

Solar Photovoltaic Installers

Labor Market Analysis: San Diego County

December 2018

Summary

According to available labor market information, there is a small demand for *Solar Photovoltaic Installers* in San Diego County. *Solar Photovoltaic Installers* has a labor market demand of 150 annual job openings. (For comparison, the average regional demand for an occupation is 275 job openings.) A few community colleges and other educational institutions (e.g., GRID Alternatives, Solar Training Institute of San Diego) in the region provide solar photovoltaic installation training, but no awards have been reported.

Additionally, this occupation's entry-level and median wages are higher than the Self-Sufficiency Standard, suggesting that students who successfully complete a program and obtain employment in a related field may earn living wages.

The following list summarizes findings from the labor market analysis for *Solar Photovoltaic Installers*:

- Between 2017 and 2022, *Solar Photovoltaic Installers* are projected to increase by 319 jobs or 46 percent.
- Employers in San Diego County will need to hire 150 workers annually to fill new jobs and backfill jobs due to attrition such as retirement or turnover.
- Between 2010 and 2017, there was an average of 46 online job postings per year for *Solar Photovoltaic Installers*.
- *Solar Photovoltaic Installers* earn median hourly earnings of \$21.65; this is more than the Self-Sufficiency Standard for a single adult in San Diego County, which is \$15.99 per hour.
- There are two TOP codes associated with this occupation: Energy Systems Technology (094610) and Roofing (095290). There are three related CIP codes.
- According to TOP and CIP data, no college supplies the region with awards for this occupation. However, Cuyamaca College offers a solar power self-installation course and MiraCosta College offers a solar PV certification training. Other training providers such as GRID Alternatives and the Solar Training Institute of San Diego offer certification programs for *Solar Photovoltaic Installers*, but no awards have been reported to the California Community Colleges Chancellor's Office.

- Comparing labor demand (annual openings) with labor supply suggests that there is a supply gap for this occupation in San Diego County, with 150 annual openings and no awards. Comparatively, there are 986 annual openings in California and 162 completions.
- Between January 1, 2015 and December 31, 2017, the top five employers in San Diego County for this occupation were SolarCity, Verengo Solar, Sunrun, Horizon Solar Power, and Direct Energy.
- The typical on-the-job training for this profession is moderate-term on-the-job training. The typical entry-level education is a high school diploma or equivalent.

Introduction

This report provides labor market information in San Diego County for the following occupational code in the Standard Occupational Classification (SOC)¹ system:

Solar Photovoltaic Installers (SOC 47-2231): Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics. May include measuring, cutting, assembling, and bolting structural framing and solar modules. May perform minor electrical work such as current checks. Sample reported job titles include:

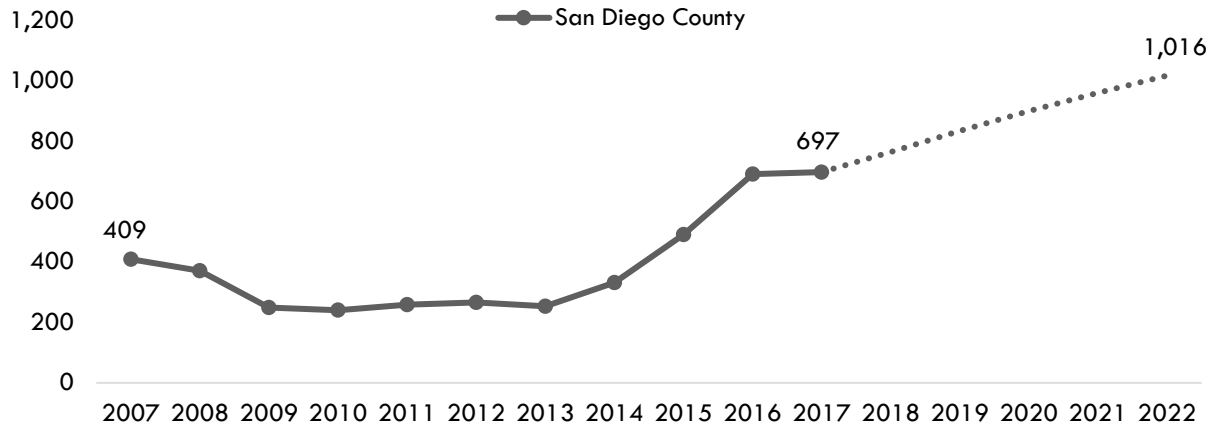
- Photovoltaic Installer
- Solar Technician
- Solar Tech
- Solar Installer Technician
- Solar Installer PV
- Solar Installation Helper
- Solar Designer/Installer
- PV Installer Tech

Projected Occupational Demand

Between 2017 and 2022, *Solar Photovoltaic Installers* are projected to increase by 319 jobs or 46 percent (Exhibit 1). Employers in San Diego County will need to hire 150 workers annually to fill new jobs and backfill jobs due to attrition such as retirement or turnover.

¹ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. bls.gov/soc.

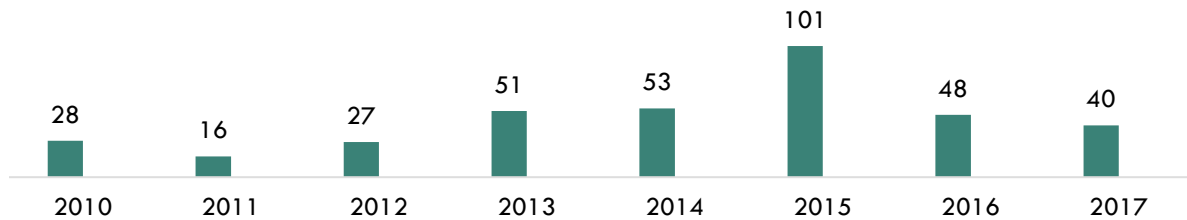
Exhibit 1: Number of Jobs for Solar Photovoltaic Installers (2007-2022)²



Online Job Postings

Between 2010 and 2017, there was an average of 46 online job postings per year for *Solar Photovoltaic Installers* (Exhibit 2).

Exhibit 2: Number of Online Job Postings for Solar Photovoltaic Installers in San Diego County (2010-2017)³



Earnings

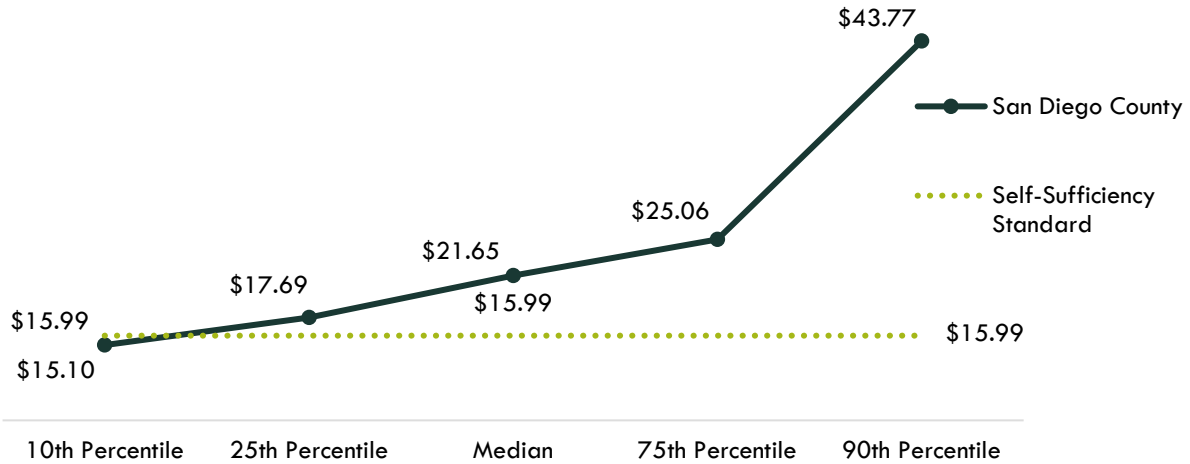
Solar Photovoltaic Installers earn median hourly earnings of \$21.65; this is more than the Self-Sufficiency Standard for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 3).⁴

² Economic Modeling Specialists, Int'l. (EMSI). San Diego (6073). 2018.04 Class of Worker. QCEW + Non-QCEW + Self-Employed. 2007-2022.

³ Labor Insight Jobs. Burning Glass Technologies. San Diego, CA. Full years 2010-2017.

⁴ The self-sufficiency wage in San Diego for one adult is \$15.99 (insightcced.org/2018-self-sufficiency-standard).

Exhibit 3: Hourly Earnings for Solar Photovoltaic Installers in San Diego County⁵



Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.⁶ There are **two** TOP codes associated with this occupation: Energy Systems Technology (094610) and Roofing (095290). There are **three** related CIP codes: CIP 15.0503: Energy Management and Systems Technology/Technician, 15.0505: Solar Energy Technology/Technician, and 46.0410: Roofer (Exhibit 4).

Exhibit 4: Related TOP and CIP Codes in San Diego County

SOC 47-2231: Solar Photovoltaic Installers

TOP 094610: Energy Systems Technology

TOP 095290: Roofing

CIP 15.0503: Energy Management and Systems Technology/Technician

CIP 15.0505: Solar Energy Technology/Technician

CIP 46.0410: Roofer

⁵ EMSI. San Diego (6073). 2018.04 Class of Worker. QCEW + Non-QCEW + Self-Employed. 2017-2022.

⁶ TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).

According to TOP and CIP data, no college supplies the region with awards for this occupation. However, Cuyamaca College offers a solar power self-installation course⁷ and MiraCosta College offers a solar PV certification training.⁸ The Solar Training Institute of San Diego offers certification programs for *Solar Photovoltaic Installers*, but no awards have been reported to the California Community Colleges Chancellor's Office, so they are not included in the analysis⁹ (Exhibit 5).

Exhibit 5: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Year 2013-14 through PY2016-17 Average)

TOP6 or CIP	TOP6 or CIP Title	3-Yr Annual Average CC Awards (PY14-15 to PY16-17)	Other Educational Institutions 3-Yr Annual Average Awards (PY13-14 to PY15-16)	3-Yr Total Average Supply (PY13-14 to PY16-17)
094610	Energy Systems Technology	0	0	0
15.0505	Solar Energy Technology/Technician	0	0	0
			Total	0

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply¹⁰ suggests that there is a **supply gap** for this occupation in San Diego County, with **150** annual openings and **no** awards. Comparatively, there are **986** annual openings in California and **162** completions¹¹ (Exhibit 6).

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

Community Colleges and Other Postsecondary Educational Institutions	Demand (Annual Openings)	Supply (Total Annual Average Supply)	Supply Gap or Oversupply
San Diego	150	0	150
California	986	162	824

Please note: This is a basic analysis of supply and demand of labor. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining

⁷ Cuyamaca College. College location changes periodically. (adulthoodworks.org/wp-content/uploads/2018/07/ERA-Fall-2018-Catalog.pdf)

⁸ MiraCosta College. (pvsolarsalestraining.com/about_us/pr/pr-6-9.php)

⁹ Solar Training Institute of San Diego. (trainingforsolar.com/Home_Page.html)

¹⁰ Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

¹¹ EMSI. San Diego (6073). 2018.04 Class of Worker. QCEW + Non-QCEW + Self-Employed. 2017-2022.

whether or not a program should be developed. Additionally, the data does not include workers who are currently in the labor force who could fill these positions or workers who are not captured by publicly available data.

Student Outcomes

Based on the information available in the CTE LaunchBoard, students who took courses in the related TOP codes exhibited the following outcomes (Exhibit 7).

Exhibit 7: Strong Workforce Program Metrics for TOP 094610: Energy Systems Technology San Diego-Imperial Region vs. California (PY2015-16)

Metric	San Diego-Imperial	California
Number of course enrollments ¹²	55	2,103
Completed 12+ CTE units in one year ¹³	25	348
Completed 48+ CTE contact hours in one year ¹⁴	0	N/A
Number of students who got a degree or certificate ¹⁵	N/A	90
Number of students who transferred ¹⁶	0	68
Employed in the second fiscal quarter after exit ¹⁷	N/A	61%
Employed in the fourth fiscal quarter after exit ¹⁸	N/A	60%
Job closely related to field of study ¹⁹	N/A	N/A
Median earnings in the second fiscal quarter after exit ²⁰	N/A	\$9,027
Median change in earnings ²¹	N/A	48%
Attained a living wage ²²	N/A	55%

¹² The number of enrollments in courses assigned to the TOP code in the selected year.

¹³ The number of students who completed 12 or more credit CTE units.

¹⁴ The number of students who completed 48 or more noncredit CTE instructional contact hours.

¹⁵ The number of unduplicated students who earned a locally-issued certificate, Chancellor's Office approved certificate, associate degree, and/or California Community Colleges bachelor's degree in the selected TOP code.

¹⁶ Students who took non-introductory courses or completed a California Community Colleges Chancellor's Office award in the selected TOP code in selected year who subsequently enrolled for the first time in a four-year institution the following year.

¹⁷ Among all exiters with a valid SSN, the percentage who were employed two quarters after exiting California Community Colleges.

¹⁸ Among exiting students with a valid SSN, the percentage who were employed four quarters after exiting California Community Colleges.

¹⁹ Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

²⁰ Among exiting students, the median second-quarter earnings one year after the year in which they exited California Community Colleges.

²¹ Among exiting students with a valid SSN, the percentage change in earnings one year before and one year after exiting California Community Colleges.

²² Among completers and skills builders who exited, the proportion of students who attained a living wage.

Top Employers and Work Locations

Between January 1, 2015 and December 31, 2017, the top five employers in San Diego County for this occupation were [SolarCity](#), [Verengo Solar](#), [Sunrun](#), [Horizon Solar Power](#) and [Direct Energy](#) (Exhibit 8).

Exhibit 8: Top Employers in San Diego County for Solar Photovoltaic Installers²³

Top Employers	
<ul style="list-style-type: none"> • SolarCity • Verengo Solar • Sunrun • Horizon Solar Power • Direct Energy 	<ul style="list-style-type: none"> • Hertz Corporation • Tyco Integrated Security • Baker Electric Solar • Empower America • HCS Renewable Energy

Skills, Education, and Certifications

Exhibit 9 indicates the educational attainment for the occupation found currently in the national labor force. The typical on-the-job training for this profession is [moderate-term on-the-job training](#). The typical entry-level education is a [high school diploma or equivalent](#).²⁴

Exhibit 9: National Educational Attainment of Solar Photovoltaic Installers²⁵

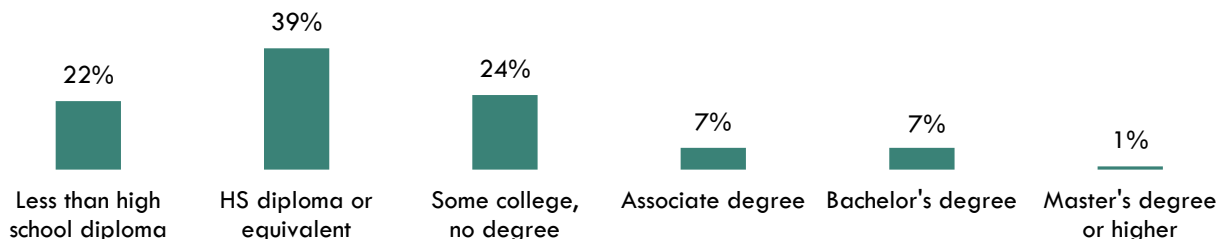


Exhibit 10 lists the top specialized, soft and software skills that appeared in online job postings for this occupation between January 1, 2015 and December 31, 2017.

Exhibit 10: Top Skills for Solar Photovoltaic Installers in San Diego County²⁶

²³ Labor Insight Jobs. Burning Glass Technologies. San Diego, CA. Full years 2015-2017.

²⁴ EMSI. San Diego (6073). 2018.04 Class of Worker. QCEW + Non-QCEW + Self-Employed. 2017-2022.

²⁵ Bureau of Labor Statistics, Educational attainment for workers 25 years and older by detailed occupation. [bls.gov/emp/ep_table_111.htm](https://www.bls.gov/emp/ep_table_111.htm).

²⁶ Labor Insight Jobs. Burning Glass Technologies. San Diego, CA. Full years 2015-2017.

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Customer Service • Solar Installation • Photovoltaic (PV) Systems • Carpentry • Repair 	<ul style="list-style-type: none"> • Communication Skills • Verbal / Oral Communication • Writing • Computer Literacy • Teamwork / Collaboration 	<ul style="list-style-type: none"> • Microsoft C# • Microsoft Excel • Microsoft Word • Adobe Acrobat • AutoCAD

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Important Disclaimers

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