

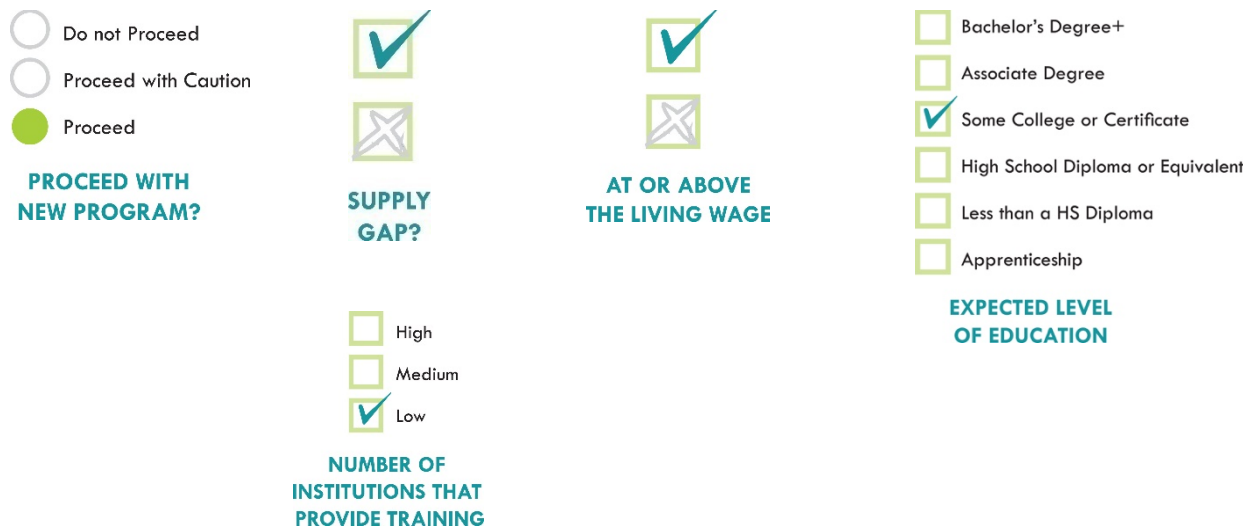
# Environmental Control Technology

## Labor Market Analysis for San Diego Continuing Education

September 2019

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### Summary



This report provides labor market information for occupation(s) selected by San Diego Continuing Education for its *Environmental Control Technology* program. The training provided by this program is likely to lead to employment as *Heating, Air Conditioning, and Refrigeration Mechanics and Installers*. According to available labor market information, the occupation has a labor market demand of 327 annual job openings, while average demand for an occupation in San Diego County is 277 annual job openings. One community college supplies the region with 69 for-credit awards: San Diego City College. This institution awards more certificates than associate degrees. More specifically, “Certificates 6 to < 18 units” has the largest number of awards in the past three years. Only San Diego Continuing Education supplies noncredit awards for this occupation, which averaged 61 awards in the same period. In short, the region supplies 130 for-credit and noncredit awards for 327 annual job openings, suggesting that there is a labor market supply gap. Additionally, entry-level and median wages are above the living wage, suggesting that students who successfully complete a program and obtain employment in a related field may earn a living wage. Expected level of education for this occupation is a postsecondary nondegree award.

## Introduction

This report provides labor market information (LMI) in San Diego County for occupations related to the six-digit Taxonomy of Programs<sup>1</sup> (TOP) code, Environmental Control Technology (TOP 094600). The purpose of this brief is to assist noncredit program providers in the region, such as San Diego Continuing Education (SDCE), with program development and review. SDCE identified one occupation from the Standard Occupational Classification (SOC)<sup>2</sup> system for the program, which will be the focus of this report:

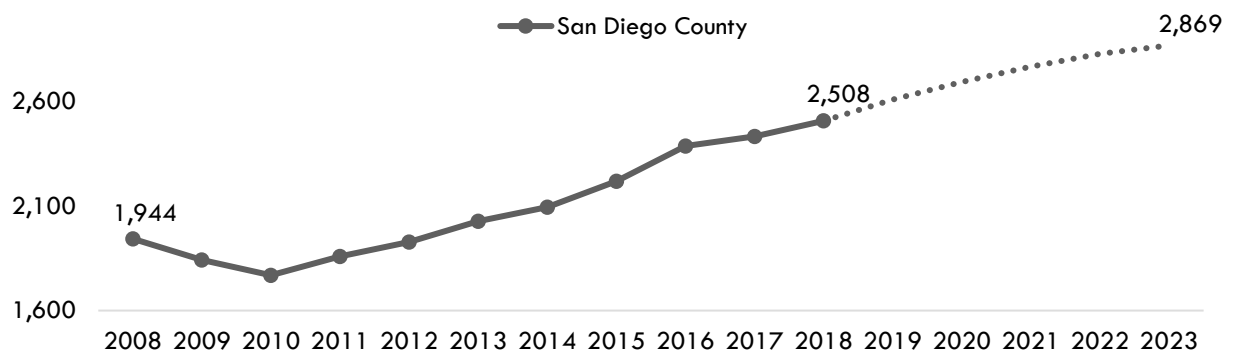
**Heating, Air Conditioning, and Refrigeration Mechanics and Installers** (SOC 49-9021): Install or repair heating, central air conditioning, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves. Sample reported job titles include:

- Refrigeration Mechanic
- Mechanic
- HVAC Installer (Heating, Ventilation, and Air Conditioning Installer)
- Transportation Refrigeration Technician
- Service Technician (Service Tech)
- HVAC Technician
- Refrigeration Technician (Refrigeration Tech)
- VRT Mechanic (Variable Retention Time Mechanic)
- Technician

## Projected Occupational Demand

Between 2018 and 2023, *Heating, Air Conditioning, and Refrigeration Mechanics and Installers* are projected to increase by **361** net jobs or **14** percent (Exhibit 1). Employers in San Diego County will need to hire **327** workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

**Exhibit 1: Number of Jobs for Heating, Air Conditioning, and Refrigeration Mechanics and Installers (2008-2023)<sup>3</sup>**



<sup>1</sup> Taxonomy of Programs (TOP) is a system of codes used by the California Community Colleges for the purpose of collecting, calculating, or disseminating data about similar training programs.

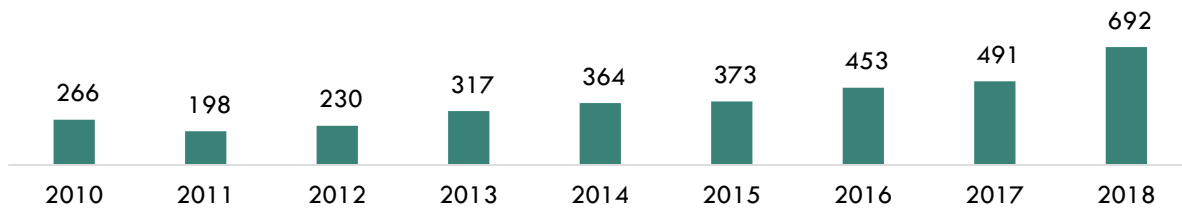
<sup>2</sup> The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc).

<sup>3</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

## Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market demand that are not captured by historical data. Between 2010 and 2018, there was an average of 376 online job postings per year for *Heating, Air Conditioning, and Refrigeration Mechanics and Installers* in San Diego County (Exhibit 2).

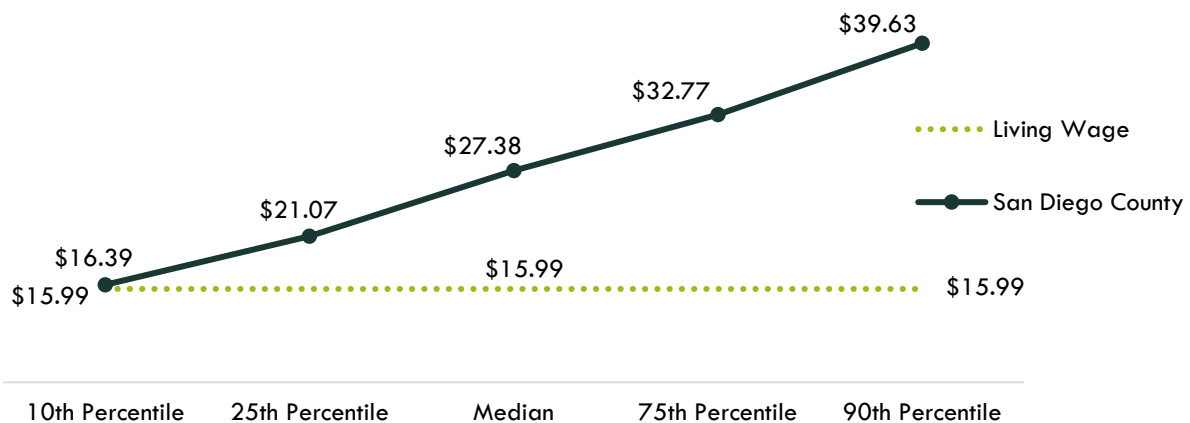
**Exhibit 2: Number of Online Job Postings for Heating, Air Conditioning, and Refrigeration Mechanics and Installers in San Diego County (2010-2018)<sup>4</sup>**



## Earnings

*Heating, Air Conditioning, and Refrigeration Mechanics and Installers* receive median hourly earnings of \$27.38; this is more than the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 3).<sup>5</sup>

**Exhibit 3: Hourly Earnings<sup>6</sup> for Heating, Air Conditioning, and Refrigeration Mechanics and Installers in San Diego County<sup>7</sup>**



<sup>4</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2018.

<sup>5</sup> "California Family Needs Calculator." Insight Center for Community Economic Development, last updated 2018. [insightccd.org/2018-family-needs-calculator](https://insightccd.org/2018-family-needs-calculator).

<sup>6</sup> 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

<sup>7</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

## Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards conferred by a course or program in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.<sup>8</sup> According to TOP and CIP<sup>9</sup> data, one community college supplies the region with for-credit awards for Environmental Control Technology (TOP 094600): [San Diego City College](#) (Exhibit 4a).

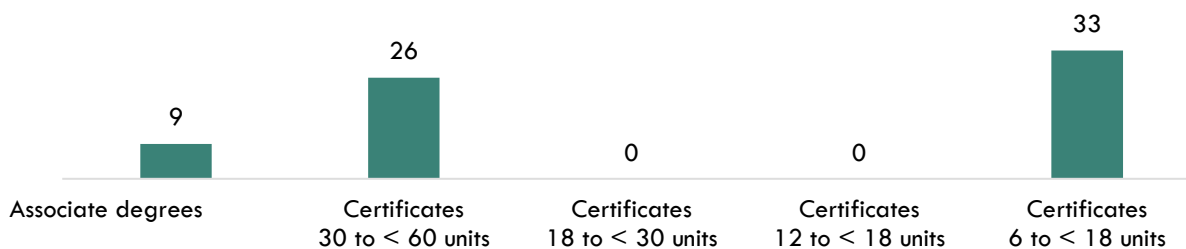
**Exhibit 4a: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Years 2015-16 through 2017-18)**

College	Award Type	PY 15-16	PY 16-17	PY 17-18	3-Year Avg
San Diego City	Associate of Science (A.S.) degree	10	9	9	9
	Certificate 30 to < 60 units	40	27	12	26
	Certificate 18 to < 30 units	0	0	1	0
	Certificate 6 to < 18 units	19	19	62	33
<b>Total</b>		<b>69</b>	<b>55</b>	<b>84</b>	<b>69*</b>

*Note: The numbers may not add up exactly due to rounding.*

While associate degrees are offered for Environmental Control Technology (TOP 094600), this institution awards more certificates than associate degrees. More specifically, “Certificates 6 to < 18 units” has the largest number of awards over the past three program years (Exhibit 4b).

**Exhibit 4b: Total Number of Awards by Type for Environmental Control Technology (TOP 094600) in San Diego County (Three-Year Average 2015-16 through 2017-18)**



<sup>8</sup> TOP data comes from the California Community Colleges Chancellor’s Office MIS Data Mart ([datamart.cccco.edu](http://datamart.cccco.edu)) and CIP data comes from the Integrated Postsecondary Education Data System ([nces.ed.gov/ipeds/use-the-data](http://nces.ed.gov/ipeds/use-the-data))

<sup>9</sup> There are three CIP codes related to Environmental Control Technology (TOP 094600): Automation Engineer Technology/Technician (CIP 150406), Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician (CIP 150501), and Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician (CIP 470201).

In terms of noncredit awards, only San Diego Continuing Education provides noncredit awards for Environmental Control Technology (TOP 094600), with an average of 61 noncredit awards between program years 2015-16 and 2017-18 (Exhibit 5).

**Exhibit 5: Number of Noncredit Awards (Certificates and Degrees) Conferred by SDCE (Program Years 2015-16 through 2017-18)**

Program Title	Award Type	PY 15-16	PY 16-17	PY 17-18	3-Year Avg
Air Conditioning/Heating	Program Award	24	100	58	61

## Demand vs. Supply

In short, the region supplies 130 for-credit and noncredit awards for 327 annual job openings, suggesting that there is a labor market supply gap (Exhibit 6).

**Exhibit 6: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)**

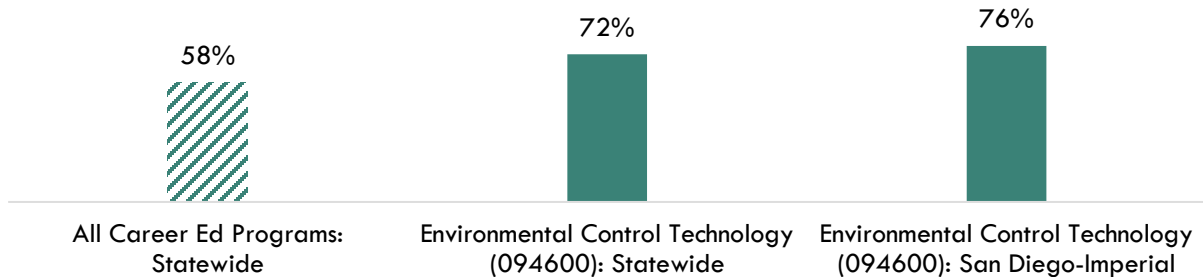
TOP6 Program	Demand (Annual Openings)	Supply (Total Annual Average Supply)		Supply Gap or Oversupply
		Noncredit	For-Credit	
Environmental Control Technology (TOP 094600)	327	61	69	197

**Please note:** This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

## Student Outcomes and Regional Comparisons

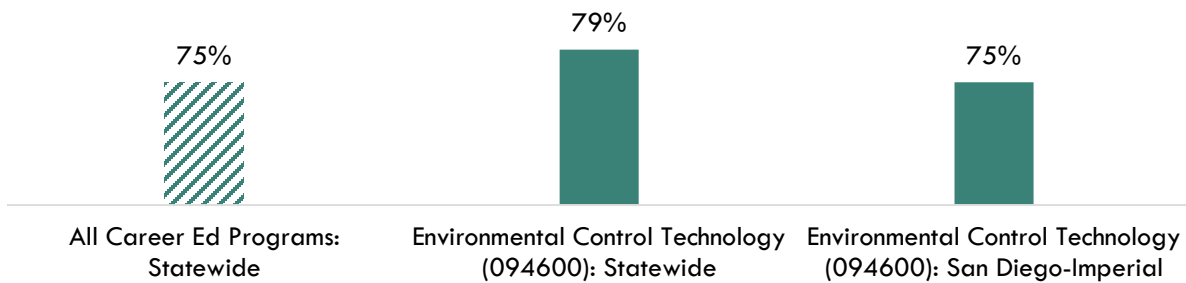
According to the California Community Colleges LaunchBoard, 76 percent of students in the San Diego-Imperial region earned a living wage after completing an Environmental Control Technology (094600) program, compared to 72 percent statewide and 58 percent of students in Career Education programs in general across the state (Exhibit 7a).

**Exhibit 7a: Proportion of Students Who Earned a Living Wage, PY2015-16<sup>10</sup>**



According to the California Community Colleges LaunchBoard, 75 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing an Environmental Control Technology (094600) program, compared to 79 percent statewide and 75 percent of students in Career Education programs in general across the state (Exhibit 7b).

**Exhibit 7b: Percentage of Students in a Job Closely Related to Field of Study, PY2014-15<sup>11</sup>**



<sup>10</sup> Among completers and skills builders who exited, the proportion of students who attained a living wage.

<sup>11</sup> Most recent year with available data is Program Year 2014-15. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

## Top Employers and Work Locations

Between January 1, 2016 and December 31, 2018, the top five employers in San Diego County for this occupation were [Sears](#), [Lincoln Military Housing](#), [John Stevenson Plumbing & Mechanical](#), [Johnson Controls Incorporated](#), and [BAE Systems](#) (Exhibit 8).

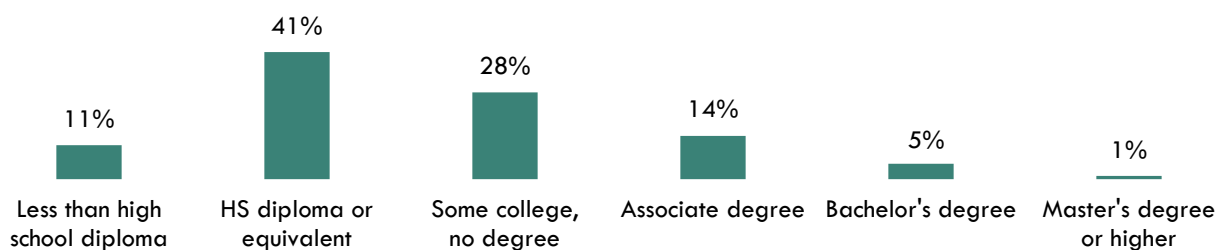
**Exhibit 8: Top Employers in San Diego County for Heating, Air Conditioning, and Refrigeration Mechanics and Installers<sup>12</sup>**

Top Employers	
<ul style="list-style-type: none"> <li>• Sears</li> <li>• Lincoln Military Housing</li> <li>• John Stevenson Plumbing &amp; Mechanical, Inc.</li> <li>• Johnson Controls</li> <li>• BAE Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Countrywide Mechanical Systems</li> <li>• General Atomics</li> <li>• American Mechanical Systems</li> <li>• Lincoln Property Company</li> <li>• Irvine Company</li> </ul>

## Skills, Education, and Certifications

Exhibit 9a indicates the educational attainment for the occupation found currently in the national labor force. The typical on-the-job training for this profession is [long-term on-the-job training](#). The typical entry-level education is [postsecondary nondegree award](#).<sup>13</sup>

**Exhibit 9a: National Educational Requirements for Heating, Air Conditioning, and Refrigeration Mechanics and Installers<sup>14</sup>**



<sup>12</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.

<sup>13</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

<sup>14</sup> Emsi 2019.03; QCEW, Non-QCEW, Self-Employed.

Based on online job postings between January 1, 2016 and December 31, 2018, the top listed educational requirement for *Heating, Air Conditioning, and Refrigeration Mechanics and Installers* was a [high school diploma or vocational training](#) (Exhibit 9b).<sup>15</sup>

**Exhibit 9b: Educational Requirements for *Heating, Air Conditioning, and Refrigeration Mechanics and Installers* in San Diego County in Online Job Postings<sup>16</sup>**



Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2016 and December 31, 2018.

**Exhibit 10: Top Skills for *Heating, Air Conditioning, and Refrigeration Mechanics and Installers* in San Diego County<sup>17</sup>**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> <li>• HVAC</li> <li>• Repair</li> <li>• Plumbing</li> <li>• Predictive / Preventative Maintenance</li> <li>• Ventilation</li> </ul>	<ul style="list-style-type: none"> <li>• Preventative Maintenance</li> <li>• Troubleshooting</li> <li>• Communication Skills</li> <li>• Physical Abilities</li> <li>• Organizational Skills</li> <li>• Computer Literacy</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft Excel</li> <li>• Microsoft Project</li> <li>• Microsoft Word</li> <li>• Vimeo</li> <li>• Microsoft PowerPoint</li> </ul>

<sup>15</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.

<sup>16</sup> "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified October 18, 2018. [bls.gov/emp/tables/educational-attainment.htm](https://www.bls.gov/emp/tables/educational-attainment.htm).

<sup>17</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2016-2018.



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### **Important Disclaimers**

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.