Labor Market Analysis for Noncredit Program: *0946.10/Energy Systems Technology* CIP: 15.1703/Solar Energy Technology/Technician *(Solar Photovoltaic Maintenance Technician, Certificate of Completion) (Energy System Technician: Solar and Energy Storage, Certificate of Completion)*

Orange County Center of Excellence, November 2026

FOR LABOR MARKET RESEARCH
ORANGE COUNTY

⚠ Endorsed: Caution Advised			
Program LMI Endorsement Criteria			
Supply Gap:	Met ☑	Partially Met ☐	Not Met ☐
	There are projected to be **214 annual job openings** throughout Los Angeles and Orange counties for *solar photovoltaic installers*, which **is more than the 51 awards conferred by educational institutions**.		
Self-Sufficiency Standard Living Wage[1]:	Met ☐	Partially Met ☐	Not Met ☑
	The typical entry-level wage for *solar photovoltaic installers* is **$24.62**, which is **below the OC living wage of $27.13**.		
Education:	Met ☐	Partially Met ☑	Not Met ☐
	Typical education requirement for *solar photovoltaic installers* is a high school diploma or equivalent and **33% of workers in the field have completed some college or an associate degree as their highest level of education.**		

This LMA brief is valid for 12 months and expires November 2027.

Summary

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to determine whether there is a supply gap in the Los Angeles and Orange counties regional labor markets related to one occupation:

- Middle-Skill
  - *Solar Photovoltaic Installers (47-2231)*

Based on the available data, there appears to be a supply gap for *solar photovoltaic installers*, and typical education requirements for this occupation generally align with a community college education. However, entry-level wages are below the Self-Sufficiency Standard living wage. **Therefore, due to some regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for the middle-skill occupation included in this report.

[1] The living wage endorsement criteria in this report uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard, which the COE refers to as a living wage; Orange County's living wage of $27.13, was last updated in March 2024.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Solar Photovoltaic Installers (47-2231)	LA: 120 OC: 94	LA: 51 OC: 0	OC: $24.62	High school diploma or equivalent	33%
Total	**214**	**51**	**N/A**	**N/A**	**N/A**

Demand

- In Los Angeles and Orange counties, the number of jobs related to *solar photovoltaic installers* is projected to increase 13% through 2030, equating to 214 annual job openings.
- Hourly entry-level wages for *solar photovoltaic installers* are $24.62 in Orange County, which is below the Self-Sufficiency Standard living wage.
- There were 273 online job postings for *solar photovoltaic installers* over the past 12 months. The highest number of postings were for solar installers, solar technicians, and lead solar installers.
- The typical entry-level education for *solar photovoltaic installers* is a high school diploma or equivalent.
- Approximately 33% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Supply

- Between 2022 to 2024, an average of 51 awards were conferred by 5 community colleges for the middle-skill occupation in Los Angeles and Orange counties.
- From 2021 to 2024, non-community college institutions did not confer any awards for the middle-skill occupation.
- In the 2023-24 academic year, Orange County community college students that exited energy systems technology programs had a median annual wage of $58,752 ($28.25 per hour) post-exit, and 52% attained the regional living wage.
- In 2022-23, DataVista reports there was insufficient data to determine the percentage of Orange County energy systems technology students that exited their programs and reported working a job closely related to their field of study.

Demand

Occupational Projections

Exhibit 2 shows the annual percentage change in jobs for *solar photovoltaic installers* from 2020 through 2030. Beginning in 2025, Orange County job levels are projected to grow at a higher rate than all occupations through 2030.

Exhibit 2: Annual Percentage Change in Jobs for *Solar Photovoltaic Installers*, 2020-2030

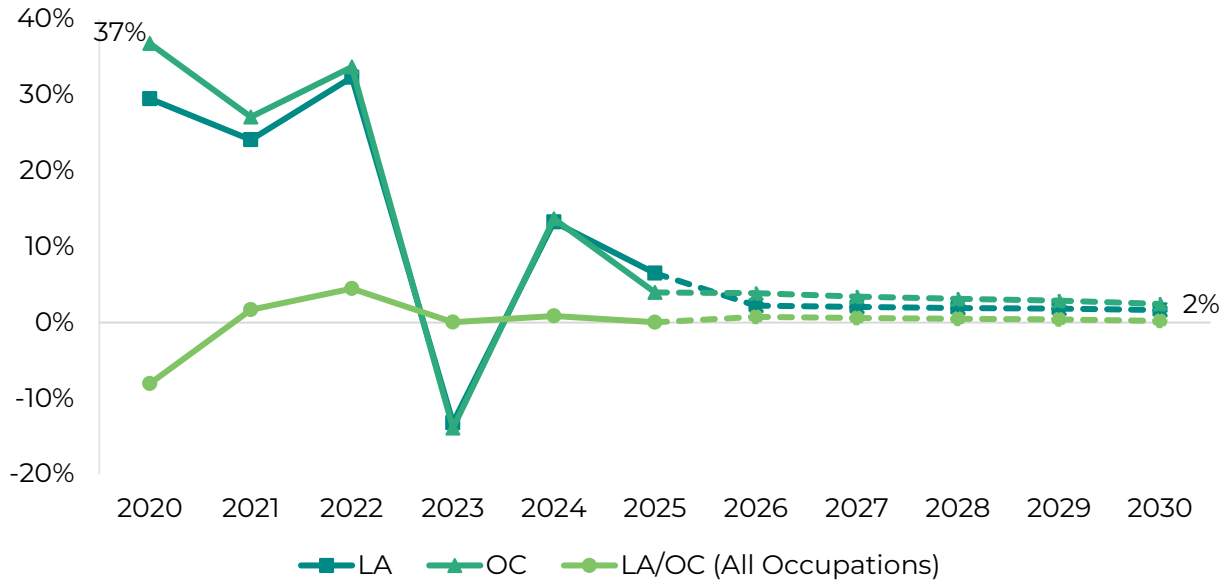


Exhibit 3 shows the five-year occupational demand projections for *solar photovoltaic installers*. In Los Angeles and Orange counties, the number of jobs related to this occupation is projected to increase 13% through 2030. There is projected to be 214 jobs available annually.

Exhibit 3: Middle-Skill Occupational Demand in Los Angeles and Orange Counties[2]

Geography	2025 Jobs	2030 Jobs	2025-2030 Change	2025-2030 % Change	Annual Openings
Los Angeles	1,112	1,225	112	10%	120
Orange	757	885	127	17%	94
Total	**1,870**	**2,109**	**240**	**13%**	**214**

Wages

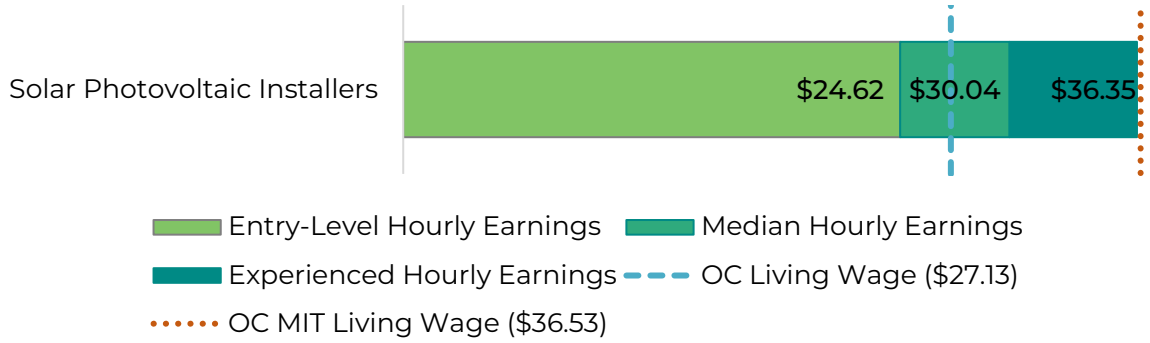
The labor market endorsement in this report considers the entry-level hourly wage for *solar photovoltaic installers* in Orange County as it relates to the county's living wage. Los Angeles County wages are included below to provide a complete analysis of the LA/OC region.

In addition to the Self Sufficiency Standard living wage, data for the MIT Living Wage (updated on February 15, 2026) is provided as a reference. Currently, the MIT Living Wage in Orange County is $36.53. Both figures account for geographic-specific costs of necessities such as housing, food, health care, and transportation to assess the cost of living, and are notated in the exhibits below.

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

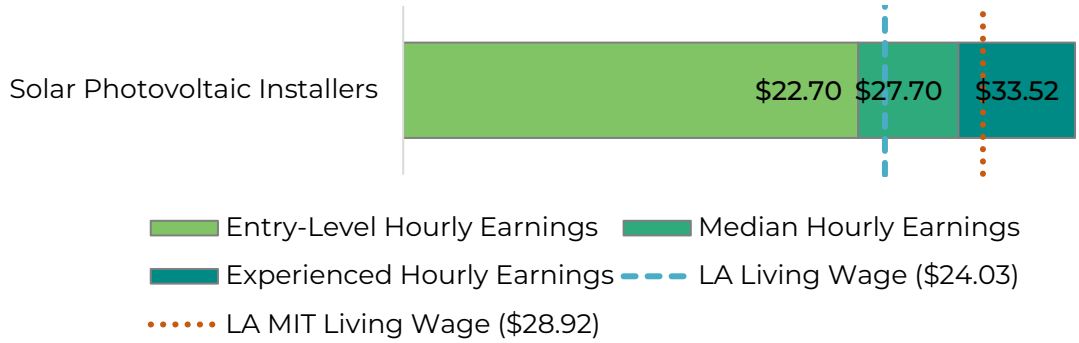
In Orange County, the typical entry-level wage for *solar photovoltaic installers* is $24.62, which is below the Self-Sufficiency living wage of $27.13 for a single adult. Exhibit 4 shows the wage range for *solar photovoltaic installers* in Orange County and how it compares to the regional living wage.

Exhibit 4: Wages by Occupation in Orange County



In Los Angeles County, the typical entry-level wage for *solar photovoltaic installers* is $22.70, which is below the Self-Sufficiency living wage of $24.03 for a single adult. Exhibit 5 shows the wage range for *solar photovoltaic installers* in Los Angeles County and how it compares to the regional living wage.

Exhibit 5: Wages by Occupation in Los Angeles County



Resilient Jobs and U.S. News & World Report Best Jobs

Exhibit 6 shows if the occupation is considered an Orange County Great Recession-Resilient, COVID-19 Pandemic Recession-Resilient Job, or a 2026 U.S. News & World Report (USN&WR) Best Job[3]. *Solar photovoltaic installers* only meet the criteria for a USN&WR Best Job.

Exhibit 6: Resilient Jobs and USN&WR Best Jobs Designations

Occupation	Great Recession-Resilient Job	COVID-19 Pandemic Recession-Resilient Job	2026 USN&WR Best Job
Solar Photovoltaic Installers	☐	☐	☑

[3] "100 Best Jobs," U.S. News & World Report, accessed January 12, 2026, https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs.

Job Postings

Important Job Postings Data Note: *There are limitations when analyzing job postings. A single job posting may not represent a single job opening for a variety of reasons.*

There were 273 online job postings related to *solar photovoltaic installers* listed in the past 12 months. Exhibit 7 shows the number of job postings by occupation.

Exhibit 7: Number of Job Postings by Occupation (n=273)

Occupation	Job Postings	Percentage of Job Postings
Solar Photovoltaic Installers	273	100%
Total Postings	**273**	**100%**

The top job titles for *solar photovoltaic installers* in the region, by number of job postings, are shown in Exhibit 8.

Exhibit 8: Top Job Titles by Number of Job Postings for the Middle-Skill Occupation (n=273)

Job Titles	Job Postings	Percentage
Solar Installers	76	28%
Solar Technicians	35	13%
Lead Solar Installers	13	5%
Installers	12	4%
Solar Service Technicians	12	4%
Lead Installers	11	4%
Solar Electricians	8	3%
Field Service Technicians	5	2%
Solar Pv Installers	5	2%
Assistant Crew Leaders	4	1%

The top employers for *solar photovoltaic installers* in the region, by number of job postings, are shown in Exhibit 9.

Exhibit 9: Top Employers by Number of Job Postings for the Middle-Skill Occupation (n=273)

Employer	Job Postings	Percentage of Job Postings
Sunrun	23	8%
The AES Corporation	18	7%
Solarshoppers	14	5%
Better Earth	11	4%
Pearce Services	10	4%
Aerotek	9	3%
Tesla	5	2%
Abstrakt Marketing Group	5	2%
Bonbon Electric Corp	4	1%
Treepublic	4	1%

The top specialized, soft, and computer skills for *solar photovoltaic installers* listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 10.

Exhibit 10: Top Skills by Number of Job Postings for the Middle-Skill Occupation (n=273)

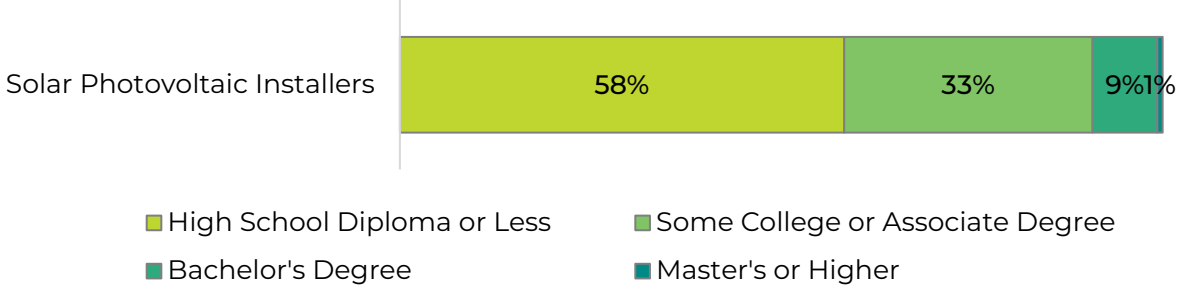
Top Specialized Skills	Top Soft Skills	Top Computer Skills
Solar Energy Systems Installation (123)	Communication (108)	Microsoft Excel (23)
Roofing (95)	Troubleshooting (Problem Solving) (92)	Business Software (22)
Construction (74)	Detail Oriented (81)	Microsoft Office (11)
Photovoltaic Systems (63)	Operations (59)	System Status (3)
Lifting Ability (59)	Professionalism (54)	AutoCAD (2)
Electrical Wiring (54)	Strong Work Ethic (48)	Microsoft Word (2)
Personal Protective Equipment (54)	Problem Solving (45)	Equinox (OSGi) (1)
Electrical Equipment (53)	Customer Service (41)	Gmail (1)
Good Driving Record (53)	Leadership (32)	Google Workspace (1)
Safety Standards (50)	Management (31)	Inventory Control Systems (1)

Educational Attainment

The Bureau of Labor Statistics (BLS) lists high school diploma or equivalent as the typical entry-level education for *solar photovoltaic installers*.

The national-level educational attainment data indicates that 33% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 11 shows the educational attainment for this occupation.

Exhibit 11: National-level Educational Attainment for Occupations



Requested Minimum Education Requirement

In Los Angeles and Orange Counties, 26% (72) of job postings for *solar photovoltaic installers* included a stated minimum education requirement:

- 99% (71) requested a high school diploma or associate degree
- 1% (1) requested a bachelor's degree

Educational Supply

The following tables display the total educational supply for the TOP and CIP codes associated with the middle-skill occupation.

Community College Supply

Exhibit 12 shows the three-year average number of awards conferred by community colleges in the related TOP code: Energy Systems Technology (0946.10).

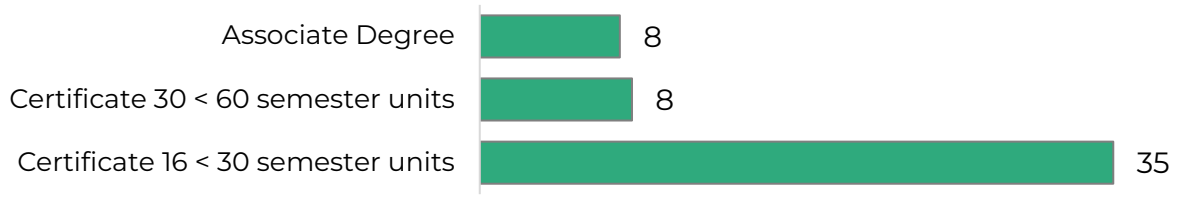
The colleges with the most completions in the region are LA Trade (30), followed by Mt San Antonio (12), and Pasadena (7). Over the past 12 months, there were no related program recommendation requests from regional community colleges.

Exhibit 12: Regional Community College Awards (Certificates and Degrees), 2022-2025

TOP Code	Program	College	2022-2023 Awards	2023-2024 Awards	2024-2025 Awards	3-Year Award Average
0946.10	Energy Systems Technology	LA Trade	21	22	46	30
		Mt San Antonio	6	16	13	12
		Pasadena	5	14	2	7
		Rio Hondo	1	2	2	2
		Santa Monica	0	2	0	1
		LA Subtotal	**33**	**56**	**63**	**51**
		-	-	-	-	-
		OC Subtotal	**-**	**-**	**-**	**-**
		Supply Total/Average	**33**	**56**	**63**	**51**

Exhibit 13 shows the annual average community college awards by type from 2022-23 to 2024-25. The plurality of the awards are for certificate 16 to 30 semester units, followed by certificate 30 to 60 semester units then associate degree.

Exhibit 13: Annual Average Community College Awards by Type, 2022-2025



Community College Student Outcomes

Exhibit 14 shows the Strong Workforce Program (SWP) metrics for energy systems technology programs in Coast Community College District (CCCD), the Orange County Region, and California. Of the 116 Orange County energy systems technology students in the 2024-25 academic year, 70% (81) attended a CCCD college.

CCCD students that exited energy systems technology programs in the 2023-24 academic year had similar median annual earnings ($58,828 or $25.28 per hour) compared to all energy systems technology students in Orange County ($58,752 or $28.25 per hour). There is insufficient data to determine what percentage CCCD energy systems technology students

attained a living wage compared to all energy systems technology students in Orange County. Approximately 52% of all energy systems technology students in Orange County attained a living wage after exit.

Exhibit 14: Energy Systems Technology (0946.10) Strong Workforce Program Metrics, 2022-25[4]

SWP Metric	CCCD	OC Region	California
SWP Students	81	116	955
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	81%	70%	50%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	Insufficient Data	Insufficient Data	77%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	Insufficient Data	Insufficient Data	79
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2023-24)	Insufficient Data	Insufficient Data	17
SWP Students with a Job Closely Related to Their Field of Study (2022-23)	Insufficient Data	Insufficient Data	35%
Median Annual Earnings for SWP Exiting Students (2023-24)	$58,828 ($28.28)	$58,752 ($28.25)	$52,914 ($25.44)
Median Change in Earnings for SWP Exiting Students (2023-24)	46%	13%	27%
SWP Exiting Students Who Attained the Living Wage (2023-24)	Insufficient Data	52%	50%

Non-Community College Supply

No awards were granted by non-community college institutions under the related Classification of Instructional Programs (CIP) codes: Solar Energy Technology/Technician (15.1703).

[4] All SWP metrics are for 2024-25 unless otherwise noted.

Regional Demographics

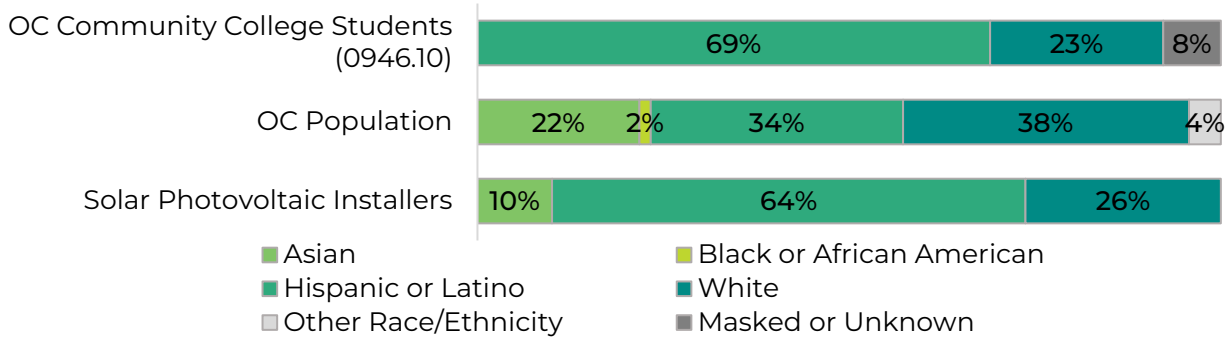
The following section presents occupational, community college program, and population demographic data for Orange County. This comparison can help identify possible equity gaps between the local workforce and the student pipeline who are preparing for these occupations. These insights can inform program development, outreach, and support strategies to better align community college programs with current labor market needs.

Ethnicity

Exhibit 16 compares the ethnicity of Orange County community college students enrolled in energy systems technology programs, the overall Orange County population, and occupation-specific data for *solar photovoltaic installers*.

The majority (64%) of *solar photovoltaic installers* are Hispanic or Latino, which is commensurate with their representation in energy systems technology programs (69%). Likewise, white workers make up 26% of workers while also making up 23% of students. Based on available data, these two groups combine to form 90% of *solar photovoltaic installers* and 92% of students in energy systems technology programs

Exhibit 15: Program and County Demographics by Ethnicity

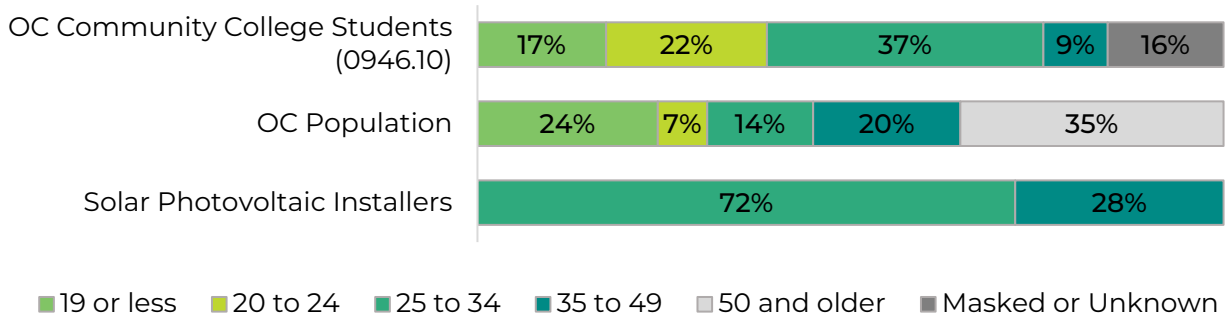


Age

Exhibit 17 compares the age of Orange County community college students enrolled in energy systems technology programs, the overall Orange County population, and occupation-specific data for *solar photovoltaic installers*.

The majority (72%) of *solar photovoltaic installers* are aged 25 to 34, while only 37% of this age group is make up energy systems technology students. Furthermore, the other 28% of workers are aged 35 to 49, yet only 9% of students. This suggests the field may attract mid-career individuals or require some level of prior training and experience for entry.

Exhibit 16: Program and County Demographics by Age

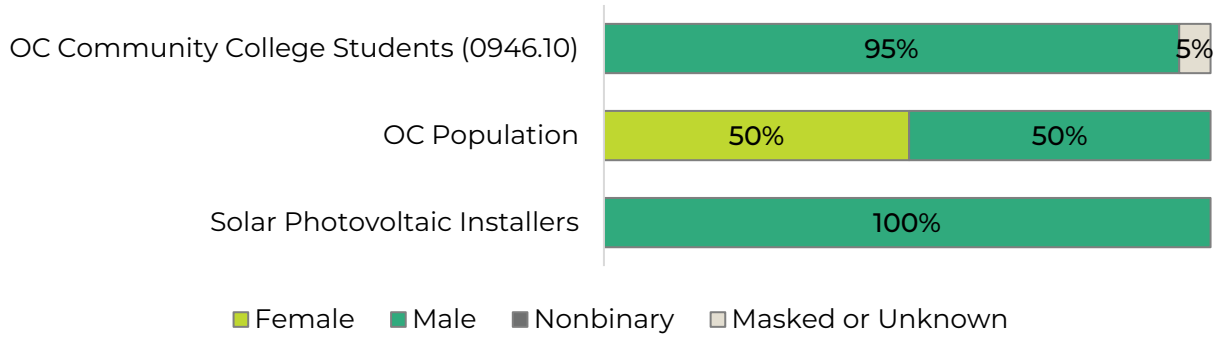


Sex

Exhibit 18 compares the sex of Orange County community college students enrolled in energy systems technology programs, the overall Orange County population, and occupation-specific data for *solar photovoltaic installers*.

Though the population is split evenly between women and men, all (100%) of *solar photovoltaic installers* and nearly all (95%) of community college students are men.

Exhibit 17: Program and County Demographics by Sex



Appendix A: Methodology

OC COE prepared this report by analyzing occupational and educational program data. Occupational data comes from Lightcast, a labor market analytics firm which compiles information from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS), and other agencies. Analysis of emerging occupations is predicated on online job postings data combined with Occupational Information Network (O*NET) profile descriptions. Program supply data was sourced from the California Community Colleges Chancellor's Office Data Mart (MIS Data Mart) (datamart.cccco.edu) and the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS, which was integrated into the COE's Supply Table. (IPEDS).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

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

The OC COE determined labor market supply for each occupation (SOC code) by analyzing the number of 3-year average program completers or awards in related TOP and CIP codes. TOP code data comes from MIS Data Mart and CIP code data comes from the IPEDS. The TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education throughout the United States and Canada. The California Community Colleges are the only system that use TOP codes.

The analysis reflects labor market demand for occupations closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market data was used to assess current and projected employment based on data trends for detailed occupations, as well as annual average awards granted by regional postsecondary educational institutions. Real-time labor market information (online job postings) assesses employer preferences but cannot be used to measure the quantity of open positions, number of jobs, or annual openings.

All findings are based on the most current available data and a combination of primary and secondary sources. While care was taken to ensure accuracy, the OC COE, its host district, and the California Community Colleges Chancellor's Office are not responsible for individual decisions made based on this report.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	Traditional and real-time labor market information are captured using data from Lightcast (v.2026.3), a labor market analytics firm.
Living Wage	Per the CCCCO's this report's endorsement criteria uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard last updated in March 2024, which is $27.13 per hour ($57,294 annually) in Orange County. The MIT Living Wage, updated on February 15, 2026, is a nationally recognized living wage metric and is provided for reference. The current MIT Living Wage in Orange County is $36.53.
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data.
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations.
Educational Supply	The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions).
Student Metrics and Demographics	Data Vista, a statewide data system supported by the California Community Colleges Chancellor's Office provides data on progress, success, employment, and earnings outcomes for California community college students.
Population and Occupation Demographics	The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products.

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