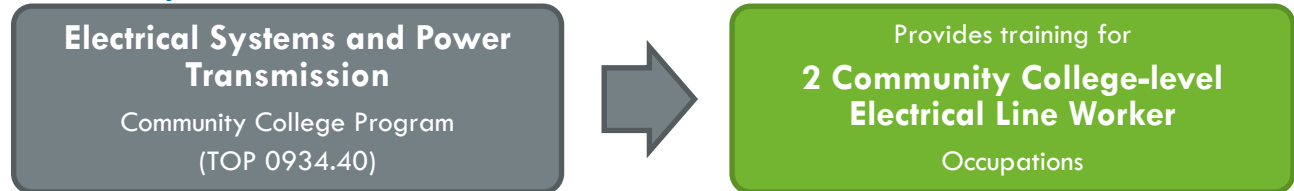


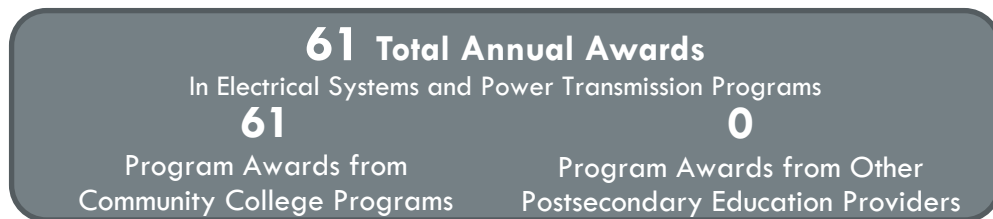
# Electrical Line Workers

*Inland Empire/Desert Region (Riverside and San Bernardino counties)*

## Summary



Over the next five years (2021-2026), employment for community college-level electrical line worker occupations is projected to



The Inland Empire/Desert Centers of Excellence

 **Recommends**

Electrical Line Worker Program Expansion  
to meet the need for more workers in the region

## Introduction

This report provides labor market occupational demand and wage research and postsecondary program outcomes related to electrical line workers. The California Community College program most likely to prepare students for electrical line worker employment is the electrical systems and power transmission (TOP 0934.40) program. Electrical systems and power transmission programs prepare students for employment through instruction related to the installation, operation, maintenance, and repair of electrical systems and the power lines that transmit electricity. These programs include the assembly, installation, maintenance, and repair of motors, generators, transformers, and related equipment (Taxonomy of Programs, 2012). The knowledge, skills, and abilities trained by electrical systems and power transmission programs lead to employment in the

following occupations, further referred to as the electrical line worker occupational group.

- Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (SOC 49-2095)
- Electrical Power-Line Installers and Repairers (49-9051)

## Job Counts and Projections

In 2021, there were 1,764 electrical line worker jobs in the region. Regional employment for the electrical line worker occupational group is projected to remain flat through 2026; 158 job openings are expected annually. Exhibit 1 displays the job counts, five-year projected job growth, job openings, and the share of incumbent workers aged 55 years and older in the region.

*Exhibit 1. Five-year projections for the electrical line worker occupational group, Inland Empire/Desert Region, 2021-2026*

Occupation	2021 Jobs	2026 Jobs	5-Yr % Change	5-Yr Openings (New + Replacement Jobs)	Annual Openings (New + Replacement Jobs)	% of workers age 55+
Electrical Power-Line Installers and Repairers	1,407	1,422	1%	654	131	15%
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	357	346	(3%)	137	27	20%
<b>Total</b>	<b>1,764</b>	<b>1,769</b>	<b>0%</b>	<b>791</b>	<b>158</b>	<b>16%</b>

Source: Lightcast 2022.4

An online job ad search for jobs in the electrical line worker occupational group was conducted to reveal the employers seeking these workers, including the median job advertisement duration, earnings information, and in-demand skills. Over the last twelve months, from February 2022 through January 2023, only 31 job ads were posted for the regional electrical line worker occupational group. The job ad search was expanded to include all electrical line worker jobs posted throughout California to ensure that the advertisement information included in this report is reliable and generalizable.

Exhibit 2 shows the number of job ads posted over the last twelve months in California and the median posting duration. On average, employers kept online job ads for the electrical line worker occupational group open for 22 days. The average statewide online job is open for 27 days, indicating that it may be easier for employers to fill electrical line worker positions than other jobs.

Exhibit 2. Job ads and time to fill, California, February 2022 through January 2023

Occupation	Job Ads	Median Posting Duration (Days)
Electrical Power-Line Installers and Repairers	456	22
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	59	20
<b>Total</b>	<b>515</b>	<b>22</b>

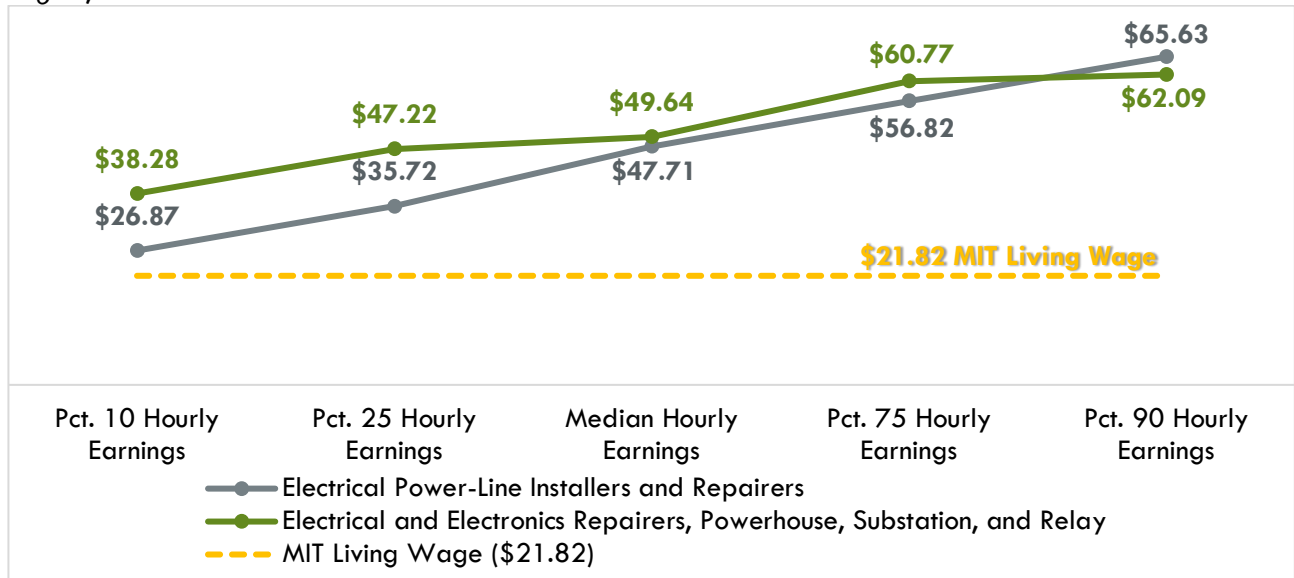
Source: Lightcast 2022.4

### Earnings and Benefits

Community colleges should ensure their training programs lead to employment opportunities that provide a living wage. The MIT living wage calculator estimates that an individual must earn \$21.82 per hour or \$45,386 annually to be self-sufficient in California (Glasmeier, 2022).

Exhibit 3 displays the hourly earnings for the electrical line worker occupational group. The 10<sup>th</sup> percentile hourly earnings for the electrical line worker occupational group are above the living wage standard, indicating that at least 90% of workers earn a living wage.

Exhibit 3. Hourly earnings by percentile for the electrical line worker occupational group, Inland Empire/Desert Region, 2021



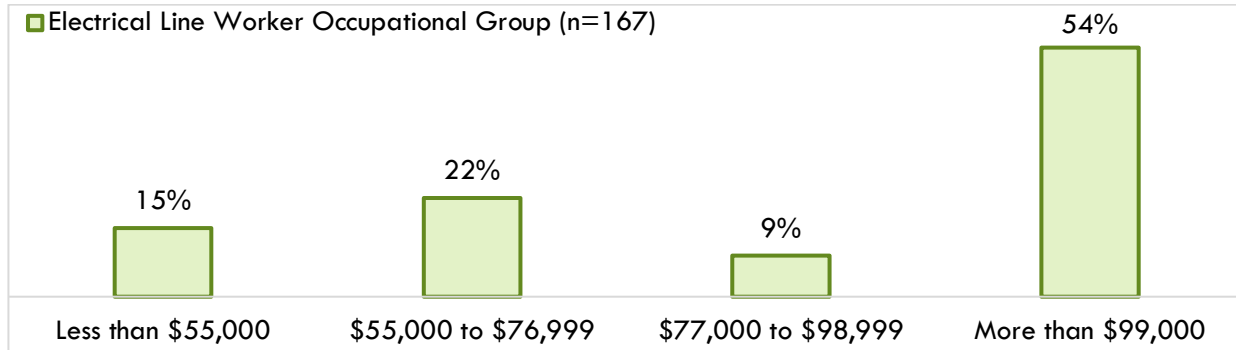
Source: Lightcast 2022.4

### Advertised Salary from Online Job Ads

Exhibit 4 displays the statewide online advertised salaries for electrical line workers over the last 12 months. Online job ad salary information reveals employers are willing to pay this occupational group \$110,000 annually or \$52.89 per hour, well above the \$21.82 hourly living wage standard. Consider the salary

information with caution since only 32% (167 out of 515) of online job ads for this occupational group provided salary information.

Exhibit 4. Online Advertised Salaries for the electrical line worker occupational group, California, February 2022 through January 2023



Source: Lightcast 2022.4

### Job Titles, Employers, Skills, Education, and Work Experience

Exhibit 5 displays the job titles most frequently used in job ads for the electrical line worker occupational group over the last 12 months. Displaying advertised job titles may provide insight into the types of positions sought by employers posting ads. The most frequently requested job title in the state was journeyman linemen.

Exhibit 5. Job titles most frequently used in electrical line worker job ads, California, February 2022 through January 2023

Job Titles	Unique Job Ads
Journeyman Linemen	303
Tower Foremen	62
Power-Generation Equipment Repairers	19
Linemen	18
Electrical Assistants	18
Field Electronics Technicians	14
Substation Technicians	8
Electrician Assistants	7
Electrical Linemen	6
Line Workers	5

Source: Lightcast 2022.4

Exhibit 6 displays the employers posting the most job ads for the electrical line worker occupational group during the last 12 months. Showing employer names provides insight into where students may find employment after completing a program. Pacific Gas and Electric Company (PG&E), an energy transmission business, posted most job ads for the electrical line worker occupational group over the last 12 months in California.

*Exhibit 6. Employers posting the most job ads for the electrical line worker occupational group, California, February 2022 through January 2023*

Top Employer	Unique Job Ads
Pacific Gas and Electric Company (PG&E)	323
Eaton Corporation	24
QualTek	23
MasTec North America	11
Liberty Utilities	6
Bear Valley Electric Service	5

Source: Lightcast 2022.4

Exhibit 7 lists a sample of specialized and employability skills employers seek when seeking workers to fill electrical line worker positions. Specialized skills are occupation-specific skills that employers request for industry or job competency. Common skills are foundational skills that transcend industries and occupations; this category is often referred to as "soft skills." The skills requested in job ads may be utilized to guide curriculum development.

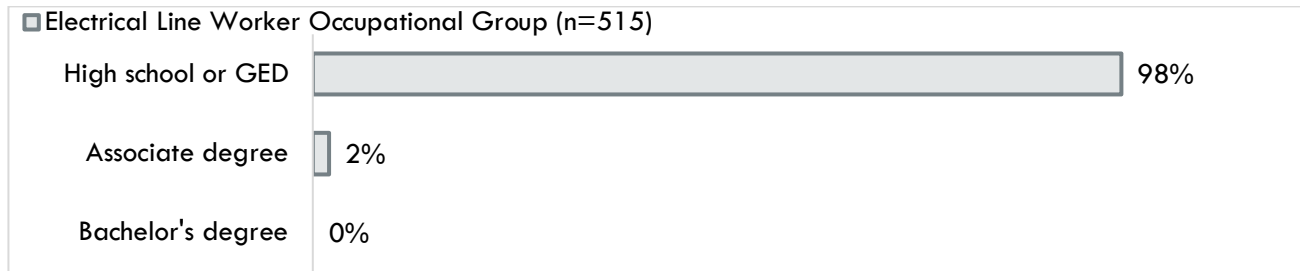
*Exhibit 7. Sample of in-demand skills from employer job ads, California, February 2022 through January 2023*

Specialized skills (n=389)	Common skills
<ul style="list-style-type: none"> <li>• Power Tool Operation</li> <li>• Aerial Lift Operation</li> <li>• Power Line Installation</li> <li>• Substation Switching</li> <li>• Equipment Repair</li> <li>• Electrical Transmission Restoration</li> </ul>	<ul style="list-style-type: none"> <li>• Operations</li> <li>• Lifting Ability</li> <li>• Leadership</li> <li>• Planning</li> <li>• Record Keeping</li> <li>• Communication Skills</li> </ul>

Source: Lightcast 2022.4

Exhibit 8 displays the minimum advertised education requirements for the electrical line worker occupational group. According to the Bureau of Labor Statistics, between 48% and 49% of incumbent workers in this field hold a community college level of educational attainment, "some college, no degree," and an "associate degree." Most employers listing a minimum education level requested a high school diploma or GED.

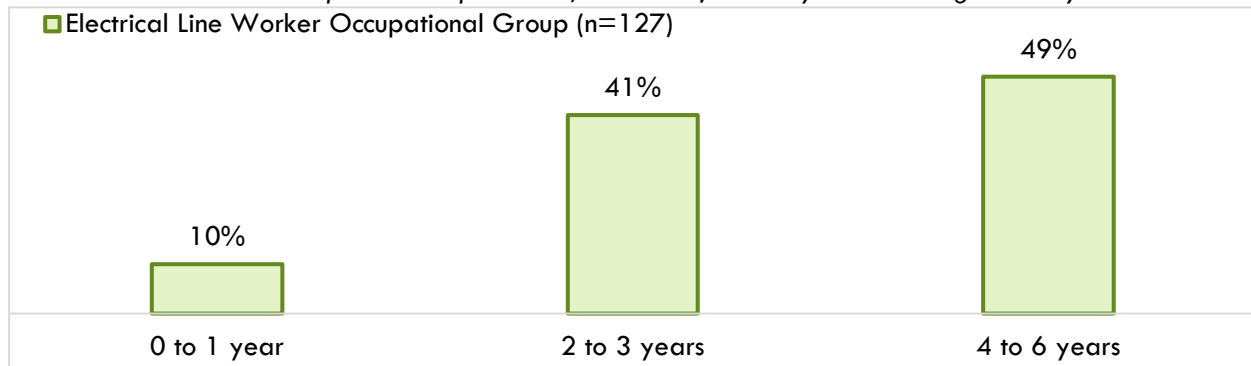
Exhibit 8. Minimum advertised education requirements, California, February 2022 through January 2023



Source: Lightcast 2022.4

Exhibit 9 displays the real-time work experience requirements from employer job ads for the electrical line worker occupational group. The electrical and electronics repairers, powerhouse, substation, and relay occupation typically requires workers to have less than five years of previous work experience. A large share of employers, 75%, did not list a work experience requirement. Of the job ads with experience requirements listed, approximately 49% sought candidates with four to six years of previous work experience, while 41% of employers sought candidates with two to three years of previous work experience.

Exhibit 9. Real-time work experience requirements, California, February 2022 through January 2023



Source: Lightcast 2022.4

## Student Completions and Programs Outcomes

Two regional community colleges currently offer electrical systems and power transmission (TOP 0934.40) programs, issuing an average of 61 awards annually over the last three academic years, 2019-2022. Program completion and student outcome methodologies can be found in the appendix.

Exhibit 10: Annual average community college awards for electrical systems and power transmission programs, Inland Empire/Desert Region, Academic Years 2019-2022

TOP 0934.40 – Electrical Systems and Power Transmission (Local Program Title)	Academic Year 2019-20	Academic Year 2020-21	Academic Year 2021-22	Total CC Annual Average Awards, Academic Years 2019-22
<b>Chaffey</b> (Industrial Electrical Technology/Industrial Electrical Technology Level 1,2,3)				<b>44</b>
Associate Degree	8	6	16	10
Certificate 16 < 30 semester units	35	12	14	20
Certificate 30 < 60 semester units	10	10	19	13
Certificate 6 < 18 semester units	2	1	0	1
<b>San Bernardino Valley</b> (Electric Power Technology/General Electrician/Green Technician)				<b>17</b>
Associate Degree	3	2	6	4
Certificate 30 < 60 semester units	6	2	17	8
Certificate 6 < 18 semester units	5	2	8	5
<b>Total</b>	<b>69</b>	<b>35</b>	<b>80</b>	<b>61</b>

Source: MIS Data Mart, COCI

California program outcome data may provide useful insight into the likelihood of success for the proposed program. Community college student outcome information based on the selected TOP code and region is provided in Exhibit 11.

Exhibit 11: 0934.40 – Electrical systems and power transmission strong workforce program outcomes, Inland Empire/Desert Region, Academic Year 2019-2020 (Unless Noted)

Strong Workforce Program Metrics: 0934.40 – Electrical Systems and Power Transmission	Inland Empire/Desert Region	California
Unduplicated count of enrolled students (2020-21)	258	1,427
Completed 9+ career education units in one year (2020-21)	40%	31%
Students who completed a noncredit CTE or workforce preparation course (2020-21)	-	39%
Students who earned a degree, certificate, or attained apprenticeship (2020-21)	-	29
Job closely related to the field of study (2018-19)	73%	84%
Median annual earnings (all exiters)	\$51,904	\$61,152
Median change in earnings (all exiters)	23%	54%
Attained a living wage (completers and skills-builders)	73%	71%

Sources: LaunchBoard Community College Pipeline and Strong Workforce Program Metrics

Other postsecondary institutions in the region may utilize the electrical and power transmission installation/installer, general (CIP 46.0301) program code for programs related to electrical line workers. Over the last three academic years, other postsecondary education institutions in the region did not issue awards under this program code. The following program description for electrical and power transmission installation/installer general programs may be helpful for program development.

*A program that generally prepares individuals to apply technical knowledge and skills to install indoor and outdoor residential, commercial, and industrial electrical systems, and associated power transmission lines. Includes instruction in electricity, safety procedures, wiring, insulation and grounding, schematic blueprint interpretation, equipment operation and maintenance, and applicable codes and standards (NCES, 2023).*

## Summary of Findings

The knowledge, skills, and abilities trained by electrical systems and power transmission (TOP 0934.40) programs prepare students for employment in two community college-level occupations. These occupations are projected to have 158 annual job openings despite employment remaining flat through 2026 in the region. The 10<sup>th</sup> percentile earnings for these occupations are between \$26.87 and \$38.28 per hour, above the living wage standard, indicating that at least 90% of workers in the field earn a living wage. Online job ad salary information confirms the strong wages associated with these occupations, with employers indicating they were willing to pay this occupational group \$110,000 annually or \$52.89 per hour.

Regional community colleges issued 61 awards annually in electrical systems and power transmission programs over the last three academic years, 2019-2022. Other postsecondary education institutions in the region have not issued awards related to electrical line workers over the last three academic years.

The Centers of Excellence recommends expanding programs related to electrical line workers to meet the regional demand for more workers. Colleges considering this program should partner with relevant employers and confirm their demand for electrical line worker workers and the skills needed for students to secure work in this field shortly after exiting the program.

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February 2023



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## Appendix: Occupation definitions, sample job titles, five-year projections, and earnings for electrical line worker occupations

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

#### **Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)**

Inspect, test, repair, or maintain electrical equipment in generating stations, substations, and in-service relays.

**Sample job titles:** Electrical and Instrumentation Technician (E and I Technician), Electrical Technician, Instrument and Control Technician (I and C Technician), Instrumentation and Control Technician (I and C Technician), Relay Technician, Substation Electrician, Substation Mechanic, Substation Technician, Substation Wireman, Wireman

*Entry-Level Educational Requirement: Postsecondary nondegree award*

*Training Requirement: Between one- and twelve months of on-the-job training*

*Work Experience: Less than five years*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 48%*

#### **Electrical Power-Line Installers and Repairers (49-9051)**

Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers.

**Sample job titles:** Class Gloving Electrical Lineman, Class Rubber Gloving Lineman, Electrical Lineman, Electrical Lineworker, Lineworker, Power Lineman, Power Lineman Technician, Service Man, Third Step Lineman, Troublemán

*Entry-Level Educational Requirement: High school diploma or equivalent*

*Training Requirement: More than twelve months of on-the-job training*

*Work Experience: None*

*Percentage of incumbent workers with a Community College Award or Some Postsecondary Coursework: 49%*

## Appendix: Methodology

Exhibit 10 displays the average annual California Community College (CCC) awards conferred during the three academic years between 2019 and 2022 from the California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart. Awards are the combined total of associate degrees and certificates issued during the timeframe, divided by three in this case to calculate an annual average. This is done to minimize the effect of atypical variations that might be present in a single year.

Community college student outcome information is from LaunchBoard and based on the selected TOP code and region. These metrics are based on records submitted to the California Community Colleges Chancellor's Office Management Information Systems (MIS) by community colleges, which come from self-reported student information from CCC Apply and the National Student Clearinghouse. Employment and earnings metrics are sourced from California's Employment Development Department's Unemployment Insurance database. When available, outcomes for completers are reported to demonstrate the impact that earning a degree or certificate can have on employment and earnings. For more information on the types of students included for each metric, please see the web link for LaunchBoard's Strong Workforce Program Metrics Data Element Dictionary in the References section (LaunchBoard, 2023a). Finally, employment in a job closely related to the field of study comes from self-reported student responses on the CTE Employment Outcomes Survey (CTEOS) administered by Santa Rosa Junior College (LaunchBoard, 2023a).

Job ad data is limited to the information provided by employers and the ability of artificial intelligence search engines to identify this information. Additionally, preliminary calculations by Georgetown Center on Education and the Workforce found that "just 30 to 40 percent of openings for candidates with some college or an associate degree, and only 40 to 60 percent of openings for high school diploma holders appear online" (Carnevale et al., 2014). Online job ads often do not reveal employers' hiring intentions; it is unknown if employers plan to hire one or multiple workers from a single online job ad or collect resumes for future hiring needs. A closed job ad may not be the result of a hired worker.

Table 1. 2021 to 2026 job growth, wages, entry-level education, training, and work experience required for the electrical line worker occupational group in the Inland Empire/Desert Region (Riverside and San Bernardino Counties combined)

Occupation	2021 Jobs	5-Year Change	5-Year % Change	Annual Openings (New + Replacement Jobs)	Entry-Experienced Hourly Wage (10 <sup>th</sup> to 90 <sup>th</sup> percentile)	Median Hourly Wage (50 <sup>th</sup> percentile)	Average Annual Earnings	Entry-Level Education & On-The-Job-Training	Work Experience Required
Electrical Power-Line Installers and Repairers (49-9051)	1,407	16	1%	131	\$26.87 to \$65.63	\$47.71	\$95,500	High school diploma or equivalent & More than 12 months	None
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	357	(11)	(3%)	27	\$38.28 to \$62.09	\$49.64	\$109,800	Postsecondary nondegree award & 1-12 months	Less than five years
<b>Total</b>	<b>1,764</b>	<b>5</b>	<b>0%</b>	<b>158</b>	-	-	-	-	-

Source: Lightcast 2022.4