C·O·E CENTERS OF EXCELLENCE FOR LABOR MARKET RESEARCH

Labor Market Analysis: 0934.40/Electrical Systems and Power Transmission
Power Generation Technician-Electrical (Certificate of Completion)

Los Angeles Center of Excellence, February 2023

Summary

Program Endorsement:	Endorsed: All Criteria Met ☒	Endorsed: Some Criteria Met ☐	Not Endorsed ☐

Program Endorsement Criteria		
Supply Gap:	Yes ☑	No ☐
Living Wage: (Entry-Level, 25th)	Yes ☑	No ☐
Education:	Yes ☑	No ☐
Emerging Occupation(s)		
	Yes ☐	No ☑

The Los Angeles Center of Excellence for Labor Market Research (LA COE) prepared this report to provide regional labor market supply and demand data related to five middle-skill occupations:

- ***Electrical and Electronics Engineering Technologists and Technicians* (17-3023)** Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, adjust, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.[1]
- ***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.[2]
- ***Electrical and 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.[3]
- ***First-Line Supervisors of Mechanics, Installers, and Repairers* (49-1011)** Directly supervise and coordinate the activities of mechanics, installers, and repairers. May also advise customers on recommended services. Excludes team or work leaders.[4]
- ***Power Distributors and Dispatchers* (51-8012)** Coordinate, regulate, or distribute electricity or steam.[5]

[1] Electrical and Electronic Engineering Technologists and Technicians : Occupational Outlook Handbook: : U.S. Bureau of Labor Statistics (bls.gov)
[2] Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (bls.gov)
[3] Electrical Power-Line Installers and Repairers (bls.gov)
[4] First-Line Supervisors of Mechanics, Installers, and Repairers (bls.gov)
[5] Power Distributors and Dispatchers (bls.gov)

Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.[6] This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for these power generation technician occupations in the region. Furthermore, entry-level wages exceed the self-sufficiency standard wage in both Los Angeles and Orange counties, and more than 40% of current workers in the field have completed some college or an associate degree. **Therefore, due to all the criteria being met, the LA COE endorses this proposed program.** Detailed reasons include:

Demand:

- ***Supply Gap Criteria* –** Over the next five years, **2,447 jobs are projected to be available annually** in the region due to new job growth and replacements, **which is more than the three-year average of 979 awards conferred** by educational institutions in the region.
- ***Living Wage Criteria* –** Within Los Angeles County, all five occupations in this report have **entry-level wages <u>above</u> the self-sufficiency standard hourly wage** ($18.10/hour).[7]
- ***Educational Criteria* –** Within the greater LA/OC region, **75% of the annual job openings** for technician occupations related to power generation **typically require a high school diploma or equivalent**
    - However, the national-level educational attainment data indicates **between 48% and 63% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **19 community colleges** in the greater LA/OC region that issue awards related to electrical systems and power generation, conferring an average of **578 awards annually** between 2018 and 2021.
- Between 2017 and 2020, there was an average of **401 awards conferred annually** in related training programs by non-community college institutions throughout the greater LA/OC region.

[6] The COE classifies middle-skill jobs as the following:

- All occupations that require 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.

[7] Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: http://selfsufficiencystandard.org/california.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these power generation technician occupations. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to increase by 4% through 2026. There will be more than 2,400 job openings per year through 2026 due to job growth and replacements.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties[8]

Geography	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	Annual Openings
Los Angeles	16,134	16,726	592	4%	1,711
Orange	6,780	7,061	281	4%	735
Total	**22,914**	**23,787**	**872**	**4%**	**2,447**

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these power generation technician occupations in Los Angeles County as they relate to the county's self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater LA/OC region. Detailed wage information, by county, is included in Appendix A.

Los Angeles County— All five occupations in this report have entry-level wages above the self-sufficiency standard wage for one adult ($18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between $23.82 and $48.59. Experienced workers can expect to earn wages between $37.89 and $62.75, which are higher than the self-sufficiency standard.

Exhibit 2: Hourly Earnings for Occupations in LA County

Occupation	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	$23.82	$29.88	$37.89
First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)	$29.25	$37.75	$48.34
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	$48.59	$50.32	$62.75
Electrical Power-Line Installers and Repairers (49-9051)	$37.13	$49.04	$62.15
Power Distributors and Dispatchers (51-8012)	$39.30	$48.36	$61.23

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

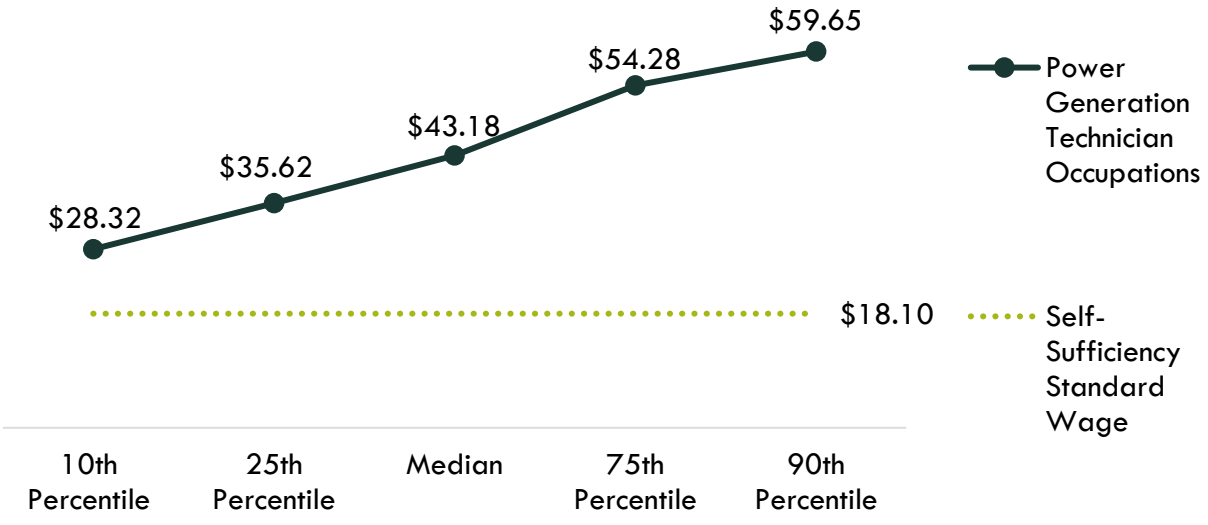
Orange County—All five occupations in this report have entry-level wages above the self-sufficiency standard wage for one adult ($20.63 in Orange County). Typical entry-level hourly wages are in a range between $25.78 and $46.73. Experienced workers can expect to earn wages between $40.15 and $60.70, which are higher than the self-sufficiency standard.

Exhibit 3: Hourly Earnings for Occupations in Orange County

Occupation	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	$25.78	$32.04	$40.15
First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)	$30.81	$39.58	$50.51
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	$46.73	$48.59	$60.70
Electrical Power-Line Installers and Repairers (49-9051)	$36.01	$47.69	$60.47
Power Distributors and Dispatchers (51-8012)	$38.87	$47.82	$60.66

On average, the entry-level earnings for the occupations in this report are $35.62; this is above the living wage for one single adult in Los Angeles County ($18.10). Exhibit 4 shows the average wage for the occupations in this report, from entry-level to experienced workers.

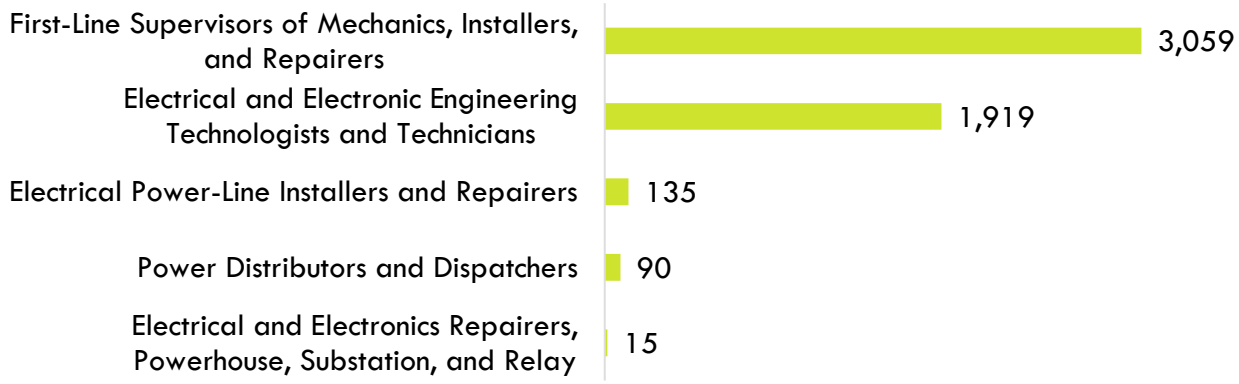
Exhibit 4: Average Hourly Earnings for Power Generation Technician Occupations in LA/OC



Job Postings

There were 5,218 online job postings related to power generation technicians listed in the past 12 months. Exhibit 5 displays the number of job postings by occupation. The majority of job postings (59%) were for *first-line supervisors of mechanics, installers, and repairers*, followed by *electrical and electronic engineering technologists and technicians* (37%) and *electrical power-line installers and repairers* (3%). The highest number of job postings were for maintenance supervisors, maintenance managers, electronics technicians, low voltage technicians, and test technicians. The top skills were plumbing, HVAC, test equipment, electronics, and electrical wiring. The top three employers, by number of job postings, in the region were Aerotek, GPAC (staffing company), and Gulfstream Aerospace.

Exhibit 5: Job postings by occupation (last 12 months)



Educational Attainment

The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the occupations in this report:

- **Associate degree:** *Electrical and electronic engineering technologists and technicians*
- **Postsecondary non-degree award**: *Electrical and electronics repairers, powerhouse, substation, and relay*
- **High school diploma or equivalent:** *First-line supervisors of mechanics, installers, and repairers; Electrical power-line installer and repairers;* and *Power distributors and dispatchers*

In the greater LA/OC region, the majority of annual job openings (75%) typically require a high school diploma or equivalent. However, the national-level educational attainment data indicates between 41% and 63% of workers in the field have completed some college or an associate degree. Of the 49% of power generation technician job postings listing a minimum education requirement in the greater Los Angeles/Orange County region, 80% (2,049) requested high school or vocational training, and 20% (522) requested an associate degree.

Educational Supply

Community College Supply—Exhibit 6 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are: LA Trade-Tech, Santiago Canyon, and Coastline.

Exhibit 6: Regional community college awards (certificates and degrees), 2018-2021

TOP	Program	College	2018-19 Awards	2019-20 Awards	2020-21 Awards	3-Year Average
0934.00	Electronics and Electric Technology	East LA	4	1	2	2
		El Camino	9	8	5	7
		Glendale	1	5	-	2
		LA City	-	4	-	1
		LA Pierce	11	4	17	11
		LA Southwest	-	9	-	3
		LA Valley	25	14	21	20
		Long Beach	55	50	42	49
		Mt San Antonio	42	48	39	43
		Pasadena	27	24	23	25
		Rio Hondo	3	-	1	1
		LA Subtotal	**177**	**167**	**150**	**165**
		Coastline	88	58	53	66
		Irvine	17	37	9	21
		Orange Coast	4	12	12	9
		Saddleback	13	14	22	16
		Santa Ana	5	8	-	4
		OC Subtotal	**127**	**129**	**96**	**117**
Supply Subtotal/Average			**304**	**296**	**246**	**282**
0934.20	Industrial Electronics	LA Valley	-	-	23	8
		LA Subtotal	**-**	**-**	**23**	**8**
Supply Subtotal/Average			**-**	**-**	**23**	**8**
0934.40	Electrical Systems and Power Transmission	Santiago Canyon	166	56	33	85
		LA Subtotal	**166**	**56**	**33**	**85**
Supply Subtotal/Average			**166**	**56**	**33**	**85**
0952.20	Electrical	LA Trade-Tech	132	149	135	139
		LA Subtotal	**132**	**149**	**135**	**139**
		Irvine	15	8	21	15

TOP	Program	College	2018-19 Awards	2019-20 Awards	2020-21 Awards	3-Year Average
		N. Orange Adult	30	2	-	11
		Orange Coast	4	-	-	1
		Santiago Canyon	51	31	33	38
		OC Subtotal	**100**	**41**	**54**	**65**
		Supply Subtotal/Average	**232**	**190**	**189**	**204**
		Supply Total/Average	**702**	**542**	**491**	**578**

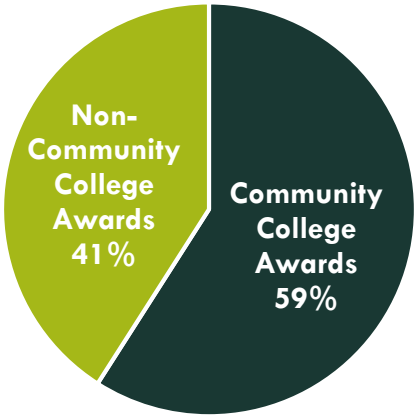
Non-Community College Supply—For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for these power generation technician occupations. Exhibit 7 shows the annual and three-year average number of awards conferred by these institutions in relevant programs. Due to different data collection periods, the most recent three-year period of available data is from 2017 to 2020. Between 2017 and 2020, non-community college institutions in the region conferred an average of 401 awards.

Exhibit 7: Regional non-community college awards, 2017-2020

CIP	Program	Institution	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
15.0399	Electrical/ Electronic Engineering Technologies/ Technicians, Other	Southern California Institute of Technology	1	-	1	1
46.0302	Electrician	Baldwin Park Adult & Community Education	62	93	61	72
		Capstone College	-	-	4	1
		InterCoast Colleges-Santa Ana	25	49	35	36
		InterCoast Colleges-West Covina	54	63	86	68
		Southern California Institute of Technology	231	242	190	221
		United Education Institute-West Covina	-	-	6	2
		Supply Total/Average	**373**	**447**	**383**	**401**

Exhibit 8 shows the proportion of community college awards conferred in LA/OC compared to the number of non-community college awards for the programs in this report. More than half of the awards conferred in these programs are awarded by community colleges in the LA/OC region.

Exhibit 8: Community College Awards Compared to Non-Community College Awards in LA/OC Region, 3-Year Average



Appendix A: Occupational demand and wage data by county

Exhibit 9. Los Angeles County

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	3,387	3,299	(88)	(3%)	363	$23.82	$29.88	$37.89
First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)	10,340	11,020	680	7%	1,135	$29.25	$37.75	$48.34
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	415	396	(19)	(5%)	38	$48.59	$50.32	$62.75
Electrical Power-Line Installers and Repairers (49-9051)	1,827	1,860	33	2%	160	$37.13	$49.04	$62.15
Power Distributors and Dispatchers (51-8012)	165	151	(14)	(8%)	15	$39.30	$48.36	$61.23
Total	**16,134**	**16,726**	**592**	**4%**	**1,711**	**-**	**-**	**-**

Exhibit 10. Orange County

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	1,895	1,893	(2)	(0%)	206	$25.78	$32.04	$40.15
First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)	4,032	4,346	314	8%	453	$30.81	$39.58	$50.51
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	138	122	(17)	(12%)	12	$46.73	$48.59	$60.70
Electrical Power-Line Installers and Repairers (49-9051)	669	660	(9)	(1%)	60	$36.01	$47.69	$60.47
Power Distributors and Dispatchers (51-8012)	46	40	(6)	(13%)	4	$38.87	$47.82	$60.66
Total	**6,780**	**7,061**	**281**	**4%**	**735**	**-**	**-**	**-**

Exhibit 11. Los Angeles and Orange Counties

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Electrical and Electronic Engineering Technologists and Technicians (17-3023)	5,282	5,192	(91)	(2%)	568	Associate degree
First-Line Supervisors of Mechanics, Installers, and Repairers (49-1011)	14,371	15,366	994	7%	1,589	High school diploma or equivalent
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (49-2095)	553	518	(35)	(6%)	50	Postsecondary non-degree award
Electrical Power-Line Installers and Repairers (49-9051)	2,496	2,520	24	1%	220	High school diploma or equivalent
Power Distributors and Dispatchers (51-8012)	211	191	(20)	(9%)	20	High school diploma or equivalent
Total	**22,914**	**23,787**	**872**	**4%**	**2,447**	**-**

Appendix B: Sources

- O*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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