Environmental Control Technology (HVAC)

Inland Empire/Desert Region (Riverside-San Bernardino-Ontario Metropolitan Statistical Area)

Summary

- Employment for the HVAC occupational group is expecting to **increase by 16% between 2017 and 2022** in the Inland Empire/Desert Region. A total of **3,673 job openings** will be available over the five-year timeframe.
- The entry-level wage for each of the occupations in the HVAC occupational group is **above the MIT Living Wage estimate of $12.39 per hour** for a single adult living in the Inland Empire/Desert Region.
- **There appears to be an opportunity for program growth** based on the average annual number of program completions for the selected community college program in the region (**77 community college credentials, 234 other educational institution credentials, 311 total**) and the annual openings for the HVAC occupational group in the local region (**735 annual job openings**).

Introduction

This report details occupations relevant to the California Community College environmental control technology (HVAC) program. This program provides students with knowledge of assembly, installation, operation, maintenance, and repair of air conditioning, heating, and refrigeration systems ("Taxonomy of Programs," 2012). The two occupations included in the HVAC occupational group are the following:

- Heating, Air Conditioning, and Refrigeration Mechanics and Installers
- Sheet Metal Workers

Job Opportunities

In 2017, there were 5,415 HVAC group jobs in the Inland Empire/Desert Region. Across the region, employment related to the HVAC occupational group is expecting to increase by 16% through 2022. Employers in the region will need to hire 3,673 workers during the five-year timeframe to fill new jobs and to backfill jobs that workers are permanently leaving (includes retirements). Table 1 in the appendix shows the projected job growth for each of the occupations in this group.

Exhibit 1: Five-year projections for the HVAC occupational group in the Inland Empire/Desert Region

Region	2017 Jobs	5-Yr % Change (New Jobs)	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Inland Empire/Desert	5,415	16%	3,673	735	17%

Source: EMSI 2018.4

Earnings

The entry-level wage (25th percentile wage) for each of the occupations in the HVAC occupational group is above the MIT Living Wage estimate of $12.39 per hour for a single adult living in the Inland Empire/Desert Region (Glasmeier, 2019). These wages are also sufficient to support a household with two adults and one child ($14.75 per hour, per adult or $30,680 annually for each adult). Exhibit 2 displays wage detailed information for this occupational group in the Inland Empire/Desert Region.

Exhibit 2: Earnings for the HVAC occupational group in the Inland Empire/Desert Region

Occupation	Entry to Experienced Hourly Earnings Range*	Median Wage*	Average Annual Earnings
Sheet Metal Workers	$18.46 to $34.11	$26.61	$58,600
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	$15.18 to $25.67	$19.31	$43,800

Source: EMSI 2018.4

*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage.

Job Postings, Top Employers, Skills, and Education

Exhibit 3 shows the number of job ads posted during the last 12 months and the average time to fill for each occupation in the region and nationally. On average, open positions for the HVAC occupational group take 41 days to fill in the Inland Empire/Desert Region. It takes three days longer than the national average for fill jobs in this group, indicating that positions may be slightly more challenging to fill in the local region.

Exhibit 3: Job ads for the HVAC occupational group in the Inland Empire/Desert Region during the last 12 months, Mar 2018 – Feb 2019

Occupation	Job Ads	Regional Average Time To Fill (Days)	National Average Time to Fill (Days)
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	518	42	38
Sheet Metal Workers	128	39	34
TOTAL	**646**	**41**	**38**

Source: Burning Glass – Labor Insights

Exhibit 4 displays the employers posting the most job ads during the last 12 months for the Inland Empire/Desert Region.

Exhibit 4: Employers posting the most job ads for the HVAC occupational group in the Inland Empire/Desert Region, Mar 2018 – Feb 2019

Occupation	Top Employers
Heating, Air Conditioning, and Refrigeration Mechanics and Installers *(n=390)*	• Sears • Sanborn's Air Conditioning & Heating • Goettl Air Conditioning
Sheet Metal Workers *(n=67)*	• Rialto Unified School District • Division 7 Services, Inc. • Ferguson: Plumbing Supplies, HVAC Parts, Valves & Fitting

Source: Burning Glass – Labor Insights

Exhibit 5 lists a sample of in-demand specialized and employability skills that employers are seeking when looking for workers to fill HVAC positions. Specialized skills are occupation-specific skills employers are requesting for industry or job competency. Employability skills are foundational skills that transcend industries and occupations; this category is commonly referred to as "soft skills." The skills reported in job postings may be utilized as a helpful guide for curriculum development.

Exhibit 5: In-demand skills for the HVAC occupational group in the Inland Empire/Desert Region, Mar 2018 – Feb 2019

Occupation	Specialized skills	Employability skills
Heating, Air Conditioning, and Refrigeration Mechanics and Installers *(n=469)*	• Repair • Plumbing • Predictive/Preventative Maintenance • Ventilation	• Troubleshooting • Communication Skills • Teamwork/Collaboration • Physical Abilities
Sheet Metal Workers *(n=83)*	• Welding • Repair • Hand Tools • Grinders	• Communication Skills • Physical Abilities • Detail-Oriented • Work Area Maintenance

Source: Burning Glass – Labor Insights

Exhibit 6 displays the entry-level education typically required to enter these occupations according to the Bureau of Labor Statistics (BLS). This chart also displays educational attainment for incumbent workers with "some college, no degree" and an "associate degree" according to the U.S. Census (2016-17) and the minimum advertised education requirement requested by employers in online job ads.

Exhibit 6: Educational attainment and online job ads with minimum advertised education requirements for the HVAC occupational group in the Inland Empire/Desert Region, Mar 2018 – Feb 2019

Occupation	Typical Entry-Level Education Requirement	Two-year Postsecondary Level of Educational Attainment*	Minimum Advertised Education Requirement from Job Ads			
			Number of Job Postings (n=)	High school diploma or vocational training	Associate degree	Bachelor's degree or higher
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Postsecondary nondegree award	41%	*209*	95%	5%	-
Sheet Metal Workers	High school diploma or equivalent	32%	*39*	95%	5%	-

Source: EMSI 2018.4, Burning Glass – Labor Insights
* Percentage of incumbent workers with a Community College Degree/Award or Some Postsecondary Coursework

Student Completions

Exhibit 7 shows the annual average regional community college credentials (associate degrees and certificates) conferred during the three academic years between 2014 and 2017, with the relevant TOP code as well as the program title used at each college, sourced from the Chancellor's Office Curriculum Inventory (COCI). Credentials granted from other educational institutions from 2013 to 2016 are displayed in Exhibit 8, along with the relevant CIP code. Please note, a credential is not always equivalent to a single person in search of a job opening since a student may earn more than one credential, such as an associate degree in addition to a certificate. Community College student outcome information is from the CTE LaunchBoard based on the selected TOP code and region.

Exhibit 7: Annual average community college student completions for environmental control technology (HVAC) programs in the Inland Empire/Desert Region

0946.00 – Environmental Control Technology (HVAC) - *Local Program Title*	**Annual Community College Headcount (2016-17)**	**Community College Annual Average Credentials (2014-17)**
Desert – *Air Conditioning & Refrigeration/Heat Pumps/Commercial Gas Heating/Residential Gas Heating/Green HVAC Commercial/ Green HVAC Residential/Facilities Operations Technician*	138	
Associate Degree		3
Certificate 18 to < 30 semester units		17
Riverside – *Air Conditioning & Refrigeration*	234	
Associate Degree		6
Certificate 18 to < 30 semester units		34
San Bernardino – *Heating, Ventilation, Air Conditioning, and Refrigeration*	122	
Associate Degree		3
Certificate 30 to < 60 semester units		14
Victor Valley	51	
Total community college headcount (2016-17)	**544**	
Total annual average community college credentials		**77**

Source: LaunchBoard, IPEDS, COCI

0946.00 – Environmental Control Technology (HVAC) program outcomes in the Inland Empire/Desert Region compared to California Community College medians. Academic year 2015-16 [unless noted otherwise]:

- Number of course enrollments: 1,231 (California median: 305) [2016-17]
- Number of students who completed 12+ CTE units in one year: 137 (CA: 41) [2016-17]
- Employed in the fourth fiscal quarter after exit: 69% (CA: 74%)
- Median annual earnings: $37,981 (CA: $40,833)
- The percentage in a job closely related to the field of study: 88% (CA: 80%) [2014-15]
- Median change in earnings: 34% (CA: 45%)
- The proportion of students who attained a living wage: 67% (CA: 73%)
- Economically disadvantaged students: 68% (CA: 70%) [2016-17]

Exhibit 8: Annual average other educational institution student completions for heating, air conditioning, ventilation and refrigeration maintenance technology/technician programs in the Inland Empire/Desert Region

47.0201 - Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	Other Educational Institutions Annual Average Certificates or Other Credit Credentials (2013-16)
CET-Coachella	
Award 1 < 2 academic years	46
CET-Colton	
Award 1 < 2 academic years	25
InterCoast Colleges-Riverside	
Award 1 < 2 academic years	32
Mayfield College	
Associate Degree	1
Award < 1 academic year	76
Summit College	
Award < 1 academic year	46
Westech College	
Award 1 < 2 academic years	8
Total annual average other credentials	**234**

Source: IPEDS

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Appendix: Occupation definitions, five-year projections, and earnings for HVAC occupations

Occupation Definitions* (SOC code), *Education and Training Requirement, Community College Education Attainment

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.

Sample job titles: *Field Installer; HVAC Sheet Metal Installer (Heating, Ventilation, and Air Conditioning Sheet Metal Installer); Journeyman Sheet Metal Worker; Sheet Metal Apprentice; Sheet Metal Fabricator; Sheet Metal Foreman; Sheet Metal Installer; Sheet Metal Layout Mechanic; Sheet Metal Mechanic; Sheet Metal Worker*

Entry-Level Educational Requirement: High school diploma or equivalent
Training Requirement: Apprenticeship
Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 32%

Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)
Install or repair heating, central air conditioning, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves.

***Sample job titles**: A/C Tech (Air Conditioning Technician); HVAC Installer (Heating, Ventilation, Air Conditioning Installer); HVAC Mechanic (Heating, Ventilation, Air Conditioning Mechanic); HVAC Service Tech (Heating, Ventilation, Air Conditioning Service Technician); HVAC Service Technician (Heating, Ventilation, Air Conditioning Service Technician); HVAC Specialist (Heating, Ventilation, and Air Conditioning Specialist); HVAC Technician (Heating, Ventilation, Air Conditioning Technician); HVAC Technician (Heating, Ventilation, and Air Conditioning Technician); Service Technician; Systems Mechanic*

Entry-Level Educational Requirement: Postsecondary nondegree award
Training Requirement: More than twelve months on-the-job training
Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 41%

Table 1. 2017 to 2022 job growth, wages, education, training, and work experience required for the HVAC occupational group, Inland Empire/Desert Region

Occupation (SOC)	2017 Jobs	5-Yr Change	5-Yr % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage*	Median Hourly Wage*	Average Annual Earnings	Typical Entry-Level Education & On-The-Job Training Required	Work Experience Required
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	3,754	618	16%	504	$15.18 to $25.67	$19.31	$43,800	Postsecondary nondegree award & more than 12 months	None
Sheet Metal Workers (47-2211)	1,661	245	15%	231	$18.46 to $34.11	$26.61	$58,600	High school diploma or equivalent & apprenticeship	None
Total	**5,415**	**862**	**16%**	**735**	**-**	**-**	**-**	**-**	**-**

Source: EMSI 2018.4
*Entry Hourly is 25th percentile wage, the median is 50th percentile wage, experienced is 75th percentile wage