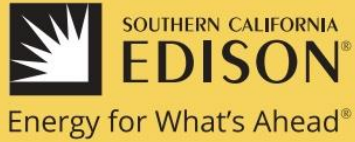
- Hired on as a helper for OJT experience **(40%+ of the current workforce)**
- OJT takes years if the person perseveres and continues working (and Learning)
- Learn from others that also have no formal training
- Don't see the career and move on to other occupations
- Do they have a career or a job?

The HVACR Energy Efficiency Challenge

- **The challenge for HVACR Energy Efficiency programs is the WORKFORCE!**
 - Without a trained workforce the goal of achieving energy efficiency will never be met
- One logical solution is the use of online/on-demand
 - Online provides access to the workforce 24/7/365
 - **The key word is ACCESS!**
 - No travel, No schedule, done from home or office, online/on-demand
 - The minimum student count to offer quality WET to the HVACR workforce is ONE

The HVACR Energy Efficiency Challenge

California Initiatives Related to the HVACR Technical Workforce



PATHWAY 2045

Update to the Clean Power and Electrification Pathway

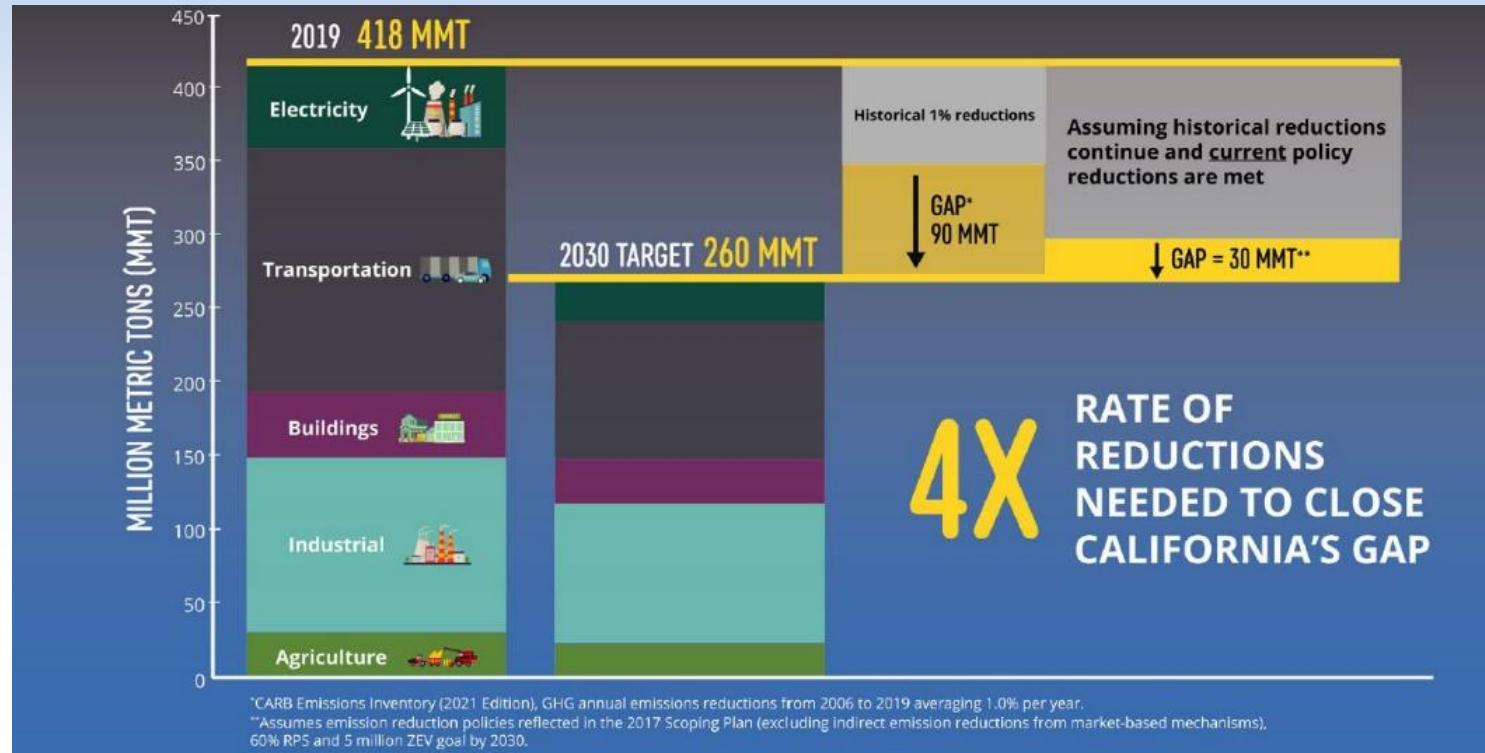
“Approximately one-third of building space and water heating will need to be electric by 2030 and almost three-quarters by 2045. Building electrification will increase electric load nearly 50 TWh by 2045 – representing almost 15% of the total 2045 grid load.

Like transportation, buildings offer an opportunity to provide flexible loads, which can be optimized to use power when it is most efficient and reduces grid upgrade costs.

In 2045, California’s grid will continue to be a summer peaking system driven by air-conditioning loads, however space heating electrification during the winter will improve system utilization.

Achieving customer conversions from natural gas to electric technologies requires customers to understand and realize the benefits of electrification. **Electric alternatives and trained technicians to install and maintain them need to be easily available.**”

An excerpt from Mind the Gap:



If California is to meet its 2030 and 2045 climate change goals, the state must quadruple its annual rate of greenhouse gas reductions by adopting market-transforming policies and incentives that address historical inequities within the next 1-2 years.

Policy Recommendations to Close the Gap at the State Level

State policies to accelerate building electrification would adopt statewide heat pump targets to achieve the electrification of one-third of all space and water heating by 2030.

Conclusion

By 2030 one-third of buildings space and water heating will need to be electric and three-quarters by 2045 representing 15% of the 2045 grid load. The peak load will continue to be summer air-conditioning. The obvious implications to the HVAC workforce is Heat Pump technology, a logical direction.

The function of Heat Pump systems requires solid knowledge and skills dealing with the refrigeration cycle, electrical circuitry, and air flow in conditioned space. The sophistication of the controls, system design and operating components must be well understood by the technical workforce to maintain operational efficiency. These are all part of the fundamental knowledge base.

A “Times 4” acceleration of the rate of reductions to meet 2030 and 2045 climate change goals will require a “Times 4” increase in many initiatives on California’s table. This would indicate a “Times 4” increase in HVACR workforce WET.

Thank You for Listening!

My Mission is to Build Awareness of Other Forms of Workforce Training for the Skilled Trades.

My Contact:

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Pertinent Links:

HVACR Career Map: <https://www.hvaccareermap.org/>
California HVACR Program: <https://www.hvacred.net/itsaboutq-net/>
Master Catalog: https://hvacrassets.net/Master_catalog.pdf