

CTE Program Review

Heating, Ventilating, Air Conditioning and Refrigeration

HVACR

Vic Cafarchia

1. How strong is the occupational demand for the program? How has the demand changed in the past 5 years and what is the outlook for the next 5 years?

Heating, air-conditioning, and refrigeration mechanics and installers held about 308,200 jobs in 2008; about 54 percent worked for plumbing, heating, and air-conditioning contractors. The rest were employed in a variety of industries throughout the country, reflecting a widespread dependence on climate-control systems. Some worked for refrigeration and air-conditioning service and repair shops, schools, and stores that sell heating and air-conditioning systems. Local governments, the Federal Government, hospitals, office buildings, and other organizations that operate large air-conditioning, refrigeration, or heating systems also employed these workers. About 16 percent of these workers were self-employed.

Employment of heating, air-conditioning, and refrigeration mechanics and installers is projected to increase 28 percent during the 2008-18 decade, much faster than the average for all occupations. As the population and stock of buildings grows, so does the demand for residential, commercial, and industrial climate-control systems. Residential HVACR systems generally need replacement after 10 to 15 years; the large number of homes built in recent years will enter this replacement timeframe by 2018. The increased complexity of HVACR systems, which increases the possibility that equipment may malfunction, also will create opportunities for service technicians. A growing focus on improving indoor air quality and the increasing use of refrigerated equipment by a rising number of stores and gasoline stations that sell food should also create more jobs for heating, air-conditioning, and refrigeration technicians.

Concern for the environment and the need to reduce energy consumption overall has prompted the development of new energy-saving heating and air-conditioning systems. This emphasis on better energy management is expected to lead to the replacement of older systems and the installation of newer, more efficient systems in existing homes and buildings. Also, demand for maintenance and service work should rise as businesses and homeowners strive to keep increasingly complex systems operating at peak efficiency. Regulations prohibiting the discharge and production of older types of refrigerants that pollute the atmosphere should continue to result in the need to replace many existing air conditioning systems or to modify them to use new environmentally safe refrigerants. The pace of replacement in the commercial and industrial sectors will quicken if Congress or individual States change tax rules designed to encourage companies to buy new HVACR equipment.

Job prospects for heating, air-conditioning, and refrigeration mechanics and installers are expected to be excellent, particularly for those who have completed training from an accredited technical school or a formal apprenticeship. A growing number of retirements of highly skilled technicians are expected to generate many more job openings. Many contractors have reported problems finding enough workers to meet the demand for service and installation of HVACR systems.

Technicians who specialize in installation work may experience periods of unemployment when the level of new construction activity declines, but maintenance and repair work usually remains relatively stable. People and businesses depend on their climate-control or refrigeration systems and must keep them in good working order, regardless of economic conditions.

In light of the complexity of new computer-controlled HVACR systems in modern high-rise buildings, prospects should be best for those who can acquire and demonstrate computer competency. Training in new techniques that improve energy efficiency will also make it much easier to enter the occupation.

Projections Data

Projections data from the National Employment Matrix					
Occupational Title	SOC Code	Employment, 2008	Projected Employment, 2018	Change, 2008-18	
				Number	Percent
Heating, air conditioning, and refrigeration mechanics and installers	49-9021	308,200	394,800	86,600	28%

Earnings

Median hourly wages of heating, air-conditioning, and refrigeration mechanics and installers were \$19.08 in May 2008. The middle 50 percent earned between \$14.94 and \$24.84 an hour. The lowest 10 percent earned less than \$12.19, and the top 10 percent earned more than \$30.59. Median hourly wages in the industries employing the largest numbers of heating, air-conditioning, and refrigeration mechanics and installers were:

Local government	\$22.79
Hardware, and plumbing and heating equipment and supplies merchant wholesalers	22.18
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	20.83
Direct selling establishments	20.03
Building equipment contractors	18.26

Apprentices usually earn about 50 percent of the wage rate paid to experienced workers. As they gain experience and improve their skills, they receive periodic increases until they reach the wage rate of experienced workers.

Heating, air-conditioning, and refrigeration mechanics and installers generally receive a variety of employer-sponsored benefits. In addition to typical benefits such as health insurance and pension plans, some employers pay for work-related training and provide uniforms, company vans, and tools.

About 15 percent of heating, air-conditioning, and refrigeration mechanics and installers are members of a union. The unions to which the greatest numbers of mechanics and installers belong are the Sheet Metal Workers International Association and the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada.

2. What is the district's need for the program?

Due to the increase of FTES in the HVACR program, we have been getting assistance from Compton College by starting another HVACR program. Some institutions might consider this as a downfall but we look at it as the program expanding and a plus for the students wishing to enter the HVACR program. **“Green” technology and higher efficiency equipment** needs within our community (Los Angeles County) have become more appealing to our students and the states new environmental needs for green technologies is increasing.

Green Occupations

- Alternative Fuel Vehicle Salespersons • Alternative Fuel Vehicle Service Technicians
- Architects (sustainable design) • Building Materials Specialists/Sales Reps (green/sustainable building materials) • Buyers and Purchasing Agents/Managers • Carpenters (green building) • Civil Engineers • Construction Managers • Construction Supervisors, First-Line • Cost Estimators • Customer Service Representatives • Drafters and CAD Technicians • Electrical and Electronic Engineering Technicians • Electrical Engineers • Electricians • Energy Engineers • Engineering Managers • HVAC Service Technicians and Installers • HVAC Salespersons • Landscape Architects (sustainable design) • Machinists • Maintenance and Repair Workers, General • Materials Engineers • Mechanical Engineering Technicians • Mechanical Engineers • Plumbers, Pipefitters, and Steamfitters • Roofers • Sales Engineers, Including **Solar/Renewable Energy and HVAC Systems** • Solar Energy Systems Designers/Engineers • Solar Energy Systems Installation Supervisors/Project Managers • Solar Energy Systems Installers/Technicians • Solar Energy Systems Sales Representatives • Solar Energy Systems Service Technicians • Sustainability Coordinators • Team Assemblers • Urban and Regional Planners, Including Land Use Planners

Top Surveyed Green Jobs OES median wage* by training level

High skill—BA or higher Architect \$81, 105
Construction Manager \$101,354

Skilled—2 years of education or training
 Carpenters\$51,839
 Electricians\$53,314
Farmers, Sustainable (emerging)\$94,164
 Plumbers\$50,643
HVAC Technicians\$46,625

Up to one year training
 Assemblers\$23,959
Farm Workers, sustainable (emerging)\$23,476
 HAZMAT workers\$40,520
Recycling Center Operators (emerging)\$39,678

****Source: 2009 Occupational Employment Statistics. Not a green survey wage!***

As long as we are able to place more students into the industry, hopefully it might look as sign that the economy has a chance of turning around.

3. What is the state's need for the program?

The state of California has mandated that the HVACR industry work in compliance with the power companies, manufacturers, unions and educational institutions to save energy. Why is this happening? The HVACR industry uses 75% of all power to run its equipment. In order to work on curbing the energy consumption the industry must learn other means by establishing stronger high efficiency guidelines for our equipment and educating our state in accomplishing such a challenge. The state has requested that all educational institutions work together in educating our students to accomplish such a task.

California employment of heating, air-conditioning, and refrigeration mechanics and installers is projected to increase 28 percent during the 2008-18 decade, much faster than the average for all occupations. As the population and stock of buildings grows, so does the demand for residential, commercial, and industrial climate-control systems. Residential HVACR systems generally need replacement after 10 to 15 years; the large number of homes built in recent years will enter this replacement timeframe by 2018. The increased complexity of HVACR systems, which increases the possibility that equipment may malfunction, also will create opportunities for service technicians. A growing focus on improving indoor air quality and the increasing use of refrigerated equipment by a rising number of stores and gasoline stations that sell food should also create more jobs for heating, air-conditioning, and refrigeration technicians. Concern for the environment and the need to reduce energy consumption overall has prompted the development of new energy-saving heating and air-conditioning systems. This emphasis on better energy management is expected to lead to the replacement of older systems and the installation of newer, more efficient systems in existing homes and buildings. Also, demand for maintenance and service work should rise as businesses and homeowners strive to keep increasingly complex systems operating at peak efficiency. Regulations prohibiting the discharge and production of older types of refrigerants that

pollute the atmosphere should continue to result in the need to replace many existing air conditioning systems or to modify them to use new environmentally safe refrigerants. The pace of replacement in the commercial and industrial sectors will quicken if Congress or individual States change tax rules designed to encourage companies to buy new HVACR equipment. Job prospects for heating, air-conditioning, and refrigeration mechanics and installers are expected to be excellent, particularly for those who have completed training from an accredited technical school or a formal apprenticeship. A growing number of retirements of highly skilled technicians are expected to generate many more job openings. Many contractors have reported problems finding enough workers to meet the demand for service and installation of HVACR systems. Technicians who specialize in installation work may experience periods of unemployment when the level of new construction activity declines, but maintenance and repair work usually remains relatively stable. People and businesses depend on their climate-control or refrigeration systems and must keep them in good working order, regardless of economic conditions. In light of the complexity of new computer-controlled HVACR systems in modern high-rise buildings, prospects should be best for those who can acquire and demonstrate computer competency. Training in new techniques that improve energy efficiency will also make it much easier to enter the occupation.

4. How does the program address needs that are not met by other similar programs in the area?

One of the goals the HVACR program is to become "**Green**". In order to accomplish this goal the instructors have gone through extensive training at institutions throughout the state. Through CTEA grants, **high efficiency** equipment (energy saving equipment) has been purchased for instruction in the labs to help our students get a better understanding of "**green**" in the HVACR program. A new solar class that includes basic **photovoltaics and solar thermal** has also been added to the program. It will begin in the summer of 2011. We are also in the process of adding a new **green certificate** to the program.

5. Are the students satisfied with their preparation for employment? Are the employers in the field satisfied with the level of preparation of our graduates?

The students are now working with the best equipment and proper tools in the lab and it will prepare them for a higher status of employment. Students must pass the **National EPA (Environmental Protection Agency) Exam**. Students are not able to get employment in the HVACR industry unless they pass the exam. Most employers present the future employee with a written and practical test before they are offered employment. We have a 95% pass rate from our students. The HVACR program at El Camino College is one of the best programs in the area; employers call our instructors and request our students for employment before they have graduated. Our students come to

the HVACR program from throughout the Los Angeles basin. With the help of our advisory board, the HVACR program at EI Camino College has become the best of the best in the industry.

6. What are the completion success and employment rates for the students?

The HVACR program at EI Camino College, up until the economy has faltered, had a 98% employment rate. That figure has decline to about 60% within the last two years due to economic downfalls. The certificate rates have increased with the addition of three more certificates to the program. This should help our student's chances of employment in the future.

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