

BOOK OF GREEN JOBS

A GUIDE TO MIDDLE-SKILL CLIMATE-READY JOBS IN LOS ANGELES COUNTY



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The LAEDC Institute for Applied Economics specializes in objective and unbiased economic and policy research in order to foster informed decision-making and guide strategic planning. In addition to commissioned research and analysis, the Institute conducts foundational research to ensure LAEDC's many programs for economic development are on target. The Institute focuses on economic impact studies, regional industry and cluster analysis and issue studies, particularly in workforce development and labor market analysis.

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Executive Summary

Los Angeles County, the most populous county in the United States, is home to nearly 10 million residents and a diverse workforce of over 4.6 million people. As the county undergoes a fundamental economic transformation towards greener business practices, it aims to enhance resource efficiency and reduce pollution, aligning with ambitious climate goals. The "Book of Green Jobs: A Guide to Middle-Skill Climate-Ready Jobs in Los Angeles County," developed by the LAEDC Institute for Applied Economics, is a comprehensive report that explores this expanding green economy. The report focuses on middle-skill jobs crucial for a sustainable future and offers strategic insights into the labor market's transformation in response to climate change initiatives and emerging environmental policies.

Overview

The report provides a contextual understanding of the green economy in Los Angeles, detailing the impact of national and state climate goals on local industries. It highlights key legislative frameworks such as the Paris Agreement and California's AB-32, which are driving significant shifts towards renewable energy, energy efficiency, and clean transportation.

Labor Market Implications

The report offers a detailed analysis of how these green initiatives are reshaping the labor market, emphasizing growth in sectors like renewable energy, green construction, and sustainable urban planning. It identifies specific middle-skill occupations expected to grow, offering pathways for workforce development, particularly through community colleges.



Middle-Skill Green Jobs

At the heart of the report is an in-depth examination of middle-skill green jobs—positions typically requiring education beyond high school but less than a four-year degree. The report provides detailed profiles of occupations such as electricians, plumbers, and HVAC technicians, including their roles, required skills, and projected growth. Each occupation is analyzed in terms of job openings, wages, educational requirements, and specific skills in demand.

Technological and Economic Trends

The report identifies technological advancements as key drivers in the green economy, particularly in areas such as renewable energy, smart grid systems, and electric vehicles. It discusses how these technologies are creating new job opportunities and reshaping existing ones, necessitating new skills and competencies.

Education and Training

A significant portion of the report focuses on the role of community colleges in supporting the green economy. It outlines educational pathways available for middle-skill jobs, including programs and certifications that align with industry needs. This section also addresses challenges faced by educational institutions in meeting the growing demand for a skilled green workforce.

Key Findings and Recommendations

The report concludes with a summary of key findings and actionable recommendations for stakeholders, including policymakers, educational institutions, and employers. It emphasizes the importance of continued investment in education and training, supportive policies to foster green job growth, and the role of public-private partnerships in building a resilient and sustainable workforce. By providing a high-level overview of the current state and future prospects of green jobs in Los Angeles County, this executive summary serves as a guide for understanding the complex interplay between policy, technology, and labor market trends in the region's evolving green economy. Los Angeles County continues to transition towards a sustainable economic model, driven by legislation related to environmental policy and climate goals, especially the 2028 Olympics where Los Angeles is working towards hosting the first "Energy Positive Games" by generating more energy through renewable sources and energy efficiency efforts.¹ The insights and recommendations offered aim to guide strategic planning and action, ensuring that the region's workforce is well-equipped to meet the demands of this rapidly evolving economic and environmental landscape. Through leveraging its unique strengths, Los Angeles County can build a more sustainable, inclusive, and resilient future.

¹ Descant, S. (2024). *Will 2028 Olympics Energize L.A.'s Race to Zero Emissions?* Retrieved from <https://www.govtech.com/transportation/will-2028-olympics-energize-l-a-s-race-to-zero-emissions>

Introduction

The Green Economy Landscape in LA County

Los Angeles County is undergoing a significant shift toward green jobs, driven by local and national environmental policies, reshaping the labor market in alignment with ambitious climate goals.



Climate Goals and Policy Landscape

National commitments like the Paris Agreement and California's pioneering environmental laws, such as AB-32 and SB 32, aim for a 40% reduction in greenhouse gas emissions by 2030, influencing local job growth in green sectors.

Labor Market and Industry-Specific Growth

Green jobs are thriving in sectors like renewable energy, clean transportation, and green construction, driven by federal and state incentives, including tax credits, rebates, and stringent building standards.

Technological Advancements and Economic Trends

Technological innovations in renewable energy, energy efficiency, and clean transportation are driving economic growth. Advances in battery storage, grid management, and green manufacturing are enhancing efficiency and competitiveness.

Education and Workforce Development

Investments in education and workforce training programs are crucial for meeting the demand for skilled labor in green industries, with partnerships between educational institutions and industry ensuring alignment with market needs.

Recent Trends in the Green Economy

In recent years, Los Angeles County has witnessed significant strides towards a greener economy characterized by several key trends. Renewable energy adoption has surged, driven by state incentives and mandates, leading to increased installations of solar and wind power infrastructure across the region. Energy efficiency has become a focal point for both residential and commercial sectors, initiated by regulations like LEED certification and Energy Star ratings, which promote sustainable building practices and reduce operational costs. The county has also experienced a rapid expansion in electric vehicle (EV) adoption, supported by initiatives such as the Clean Vehicle Rebate Project (CVRP) and the development of EV charging infrastructure. Additionally, green building and sustainable urban planning initiatives have gained momentum, with a growing emphasis on integrating green infrastructure, like green roofs and stormwater management systems, into urban developments to enhance environmental sustainability.

Recent Trends

- Expansion of Renewable Energy Infrastructure
- Growing Demand for Energy Efficient Solutions
- Rise of Electric Vehicles (EVs)
- Green Building and Sustainable Development
- Job Growth in Clean Technology and Green Industries
- Innovation in Water Conservation Management
- Public and Private Sector Collaboration

Emerging Trends in the Green Economy

Looking forward, Los Angeles County is poised to embrace several emerging trends that promise to further shape its green economy. Microgrid technology is gaining traction as a means to enhance energy resilience and integrate renewable energy sources locally, reducing dependency on centralized power grids. Circular economy initiatives are on the rise, emphasizing waste reduction, recycling, and sustainable procurement practices to create closed-loop systems that minimize environmental impact. Green finance and investment are becoming increasingly prominent, facilitating funding for sustainable infrastructure projects and clean energy developments through mechanisms like green bonds and public-private partnerships. Smart cities and sustainable urban planning are evolving with a focus on leveraging technology and data to optimize energy use, transportation systems, and overall urban resilience. Moreover, there is a growing recognition of the importance of climate adaptation and resilience strategies, prompting investments in water management, green infrastructure, and equitable access to environmental benefits across diverse communities within the county.

Emerging Trends

- ▶ Microgrids and Energy Resilience
- ▶ Circular Economy Initiatives
- ▶ Green Finance and Investment
- ▶ Smart Cities and Sustainable Urban Planning
- ▶ Climate Adaptation and Resilience Strategies
- ▶ Green Jobs in Digital and Clean Technologies
- ▶ Equity and Environmental Justice Initiatives
- ▶ Innovate Water Conservation Technologies

Los Angeles County Climate-Ready Initiatives

Adaptation and Resilience Strategies

Los Angeles County is proactively preparing for climate change impacts by implementing robust adaptation and resilience strategies.

- ▶ Updating building codes for resilience against extreme weather events
- ▶ Promoting energy-efficient and climate-smart building designs
- ▶ Conducting climate risk assessments for informed land-use planning

Equitable Climate Action and Community Engagement

Ensuring that all communities benefit from climate action is a cornerstone of Los Angeles County's approach to sustainability.

- ▶ Ensuring climate benefits reach underserved communities
- ▶ Supporting community-led resilience projects
- ▶ Promoting inclusive participation in decision-making processes

Coastal Resilience and Sea-Level Rise Preparedness

With a focus on its extensive coastline, Los Angeles County is enhancing resilience against sea-level rise and coastal hazards.

- ▶ Restoring beaches and protecting critical infrastructure
- ▶ Safeguarding coastal communities from erosion and storm surges
- ▶ Preserving economic and recreational benefits of coastal areas

Water Management and Conservation Initiatives

Water sustainability is a priority for Los Angeles County, driving initiatives to conserve and manage water resources effectively.

- ▶ Expanding water conservation programs
- ▶ Promoting water-efficient landscaping practices
- ▶ Investing in decentralized water treatment and reuse systems

These initiatives underscore Los Angeles County's proactive stance in addressing climate challenges, promoting sustainability, and building resilience across diverse communities in the region.

Looking Ahead

Los Angeles County is at the forefront of the green economy, leveraging technology and proactive economic strategies to foster sustainable growth, resilience, and environmental stewardship.

Report Organization

The Los Angeles County Economic Development Corporation (LAEDC) Institute for Applied Economics (IAE) conducted an analysis of green jobs with a focus on middle-skill level occupations in this report, the *Book of Green Jobs: A Guide to Middle-Skill Climate Ready Jobs in Los Angeles County*.

This report provides a deeper understanding of occupations that support the growing green economy and helps meet the demands of a transitioning economy towards climate resiliency.

The report is organized into seven sections including the data appendix:

- ❖ **Introduction**
- ❖ **A Selection of Climate-Ready Jobs**
- ❖ **Industries for Engagement**
- ❖ **Key Findings and Considerations**
- ❖ **Data Appendix**



Exhibit 1: California Workforce Development Board Scoping Plan Sectors, Subsectors, and Industry by NAICS

California Workforce Development Board Scoping Plan Sectors							
SECTOR	ENERGY						
Subsector	Utility-Scale Renewables - Construction	Utility-Scale Renewables - Operation	Distributed Generation	Energy Efficiency	Natural Gas Leakage Abatement		
Industry by NAICS	Utility System Construction (NAICS 2371)	Electric Power Generation, Transmission and Distribution (NAICS 2211)	Residential Building Construction (NAICS 2361)	Nonresidential Building Construction (NAICS 2362)	Residential Building Construction (NAICS 2361)	Nonresidential Building Construction (NAICS 2362)	Natural Gas Distribution (NAICS 2212)

California Workforce Development Board Scoping Plan Sectors								
SECTOR	TRANSPORTATION							
Subsector	Cleaner Vehicles	Trucking	Public Transit	Clean Fuel Infrastructure	Transit Infrastructure	Infill and Transit-Oriented Development		
Industry by NAICS	Motor Vehicle Manufacturing (NAICS 3361)	Automotive Repair and Maintenance (NAICS 8111)	Truck Transportation (NAICS 4841 and 4842)	Transit and Ground Transportation (NAICS 4851, 4852, and 4854)	Electrical Contractors and Other Wiring Installation (NAICS 23821)	Other Heavy and Civil Engineering Construction (NAICS 2372, 2373, and 2379)	Residential Building Construction (NAICS 2361)	Nonresidential Building Construction (NAICS 2362)

Exhibit 1: California Workforce Development Board Scoping Plan Sectors, Subsectors, and Industry by NAICS

California Workforce Development Board Scoping Plan Sectors							
SECTOR	INDUSTRY						
Subsector	Emissions Intensive Manufacturing	Fossil Fuel Production, Refining, and Distribution			Emissions and Leakage Abatement	Electrification	
Industry by NAICS	Various	Oil and Gas Extraction (NAICS 2111)	Petroleum and Coal Products Manufacturing (NAICS 3241)	Pipeline Transportation (NAICS 4861, 4862, and 4869)	Other Specialty Contractors (NAICS 2389)	Electrical Contractors and Other Wiring Installation (NAICS 23821)	

California Workforce Development Board Scoping Plan Sectors							
SECTOR	WASTE	WATER			NATURAL AND WORKING LANDS		
Subsector	Waste Diversion and Methane Capture	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure			Forestry Services, Fire Prevention and Suppression Forestry Logging	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Westland Restoration, Urban Greening, etc.
Industry by NAICS	Waste Management and Remediation Services (NAICS 5621 and 5622)	Water, Sewage and Other Systems (NAICS 2213)	Utility System Construction (NAICS 2371)	Remediation and Other Waste Management Services (NAICS 5629)	Forestry and Logging (NAICS 1131, 1132, and 1133)	Agriculture, Forestry, Fishing and Hunting (NAICS 1110, 1120, 1141, 1142, 1151, 1152, and 1153)	Various

A Selection of Climate-Ready Jobs

In the progressing landscape of Los Angeles County's green economy, identifying middle-skill occupations poised for significant growth is necessary to understanding workforce demands and aligning educational programs to meet future needs. This section delves into occupations within the green sector that align with community college programs, and are projected to experience growth in the number of job openings over the next five years. Recent employment trends and the industries driving hiring will be analyzed alongside each occupation's exposure to new technologies, offering insights into the evolving skills landscape.

Additionally, this research examines community college programs designed to prepare students for these roles, including program completion rates and potential challenges faced by the community college system in meeting workforce demands. These challenges include funding constraints and employer perceptions, which influence program development and the alignment of educational offerings with industry needs.



Our goal is to provide a comprehensive understanding of how Los Angeles County can strategically prepare its workforce for emerging opportunities in sustainability-focused industries. By exploring the intersection of employment projections, technological integration, and educational pathways, this analysis aims to highlight both the potential and challenges in building a skilled workforce capable of driving innovation and sustainability in the region's economy.

We also provide a supply-side analysis of the community college system. This analysis includes an occupational needs forecast, considering expected industry growth and its impact on target occupations. This forecast is compared to the regional supply of middle-skill labor, including incumbent workers in target industries, graduates from two-year community colleges in Los Angeles County, and participants in existing credential or certification programs in the county. We also project the number of program completers using a crosswalk between occupations and instructional programs. The resulting shortfall or surplus will guide curriculum and program development and the allocation of necessary educational resources.

The following pages discuss each occupation and its associated educational programs in detail. A detailed table of all identified green occupations can be found in **Exhibit A-1** of the Appendix.

Steppingstone Occupations

The Steppingstone Occupations section of the report delves into specific green jobs within Los Angeles County that typically require a high school diploma or equivalent education level but are frequently filled by community college graduates. This section provides an in-depth analysis of various occupations that are essential to the county's transition to a green economy. It details the roles, skills, and qualifications necessary for these jobs, offering valuable insights into labor market trends, job openings, and earning potential. By focusing on steppingstone occupations, this section emphasizes the critical role that community colleges play in preparing individuals to excel in these positions. It highlights the pathways available for students and graduates to enter or advance within the green workforce, underlining the importance of these roles in achieving sustainability goals and fostering economic growth in the region.

Exhibit 2: Target Steppingstone Occupations

Typical Entry Level Education: High School Diploma or Equivalent

SOC Code	Description	2022 Jobs	2022 Median Hourly Earnings	2028 Jobs	2022-2028 Forecasted Growth	2022-2028 Change in Jobs	2022-2028 Replacement Jobs	2022-2028 Job Openings	2022-2028 Percent Net Change in Jobs	Percent of 2022 Jobs in Green Sectors
47-2111	Electricians	15,185	\$33.03	15,820	4.2%	630	7,990	8,620	56.8%	60.1%
47-2152	Plumbers, Pipefitters, and Steamfitters	10,368	\$27.42	11,320	9.1%	950	5,590	6,540	63.1%	10.5%
51-4121	Welders, Cutters, Solderers, and Brazers	6,921	\$23.27	6,470	-6.6%	-450	3,820	3,370	48.7%	8.6%
47-4011	Construction and Building Inspectors	3,216	\$39.49	3,390	5.3%	170	2,250	2,420	75.2%	6.0%
47-4041	Hazardous Materials Removal Workers	1,671	\$23.90	1,930	15.2%	250	1,170	1,420	85.0%	77.1%
51-8031	Water and Wastewater Treatment Plant and System Operators	1,652	\$38.55	1,560	-5.6%	-90	870	780	47.2%	10.8%

Note: The '2022-2028 Percent Net Change in Jobs' is calculated as the total job openings from 2022 to 2028 expressed as a percentage of the total jobs in 2022. Total job openings include the '2022-2028 Change in Jobs' (growth or decline in total employment) and the '2022-2028 Replacement Jobs' (positions needing to be filled due to retirements or worker turnover). The formula is: $[(2022-2028 \text{ Change in Jobs} + 2022-2028 \text{ Replacement Jobs}) \div 2022 \text{ Jobs}] \times 100$.

Electricians

(SOC 47-2111)

Electricians are considered a green occupation due to their role in installing and maintaining systems that enhance energy efficiency and support renewable energy, such as solar panels and smart grids. To further integrate into the green sector, electricians can specialize in emerging technologies like energy storage, EV charging infrastructure, and advanced energy-efficient systems. Community colleges in Los Angeles County offer relevant certifications and degrees, such as the **Solar PV Installation and Maintenance Certificate, Energy Efficiency Technician Degree, and Advanced Transportation Technology**. Additionally, the **Electric Vehicle Infrastructure Training Program (EVITP)** provides training and certification for electricians installing electrical vehicle supply equipment. These programs help electricians stay at the forefront of green technology advancements.

Community College Talent Supply

Electrical

- ▶ **TOP code:** 0952.20
- ▶ **Description:** Installation, operation, maintenance and repair of electrical systems in buildings, including residential, commercial, and industrial electric power wiring and motors, controls, and electrical-distribution panels.

Strong Workforce Program (SWP) Statistics:	
Students with a Job Closely Related to Their Field of Study, 2019-20	63%
Median Annual Earnings for Exiting Students, 2020-21	\$49,684
Median Change in Earnings for Exiting Students, 2020-21	20%
SWP Exiting Students Who Attained the Living Wage, 2020-21	66%

Occupational Overview

Employment in Industry 2022: 15,185 workers
Percent of Jobs Identified as Middle-Skill: 46.0%
Median Hourly Wages \$33.03 per hour
Typical Entry-Level Education HS diploma or equiv.
Work Experience Required None
Typical On-the-Job Training Apprenticeship

Occupational Projections 2022 to 2028

Newly Created Jobs 630 new jobs (4.2%)
Replacement Jobs 7,990 openings
Net Job Openings 8,620 jobs
2022-2028 Percent Net Change 56.8%

Exhibit 3: Electrical Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	
L.A. Trade Technical College		●	●

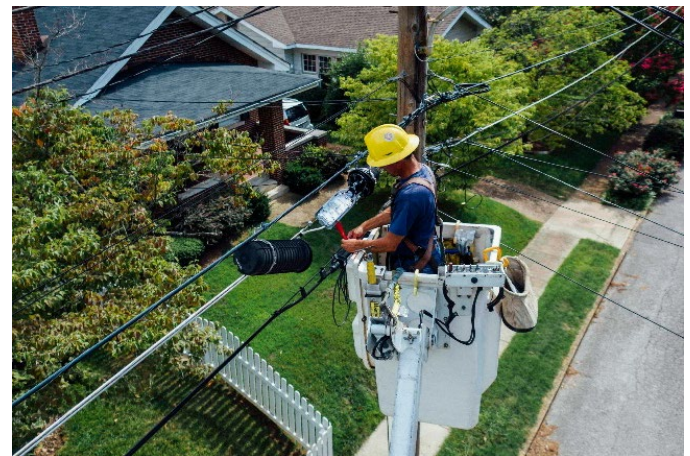


Exhibit 4: Gender, 2022-23



Exhibit 5: Race and Ethnicity, 2022-23

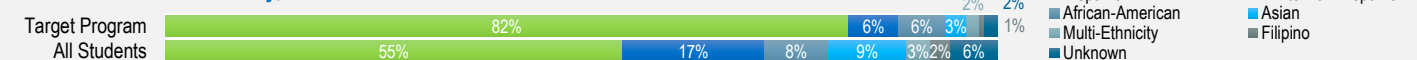
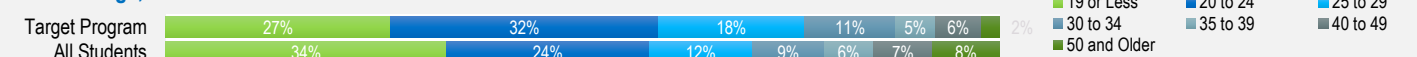


Exhibit 6: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, electricians in Los Angeles County are expected to experience 8,620 new and replacement job openings. Job postings data reveal an average of 108 monthly job openings in 2023, while average monthly hires were 664, including new jobs and openings from attrition and job transfers. In Los Angeles County, only 29 percent of employers specified an education level in their job postings, with 86 percent of those requesting an associate degree or less educational attainment. The median advertised annual salary for electricians is \$67,800.

Exhibit 7 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

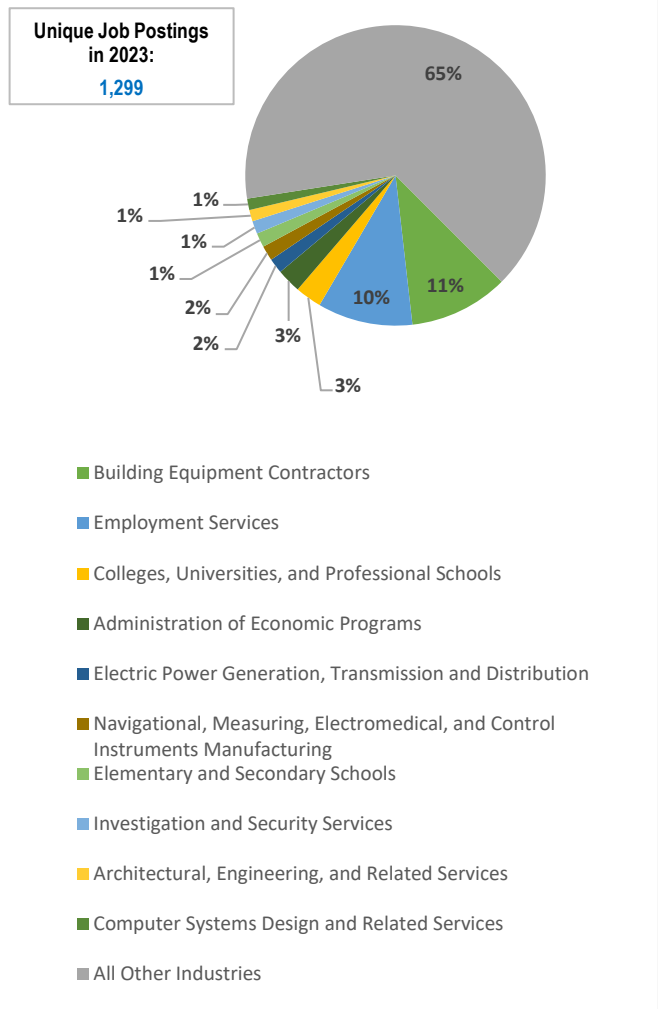
Employers in employment services, navigational, measuring, electromedical, and control instruments manufacturing, aerospace product and parts manufacturing, management, scientific, and technical consulting services, computer systems design and related services, general medical and surgical hospitals, and freight transportation arrangement advertised the most opportunities.

Top Skills Requested for Electricians

The top specialized skills desired by employers include:

- ✓ Electrical Systems
- ✓ Electrical Wiring
- ✓ Hand Tools
- ✓ Blueprinting
- ✓ Electrical Equipment
- ✓ Low Voltage
- ✓ Power Tool Operation
- ✓ Transformers (Electrical)
- ✓ Network Switches
- ✓ Machinery

Exhibit 7: Unique Job Postings by Industry
 Electricians
 Los Angeles County in 2023



- REPORTED JOB TITLES**
- ▶ Electricians
 - ▶ Low Voltage Technicians
 - ▶ Journeyman Electricians
 - ▶ Maintenance Electricians
 - ▶ Electrical Trainees
 - ▶ Certified Electricians
 - ▶ Maintenance Journeyman Electricians
 - ▶ Residential Electricians
 - ▶ Low Voltage Installers
 - ▶ Lead Electricians

The top common skills desired by employers include:

- ✓ Troubleshooting (Problem Solving)
- ✓ Communication
- ✓ Operations
- ✓ Lifting Ability
- ✓ Customer Service
- ✓ Management
- ✓ Problem Solving
- ✓ Detail Oriented
- ✓ Good Driving Record
- ✓ English Language

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ IBM Maximo
- ✓ AutoCAD
- ✓ Autodesk Revit
- ✓ Spreadsheets
- ✓ Maintenance Connection (Software)
- ✓ Exacq (Video Surveillance Software)

Skills in High-Demand

- ✓ Electrical Systems
- ✓ Electrical Wiring
- ✓ Troubleshooting (Problem Solving)
- ✓ Hand Tools
- ✓ Blueprinting
- ✓ Communication
- ✓ Electrical Equipment
- ✓ Low Voltage
- ✓ Operations
- ✓ Power Tool Operation

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ 30-Hr OSHA General Industry Card
- ✓ Journeyman Electrician
- ✓ 10-Hr OSHA General Industry Card
- ✓ Contractor License
- ✓ CDL Class C License
- ✓ Top Secret Clearance
- ✓ Functional Skills Qualification
- ✓ Airframe & Powerplant (A&P) Certificate
- ✓ Cardiopulmonary Resuscitation (CPR) Certification

Where Jobs are Typically Posted

- ✓ craigslist.org
- ✓ recruiternetworks.com
- ✓ indeed.com
- ✓ losangelesrecruiter.com
- ✓ simplyhired.com
- ✓ dejobs.org
- ✓ oxnardrecruiter.com
- ✓ energyjobline.com
- ✓ santaclaritarecruiter.com
- ✓ tustinrecruiter.com

The electrician profession was designated as 'Green Increased Demand' in O*Net's comprehensive list of green occupations, shown in **Exhibit A-2** located in the Appendix. It was also identified in O*Net's Green Economy Sectors under Green Construction and included in the Green Topic of Solar [**Exhibit A-3**]. This profession is highlighted as having a bright outlook by O*Net. Electricians contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-4**.

Community College Talent Supply

The California Community Colleges offer certificates and/or associate degree programs in electrical at two of their college locations, but have enrollment at five locations as shown in **Exhibits 3 and 8**. Electrical graduates are likely to earn a job related to their education, with 63 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$49,684 for SWP exiting students in 2020-21, which was a median change in earnings of 20 percent. Many SWP students were able to attain a living wage, with 66 percent hitting that mark in 2020-21.

There were 7,581 total enrollments in 2022-23 and a total of 150 combined associate degrees and certificates awarded, as shown in **Exhibits 8 and 9**.

Exhibit 8: Student Enrollment by College, 2022-23

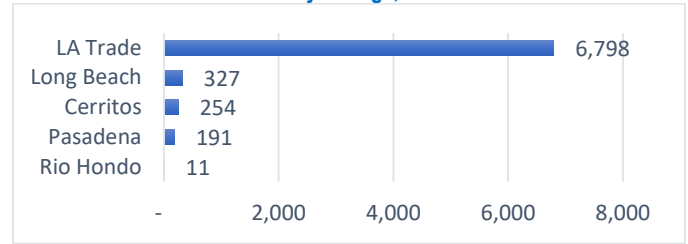
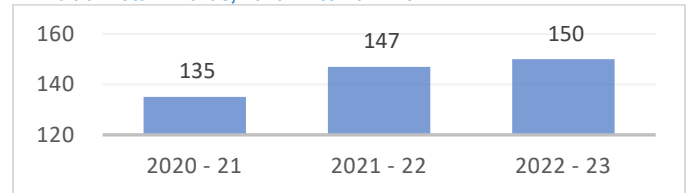


Exhibit 9: Total Awards, 2020-21 to 2022-23



Electrical Student Demographics

Approximately 94 percent of electrical students at Los Angeles community colleges are male, which is over 50 percentage points higher than the overall student enrollment [**Exhibit 4**]. More than 80 percent of these students identify as Hispanic, 27 percentage points higher than the general student population [**Exhibit 5**]. Additionally, 77 percent are 29 years old or younger, compared to 70 percent in the overall student body [**Exhibit 6**]. This young demographic represents an untapped asset for regional employers looking to strengthen their workforce. The referenced exhibits show the demographics of the 7,851 students enrolled in these programs during the 2022-23 academic year.

Plumbers, Pipefitters, and Steamfitters

(SOC 47-2152)

Plumbers, pipefitters, and steamfitters are considered a green occupation because they install and maintain systems that conserve water and improve energy efficiency, such as high-efficiency boilers and solar water heaters. To further integrate into the green sector, these professionals can focus on advanced water conservation systems, like greywater recycling and rainwater harvesting, as well as eco-friendly heating solutions like geothermal systems. Community colleges in Los Angeles County offer relevant certifications that are considered green by California Employment Development Department, such as the **Plumbing Certificate** and **Heat and Frost Insulators Certificate**, which equip these tradespeople with the skills needed to support sustainable practices and technologies.

Community College Talent Supply

Plumbing, Pipefitting, and Steamfitting

- ▶ **TOP code:** 0952.30
- ▶ **Description:** Theories, principles, methods, technical skills and use of equipment in plumbing, pipefitting, and steamfitting.

Strong Workforce Program (SWP) Statistics:	
Students with a Job Closely Related to Their Field of Study, 2019-20	92%
Median Annual Earnings for Exiting Students, 2020-21	\$49,276
Median Change in Earnings for Exiting Students, 2020-21	3%
SWP Exiting Students Who Attained the Living Wage, 2020-21	68%

Occupational Overview

Employment in Industry 2022: 10,368 workers

Percent of Jobs Identified as Middle-Skill: 33.6%

Median Hourly Wages \$27.42 per hour

Typical Entry-Level Education HS diploma or equiv.

Work Experience Required None

Typical On-the-Job Training Apprenticeship

Occupational Projections 2022 to 2028

Newly Created Jobs 950 new jobs (9.1%)

Replacement Jobs 5,590 openings

Net Job Openings 6,540 jobs

2022-2028 Percent Net Change 63.1%

Exhibit 10: Plumbing, Pipefitting, and Steamfitting Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
L.A. Trade Technical College		●	●
Rio Hondo College		●	●



Exhibit 11: Gender, 2022-23



Exhibit 12: Race and Ethnicity, 2022-23

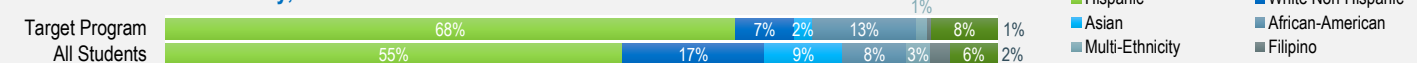
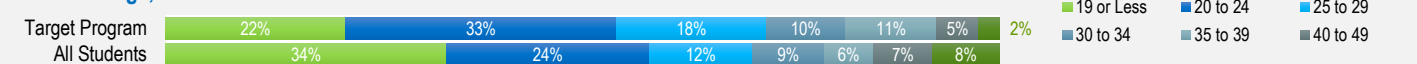


Exhibit 13: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, plumbers, pipefitters, and steamfitters in Los Angeles County are expected to experience 6,540 new and replacement job openings. Job postings data reveals an average of 65 monthly job openings in 2023, while average monthly hires were 411, including new jobs and openings from attrition and job transfers. In Los Angeles County, only 23 percent of employers specified an education level in their job postings, with 88 percent of those requesting an associate degree or lower. The median advertised annual salary for these positions is \$64,900.

Exhibit 14 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

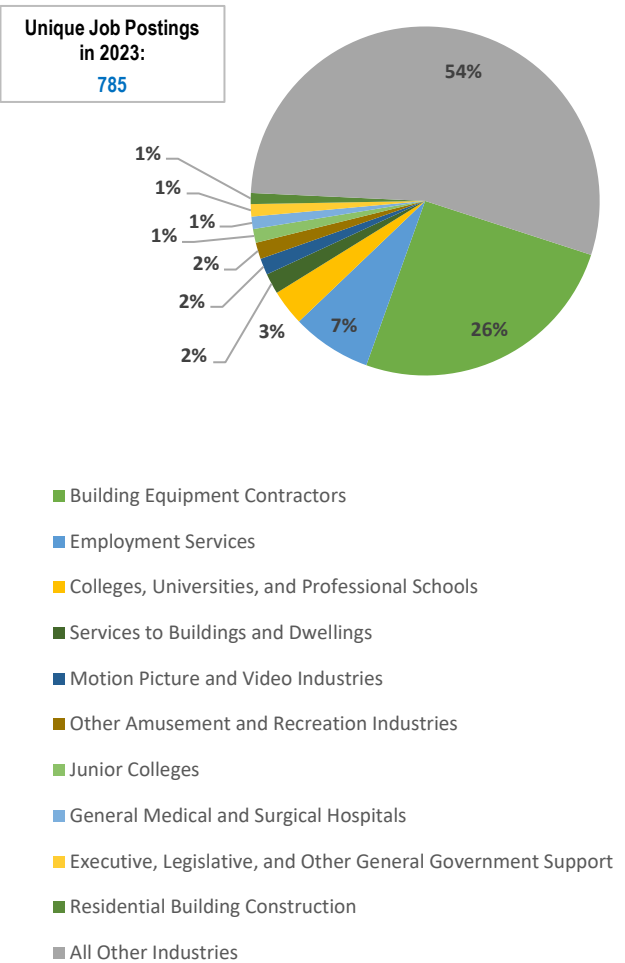
Employers in building equipment contractors, employment services, colleges, universities, and professional schools, services to buildings and dwellings, motion picture and video industries and other amusement and recreation industries advertised the most opportunities.

Top Skills Requested for Plumbers, Pipefitters, and Steamfitters

The top specialized skills desired by employers include:

- ✓ Plumbing
- ✓ Water Heaters
- ✓ Plumbing Systems
- ✓ Pipe (Fluid Conveyance)
- ✓ Valves (Piping)
- ✓ Plumbing Fixtures
- ✓ Construction
- ✓ Hand Tools
- ✓ Power Tool Operation
- ✓ Drain Cleaning

Exhibit 14: Unique Job Postings by Industry
 Plumbers, Pipefitters, and Steamfitters
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Plumbers
- ▶ Plumbing Technicians
- ▶ Plumbing Installers
- ▶ Plumbing Service Technicians
- ▶ Plumbing Apprentices
- ▶ Journeyman Plumbers
- ▶ Pipefitters
- ▶ Service Plumbers
- ▶ Maintenance Plumbers
- ▶ Drain Technicians

The top common skills desired by employers include:

- ✓ Communication
- ✓ Troubleshooting (Problem Solving)
- ✓ Good Driving Record
- ✓ Customer Service
- ✓ Detail Oriented
- ✓ Self-Motivation
- ✓ Lifting Ability
- ✓ Strong Work Ethic
- ✓ Sales
- ✓ Management

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Python (Programming Language)
- ✓ Autodesk Maya
- ✓ Houdini (3D Animation Software)
- ✓ C++ (Programming Language)
- ✓ PyQt
- ✓ Design Software

Skills in High-Demand

- ✓ Plumbing
- ✓ Communication
- ✓ Water Heaters
- ✓ Plumbing Systems
- ✓ Troubleshooting (Problem Solving)
- ✓ Good Driving Record
- ✓ Customer Service
- ✓ Detail Oriented
- ✓ Pipe (Fluid Conveyance)
- ✓ Valves (Piping)

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ CDL Class C License
- ✓ 10-Hr OSHA General Industry Card
- ✓ Contractor License
- ✓ OSHA Certification
- ✓ Certified Information Privacy Professional
- ✓ Transportation Worker Identification Credential (TWIC) Card
- ✓ Nurse Practitioner (APRN-CNP)
- ✓ National Apprenticeship Certificate
- ✓ NICET Level II Certification

Where Jobs are Typically Posted

- ✓ simplyhired.com
- ✓ indeed.com
- ✓ craigslist.org
- ✓ recruiternetworks.com
- ✓ losangelesrecruiter.com
- ✓ dejobs.org
- ✓ monster.com
- ✓ glassdoor.com
- ✓ icims.com
- ✓ santaclaritarecruiter.com

The plumbers, pipefitters, and steamfitters profession was designated as 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [Exhibit A-5]. It was also identified in O*Net's Green Economy Sector of Green Construction and in several O*Net Green Topics as shown in Exhibit A-6. This profession was included in the O*Net Green Topics related education programs under Plumbing and Related Water Supply Services, Other as shown in Exhibit A-7. Plumbers, pipefitters, and steamfitters contribute to California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in Exhibit A-8.

Community College Talent Supply

The California Community Colleges offer certificates and/or associate degree programs and have enrollment in plumbing, pipefitting, and steamfitting at two of their college locations, as shown in **Exhibits 10 and 15**. Plumbing, pipefitting, and steamfitting graduates are highly likely to earn a job related to their education, with 92 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$49,276 for SWP exiting students in 2020-21, which was a median change in earnings of 3 percent. Many SWP students were able to attain a living wage, with 68 percent hitting that mark in 2020-21.

There were 1,075 total enrollments in 2022-23 and a total of 37 combined associate degrees and certificates awarded, as shown in **Exhibits 15 and 16**.

Exhibit 15: Student Enrollment by College, 2022-23

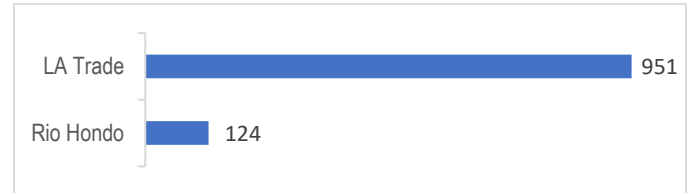
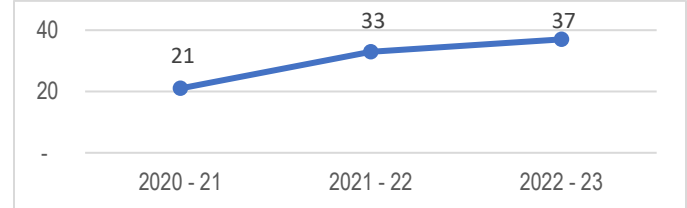


Exhibit 16: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Plumbing, Pipefitting, and Steamfitting Student Demographics

Approximately 96 percent of plumbing, pipefitting, and steamfitting students at the LA community colleges are male, which is over 50 percentage points higher than the overall student enrollment [**Exhibit 11**]. More than two-thirds identify as Hispanic, 13 percentage points higher than the general student population [**Exhibit 12**]. Additionally, 73 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 13**]. This young population of LA students is an untapped asset for regional employers seeking to strengthen their workforce. The referenced exhibits display the demographics of the 1,075 students enrolled in these programs during the 2022-23 academic year.

Welders, Cutters, Solderers, and Brazers

(SOC 51-4121)

Welders, cutters, solderers, and brazers are considered a green occupation because they contribute to building sustainable infrastructure, such as wind turbines and solar panel frames. To further integrate into the green sector, they can adopt eco-friendly materials, reduce waste with precision techniques, and focus on producing components for green technologies. Community colleges in Los Angeles County offer relevant programs, like the **Advanced Manufacturing Technology Certificate**, which equips welders with skills to support environmentally sustainable practices.

Community College Talent Supply

Welding Technology

- ▶ **TOP code:** 0956.50
- ▶ **Description:** Welding techniques, processes, and equipment applied in accordance with diagrams, blueprints, or other specifications.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	70%
Median Annual Earnings for Exiting Students, 2020-21	\$45,740
Median Change in Earnings for Exiting Students, 2020-21	39%
SWP Exiting Students Who Attained the Living Wage, 2020-21	59%

Occupational Overview

Employment in Industry 2022:..... 6,921 workers
 Percent of Jobs Identified as Middle-Skill:..... 31.1%
 Median Hourly Wages..... \$23.27 per hour
 Typical Entry-Level Education..... HS diploma or equiv.
 Work Experience Required None
 Typical On-the-Job Training Moderate-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... -450 new jobs (-6.6%)
 Replacement Jobs 3,820 openings
 Net Job Openings 3,370 jobs
 2022-2028 Percent Net Change..... 48.7%

Exhibit 17: Welding Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College	●	●	●
Compton College			●
El Camino College		●	●
Glendale Community College		●	●
L.A. Pierce College		●	●
L.A. Trade Technical College		●	●
Long Beach City College	●	●	●
Mt. San Antonio College	●	●	●
Pasadena City College		●	●
Rio Hondo College		●	●



Exhibit 18: Gender, 2022-23

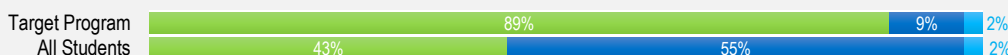
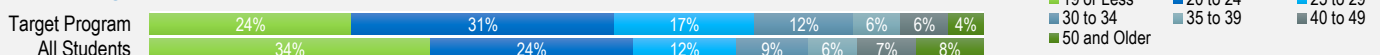


Exhibit 19: Race and Ethnicity, 2022-23



Exhibit 20: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, welders, cutters, solderers, and brazers in Los Angeles County are expected to experience 3,370 new and replacement job openings. Job postings data reveals an average of 38 monthly job openings in 2023, while average monthly hires were 267, including new jobs and openings from attrition and job transfers. In Los Angeles County, only 38 percent of employers specified an education level in their job postings, with 97 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$52,000.

Exhibit 21 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

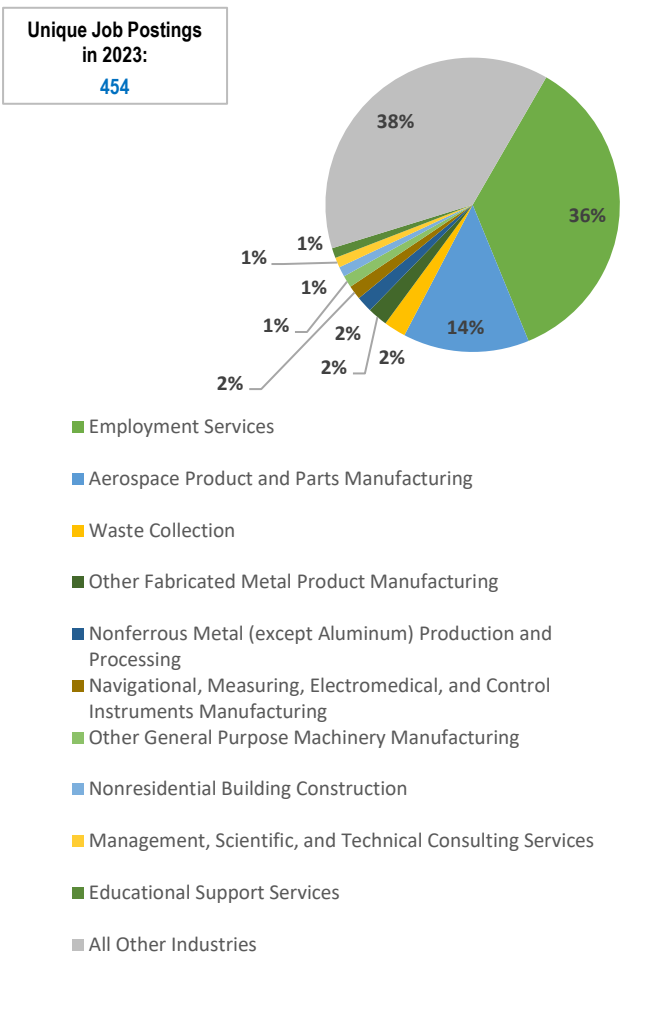
Employers in employment services, aerospace product and parts manufacturing, waste collection, other fabricated metal product manufacturing, nonferrous metal (except aluminum) production and processing, and navigational, measuring, electromedical, and control instruments manufacturing advertised the most opportunities.

Top Skills Requested for Welders, Cutters, Solderers, and Brazers

The top specialized skills desired by employers include:

- ✓ Welding
- ✓ Gas Tungsten Arc Welding
- ✓ Metal Inert Gas (MIG) Welding
- ✓ Fabrication
- ✓ Aluminum
- ✓ Grinding
- ✓ Sheet Metal
- ✓ American Welding Society Codes
- ✓ Blueprinting
- ✓ Welding Equipment

Exhibit 21: Unique Job Postings by Industry
Welders, Cutters, Solderers, and Brazers
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Welders
- ▶ TIG Welders
- ▶ MIG Welders
- ▶ Welders/Fabricators
- ▶ Pipe Welder Journeymen
- ▶ Solderers
- ▶ Lead Welders
- ▶ MIG/TIG Welders
- ▶ Mig Welders/Fabricators
- ▶ Certified Welders

The top common skills desired by employers include:

- ✓ Lifting Ability
- ✓ Communication
- ✓ Operations
- ✓ Detail Oriented
- ✓ Mathematics
- ✓ Filing
- ✓ Quality Control
- ✓ Planning
- ✓ Management
- ✓ Customer Service

The top software skills desired by employers include:

- ✓ SAP Applications
- ✓ Protractor (Software)
- ✓ Fleet Maintenance Software
- ✓ Application Programming Interface (API)
- ✓ Microsoft Windows
- ✓ Telepresence
- ✓ Aruba (Network Management Software)
- ✓ Microsoft Excel/Office/Outlook/Word

Skills in High-Demand

- ✓ Welding
- ✓ Gas Tungsten Arc Welding
- ✓ Metal Inert Gas (MIG) Welding
- ✓ Fabrication
- ✓ Aluminum
- ✓ Grinding
- ✓ Sheet Metal
- ✓ Lifting Ability
- ✓ Communication
- ✓ Operations

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Certified Welder
- ✓ CDL Class C License
- ✓ American Welding Society Certification
- ✓ Security Clearance
- ✓ CDL Class A License
- ✓ American Society of Mechanical Engineers (ASME) Certified
- ✓ Forklift Certification
- ✓ CDL Class B License
- ✓ Aerial Lift Certification

Where Jobs are Typically Posted

- ✓ dejobs.org
- ✓ recruiternetworks.com
- ✓ craigslist.org
- ✓ losangelesrecruiter.com
- ✓ monster.com
- ✓ energyjobline.com
- ✓ careercast.com
- ✓ greenhouse.io
- ✓ santaclaritarecruiter.com
- ✓ oxnardrecruiter.com

The welders, cutters, solderers, and brazers profession was designated as 'Green Increased Demand' in O*Net's comprehensive list of green occupations [Exhibit A-9]. It was also identified in O*Net's Green Economy Sectors under Green Construction and Manufacturing [Exhibit A-10]. Welders, cutters, solderers, and brazers contribute to California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in Exhibit A-11.

Community College Talent Supply

The California Community Colleges have enrollment and offer nondegree awards, certificates and/or associate degree programs in welding technology at 10 of their college locations as shown in **Exhibits 17 and 22**. Welding technology graduates are likely to earn a job related to their education, with 70 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings was \$45,740 for SWP exiting students in 2020-21, which was a median change in earnings of 39 percent. Many SWP students were able to attain a living wage, with 59 percent hitting that mark in 2020-21.

There were 12,377 total enrollments in 2022-23 and a total of 256 combined associate degrees and certificates awarded, as shown in **Exhibits 22 and 23**.

Exhibit 22: Student Enrollment by College, 2022-23

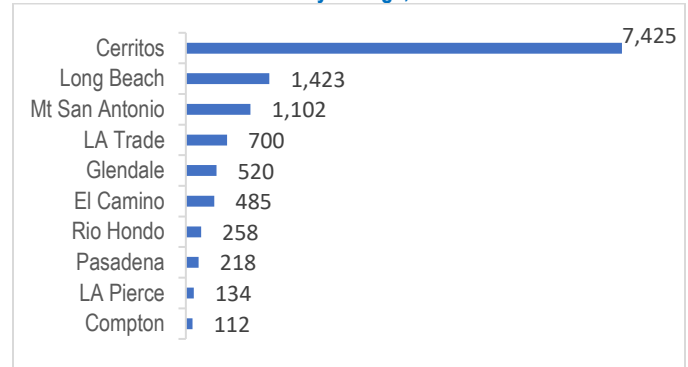
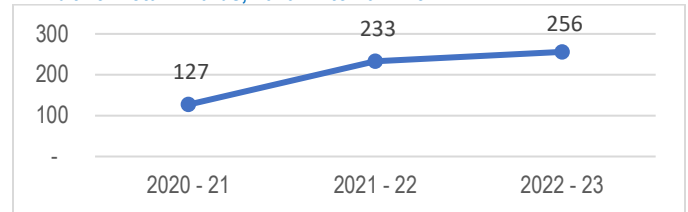


Exhibit 23: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Welding Technology Student Demographics

Approximately 89 percent of welding technology students at Los Angeles community colleges are male, 46 percentage points higher than the overall student enrollment [**Exhibit 18**]. Seventy percent identify as Hispanic, 15 percentage points higher than the general student population [**Exhibit 19**]. Additionally, 72 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 20**]. This young population of LA students is an untapped asset for regional employers seeking to strengthen their workforce. The referenced exhibits display LA welding technology student demographics of the 12,377 students enrolled in the during the 2022-23 academic year.

Construction and Building Inspectors

(SOC 47-4011)

Construction and building inspectors are considered a green occupation because they ensure compliance with environmental regulations and sustainability standards in building projects. To further integrate into the green sector, inspectors can obtain certifications like the **Sustainable Building Construction Certificate, Sustainable Construction Management Program, and the Leadership in Energy and Environmental Design (LEED)** course offered by community colleges in Los Angeles County. These programs equip inspectors with the knowledge to enforce green building practices, energy efficiency, and the use of sustainable materials.

Community College Talent Supply

Construction Inspection

- ▶ **TOP code:** 0957.20
- ▶ **Description:** Inspection of new or remodeled structures to determine their soundness and compliance to specifications, building codes and other regulations.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	80%
Median Annual Earnings for Exiting Students, 2020-21	\$61,624
Median Change in Earnings for Exiting Students, 2020-21	26%
SWP Exiting Students Who Attained the Living Wage, 2020-21	60%

Occupational Overview

Employment in Industry 2022:..... 3,216 workers
 Percent of Jobs Identified as Middle-Skill:..... 40.7%
 Median Hourly Wages..... \$39.49 per hour
 Typical Entry-Level Education..... HS diploma or equiv.
 Work Experience Required 5 years or more
 Typical On-the-Job Training Moderate-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... 170 new jobs (5.3%)
 Replacement Jobs 2,250 openings
 Net Job Openings 2,420 jobs
 2022-2028 Percent Net Change..... 75.2%

Exhibit 24: Construction Inspection Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Pasadena City College		●	●

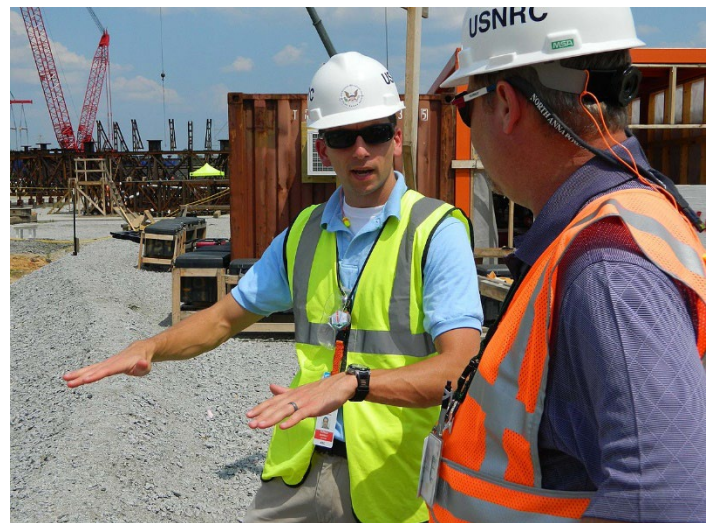


Exhibit 25: Gender, 2022-23



Exhibit 26: Race and Ethnicity, 2022-23

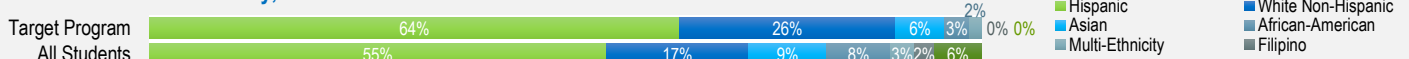
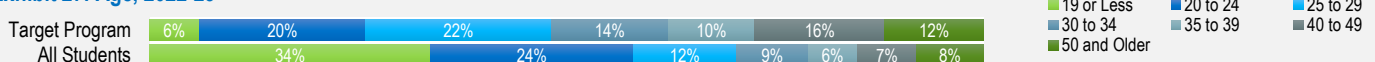


Exhibit 27: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, construction and building inspectors in Los Angeles County are expected to experience 2,420 new and replacement job openings. Job postings data reveals an average of 53 monthly job openings in 2023, while average monthly hires were 114, including new jobs and openings from attrition and job transfers. In Los Angeles County, 60 percent of employers specified an education level in their job postings, with 55 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$81,700.

Exhibit 28 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

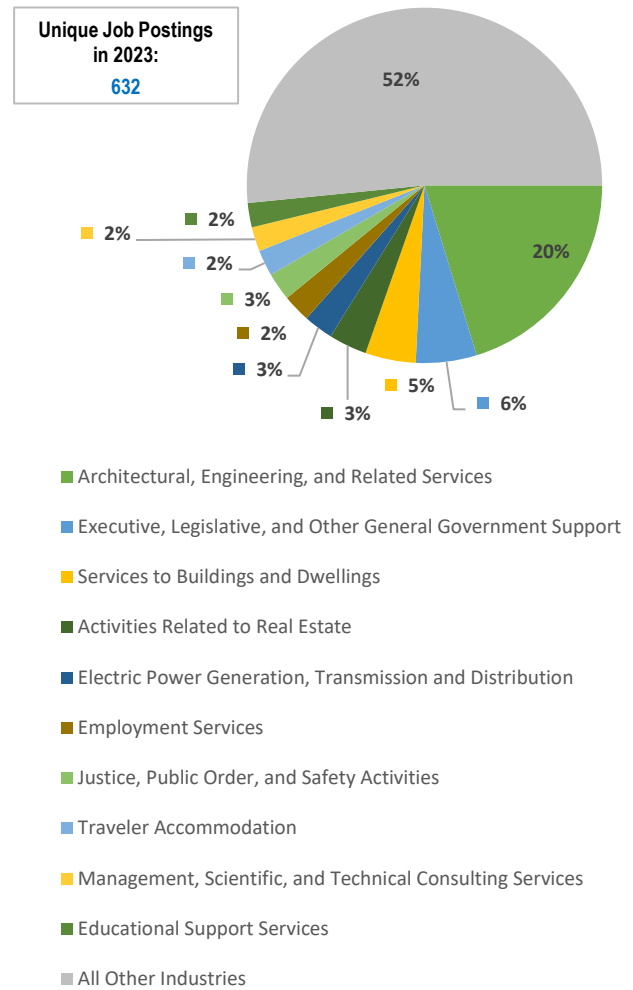
Employers in architectural, engineering, and related services, executive, legislative, and other government support, services to buildings and dwellings, activities related to real estate, and electric power generation, transmission and distribution advertised the most opportunities.

Top Skills Requested for Construction and Building Inspectors

The top specialized skills desired by employers include:

- ✓ Construction
- ✓ Building Codes
- ✓ Plumbing
- ✓ Code Enforcement
- ✓ Field Inspection
- ✓ Ordinances
- ✓ Construction Management
- ✓ Building Inspections
- ✓ Project Management
- ✓ Construction Inspection

Exhibit 28: Unique Job Postings by Industry
Construction and Building Inspectors
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Building Inspectors
- ▶ Construction Inspectors
- ▶ Home Inspectors
- ▶ Code Enforcement Officers
- ▶ Public Works Inspectors
- ▶ Termite Inspectors
- ▶ Electrical Inspectors
- ▶ Energy Analysts
- ▶ Plans Examiners
- ▶ Rooms Inspectors

The top common skills desired by employers include:

- ✓ Communication
- ✓ Customer Service
- ✓ Management
- ✓ Writing
- ✓ Operations
- ✓ Planning
- ✓ Microsoft Office
- ✓ Problem Solving
- ✓ Detail Oriented
- ✓ Coordinating

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Geographic Information Systems
- ✓ Microsoft PowerPoint
- ✓ Spreadsheets
- ✓ Permitting Software
- ✓ Power BI
- ✓ Visual Basic For Applications

Skills in High-Demand

- ✓ Construction
- ✓ Communication
- ✓ Customer Service
- ✓ Management
- ✓ Writing
- ✓ Building Codes
- ✓ Plumbing
- ✓ Operations
- ✓ Planning
- ✓ Microsoft Office

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ CDL Class C License
- ✓ 30-Hour OSHA General Industry Card
- ✓ CompTIA Advanced Security Practitioner (CASP+)
- ✓ NICET Certification (National Institute For Certification In Engineering Technologies)
- ✓ Residential Building Inspector
- ✓ Security Clearance
- ✓ OSHA Certification
- ✓ Structural Masonry Special Inspector
- ✓ Certified Public Infrastructure Inspector

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ governmentjobs.com
- ✓ losangelesrecruiter.com
- ✓ recruiternetworks.com
- ✓ santaclaritarecruiter.com
- ✓ oxnardrecruiter.com
- ✓ tustinrecruiter.com
- ✓ dejobs.org
- ✓ craigslist.org

The construction and building inspectors profession was designated as 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [Exhibit A-12]. It was also identified in O*Net's Green Economy Sectors under Green Construction and several O*Net Green Topics as shown in Exhibit A-13. Construction and building inspectors contribute to the California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, and Water as identified in Exhibit A-14.

Community College Talent Supply

The California Community Colleges have enrollment and offer a certificate or associate degree program in construction inspection at just one of their college locations as shown in **Exhibits 24 and 29**.

Construction inspection graduates are likely to earn a job related to their education, with 80 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$61,624 for SWP exiting students in 2020-21, which was a median change in earnings of 26 percent. Many SWP students were able to attain a living wage, with 60 percent hitting that mark in 2020-21.

There were 135 total enrollments in 2022-23 and a total of 18 combined associate degrees and certificates awarded, as shown in **Exhibits 29 and 30**.

Exhibit 29: Student Enrollment by College, 2022-23

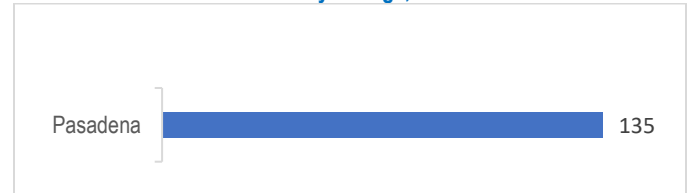
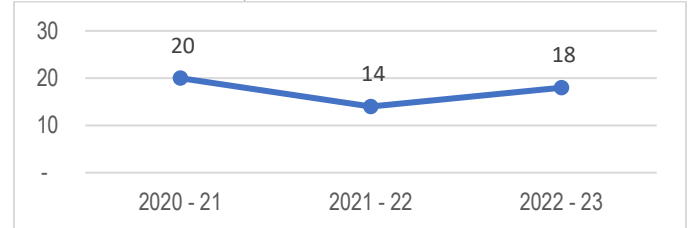


Exhibit 30: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Construction Inspection Student Demographics

Nearly 80 percent of construction inspection students at Los Angeles community colleges are male, 35 percentage points higher than the overall student enrollment [**Exhibit 25**]. Almost two-thirds of these students identify as Hispanic, and over a quarter identify as white, non-Hispanic, both 9 percentage points higher than the general student population [**Exhibit 26**]. Only 48 percent are 29 years old or younger, compared to 70 percent in the overall student body, with the most significant age difference being in the under 19 category [**Exhibit 27**]. The referenced exhibits show the demographics of the 135 students enrolled in these programs during the 2022-23 academic year.

Hazardous Materials Removal Workers

(SOC 47-4041)

Hazardous materials removal workers are considered a green occupation because they safely remove and dispose of hazardous materials, preventing environmental harm. To further integrate into the green sector, workers can specialize in eco-friendly disposal methods and advanced recycling techniques. Community colleges in Los Angeles County offer relevant programs like the **Hazardous Waste Management Certificate** and **Environmental Technology Certificate**, which equip workers with sustainable practices to minimize environmental impact.

Community College Talent Supply

Environmental Technology

- ▶ **TOP code:** 0303.00
- ▶ **Description:** Environmental management, monitoring, assessment, and restoration, including environmental pollution control systems and the management of hazardous materials and hazardous waste, and related government regulations.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	88%
Median Annual Earnings for Exiting Students, 2020-21	\$45,376
Median Change in Earnings for Exiting Students, 2020-21	17%
SWP Exiting Students Who Attained the Living Wage, 2020-21	58%

Occupational Overview

Employment in Industry 2022:..... 1,671 workers
 Percent of Jobs Identified as Middle-Skill:..... 34.0%
 Median Hourly Wages..... \$23.90 per hour
 Typical Entry-Level Education..... HS diploma or equiv.
 Work Experience Required None
 Typical On-the-Job Training Moderate-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... 250 new jobs (15.2%)
 Replacement Jobs 1,170 openings
 Net Job Openings 1,420 jobs
 2022-2028 Percent Net Change..... 85.0%

Exhibit 31: Environmental Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Mt. San Antonio College		●	
Rio Hondo College		●	●
Santa Monica College	●	●	●



Exhibit 32: Gender, 2022-23

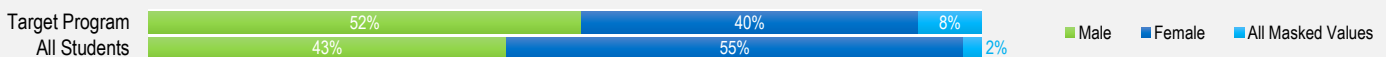


Exhibit 33: Race and Ethnicity, 2022-23

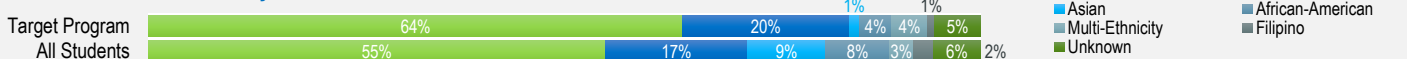
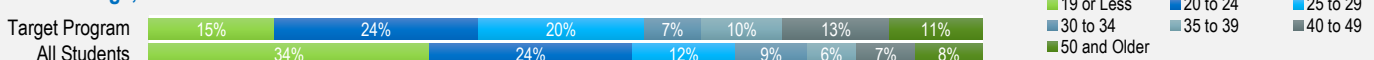


Exhibit 34: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, hazardous materials removal workers in Los Angeles County are expected to experience 1,420 new and replacement job openings. Job postings data reveals an average of 10 monthly job openings in 2023, while average monthly hires were 115, including new jobs and openings from attrition and job transfers. In Los Angeles County, 42 percent of employers specified an education level in their job postings, with 72 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$48,600.

Exhibit 35 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

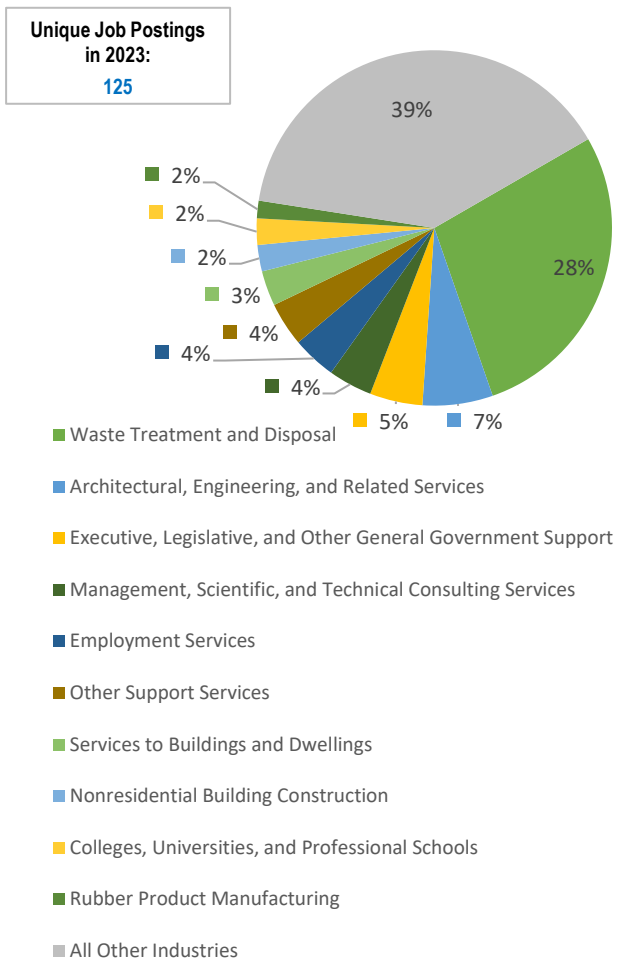
Employers in waste treatment and disposal, architectural, engineering, and related services, executive, legislative, and other general government support, management, scientific, and technical consulting services, employment services, and other support services advertised the most opportunities.

Top Skills Requested for Hazardous Materials Removal Workers

The top specialized skills desired by employers include:

- ✓ Spill Response
- ✓ Environment Health And Safety
- ✓ Forklift Truck
- ✓ Regulatory Compliance
- ✓ Chemistry
- ✓ Corrugated Stainless Steel Tubing
- ✓ Project Management
- ✓ Occupational Hygiene
- ✓ Fluorescent Lamps
- ✓ Solvent

Exhibit 35: Unique Job Postings by Industry
 Hazardous Materials Removal Workers
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Hazardous Materials Technicians
- ▶ Hazardous Waste Technicians
- ▶ Site Supervisors
- ▶ Asbestos Supervisors
- ▶ Asbestos Workers
- ▶ Technicians
- ▶ Junk Removal Specialists
- ▶ Hazardous Waste Specialists
- ▶ Environmental Technicians
- ▶ Environmental Health and Safety Managers

The top common skills desired by employers include:

- ✓ Packaging And Labeling
- ✓ Detail Oriented
- ✓ Communication
- ✓ Lifting Ability
- ✓ Operations
- ✓ Loading And Unloading
- ✓ Good Driving Record
- ✓ Management
- ✓ Investigation
- ✓ Leadership

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Microsoft PowerPoint
- ✓ Git (Version Control System)
- ✓ Microsoft Access
- ✓ Microsoft Windows
- ✓ Spreadsheets
- ✓ Version Control Software

Skills in High-Demand

- ✓ Management
- ✓ Packaging And Labeling
- ✓ Detail Oriented
- ✓ Waste Collection
- ✓ Forklift Truck
- ✓ Regulatory Compliance
- ✓ Spill Response
- ✓ Detail Oriented
- ✓ Loading And Unloading
- ✓ Customer Service

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ HAZWOPER Certification
- ✓ Asbestos License/Certification
- ✓ Forklift Certification
- ✓ Hazardous Materials Certification - Technician Level
- ✓ CDL Class C License
- ✓ Professional Engineer (PE) License
- ✓ Select row Asbestos Abatement Worker License/Certification
- ✓ CDL Class B License
- ✓ Hazmat Endorsement

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ losangelesrecruiter.com
- ✓ snagajob.com
- ✓ cleanharbors.com
- ✓ craigslist.org
- ✓ monster.com
- ✓ oraclecloud.com
- ✓ dejobs.org
- ✓ ca.gov

The hazardous materials removal workers profession was designated as 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [Exhibit A-15]. It was also identified in O*Net's Green Economy Sectors under Green Construction, Environment Protection, Recycling and Waste Reduction, and Governmental and Regulatory Administration and under several Green Topics as shown in Exhibit A-16. Hazardous materials removal workers contribute to the California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, and Water as identified in Exhibit A-17.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in environmental technology at three of their college locations, but have enrollment at four locations as shown in **Exhibits 31 and 36**.

Environmental technology graduates are highly likely to earn a job related to their education, with 88 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$45,376 for SWP exiting students in 2020-21, which was a median change in earnings of 17 percent. Many SWP students were able to attain a living wage, with 58 percent hitting that mark in 2020-21.

There were 285 total enrollments in 2022-23 and a total of 41 combined associate degrees and certificates awarded, as shown in **Exhibits 36 and 37**.

Environmental Technology Student Demographics

A little more than 50 percent of environmental technology students at Los Angeles community colleges are male, just 9 percentage points higher than the overall student enrollment [**Exhibit 32**]. Nearly two-thirds identify as Hispanic, 9 percentage points higher than the general student population [**Exhibit 33**]. Only 59 percent are 29-year-olds or younger, compared to 70 percent in the overall student body, with the most significant age difference being in the 19 or less category [**Exhibit 34**]. The referenced exhibits display student demographics of the 285 students enrolled in environmental technology at LA community colleges during the 2022-23 academic year.

Exhibit 36: Student Enrollment by College, 2022-23

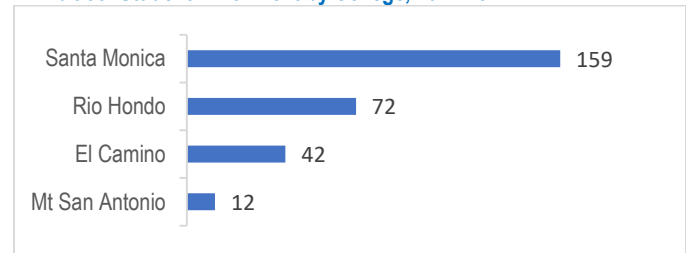
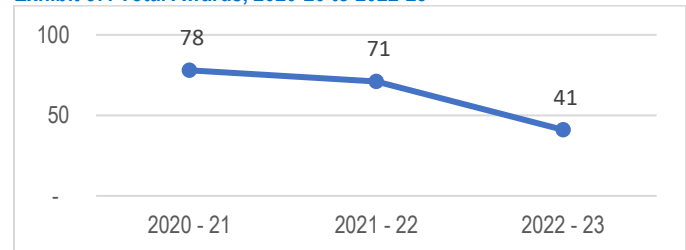


Exhibit 37: Total Awards, 2020-20 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Water and Wastewater Treatment Plant and System Operators

(SOC 51-8031)

Water and wastewater treatment plant and system operators are considered a green occupation because they manage water quality and treatment processes, crucial for preventing pollution and ensuring sustainable water use. To further integrate into the green sector, operators can adopt energy-efficient technologies, enhance water recycling methods, and reduce chemical usage. Community colleges in Los Angeles County offer relevant programs like the **Environmental Technology Certificate**, and **Water Efficiency Management Certificate** which equip operators with the skills to optimize sustainability in water management.

Community College Talent Supply

Water and Wastewater Technology

- ▶ **TOP code:** 0958.00
- ▶ **Description:** Principles, technical skills and equipment used to process, purify, store and distribute potable water, and dispose of wastewater. Design, construction, operation, and maintenance of equipment for water or wastewater treatment systems.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	80%
Median Annual Earnings for Exiting Students, 2020-21	\$55,362
Median Change in Earnings for Exiting Students, 2020-21	17%
SWP Exiting Students Who Attained the Living Wage, 2020-21	70%

Occupational Overview

Employment in Industry 2022:..... 1,652 workers
 Percent of Jobs Identified as Middle-Skill:..... 45.7%
 Median Hourly Wages..... \$38.55 per hour
 Typical Entry-Level Education..... HS diploma or equiv.
 Work Experience Required None
 Typical On-the-Job Training Long-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... -90 new jobs (-5.6%)
 Replacement Jobs 870 openings
 Net Job Openings 780 jobs
 2022-2028 Percent Net Change..... 47.2%

Exhibit 38: Water and Wastewater Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Citrus College		●	●
L.A. Trade Technical College		●	●



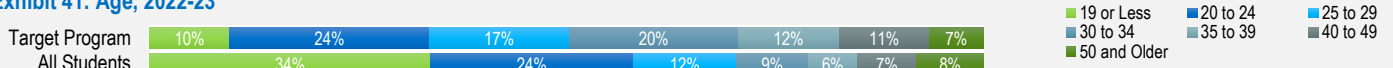
Exhibit 39: Gender, 2022-23



Exhibit 40: Race and Ethnicity, 2022-23



Exhibit 41: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, water and wastewater treatment plant and system operators in Los Angeles County are expected to experience 780 new and replacement job openings. Job postings data reveals an average of 31 monthly job openings in 2023, while average monthly hires were 36, including new jobs and openings from attrition and job transfers. In Los Angeles County, 67 percent of employers specified an educational attainment in their job postings, with 76 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$68,900.

Exhibit 42 displays the top industries (4-digit NAICS) with the most unique job posting looking to fill vacancies for this role in Los Angeles County in 2023.

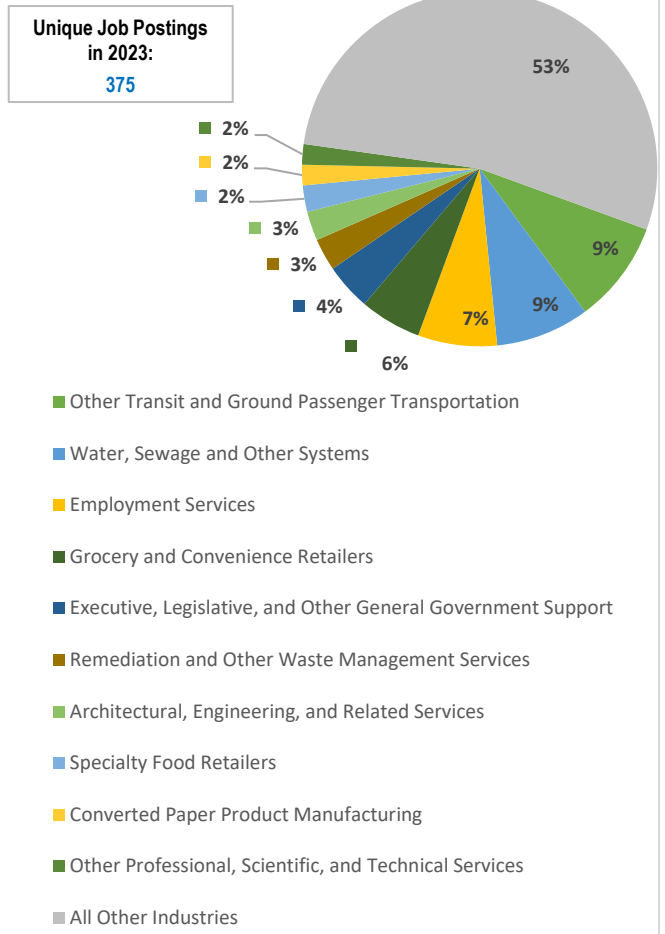
Employers in other transit and ground passenger transportation, water, sewage and other systems, employment services, grocery and convenience retailers, executive, legislative, and other general government support, remediation and other waste management services, and architectural, engineering, and related services advertised the most opportunities.

Top Skills Requested for Water and Wastewater Treatment Plant and System Operators

The top specialized skills desired by employers include:

- ✓ Valves (Piping)
- ✓ Water Treatment
- ✓ Water Distribution
- ✓ Wastewater
- ✓ Water Supply Networks
- ✓ Sewage Treatments
- ✓ Water Supply
- ✓ Hand Tools
- ✓ Food Manufacturing
- ✓ Water Resources

Exhibit 42: Unique Job Postings by Industry
 Water and Wastewater Treatment Plant and System Operators
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Sanitation Supervisors
- ▶ Water Distribution Operators
- ▶ Wastewater Operators
- ▶ Utility Operators
- ▶ Water Operators
- ▶ Wastewater Treatment Operators
- ▶ Wastewater Treatment Plant Operators
- ▶ Wastewater Technicians
- ▶ Water Treatment Plant Operators
- ▶ Water Treatment Operators

The top common skills desired by employers include:

- ✓ Operations
- ✓ Communication
- ✓ Management
- ✓ Sanitation
- ✓ Customer Service
- ✓ Mathematics
- ✓ Writing
- ✓ Leadership
- ✓ Troubleshooting (Problem Solving)
- ✓ Teamwork

The top software skills desired by employers include:

- ✓ Spreadsheets
- ✓ Microsoft Office: Excel/Outlook/Word
- ✓ Microsoft PowerPoint
- ✓ Gmail
- ✓ Google Drive
- ✓ Microsoft Windows
- ✓ Google Workspace
- ✓ Kronos (Timekeeping Software)
- ✓ Microsoft Access
- ✓ Geographic Information Systems

Skills in High-Demand

- ✓ Operations
- ✓ Communication
- ✓ Management
- ✓ Valves (Piping)
- ✓ Water Treatment
- ✓ Water Distribution
- ✓ Wastewater
- ✓ Water Supply Networks
- ✓ Sanitation
- ✓ Sewage Treatments

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Operator Certification
- ✓ CDL Class C License
- ✓ Wastewater Operator Certification
- ✓ SQF (Sage Quality Food) Practitioner
- ✓ First Aid Certification
- ✓ Cardiopulmonary Resuscitation (CPR) Certification
- ✓ CDL Class B License
- ✓ CDL Class A License
- ✓ Tanker Endorsement

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ governmentjobs.com
- ✓ recruiternetworks.com
- ✓ dejobs.org
- ✓ taleo.net
- ✓ losangelesrecruiter.com
- ✓ monster.com
- ✓ latpro.com
- ✓ careerjet.com

The water and wastewater treatment plant and system operators profession not included in O*Net's list of green occupations or identified in an O*Net Green Economy Sector, but it was included in O*Net's Green Topics as shown in **Exhibit A-18**. Wind Turbine Service Technicians contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Industry, Waster, and Water as identified in **Exhibit A-19**.

Community College Talent Supply

The California Community Colleges offer certificates and/or associate degree programs in water and wastewater technology at two of their college locations, but have enrollment at three locations as shown in **Exhibits 38 and 43**. Water and wastewater technology graduates are likely to earn a job related to their education, with 80 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$55,362 for SWP exiting students in 2020-21, which was a median change in earnings of 17 percent. Many SWP students were able to attain a living wage, with 70 percent hitting that mark in 2020-21.

There were 697 total enrollments in 2022-23 and a total of 75 combined associate degrees and certificates awarded, as shown in **Exhibits 43 and 44**.

Exhibit 43: Student Enrollment by College, 2022-23

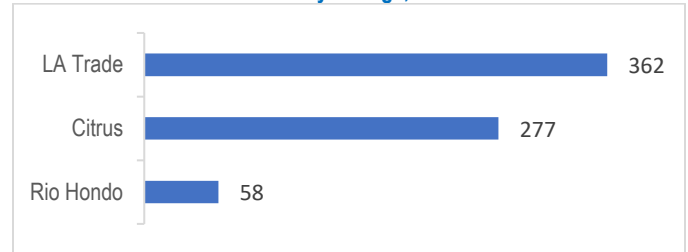
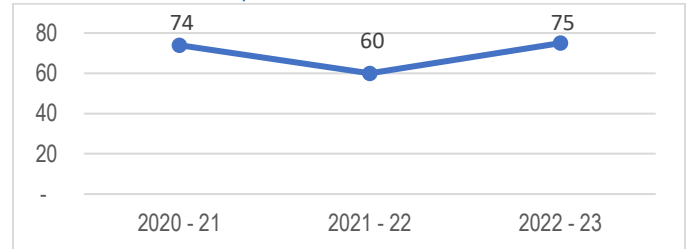


Exhibit 44: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Water and Wastewater Technology Student Demographics

Approximately 85 percent of water and wastewater technology students at Los Angeles community colleges are male, 42 percentage points higher than the overall student enrollment [**Exhibit 39**]. More than 75 percent identify as Hispanic, more than 20 percentage points higher than the general student population [**Exhibit 40**]. Only 51 percent are 29-year-olds or younger, compared to 70 percent for the overall student body, with the most significant age difference being in the 19 or less category [**Exhibit 41**]. The proportion of students aged 30 to 39 are more than double that of the overall student body. The referenced exhibits display student demographics of the 697 students enrolled in water and wastewater technology at LA community colleges during the 2022-23 academic year.

Middle-Skill Occupations

The Middle-Skill Occupations section of this report provides a comprehensive examination of various green jobs in Los Angeles County that require education beyond a high school diploma but less than a four-year degree. This section focuses on middle-skill occupations crucial for advancing the region's green economy. It offers detailed profiles of these jobs, including descriptions, necessary skills, educational requirements, and career prospects. By spotlighting these occupations, the section aims to inform job seekers, educators, and policymakers about the specific roles that support environmental sustainability and economic resilience. It also highlights the pathways available for community college graduates and others seeking to enter or advance in these vital sectors.

Exhibit 45: Target Middle-Skill Occupations

Typical Entry Level Education: Associate Degree / Postsecondary Nondegree Award / Some college, no degree

SOC Code	Description	2022 Jobs	2022 Median Hourly Earnings	2028 Jobs	2022-2028 Forecasted Growth	2022-2028 Change in Jobs	2022-2028 Replacement Jobs	2022-2028 Job Openings	2022-2028 Percent Net Change in Jobs	Percent of 2022 Jobs in Green Sectors
49-3023	Automotive Service Technicians and Mechanics	17,020	\$25.61	16,680	-2.0%	-350	8,390	8,040	47.2%	28.9%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,449	\$27.32	7,310	-1.9%	-140	3,560	3,420	45.9%	3.1%
17-3023	Electrical and Electronic Engineering Technologists and Technicians	2,895	\$32.74	2,720	-6.2%	-180	1,600	1,420	49.0%	6.7%
17-3011	Architectural and Civil Drafters	2,972	\$29.27	3,160	6.2%	180	1,720	1,900	63.9%	7.3%
19-4042	Environmental Science and Protection Technicians, Including Health	1,246	\$25.45	1,300	4.0%	50	760	810	65.0%	4.9%
17-3022	Civil Engineering Technologists and Technicians	1,209	\$37.90	1,250	2.8%	30	660	690	57.1%	3.7%
17-3027	Mechanical Engineering Technologists and Technicians	928	\$33.72	900	-3.1%	-30	490	460	49.6%	2.3%
17-3026	Industrial Engineering Technologists and Technicians	743	\$36.19	890	18.8%	140	460	600	80.7%	2.4%

Note: The '2022-2028 Percent Net Change in Jobs' is calculated as the total job openings from 2022 to 2028 expressed as a percentage of the total jobs in 2022. Total job openings include the '2022-2028 Change in Jobs' (growth or decline in total employment) and the '2022-2028 Replacement Jobs' (positions needing to be filled due to retirements or worker turnover). The formula is: $[(2022-2028 \text{ Change in Jobs} + 2022-2028 \text{ Replacement Jobs}) \div 2022 \text{ Jobs}] \times 100$.

Automotive Service Technicians and Mechanics

(SOC 49-3023)

Automotive service technicians and mechanics are considered a green occupation because they work on energy-efficient vehicles, including hybrids and EVs, supporting the shift to cleaner transportation. To further integrate into the green sector, technicians can specialize in electric vehicle technology and alternative fuel systems. Community colleges in Los Angeles County offer programs like the **Alternative Fuels and Advanced Transportation Technology Certificate** and **Clean Energy and Vehicle Electrification Technology Certificate**, equipping technicians with the skills to excel in green automotive technologies.

Community College Talent Supply

Automotive Technology

- ▶ **TOP code:** 0948.00
- ▶ **Description:** The servicing, maintenance, and diagnosis of malfunctions, and repair and overhaul of components.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	60%
Median Annual Earnings for Exiting Students, 2020-21	\$34,940
Median Change in Earnings for Exiting Students, 2020-21	49%
SWP Exiting Students Who Attained the Living Wage, 2020-21	42%

Occupational Overview

Employment in Industry 2022:..... 17,020 workers
Percent of Jobs Identified as Middle-Skill:..... 35.3%
Median Hourly Wages:..... \$25.61 per hour
Typical Entry-Level Education:..... Postsecondary nondegree award
Work Experience Required:..... None
Typical On-the-Job Training:..... Short-term

Occupational Projections 2022 to 2028

Newly Created Jobs:..... -350 new jobs (-2.0%)
Replacement Jobs:..... 8,390 openings
Net Job Openings:..... 8,040 jobs
2022-2028 Percent Net Change:..... 47.2%

Exhibit 46: Automotive Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	●
Citrus College	●	●	●
Compton College		●	●
East LA College	●	●	●
El Camino College		●	●
L.A. Pierce College		●	●
L.A. Trade Technical College	●	●	●
Long Beach City College	●	●	●
Pasadena City College		●	●
Rio Hondo College*		●	●

*Note: Rio Hondo also offers a Bachelor's Degree program.



Exhibit 47: Gender, 2022-23



Exhibit 48: Race and Ethnicity, 2022-23



Exhibit 49: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, automotive service technicians and mechanics in Los Angeles County are expected to experience 8,040 new and replacement job openings. Job postings data reveals an average of 319 monthly job openings in 2023, while average monthly hires were 446, including new jobs and openings from attrition and job transfers. In Los Angeles County, only half of the employers specified an education level in their job postings, with 84 percent of those requesting an associate degree or less and only 16 percent asking for a bachelor’s degree or higher. The median advertised annual salary for these positions is \$53,100.

Exhibit 50 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

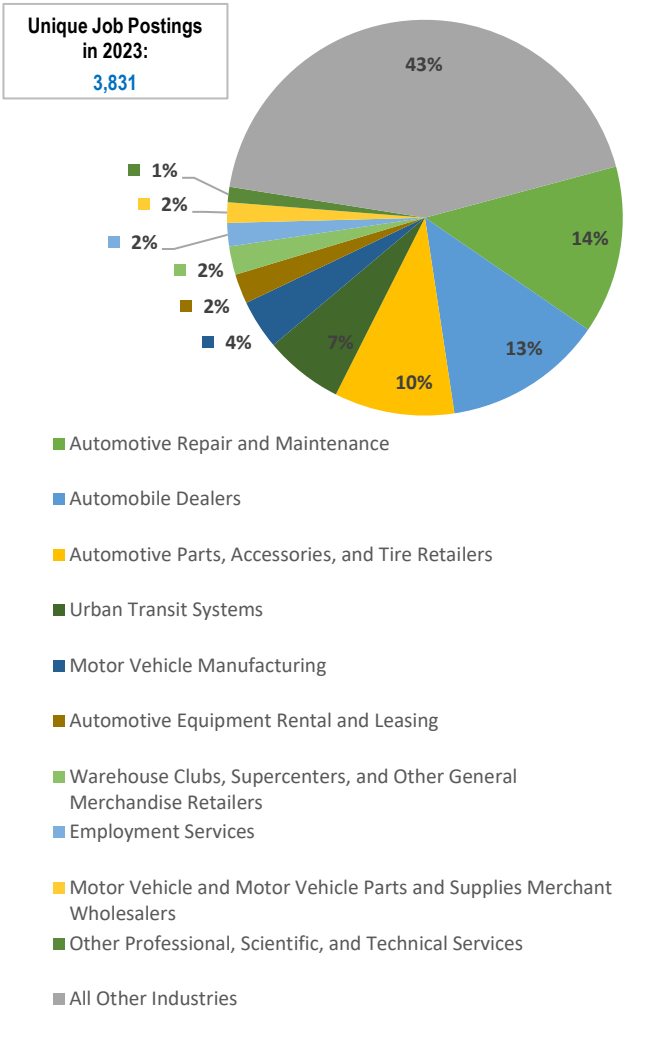
Employers in automotive repair and maintenance, automobile dealers, automotive parts, accessories, and tire retailers, urban transit systems, and motor vehicle manufacturing advertised the most opportunities.

Top Skills Requested for Automotive Service Technicians and Mechanics

The top specialized skills desired by employers include:

- ✓ Automotive Services
- ✓ Brakes
- ✓ Suspension (Vehicle)
- ✓ Changing Oil
- ✓ Mechanics
- ✓ HVAC
- ✓ Preventive Maintenance
- ✓ Tire Repairs
- ✓ Automotive Technologies
- ✓ Transmission

Exhibit 50: Unique Job Postings by Industry
Automotive Service Technicians and Mechanics
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Automotive Technicians
- ▶ Automotive Mechanics
- ▶ Mechanics
- ▶ Automotive Service Advisors
- ▶ Automotive Technicians/Mechanics
- ▶ Lube Technicians
- ▶ Tire and Lube Technicians
- ▶ Automotive Service Technicians
- ▶ Smog Technicians
- ▶ Automotive Tire and Lube Technicians

The top common skills desired by employers include:

- ✓ Customer Service
- ✓ Communication
- ✓ Good Driving Record
- ✓ Lifting Ability
- ✓ Management
- ✓ Sales
- ✓ Detail Oriented
- ✓ Problem Solving
- ✓ Troubleshooting (Problem Solving)
- ✓ Willingness To Learn

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ MVS (OS)
- ✓ Microsoft PowerPoint
- ✓ Inventory Control Systems
- ✓ Disassembler
- ✓ SAP Applications
- ✓ Web Browsers

Skills in High-Demand

- ✓ Automotive Services
- ✓ Customer Service
- ✓ Communication
- ✓ Good Driving Record
- ✓ Brakes
- ✓ Suspension (Vehicle)
- ✓ Changing Oil
- ✓ Lifting Ability
- ✓ Management
- ✓ Mechanics

Other Requested Qualifications

- ✓ Valid Drivers License
- ✓ Automotive Service Excellence (ASE) Certification
- ✓ Commercial Driver's License (CDL)
- ✓ CDL Class A License
- ✓ Hazmat Endorsement
- ✓ ASE Advanced Engine Performance Certification
- ✓ CDL Class B License
- ✓ CDL Class C License
- ✓ Security Clearance
- ✓ DOT Certification

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ recruiternetworks.com
- ✓ craigslist.org
- ✓ dejobs.org
- ✓ monster.com
- ✓ losangelesrecruiter.com
- ✓ adp.com
- ✓ snagajob.com
- ✓ myworkdayjobs.com

The automotive specialty technicians profession was designated as 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [**Exhibit A-20**]. It was also identified in O*Net's Green Economy Sectors under Transportation, however it was not included in O*Net Green Topics [**Exhibit A-21**]. This profession was included in the O*Net Green Topics related education programs under Alternative Fuel Vehicle Technology/Technician as shown in **Exhibit A-22**. Automotive service technicians and mechanics contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-23**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in automotive technology at 10 of their college locations, but have enrollment at 11 locations as shown in **Exhibits 46 and 51**. Automotive technology graduates are likely to earn a job related to their education, with 60 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$34,940 for SWP exiting students in 2020-21, which was a median change in earnings of 49 percent. Many SWP students were able to attain a living wage, with 42 percent hitting that mark in 2020-21.

There were 10,997 total enrollments in 2022-23 and a total of 810 combined associate degrees and certificates awarded, as shown in **Exhibits 51 and 52**.

Exhibit 51: Student Enrollment by College, 2022-23

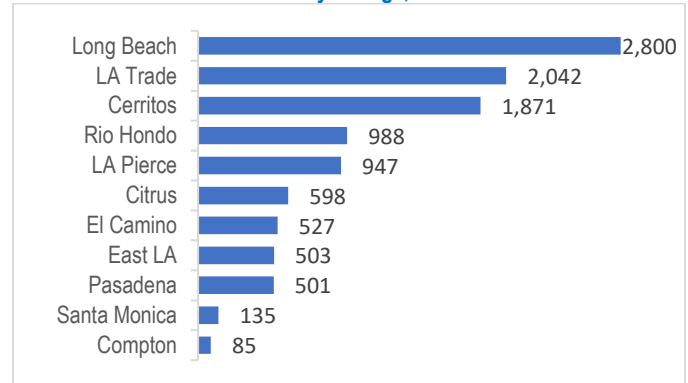
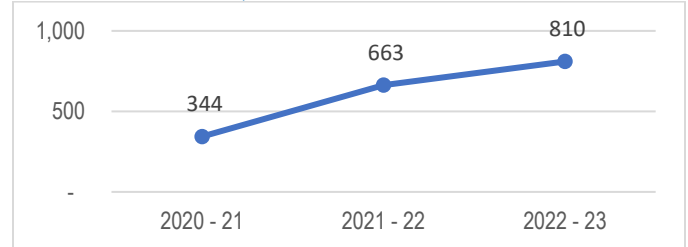


Exhibit 52: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Automotive Technology Student Demographics

Approximately 92 percent of automotive technology students at Los Angeles community colleges are male, 49 percentage points higher than the overall student enrollment [**Exhibit 47**]. Additionally, 79 percent of these students identify as Hispanic, 24 percentage points higher than the general student population [**Exhibit 48**]. Notably, 89 percent of automotive technology students are 29 years old or younger, compared to 70 percent in the overall student body [**Exhibit 49**]. This young demographic represents an untapped resource for regional employers looking to strengthen their workforce. The referenced exhibits present the demographics of the 10,997 students enrolled in automotive technology programs at LA community colleges during the 2022-23 academic year.

Heating, Air Conditioning, and Refrigeration Mechanics and Installers

(SOC 49-9021)

Heating, air conditioning, and refrigeration mechanics and installers are considered a green occupation because they install and maintain energy-efficient HVAC systems that reduce energy use and emissions. To further integrate into the green sector, technicians can specialize in advanced systems with low-impact refrigerants and smart technologies. Community colleges in Los Angeles County offer programs like the **Energy Efficiency Technician Certificate**, equipping technicians with skills to enhance sustainability in their work.

Community College Talent Supply

Environmental Control Technology

- ▶ **TOP code:** 0946.00
- ▶ **Description:** Assembly, installation, operation, maintenance, and repair of air conditioning, heating, and refrigeration systems.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	64%
Median Annual Earnings for Exiting Students, 2020-21	\$43,576
Median Change in Earnings for Exiting Students, 2020-21	19%
SWP Exiting Students Who Attained the Living Wage, 2020-21	59%

Occupational Overview

Employment in Industry 2022:..... 7,449 workers
Percent of Jobs Identified as Middle-Skill:..... 44.6%
Median Hourly Wages..... \$27.32 per hour
Typical Entry-Level Education..... Postsecondary nondegree award
Work Experience Required None
Typical On-the-Job Training Long-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... -140 new jobs (-1.9%)
Replacement Jobs 3,560 openings
Net Job Openings 3,420 jobs
2022-2028 Percent Net Change..... 45.9%

Exhibit 53: Environmental Control Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Citrus College	●		
Compton College		●	●
El Camino College		●	●
L.A. Trade Technical College		●	●
Mt. San Antonio College		●	●



Exhibit 54: Gender, 2022-23



Exhibit 55: Race and Ethnicity, 2022-23



Exhibit 56: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, heating, air conditioning, and refrigeration mechanics and installers in Los Angeles County are expected to experience 3,420 new and replacement job openings. Job postings data reveals an average of 117 monthly job openings in 2023, while average monthly hires were 259, including new jobs and openings from attrition and job transfers. In Los Angeles County, 35 percent of employers specified an education level in their job postings, with 85 percent of those requesting an associate degree or higher. The median advertised annual salary for these positions is \$69,000.

Exhibit 57 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

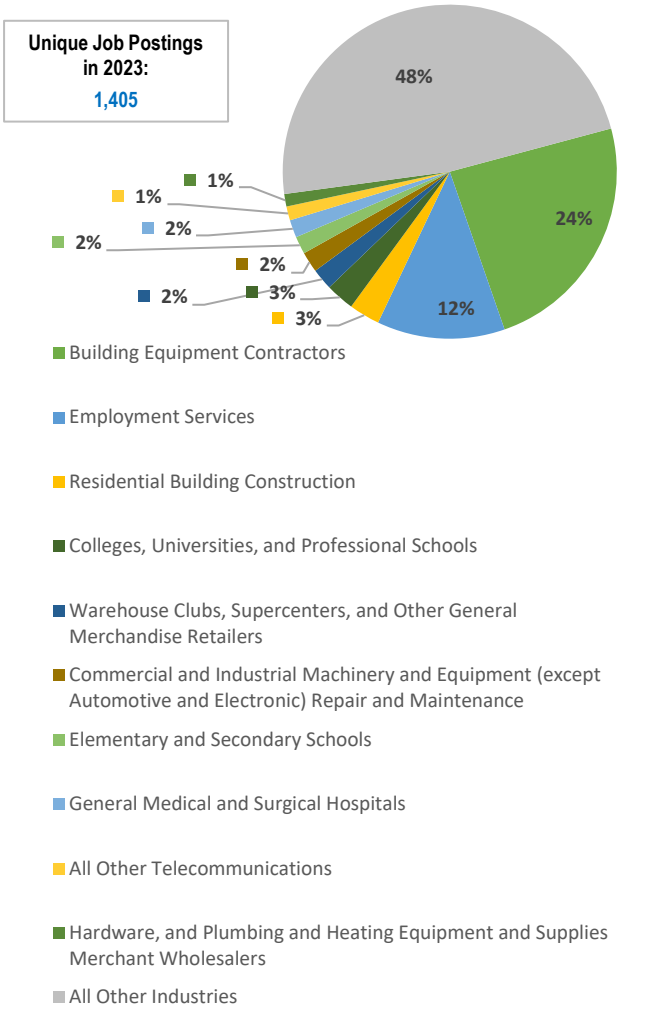
Employers in building equipment contractors, employment services, residential building construction, colleges, universities, and professional schools, warehouse clubs, supercenters, and other general merchandise retailers, and commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance advertised the most opportunities.

Top Skills Requested for Heating, Air Conditioning, and Refrigeration Mechanics and Installers

The top specialized skills desired by employers include:

- ✓ HVAC
- ✓ Boilers
- ✓ Preventive Maintenance
- ✓ Ice Machines
- ✓ Refrigeration
- ✓ Furnaces
- ✓ Ventilation
- ✓ Refrigerant
- ✓ Electric Motors
- ✓ Plumbing

Exhibit 57: Unique Job Postings by Industry
Heating, Air Conditioning, and Refrigeration Mechanics and Installers
 Los Angeles County in 2023



- REPORTED JOB TITLES**
- ▶ Plumbers
 - ▶ Plumbing Technicians
 - ▶ Plumbing Installers
 - ▶ Plumbing Service Technicians
 - ▶ Plumbing Apprentices
 - ▶ Journeyman Plumbers
 - ▶ Pipefitters
 - ▶ Service Plumbers
 - ▶ Maintenance Plumbers
 - ▶ Drain Technicians

The top common skills desired by employers include:

- ✓ Troubleshooting (Problem Solving)
- ✓ Communication
- ✓ Customer Service
- ✓ Good Driving Record
- ✓ Mechanical Aptitude
- ✓ Interpersonal Communications
- ✓ Lifting Ability
- ✓ Operations
- ✓ Management
- ✓ Problem Solving

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Airflow
- ✓ Operating Systems
- ✓ Inventory Control Systems
- ✓ Microsoft PowerPoint
- ✓ Learning Management Systems
- ✓ Spreadsheets

Skills in High-Demand

- ✓ HVAC
- ✓ Troubleshooting (Problem Solving)
- ✓ Communication
- ✓ Customer Service
- ✓ Good Driving Record
- ✓ Boilers
- ✓ Preventive Maintenance
- ✓ Mechanical Aptitude
- ✓ Interpersonal Communications
- ✓ Ice Machines

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ EPA 608 Technician Certification
- ✓ EPA Universal Certification
- ✓ NATE Certification (North American Technician Excellence)
- ✓ HVAC Certification
- ✓ EPA Type II Certification
- ✓ CFC Refrigeration Certification
- ✓ CDL Class C License
- ✓ Contractor License
- ✓ EPA Type I Certification

Where Jobs are Typically Posted

- ✓ recruiternetworks.com
- ✓ craigslist.org
- ✓ indeed.com
- ✓ monster.com
- ✓ simplyhired.com
- ✓ losangelesrecruiter.com
- ✓ dejobs.org
- ✓ glassdoor.com
- ✓ energyjobline.com
- ✓ santaclaritarecruiter.com

The heating, air conditioning, and refrigeration mechanics and installers profession was designated as 'Green Enhanced Skills' and 'Green Increased Demand' in O*Net's comprehensive list of green occupations [**Exhibit A-24**]. It was also identified in O*Net's Green Economy Sectors under Energy Efficiency and Green Construction. It was also included in several O*Net Green Topics as shown in **Exhibit A-25**. This profession is highlighted as having a bright outlook by O*Net. This profession was included in the O*Net Green Topics related education programs under Heating, Air Conditioning, Ventilation and Refrigeration as shown in **Exhibit A-26**. Heating, Air Conditioning, and Refrigeration Mechanics and Installers contribute to California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-27**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in environmental control technology at five of their college locations, but have enrollment at four locations as shown in **Exhibits 53 and 58**.

Environmental control technology graduates are likely to earn a job related to their education, with 64 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$43,576 for SWP exiting students in 2020-21, which was a median change in earnings of 19 percent. Many SWP students were able to attain a living wage, with 59 percent hitting that mark in 2020-21.

There were 2,044 total enrollments in 2022-23 and a total of 191 combined associate degrees and certificates awarded, as shown in **Exhibits 58 and 59**.

Exhibit 58: Total Awards, 2020-21 to 2022-23

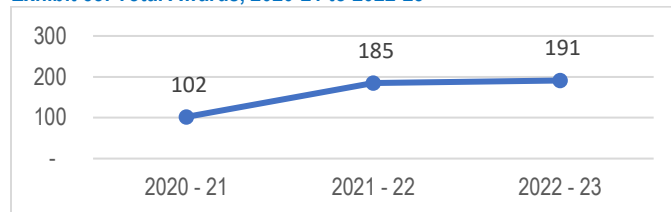
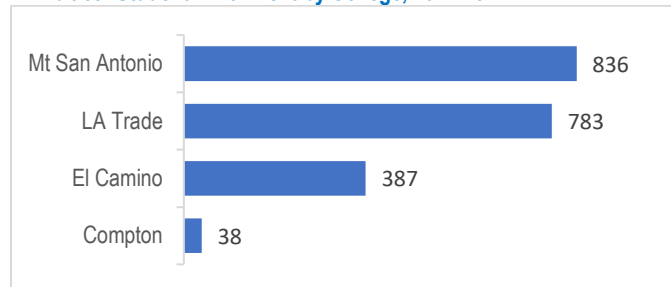


Exhibit 59: Student Enrollment by College, 2022-23



Source: [California Community Colleges LaunchBoard](#)

Environmental Control Technology Student Demographics

Approximately 96 percent of environmental control technology students at Los Angeles community colleges are male, 53 percentage points higher than the overall student enrollment [**Exhibit 54**]. Additionally, 76 percent identify as Hispanic, 21 percentage points higher than the general student population [**Exhibit 55**]. Just 68 percent of environmental control technology students are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 56**]. The referenced exhibits display student demographics of the 2,044 students enrolled in environment control technology at LA community colleges during the 2022-23 academic year.

Electrical and Electronic Engineering Technologists and Technicians

(SOC 17-3023)

Electrical and electronic engineering technologists and technicians are considered a green occupation because they develop and maintain systems crucial for renewable energy and energy efficiency, such as components for solar panels and smart grids. To further integrate into the green sector, they can specialize in renewable energy technologies and energy-efficient electronics. Community colleges in Los Angeles County offer programs like the **Renewable Energy Technician Certificate** and **Energy Efficiency Technician Certificate**, which equip them with the skills to advance sustainability in their field

Community College Talent Supply

Electronics and Electric Technology

- ▶ **TOP code:** 0934.00
- ▶ **Description:** Theory and application of electric and electronic systems and components, including circuits, electro-magnetic fields, energy sources, communications devices, radio, and television circuits, computers, and other electric and electronic components and devices.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	54%
Median Annual Earnings for Exiting Students, 2020-21	\$44,246
Median Change in Earnings for Exiting Students, 2020-21	22%
SWP Exiting Students Who Attained the Living Wage, 2020-21	58%

Occupational Overview

Employment in Industry 2022:..... 2,895 workers
Percent of Jobs Identified as Middle-Skill:..... 60.5%
Median Hourly Wages:..... \$32.74 per hour
Typical Entry-Level Education:..... Associate degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs..... -180 new jobs (-6.2%)
Replacement Jobs 1,600 openings
Net Job Openings 1,420 jobs
2022-2028 Percent Net Change..... 49.0%

Exhibit 60: Electronics and Electrical Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
East LA College	●		
El Camino College		●	●
Glendale Community College		●	●
L.A. Pierce College		●	●
L.A. Southwest College			●
L.A. Trade Technical College		●	
L.A. Valley College	●	●	●
Long Beach City College	●	●	●
Mt. San Antonio College	●	●	●
Pasadena City College		●	●
Rio Hondo College		●	●



Exhibit 61: Gender, 2022-23

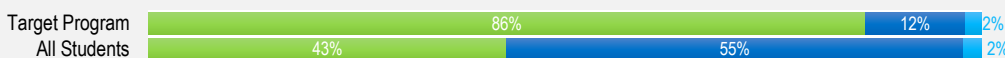


Exhibit 62: Race and Ethnicity, 2022-23



Exhibit 63: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, electrical and electronic engineering technologists and technicians in Los Angeles County are expected to experience 1,420 new and replacement job openings. Job postings data reveals an average of 56 monthly job openings in 2023, while average monthly hires were 89, including new jobs and openings from attrition and job transfers. In Los Angeles County, 61 percent of employers specified an education level in their job postings, with 75 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$71,000.

Exhibit 64 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

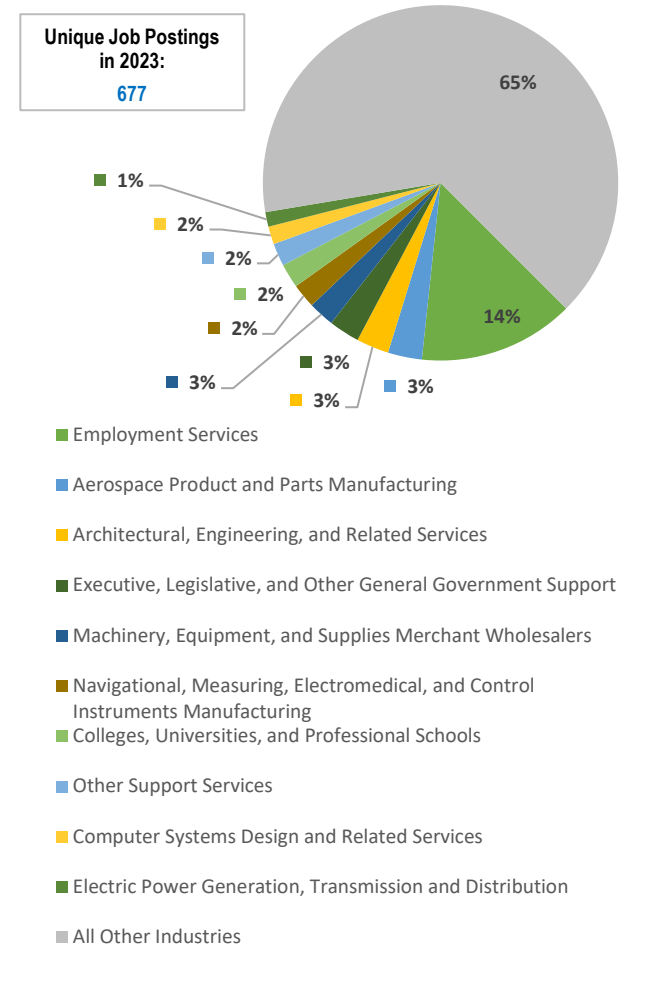
Employers in employment services, aerospace product and parts manufacturing, architectural, engineering, and related services, executive, legislative, and other general government support, and machinery, equipment, and supplies merchant wholesalers advertised the most opportunities.

Top Skills Requested for Electrical and Electronic Engineering Technologists and Technicians

The top specialized skills desired by employers include:

- ✓ Programmable Logic Controllers
- ✓ Instrumentation
- ✓ Test Equipment
- ✓ Electronics
- ✓ Electromechanics
- ✓ Automation
- ✓ Hand Tools
- ✓ Electrical Systems
- ✓ Control Systems
- ✓ Electrical Wiring

Exhibit 64: Unique Job Postings by Industry
Electrical and Electronic Engineering Technologists and Technicians
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Electrical Technicians
- ▶ PLC Technicians
- ▶ Electromechanical Technicians
- ▶ Automation Technicians
- ▶ Electrical and Instrumentation Technicians
- ▶ Instrumentation Technicians
- ▶ Technicians
- ▶ Instrument and Electrical Technicians
- ▶ Electrical Maintenance Technicians
- ▶ Office Automation Technicians

The top common skills desired by employers include:

- ✓ Troubleshooting (Problem Solving)
- ✓ Communication
- ✓ Operations
- ✓ Problem Solving
- ✓ Management
- ✓ Writing
- ✓ English Language
- ✓ Detail Oriented
- ✓ Lifting Ability
- ✓ Research

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ AutoCAD
- ✓ SAP Applications
- ✓ Microsoft PowerPoint
- ✓ Unix
- ✓ Firewall
- ✓ Operating Systems

Skills in High-Demand

- ✓ Troubleshooting (Problem Solving)
- ✓ Communication
- ✓ Operations
- ✓ Programmable Logic Controllers
- ✓ Instrumentation
- ✓ Test Equipment
- ✓ Electronics
- ✓ Electromechanics
- ✓ Automation
- ✓ Problem Solving

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Security Clearance
- ✓ CDL Class C License
- ✓ 10-Hr OSHA General Industry Card
- ✓ Secret Clearance
- ✓ Forklift Certification
- ✓ Transportation Worker Identification Credential (TWIC) Card
- ✓ FCC General Radiotelephone Operator License (GROL)
- ✓ Professional Engineer (PE) License
- ✓ NICET Level II Certification

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ recruiternetworks.com
- ✓ dejobs.org
- ✓ losangelesrecruiter.com
- ✓ energyjobline.com
- ✓ santaclaritarecruiter.com
- ✓ oxnardrecruiter.com
- ✓ monster.com
- ✓ tustinrecruiter.com

The electrical and electronic engineering technologists and technicians profession was designated as 'Green Increased Demand' and 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [**Exhibit A-28**]. It was also identified in O*Net's Green Economy Sectors under Manufacturing and the Green Topics of Energy Engineering and Solar [**Exhibit A-29**]. Electrical and electronic engineering technologists and technicians contribute to California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-30**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in electronics and electric technology at 11 of their college locations, but have enrollment at 12 locations as shown in **Exhibits 60 and 65**.

Electronics and electric technology graduates are likely to earn a job related to their education, with 54 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$44,246 for SWP exiting students in 2020-21, which was a median change in earnings of 22 percent. Many SWP students were able to attain a living wage, with 58 percent hitting that mark in 2020-21.

There were 5,263 total enrollments in 2022-23 and a total of 370 combined associate degrees and certificates awarded, as shown in **Exhibits 65 and 66**.

Exhibit 65: Student Enrollment by College, 2022-23

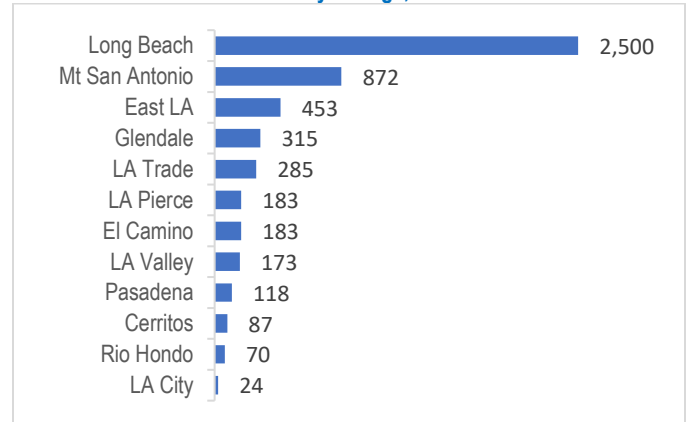
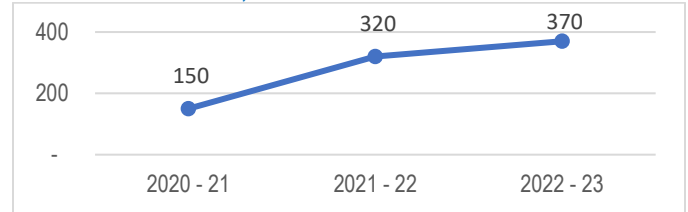


Exhibit 66: Total Awards, 2020-21 to 2022-23



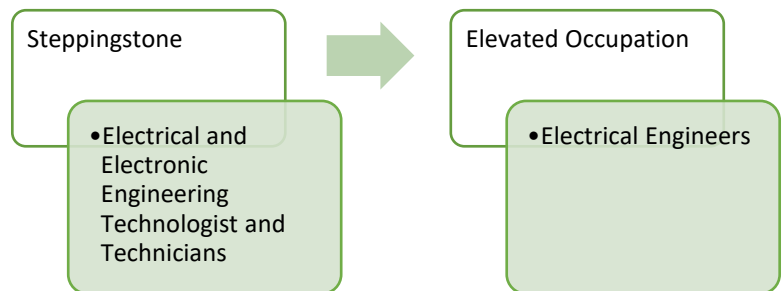
Source: [California Community Colleges LaunchBoard](#)

Electronics and Electrical Technology Student Demographic

Approximately 86 percent of electronics and electrical technology students at Los Angeles community colleges are male, 43 percentage points higher than the overall student enrollment [**Exhibit 61**]. Additionally, 61 percent identify as Hispanic, just 6 percentage points higher than the general student population [**Exhibit 62**]. 79 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 63**]. The referenced exhibits display student demographics of the 5,263 students enrolled in electronics and electrical technology at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The electrical and electronic engineering technologists and technicians occupation can provide a steppingstone to the elevated occupation of electrical engineers through additional education and work experience.



Architectural and Civil Drafters

(SOC 17-3011)

Architectural and civil drafters are considered a green occupation because they design plans for sustainable buildings and infrastructure. To further integrate into the green sector, drafters can specialize in green building practices, such as LEED standards, and advanced technologies like Building Information Modeling (BIM). Community colleges in Los Angeles County offer programs like the **Architectural Technology and Environmental Design Certificate**, and the **Sustainable Building Program**, and the **Leadership in Energy and Environmental Design (LEED)** course equipping drafters to contribute to environmentally responsible construction.

Community College Talent Supply

Architecture and Architectural Technology

- ▶ **TOP code:** 0201.00
- ▶ **Description:** Planning, organization, and enclosure of space for functional and esthetic purposes, including the design of structures, testing of materials, estimating, environmental impact studies, and dealing with contracts and specifications.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	76%
Median Annual Earnings for Exiting Students, 2020-21	\$36,692
Median Change in Earnings for Exiting Students, 2020-21	26%
SWP Exiting Students Who Attained the Living Wage, 2020-21	48%



Occupational Overview

Employment in Industry 2022:..... 2,972 workers
Percent of Jobs Identified as Middle-Skill:..... 58.3%
Median Hourly Wages:..... \$29.27 per hour
Typical Entry-Level Education:..... Associate degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs..... 180 new jobs (6.2%)
Replacement Jobs 1,720 openings
Net Job Openings 1,900 jobs
2022-2028 Percent Net Change..... 63.9%

Exhibit 67: Architecture and Architectural Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	●
Citrus College			●
East LA College		●	●
El Camino College		●	●
Glendale Community College	●	●	●
L.A. Harbor College		●	●
L.A. Pierce College		●	●
L.A. Trade Technical College		●	●
L.A. Valley College		●	
Long Beach City College	●	●	●
Mt. San Antonio College	●	●	●
Pasadena City College			●
Rio Hondo College		●	●
Santa Monica College		●	●
West Los Angeles College		●	

Exhibit 68: Gender, 2022-23



Exhibit 69: Race and Ethnicity, 2022-23

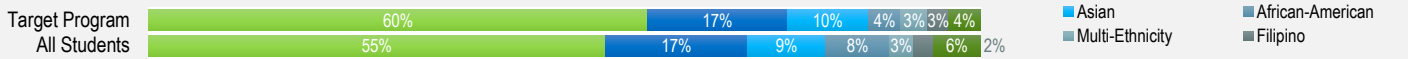
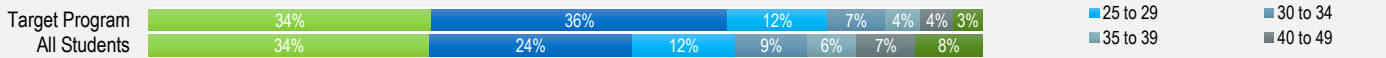


Exhibit 70: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Alternate Community College Program

Drafting Technology

- ▶ **TOP code:** 0953.00
- ▶ **Description:** Planning, preparation, and interpretation of various engineering sketches for design and drafting duties, circuits, machines, structures, weldments, or architectural plans. Includes the application of advanced computer software and hardware (Computer Assisted Drafting and Computer Assisted Design) to the creation of graphic representations and simulations in support of engineering projects.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	68%
Median Annual Earnings for Exiting Students, 2020-21	\$45,474
Median Change in Earnings for Exiting Students, 2020-21	20%
SWP Exiting Students Who Attained the Living Wage, 2020-21	48%

Exhibit 71: Drafting Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	●
Citrus College		●	●
East LA College		●	●
El Camino College		●	●
Glendale Community College	●		
L.A. Mission College		●	
L.A. Pierce College		●	●
L.A. Valley College		●	
Long Beach City College	●		●
Mt. San Antonio College		●	●
Pasadena City College		●	●
Rio Hondo College		●	

Exhibit 72: Gender, 2022-23



Exhibit 73: Race and Ethnicity, 2022-23

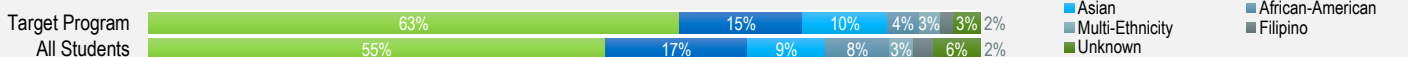
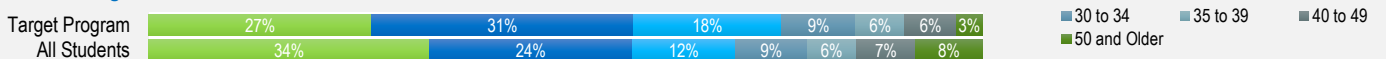


Exhibit 74: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, architectural and civil drafters in Los Angeles County are expected to experience 1,900 new and replacement job openings. Job posting data reveals an average of 61 monthly job openings in 2023, while average monthly hires were 132, including new jobs and openings from attrition and job transfers. In Los Angeles County, 60 percent of employers specified an education level in their job postings, with 17 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$83,200.

Exhibit 75 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

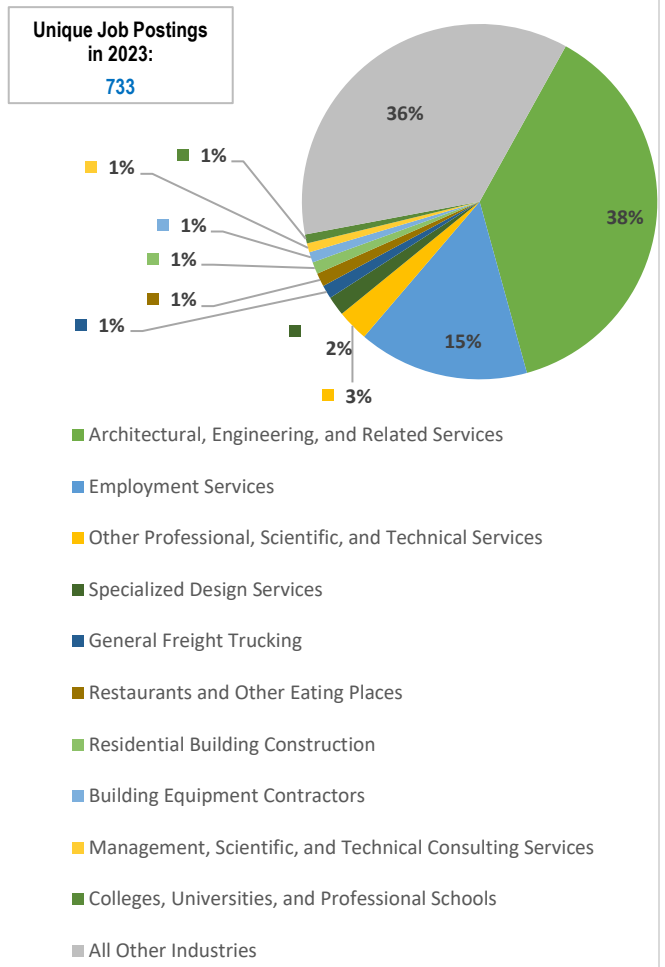
Employers in architectural, engineering, and related services, employment services, other professional, scientific, and technical services, and specialized design services advertised the most opportunities.

Top Skills Requested for Architectural and Civil Drafters

The top specialized skills desired by employers include:

- ✓ Autodesk Revit
- ✓ AutoCAD
- ✓ Project Management
- ✓ Construction
- ✓ SketchUp (3D Modeling Software)
- ✓ Computer-Aided Design
- ✓ Building Information Modeling
- ✓ 3D Modeling
- ✓ AutoCAD Civil 3D
- ✓ Rhinoceros 3D

Exhibit 75: Unique Job Postings by Industry
Architectural and Civil Drafters
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Architectural Designers
- ▶ Piping Designers
- ▶ Civil Designers
- ▶ Architectural Drafters
- ▶ Interior Architectural Designers
- ▶ Designers
- ▶ Civil Design Engineers
- ▶ Drafters
- ▶ BIM Specialists
- ▶ Architectural Design Managers

The top common skills desired by employers include:

- ✓ Communication
- ✓ Coordinating
- ✓ Presentations
- ✓ Planning
- ✓ Research
- ✓ Detail Oriented
- ✓ Microsoft Office
- ✓ Problem Solving
- ✓ Leadership
- ✓ Writing

The top software skills desired by employers include:

- ✓ Autodesk Revit
- ✓ AutoCAD
- ✓ SketchUp (3D Modeling Software)
- ✓ Rhinoceros 3D
- ✓ AutoCAD Civil 3D
- ✓ Microsoft Office
- ✓ Adobe Photoshop
- ✓ Adobe Creative Suite
- ✓ Adobe Illustrator
- ✓ Adobe InDesign

Skills in High-Demand

- ✓ Autodesk Revit
- ✓ AutoCAD
- ✓ Communication
- ✓ Autodesk Revit
- ✓ AutoCAD
- ✓ Project Management
- ✓ Coordinating
- ✓ SketchUp (3D Modeling Software)
- ✓ Construction
- ✓ SketchUp (3D Modeling Software)

Other Requested Qualifications

- ✓ Architecture License
- ✓ LEED Accredited Professional (AP)
- ✓ Valid Driver's License
- ✓ Architect Registration Examination
- ✓ Engineer in Training
- ✓ Professional Engineer (PE) License
- ✓ LEED Green Associate
- ✓ Security Clearance
- ✓ Secret Clearance
- ✓ Top Secret-Sensitive Compartmented Information (TS/SCI Clearance)

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ losangelesrecruiter.com
- ✓ recruiternetworks.com
- ✓ archinect.com
- ✓ santaclaritarecruiter.com
- ✓ oxnardrecruiter.com
- ✓ tustinrecruiter.com
- ✓ dejobs.org
- ✓ craigslist.org

The architectural and civil drafters profession was designated as 'Green Increased Demand' in O*Net's comprehensive list of green occupations [Exhibit A-31]. It was also identified in O*Net's Green Economy Sectors under Green Construction, and under the Green Topics of Earth Science and Landscape Architecture as shown in Exhibit A-32. This profession was included in the O*Net Green Topics related education programs under Architectural Technology/ Technician, Architectural Sciences and Technology, Other, Architectural Engineering Technologies/ Technicians, and Civil Drafting and Civil Engineering CAD/CADD as shown in Exhibit A-33. Architectural and civil drafters contribute to California Workforce Development Board scoping plan sectors of Energy, Transportation, and Water as identified in Exhibit A-34.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in architecture and architectural technology at 15 of their college locations, but have enrollment at 13 locations as shown in **Exhibits 67 and 76**. Architecture and architectural technology graduates are likely to earn a job related to their education, with 76 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$36,692 for SWP exiting students in 2020-21, which was a median change in earnings of 26 percent. Many SWP students were able to attain a living wage, with 48 percent hitting that mark in 2020-21.

There were 8,489 total enrollments in 2022-23 and a total of 287 combined associate degrees and certificates awarded, as shown in **Exhibits 76 and 77**.

Exhibit 76: Student Enrollment by College, 2022-23

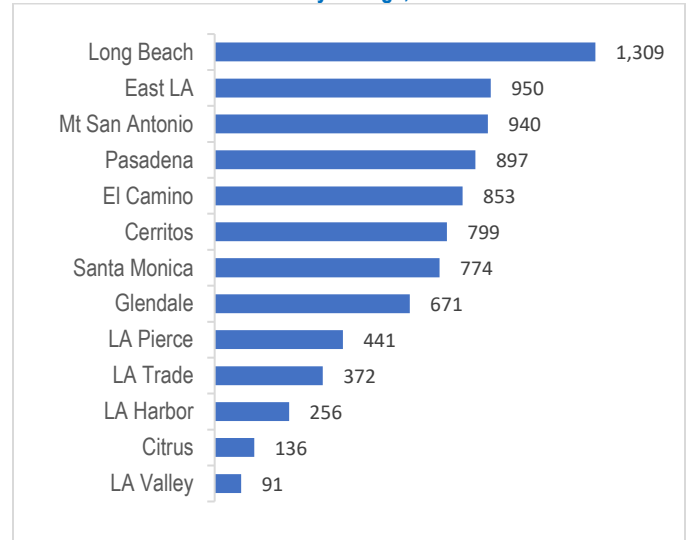
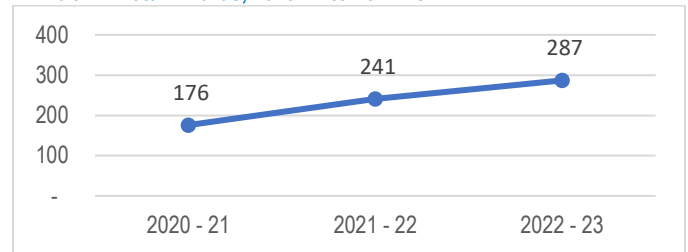


Exhibit 77: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Architecture and Architectural Technology Student Demographics

Approximately 57 percent of architecture and architectural technology students at Los Angeles community colleges are female, which is 14 percent higher than the overall student enrollment [**Exhibit 68**]. Sixty percent of these students identify as Hispanic, 5 percentage points higher than the general student population [**Exhibit 69**]. Additionally, 82 percent of architecture students are 29 years old or younger, compared to 70 percent in the overall student body [**Exhibit 70**]. This young demographic represents an untapped resource for regional employers looking to strengthen their workforce. The referenced exhibits show the demographics of the 8,489 students enrolled in these programs during the 2022-23 academic year.

Alternate Community College Program

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in drafting technology at 12 of their college locations, but enrollment at 16 locations as shown in **Exhibits 71 and 75**. Drafting technology graduates are likely to earn a job related to their education, with 68 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings was \$45,474 for SWP exiting students in 2020-21, which was a median change in earnings of 20 percent. Many SWP students were able to attain a living wage, with 48 percent hitting that mark in 2020-21.

There were 2,841 total enrollments in 2022-23 and a total of 109 combined associate degrees and certificates awarded, as shown in **Exhibits 75 and 76**.

Exhibit 75: Student Enrollment by College, 2022-23

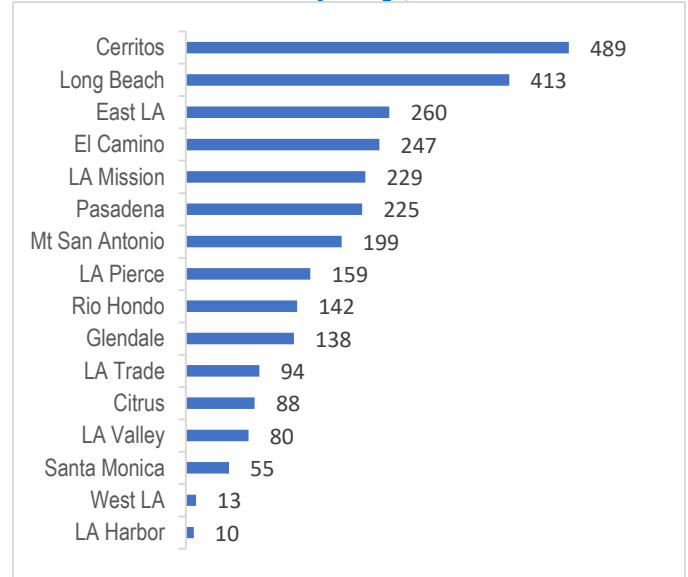
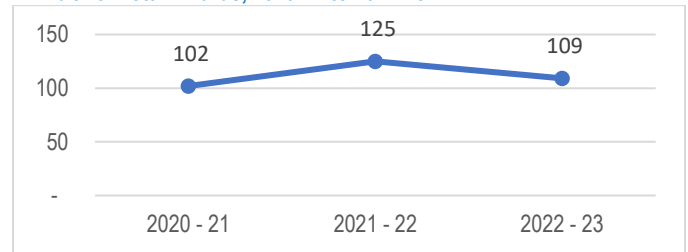


Exhibit 76: Total Awards, 2020-21 to 2022-23



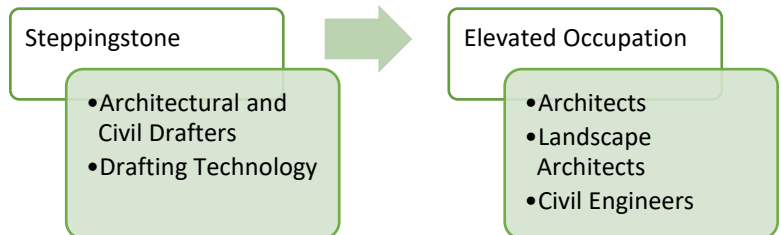
Source: [California Community Colleges LaunchBoard](#)

Drafting Technology Student Demographics

Approximately 76 percent of drafting technology students at Los Angeles community colleges are male, 33 percentage points higher than the overall student enrollment [**Exhibit 72**]. Additionally, 63 percent identify as Hispanic, 8 percentage points higher than the general student population [**Exhibit 73**]. Additionally, 76 percent are 29-year-olds or younger, compared to 70 percent in the overall student body, with a 13-percentage point higher representation in the 20-29 age range [**Exhibit 74**]. The referenced exhibits display student demographics of the 2,841 students enrolled in drafting technology at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The architectural and civil drafters and drafting technology occupations can provide a steppingstone to the elevated occupations of architects, landscape architects, and civil engineers through additional education and work experience.



Environmental Science and Protection Technicians, Including Health

(SOC 19-4042)

Environmental science and protection technicians, including health, are considered a green occupation because they monitor environmental conditions to protect public health and ecosystems. To further integrate into the green sector, technicians can specialize in areas like climate change adaptation and advanced pollution control. Community colleges in Los Angeles County offer programs like the **Sustainability Services Technician Certificate**, equipping them with the skills to enhance their role in environmental protection.

Community College Talent Supply

Environmental Technology

- ▶ **TOP code:** 0303.00
- ▶ **Description:** Environmental management, monitoring, assessment, and restoration, including environmental pollution control systems and the management of hazardous materials and hazardous waste, and related government regulations.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	88%
Median Annual Earnings for Exiting Students, 2020-21	\$45,376
Median Change in Earnings for Exiting Students, 2020-21	17%
SWP Exiting Students Who Attained the Living Wage, 2020-21	58%

Occupational Overview

Employment in Industry 2022:..... 1,246 workers
Percent of Jobs Identified as Middle-Skill:..... 34.2%
Median Hourly Wages:..... \$25.45 per hour
Typical Entry-Level Education:..... Associate degree
Work Experience Required:..... None
Typical On-the-Job Training:..... None

Occupational Projections 2022 to 2028

Newly Created Jobs:..... 50 new jobs (4.0%)
Replacement Jobs:..... 760 openings
Net Job Openings:..... 810 jobs
2022-2028 Percent Net Change:..... 65.0%

Exhibit 77: Environmental Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Mt. San Antonio College		●	
Rio Hondo College		●	●
Santa Monica College	●	●	●



Exhibit 78: Gender, 2022-23

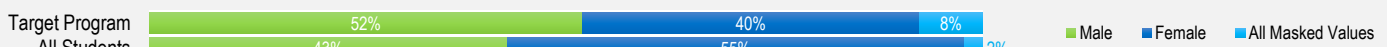


Exhibit 79: Race and Ethnicity, 2022-23

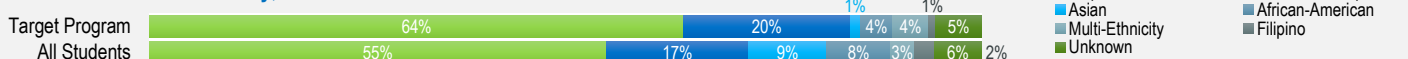
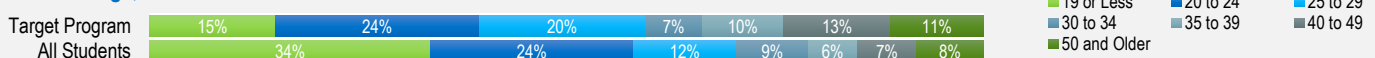


Exhibit 80: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, environmental science and protection technicians, including health, in Los Angeles County are expected to experience 810 new and replacement job openings. Job postings data reveals an average of 28 monthly job openings in 2023, while average monthly hires were 55, including new jobs and openings from attrition and job transfers. In Los Angeles County, 56 percent of employers specified an education level in their job postings, with 65 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$47,700.

Exhibit 81 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

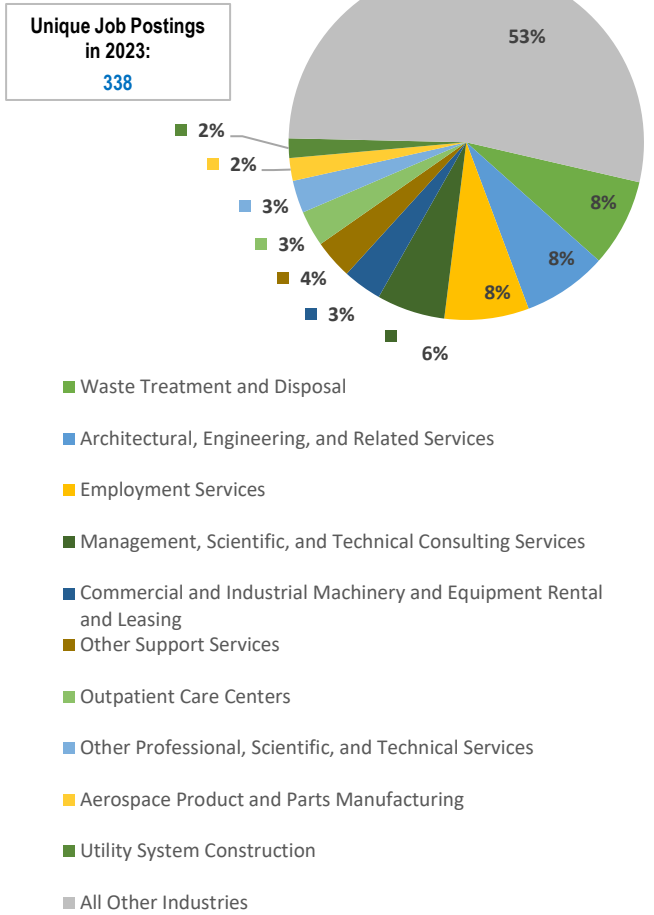
Employers in waste treatment and disposal, architectural, engineering, and related services, employment services, management, scientific, and technical consulting services, commercial and industrial machinery and equipment rental and leasing, and other support services advertised the most opportunities.

Top Skills Requested for Environmental Science and Protection Technicians, Including Health

The top specialized skills desired by employers include:

- ✓ Biology
- ✓ Emergency Response
- ✓ Hazardous Waste Operations And Emergency Response Standard(HAZWOPER)
- ✓ Environmental Monitoring
- ✓ Pressure Washer
- ✓ Construction
- ✓ Oil Containment Booms
- ✓ Occupational Safety and Health Administration (OSHA)
- ✓ Heavy Equipment
- ✓ Decontamination

Exhibit 81: Unique Job Postings by Industry
Environmental Science and Protection Technicians, Including Health
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Environmental Technicians
- ▶ Environmental Field Technicians
- ▶ Environmental Monitoring Technicians
- ▶ Onsite Technicians
- ▶ Environmental Services Aides
- ▶ Laboratory Technicians
- ▶ Environmental Test Technicians
- ▶ Field Technicians
- ▶ Environmental Techs
- ▶ Mitigation Technicians

The top common skills desired by employers include:

- ✓ Communication
- ✓ Detail Oriented
- ✓ Lifting Ability
- ✓ Interpersonal Communications
- ✓ Operations
- ✓ Management
- ✓ Problem Solving
- ✓ Computer Literacy
- ✓ Microsoft Office
- ✓ Good Driving Record

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Microsoft PowerPoint
- ✓ Laboratory Information Management Systems
- ✓ JIRA
- ✓ Atlassian Confluence
- ✓ JavaScript (Programming Language)
- ✓ Microsoft Windows

Skills in High-Demand

- ✓ Biology
- ✓ Emergency Response
- ✓ Communication
- ✓ Detail Oriented
- ✓ Lifting Ability
- ✓ Environmental Monitoring
- ✓ Hazardous Waste Operations And Emergency Response Standard (HAZWOPER)
- ✓ Pressure Washer
- ✓ Construction
- ✓ Oil Containment Booms

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Transportation Worker Identification Credential (TWIC) Card
- ✓ HAZWOPER Certification
- ✓ Security Clearance
- ✓ Certified Asbestos Consultant
- ✓ Forklift Certification
- ✓ CDL Class C License
- ✓ 10-Hr OSHA General Industry Card
- ✓ Asbestos License/Certification
- ✓ Cardiopulmonary Resuscitation (CPR) Certification

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ dejobs.org
- ✓ careerjet.com
- ✓ energyjobline.com
- ✓ recruiternetworks.com
- ✓ myworkdayjobs.com
- ✓ losangelesrecruiter.com
- ✓ smartrecruiters.com
- ✓ craigslist.org

The environmental science and protection technicians, including health profession not included in O*Net's comprehensive list of green occupations. This profession was also not identified in O*Net's Green Economy Sectors, but it was included in several O*Net's Green Topics as shown in **Exhibit A-35**. This profession is highlighted by O*Net as having a bright outlook. Environmental Science and Protection Technicians, including Health contribute to the California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-36**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in environmental technology at three of their college locations, but have enrollment at four locations as shown in **Exhibits 77 and 82**. Environmental technology graduates are highly likely to earn a job related to their education, with 88 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$45,376 for SWP exiting students in 2020-21, which was a median change in earnings of 17 percent. Many SWP students were able to attain a living wage, with 58 percent hitting that mark in 2020-21.

There were 285 total enrollments in 2022-23 and a total of 41 combined associate degrees and certificates awarded, as shown in **Exhibits 82 and 83**.

Exhibit 82: Student Enrollment by College, 2022-2023

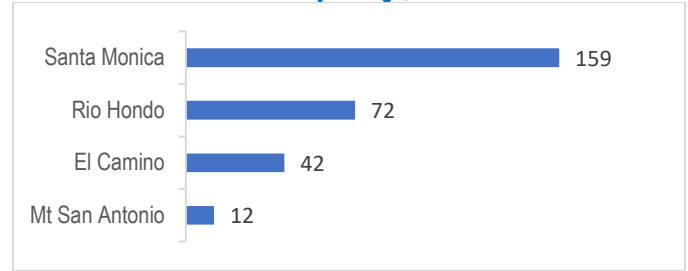
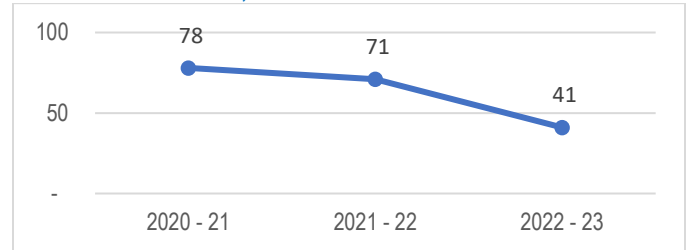


Exhibit 83: Total Awards, 2020-2023



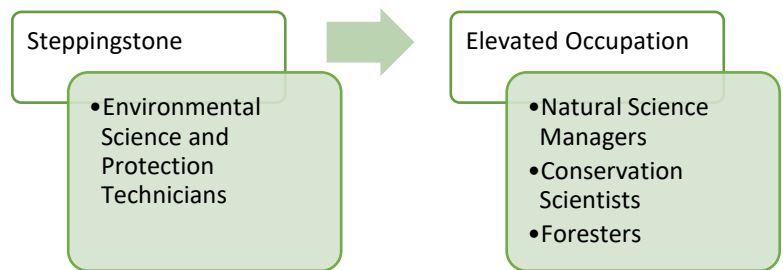
Source: [California Community Colleges LaunchBoard](#)

Environmental Technology Student Demographics

A little more than 50 percent of environmental technology students at Los Angeles community colleges are male, just 9 percentage points higher than the overall student enrollment [**Exhibit 78**]. Nearly two-thirds identify as Hispanic, 9 percentage points higher than the general student population [**Exhibit 79**]. Only 59 percent are 29-year-olds or younger, compared to 70 percent in the overall student body, with the most significant age difference being in the 19 or less category [**Exhibit 80**]. The referenced exhibits display student demographics of the 285 students enrolled in environmental technology at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The environmental science and protection technicians, including health occupations can provide a steppingstone to the elevated occupations of natural science managers, environmental engineers, conservation scientists, and foresters through additional education and work experience.



Civil Engineering Technologists and Technicians

(SOC 17-3022)

Civil engineering technologists and technicians are considered a green occupation because they support the development of sustainable infrastructure, including energy-efficient buildings and eco-friendly transportation systems. To further integrate into the green sector, they can specialize in integrating renewable energy and sustainable materials into projects. Community colleges in Los Angeles County offer programs like the **Sustainable Construction Management Certificate** and the **Leadership in Energy and Environmental Design (LEED)** course, equipping them to contribute to environmentally responsible infrastructure development.

Occupational Overview

Employment in Industry 2022:..... 1,209 workers
Percent of Jobs Identified as Middle-Skill:..... 50.1%
Median Hourly Wages:..... \$37.90 per hour
Typical Entry-Level Education:..... Associate degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs:..... 30 new jobs (2.8%)
Replacement Jobs 660 openings
Net Job Openings 690 jobs
2022-2028 Percent Net Change:..... 57.1%

Community College Talent Supply

Engineering Technology, General

- ▶ **TOP code:** 0924.00
- ▶ **Description:** Technical support of engineering, including the use of civil and mechanical engineering principles, physical sciences, basic physics, mathematics, surveying, materials testing, hydraulics and pneumatics, and the preparation of plans, specifications, and engineering reports.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	75%
Median Annual Earnings for Exiting Students, 2020-21	\$39,724
Median Change in Earnings for Exiting Students, 2020-21	44%
SWP Exiting Students Who Attained the Living Wage, 2020-21	54%

Exhibit 84: Engineering Technology, General Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	●
Compton College		●	
East LA College		●	●
El Camino College		●	●
Long Beach City College		●	●
Mt. San Antonio College		●	●
Pasadena City College		●	●



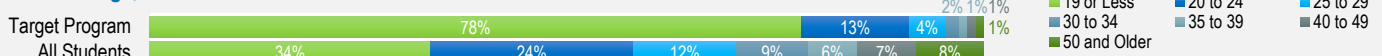
Exhibit 85: Gender, 2022-23



Exhibit 86: Race and Ethnicity, 2022-23



Exhibit 87: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, civil engineering technologists and technicians in Los Angeles County are expected to experience 690 new and replacement job openings. Job postings data reveals an average of 5 monthly job openings, while average monthly hires were 39 in 2023, including new jobs and openings from attrition and job transfers. In Los Angeles County, 43 percent of employers specified an education level in their job postings, with 42 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$49,900.

Exhibit 88 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

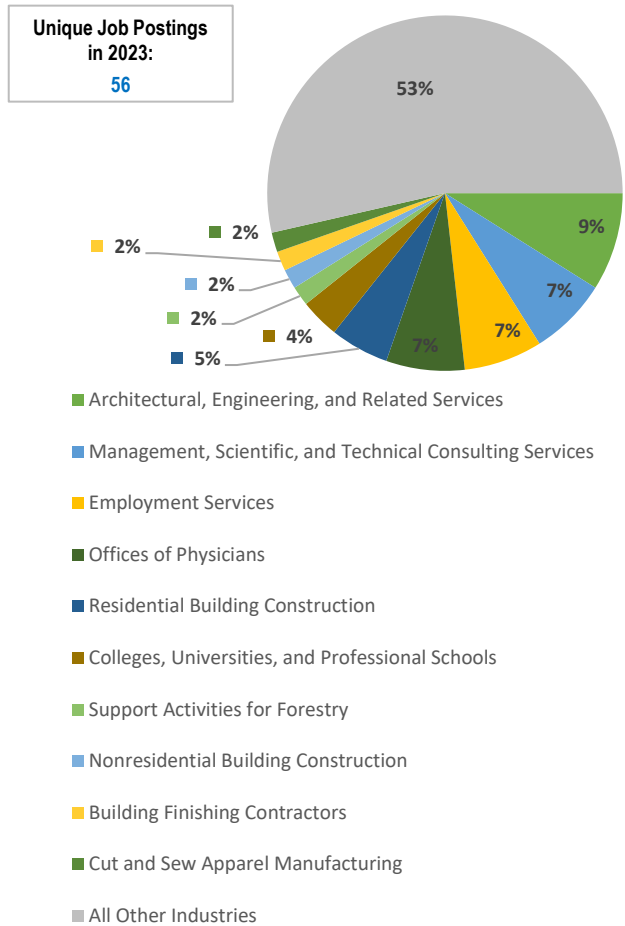
Employers in architectural, engineering, and related services, management, scientific, and technical consulting services, employment services, offices of physicians, and residential building construction advertised the most opportunities.

Top Skills Requested for Civil Engineering Technologists and Technicians

The top specialized skills desired by employers include:

- ✓ Civil Engineering
- ✓ Construction
- ✓ Project Management
- ✓ Rehabilitation
- ✓ Zuken (Software)
- ✓ Patient Transfer
- ✓ AutoCAD
- ✓ Civil Design
- ✓ Engineering Calculations
- ✓ Patient Transport

Exhibit 88: Unique Job Postings by Industry
Civil Engineering Technologists and Technicians
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Civil Engineering Technicians
- ▶ Transportation Technicians
- ▶ IT Support Assistants
- ▶ Real Property Agents
- ▶ Building Designers
- ▶ Design Technicians
- ▶ Field Service Engineers
- ▶ Highway Construction Inspectors
- ▶ Construction Field Technicians
- ▶ Construction Field Representatives

The top common skills desired by employers include:

- ✓ Communication
- ✓ Customer Service
- ✓ English Language
- ✓ Sales
- ✓ Management
- ✓ Mathematics
- ✓ Clerical Works
- ✓ Leadership
- ✓ Writing
- ✓ Coordinating

The top software skills desired by employers include:

- ✓ Zuken (Software)
- ✓ AutoCAD
- ✓ Microsoft Office
- ✓ MicroStation (CAD Design Software)
- ✓ Geographic Information Systems
- ✓ AutoCAD Civil 3D
- ✓ Autodesk Revit
- ✓ IBM Maximo
- ✓ ProjectWise
- ✓ SketchUp (3D Modeling Software)

Skills in High-Demand

- ✓ Communication
- ✓ Customer Service
- ✓ Civil Engineering
- ✓ English Language
- ✓ Sales
- ✓ Management
- ✓ Mathematics
- ✓ Clerical Works
- ✓ Construction
- ✓ Project Management

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Basic Life Support (BLS) Certification
- ✓ Real Estate Salesperson License
- ✓ CDL Class C License
- ✓ Engineer in Training
- ✓ Structural Engineer License
- ✓ 10-Hour OSHA General Industry Card
- ✓ Registered Nurse (RN)
- ✓ Security Identification Display Area (SIDA) Badge
- ✓ American Red Cross (ARC) Certification

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ craigslist.org
- ✓ dejobs.org
- ✓ recruiternetworks.com
- ✓ energyjobline.com
- ✓ losangelesrecruiter.com
- ✓ jobsinanaheim.com
- ✓ santaclaritarecruiter.com
- ✓ governmentjobs.com

The civil engineering technologists and technicians profession was not included in O*Net's comprehensive list of green occupations. It was also not identified in O*Net's Green Economy Sectors. This profession was included in the O*Net Green Topics related education programs under Building Construction Technology/ Technician as shown in **Exhibit A-37**. Civil engineering technologists and technicians contribute to the California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, and Water as identified in **Exhibit A-38**.

Community College Talent Supply

The California Community Colleges offer certificates and/or associate degree programs in engineering technology, general (requires trigonometry) at seven of their college locations, but have enrollments at 11 locations as shown in **Exhibits 84 and 89**.

Engineering technology, general (requires trigonometry) graduates are likely to earn a job related to their education, with 75 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$39,724 for SWP exiting students in 2020-21, which was a median change in earnings of 44 percent. Many SWP students were able to attain a living wage, with 54 percent hitting that mark in 2020-21.

There were 3,250 total enrollments in 2022-23 and a total of 234 combined associate degrees and certificates awarded, as shown in **Exhibits 89 and 90**.

Exhibit 89: Student Enrollment by College, 2022-23

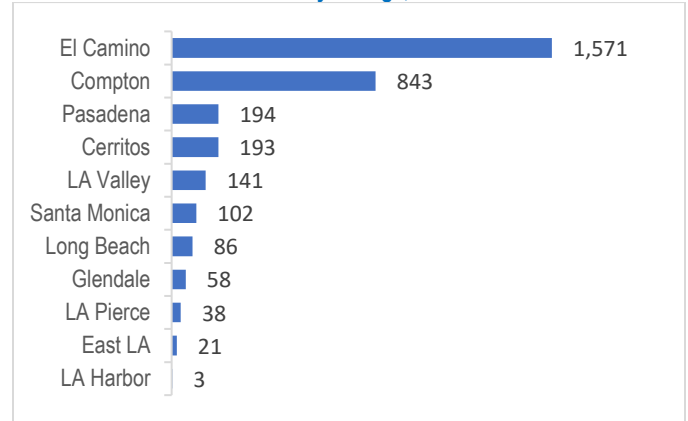
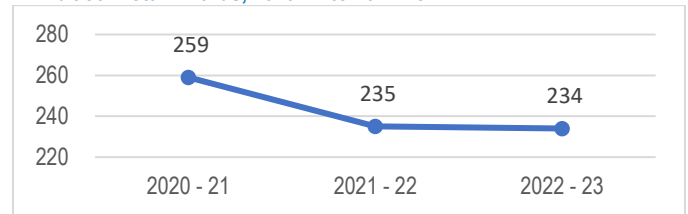


Exhibit 90: Total Awards, 2020-21 to 2022-23



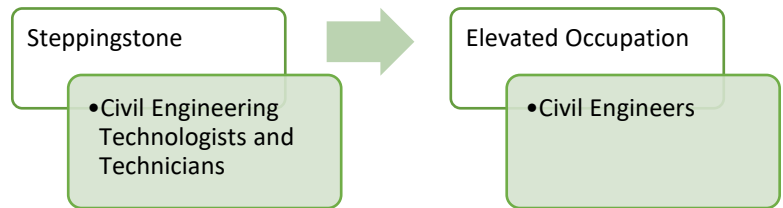
Source: [California Community Colleges LaunchBoard](#)

Engineering Technology, General Student Demographics

Approximately 71 percent of engineering technology, general students at Los Angeles community colleges are male, 28 percent higher than the overall student enrollment [**Exhibit 85**]. 18 percent of these students identify as Asian, twice as much as the general student population [**Exhibit 86**]. Notably, 95 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 87**]. This young population of LA students is an untapped asset for regional employers seeking to strengthen their workforce. The referenced exhibits display student demographics of the 3,250 students enrolled in engineering technology, general (requires trigonometry) at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The civil engineering technologists and technicians occupations can provide a steppingstone to the elevated occupation of civil engineers through additional education and work experience.



Mechanical Engineering Technologists and Technicians

(SOC 17-3027)

Mechanical engineering technologists and technicians are considered a green occupation because they develop energy-efficient systems and machinery that reduce environmental impact. To further integrate into the green sector, they can specialize in renewable energy systems and sustainable manufacturing. Community colleges in Los

Angeles County offer programs like the **Energy Efficiency Technician Certificate** and the **Leadership in Energy and Environmental Design (LEED)** course, equipping them with skills to advance green engineering practices.

Community College Talent Supply

Manufacturing and Industrial Technology

- ▶ **TOP code:** 0956.00
- ▶ **Description:** Engineering principles and technical skills for the manufacture of products and related industrial processes. Includes shaping and forming operations, materials handling, instrumentation and controls, and quality control. Includes Computer Aided Manufacturing and robotics. Also includes optimization theory, industrial and manufacturing planning, and related management skills.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	67%
Median Annual Earnings for Exiting Students, 2020-21	\$67,762
Median Change in Earnings for Exiting Students, 2020-21	74%
SWP Exiting Students Who Attained the Living Wage, 2020-21	74%

Occupational Overview

Employment in Industry 2022:..... 928 workers
Percent of Jobs Identified as Middle-Skill:..... 50.1%
Median Hourly Wages:..... \$33.72 per hour
Typical Entry-Level Education:..... Associate degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs..... -30 new jobs (-3.1%)
Replacement Jobs 490 openings
Net Job Openings 460 jobs
2022-2028 Percent Net Change..... 49.6%

Exhibit 91: Manufacturing and Industrial Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	●
El Camino College		●	●
Glendale Community College		●	
L.A. Trade Technical College		●	●
L.A. Valley College		●	●
Long Beach City College		●	●
Mt. San Antonio College	●	●	●
West Los Angeles College		●	



Exhibit 92: Gender, 2022-23



Exhibit 93: Race and Ethnicity, 2022-23

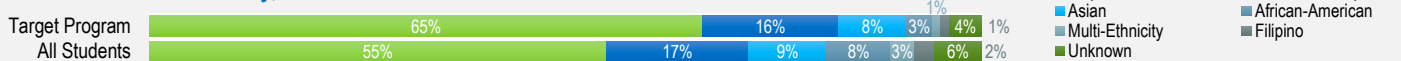
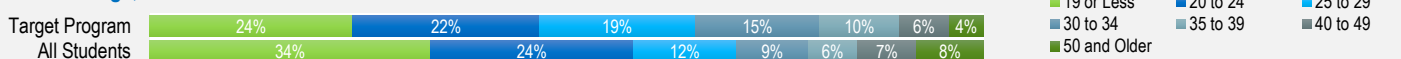


Exhibit 94: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, mechanical engineering technologists and technicians in Los Angeles County are expected to experience 460 new and replacement job openings. Job postings data reveals an average of 9 monthly job openings in 2023, while average monthly hires were 32, including new jobs and openings from attrition and job transfers. In Los Angeles County, 77 percent of employers specified an education level in their job postings, with 35 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$81,700.

Exhibit 95 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

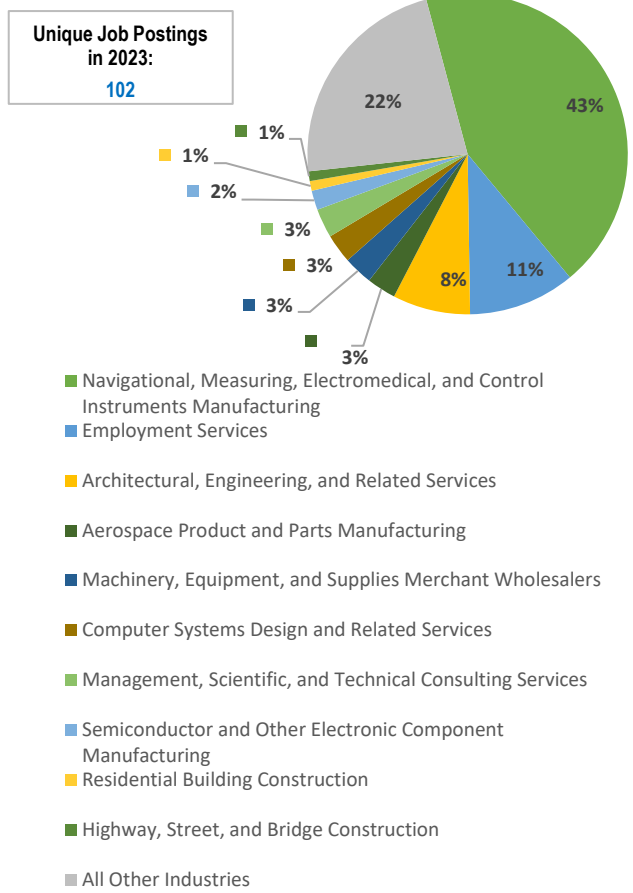
Employers in navigational, measuring, electromedical, and control instruments manufacturing, employment services, and architectural, engineering, and related services advertised the most opportunities.

Top Skills Requested for Mechanical Engineering Technologists and Technicians

The top specialized skills desired by employers include:

- ✓ Mechanical Engineering
- ✓ Hand Tools
- ✓ Aerospace Engineering
- ✓ Teamcenter (PLM Software)
- ✓ Fabrication
- ✓ SAP Applications
- ✓ Computer-Aided Design
- ✓ Machinery
- ✓ Mechanical Design
- ✓ Export Control

Exhibit 95: Unique Job Postings by Industry
 Mechanical Engineering Technologists and Technicians
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Mechanical Technicians
- ▶ Principal Mechanical Engineers
- ▶ Mechanical Engineers
- ▶ Mechanical Engineering Technicians
- ▶ Vehicle Engineers
- ▶ Electromechanical Technicians
- ▶ Prototype Technicians
- ▶ Mechanical Technologists
- ▶ MRO Managers
- ▶ Thermal Mechanical Engineers

The top common skills desired by employers include:

- ✓ Self-Motivation
- ✓ Troubleshooting (Problem Solving)
- ✓ Communication
- ✓ Problem Solving
- ✓ Leadership
- ✓ Operations
- ✓ Research
- ✓ Mathematics
- ✓ Microsoft Office
- ✓ Management

The top software skills desired by employers include:

- ✓ Teamcenter (PLM Software)
- ✓ SAP Applications
- ✓ Computer Aided Three-Dimensional Interactive Application (CATIA)
- ✓ Microsoft Office
- ✓ CAD Programs
- ✓ SolidWorks (CAD)
- ✓ PTC Creo (CAD Suite)
- ✓ JIRA
- ✓ Ansys Simulation Software
- ✓ Atlassian Confluence

Skills in High-Demand

- ✓ Mechanical Engineering
- ✓ Self-Motivation
- ✓ Troubleshooting (Problem Solving)
- ✓ Communication
- ✓ Hand Tools
- ✓ Aerospace Engineering
- ✓ Problem Solving
- ✓ Teamcenter (PLM Software)
- ✓ SAP Applications
- ✓ Computer Aided Three-Dimensional Interactive Application (CATIA)

Other Requested Qualifications

- ✓ Security Clearance
- ✓ Secret Clearance
- ✓ Top Secret Clearance
- ✓ Top Secret-Sensitive Compartmented Information (TS/SCI Clearance)
- ✓ Valid Driver's License
- ✓ Airframe & Powerplant (A&P) Certificate

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ myworkdayjobs.com
- ✓ simplyhired.com
- ✓ careercast.com
- ✓ clearancejobs.com
- ✓ energyjobline.com
- ✓ powerjobs.com
- ✓ recruiternetworks.com
- ✓ santaclaritarecruiter.com
- ✓ icims.com

The mechanical engineering technologist and technicians profession was designated as 'Green New and Emerging' in O*Net's comprehensive list of green occupations [**Exhibit A-39**]. It was also identified in O*Net's Green Topics under Energy Engineering and Transportation [**Exhibit A-40**]. This profession was included in the O*Net Green Topics related education programs under Hydraulics and Fluid Power Technology/Technician as shown in **Exhibit A41**. This occupation also supports the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Industry, Waste, and Water as shown in **Exhibit A-42**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in manufacturing and industrial technology at eight of their college locations, but have enrollment at 10 locations as shown in **Exhibits 91 and 96**. Manufacturing and industrial technology graduates are likely to earn a job related to their education, with 67 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$67,762 for SWP exiting students in 2020-21, which was a median change in earnings of 74 percent. Many SWP students were able to attain a living wage, with 74 percent hitting that mark in 2020-21.

There were 3,569 total enrollments in 2022-23 and a total of 34 combined associate degrees and certificates awarded, as shown in **Exhibits 96 and 97**.

Exhibit 96: Student Enrollment by College, 2022-23

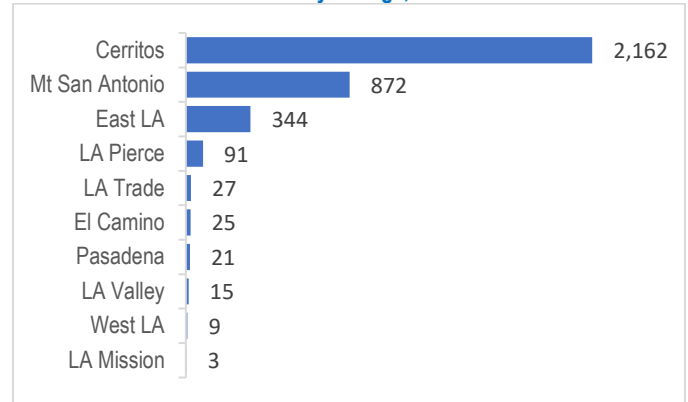
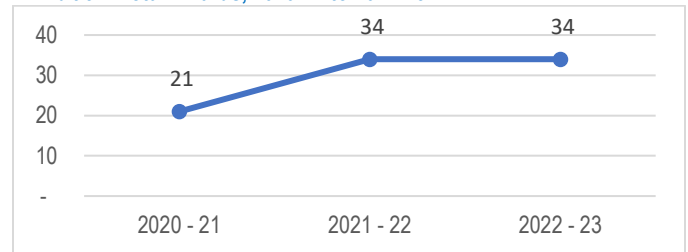


Exhibit 97: Total Awards, 2020-21 to 2022-23



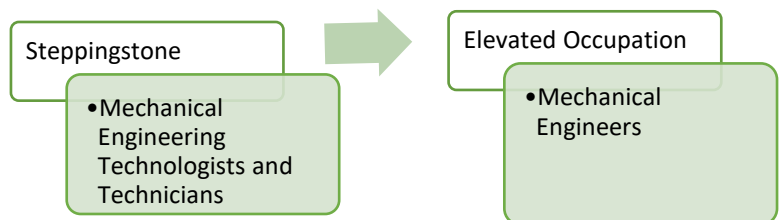
Source: [California Community Colleges LaunchBoard](#)

Manufacturing and Industrial Technology Student Demographics

Approximately 83 percent of manufacturing and industrial technology students at LA community colleges are male, 40 percentage points higher than the overall student enrollment **[Exhibit 92]**. 65 percent identify as Hispanic, 10 percentage points higher than the general student population **[Exhibit 93]**. Just 65 percent are 29-year-olds or younger, compared to 70 percent in the overall student body **[Exhibit 94]**. The referenced exhibits display student demographics of the 3,569 students enrolled in manufacturing and industrial technology at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The mechanical engineering technologists and technicians occupations can provide a steppingstone to the elevated occupations of mechanical engineers through additional education and work experience.



Industrial Engineering Technologists and Technicians

(SOC 17-3026)

Industrial engineering technologists and technicians are considered a green occupation because they optimize industrial processes to improve efficiency and reduce waste, supporting sustainable manufacturing. To further integrate into the green sector, they can focus on sustainable practices and energy-efficient systems. Community colleges in Los Angeles County offer programs like the **Sustainable Technology Certificate** and **Energy Efficiency Certificate**, equipping them with skills to enhance sustainability in industrial processes.

Community College Talent Supply

Industrial Systems Technology and Maintenance

- ▶ **TOP code:** 0945.00
- ▶ **Description:** Design, construction, maintenance, and operation of mechanical, hydraulic, pneumatic, and electrical equipment and related systems, such as production machinery. Includes building and plant maintenance.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	56%
Median Annual Earnings for Exiting Students, 2020-21	\$48,826
Median Change in Earnings for Exiting Students, 2020-21	3%
SWP Exiting Students Who Attained the Living Wage, 2020-21	73%

Occupational Overview

Employment in Industry 2022:..... 743 workers
Percent of Jobs Identified as Middle-Skill:..... 50.1%
Median Hourly Wages:..... \$36.19 per hour
Typical Entry-Level Education:..... Associate degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs..... 140 new jobs (18.8%)
Replacement Jobs 460 openings
Net Job Openings 600 jobs
2022-2028 Percent Net Change..... 80.7%

Exhibit 98: Industrial Systems Technology and Maintenance Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
L.A. Southwest College	●		
L.A. Trade Technical College		●	●
West Los Angeles College	●		

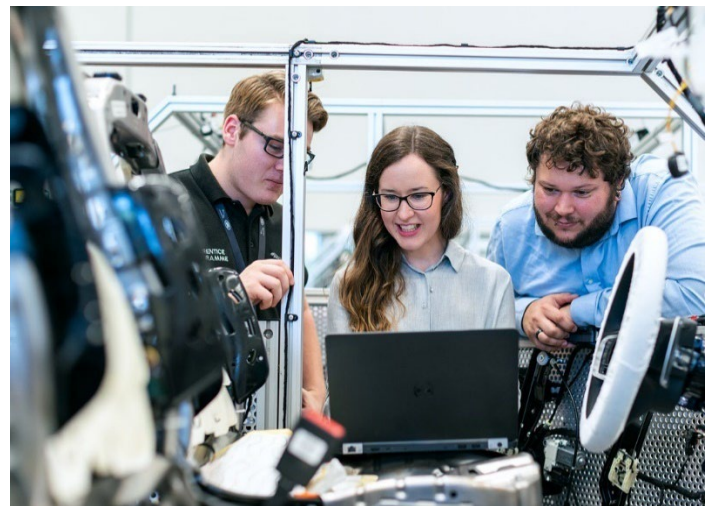


Exhibit 99: Gender, 2022-23



Exhibit 100: Race and Ethnicity, 2022-23

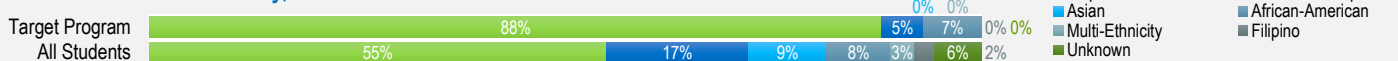
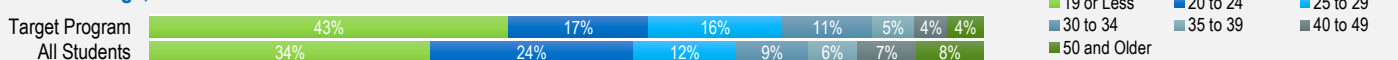


Exhibit 101: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, industrial engineering technologists and technicians in Los Angeles County are expected to experience 600 new and replacement job openings. Job postings data reveals an average of 92 monthly job openings in 2023, while average monthly hires were 27, including new jobs and openings from attrition and job transfers. In Los Angeles County, 69 percent of employers specified an education level in their job postings, with 70 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$50,000.

Exhibit 102 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

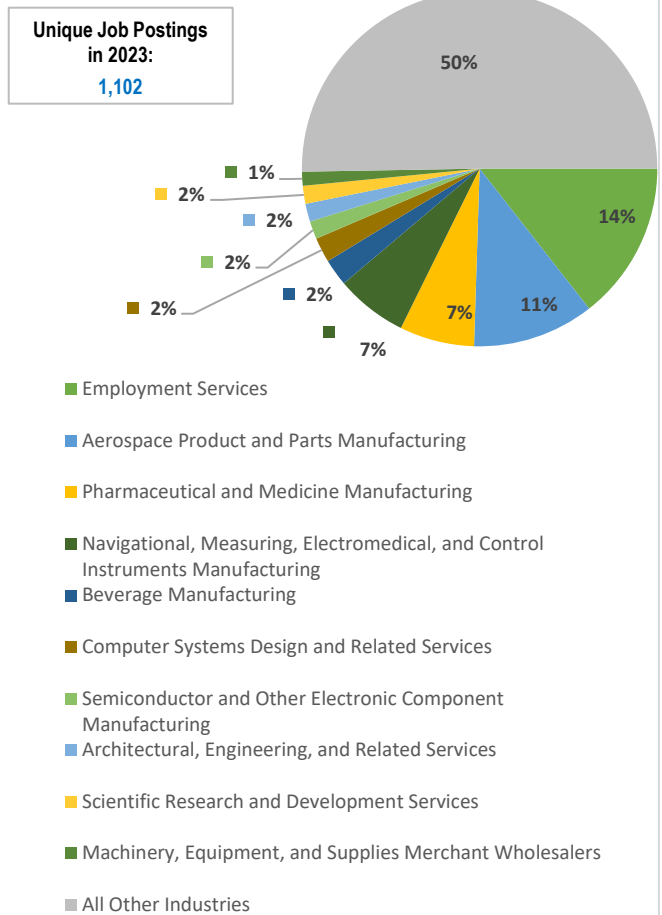
Employers in employment services, aerospace product and parts manufacturing, pharmaceutical and medicine manufacturing, and navigational, measuring, electromedical, and control instruments manufacturing advertised the most opportunities.

Top Skills Requested for Industrial Engineering Technologists and Technicians

The top specialized skills desired by employers include:

- ✓ Good Manufacturing Practices
- ✓ Hand Tools
- ✓ Machinery
- ✓ Manufacturing Processes
- ✓ Calipers
- ✓ Valves (Piping)
- ✓ Power Tool Operation
- ✓ Micrometer
- ✓ Manufacturing Operations
- ✓ Process Improvement

Exhibit 102: Unique Job Postings by Industry
Industrial Engineering Technologists and Technicians
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Manufacturing Technicians
- ▶ Production Technicians
- ▶ Propulsion Technicians
- ▶ Manufacturing Analysts
- ▶ Process Technicians
- ▶ Engineering Technicians
- ▶ Service Technicians
- ▶ Maintenance Apprentices
- ▶ Cryogenic Technicians
- ▶ Laboratory Technicians

The top common skills desired by employers include:

- ✓ Communication
- ✓ Troubleshooting (Problem Solving)
- ✓ Operations
- ✓ Management
- ✓ Detail Oriented
- ✓ Lifting Ability
- ✓ Problem Solving
- ✓ Mathematics
- ✓ Computer Literacy
- ✓ Self-Motivation

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Microsoft PowerPoint
- ✓ SAP Applications
- ✓ Spreadsheets
- ✓ Disassembler
- ✓ Microsoft Access
- ✓ DeltaV Distributed Control System

Skills in High-Demand

- ✓ Communication
- ✓ Troubleshooting (Problem Solving)
- ✓ Operations
- ✓ Management
- ✓ Detail Oriented
- ✓ Lifting Ability
- ✓ Problem Solving
- ✓ Mathematics
- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Good Manufacturing Practices

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Airframe & Powerplant (A&P) Certificate
- ✓ Secret Clearance
- ✓ Security Clearance
- ✓ Automotive Service Excellence (ASE) Certification
- ✓ Basic Life Support (BLS) Certification
- ✓ CDL Class C License
- ✓ CompTIA A+
- ✓ Top Secret Clearance
- ✓ Product Certification

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ dejobs.org
- ✓ recruiternetworks.com
- ✓ losangelesrecruiter.com
- ✓ careercast.com
- ✓ myworkdayjobs.com
- ✓ greenhouse.io
- ✓ santaclaritarecruiter.com
- ✓ tustinrecruiter.com

The industrial engineering technologists and technicians profession was designated as 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [**Exhibit A-43**]. It was also identified in O*Net's Green Economy Sectors under Manufacturing and covers the green topics identified in **Exhibit A-44**. This profession was included in the O*Net Green Topics related education programs under Manufacturing Engineering Technology/Technician, Industrial Safety Technology/Technician, and Process Safety Technology/Technician as shown in **Exhibit A-45**. Industrial engineering technologists and technicians contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, and Industry as identified in **Exhibit A-46**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in industrial systems technology and maintenance at three of their college locations, but have enrollment at two locations as shown in **Exhibits 98 and 103**. Industrial systems technology and maintenance graduates are likely to earn a job related to their education, with 56 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$48,826 for SWP exiting students in 2020-21, which was a median change in earnings of 3 percent. Many SWP students were able to attain a living wage, with 73 percent hitting that mark in 2020-21.

There were 99 total enrollments in 2022-23 and a total of 119 combined associate degrees and certificates awarded, as shown in **Exhibits 103 and 104**.

Exhibit 103: Student Enrollment by College, 2022-23

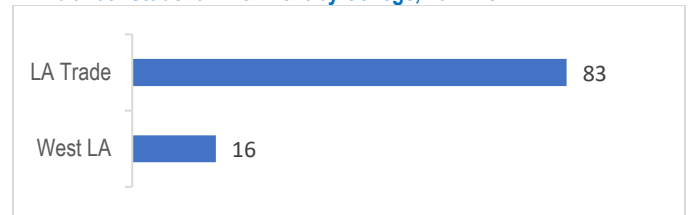
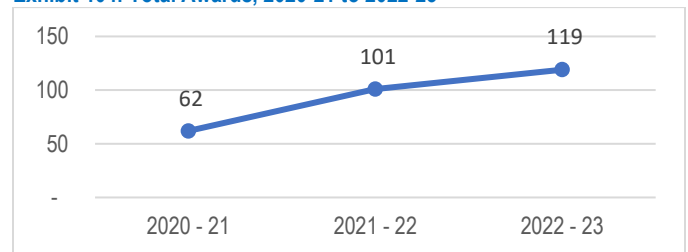


Exhibit 104: Total Awards, 2020-21 to 2022-23



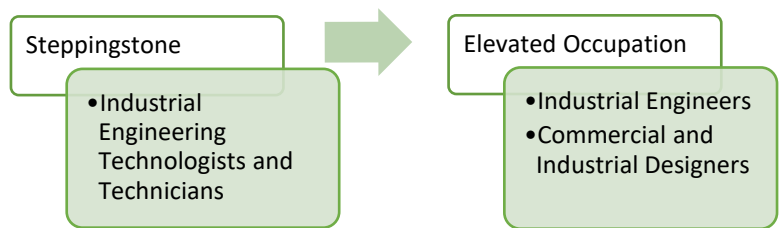
Source: [California Community Colleges LaunchBoard](#)

Industrial Systems Technology and Maintenance Student Demographics

Approximately 69 percent of industrial systems technology students at LA community colleges are male, 26 percentage points higher than the overall student enrollment [**Exhibit 99**]. Notably, 88 percent of these students identify as Hispanic, 33 percentage points higher than the general student population [**Exhibit 100**]. Additionally, 76 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 101**]. The referenced exhibits display student demographics of the 99 students enrolled in industrial systems technology and maintenance at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The industrial engineering technologists and technicians occupations can provide a steppingstone to the elevated occupations of industrial engineers and commercial and industrial designers through additional education and work experience.



Elevated Occupations

The Elevated Occupations section of this report examines green jobs in Los Angeles County that typically require a bachelor's degree or greater but are still accessible to community college graduates. This section provides an in-depth analysis of these advanced roles, which are critical to driving innovation and leadership in the county's green economy. It covers the specific responsibilities, skills, and educational qualifications needed for these positions, as well as labor market trends, job openings, and salary expectations. By focusing on elevated occupations, this section highlights the opportunities for individuals seeking to leverage their higher education to make significant contributions to environmental sustainability and economic growth. These roles are pivotal in shaping the future of green industries and ensuring the successful implementation of sustainability initiatives.

Exhibit 105: Target Climate-Ready Elevated Occupations

Typical Entry Level Education: Bachelor's Degree

SOC Code	Description	2022 Jobs	2022 Median Hourly Earnings	2028 Jobs	2022-2028 Forecasted Growth	2022-2028 Change in Jobs	2022-2028 Replacement Jobs	2022-2028 Job Openings	2022-2028 Percent Net Change in Jobs	Percent of 2022 Jobs in Green Sectors
11-9021	Construction Managers	14,980	\$41.54	16,230	8.3%	1,250	6,570	7,820	52.2%	28.1%
13-1041	Compliance Officers	12,765	\$38.03	13,750	7.7%	980	6,100	7,080	55.5%	3.8%
13-1081	Logisticians	6,954	\$38.30	8,410	20.9%	1,450	3,720	5,170	74.3%	4.3%
19-4021	Biological Technicians	1,184	\$28.55	1,430	20.8%	250	990	1,240	104.8%	0.8%

Note: The '2022-2028 Percent Net Change in Jobs' is calculated as the total job openings from 2022 to 2028 expressed as a percentage of the total jobs in 2022. Total job openings include the '2022-2028 Change in Jobs' (growth or decline in total employment) and the '2022-2028 Replacement Jobs' (positions needing to be filled due to retirements or worker turnover). The formula is: $[(2022-2028 \text{ Change in Jobs} + 2022-2028 \text{ Replacement Jobs}) \div 2022 \text{ Jobs}] \times 100$.

Construction Managers

(SOC 17-3026)

Construction managers are considered a green occupation because they oversee projects that use sustainable building practices and materials. To further integrate into the green sector, they can specialize in green construction techniques and renewable energy integration. Community colleges in Los Angeles County offer programs like the **Sustainable Construction Management Certificate** and the **Leadership in Energy and Environmental Design (LEED)** course equipping them to lead environmentally responsible projects.

Occupational Overview

Employment in Industry 2022:..... 14,980 workers
Percent of Jobs Identified as Middle-Skill:..... 31.2%
Median Hourly Wages..... \$41.54 per hour
Typical Entry-Level Education..... Bachelor's degree
Work Experience Required None
Typical On-the-Job Training Moderate-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... 1,250 new jobs (8.3%)
Replacement Jobs 6,570 openings
Net Job Openings 7,820 jobs
2022-2028 Percent Net Change..... 52.2%

Community College Talent Supply

Civil and Construction Management Technology

- ▶ **TOP code:** 0957.00
- ▶ **Description:** Application of procedures and techniques related to civil and construction management, including estimating and bidding, scheduling and control, inspection, building systems, construction practices, quality control, labor and safety practices. Includes public works management.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	63%
Median Annual Earnings for Exiting Students, 2020-21	\$84,080
Median Change in Earnings for Exiting Students, 2020-21	11%
SWP Exiting Students Who Attained the Living Wage, 2020-21	84%

Exhibit 106: Civil and Construction Management Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Citrus College		●	●
East LA College	●		
L.A. Valley College		●	●
Long Beach City College	●		
Mt. San Antonio College		●	●
Pasadena City College		●	●
Rio Hondo College			●
West Los Angeles College	●		



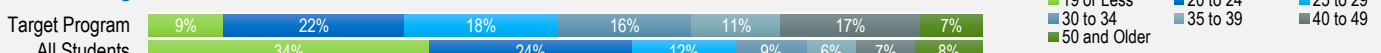
Exhibit 107: Gender, 2022-23



Exhibit 108: Race and Ethnicity, 2022-23



Exhibit 109: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, construction managers in Los Angeles County are expected to experience 7,820 new and replacement job openings. Job postings data reveals an average of 310 monthly job openings in 2023, while average monthly hires were 338, including new jobs and openings from attrition and job transfers. In Los Angeles County, 56 percent of employers specified an education level in their job postings, with 22 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$114,400.

Exhibit 110 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

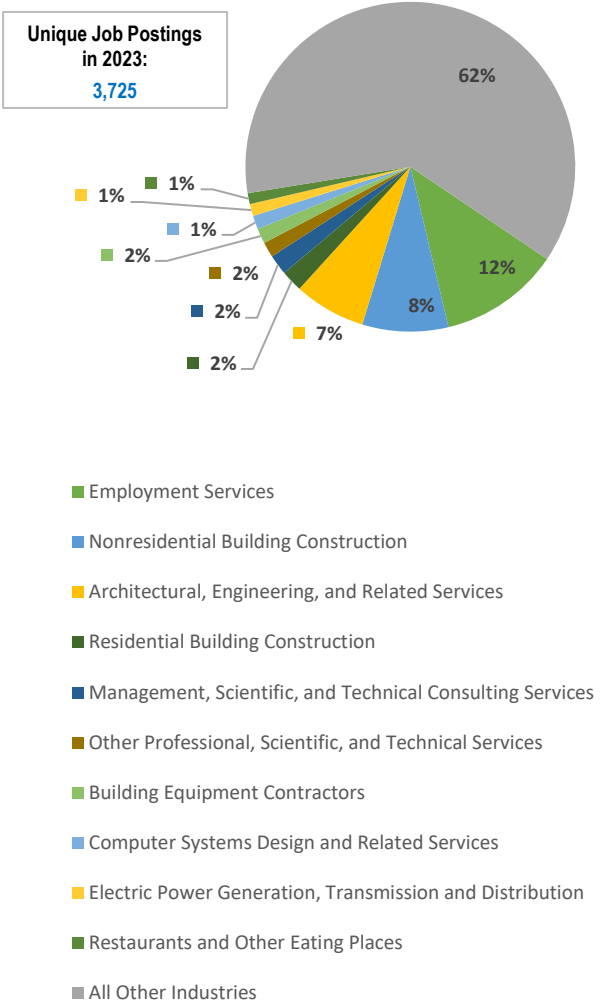
Employers in employment services, nonresidential building construction, architectural, engineering, and related services, residential building construction, management, scientific, and technical consulting services advertised the most opportunities.

Top Skills Requested for Construction Managers

The top specialized skills desired by employers include:

- ✓ Construction
- ✓ Project Management
- ✓ Construction Management
- ✓ Subcontracting
- ✓ Change Orders
- ✓ Project Schedules
- ✓ Submittals (Construction)
- ✓ Procurement
- ✓ Commercial Construction
- ✓ Building Codes

Exhibit 110: Unique Job Postings by Industry
Construction Managers
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Construction Project Managers
- ▶ Construction Superintendents
- ▶ Construction Managers
- ▶ Superintendents
- ▶ Multifamily Superintendents
- ▶ Commercial Construction Superintendents
- ▶ Design Managers
- ▶ Commercial Construction Project Managers
- ▶ Construction Office Managers
- ▶ Site Coordinators

The top common skills desired by employers include:

- ✓ Communication
- ✓ Management
- ✓ Leadership
- ✓ Scheduling
- ✓ Coordinating
- ✓ Planning
- ✓ Operations
- ✓ Quality Control
- ✓ Microsoft Office
- ✓ Problem Solving

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Procore
- ✓ Microsoft PowerPoint
- ✓ Microsoft Project
- ✓ Project Management Software
- ✓ Primavera (Software)
- ✓ Construction Management Software

Skills in High-Demand

- ✓ Construction
- ✓ Project Management
- ✓ Construction Management
- ✓ Subcontracting
- ✓ Communication
- ✓ Management
- ✓ Leadership
- ✓ Scheduling
- ✓ Coordinating
- ✓ Planning

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ 30-Hour OSHA General Industry Card
- ✓ Project Management Professional Certification
- ✓ Cardiopulmonary Resuscitation (CPR) Certification
- ✓ Certified Construction Manager
- ✓ Professional Engineer (PE) License
- ✓ First Aid Certification
- ✓ 10-Hour OSHA General Industry Card
- ✓ Contractor License
- ✓ Project Management Certification

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ recruiternetworks.com
- ✓ losangelesrecruiter.com
- ✓ oxnardrecruiter.com
- ✓ santaclaritarecruiter.com
- ✓ tustinrecruiter.com
- ✓ dejobs.org
- ✓ energyjobline.com
- ✓ craigslist.org

The construction managers profession was designated as 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [**Exhibit A-47**]. It was also identified in O*Net's Green Economy Sectors of Green Construction and Environmental Protection as well as the Green Topics as shown in **Exhibit A-48**. This profession is highlighted as having a bright outlook by O*Net. This profession was included in the O*Net Green Topics related education programs under Construction Engineering Technology/Technician, Construction Management, General, Construction Management, Other, and Construction Project Management as shown in **Exhibit A-49**. Construction managers contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-50**.

Community College Talent Supply

The California Community Colleges offer non degree awards, certificates and/or associate degree programs in civil and construction management technology at six of their college locations, but have enrollment at four locations as shown in **Exhibits 106 and 111**. Civil and construction management technology graduates are likely to earn a job related to their education, with 63 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$84,080 for SWP exiting students in 2020-21, which was a median change in earnings of 11 percent. Many SWP students were able to attain a living wage, with 84 percent hitting that mark in 2020-21.

There were 668 total enrollments in 2022-23 and a total of 37 combined associate degrees and certificates awarded, as shown in **Exhibits 111 and 112**.

Exhibit 111: Student Enrollment by College, 2022-23

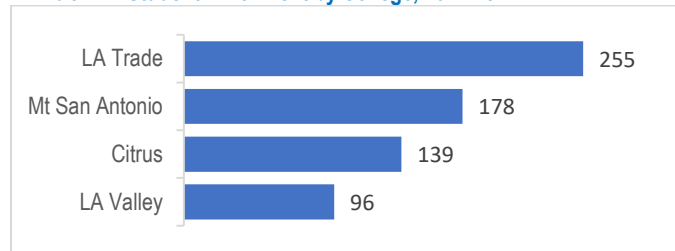
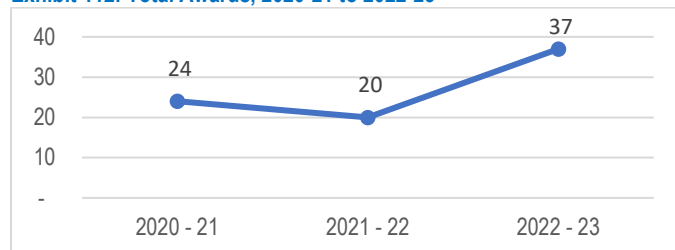


Exhibit 112: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Civil and Construction Management Technology Student Demographics

Approximately 82 percent of civil and construction management technology students at LA community colleges are male, 39 percentage points higher than the overall student enrollment [**Exhibit 107**]. Additionally, 75 percent of these students identify as Hispanic, 20 percentage points higher than the general student population [**Exhibit 108**]. Just 49 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 109**]. The referenced exhibits display student demographics of the 668 students enrolled in civil and construction management technology at LA community colleges during the 2022-23 academic year.

Compliance Officers

(SOC 13-1041)

Compliance officers are considered a green occupation because they ensure organizations comply with environmental regulations and sustainability standards. To further integrate into the green sector, they can specialize in environmental laws and sustainability reporting. Community colleges in Los Angeles County offer programs like the **Sustainability Services Technician Certificate** and **Energy and Sustainable Technologies Degree**, equipping them to enforce and promote environmentally responsible practices.

Occupational Overview

Employment in Industry 2022:..... 1,765 workers
Percent of Jobs Identified as Middle-Skill:..... 25.7%
Median Hourly Wages:..... \$38.03 per hour
Typical Entry-Level Education:..... Bachelor's degree
Work Experience Required:..... None
Typical On-the-Job Training:..... Moderate-term

Occupational Projections 2022 to 2028

Newly Created Jobs:..... 980 new jobs (7.7%)
Replacement Jobs:..... 6,100 openings
Net Job Openings:..... 7,080 jobs
2022-2028 Percent Net Change:..... 55.5%

Community College Talent Supply

Environmental Technology

- ▶ **TOP code:** 0303.00
- ▶ **Description:** Environmental management, monitoring, assessment, and restoration, including environmental pollution control systems and the management of hazardous materials and hazardous waste, and related government regulations.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	88%
Median Annual Earnings for Exiting Students, 2020-21	\$45,376
Median Change in Earnings for Exiting Students, 2020-21	17%
SWP Exiting Students Who Attained the Living Wage, 2020-21	58%

Exhibit 113: Environmental Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Mt. San Antonio College		●	
Rio Hondo College		●	●
Santa Monica College	●	●	●

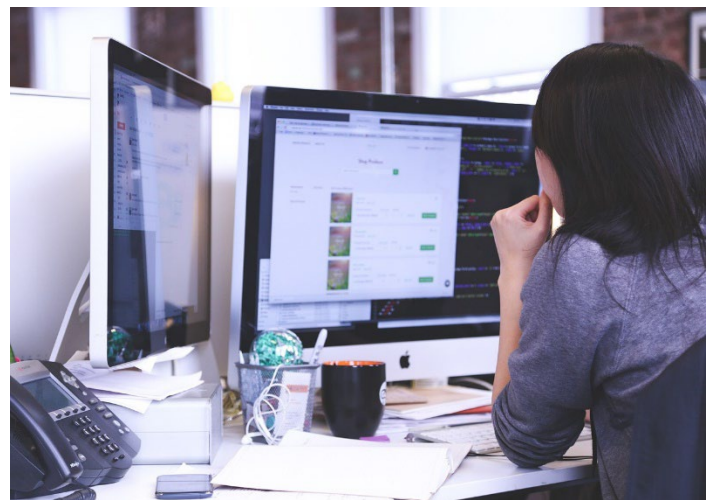


Exhibit 114: Gender, 2022-23

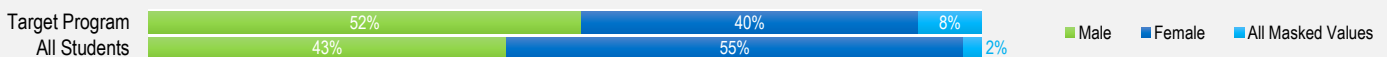
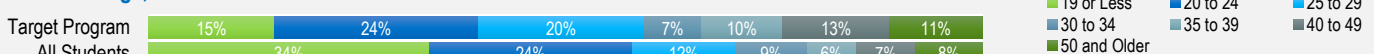


Exhibit 115: Race and Ethnicity, 2022-23



Exhibit 116: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, compliance officers in Los Angeles County are expected to experience 7,080 new and replacement job openings. Job postings data reveals an average of 173 monthly job openings in 2023, while average monthly hires were 430, including new jobs and openings from attrition and job transfers. In Los Angeles County, 71 percent of employers specified an education level in their job postings, with 20 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$77,700.

Exhibit 117 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

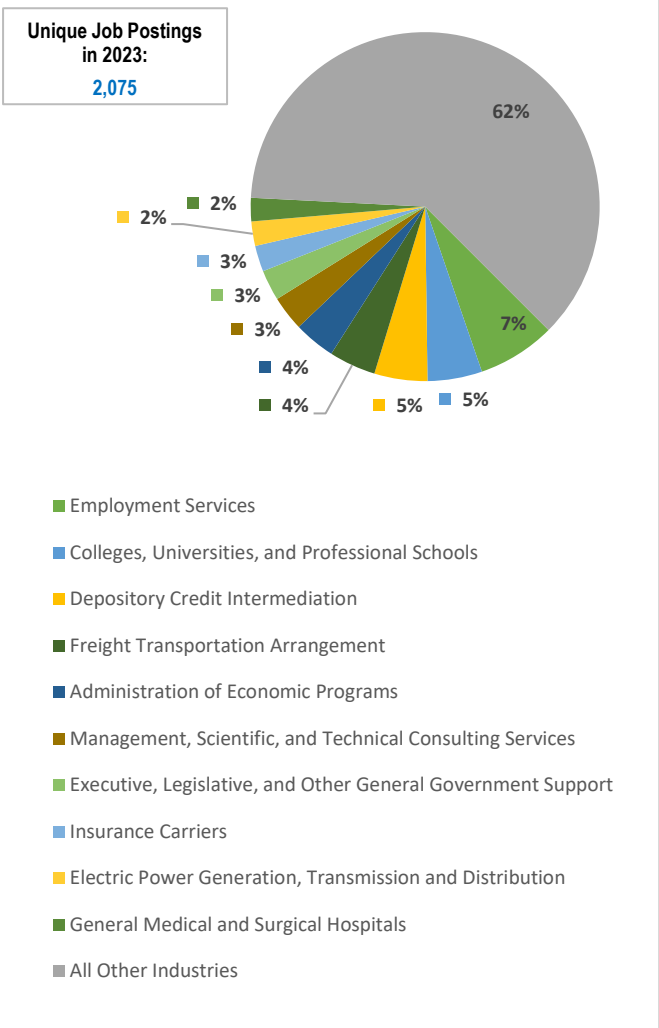
Employers in employment services, colleges, universities, and professional schools, depository credit intermediation, freight transportation arrangement, and administration of economic programs advertised the most opportunities.

Top Skills Requested for Compliance Officers

The top specialized skills desired by employers include:

- ✓ Auditing
- ✓ Regulatory Compliance
- ✓ Project Management
- ✓ Regulatory Affairs
- ✓ Risk Analysis
- ✓ Finance
- ✓ Risk Management
- ✓ Data Analysis
- ✓ Marketing
- ✓ Accounting

Exhibit 117: Unique Job Postings by Industry
Compliance Officers
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Compliance Analysts
- ▶ Compliance Officers
- ▶ Regulatory Affairs Specialists
- ▶ Compliance Coordinators
- ▶ Customs and Border Patrol Agents
- ▶ Compliance Specialists
- ▶ Regulatory Coordinators
- ▶ Inclusion Specialists
- ▶ Public Utilities Regulatory Analysts
- ▶ Safety Compliance Specialists

The top common skills desired by employers include:

- ✓ Communication
- ✓ Management
- ✓ Operations
- ✓ Detail Oriented
- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Writing
- ✓ Research
- ✓ Leadership
- ✓ Problem Solving

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Microsoft PowerPoint
- ✓ Spreadsheets
- ✓ SAP Applications
- ✓ Microsoft Access
- ✓ Microsoft SharePoint
- ✓ Microsoft Visio

Skills in High-Demand

- ✓ Auditing
- ✓ Communication Management
- ✓ Operations
- ✓ Detail Oriented
- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Writing
- ✓ Research
- ✓ Regulatory Compliance
- ✓ Project Management
- ✓ Management

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Certified Regulatory Compliance Manager
- ✓ Certified Information Systems Security Professional
- ✓ Certified Internal Auditor
- ✓ CDL Class C License
- ✓ Certified Information System Auditor (CISA)
- ✓ Certified Information Security Manager
- ✓ Cardiopulmonary Resuscitation (CPR) Certification
- ✓ Certified Quality Auditor
- ✓ Registered Investment Advisor

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ recruiternetworks.com
- ✓ losangelesrecruiter.com
- ✓ dejobs.org
- ✓ santaclaritarecruiter.com
- ✓ oxnardrecruiter.com
- ✓ tustinrecruiter.com
- ✓ monster.com
- ✓ latpro.com

The compliance officers profession was designated as 'Green New and Emerging' in O*Net's comprehensive list of green occupations [**Exhibit A-51**]. This occupation was not included in O*Net's Green Economy Sectors, but it was included in several of the O*Net Green Topics as shown in **Exhibit A-52**. This profession is highlighted as having a bright outlook by O*Net. This profession was included in the O*Net Green Topics related education programs under Environmental Studies, Environmental Science, Environmental/ Natural Resources Law Enforcement and Protective Services, and Energy and Environmental Policy as shown in **Exhibit A-53**. Compliance officers contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-54**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in environmental technology at three of their college locations, but have enrollment at four locations as shown in **Exhibits 113 and 118**. Environmental technology graduates are highly likely to earn a job related to their education, with 88 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$45,376 for SWP exiting students in 2020-21, which was a median change in earnings of 17 percent. Many SWP students were able to attain a living wage, with 58 percent hitting that mark in 2020-21.

There were 285 total enrollments in 2022-23 and a total of 41 combined associate degrees and certificates awarded, as shown in **Exhibits 118 and 119**.

Environmental Technology Student Demographics

A little more than 50 percent of environmental technology students at Los Angeles community colleges are male, just 9 percentage points higher than the overall student enrollment [**Exhibit 114**]. Nearly two-thirds identify as Hispanic, 9 percentage points higher than the general student population [**Exhibit 115**]. Only 59 percent are 29-year-olds or younger, compared to 70 percent in the overall student body, with the most significant age difference being in the 19 or less category [**Exhibit 116**]. The referenced exhibits display student demographics of the 285 students enrolled in environmental technology at LA community colleges during the 2022-23 academic year.

Exhibit 118: Student Enrollment by College, 2022-23

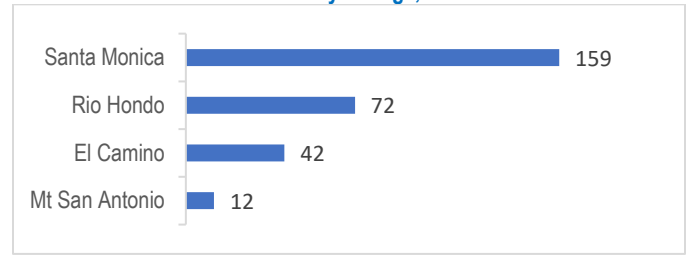
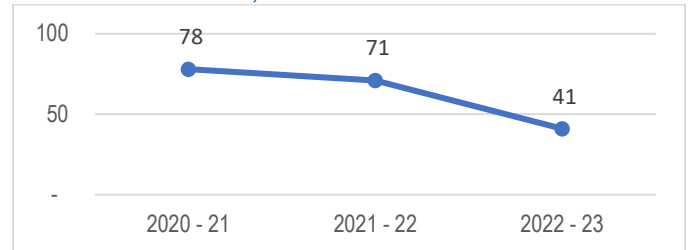


Exhibit 119: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Logisticians

(SOC 13-1081)

Logisticians are considered a green occupation because they optimize supply chains to reduce waste, lower emissions, and increase energy efficiency. To further integrate into the green sector, they can focus on integrating renewable energy, enhancing recycling logistics, and adopting digital technologies to minimize environmental impact. Community colleges in Los Angeles County offer programs like the **Supply Chain Management Certificate** and **Technology and Logistics Certificate**, equipping them to promote sustainability in supply chain management.

Occupational Overview

Employment in Industry 2022:..... 6,954 workers
Percent of Jobs Identified as Middle-Skill:..... 35.2%
Median Hourly Wages:..... \$38.30 per hour
Typical Entry-Level Education:..... Bachelor's degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs..... 1,450 new jobs (20.9%)
Replacement Jobs 3,720 openings
Net Job Openings 5,170 jobs
2022-2028 Percent Net Change..... 74.3%

Community College Talent Supply

Logistics and Materials Transportation

- ▶ **TOP code:** 0510.00
- ▶ **Description:** Theory, principles, functions, and procedures for the orderly and economic receiving, manufacturing, shipping, and servicing of products or services.

Strong Workforce Program (SWP) Statistics:	
Students with a Job Closely Related to Their Field of Study, 2019-20	77%
Median Annual Earnings for Exiting Students, 2020-21	\$46,784
Median Change in Earnings for Exiting Students, 2020-21	19%
SWP Exiting Students Who Attained the Living Wage, 2020-21	62%

Exhibit 120: Logistics and Materials Transportation Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
East LA College		●	●
L.A. City College	●		
L.A. Harbor College	●		
Mt. San Antonio College	●	●	
Pasadena City College		●	
Rio Hondo College		●	●
Santa Monica College		●	●

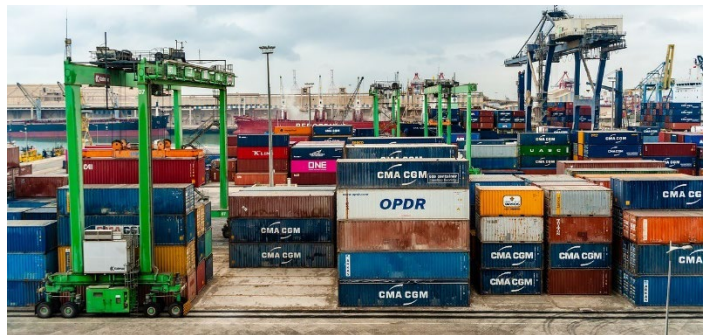


Exhibit 121: Gender, 2022-23



Exhibit 122: Race and Ethnicity, 2022-23

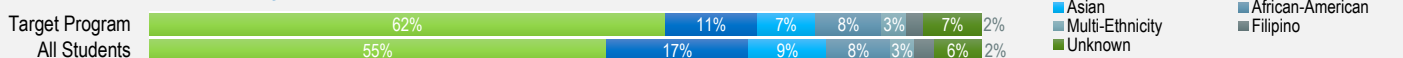
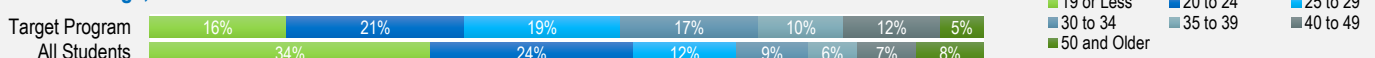


Exhibit 123: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, logisticians in Los Angeles County are expected to experience 5,170 new and replacement job openings, with additional openings from exits and job transfers. Job postings data provides insight into the total number of opportunities, showing an average of 338 monthly job openings in 2023, but only 290 average monthly hirings. In Los Angeles County, 68 percent of employers specified an education level in their job postings, with 34 percent asking for an associate degree or less. The median advertised annual salary in Los Angeles County for jobs posted for logisticians is \$66,900.

Exhibit 124 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

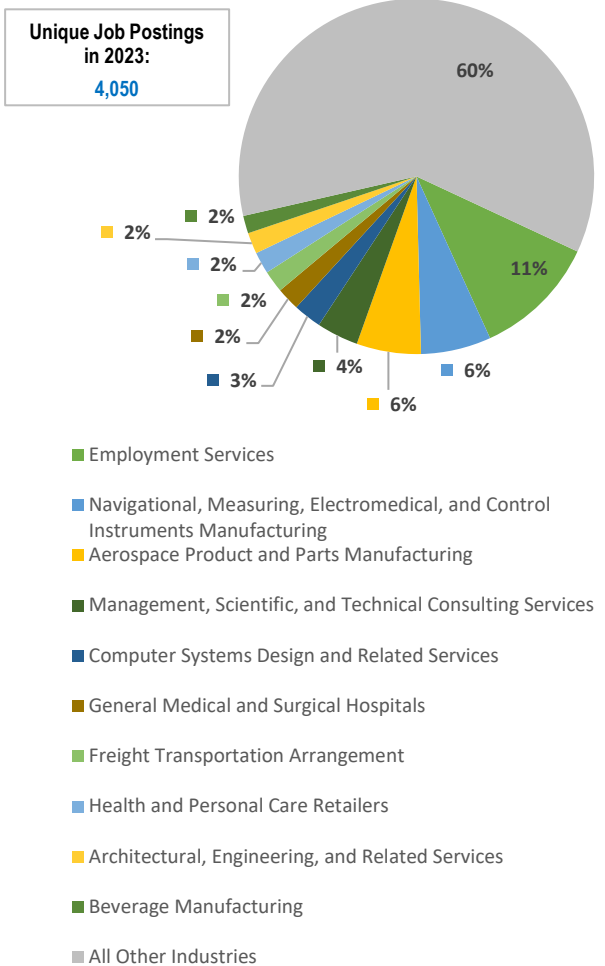
Employers in employment services, navigational, measuring, electromedical, and control instruments manufacturing, aerospace product and parts manufacturing, management, scientific, and technical consulting services, computer systems design and related services, general medical and surgical hospitals, and freight transportation arrangement advertised the most opportunities.

Top Skills Requested for Logisticians

The top specialized skills desired by employers include:

- ✓ Supply Chain
- ✓ Logistics
- ✓ Purchasing
- ✓ Warehousing
- ✓ Procurement
- ✓ Inventory Management
- ✓ Material Requirements Planning
- ✓ SAP Applications
- ✓ Supply Chain Management
- ✓ Supply Chain Planning

Exhibit 124: Unique Job Postings by Industry
Logisticians
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Logistics Coordinators
- ▶ Production Planners
- ▶ Supply Chain Specialists
- ▶ Supply Chain Analysts
- ▶ Demand Planners
- ▶ Supply Chain Planners
- ▶ Supply Chain Planning Specialists
- ▶ Manufacturing Planners
- ▶ Supply Chain Coordinators

The top common skills desired by employers include:

- ✓ Communication
- ✓ Management
- ✓ Planning
- ✓ Operations
- ✓ Microsoft Excel
- ✓ Customer Service
- ✓ Detail Oriented
- ✓ Microsoft Office
- ✓ Problem Solving
- ✓ Sales

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ SAP Applications
- ✓ Microsoft PowerPoint
- ✓ SQL (Programming Language)
- ✓ Tableau (Business Intelligence Software)
- ✓ Power BI
- ✓ Inventory Management System

Skills in High-Demand

- ✓ Communication
- ✓ Management
- ✓ Planning
- ✓ Operations
- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Supply Chain
- ✓ Logistics
- ✓ Purchasing
- ✓ Customer Service
- ✓ Detail Oriented

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Secret Clearance
- ✓ Security Clearance
- ✓ American Production And Inventory Control Society (APICS) Certification
- ✓ Certified In Production And Inventory Management
- ✓ Top Secret-Sensitive Compartmented Information (TS/SCI Clearance)
- ✓ Forklift Certification
- ✓ Top Secret Clearance
- ✓ Master Of Business Administration (MBA)
- ✓ APICS Certified Supply Chain Professional

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ recruiternetworks.com
- ✓ losangelesrecruiter.com
- ✓ dejobs.org
- ✓ santaclaritarecruiter.com
- ✓ myworkdayjobs.com
- ✓ oxnardrecruiter.com
- ✓ energyjobline.com
- ✓ tustinrecruiter.com

The logisticians profession was designated as 'Green New and Emerging (Candidate N&E)' in O*Net's comprehensive list of green occupations [**Exhibit A-55**]. It was also identified in the O*Net Green Economy Sectors of Research, Design, and Consulting Services, and Manufacturing. It was also identified in several O*Net Green Topics as shown in **Exhibit A-56**. This profession is highlighted as having a bright outlook by O*Net. Logisticians contribute to California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, Water, and Natural and Working Lands as identified in **Exhibit A-57**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs for logisticians and materials transportation at seven of their college locations, but enrollment at five locations as shown in **Exhibits 120 and 125**. Logistician and materials transportation graduates are likely to earn a job related to their education, with 77 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-2020. The median annual earnings for was \$46,784 for SWP exiting students in 2020-2021, which was a median change in earnings for 19 percent. Many SWP students were able to attain a living wage, with 62 percent hitting that mark in 2020-2021.

There were 1,003 total enrollments in 2022-23 and a total of 56 combined associate degrees and certificates awarded, as shown in **Exhibits 125 and 126**.

Exhibit 125: Student Enrollment by College, 2022-23

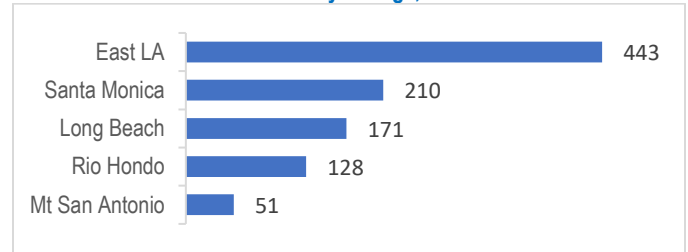
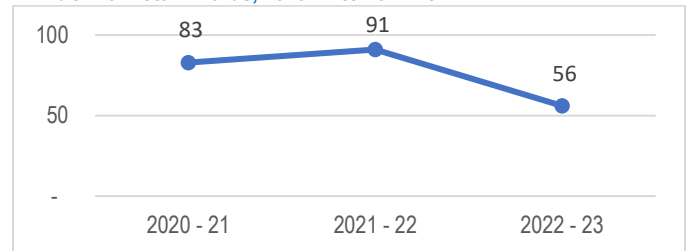


Exhibit 126: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Logistician and Materials Transportation Student Demographics

Approximately 55 percent of logistician and materials transportation students at LA community colleges are male, 12 percentage points higher than the overall student enrollment [**Exhibit 121**]. Nearly two-thirds identify as Hispanic, 7 percentage points higher than the general student population [**Exhibit 122**]. Only 56 percent are 29-year-olds or younger, compared to 70 percent in the overall student body, with the most significant age difference being in the 19 or less category [**Exhibit 123**]. The referenced exhibits display student demographics of the 1,003 students enrolled in logistician and materials transportation at LA community colleges during the 2022-23 academic year.

Biological Technicians

(SOC 19-4021)

Biological technicians are considered a green occupation because they support research in environmental conservation and sustainable practices. To further integrate into the green sector, they can focus on environmental monitoring, renewable resources, and sustainable agriculture. Community colleges in Los Angeles County offer programs like the **Environmental Technology and Sciences Certificates** and **Environmental Horticulture Certificate**, equipping them to advance sustainability in their research and practices.

Community College Talent Supply

Biotechnology and Biomedical Technology

- ▶ **TOP code:** 0430.00
- ▶ **Description:** Theories, operations, and technical skills used to assist researchers and engineers engaged in developing or manufacturing biological, biotechnical, or medical systems or products.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	60%
Median Annual Earnings for Exiting Students, 2020-21	\$30,206
Median Change in Earnings for Exiting Students, 2020-21	-13%
SWP Exiting Students Who Attained the Living Wage, 2020-21	40%



Occupational Overview

Employment in Industry 2022:..... 1,184 workers
Percent of Jobs Identified as Middle-Skill:..... 25.7%
Median Hourly Wages:..... \$28.55 per hour
Typical Entry-Level Education:..... Bachelor's degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs..... 250 new jobs (20.8%)
Replacement Jobs 990 openings
Net Job Openings 1,240 jobs
2022-2028 Percent Net Change..... 104.8%

Exhibit 127: Biotechnology and Biomedical Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	●
Citrus College		●	●
Compton College		●	●
East LA College		●	
Glendale Community College		●	●
L.A. Harbor College		●	●
L.A. Mission College*		●	●
L.A. Pierce College	●	●	●
L.A. Trade Technical College		●	●
Pasadena City College		●	●
Rio Hondo College		●	
Santa Monica College		●	
West Los Angeles College		●	

*Note: LA Mission College also offers a Bachelor's Degree program.

Exhibit 128: Gender, 2022-23



Exhibit 129: Race and Ethnicity, 2022-23

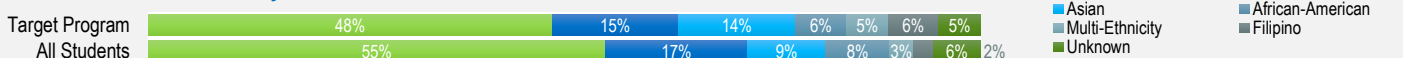
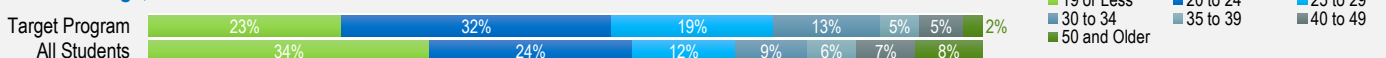


Exhibit 130: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, biological technicians in Los Angeles County are expected to experience 1,240 new and replacement job openings. Job postings data reveals an average of 18 monthly job openings in 2023, while average monthly hires were 64, including new jobs and openings from attrition and job transfers. In Los Angeles County, 58 percent of employers specified an education level in their job postings, with 43 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$47,600.

Exhibit 131 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

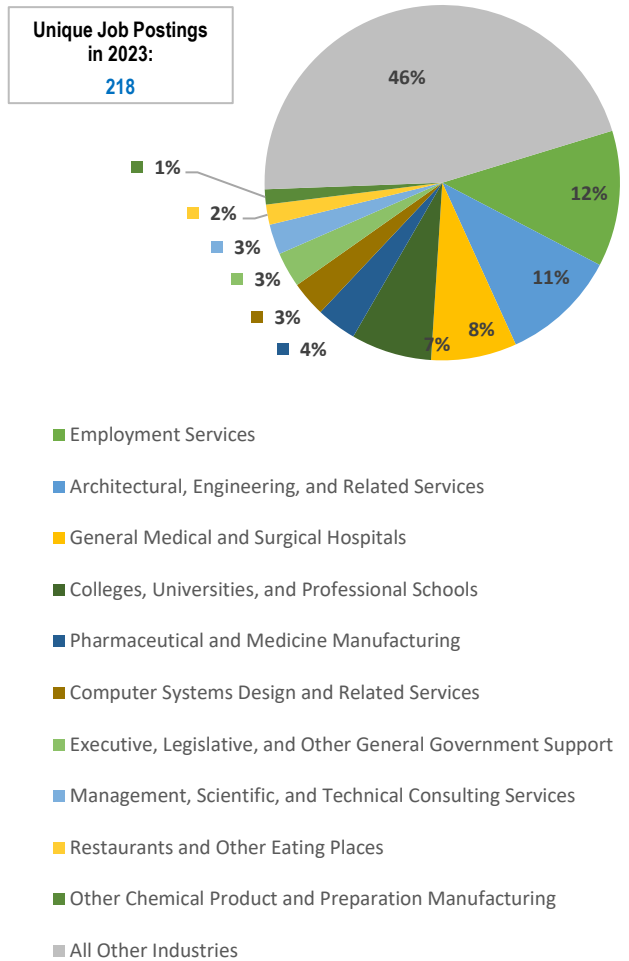
Employers in employment services, architectural, engineering, and related services, general medical and surgical hospitals, colleges, universities, and professional schools, and pharmaceutical and medicine manufacturing advertised the most opportunities.

Top Skills Requested for Biological Technicians

The top specialized skills desired by employers include:

- ✓ Biology
- ✓ Microbiology
- ✓ Good Manufacturing Practices
- ✓ Biotechnology
- ✓ Pharmaceuticals
- ✓ Standard Operating Procedure
- ✓ Cell Cultures
- ✓ Data Analysis
- ✓ Cell Therapy
- ✓ Laboratory Equipment

Exhibit 131: Unique Job Postings by Industry
Biological Technicians
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Laboratory Technicians
- ▶ Microbiology Technicians
- ▶ Electronics Technicians
- ▶ Biometrics Technicians
- ▶ Microbiology Laboratory Technicians
- ▶ Cell Culture Technicians
- ▶ Fish and Wildlife Technicians
- ▶ Scientific Associates
- ▶ Micro Technicians
- ▶ Manufacturing Technicians

The top common skills desired by employers include:

- ✓ Communication
- ✓ Problem Solving
- ✓ Writing
- ✓ Detail Oriented
- ✓ Troubleshooting (Problem Solving)
- ✓ Research
- ✓ Operations
- ✓ Quality Control
- ✓ Microsoft Excel
- ✓ Management

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Microsoft PowerPoint
- ✓ Laboratory Information Management Systems
- ✓ .NET Framework
- ✓ FlowJo
- ✓ Google Sheets
- ✓ Application Programming Interface (API)

Skills in High-Demand

- ✓ Communication
- ✓ Biology
- ✓ Microbiology
- ✓ Good Manufacturing Practices
- ✓ Biotechnology
- ✓ Problem Solving
- ✓ Pharmaceuticals
- ✓ Writing
- ✓ Detail Oriented
- ✓ Standard Operating Procedure

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ Security Clearance
- ✓ Certified First Responder (CFR)
- ✓ Clinical Laboratory Scientist License (CLS)
- ✓ American Society For Clinical Pathology (ASCP) Certification
- ✓ Automotive Service Excellence (ASE) Certification
- ✓ Certified Risk Adjustment Coder (CRC)
- ✓ Qualified Security Assessor
- ✓ English Learner Authorization
- ✓ Board Certified In Psychiatry

Where Jobs are Typically Posted

- ✓ simplyhired.com
- ✓ indeed.com
- ✓ recruiternetworks.com
- ✓ dejobs.org
- ✓ craigslist.org
- ✓ losangelesrecruiter.com
- ✓ careerbuilder.com
- ✓ santaclaritarecruiter.com
- ✓ arkansasjobboard.com
- ✓ clearancejobs.com

The biological technicians profession was not included in O*Net's comprehensive list of green occupations. It was also not included in an O*Net Green Economy Sectors, but it was included in the O*Net Green Topics of Aquaculture, Biodegradable, Biodiversity, Biomass, Environmental Science, Fisheries, Forestry, and Wildlife as shown in **Exhibit A-58**. This profession is highlighted as having a bright outlook. Biological technicians contribute to the California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, and Water as identified in **Exhibit A-59**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in biotechnology and biomedical technology at 13 of their college locations, but have enrollment at 11 locations as shown in **Exhibits 127 and 132**. Biotechnology and biomedical technology graduates are likely to earn a job related to their education, with 60 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$30,206 for SWP exiting students in 2020-21, which was a median change in earnings of -13 percent. Many SWP students were able to attain a living wage, with 40 percent hitting that mark in 2020-21.

There were 533 total enrollments in 2022-23 and a total of 106 combined associate degrees and certificates awarded, as shown in **Exhibits 132 and 133**.

Exhibit 132: Student Enrollment by College, 2022-23

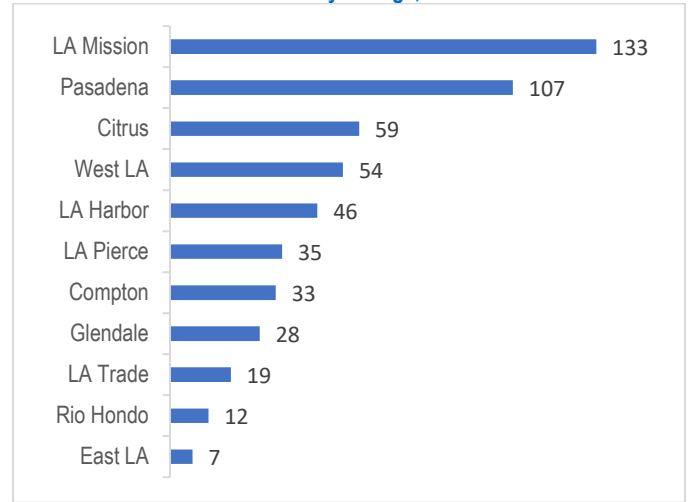
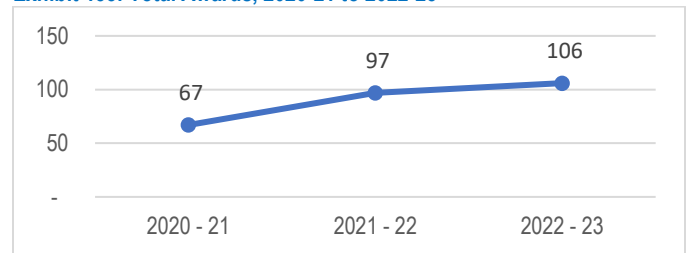


Exhibit 133: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Biotechnology and Biomedical Technology Student Demographics

Nearly half of biotechnology and biomedical technology students at Los Angeles community colleges are male, 6 percentage points higher than the overall student enrollment [**Exhibit 128**]. Additionally, 14 percent identify as Asian and 6 percent identify as Filipino, a combined 9 percentage points higher than the general student population [**Exhibit 129**]. 74 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 130**]. The referenced exhibits display student demographics of the 533 students enrolled in biotechnology and biomedical technology at LA community colleges during the 2022-23 academic year.

Emerging Occupations

The Emerging Occupations section of this report focuses on middle-skill green jobs in Los Angeles County that require more than a high school diploma but less than a bachelor's degree. These occupations are characterized by their potential for growth as the green economy expands. This section provides detailed insights into these emerging roles, including job descriptions, required skills, educational pathways, and future career prospects. By highlighting these positions, the section underscores the opportunities for individuals to enter or transition into the green workforce, emphasizing the importance of these emerging occupations in supporting sustainable practices and innovation. These roles are not only essential for meeting current environmental goals but also for driving the future development of green industries in the region.

Exhibit 134: Target Climate-Ready Emerging Occupations

Typical Entry Level Education: Associate degree / Postsecondary Nondegree Award / Some college, no degree

SOC Code	Description	2022 Jobs	2022 Median Hourly Earnings	2028 Jobs	2022-2028 Forecasted Growth	2022-2028 Change in Jobs	2022-2028 Replacement Jobs	2022-2028 Job Openings	2022-2028 Percent Net Change in Jobs	Percent of 2022 Jobs in Green Sectors
19-4031	Chemical Technicians	1,688	\$23.31	1,640	-3.2%	-50	1,140	1,090	64.6%	6.7%
17-3025	Environmental Engineering Technologists and Technicians	239	\$36.36	170	-31.0%	-70	90	20	8.4%	14.1%
49-9081	Wind Turbine Service Technicians	207	\$29.83	210	-1.2%	0	110	110	53.3%	24.5%

Note: The '2022-2028 Percent Net Change in Jobs' is calculated as the total job openings from 2022 to 2028 expressed as a percentage of the total jobs in 2022. Total job openings include the '2022-2028 Change in Jobs' (growth or decline in total employment) and the '2022-2028 Replacement Jobs' (positions needing to be filled due to retirements or worker turnover). The formula is: $[(2022-2028 \text{ Change in Jobs} + 2022-2028 \text{ Replacement Jobs}) \div 2022 \text{ Jobs}] \times 100$.

Chemical Technicians

(SOC 19-4031)

Chemical technicians are considered a green occupation because they develop and test chemical processes that reduce environmental impact and support clean energy. To further integrate into the green sector, they can focus on green chemistry, renewable resources, and efficient environmental monitoring. Community colleges in Los Angeles County offer programs like the **Environmental Technology and Sciences Certificates**, equipping them to advance sustainability in the chemical industry.

Occupational Overview

Employment in Industry 2022:..... 1,688 workers
Percent of Jobs Identified as Middle-Skill:..... 35.9%
Median Hourly Wages..... \$23.31 per hour
Typical Entry-Level Education..... Associate degree
Work Experience Required None
Typical On-the-Job Training Moderate-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... -50 new jobs (-3.2%)
Replacement Jobs 1,140 openings
Net Job Openings 1,090 jobs
2022-2028 Percent Net Change..... 64.6%

Community College Talent Supply

Chemical Technology

- ▶ **TOP code:** 0954.00
- ▶ **Description:** Chemical processes, including heat transfer, treatment of liquid and gases, and physical-chemical operations used in industrial processes and the chemical industry.

Exhibit 135: Chemical Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College		●	
East LA College		●	●
L.A. Trade Technical College		●	●

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	100%
Median Annual Earnings for Exiting Students, 2020-21	\$23,822
Median Change in Earnings for Exiting Students, 2020-21	-9%
SWP Exiting Students Who Attained the Living Wage, 2020-21	59%



Exhibit 136: Gender, 2022-23



Exhibit 137: Race and Ethnicity, 2022-23



Exhibit 138: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, chemical technicians in Los Angeles County are expected to experience 1,090 new and replacement job openings. Job postings data reveals an average of 17 monthly job openings in 2023, while average monthly hires were 66, including new jobs and openings from attrition and job transfers. In Los Angeles County, 76 percent of employers specified an education level in their job postings, with 45 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is \$50,000.

Exhibit 139 displays the top industries (4-digit NAICS) with the most unique job posting looking to fill vacancies for this role in Los Angeles County in 2023.

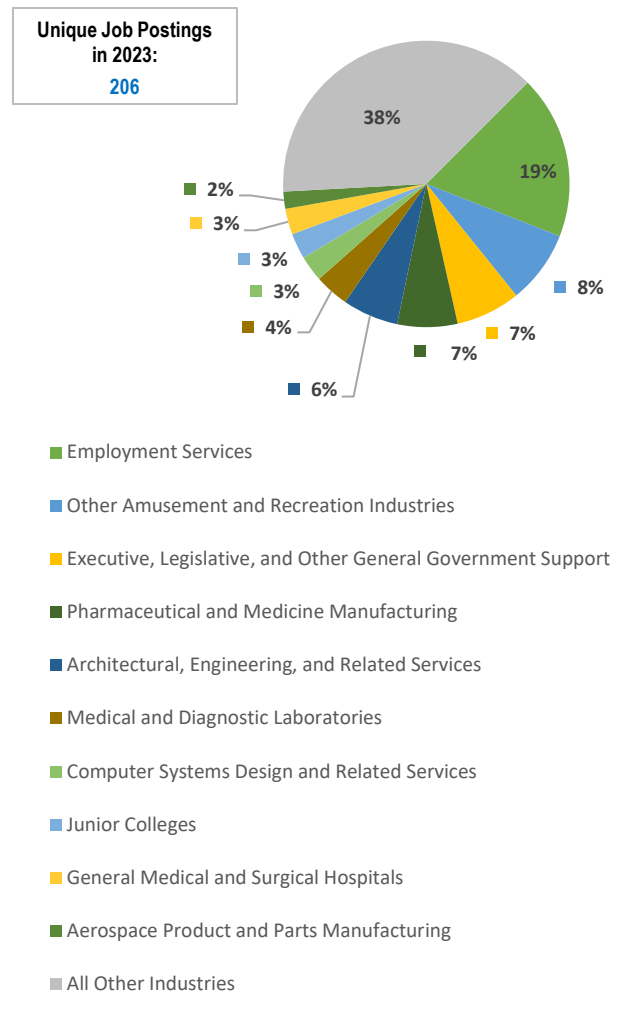
Employers in employment services, other amusement and recreation industries, executive, legislative, and other general government support, pharmaceutical and medicine manufacturing, architectural, engineering, and related services, and medical and diagnostic laboratories advertised the most opportunities.

Top Skills Requested for Chemical Technicians

The top specialized skills desired by employers include:

- ✓ Chemistry
- ✓ Good Manufacturing Practices
- ✓ Laboratory Equipment
- ✓ Laboratory Experience
- ✓ Analytical Chemistry
- ✓ Wet Chemistry
- ✓ Biology
- ✓ Merchandising
- ✓ Balancing (Ledger/Billing)
- ✓ Chromatography

Exhibit 139: Unique Job Postings by Industry
Chemical Technicians
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Chemistry Technicians
- ▶ Service Technicians
- ▶ Chemistry Laboratory Technicians
- ▶ Laboratory Technicians
- ▶ Chemical Technicians
- ▶ Gas Technicians
- ▶ Medical Laboratory Technicians
- ▶ Chemists
- ▶ Human Intelligence Collectors
- ▶ Formulators

The top common skills desired by employers include:

- ✓ Communication
- ✓ Management
- ✓ Research
- ✓ Computer Literacy
- ✓ Quality Control
- ✓ Mathematics
- ✓ Time Management
- ✓ Troubleshooting (Problem Solving)
- ✓ Detail Oriented
- ✓ Customer Service

The top software skills desired by employers include:

- ✓ Microsoft Excel/Office/Outlook/Word
- ✓ Microsoft PowerPoint
- ✓ Python (Programming Language)
- ✓ MATLAB
- ✓ SAP Applications
- ✓ Microsoft Access
- ✓ C (Programming Language)

Skills in High-Demand

- ✓ Chemistry
- ✓ Communication
- ✓ Management
- ✓ Research
- ✓ Good Manufacturing Practices
- ✓ Laboratory Equipment
- ✓ Laboratory Experience
- ✓ Computer Literacy
- ✓ Quality Control
- ✓ Mathematics

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ DOT Certification
- ✓ Registered Dietitian (RD/RDN)
- ✓ Typing Certification
- ✓ Certified Risk Adjustment Coder (CRC)
- ✓ Certified Histotechnologist (HTL-ASCP)
- ✓ Forklift Certification
- ✓ Basic Life Support (BLS) Certification
- ✓ Security Clearance

Where Jobs are Typically Posted

- ✓ indeed.com
- ✓ simplyhired.com
- ✓ dejobs.org
- ✓ careerjet.com
- ✓ recruiternetworks.com
- ✓ arkansasjobboard.com
- ✓ monster.com
- ✓ myworkdayjobs.com
- ✓ snagajob.com
- ✓ scholarshipdb.net

The chemical technicians profession was designated as 'Green Increased Demand' in O*Net's comprehensive list of green occupations [Exhibit A-60]. It was also identified in O*Net's Green Economy Sectors under Manufacturing [Exhibit A-61]. This profession is also highlighted as having a bright outlook by O*Net. This profession was included in the O*Net Green Topics related education programs under Chemical Process Technology as shown in Exhibit A-62. Chemical Technicians contribute to the California Workforce Development Board scoping plan sectors of Energy, Transportation, Industry, Waste, and Water as identified in Exhibit A-63.

Community College Talent Supply

The California Community Colleges offer certificates and/or associate degree programs in chemical technology at three of their college locations, but had enrollment at just one location, as shown in **Exhibits 135 and 140**. Chemical technology graduates are likely to earn a job related to their education, with 100 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$23,822 for SWP exiting students in 2020-21, which was a median change in earnings of -9 percent. Many SWP students were able to attain a living wage, with 59 percent hitting that mark in 2020-21.

There were 7 total enrollments in 2022-23 and a total of 1 combined associate degree and certificates awarded, as shown in **Exhibits 140 and 141**.

Exhibit 140: Student Enrollment by College, 2022-23

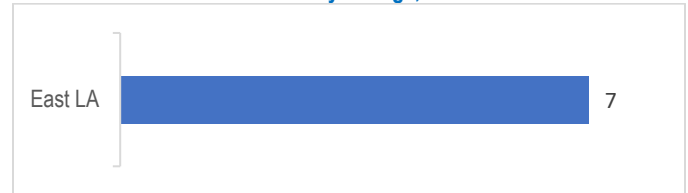
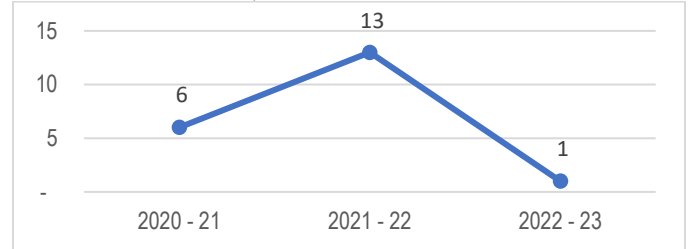


Exhibit 141: Total Awards, 2020-21 to 2022-23



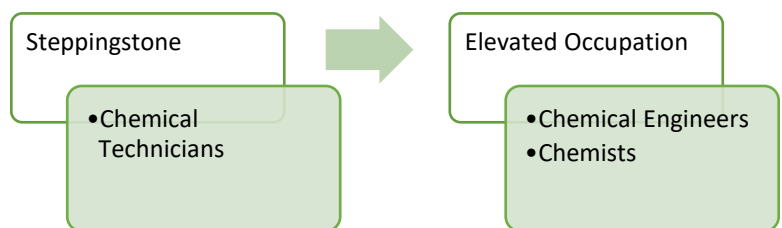
Source: [California Community Colleges LaunchBoard](#)

Chemical Technology Student Demographics

Approximately 43 percent of chemical technology students at Los Angeles community colleges are male, matching the overall student enrollment [**Exhibit 136**]. Remarkably, 100 percent identify as Hispanic, 45 percentage points higher than the general student body [**Exhibit 137**]. Notably, 86 percent are 29-year-olds or younger, compared to 70 percent in the overall student body [**Exhibit 138**]. This young population of LA students is an untapped asset for regional employers seeking to strengthen their workforce. The referenced exhibits display student demographics of the 7 students enrolled in chemical technology at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The chemical technicians occupation can provide a steppingstone to the elevated occupations of chemical engineers and chemists through additional education and work experience.



Environmental Engineering Technologists and Technicians

(SOC 17-3025)

Environmental engineering technologists and technicians are considered a green occupation because they support systems that reduce pollution and promote sustainability. To further integrate into the green sector, they can specialize in renewable energy, sustainable waste management, and advanced environmental monitoring. Community colleges in Los Angeles County offer programs like the **Environmental Technology and Sciences Certificates** and **Environmental Horticulture Certificate**, equipping them to enhance their role in environmental protection.

Community College Talent Supply

Environmental Technology

- ▶ **TOP code:** 0303.00
- ▶ **Description:** Environmental management, monitoring, assessment, and restoration, including environmental pollution control systems and the management of hazardous materials and hazardous waste, and related government regulations.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	88%
Median Annual Earnings for Exiting Students, 2020-21	\$45,376
Median Change in Earnings for Exiting Students, 2020-21	17%
SWP Exiting Students Who Attained the Living Wage, 2020-21	58%

Occupational Overview

Employment in Industry 2022:..... 239 workers
Percent of Jobs Identified as Middle-Skill:..... 50.1%
Median Hourly Wages:..... \$36.36 per hour
Typical Entry-Level Education:..... Associate degree
Work Experience Required None
Typical On-the-Job Training None

Occupational Projections 2022 to 2028

Newly Created Jobs..... -70 new jobs (-31.0%)
Replacement Jobs 90 openings
Net Job Openings 20 jobs
2022-2028 Percent Net Change..... 8.4%

Exhibit 142: Environmental Technology Programs in Los Angeles County

Community College	Nondegree Award	Certificate	Associate Degree
Mt. San Antonio College		●	
Rio Hondo College		●	●
Santa Monica College	●	●	●

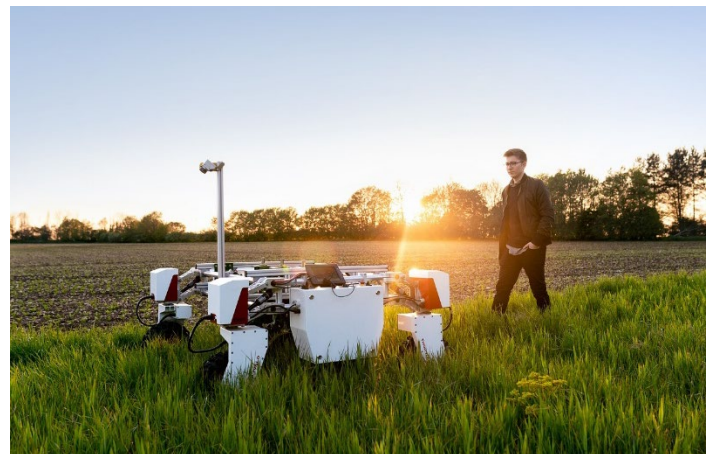


Exhibit 143: Gender, 2022-23

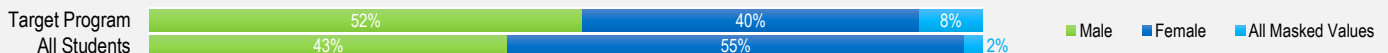
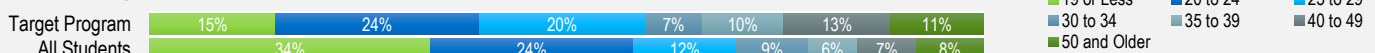


Exhibit 144: Race and Ethnicity, 2022-23



Exhibit 145: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, environmental engineering technologists and technicians in Los Angeles County are expected to experience 20 new and replacement job openings. Job postings data reveal an average of one monthly job opening in 2023, while average monthly hires were seven, including new jobs and openings from attrition and job transfers. In Los Angeles County, 80 percent of employers specified an education level in their job postings, with 70 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is not available.

Exhibit 146 displays the top industries (4-digit NAICS) with the most unique job postings looking to fill vacancies for this role in Los Angeles County in 2023.

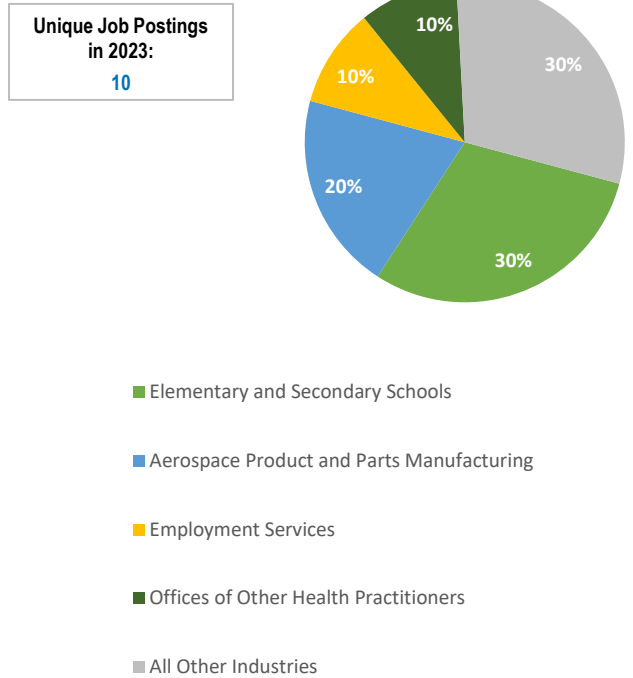
Employers in elementary and secondary schools, aerospace product and parts manufacturing, employment services, and offices of other health practitioners advertised the most opportunities.

Top Skills Requested for Environmental Engineering Technologists and Technicians

The top specialized skills desired by employers include:

- ✓ Environmental Engineering
- ✓ Student Information Systems
- ✓ Data Science
- ✓ Aquatic Ecology
- ✓ Algorithm Design
- ✓ Computer Science
- ✓ Computer Programming
- ✓ Data Processing
- ✓ Remote Sensing
- ✓ Technical Training

Exhibit 146: Unique Job Postings by Industry
Environmental Engineering Technologists and Technicians
 Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Assessment Technicians
- ▶ Technology Technicians
- ▶ Environmental Engineering Technicians
- ▶ Environmental Services Associates
- ▶ Assessment Specialists
- ▶ Test Specialists
- ▶ Computer Systems Technologists

The top common skills desired by employers include:

- ✓ Research
- ✓ Troubleshooting (Problem Solving)
- ✓ Writing
- ✓ Good Driving Record
- ✓ Detail Oriented
- ✓ Resilience
- ✓ Administrative Functions
- ✓ Clerical Works
- ✓ Communication
- ✓ Information Technology

The top software skills desired by employers include:

- ✓ Student Information Systems
- ✓ Git (Version Control System)
- ✓ R (Programming Language)
- ✓ Python (Programming Language)
- ✓ MATLAB
- ✓ Microsoft Office
- ✓ Version Control Software
- ✓ Apache Subversion
- ✓ System Software
- ✓ Apache Spark

Skills in High-Demand

- ✓ Environmental Engineering
- ✓ Student Information Systems
- ✓ Data Science
- ✓ Research
- ✓ Troubleshooting (Problem Solving)
- ✓ Writing
- ✓ Student Information Systems
- ✓ Aquatic Ecology
- ✓ Algorithm Design
- ✓ Good Driving Record

Other Requested Qualifications

- ✓ Valid Driver's License
- ✓ 10-Hour OSHA General Industry Card

Where Jobs are Typically Posted

- ✓ dejobs.org
- ✓ edjoin.org
- ✓ indeed.com
- ✓ myworkdayjobs.com
- ✓ simplyhired.com
- ✓ conbio.org
- ✓ craigslist.org
- ✓ losangelesrecruiter.com
- ✓ mykelly.com
- ✓ oxnardrecruiter.com

The environmental engineering technologists and technicians profession was designated as 'Green Enhanced Skills' in O*Net's comprehensive list of green occupations [**Exhibit A-64**]. It was also identified in O*Net's Green Economy Sectors under Environmental Protection and several Green Topics as shown in **Exhibit A-65**. This profession was included in the O*Net Green Topics related education programs under Water Quality and Wastewater Treatment Management, Environmental/ Environmental Engineering Technology/ Technician, Hazardous Materials Management and Waste Technology/ Technician, Hazardous Materials Information Systems Technology/ Technician, and Environmental Toxicology as shown in **Exhibit A-66**. Environmental Engineering Technologists and Technicians contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Industry, Waste, and Water as identified in **Exhibit A-67**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in environmental technology at three of their college locations, but had enrollment at four locations as shown in **Exhibits 142 and 147**. Environmental technology graduates are highly likely to earn a job related to their education, with 88 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings for was \$45,376 for SWP exiting students in 2020-21, which was a median change in earnings of 17 percent. Many SWP students were able to attain a living wage, with 58 percent hitting that mark in 2020-21.

There were 285 total enrollments in 2022-23 and a total of 41 combined associate degrees and certificates awarded, as shown in **Exhibits 147 and 148**.

Exhibit 147: Student Enrollment by College, 2022-23

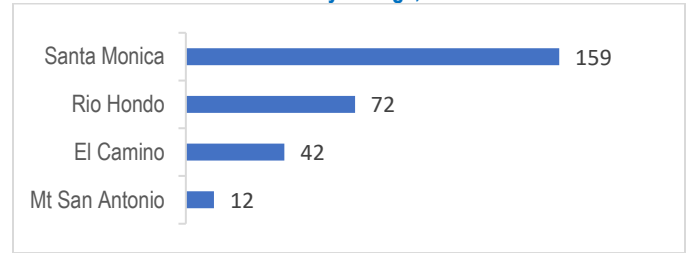
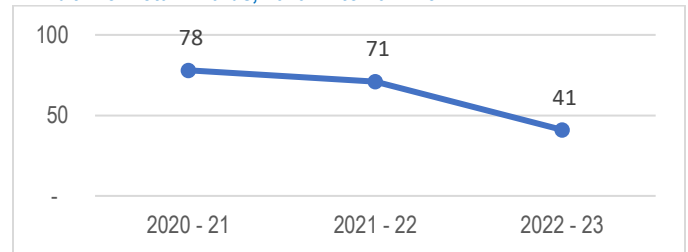


Exhibit 148: Total Awards, 2020-21 to 2022-23



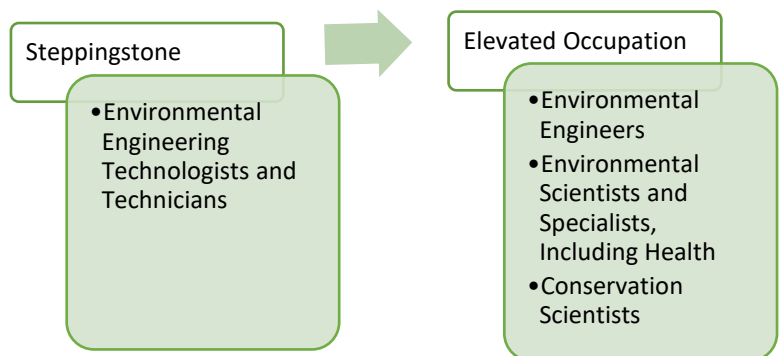
Source: [California Community Colleges LaunchBoard](#)

Environmental Technology Student Demographics

A little more than 50 percent of environmental technology students at Los Angeles community colleges are male, just 9 percentage points higher than the overall student enrollment [**Exhibit 143**]. Nearly two-thirds identify as Hispanic, 9 percentage points higher than the general student population [**Exhibit 144**]. Only 59 percent are 29-year-olds or younger, compared to 70 percent in the overall student body, with the most significant age difference being in the 19 or less category [**Exhibit 145**]. The referenced exhibits display student demographics of the 285 students enrolled in environmental technology at LA community colleges during the 2022-23 academic year.

Occupational Pathways

The environmental engineering technologists and technicians occupations can provide a steppingstone to the elevated occupations of environmental engineers, environmental scientists and specialist, including health, and conservation scientists through additional education and work experience.



Wind Turbine Service Technicians

(SOC 49-9081)

Wind turbine service technicians are considered a green occupation because they maintain and repair wind turbines, crucial for generating clean, renewable energy. To further integrate into the green sector, they can specialize in advanced turbine technologies and sustainable maintenance practices. Community colleges in Los Angeles County offer programs like the **Alternative Energy Certificate** and **Renewable Energy Certificate**, equipping them to enhance their role in the renewable energy sector.

Occupational Overview

Employment in Industry 2022:..... 207 workers
Percent of Jobs Identified as Middle-Skill:..... 36.8%
Median Hourly Wages:..... \$29.83 per hour
Typical Entry-Level Education:..... Postsecondary nondegree award
Work Experience Required None
Typical On-the-Job Training Long-term

Occupational Projections 2022 to 2028

Newly Created Jobs..... 0 new jobs (-1.2%)
Replacement Jobs 110 openings
Net Job Openings 110 jobs
2022-2028 Percent Net Change..... 53.3%

Community College Talent Supply

Energy Systems Technology

- ▶ **TOP code:** 0946.10
- ▶ **Description:** Theory and methods of energy conservation applied to heating, cooling, and related systems, including the measurement and assessment of energy consumption, diagnosis and prescription. Includes alternative energy systems.

Strong Workforce Program (SWP) Statistics:

Students with a Job Closely Related to Their Field of Study, 2019-20	35%
Median Annual Earnings for Exiting Students, 2020-21	\$38,244
Median Change in Earnings for Exiting Students, 2020-21	43%
SWP Exiting Students Who Attained the Living Wage, 2020-21	51%

Exhibit 149: Energy Systems Technology Programs in LA County

Community College	Nondegree Award	Certificate	Associate Degree
Cerritos College	●		
L.A. Southwest College	●		
L.A. Trade Technical College		●	●
Mt. San Antonio College	●	●	●
Pasadena City College		●	●
Rio Hondo College		●	●
Santa Monica College			●



Exhibit 150: Gender, 2022-23



Exhibit 151: Race and Ethnicity, 2022-23

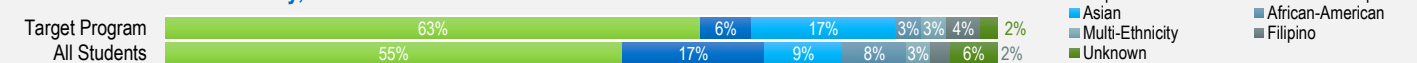
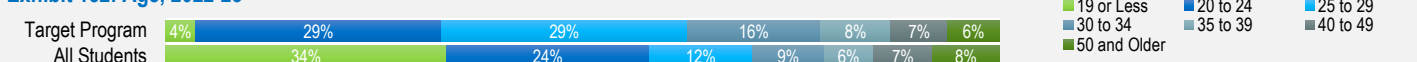


Exhibit 152: Age, 2022-23



Source: California Community Colleges LaunchBoard. *Not pictured: Pacific Islander and American Indian/Alaska Native, all less than 1%

Unique Job Postings

Between 2022 and 2028, wind turbine service technicians in Los Angeles County are expected to experience 110 new and replacement job openings. Job postings data reveals an average of just one monthly job opening in 2023, while average monthly hires were eight, including new jobs and openings from attrition and job transfers. In Los Angeles County, 78 percent of employers specified an education level in their job postings, with 56 percent of those requesting an associate degree or less. The median advertised annual salary for these positions is not available.

Exhibit 153 displays the top industries (4-digit NAICS) with the most unique job posting looking to fill vacancies for this role in Los Angeles County in 2023.

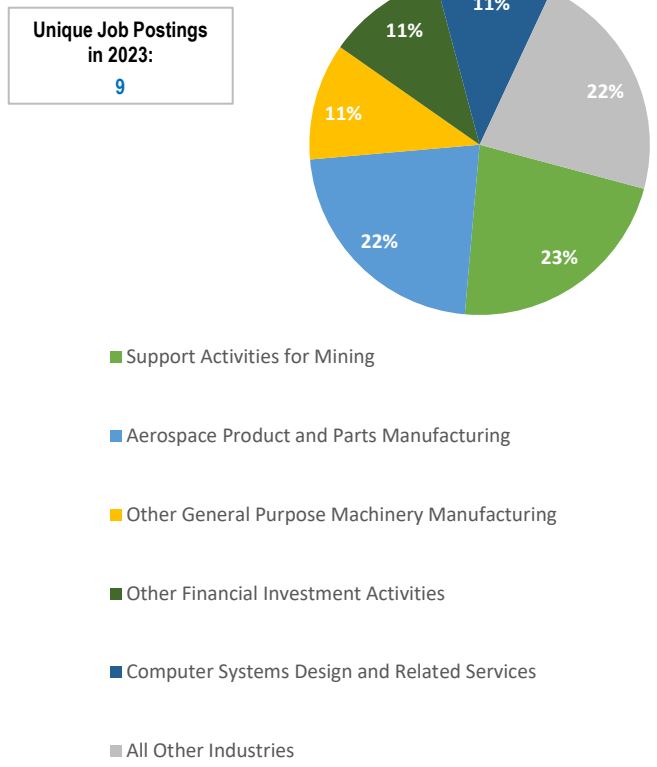
Employers in support activities for mining, aerospace product and parts manufacturing, other general purpose machinery manufacturing, other financial investment activities, and computer systems design and related services advertised the most opportunities.

Top Skills Requested for Wind Turbine Service Technicians

The top specialized skills desired by employers include:

- ✓ Product Inspection
- ✓ Calipers
- ✓ Assembly Drawing
- ✓ Application Programming Interface (API)
- ✓ Calibration
- ✓ Computer Networks
- ✓ Engineering Drawings
- ✓ Filament Winding
- ✓ Final Assembly Schedule
- ✓ Machinery

Exhibit 153: Unique Job Postings by Industry
Wind Turbine Service Technicians
Los Angeles County in 2023



REPORTED JOB TITLES

- ▶ Vending Technicians
- ▶ Wind Turbine Blade Composite Technicians
- ▶ Wind Turbine Technicians
- ▶ Turbine Mechanics

The top common skills desired by employers include:

- ✓ Management
- ✓ Lifting Ability
- ✓ Operations
- ✓ Troubleshooting (Problem Solving)
- ✓ Proactivity
- ✓ Coordinating
- ✓ Research
- ✓ Teamwork

The top software skills desired by employers include:

- ✓ Application Programming Interface (API)
- ✓ Software Systems
- ✓ Dashboard
- ✓ Disassembler
- ✓ Python (Programming Language)
- ✓ Power BI
- ✓ Apache Spark

Skills in High-Demand

- ✓ Management
- ✓ Lifting Ability
- ✓ Operations
- ✓ Troubleshooting (Problem Solving)
- ✓ Application Programming Interface (API)
- ✓ Software Systems
- ✓ Product Inspection
- ✓ Calipers
- ✓ Assembly Drawing
- ✓ Calibration

Other Requested Qualifications

- ✓ Valid Driver's License

Where Jobs are Typically Posted

- ✓ dice.com
- ✓ greenhouse.io
- ✓ jobsinanaheim.com
- ✓ recruiternetworks.com
- ✓ careercast.com
- ✓ careerjet.com
- ✓ energyjobline.com
- ✓ indeed.com
- ✓ jobsinpaterson.com
- ✓ jsfirm.com

The wind turbine service technicians profession was designated as 'Green New and Emerging' in O*Net's comprehensive list of green occupations [**Exhibit A-68**]. This occupation was not identified in an O*Net Green Economy Sector, but it was included in O*Net's Green Topics as shown in **Exhibit A-69**. This profession is highlighted as having a bright outlook. Wind Turbine Service Technicians contribute to the California Workforce Development Board Report scoping plan sectors of Energy, Transportation, Water, and Energy as identified in **Exhibit A-70**.

Community College Talent Supply

The California Community Colleges offer nondegree awards, certificates and/or associate degree programs in energy systems technology at seven of their college locations, but had enrollment at just five locations as shown in **Exhibits 149 and 154**. Energy systems technology graduates are likely to earn a job related to their education, with 35 percent of Strong Workforce Program (SWP) students obtaining a job closely related to their field of study in 2019-20. The median annual earnings was \$38,244 for SWP exiting students in 2020-21, which was a median change in earnings of 43 percent. Many SWP students were able to attain a living wage, with 51 percent hitting that mark in 2020-21.

There were 235 total enrollments in 2022-23 and a total of 33 combined associate degrees and certificates awarded, as shown in **Exhibits 154 and 155**.

Exhibit 154: Student Enrollment by College, 2022-23

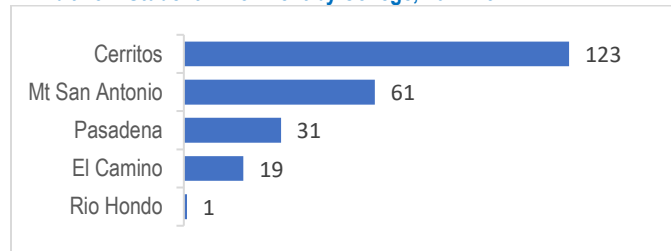
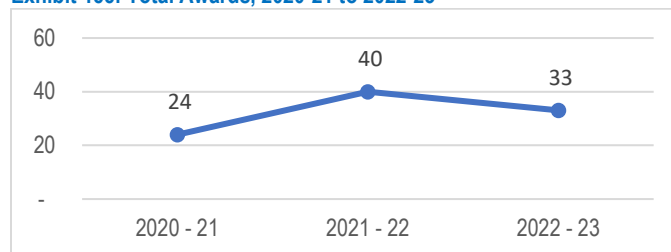


Exhibit 155: Total Awards, 2020-21 to 2022-23



Source: [California Community Colleges LaunchBoard](#)

Energy Systems Technology Student Demographics

Approximately 94 percent energy systems technology students at the LA community colleges are male, 51 percentage points higher than the overall student enrollment [**Exhibit 150**]. Additionally, 63 percent identify as Hispanic, 8 percentage points higher than the general student population [**Exhibit 151**]. Only 62 percent are 29-year-olds or younger, compared to 70 percent in the overall student body, with the most significant difference being in the 19 or less category [**Exhibit 152**]. The referenced exhibits display student demographics of the 235 students enrolled in energy systems technology at LA community colleges during the 2022-23 academic year.

Industries for Engagement

In addition to the occupational and supply-side analysis outlined above, we identified local target industries with the most growth potential for green middle-skill occupations across a five-year period, to assist with identifying industries for community college outreach and engagement for green jobs.

Engaging key industries is critical for the successful development and deployment of a green workforce in Los Angeles County. These industries not only drive economic growth but also play a pivotal role in achieving the region's sustainability goals. The following industries have been identified as priority areas for engagement due to their significant contributions to the green economy and their potential for job creation in middle-skill occupations:

Renewable Energy and Energy Efficiency

- **Overview:** This sector includes solar, wind, and other renewable energy sources, as well as energy efficiency improvements in buildings and infrastructure. It is a primary driver of job creation in green occupations.
- **Opportunities for Engagement:** Partnerships with industry leaders, utility companies, and government agencies can facilitate workforce training programs, internships, and apprenticeships. Collaborations can focus on skills development in installation, maintenance, and energy management systems.

Clean Transportation

- **Overview:** The clean transportation sector encompasses electric vehicles (EVs), public transit, and infrastructure for alternative fuels. This industry is expanding rapidly due to policies promoting EV adoption and sustainable transit solutions.
- **Opportunities for Engagement:** Engaging automakers, transit authorities, and technology companies can lead to specialized training programs for EV technicians, infrastructure maintenance workers, and public transit operators. Emphasis on developing skills in EV technology, battery maintenance, and sustainable transit planning is crucial.

Green Construction and Sustainable Urban Planning

- **Overview:** This industry includes green building practices, sustainable urban development, and the incorporation of energy-efficient technologies in construction projects. It contributes significantly to reducing the carbon footprint of the built environment.
- **Opportunities for Engagement:** Collaboration with construction firms, architectural firms, and urban planners can support the development of curricula in sustainable building practices, LEED certification training, and green infrastructure design. Programs should focus on training for construction managers, building inspectors, and urban planners with an emphasis on sustainability.

Waste Management and Recycling

- **Overview:** The waste management and recycling industry is integral to the circular economy, focusing on reducing waste, promoting recycling, and managing hazardous materials. It supports environmental conservation and resource efficiency.
- **Opportunities for Engagement:** Partnering with waste management companies, recycling facilities, and environmental organizations can help develop specialized training programs for waste management professionals, recycling coordinators, and hazardous materials handlers. Emphasis should be placed on best practices in waste reduction, recycling technologies, and regulatory compliance.

Water and Environmental Management

- **Overview:** This sector includes water conservation, wastewater treatment, and environmental protection services. It is essential for sustainable water resource management and environmental stewardship.
- **Opportunities for Engagement:** Engaging with water utilities, environmental agencies, and conservation organizations can facilitate training in water treatment, environmental monitoring, and sustainable water use practices. Programs can prepare workers for roles as water treatment operators, environmental technicians, and conservation specialists.

Agriculture and Sustainable Food Systems

- **Overview:** Sustainable agriculture practices and local food systems are vital for reducing the environmental impact of food production and distribution. This industry supports biodiversity, soil health, and sustainable land use.
- **Opportunities for Engagement:** Collaboration with agricultural organizations, food producers, and local food initiatives can support training in sustainable farming practices, organic food production, and supply chain management. Training programs should focus on developing skills for sustainable agriculture technicians, organic farmers, and food systems coordinators.

Strategic Collaboration and Workforce Development

To capitalize on the opportunities within these industries, strategic collaboration between educational institutions, industry stakeholders, and government agencies is essential. Developing targeted training programs, aligning curricula with industry needs, and providing pathways for career advancement are key to building a robust green workforce. By focusing on these priority industries, Los Angeles County can foster economic growth, enhance environmental sustainability, and create high-quality jobs for its residents.

Key Findings and Recommendations

The analysis of Los Angeles County's green economy reveals critical insights and actionable strategies for fostering a robust and skilled green workforce. The following key findings and recommendations are derived from an in-depth examination of industry trends, workforce needs, and educational pathways.

Key Findings

- ❖ **Significant Growth in Green Industries:** Sectors such as renewable energy, clean transportation, green construction, and waste management are experiencing rapid growth. This expansion is driven by both public policy initiatives and market demand for sustainable practices.
- ❖ **Demand for Middle-Skill Occupations:** There is a high demand for middle-skill occupations—those requiring more than a high school diploma but less than a four-year degree. These roles are essential for implementing green technologies and practices across industries.
- ❖ **Technological Advancements:** Innovations in renewable energy, electric vehicles, energy-efficient construction, and water management are transforming the economic landscape. Workers skilled in these technologies are crucial for maintaining industry competitiveness and meeting sustainability goals.
- ❖ **Educational Gaps and Workforce Development Challenges:** While community colleges and vocational training programs offer relevant courses, there is a need for more targeted and up-to-date curricula that align with industry needs. Additionally, funding constraints and limited awareness of green career opportunities pose challenges to workforce development.
- ❖ **Collaboration Between Stakeholders:** Effective collaboration between educational institutions, industry stakeholders, and government agencies is necessary to address workforce gaps and ensure that training programs meet the evolving demands of the green economy.

Recommendations

- ❖ **Enhance Educational Programs and Curriculum Development:** Community colleges and vocational institutions should update and expand their curricula to include the latest green technologies and practices. Programs should focus on skills such as renewable energy installation, energy efficiency, sustainable construction, and environmental management.
- ❖ **Increase Funding and Support for Green Workforce Development:** Local and state governments should allocate additional funding to support green job training programs, including scholarships, apprenticeships, and internships. This investment will help bridge the gap between educational offerings and industry needs.
- ❖ **Promote Awareness of Green Career Pathways:** There is a need for greater outreach and education about green career opportunities. Initiatives should target students, job seekers, and transitioning workers, highlighting the benefits and opportunities within the green economy.
- ❖ **Strengthen Industry-Education Partnerships:** Building stronger partnerships between educational institutions and industry can enhance curriculum relevance and provide students with real-world experience. This collaboration can include guest lectures, site visits, internships, and joint research initiatives.
- ❖ **Support Equity and Inclusion in the Green Workforce:** Efforts should be made to ensure that green job opportunities are accessible to all communities, including underserved and minority populations. Programs should focus on removing barriers to entry, such as financial constraints, and provide support services like career counseling and mentorship.
- ❖ **Develop a Regional Green Workforce Strategy:** A comprehensive regional strategy should be developed to coordinate efforts across different sectors and stakeholders. This strategy should outline specific goals, actions, and metrics for building a skilled green workforce in Los Angeles County.

By implementing these recommendations, Los Angeles County can position itself as a leader in the green economy, driving sustainable economic growth, enhancing environmental quality, and improving the quality of life for its residents. The coordinated efforts of educational institutions, industry leaders, and government agencies will be crucial in achieving these objectives and building a resilient, future-ready workforce.

Appendix

Exhibit A-1

Target Climate-Ready Occupations

SOC Code	Description	2022 Jobs	2022 Median Hourly Earnings	2028 Jobs	2022-2028 Forecasted Growth	2022-2028 Change in Jobs	2022-2028 Replacement Jobs	2022-2028 Job Openings	2022-2028 Percent Net Change in Jobs	Percent of 2022 Jobs in Green Sectors
<i>Typical Entry Level Education: High School Diploma or Equivalent</i>										
47-2111	Electricians	15,185	\$33.03	15,820	4.2%	630	7,990	8,620	56.8%	60.1%
47-2152	Plumbers, Pipefitters, and Steamfitters	10,368	\$27.42	11,320	9.1%	950	5,590	6,540	63.1%	10.5%
51-4121	Welders, Cutters, Solderers, and Brazers	6,921	\$23.27	6,470	-6.6%	-450	3,820	3,370	48.7%	8.6%
47-4011	Construction and Building Inspectors	3,216	\$39.49	3,390	5.3%	170	2,250	2,420	75.2%	6.0%
47-4041	Hazardous Materials Removal Workers	1,671	\$23.90	1,930	15.2%	250	1,170	1,420	85.0%	77.1%
51-8031	Water and Wastewater Treatment Plant and System Operators	1,652	\$38.55	1,560	-5.6%	-90	870	780	47.2%	10.8%
<i>Typical Entry Level Education: Associate Degree / Postsecondary Nondegree Award / Some college, no degree</i>										
49-3023	Automotive Service Technicians and Mechanics	17,020	\$25.61	16,680	-2.0%	-350	8,390	8,040	47.2%	28.9%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	7,449	\$27.32	7,310	-1.9%	-140	3,560	3,420	45.9%	3.1%
17-3023	Electrical and Electronic Engineering Technologists and Technicians	2,895	\$32.74	2,720	-6.2%	-180	1,600	1,420	49.0%	6.7%
17-3011	Architectural and Civil Drafters	2,972	\$29.27	3,160	6.2%	180	1,720	1,900	63.9%	7.3%
19-4042	Environmental Science and Protection Technicians, Including Health	1,246	\$25.45	1,300	4.0%	50	760	810	65.0%	4.9%
17-3022	Civil Engineering Technologists and Technicians	1,209	\$37.90	1,250	2.8%	30	660	690	57.1%	3.7%
17-3027	Mechanical Engineering Technologists and Technicians	928	\$33.72	900	-3.1%	-30	490	460	49.6%	2.3%
17-3026	Industrial Engineering Technologists and Technicians	743	\$36.19	890	18.8%	140	460	600	80.7%	2.4%

Exhibit A-1

Target Climate-Ready Occupations

SOC Code	Description	2022 Jobs	2022 Median Hourly Earnings	2028 Jobs	2022-2028 Forecasted Growth	2022-2028 Change in Jobs	2022-2028 Replacement Jobs	2022-2028 Job Openings	2022-2028 Percent Net Change in Jobs	Percent of 2022 Jobs in Green Sectors
<i>Typical Entry Level Education: Bachelor's Degree</i>										
11-9021	Construction Managers	14,980	\$41.54	16,230	8.3%	1,250	6,570	7,820	52.2%	28.1%
13-1041	Compliance Officers	12,765	\$38.03	13,750	7.7%	980	6,100	7,080	55.5%	3.8%
13-1081	Logisticians	6,954	\$38.30	8,410	20.9%	1,450	3,720	5,170	74.3%	4.3%
19-4021	Biological Technicians	1,184	\$28.55	1,430	20.8%	250	990	1,240	104.8%	0.8%
<i>Emerging Occupations</i>										
<i>Typical Entry Level Education: Associate Degree / Postsecondary Nondegree Award / Some college, no degree</i>										
17-3025	Environmental Engineering Technologists and Technicians	239	\$36.36	170	-31.0%	-70	90	20	8.4%	14.1%
49-9081	Wind Turbine Service Technicians	207	\$29.83	210	-1.2%	0	110	110	53.3%	24.5%
19-4031	Chemical Technicians	1,688	\$23.31	1,640	-3.2%	-50	1,140	1,090	64.6%	6.7%

Note: The '2022-2028 Percent Net Change in Jobs' is calculated as the total job openings from 2022 to 2028 expressed as a percentage of the total jobs in 2022. Total job openings include the '2022-2028 Change in Jobs' (growth or decline in total employment) and the '2022-2028 Replacement Jobs' (positions needing to be filled due to retirements or worker turnover). The formula is: $[(2022-2028 \text{ Change in Jobs} + 2022-2028 \text{ Replacement Jobs}) \div 2022 \text{ Jobs}] \times 100$.

Detailed Occupation Tables

Electricians (SOC 47-2111)

Exhibit A-2: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
47-2111.00	Electricians	Green Increased Demand

Sources: O*NET Resource Center. Green Occupations

Exhibit A-3: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
47-2111.01	Electricians	Green Construction	Solar	3	Yes

Sources: O*NET Resource Center. Green Topics Occupations

Exhibit A-4: California Workforce Development Board Report Scoping Plan Details 47-2111 Electricians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Public Transit	Transit and Ground Passenger Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Oil and Gas Extraction

Exhibit A-4: California Workforce Development Board Report Scoping Plan Details
47-2111 Electricians

Scoping Plan Sector	Subsector	Industry by NAICS
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Plumbers, Pipefitters, and Steamfitters (SOC 47-2152)

Exhibit A-5: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
47-2152.01	Pipe Fitters and Steamfitters	Green Enhanced Skills
47-2152.02	Plumbers	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-6: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
47-2152.00	Plumbers, Pipe Fitters and Steamfitters	Green Construction	Geothermal; Green Construction; Water Resources	3	No
47-2152.04	Solar Thermal Installers and Technicians	N/A	Biodegradable; Clean Energy; Energy; Energy Efficiency; Energy Engineering; Energy Trading; Renewable Energy; Solar; Water Resources	3	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-7: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
46.0599	2	Plumbing and Related Water Supply Services, Other	N/A	N/A

Sources: O*NET Resource Center. Green Topics Education Programs

**Exhibit A-8: California Workforce Development Board Report Scoping Plan Details
47-2152 Plumbers, Pipefitters, and Steamfitters**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation
Transportation	Public Transit	Transit and Ground Passenger Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Welders, Cutters, Solderers, and Brazers (SOC 51-4121)

Exhibit A-9: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
51-4121.06	Welders, Cutters, and Welder Fitters	Green Increased Demand
51-4121.07	Solderers and Brazers	Green Increased Demand

Sources: O*NET Resource Center. Green Occupations

Exhibit A-10: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
51-4121.06	Welders, Cutters, and Welder Fitters	Sector IV: Green Construction; Sector X: Manufacturing	N/A	2	No
51-4121.07	Solderers and Brazers	Sector IV: Green Construction; Sector X: Manufacturing	N/A	2	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-11: California Workforce Development Board Report Scoping Plan Details

51-4121 Welders, Cutters, Solderers, and Brazers

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation
Transportation	Public Transit	Transit and Ground Passenger Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction

**Exhibit A-11: California Workforce Development Board Report Scoping Plan Details
51-4121 Welders, Cutters, Solderers, and Brazers**

Scoping Plan Sector	Subsector	Industry by NAICS
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Construction and Building Inspectors (SOC 47-4011)

Exhibit A-12: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
47-4011.00	Construction Building Inspectors	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-13: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
47-4011.00	Construction Building Inspectors	Green Construction	Green Construction; Infrastructure; Regulation Enforcement	3	No
47-4011.01	Energy Auditors	Green Construction	Clean Energy; Conservation; Energy; Energy Efficiency; Energy Engineering; Energy Trading; Renewable Energy; Weatherization	3	No

Sources: O*NET Resource Center. Green Economy Occupations

**Exhibit A-14: California Workforce Development Board Report Scoping Plan Details
47-4011 Construction and Building Inspectors**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction

Exhibit A-14: California Workforce Development Board Report Scoping Plan Details
47-4011 Construction and Building Inspectors

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services

Hazardous Materials Removal Workers (SOC 47-4041)

Exhibit A-15: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
47-4041.00	Hazardous Materials Removal Workers	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-16: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
47-4041.00	Hazardous Materials Removal Workers	Green Construction; Environment Protection; Recycling and Waste Reduction; Governmental and Regulatory Administration	Disaster Risk Management; Recycling; Solid Waste Management, Treatment, and Reduction; Waste Reduction; Wastewater Management, Treatment, and Reduction	3	No

Sources: O*NET Resource Center. Green Economy Occupations

**Exhibit A-17: California Workforce Development Board Report Scoping Plan Details
47-4041 Hazardous Materials Removal Workers**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Transportation	Trucking	Truck Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services

Water and Wastewater Treatment Plant and System Operators (SOC 51-8031)

Exhibit A-18: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sector	O*Net Green Topics	Job Zone	Bright Outlook
51-8031.00	Water and Wastewater Treatment Plant and system Operators	N/A	Solid Waste Management, Treatment, and Reduction; Waste Reduction; Wastewater Management, Treatment, and Reduction; Water Resources	3	No

Sources: O*NET Resource Center. Green Economy Occupations

**Exhibit A-19: California Workforce Development Board Report Scoping Plan Details
51-8031 Water and Wastewater Treatment Plant and System Operators**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution

**Exhibit A-19: California Workforce Development Board Report Scoping Plan Details
51-8031 Water and Wastewater Treatment Plant and System Operators**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Transportation	Trucking	Truck Transportation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services

Automotive Service Technicians and Mechanics (SOC 49-3023)

Exhibit A-20: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
49-3023.02	Automotive Specialty Technicians	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-21: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
49-3023.02	Automotive Specialty Technicians	Transportation	N/A	3	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-22: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
47.0614	1	Alternative Fuel Vehicle Technology/Technician	0948.40	Alternative Fuels and Advanced Transportation Technology

Sources: O*NET Resource Center. Green Topics Education Programs

**Exhibit A-23: California Workforce Development Board Report Scoping Plan Details
49-3023 Automotive Service Technicians and Mechanics**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation
Transportation	Public Transit	Transit and Ground Passenger Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Heating, Air Conditioning, and Refrigeration Mechanics and Installers (SOC 49-9021)

Exhibit A-24: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
49-9021.01	Heating and Air Conditioning Mechanics and Installers	Green Enhanced Skills
49-9021.02	Refrigeration Mechanics and Installers	Green Increased Demand

Sources: O*NET Resource Center. Green Occupations

Exhibit A-25: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
49-9021.00	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Energy Efficiency; Green Construction	Air Quality; Clean Energy; Energy; Energy Efficiency; Energy Engineering; Energy Trading	3	Yes

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-26: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
47.0201	1	Heating, Air Conditioning, Ventilation and Refrigeration	0946.00	Environmental Control Technology

Sources: O*NET Resource Center. Green Topics Education Programs

**Exhibit A-27: California Workforce Development Board Report Scoping Plan Details
49-9021 Heating, Air Conditioning, and Refrigeration Mechanics and Installers**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation
Transportation	Public Transit	Transit and Ground Passenger Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction

Exhibit A-27: California Workforce Development Board Report Scoping Plan Details
49-9021 Heating, Air Conditioning, and Refrigeration Mechanics and Installers

Scoping Plan Sector	Subsector	Industry by NAICS
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Electrical and Electronic Engineering Technologists and Technicians (SOC 17-3023)

Exhibit A-28: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
17-3023.01	Electronics Engineering Technicians	Green Increased Demand
17-3023.03	Electrical Engineering Technicians	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-29: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
17-3023.00	Electrical and Electronic Engineering Technologists and Technicians	Manufacturing	Energy Engineering; Solar	3	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-30: California Workforce Development Board Report Scoping Plan Details
17-3023 Electrical and Electronic Engineering Technologists and Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction

**Exhibit A-30: California Workforce Development Board Report Scoping Plan Details
17-3023 Electrical and Electronic Engineering Technologists and Technicians**

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Natural and Working Lands	Wetlands Restoration, Urban Greening, etc.	Various

Architectural and Civil Drafters (SOC 17-3011)

Exhibit A-31: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
17-3011.01	Architectural Drafters	Green Increased Demand

Sources: O*NET Resource Center. Green Occupations

Exhibit A-32: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
17-3011.00	Architectural and Civil Drafters	Green Construction	Earth Science; Landscape Architecture	3	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-33: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
4.0901	3	Architectural Technology / Technician	0201.00	Architecture and Architectural Technology
4.0999	2	Architectural Sciences and Technology, Other	N/A	N/A
15.0101	10	Architectural Engineering Technologies / Technicians	0201.00	Architecture and Architectural Technology
15.1304	1	Civil Drafting and Civil Engineering CAD/CADD	0953.20	Civil Drafting

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-34: California Workforce Development Board Report Scoping Plan Details

17-3011

Architectural and Civil Drafters

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction

Environmental Science and Protection Technicians, Including Health (SOC 19-4042)

Exhibit A-35: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
19-4042.00	Environmental Science and Protection Technicians, Including Health	N/A	Air Quality; Atmospheric Science; Conservation; Earth Science; Ecology; Energy; Energy Efficiency; Energy Trading; Environment; Environmental Health and Safety (EHS); Environmental Impact; Environmental Protection; Environmental Remediation; Environmental Science; Green Solutions; Health and Safety; Natural Pesticides; Naturalist; Pollution Prevention; Public Health; Recycling; Solid Waste Management, Treatment, and Reduction; Waste Reduction; Wastewater Management, Treatment, and Reduction; Water Resources	4	Yes

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-36: California Workforce Development Board Report Scoping Plan Details 19-4042 Environmental Science and Protection Technicians, Including Health

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Civil Engineering Technologists and Technicians (SOC 17-3022)

Exhibit A-37: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
46.0415	3	Building Construction Technology / Technician	0952.00	Construction Crafts Technology

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-38: California Workforce Development Board Report Scoping Plan Details 17-3022 Civil Engineering Technologists and Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction

Mechanical Engineering Technologists and Technicians (SOC 17-3027)

Exhibit A-39: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
17-3027.01	Automotive Engineering Technicians	Green New and Emerging

Sources: O*NET Resource Center. Green Occupations

Exhibit A-40: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sector	O*Net Green Topics	Job Zone	Bright Outlook
17-3027.00	Mechanical Engineering Technologists and Technicians	N/A	Energy Engineering	3	No
17-3027.01	Automotive Engineering Technicians	N/A	Energy Engineering; Transportation	3	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-41: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
15.1103	5	Hydraulics and Fluid Power Technology / Technician	N/A	N/A

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-42: California Workforce Development Board Report Scoping Plan Details

17-3027 Mechanical Engineering Technologists and Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing

Exhibit A-42: California Workforce Development Board Report Scoping Plan Details

17-3027 Mechanical Engineering Technologists and Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services

Industrial Engineering Technologists and Technicians (SOC 17-3026)

Exhibit A-43: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
17-3026.00	Industrial Engineering Technicians	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-44: O*Net Green Economy Sectors

O*Net SOC Code	Description	Engineering	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
17-3026.00	Industrial Technicians		Manufacturing	Air Quality; Energy Engineering; Renewable; Solar	3	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-45: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
15.0613	2	Manufacturing Engineering Technology / Technician	0956.00	Manufacturing and Industrial Technology
15.0703	9	Industrial Safety Technology / Technician	0956.70	Industrial Occupational Safety and Health
15.0705	9	Process Safety Technology / Technician	0956.70	Industrial Occupational Safety and Health

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-46: California Workforce Development Board Report Scoping Plan Details

17-3026 Industrial Engineering Technologists and Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation

Construction Managers (SOC 11-9021)

Exhibit A-47: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
11-9021.00	Construction Managers	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-48: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
11-9021.00	Construction Managers	Green Construction; Environment Protection	Carbon Trading, Clean Energy, Energy, Energy Efficiency, Energy Engineering, Energy Trading, Environment, Environmental Impact, Environmental Protection, Environmental Remediation, Green Communities, Green Construction, Leadership in Energy and Environmental Design (LEED), Sustainability, Weatherization	4	Yes

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-49: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
15.1001	3	Construction Engineering Technology / Technician	N/A	N/A
52.2001	1	Construction Management, General	0957.00	Civil and Construction Management Technology
52.2099	2	Construction Management, Other	N/A	N/A
52.2002	9	Construction Project Management	0952.00	Construction Crafts Technology

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-50: California Workforce Development Board Report Scoping Plan Details

11-9021 Construction Managers

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation

**Exhibit A-50: California Workforce Development Board Report Scoping Plan Details
11-9021 Construction Managers**

Scoping Plan Sector	Subsector	Industry by NAICS
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Oil and Gas Extraction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Compliance Officers (13-1041)

Exhibit A-51: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
13-1041.07	Regulatory Affairs Specialist	Green New & Emerging

Sources: O*NET Resource Center. Green Occupations

Exhibit A-52: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
13-1041.00	Compliance Officers	N/A	Naturalist; Pollution Prevention; Regulation Enforcement	3	Yes
13-1041.01	Environmental Compliance Inspectors	N/A	Agriculture; Air Quality; Conservation; Environment; Environmental Health and Safety (EHS); Environmental Impact; Environmental Protection; Environmental Remediation; Environmental Science; Pollution Prevention; Regulation Enforcement; Solid Waste Management, Treatment, and Reduction; Waste Reduction; Wastewater Management, Treatment, and Reduction; Water Resources	4	Yes

Exhibit A-52: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
13-1041.04	Government Property Inspectors and Investigators	N/A	Regulation Enforcement	3	Yes
13-1041.07	Regulatory Affairs Specialist	N/A	Regulation Enforcement	4	Yes

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-53: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
3.0103	132	Environmental Studies	0302.00	Environmental Studies
3.0104	156	Environmental Science	0301.00	Environmental Science
3.0208	187	Environmental / Natural Resources Law Enforcement and Protective Services	N/A	N/A
3.0209	154	Energy and Environmental Policy	0302.00	Environmental Studies

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-54: California Workforce Development Board Report Scoping Plan Details 13-1041 Compliance Officers

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation
Transportation	Public Transit	Transit and Ground Passenger Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction

Exhibit A-54: California Workforce Development Board Report Scoping Plan Details

13-1041

Compliance Officers

Scoping Plan Sector	Subsector	Industry by NAICS
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Oil and Gas Extraction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Industry	Fossil Fuel Production, Refining, and Distribution	Pipeline Transportation
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Logisticians (SOC 13-1081)

Exhibit A-55: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
13-1081.01	Logistics Engineers	Green New & Emerging (Candidate N&E)
13-1081.02	Logistics Analysts	Green New & Emerging (Candidate N&E)

Sources: O*NET Resource Center. Green Occupations

Exhibit A-56: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
13-1081.01	Logistics Engineers	Research, Design, and Consulting Services; Manufacturing	Carbon Trading; Environmental Impact; Transportation; Waste Reduction; Wastewater Management, Treatment, and Reduction	4	Yes
13-1081.02	Logistics Analysts	Research, Design, and Consulting Services; Manufacturing	Transportation	4	Yes

Sources: O*NET Resource Center. Green Economy Occupations

**Exhibit A-57: California Workforce Development Board Report Scoping Plan Details
13-1081**
Logisticians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Cleaner Vehicles	Automotive Repair and Maintenance
Transportation	Trucking	Truck Transportation
Transportation	Public Transit	Transit and Ground Passenger Transportation
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services
Natural and Working Lands	Lower Carbon Soil Management and Crop Production; Manure Management for Methane Capture	Agriculture, Forestry, Fishing, and Hunting

Biological Technicians (SOC 19-4021)

Exhibit A-58: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
19-4021.00	Biological Technician	N/A	Aquaculture; Biodegradable; Biodiversity; Biomass; Environmental Science; Fisheries; Forestry; Wildlife	4	Yes

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-59: California Workforce Development Board Report Scoping Plan Details

19-4021

Biological Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction

Chemical Technicians (SOC 19-4031)

Exhibit A-60: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
19-4031.00	Chemical Technicians	Green Increased Demand

Sources: O*NET Resource Center. Green Occupations

Exhibit 61: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
19-4031.00	Chemical Technicians	Sector X: Manufacturing	N/A	4	Yes

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-62: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
41.0303	21	Chemical Process Technology	N/A	N/A

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-63: California Workforce Development Board Report Scoping Plan Details

19-4031

Chemical Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Cleaner Vehicles	Motor Vehicle Manufacturing
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Transit Infrastructure	Other Heavy and Civil Engineering Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services

Environmental Engineering Technologists and Technicians (SOC 17-3025)

Exhibit A-64: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
17-3025.00	Environmental Engineering Technicians	Green Enhanced Skills

Sources: O*NET Resource Center. Green Occupations

Exhibit A-65: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sectors	O*Net Green Topics	Job Zone	Bright Outlook
17-3025.00	Environmental Engineering Technicians	Environmental Protection	Air Quality; Biodegradable; Energy Engineering; Environment; Environmental Health and Safety (EHS); Environmental Impact; Environmental Protection; Environmental Remediation; Environmental Science; Green Solutions; Pollution Prevention; Solid Waste Management, treatment, and Reduction; Waste Reduction; Wastewater Management, Treatment, and Reduction; Water Resources	4	No

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-66: O*NET Green Topics Related Education Programs

CIP Code	Number of Relevant Occupations	CIP Code Title	TOP Code	Community College Program
15.0506	15	Water Quality and Wastewater Treatment Management	0958.00	Water and Wastewater Technology
15.0507	14	Environmental / Environmental Engineering Technology / Technician	0303.00	Environmental Technology
15.0508	12	Hazardous Materials Management and Waste Technology / Technician	0303.00	Environmental Technology
15.0704	2	Hazardous Materials Information Systems Technology / Technician	N/A	N/A
26.1006	111	Environmental Toxicology	N/A	N/A

Sources: O*NET Resource Center. Green Topics Education Programs

Exhibit A-67: California Workforce Development Board Report Scoping Plan Details 17-3025 Environmental Engineering Technologists and Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Industry	Fossil Fuel Production, Refining, and Distribution	Petroleum and Coal Products Manufacturing
Waste	Waste Diversion and Methane Capture	Waste Management and Remediation Services
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Water, Sewage and Other Systems
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Remediation and Other Waste Management Services

Wind Turbine Service Technicians (SOC 49-9081)

Exhibit A-68: O*Net Green Occupations

O*Net SOC Code	Description	O*Net Green Occupational Category
49-9081.00	Wind Turbine Service Technicians	Green New & Emerging

Sources: O*NET Resource Center. Green Occupations

Exhibit A-69: O*Net Green Topics Sectors

O*Net SOC Code	Description	O*Net Green Economy Sector	O*Net Green Topics	Job Zone	Bright Outlook
49-9081.00	Wind Turbine Service Technicians	N/A	Agriculture; Energy; Energy Efficiency; Energy Trading; Renewable; Renewable Energy; Wind	3	Yes

Sources: O*NET Resource Center. Green Economy Occupations

Exhibit A-70: California Workforce Development Board Report Scoping Plan Details

49-9081

Wind Turbine Service Technicians

Scoping Plan Sector	Subsector	Industry by NAICS
Energy	Utility-Scale Renewables - Construction	Utility System Construction
Energy	Utility-Scale Renewables - Operations	Electric Power Generation, Transmission and Distribution
Energy	Distributed Generation	Residential Building Construction
Energy	Distributed Generation	Nonresidential Building Construction
Energy	Energy Efficiency	Residential Building Construction
Energy	Energy Efficiency	Nonresidential Building Construction
Energy	Natural Gas Leakage Abatement	Natural Gas Distribution
Transportation	Clean Fuel Infrastructure	Electrical Contractors and Other Wiring Installation
Transportation	Infill and Transit-Orientated Development	Residential Building Construction
Transportation	Infill and Transit-Orientated Development	Nonresidential Building Construction
Water	Water Conservation in Drinking Water, Stormwater, Waste Water, Efficient Water Infrastructure	Utility System Construction



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