

Labor Market Analysis: 0946.00/Environmental Control Technology (HVAC)

HVAC and Refrigeration - Associate of Science (A.S.) degree; Certificate requiring 30 to <60 semester units

Los Angeles Center of Excellence, December 2023

Summary

Program Endorsement:	Endorsed: All Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some Criteria Met <input type="checkbox"/>	Not Endorsed <input type="checkbox"/>
Program Endorsement Criteria			
Supply Gap:	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
Living Wage: (Entry-Level, 25th)	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
Education:	Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>
Emerging Occupation(s)			
	Yes <input type="checkbox"/>		No <input checked="" type="checkbox"/>

The Los Angeles Center of Excellence for Labor Market Research (LA COE) prepared this report to provide regional labor market supply and demand data related to two middle-skill occupations:

- **Sheet Metal Workers (47-2211)** Fabricate, assemble, install, and repair sheet metal products and equipment, such as ducts, control boxes, drainpipes, and furnace casings. Work may involve any of the following: setting up and operating fabricating machines to cut, bend, and straighten sheet metal; shaping metal over anvils, blocks, or forms using hammer; operating soldering and welding equipment to join sheet metal parts; or inspecting, assembling, and smoothing seams and joints of burred surfaces. Includes sheet metal duct installers who install prefabricated sheet metal ducts used for heating, air conditioning, or other purposes.¹
- **Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)** Install or repair heating, central air conditioning, HVAC, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves.²

Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.³ This report is intended to help determine whether there is demand in the local

¹ [Sheet Metal Workers : Occupational Outlook Handbook \(bls.gov\)](#)

² [Heating, Air Conditioning, and Refrigeration Mechanics and Installers \(bls.gov\)](#)

³ The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for these HVACR occupations in the region. Furthermore, entry-level wages exceed the self-sufficiency standard wage in both Los Angeles and Orange counties, and the majority of annual openings for the occupations in this report typically require a postsecondary non-degree award. **Therefore, due to all the criteria being met, the LA COE endorses this proposed program.** Detailed reasons include:

Demand:

- **Supply Gap Criteria** – Over the next five years, **1,671 jobs** are projected to be available annually in the region due to new job growth and replacements, which is **more** than the three-year average of **995 awards** conferred by educational institutions in the region.
- **Living Wage Criteria** – Within Los Angeles County, both occupations have entry-level wages **above** the self-sufficiency standard hourly wage (\$18.10/hour).⁴
- **Educational Criteria** – Within the greater LA/OC region, **79% of the annual job openings** for occupations related to HVACR **typically require a postsecondary non-degree award.**
 - Furthermore, the national-level educational attainment data indicates **between 34% and 44% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **11 community colleges** in the greater LA/OC region that issue awards related to HVACR, conferring an average of **365 awards annually** between 2019 and 2022.
- Between 2019 and 2021, an average of **630 awards** were conferred annually in related training programs by non-community college institutions throughout the greater LA/OC region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these HVACR occupations. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to increase by 7% through 2027. There will be nearly 1,700 job openings per year through 2027 due to job growth and replacements.

⁴ Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties⁵

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	10,694	11,373	678	6%	1,069
Orange	5,759	6,228	469	8%	601
Total	16,454	17,601	1,147	7%	1,671

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these HVACR occupations in Los Angeles County as they relate to the county’s self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater LA/OC region. Detailed wage information, by county, is included in Appendix A.

Los Angeles County

Both occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages range between \$20.44 and \$22.00. Experienced workers can expect to earn wages between \$36.53 and \$49.18.

Exhibit 2: Earnings for Occupations in LA County

Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)	Median Annual Earnings*
Sheet Metal Workers (47-2211)	\$22.00	\$34.57	\$49.18	\$71,900
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	\$20.44	\$27.17	\$36.53	\$56,500

*Rounded to the nearest \$100

Orange County

Both occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages range between \$23.83 and \$24.75. Experienced workers can expect to earn wages between \$41.22 and \$54.43.

Exhibit 3: Earnings for Occupations in Orange County

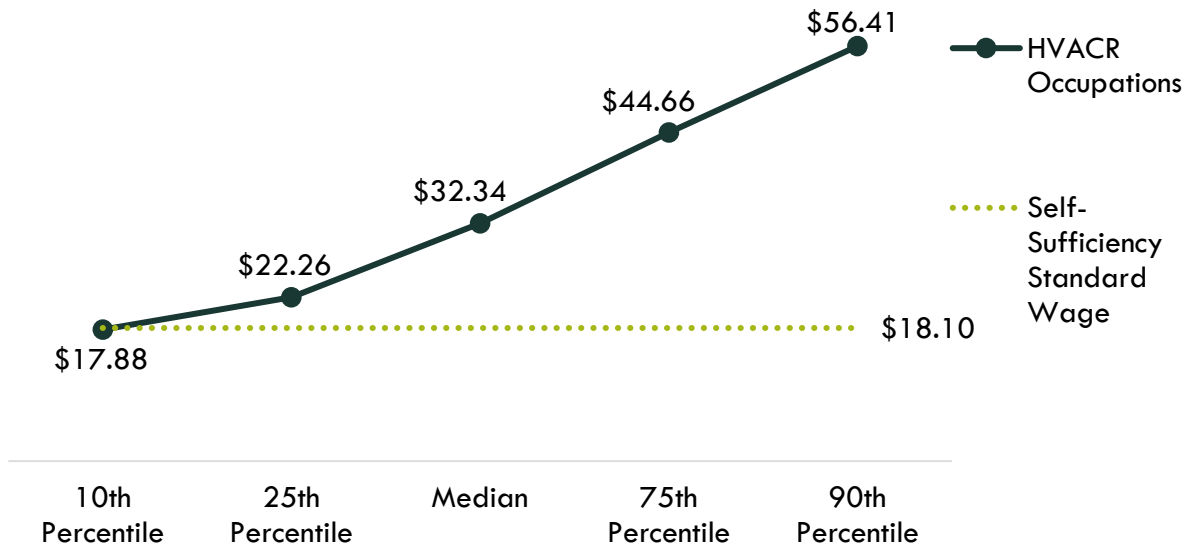
Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)	Median Annual Earnings*
Sheet Metal Workers (47-2211)	\$24.75	\$39.07	\$54.43	\$81,300
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	\$23.83	\$31.26	\$41.22	\$65,000

*Rounded to the nearest \$100

⁵ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

On average, the entry-level earnings for the occupations in this report are \$22.26; this is above the living wage for one single adult in Los Angeles County (\$18.10). Exhibit 4 shows the average wage for the occupations in this report, from entry-level to experienced workers.

Exhibit 4: Average Hourly Earnings for HVACR Occupations in LA/OC



Job Postings

There were 3,027 online job postings related to HVACR occupations listed in the past 12 months. Exhibit 5 displays the number of job postings by occupation. The majority of job postings (86%) were for *heating, air conditioning, and refrigeration mechanics and installers*, followed by *sheet metal workers* (14%). The highest number of job postings were for HVAC technicians, HVAC service technicians, HVAC installers, refrigeration technicians, and commercial refrigeration service technicians. The top skills were HVAC, preventative maintenance, plumbing, hand tools, boilers, and ventilation. The top three employers, by number of job postings, in the region were Coolsys, Aerotek, and GPAC.

Exhibit 5: Job postings by occupation (last 12 months)



Educational Attainment

The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the occupations in this report:

- **Postsecondary non-degree award:** *Heating, air conditioning, and refrigeration mechanics and installers*
- **High school diploma or equivalent:** *Sheet metal workers*

In the greater LA/OC region, the majority of annual job openings (79%) typically require a postsecondary non-degree award. Furthermore, the national-level educational attainment data indicates between 34% and 44% of workers in the field have completed some college or an associate degree. Of the 41% of HVACR job postings listing a minimum education requirement in the greater Los Angeles/Orange County region, 88% (1,082) requested high school or vocational training, 5% (61) requested an associate degree, and 7% (83) requested a bachelor's degree.

Educational Supply

Community College Supply

Exhibit 6 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are Cypress, LA Trade-Tech, and Mt. San Antonio.

Exhibit 6: Regional community college awards (certificates and degrees), 2019-2022

TOP	Program	College	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Average
0946.00	Environmental Control Technology (HVAC)	Citrus	4	2	-	2
		Compton	18	2	5	8
		El Camino	80	5	45	43
		LA Trade-Tech	72	63	80	72
		Mt San Antonio	35	30	55	40
		LA Subtotal	209	102	185	165
		Cypress	84	128	125	112
		Orange Coast	50	41	44	45
		OC Subtotal	134	169	169	157
Supply Subtotal/Average			343	271	354	323
0946.10	Energy Systems Technology	LA Trade-Tech	18	12	14	15
		Mt San Antonio	8	3	13	8
		Pasadena	5	6	9	7
		Rio Hondo	7	1	4	4
		Santa Monica	2	2	-	1
		LA Subtotal	40	24	40	35
Supply Subtotal/Average			40	24	40	35
0956.40	Sheet Metal and Structural Metal	Long Beach	1	11	11	8
		LA Subtotal	1	11	11	8
Supply Subtotal/Average			1	11	11	8
Supply Total/Average			384	306	405	365

Non-Community College Supply

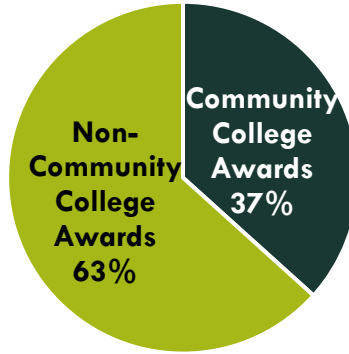
For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for HVACR occupations. Exhibit 7 shows the annual and three-year average number of awards conferred by these institutions in relevant programs. Due to different data collection periods, the most recent three-year period of available data is from 2019 to 2021. Between 2019 and 2021, non-community college institutions in the region conferred an average of 630 sub-baccalaureate awards. Sub-baccalaureate awards include associate degrees, postsecondary awards, and other academic awards.

Exhibit 7: Regional non-community college awards, 2019-2021

CIP	Program	Institution	2019-20 Awards	2020-21 Awards	2-Year Average
47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/ Technician	Baldwin Park Adult & Community Education	14	11	13
		Brownson Technical School	13	142	78
		Capstone College	36	20	28
		Hacienda La Puente Adult Education	-	23	12
		InterCoast Colleges-Santa Ana	2	-	1
		InterCoast Colleges-West Covina	28	16	22
		UEI College-Gardena	115	88	102
		United Education Institute-Encino	96	113	105
		United Education Institute-Garden Grove	94	132	113
		United Education Institute-Huntington Park Campus	103	118	111
		United Education Institute-West Covina	58	38	48
		Supply Total/Average			559

Exhibit 8 shows the proportion of community college awards conferred in LA/OC compared to the number of non-community college awards for the programs in this report. Just over one in three awards conferred in these programs are awarded by community colleges in the LA/OC region.

Exhibit 8: Community College Awards Compared to Non-Community College Awards in LA/OC Region, 3-Year Average



Appendix A: Occupational demand and wage data by county

Exhibit 9. Los Angeles County

Occupation (SOC)	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Sheet Metal Workers (47-2211)	2,223	2,290	67	3%	219	\$22.00	\$34.57	\$49.18
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	8,472	9,083	611	7%	850	\$20.44	\$27.17	\$36.53
Total	10,694	11,373	678	6%	1,069	-	-	-

Exhibit 10. Orange County

Occupation (SOC)	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Sheet Metal Workers (47-2211)	1,224	1,285	61	5%	127	\$24.75	\$39.07	\$54.43
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	4,535	4,944	408	9%	475	\$23.83	\$31.26	\$41.22
Total	5,759	6,228	469	8%	601	-	-	-

Exhibit 11. Los Angeles and Orange Counties

Occupation (SOC)	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	% Age 55 and older*	Typical Entry-Level Education
Sheet Metal Workers (47-2211)	3,447	3,575	128	4%	346	24%	High school diploma or equivalent
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	13,007	14,026	1,020	8%	1,325	22%	Postsecondary non-degree award
Total	16,454	17,601	1,147	7%	1,671	-	-

*The average percentage of workers age 55 and older across all occupations in the greater LA/OC region is 27%. These occupations have a smaller share of older workers, which typically indicates fewer replacements needed to offset the amount of impending retirements.

Appendix B: Sources

- O*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor’s Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women’s Welfare, University of Washington
- Chancellor’s Office Curriculum Inventory (COCI 2.0)

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