

## ECU Occupations – Labor Market Information, Wage and Supply Data

### INLAND EMPIRE/DESERT

This labor market data compilation focuses on 54 energy, construction and utilities (ECU) occupations most closely aligned with the sector. The Inland Empire/Desert includes the following two counties in California: Riverside and San Bernardino.

#### Current and Future Employment

In the Inland Empire/Desert, the number of jobs for this cluster of occupations is expected to increase by 8% over the next five years. **More than 13,200 job opportunities** will be available annually for these occupations through 2022 due to new job growth and replacement need (e.g., retirements). Exhibit 1 contains detailed employment projections data for these occupations.

**Exhibit 1 – Five-year projections for ECU occupations, 2017-2022**

Occupation Category	Occupation	2017 Jobs	2022 Jobs	2017 - 2022 Change	2017 - 2022 % Change	Annual Openings	Typical Entry Level Education
Energy	Electricians	7,428	8,497	1,069	14%	1,079	HS diploma or equivalent
	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,743	4,435	692	18%	525	Postsecondary non-degree award
	Solar Photovoltaic Installers	287	440	153	53%	67	HS diploma or equivalent
	Stationary Engineers and Boiler Operators	254	271	17	7%	31	HS diploma or equivalent
	Wind Turbine Service Technicians	109	130	21	19%	15	Postsecondary non-degree award

<b>Utilities</b>	Maintenance and Repair Workers, General	13,329	14,750	1,421	11%	1,629	HS diploma or equivalent
	Water and Wastewater Treatment Plant and System Operators	1,472	1,532	60	4%	135	HS diploma or equivalent
	Electrical Power-Line Installers and Repairers	1,284	1,536	252	20%	160	HS diploma or equivalent
	Security and Fire Alarm Systems Installers	801	901	100	12%	112	HS diploma or equivalent
	Power Plant Operators	431	401	(30)	(7%)	36	HS diploma or equivalent
	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	367	357	(10)	(3%)	32	Postsecondary non-degree award
	Plant and System Operators, All Other	286	295	9	3%	30	HS diploma or equivalent
	Power Distributors and Dispatchers	268	284	16	6%	27	HS diploma or equivalent
<b>Drafters</b>	Architectural and Civil Drafters	1,099	1,175	76	7%	110	Associate degree
	Mechanical Drafters	463	492	29	6%	46	Associate degree
	Electrical and Electronics Drafters	262	283	21	8%	27	Associate degree
	Drafters, All Other	101	111	10	10%	11	Associate degree
<b>Engineering Technicians</b>	Industrial Machinery Mechanics	3,007	3,277	270	9%	321	HS diploma or equivalent
	Electrical and Electronics Engineering Technicians	978	1,016	38	4%	92	Associate degree
	Civil Engineering Technicians	754	813	59	8%	78	Associate degree
	Electrical and Electronics Repairers, Commercial and Industrial Equipment	741	777	36	5%	73	Postsecondary non-degree award

	Electro-Mechanical Technicians	345	349	4	1%	31	Associate degree
	Environmental Engineering Technicians	332	344	12	4%	31	Associate degree
	Mechanical Engineering Technicians	150	163	13	9%	16	Associate degree
<b>Construction Trades</b>	Carpenters	20,054	20,838	784	4%	2,033	HS diploma or equivalent
	Painters, Construction and Maintenance	6,201	6,284	83	1%	552	None
	Plumbers, Pipefitters, and Steamfitters	5,709	6,727	1,018	18%	841	HS diploma or equivalent
	Drywall and Ceiling Tile Installers	3,599	3,659	60	2%	354	None
	Cement Masons and Concrete Finishers	2,833	3,110	277	10%	371	None
	Roofers	2,254	2,417	163	7%	261	None
	Sheet Metal Workers	1,660	1,885	225	14%	227	HS diploma or equivalent
	Tapers	1,357	1,359	2	0%	131	None
	Brickmasons and Blockmasons	1,219	1,276	57	5%	128	HS diploma or equivalent
	Structural Iron and Steel Workers	1,212	1,370	158	13%	166	HS diploma or equivalent
	Glaziers	1,043	1,184	141	14%	153	HS diploma or equivalent
	Stonemasons	729	760	31	4%	72	HS diploma or equivalent
	Occupational Health and Safety Specialists	569	628	59	10%	42	Bachelor's degree
	Miscellaneous Construction and Related Workers	439	476	37	8%	55	HS diploma or equivalent
	Reinforcing Iron and Rebar Workers	421	462	41	10%	54	HS diploma or equivalent
Highway Maintenance Workers	350	440	90	26%	57	HS diploma or equivalent	

	Insulation Workers, Floor, Ceiling, and Wall	245	261	16	7%	31	None
	Insulation Workers, Mechanical	93	109	16	17%	14	HS diploma or equivalent
	Terrazzo Workers and Finishers	32	35	3	9%	4	HS diploma or equivalent
<b>Construction Managers</b>	First-Line Supervisors of Construction Trades and Extraction Workers	6,914	7,382	468	7%	811	HS diploma or equivalent
	First-Line Supervisors of Production and Operating Workers	5,383	5,606	223	4%	575	HS diploma or equivalent
	Construction Managers	5,038	5,164	126	3%	409	Bachelor's degree
	First-Line Supervisors of Mechanics, Installers, and Repairers	4,477	4,931	454	10%	485	HS diploma or equivalent
	Cost Estimators	2,927	3,197	270	9%	347	Bachelor's degree
	Construction and Building Inspectors	1,232	1,329	97	8%	156	HS diploma or equivalent
<b>Construction Specialties</b>	Cabinetmakers and Bench Carpenters	1,681	1,554	(127)	(8%)	166	HS diploma or equivalent
	Sawing Machine Setters, Operators, and Tenders, Wood	372	361	(11)	(3%)	42	HS diploma or equivalent
	Woodworkers, All Other	222	226	4	2%	26	HS diploma or equivalent
	Patternmakers, Wood	25	24	(1)	(4%)	3	HS diploma or equivalent
	Model Makers, Wood	19	19	0	0%	2	HS diploma or equivalent
<b>Total</b>		<b>116,599</b>	<b>125,704</b>	<b>9,105</b>	<b>8%</b>	<b>13,279</b>	

Source: EMSI 2018.3 – QCEW, non-QCEW, Self-Employed.

## Earnings

In the Inland Empire/Desert, the **entry-level average wages** for these occupations is between **\$10.61-\$32.02 per hour**. The average annual earnings for the occupations in the region is between **\$28,000 and \$90,000** per year, assuming full-time employment.

Exhibit 2 contains hourly wages and annual average earnings for these ECU occupations. Entry-level hourly earnings is represented by the 10<sup>th</sup> percentile of wages, median hourly earnings is represented by the 50<sup>th</sup> percentile of wages, and experienced hourly earnings is represented by the 90<sup>th</sup> percentile of wages, demonstrating various levels of employment.

**Exhibit 2 – Earnings for ECU occupations**

Occupation Group	Occupation	Entry-level hourly earnings	Median hourly earnings	Experienced hourly earnings
<b>Energy</b>	Stationary Engineers and Boiler Operators	\$26.61	\$33.38	\$44.06
	Wind Turbine Service Technicians	\$16.41	\$20.21	\$28.69
	Solar Photovoltaic Installers	\$15.00	\$18.14	\$31.03
	Electricians	\$14.80	\$24.19	\$38.52
	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$13.67	\$19.33	\$31.28
<b>Utilities</b>	Power Distributors and Dispatchers	\$32.02	\$38.78	\$59.25
	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	\$27.47	\$43.06	\$60.52
	Plant and System Operators, All Other	\$20.98	\$30.18	\$50.39
	Water and Wastewater Treatment Plant and System Operators	\$20.06	\$31.48	\$46.78
	Electrical Power-Line Installers and Repairers	\$18.02	\$37.49	\$60.97
	Power Plant Operators	\$16.86	\$38.61	\$49.83
	Security and Fire Alarm Systems Installers	\$14.49	\$19.01	\$30.89
	Maintenance and Repair Workers, General	\$11.24	\$18.56	\$30.26
<b>Drafters</b>	Electrical and Electronics Drafters	\$21.22	\$32.11	\$45.30
	Drafters, All Other	\$19.21	\$28.68	\$37.76
	Mechanical Drafters	\$16.23	\$22.24	\$33.86

	Architectural and Civil Drafters	\$14.47	\$25.45	\$39.78
<b>Engineering Technicians</b>	Electro-Mechanical Technicians	\$24.97	\$30.14	\$47.43
	Environmental Engineering Technicians	\$21.50	\$30.73	\$41.77
	Electrical and Electronics Repairers, Commercial and Industrial Equipment	\$18.92	\$31.12	\$40.98
	Civil Engineering Technicians	\$18.03	\$28.75	\$42.32
	Industrial Machinery Mechanics	\$17.20	\$25.65	\$37.24
	Electrical and Electronics Engineering Technicians	\$15.28	\$27.34	\$47.61
	Mechanical Engineering Technicians	\$13.61	\$25.52	\$41.99
	<b>Construction Trades</b>	Occupational Health and Safety Specialists	\$23.26	\$36.49
Structural Iron and Steel Workers		\$18.97	\$33.39	\$42.54
Highway Maintenance Workers		\$17.41	\$20.67	\$29.06
Tapers		\$15.22	\$25.46	\$44.43
Sheet Metal Workers		\$15.05	\$26.62	\$45.04
Cement Masons and Concrete Finishers		\$14.28	\$23.34	\$46.39
Drywall and Ceiling Tile Installers		\$13.92	\$21.89	\$45.60
Miscellaneous Construction and Related Workers		\$13.74	\$20.30	\$40.40
Brickmasons and Blockmasons		\$13.48	\$23.24	\$39.13
Plumbers, Pipefitters, and Steamfitters		\$13.04	\$21.05	\$34.15
Carpenters		\$12.85	\$17.70	\$37.78
Terrazzo Workers and Finishers		\$12.31	\$18.67	\$35.06
Reinforcing Iron and Rebar Workers		\$12.24	\$14.91	\$33.95
Roofers		\$12.20	\$20.98	\$29.64
Insulation Workers, Mechanical		\$12.08	\$19.88	\$38.12
Stonemasons		\$11.93	\$19.80	\$30.10
Insulation Workers, Floor, Ceiling, and Wall		\$11.47	\$17.63	\$34.16
Painters, Construction and Maintenance		\$11.36	\$14.16	\$28.20
Glaziers		\$11.35	\$19.78	\$53.32
		Construction and Building Inspectors	\$23.47	\$40.43

<b>Construction Managers</b>	First-Line Supervisors of Mechanics, Installers, and Repairers	\$19.16	\$32.21	\$52.03
	First-Line Supervisors of Production and Operating Workers	\$16.60	\$26.37	\$47.60
	Cost Estimators	\$15.77	\$28.18	\$49.27
	First-Line Supervisors of Construction Trades and Extraction Workers	\$14.43	\$29.76	\$48.86
	Construction Managers	\$13.72	\$27.46	\$72.76
<b>Construction Specialties</b>	Model Makers, Wood	\$19.34	\$25.95	\$30.08
	Patternmakers, Wood	\$16.00	\$24.41	\$35.22
	Woodworkers, All Other	\$11.88	\$16.14	\$23.90
	Cabinetmakers and Bench Carpenters	\$10.66	\$13.96	\$20.08
	Sawing Machine Setters, Operators, and Tenders, Wood	\$10.61	\$12.63	\$17.22

Source: EMSI 2018.3 – QCEW, non-QCEW, Self-Employed.

## Supply

In the Inland Empire/Desert, **nine community colleges** recently conferred awards in programs **that train students for the ECU occupations** of interest. Between 2014 and 2017, there was an average of **299 community college** degrees and certificates awarded in 12 ECU programs. It is important to note that an award is not equivalent to a single person in search of a job opening, since a student may earn more than one award (e.g. an associate degree and a certificate).

**Exhibit 3 –ECU certificates and degrees, 2014-2017**

Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Average Awards
Architecture and Architectural Technology	Desert	8	11	8	9
	Norco	6	13	9	9
	Riverside	1	-	-	0
	<b>Program total/average</b>	<b>15</b>	<b>24</b>	<b>17</b>	<b>19</b>
Electrical Systems and Power Transmission	Chaffey	24	50	23	32

	San Bernardino	9	12	6	9
	<b>Program total/average</b>	<b>33</b>	<b>62</b>	<b>29</b>	<b>41</b>
Industrial Systems Technology and Maintenance	Barstow	-	-	5	2
	<b>Program total/average</b>	<b>-</b>	<b>-</b>	<b>5</b>	<b>2</b>
Environmental Control Technology	Desert	21	20	19	20
	Riverside	50	30	41	40
	San Bernardino	15	20	16	17
	<b>Program total/average</b>	<b>86</b>	<b>70</b>	<b>76</b>	<b>77</b>
Energy Systems Technology	Desert	-	-	1	0
	<b>Program total/average</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>0</b>
Construction Crafts Technology	Palo Verde	-	-	16	5
	Victor Valley	1	4	5	3
	<b>Program total/average</b>	<b>1</b>	<b>4</b>	<b>21</b>	<b>9</b>
Electrical	Norco	-	-	45	15
	<b>Program total/average</b>	<b>-</b>	<b>-</b>	<b>45</b>	<b>15</b>
Drafting Technology	Desert	2	4	1	2
	Mt. San Jacinto	6	4	3	4
	Norco	24	27	29	27
	Victor Valley	12	23	15	17
	<b>Program total/average</b>	<b>44</b>	<b>58</b>	<b>48</b>	<b>50</b>
Architectural Drafting	Chaffey	-	-	1	0
	<b>Program total/average</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>0</b>
Civil and Construction Management Technology	Desert	3	7	4	5
	<b>Program total/average</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>5</b>
Construction Inspection	Desert	7	2	-	3
	Norco	24	14	10	16
	Riverside	-	1	-	0



	San Bernardino	4	3	3	3
	<b>Program total/average</b>	<b>35</b>	<b>20</b>	<b>13</b>	<b>23</b>
Water and Wastewater Technology	Mt. San Jacinto	31	32	36	33
	San Bernardino	24	26	27	26
	<b>Program total/average</b>	<b>55</b>	<b>58</b>	<b>63</b>	<b>59</b>
	<b>ECU TOP Total/Average</b>	<b>272</b>	<b>303</b>	<b>323</b>	<b>299</b>

Source: California Community Colleges Chancellor's Office MIS Data Mart

### Sources

Economic Modeling Specialists International (EMSI), California Community Colleges Chancellor's Office Management Information Systems (MIS) Data Mart

### Notes

Data included in this analysis represents the labor market demand for positions most closely related to the ECU industry. Standard occupational classification (SOC) codes were chosen based on the Taxonomy of Program (TOP) codes aligned with the ECU sector, resulting in a list of occupations that are the most relevant employment opportunities for students who have completed these community college education and/or training programs. Traditional labor market information is used to show current and projected employment based on data trends, as well as annual average awards granted by California Community Colleges.