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Labor Market Analysis

Electrical Technology



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Prepared by the Central Valley/Mother Lode Center of Excellence

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COVID-19 Statement: This report includes employment projection data by Emsi. Emsi’s projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

If for any reason this document is not accessible or if you have specific needs for readability, please contact us and we will do our utmost to accommodate you with a modified version. To make a request, contact Nora Seronello by phone at (209) 575-6894 or by email seronellon@mjc.edu.

Summary

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for Electrical Technology. Three occupations related to Electrical Technology were identified for College of the Sequoias:

- 47-2111, Electricians
- 49-1011, First-Line Supervisors of Mechanics, Installers, and Repairers
- 49-9051, Electrical Power-Line Installers and Repairers

Key findings:

- **Occupational demand** — Nearly 8,110 workers were employed in jobs related to Electrical Technology in 2020 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is electricians with 4,435 workers, a projected growth rate of 10% over the next five years, and 569 annual openings.
- **Wages** — First-line supervisors of mechanics, installers, and repairers earn the highest entry-level wage, \$28.62/hour in the subregion.
- **Employers** — Employers with the most job postings in the subregion are state of California, Pacific Gas and Electric Company, and Quinn Company.
- **Occupational titles** — The most common occupational title in job postings in the subregion is First-Line Supervisors of Mechanics, Installers, and Repairers. The most common job title is Electrician.
- **Skills and certifications** — The top baseline skill is communication skills, the top specialized skill is repair, and the top software skill is Microsoft Excel. The most in-demand certification is an electrician certification.
- **Education** — A high school diploma or equivalent is typically required for the three occupations.
- **Supply** — Analysis of postsecondary completions shows that on average 198 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 804 trained workers in the subregion and 1,358 workers in the region. The Center of Excellence recommends that College of the Sequoias work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Electrical Technology workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by College of the Sequoias to provide labor market information for Electrical Technology. 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. The average living wage for a single adult in the SCV/SML subregion is \$11.91/hour.¹ Analysis of the program and occupational data related to Electrical Technology resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 47-2111, Electricians
- 49-1011, First-Line Supervisors of Mechanics, Installers, and Repairers
- 49-9051, Electrical Power-Line Installers and Repairers

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O*NET OnLine are shown below.

Electricians

Job Description: Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.

Knowledge: Building and Construction, Mechanical, Mathematics, Design, English Language

Skills: Troubleshooting, Repairing, Active Listening, Critical Thinking, Judgment and Decision Making

First-Line Supervisors of Mechanics, Installers, and Repairers

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: Administration and Management, Mechanical, Customer and Personal Service, Administrative, English Language

Skills: Monitoring, Management of Personnel Resources, Coordination, Critical Thinking, Judgment and Decision Making

Electrical Power-Line Installers and Repairers

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, Operation Monitoring

¹ The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Occupational Demand

The SCV/SML subregion employed 8,108 workers in Electrical Technology occupations in 2020 (Exhibit 1). The largest occupation is electricians with 4,435 workers. This occupation is projected to grow by 10% over the next five years and has the greatest number of projected annual openings, 569.

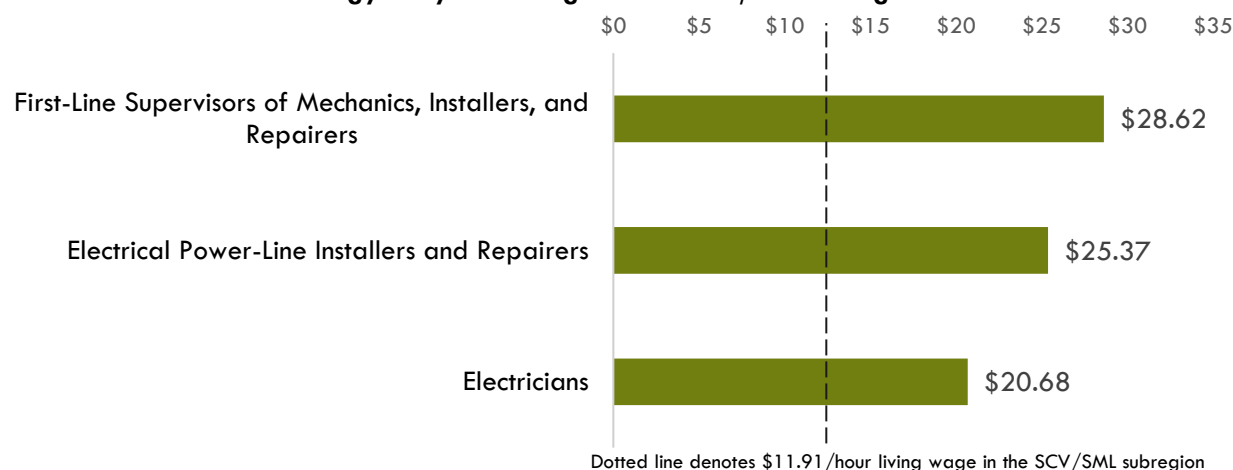
Exhibit 1. Electrical Technology employment and occupational projections in the SCV/SML subregion

Occupation	2020 Jobs	2025 Jobs	5-Year Change	5-Year % Change	Annual Openings
Electricians	4,435	4,875	440	10%	569
First-Line Supervisors of Mechanics, Installers, and Repairers	2,881	3,106	225	8%	308
Electrical Power-Line Installers and Repairers	792	771	(20)	(3%)	74
TOTAL	8,108	8,752	645	8%	951

Wages

Exhibit 2 shows the entry-level hourly wages of the Electrical Technology occupations. First-line supervisors of mechanics, installers, and repairers earn the highest entry-level wage, \$28.62/hour in the subregion².

Exhibit 2. Electrical Technology entry-level wages in the SCV/SML subregion



Job Postings

There were 995 job postings for the three occupations in the SCV/SML subregion from January 2022 to June 2022.³ The employers with the most job postings are listed in Exhibit 3.

² Entry-level wages are derived from the 25th percentile.

³ Other than occupation 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.

Exhibit 3. Top employers of Electrical Technology by number of job postings

Employer	Job Postings	% Job Postings
state of california	32	4%
Pacific Gas and Electric Company	19	3%
Quinn Company	16	2%
Transdevna	12	2%
Mammoth Mountain Ski Area	11	2%
Rio Tinto	8	1%
California Public Utilities Commission	7	1%
Foster Farms	7	1%
Naval Facilities Engineering Command	7	1%
PepsiCo Inc.	7	1%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across two O*NET OnLine occupations. The occupational title First-Line Supervisors of Mechanics, Installers, and Repairers is listed in 617 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Electrician in 88 job postings, Maintenance Supervisor in 81 job postings, and Maintenance Manager in 56 job postings.

Exhibit 4. Top occupational titles in job postings for Electrical Technology

Occupational Title	Job Postings	% of Job Postings
First-Line Supervisors of Mechanics, Installers, and Repairers	617	62%
Electricians	378	38%

Salaries

Exhibit 5 shows the “Market Salaries” for Electrical Technology occupations. These are calculated by Burning Glass using a machine learning model built off of millions of job postings every year. This accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 5. Salaries for Electrical Technology occupations

Market Salary Percentile	Salary Amount
10th Percentile	\$36,697
25th Percentile	\$44,216
50th Percentile	\$54,432
75th Percentile	\$65,600
90th Percentile	\$76,482

Education

Of the 995 job postings, 495 listed an education level preferred for the positions being filled. Among those, 72% requested high school or vocational training, 37% requested bachelor’s degree and 15%

requested an associate degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

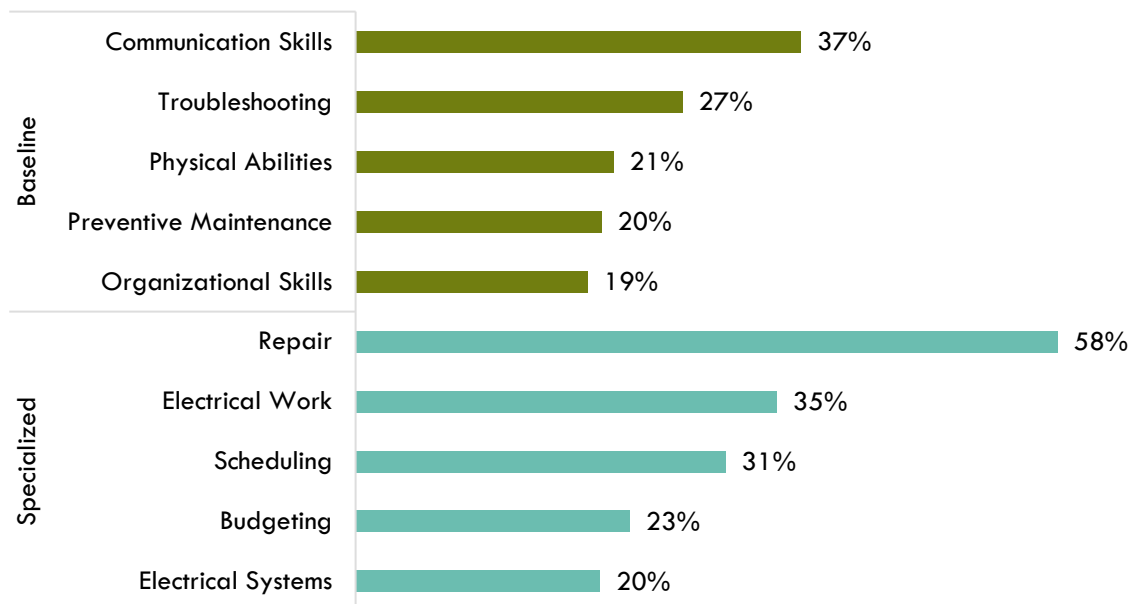
Exhibit 6. Education levels requested in job postings for Electrical Technology

Education Level	Job Postings	% of Job Postings
High school or vocational training	354	72%
Bachelor's degree	185	37%
Associate's degree	74	15%
Master's degree	15	3%
Doctoral degree	2	0%

Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication skills, 37% of job postings, troubleshooting, 27%, and physical abilities, 21%. The top three specialized skills are repair, 58% of job postings, electrical work, 35%, and scheduling, 31%.

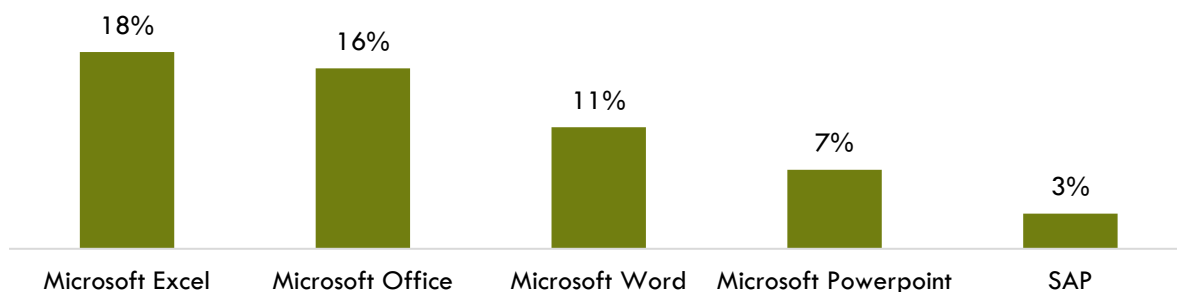
Exhibit 7. In-demand Electrical Technology baseline and specialized skills



Software Skills

Analysis also included the software skills most in demand by employers. Microsoft Excel and Office were the top two software skills identified in job postings (Exhibit 8).

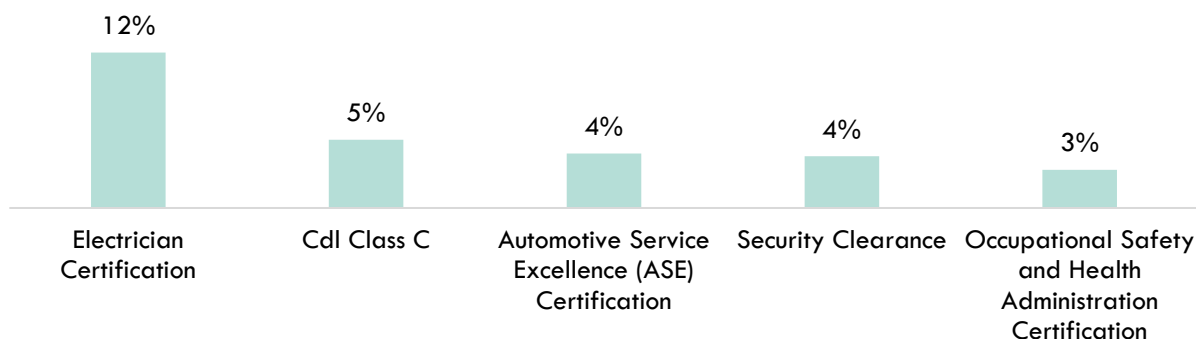
Exhibit 8. In-demand Electrical Technology software skills



Certifications

Of the 995 job postings, 472 contained certification data. Among those, 13% indicated a need for an electrician certification. The next top certifications are Cdl Class C and Automotive Service Excellence (ASE) Certification (Exhibit 9).

Exhibit 9. Top Electrical Technology certifications requested in job postings



Education, Work Experience & Training

A high school diploma or equivalent is typically required for the two occupations (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for Electrical Technology occupations⁴

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Electricians	High school diploma or equivalent	None	Apprenticeship	45.8%
First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	Less than 5 years	None	41.7%
Electrical Power-Line Installers and Repairers	High school diploma or equivalent	None	Long-term	47.4%

⁴ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Supply

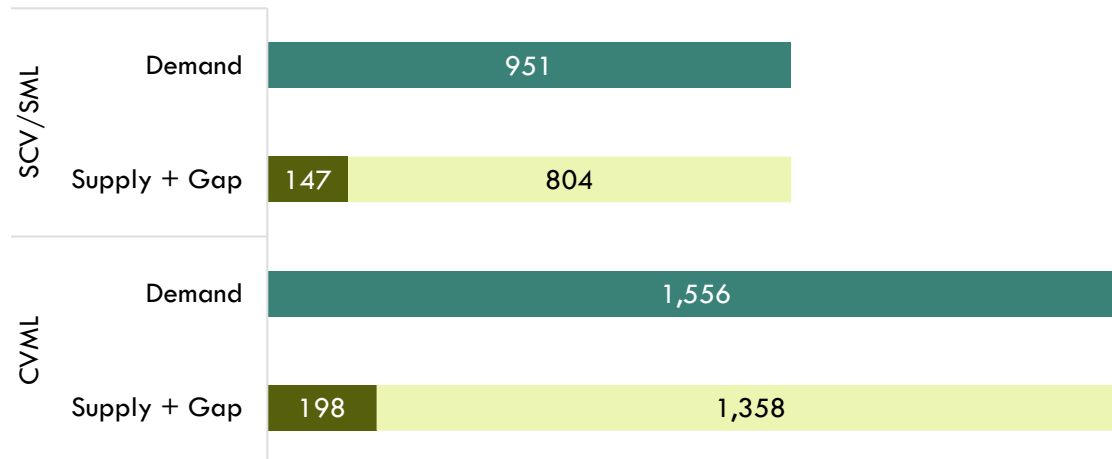
Analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) included the TOP and CIP codes and titles: 095220 – Electrical and 46.0302 - Electrician. Analysis of the last three years of data shows that, on average, 198 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11).

Exhibit 11. Postsecondary supply for Electrical Technology occupations in the region

TOP/ CIP Code- Title	College	Associate Degree	Award < 2 Academic Years	Certificate 12 < 18 Semester Units	Certificate 16 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 8 < 16 Semester Units	Subtotal
095220 - Electrical	Bakersfield		2			22		24
	Merced		4			20		25
	Modesto					2		2
	San Joaquin Delta		9		8	8		25
	Sequoias				16	1	2	19
46.0302 - Electrician	Milan Institute-Bakersfield West			33				33
	San Joaquin Valley College-Visalia		7	64				72
TOTAL		22	97	16	8	53	2	198

There is an undersupply of 804 Electrical Technology workers in the SCV/SML subregion and 1,358 workers in the region (Exhibit 12).

Exhibit 12. Electrical Technology workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the SCV/SML subregion and region



Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor's Cal-PASS Plus LaunchBoard for the TOP code related to Electrical Technology. Of note, 18 welding technology students received a degree or certificate or attained apprenticeship journey status; 75% of students obtained a job closely related to their field of study; 75% had a median change in earnings; and 80% of students attained a living wage.

Exhibit 13. Regional metrics for the TOP code related to Electrical Technology

Metric	Electrical 095220
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	18
Number of Students Who Transferred	*
Job Closely Related to Field of Study	75%
Median Change in Earnings	75%
Attained a Living Wage	80%
* denotes data not available.	

Conclusion

The entry-level wages of the three occupations exceed the SCV/SML subregion's average living wage. There were 995 job postings in the past six months for occupations related to Electrical Technology in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication skills, and the top specialized skill is repair.
- The top software skill is Microsoft Excel.
- The top certification is an electrician certification.

There is an undersupply of trained workers, a shortage of 804 in the SCV/SML subregion and 1,358 in the region.

Recommendation

Based on these findings, it is recommended that College of the Sequoias work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Electrical Technology workers in the region.

Appendix A: 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. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI 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 EMSI 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 .
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations 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. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

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.