



# Occupations for Low Voltage Electronics & Electrical Technology

## Labor Market Analysis: Imperial County

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December 2018

### Summary

According to available labor market information, there is demand for occupations that could be trained by a *Low Voltage Electronics & Electrical Technology* program. For the purpose of this report, these occupations are referred to as “Low Voltage Occupations.” *Low Voltage Occupations* in Imperial County have a labor market demand of 60 annual job openings. Imperial Valley College (IVC) supplies 25 awards, suggesting that there is a supply gap for this occupation. These occupations’ median earnings are higher than the Self-Sufficiency Standard, suggesting that students who successfully complete a program and obtain employment in a related field may earn a living wage.

The following list summarizes findings from the labor market analysis below for *Low Voltage Occupations*:

- Between 2017 and 2022, *Low Voltage Occupations* are projected to increase by 19 jobs or four percent.
- Employers in Imperial County will need to hire 60 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 54 online job postings per year for *Low Voltage Occupations* in Imperial County. Of the online postings in Imperial County during the same period, there was an average of nine online job postings per year listing “low voltage” as a skill.
- Based on available data, on average, the median hourly earnings for *Low Voltage Occupations* is \$23.70; this is more than the Self-Sufficiency Standard for two adults and two children (school-age) in Imperial County, which is \$13.20 per hour.
- There are seven TOP codes associated with these occupations: Electronics and Electric Technology (093400), Computer Electronics (093410), Industrial Electronics (093420), Electrical Systems and Power Transmission (093440), Instrumentation Technology (093300), Industrial Systems Technology and Maintenance (094500), and Electrical (095220). There are 14 related CIP codes
- According to TOP and CIP data, Imperial Valley College is the only educational institution that supplies the region with awards.

- Comparing labor demand (annual openings) with labor supply suggests that there is a supply gap for these occupations in Imperial County, with 60 annual openings and 25 awards. Comparatively, there are 20,153 annual openings in California and 2,974 awards.
- Between January 1, 2015 and December 31, 2017, the top five employers in Imperial County for these occupations were Schlumberger, Toys R Us, Imperial County, RDO Equipment and Imperial County Office of Education.
- Based on online job postings between January 1, 2015 and December 31, 2017, the top listed educational requirement for *Low Voltage Occupations* is a high school diploma or equivalent.

## Introduction

This report analyzes five occupations that could be trained by a Low Voltage Electronics & Electrical Technology program. The occupations are:

- **Electrical and Electronic Engineering Technicians (SOC<sup>1</sup> 17-3023):** Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.
- **Electronic Home Entertainment Equipment Installers and Repairers (SOC 49-2097):** Repair, adjust, or install audio or television receivers, stereo systems, camcorders, video systems, or other electronic home entertainment equipment.
- **Maintenance and Repair Workers, General (SOC 49-9071):** Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.
- **Security and Fire Alarm Systems Installers (SOC 49-2098):** Install, program, maintain, or repair security or fire alarm wiring and equipment. Ensure that work is in accordance with relevant codes.
- **Engineering Technicians, Except Drafters, All Other (SOC 17-3029):** For this report, all Engineering Technicians, Except Drafters, are also analyzed, including more specific titles such as:
  - **Electrical Engineering Technologists (17-3029.02):** Assist electrical engineers in such activities as process control, electrical power distribution, or instrumentation design. May

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<sup>1</sup> 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](http://bls.gov/soc).

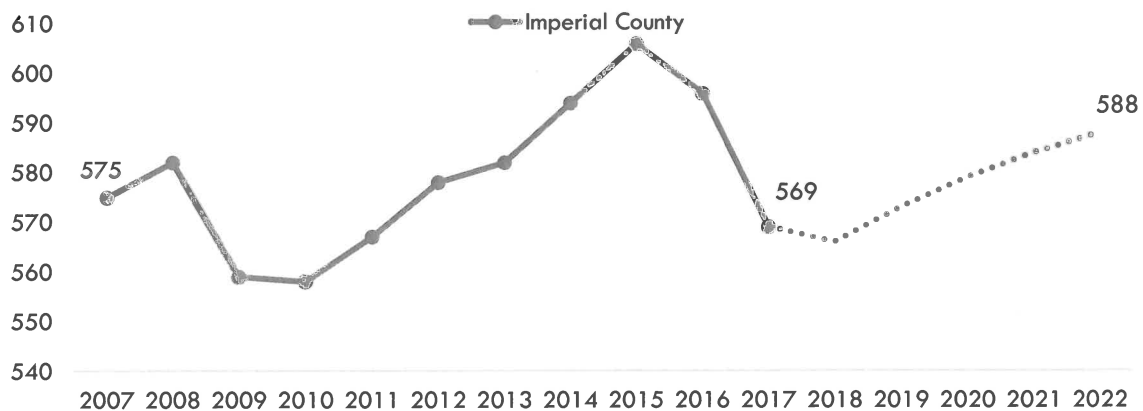
prepare layouts of electrical transmission or distribution systems, supervise the flow of work, estimate project costs, or participate in research studies.

- **Electrical Engineering Technicians (17-3023.03):** Test or modify developmental or operational electrical machinery or electrical control equipment and circuitry in industrial or commercial plants or laboratories. Usually work under direction of engineers or technologists.
- **Electronics Engineering Technologists (17-3029.04):** Assist electronics engineers in such activities as electronics systems and instrumentation design or digital signal processing.

## Projected Occupational Demand

Between 2017 and 2022, *Low Voltage Occupations* are projected to increase by 19 jobs or three percent (Exhibit 1). Employers in Imperial County will need to hire 60 workers annually to fill new jobs and backfill jobs due to attrition such as retirement or turnover.

**Exhibit 1: Number of Jobs for Low Voltage Occupations (2007-2022)<sup>2</sup>**



## Online Job Postings

Between 2010 and 2017, there was an average of 54 online job postings per year for *Low Voltage Occupations* in Imperial County. Of the online postings in Imperial County during the same period, there was an average of nine online job postings per year listing “low voltage” as a skill (Exhibit 2).

<sup>2</sup> Economic Modeling Specialists, Int'l. (EMS). Imperial (6025). 2018.04 Class of Worker. QCEW + Non-QCEW + Self-Employed. 2007-2022.

**Exhibit 2: Number of Online Job Postings for Low Voltage Occupations  
Imperial County (2010-2017)<sup>3</sup>**



## Earnings

There is insufficient data on median hourly earnings for two of the five *Low Voltage Occupations* (Exhibit 3a). However, based on data available for the other three occupations, on average, the median hourly earnings for *Low Voltage Occupations* is \$23.70; this is more than the Self-Sufficiency Standard for two adults and two children (school-age) in Imperial County, which is \$13.20 per hour (Exhibit 3).<sup>4</sup>

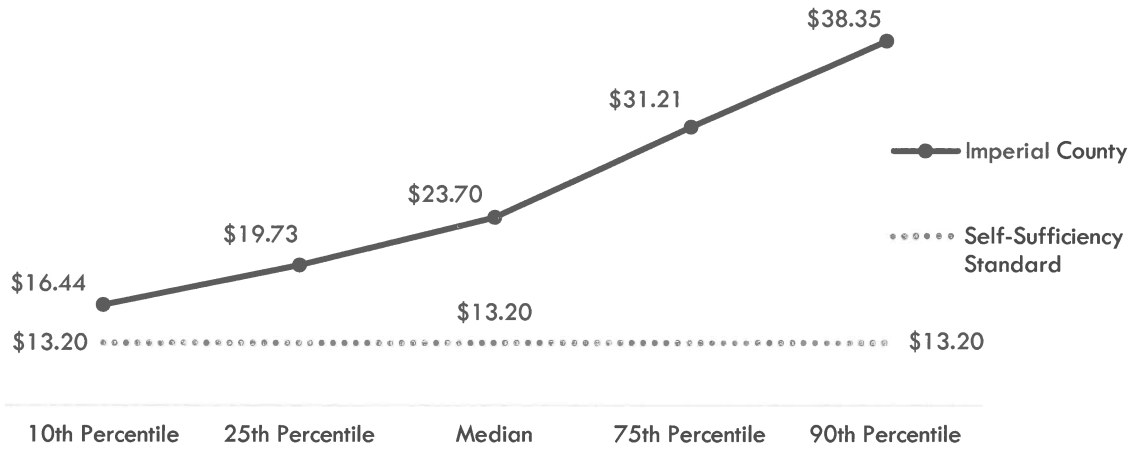
**Exhibit 3a: Hourly Earnings for Low Voltage Occupations in Imperial County**

Occupational Title	Entry-Level Hourly Earnings (10 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (90 <sup>th</sup> Percentile)
Electrical and Electronics Engineering Technicians	\$19.41	\$26.79	\$42.00
Engineering Technicians, Except Drafters, All Other	\$19.40	\$27.02	\$36.17
Electronic Home Entertainment Equipment Installers and Repairers	Insufficient Data	Insf. Data	Insf. Data
Security and Fire Alarm Systems Installers	Insf. Data	Insf. Data	Insf. Data
Maintenance and Repair Workers, General	\$10.50	\$17.30	\$23.43

<sup>3</sup> Labor Insight Jobs. Burning Glass Technologies. Imperial, CA. Full years 2010-2017.

<sup>4</sup> The standard for two adults and two children was chosen due to the 3.68 persons per household (2012-2016) as determined by the U.S. Census for Imperial County ([insightccd.org/2018-self-sufficiency-standard](http://insightccd.org/2018-self-sufficiency-standard)).

**Exhibit 3b: Hourly Earnings for Low Voltage Occupations in Imperial County<sup>5</sup>**



## 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.<sup>6</sup> There are seven TOP codes associated with these occupations: Electronics and Electric Technology (093400), Computer Electronics (093410), Industrial Electronics (093420), Electrical Systems and Power Transmission (093440), Instrumentation Technology (093300), Industrial Systems Technology and Maintenance (094500), and Electrical (095220). There are 14 related CIP codes (Exhibit 4).

**Exhibit 4: Related TOP and CIP Codes for Low Voltage Occupations**

Low Voltage Occupations
TOP 093300: Instrumentation Technology
TOP 093400: Electronics and Electric Technology
TOP 093410: Computer Electronics
TOP 093420: Industrial Electronics
TOP 093440: Electrical Systems and Power Transmission
TOP 094500: Industrial Systems Technology and Maintenance

<sup>5</sup> EMSI. Imperial (6025). 2018.04 Class of Worker. QCEW + Non-QCEW + Self-Employed. 2017-2022.

<sup>6</sup> 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).

**Low Voltage Occupations**

TOP 095220: Electrical

CIP 15.0303: Electrical, Electronic and Communications Engineering Technology/Technician

CIP 15.0306: Integrated Circuit Design

CIP 15.0399: Electrical and Electronic Engineering Technologies/Technicians, Other

CIP 15.0406: Automation Engineer Technology/Technician

CIP 15.0612: Industrial Technology/Technician

CIP 15.1201: Computer Engineering Technology/Technician

CIP 15.1203: Computer Hardware Technology/Technician

CIP 46.0301: Electrical and Power Transmission Installation/Installer, General

CIP 46.0302: Electrician

CIP 46.0303: Lineworker

CIP 47.0101: Electrical/Electronics Equipment Installation and Repair, General

CIP 47.0105: Industrial Electronics Technology/Technician

CIP 47.0199: Electrical/Electronics Maintenance and Repair Technology, Other

CIP 47.0303: Industrial Mechanics and Maintenance Technology

According to TOP and CIP data, Imperial Valley College is the only educational institution that supplies the region with awards (Exhibit 5).

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

TOP6	TOP6 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)
093300	Instrumentation Technology	0	0	0
093400	Electronics and Electric Technology	24	0	24
	• Imperial	24	0	
093410	Computer Electronics	0	0	0

TOP6	TOP6 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)
093420	Industrial Electronics	1	0	1
	• Imperial	1	0	
093440	Electrical Systems and Power Transmission	0	0	0
094500	Industrial Systems Technology and Maintenance	0	0	0
095220	Electrical	0	0	0
			Total	25

## Demand vs. Supply

Comparing labor demand (annual openings) with labor supply<sup>7</sup> suggests that there is a supply gap for these occupations in Imperial County, with 60 annual openings and 25 awards. Comparatively, there are 20,153 annual openings in California and 2,974 awards<sup>8</sup> (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
Imperial	58	25	33
California	20,153	2,974	17,179

**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 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.

<sup>7</sup> 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.

<sup>8</sup> Centers of Excellence Student Outcomes supply table. (coecc.net/Supply-and-Demand.aspx).

## 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 093400: Electronics and Electric Technology  
Imperial Valley College vs. California (PY2015-16)**

Metric	Imperial Valley	California
Number of course enrollments <sup>9</sup>	214	17,521
Completed 12+ CTE Units in One Year <sup>10</sup>	33	2,380
Completed 48+ CTE Contact Hours in One Year <sup>11</sup>	0	364
Number of students who got a degree or certificate <sup>12</sup>	16	786
Number of students who transferred <sup>13</sup>	N/A	348
Employed in the second fiscal quarter after exit <sup>14</sup>	78%	67%
Employed in the fourth fiscal quarter after exit <sup>15</sup>	78%	69%
Job closely related to field of study <sup>16</sup>	N/A	N/A
Median earnings in the second fiscal quarter after exit <sup>17</sup>	\$9,082	\$9,531
Median change in earnings <sup>18</sup>	23%	46%
Attained a living wage <sup>19</sup>	63%	59%

<sup>9</sup> The number of enrollments in courses assigned to the TOP code in the selected year.

<sup>10</sup> The number of students who completed 12 or more credit CTE units.

<sup>11</sup> The number of students who completed 48 or more noncredit CTE instructional contact hours.

<sup>12</sup> 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.

<sup>13</sup> 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.

<sup>14</sup> Among all exiters with a valid SSN, the percentage who were employed two quarters after exiting California Community Colleges.

<sup>15</sup> Among exiting students with a valid SSN, the percentage who were employed four quarters after exiting California Community Colleges.

<sup>16</sup> Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

<sup>17</sup> Among exiting students, the median second-quarter earnings one year after the year in which they exited California Community Colleges.

<sup>18</sup> Among exiting students with a valid SSN, the percentage change in earnings one year before and one year after exiting California Community Colleges.

<sup>19</sup> 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 Imperial County for these occupations were Schlumberger, Toys R Us, Imperial County, RDO Equipment and Imperial County Office of Education (Exhibit 8).

**Exhibit 8: Top Employers in Imperial County for Low Voltage occupations<sup>20</sup>**

Top Employers	
<ul style="list-style-type: none"> <li>• Schlumberger</li> <li>• Toys R Us</li> <li>• Imperial County</li> <li>• RDO Equipment</li> <li>• Imperial County Office of Education</li> </ul>	<ul style="list-style-type: none"> <li>• ConAm Management</li> <li>• Dish Network</li> <li>• Advanced Technology Services</li> <li>• El Centro Regional Medical Center</li> <li>• McDonald's</li> </ul>

## Skills, Education, and Certifications

*Low Voltage Occupations* have varying educational requirements; however, they range from a high school diploma or equivalent to an associate degree (Exhibit 9a).

**Exhibit 9a: Educational Requirements for Low Voltage Occupations**

Occupational Title	Typical Entry-Level Education
Electrical and Electronics Engineering Technicians	Associate degree
Engineering Technicians, Except Drafters, All Other	Associate degree
Electronic Home Entertainment Equipment Installers and Repairers	Postsecondary non-degree award
Security and Fire Alarm Systems Installers	High school diploma or equivalent
Maintenance and Repair Workers, General	High school diploma or equivalent

Based on online job postings between January 1, 2015 and December 31, 2017, the top listed educational requirement for the five *Low Voltage Occupations* is a high school diploma or equivalent (Exhibit 9b).<sup>21</sup>

<sup>20</sup> Labor Insight Jobs. Burning Glass Technologies. Imperial, CA. Full years 2015-2017.

<sup>21</sup> Labor Insight Jobs. Burning Glass Technologies. Imperial, CA. Full years 2015-2017.

**Exhibit 9b: Educational Requirements for Low Voltage Occupations in Imperial County<sup>22</sup>**

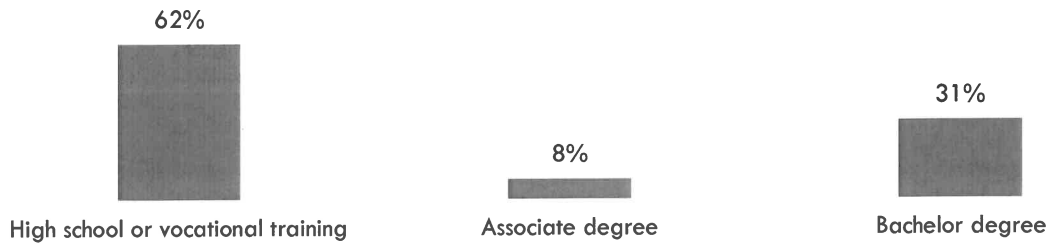


Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings for these occupations between January 1, 2015 and December 31, 2017.

**Exhibit 10: Top Skills for Low Voltage Occupations in Imperial County<sup>23</sup>**

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> <li>• Repair</li> <li>• Plumbing</li> <li>• Carpentry</li> <li>• HVAC</li> <li>• Machinery</li> </ul>	<ul style="list-style-type: none"> <li>• Troubleshooting</li> <li>• Communication Skills</li> <li>• Physical Abilities</li> <li>• Computer Literacy</li> <li>• Preventive Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft Office</li> <li>• COBOL</li> <li>• Enterprise Resource Planning</li> <li>• Structured Programming</li> <li>• Systems Analysis</li> </ul>

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<sup>22</sup> Bureau of Labor Statistics, Educational attainment for workers 25 years and older by detailed occupation. [bls.gov/emp/ep\\_table\\_111.htm](https://bls.gov/emp/ep_table_111.htm).

<sup>23</sup> Labor Insight Jobs. Burning Glass Technologies. Imperial, CA. Full years 2015-2017.

### **Important Disclaimers**

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.