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Labor Market Analysis

Electrical Safety Certificate



Prepared by Central Valley/Mother Lode Center of Excellence



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Summary

The Central Valley/Mother Lode Center of Excellence developed this report for Fresno City College to determine whether there is demand in the local labor market that is not being met by the supply from postsecondary programs. This report summarizes labor market demand, wages, skills, and postsecondary supply for:

- First-Line Supervisors of Mechanics, Installers, and Repairers (SOC 49-1011)
- Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (SOC 49-2095)
- Electrical Power-Line Installers and Repairers (SOC 49-9051)

Key Findings

- **Occupational Demand** — Occupations related to *Electrical Safety* have a labor market demand of 490 annual job openings in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. Between 2022 and 2027, *First-Line Supervisors of Mechanics, Installers, and Repairers* are projected to have the most demand with 402 annual job openings.
- **Wages** — Average entry-level earnings of \$36.43/hour for *Electrical Safety*-related occupations are higher than the living wage in the SCV/SML subregion. *Electrical Power-Line Installers and Repairers* earn the highest entry-level wage, \$39.64/hour.
- **Employers and Job Titles** — Employers in the SCV/SML subregion include State of California, PG&E, and Southern California Edison. The most common job title is Maintenance Supervisor.
- **Skills** — The top baseline skill is communication; the top specialized skill is preventive maintenance; and the top software skill is Microsoft Office.
- **Education** — A high school diploma or equivalent is typically required for *First-Line Supervisors of Mechanics, Installers, and Repairers* and *Electrical Power-Line Installers and Repairers*; while a postsecondary nondegree award is typically required for *Electrical and Electronics Repairers, Powerhouse, Substation, and Relay*.
- **Supply and Demand Analysis** — Based on 490 annual openings (i.e., demand) and 196 postsecondary awards conferred (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 294 workers in the SCV/SML subregion. In the CVML region, 262 awards were conferred suggesting an undersupply of 514 workers (based on 776 annual openings in the CVML region).

Recommendation

Based on a comparison of demand and supply, there is an undersupply of trained workers in the SCV/SML subregion and the CVML region. The Center of Excellence recommends that Fresno City College work with the regional directors, the college's advisory board, and local industry in the creation or expansion of programs to address the shortage of workers.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide Fresno City College with labor market information for *Electrical Safety-related* occupations. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. Analysis of the program and occupational data related to *Electrical Safety* is included in the report. The Standard Occupational Classification (SOC) System codes and occupational titles used in this report from the Bureau of Labor Statistics and O*NET OnLine are shown below.

First-Line Supervisors of Mechanics, Installers, and Repairers (SOC 49-1011)

- **Job description:** Directly supervise and coordinate the activities of mechanics, installers, and repairers. May also advise customers on recommended services. Excludes team or work leaders.
- **Knowledge:** Customer and Personal Service, English Language, Administration and Management, Mechanical, Administrative
- **Skills:** Monitoring, Management of Personnel Resources, Coordination, Critical Thinking, Judgment and Decision Making

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

- **Job description:** Inspect, test, repair, or maintain electrical equipment in generating stations, substations, and in-service relays.
- **Knowledge:** Mechanical, Engineering and Technology, Mathematics, Public Safety and Security, English Language
- **Skills:** Critical Thinking, Equipment Maintenance, Repairing, Troubleshooting, Reading Comprehension

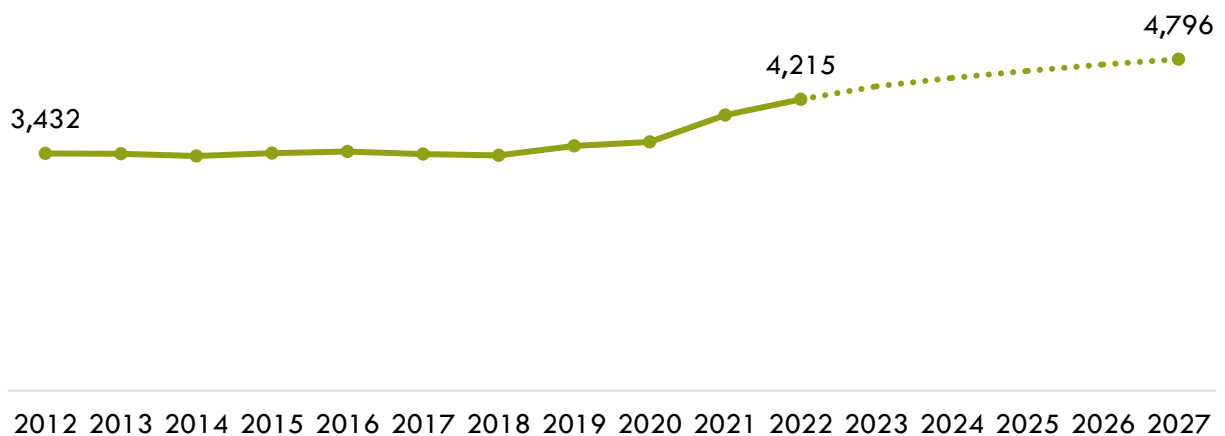
Electrical Power-Line Installers and Repairers (SOC 49-9051)

- **Job description:** Install or repair cables or wires used in electrical power or distribution systems. May erect poles and light or heavy duty transmission towers.
- **Knowledge:** Building and Construction, English Language, Education and Training, Public Safety and Security, Transportation
- **Skills:** Active Listening, Troubleshooting, Monitoring, Operation and Control, Operations Monitoring

Employment

Exhibit 1a shows employment trends for *Electrical Safety*-related occupations in the SCV/SML subregion. Between 2022 to 2027, the number of jobs for occupations related to *Electrical Safety* is projected to increase by 581 – growth of 14%.

Exhibit 1a. Historical employment and projected occupational demand for occupations related to *Electrical Safety* in the SCV/SML subregion, 2012-2027



Occupations related to *Electrical Safety* in the SCV/SML subregion employed 4,215 workers in 2022 (Exhibit 1b). *First-Line Supervisors of Mechanics, Installers, and Repairers* are projected to have the largest annual openings, 402.

Exhibit 1b. Current employment and projected occupational demand for occupations related to *Electrical Safety* in the SCV/SML subregion, 2022-2027

Occupation	2022 Jobs	2027 Jobs	5-Year Change	5-Year % Change	Annual Openings
First-Line Supervisors of Mechanics, Installers, and Repairers	3,452	3,946	495	14%	402
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	89	114	25	28%	14
Electrical Power-Line Installers and Repairers	674	736	61	9%	74
TOTAL	4,215	4,796	581	14%	490

Wages

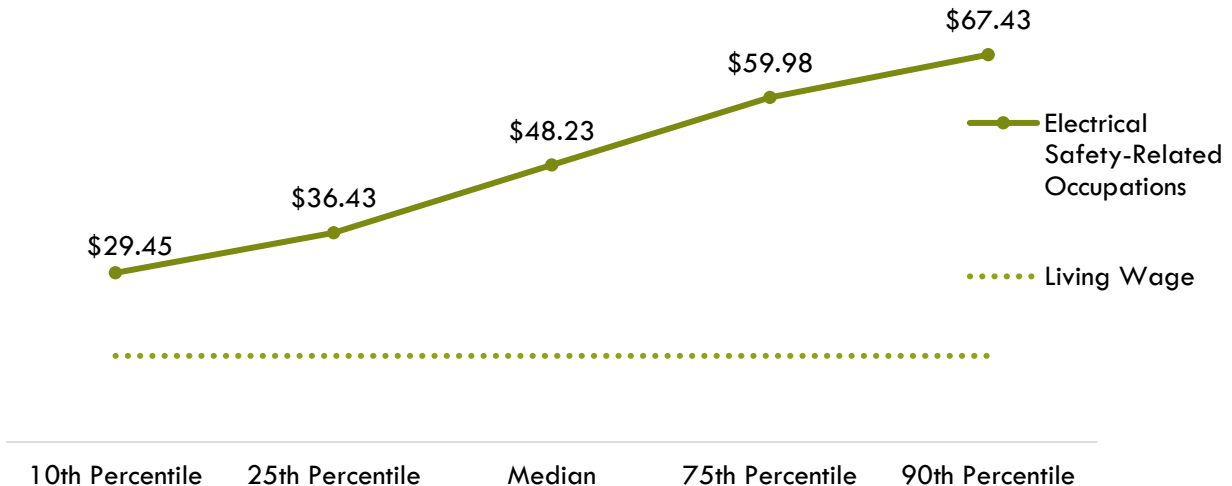
Exhibit 2a shows the hourly wages for the three occupations studied in this report. Of the three occupations studied in this report, *Electrical Power-Line Installers and Repairers* have the highest entry-level wage, \$39.64/hour.¹

Exhibit 2a. Hourly wages for occupations related to *Electrical Safety* in the SCV/SML subregion.

Occupation	25 th Percentile Hourly Earnings	Median Hourly Earnings	75 th Percentile Hourly Earnings
First-Line Supervisors of Mechanics, Installers, and Repairers	\$30.54	\$39.24	\$49.37
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	\$39.10	\$50.77	\$61.39
Electrical Power-Line Installers and Repairers	\$39.64	\$54.67	\$69.18

Exhibit 2b shows the average hourly wages for *Electrical Safety-related* occupations; all five average wages are above the living wage for the SCV/SML subregion.

Exhibit 2b. Average hourly wages for occupations related to *Electrical Safety* in the SCV/SML subregion



¹ Note: 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, which may be obtained through long-term employment or extra training, etc.

Job Postings

There were 1,025 unique job postings for occupations related to *Electrical Safety* in the SCV/SML subregion from September 2023 to August 2024.²

Top Employers

The employers with the most job postings are listed in Exhibit 3. The top employers in online job postings were State of California, PG&E, and Southern California Edison.

Exhibit 3. Top employers

Employer
State of California
PG&E
Southern California Edison
Lockheed Martin
Kanaan Communications
CBRE
UtiliQuest
GPAC

Top Job Titles

Exhibit 4 shows the most common job titles for the *Electrical Safety* occupations in the SCV/SML subregion.

Exhibit 4. Top job titles

Job Title
Maintenance Supervisors/Managers
Maintenance Planners
Journeyman Linemen
Utility Locators
Maintenance Leads
Maintenance Coordinators
Maintenance Workers
Service Managers
Installers
Installation Technicians

² Other than occupational titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Salaries

Exhibit 5 shows the “Market Salaries” for the three *Electrical Safety* occupations. These are calculated by Lightcast using a machine learning model built from millions of job postings every year. This accounts for adjustments based on location, industry, skills, experience, education, among other variables.

Exhibit 5. Market salaries

Market Salary	Job Postings
\$47,999 or less	90
\$48,000-\$55,999	73
\$56,000-\$63,999	62
\$64,000-\$71,999	67
\$72,000-\$79,999	77
\$80,000-\$87,999	76
\$88,000-\$95,999	79
\$96,000-\$103,999	44
\$104,000-\$111,999	47
\$112,000+	121

Education

Of the 1,025 unique job postings, 692 listed a minimum educational requirement for the position being filled. Among those, 46% requested a high school diploma or GED, 14% requested an associate degree, and 36% requested a bachelor’s degree (Exhibit 6).

Exhibit 6. Education levels requested in job postings

Education Level	Job Postings	% of Job Postings
High school or GED	318	46%
Associate degree	96	14%
Bachelor's degree	248	36%
Master's degree or higher	30	4%

Baseline, Specialized, and Software Skills

Exhibit 7 depicts the top baseline, specialized, and software skills in job postings. The most requested baseline skill is communication. The most requested specialized skill is preventive maintenance. The most requested software skill is Microsoft Office.

Exhibit 7. In-demand baseline, specialized, and software skills

Baseline Skills	Specialized Skills	Software Skills
Communication	Preventive Maintenance	Microsoft Office
Management	Construction	Microsoft Excel
Operations	Plumbing	Microsoft Outlook
Leadership	HVAC	Microsoft PowerPoint
Customer Service	Food Safety and Sanitation	SAP Applications

Education, Work Experience, & Training

A high school diploma or equivalent is typically required for *First-Line Supervisors of Mechanics, Installers, and Repairers* and *Electrical Power-Line Installers and Repairers*; while a postsecondary nondegree award is typically required for *Electrical and Electronics Repairers, Powerhouse, Substation, and Relay* (Exhibit 8).

Exhibit 8. Education, work experience, training, and Current Population Survey results for occupations related to *Electrical Safety*³

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training
First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	Less than 5 years	None
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	Postsecondary nondegree award	Less than 5 years	Moderate-term on-the-job training
Electrical Power-Line Installers and Repairers	High school diploma or equivalent	None	Long-term on-the-job training

³ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Supply

An analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) for the last three program years shows that, on average, 196 awards were conferred in the SCV/SML subregion (Exhibits 9 and 10).

Exhibit 9. TOP and CIP codes

TOP Titles	CIP Titles
0934.00 – Electronics and Electric Technology	46.0301 – Electrical and Power Transmission Installation/Installer, General
0934.40 – Electrical Systems and Power Transmission (No Supply)	46.0303 – Lineworker
0946.10 – Energy Systems Technology (No Supply)	47.0617 – High Performance and Custom Engine Technician/Mechanic
0952.20 – Electrical	47.0701 – Energy Systems Installation and Repair Technology/Technician

Exhibit 10. Community College Awards in the CVML region

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Award Average
0934.00	Electronics and Electric Technology	Merced	-	2	1	1
		San Joaquin Delta	1	1	1	1
		NCV/NML Subtotal	1	3	2	2
		Bakersfield	34	36	26	32
		Fresno City	85	83	116	95
		SCV/SML Subtotal	119	119	142	127
Supply Subtotal/Average			120	122	144	129

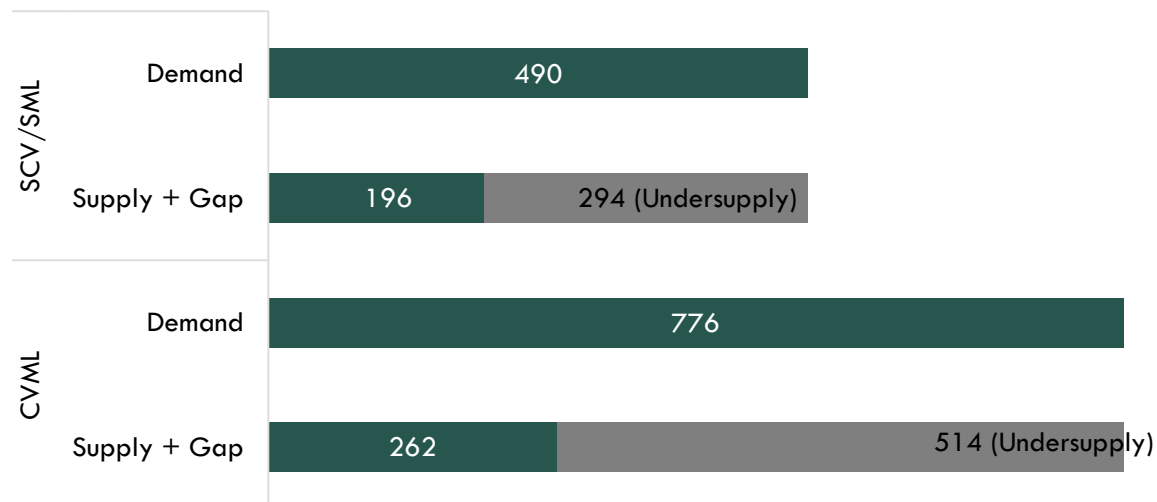
TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Award Average
0952.20	Electrical	Merced	31	12	28	24
		Modesto	4	1	14	6
		San Joaquin Delta	21	56	24	34
		NCV/NML Subtotal	56	69	66	64
		Bakersfield	-	41	4	15
		Sequoias	78	41	44	54
		SCV/SML Subtotal	78	82	48	69
Supply Subtotal/Average			134	151	114	133
CVML Supply Total/Average			254	273	258	262

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for the three occupations. Over the past 3 years, there were no awards conferred by institutions in the related Classification of Instructional Programs (CIP) Codes:

- Electrical and Power Transmission Installation/Installer, General (46.0301)
- Lineworker (46.0303)
- High Performance and Custom Engine Technician/Mechanic (47.0617)
- Energy Systems Installation and Repair Technology/Technician (47.0701)

There is an undersupply of 294 *Electrical Safety-related* workers in the SCV/SML subregion and an undersupply of 514 workers in the CVML region (Exhibit 11).

Exhibit 11. Workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the SCV/SML subregion and CVML region



Recommendation

This report suggests there is a shortage of 294 workers in the SCV/SML subregion and a shortage of 514 workers in the CVML region for *Electrical Safety-related* occupations. Based on these findings, it is recommended that Fresno City College work with the regional directors, the college's advisory board, and local industry in the creation or expansion of programs to address the shortage of workers in the region.

Appendix: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (Lightcast). Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level Lightcast earnings by industry: economicmodeling.com.
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm .
LaunchBoard	Chancellor's LaunchBoard. https://www.calpassplus.org/LaunchBoard/SWP.aspx
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Lightcast: https://lightcast.io/ .
Additional Education Requirements/Employer Preferences	The O*NET Job Zone database includes over 900 as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org .

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (LIGHTCAST) formula that includes historical employment and economic indicators along with national, state and local trends.

LaunchBoard (Attained the Living Wage): Among SWP students who exited college and did not transfer to any postsecondary institution, the proportion who attained the district county living wage for a single adult measured immediately following academic year of exit.

LaunchBoard (Median Annual Earnings): Among SWP students who exited the community college system and who did not transfer to any postsecondary institution, median earnings following the academic year of exit.

LaunchBoard (Median Change in Earnings): Among SWP students who exited and who did not transfer to any postsecondary institution, median change in earnings between the second quarter prior to the beginning of the academic year of entry and the second quarter after the end of the academic year of exit from the last college attended.

LaunchBoard (Job Closely Related to Field of Study): Among SWP students who responded to the CTE Outcomes Survey and did not transfer to any postsecondary institution, the proportion who reported that they are working in a job very closely or closely related to their field of study.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.