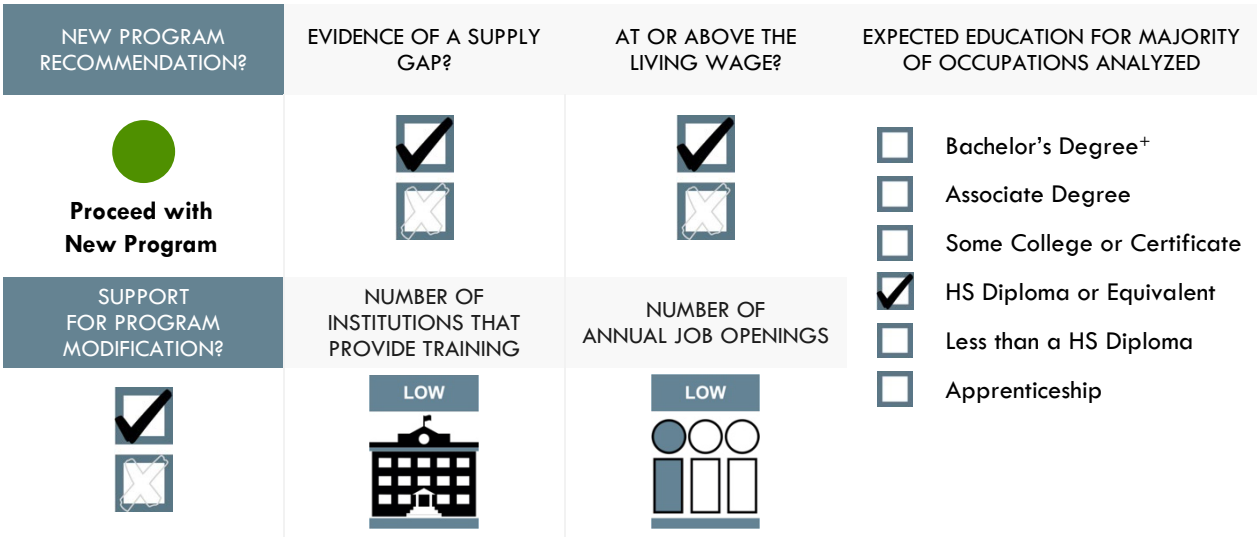
Plant Operator Occupations

Labor Market Analysis: San Diego County

January 2022

Summary



This brief provides labor market information about *Plant Operator Occupations* to assist the San Diego and Imperial Counties Community Colleges with program development and strategic planning. *Plant Operator Occupations* include "Chemical Plant and System Operators," "Gas Plant Operators," and "Power Plant Operators." According to available labor market information, *Plant Operator Occupations* in San Diego County have a labor market demand of 31 annual job openings (while average demand for a single occupation in San Diego County is 242 annual job openings), and no institutions supply awards for these occupations, suggesting that there is a supply gap in the labor market. Entry-level and median wages are above the living wage for all occupations. This brief recommends proceeding a new program and supports a program modification because 1) these occupations' entry-level and median earnings are above the living wage and 2) a supply gap exists for these occupations. Colleges should note that **employers typically require a high school diploma or equivalent as the minimum educational requirement for these occupations.**

Introduction

This report provides labor market information in San Diego County for the following occupational codes in the Standard Occupational Classification (SOC)[1] system:

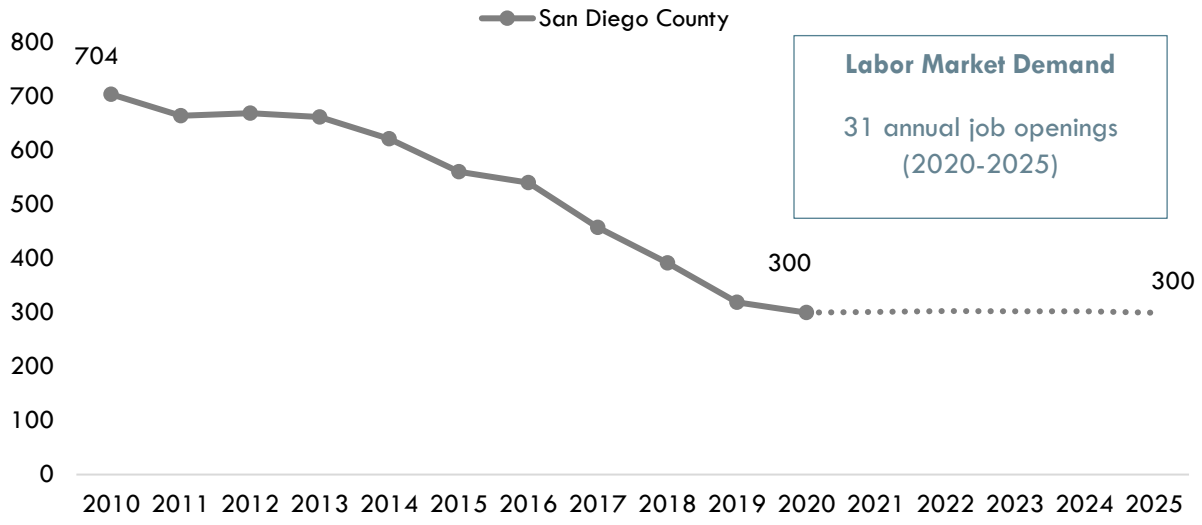
- **Chemical Plant and System Operators** (SOC 51-8091): Control or operate entire chemical processes or system of machines.
- **Gas Plant Operators** (SOC 51-8092): Distribute or process gas for utility companies and others by controlling compressors to maintain specified pressures on main pipelines.
- **Power Plant Operators** (SOC 51-8013): Control, operate, or maintain machinery to generate electric power.

For the purpose of this report, these occupations are referred to as *Plant Operator Occupations*.

Projected Occupational Demand

Between 2020 and 2025, *Plant Operator Occupations* are projected to remain at 300 net jobs (Exhibit 1a). Employers in San Diego County will need to hire 31 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

Exhibit 1a: Number of Jobs for *Plant Operator Occupations* (2010-2025)[2]



[1] 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.
[2] EMSI 2021.4; QCEW, Non-QCEW, Self-Employed.

Exhibit 1b disaggregates the projected number of jobs change by occupation. "Power Plant Operators" are projected to have the most labor market demand between 2020 and 2025, with 17 annual job openings.

Exhibit 1b: Number of Jobs for *Plant Operator Occupations* in San Diego County (2020-2025)[3]

Occupational Title	2020 Jobs	2025 Jobs	2020 - 2025 Net Jobs Change	2020-2025 % Net Jobs Change	Annual Job Openings (Demand)
Power Plant Operators	190	175	-15	-8%	17
Chemical Plant and System Operators	42	55	13	30%	7
Gas Plant Operators	68	70	2	2%	7
Total	300	300	0	0%	31

Earnings

Exhibit 2a disaggregates hourly earnings by occupation. The entry-level hourly earnings for *Plant Operator Occupations* range from $18.91 to $38.73.

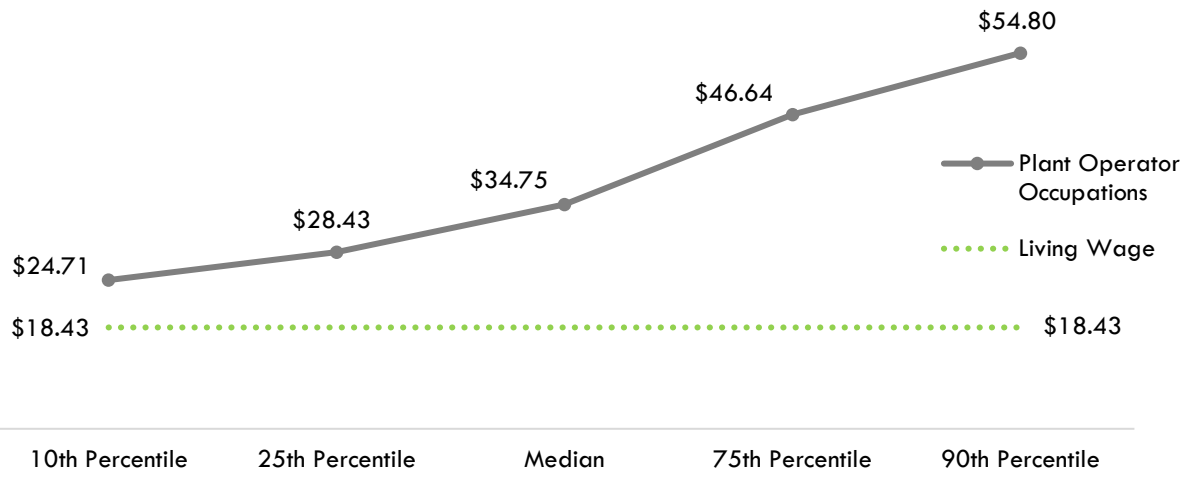
Exhibit 2a: Hourly Earnings for *Plant Operator Occupations* in San Diego County[4]

Occupational Title	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Gas Plant Operators	$38.73	$46.58	$56.73
Power Plant Operators	$27.65	$33.97	$49.73
Chemical Plant and System Operators	$18.91	$23.70	$33.47

[3] EMSI 2021.4; QCEW, Non-QCEW, Self-Employed.
[4] EMSI 2021.4; QCEW, Non-QCEW, Self-Employed.

On average, the entry-level hourly earnings for *Plant Operator Occupations* are $28.43; this is more than the living wage for a single adult in San Diego County, which is $18.43 per hour (Exhibit 2b).[5]

Exhibit 2b: Average Hourly Earnings[6] for *Plant Operator Occupations* in San Diego County[7]



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.[8] There are three TOP codes and four CIP codes related to *Plant Operator Occupations* (Exhibit 3).

Exhibit 3: Related TOP and CIP Codes for *Plant Operator Occupations*[9]

TOP or CIP Code	TOP or CIP Program Title
TOP 0946.10	Energy Systems Technology
TOP 0954.00	Chemical Technology
TOP 0954.30	Petroleum Technology
CIP 15.0903	Petroleum Technology/Technician
CIP 15.1701	Energy Systems Technology/Technician
CIP 15.1702	Power Plant Technology/Technician
CIP 41.0301	Chemical Technology/Technician

[5] "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightcced.org/family-needs-calculator/.
[6] 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.
[7] EMSI 2021.4; QCEW, Non-QCEW, Self-Employed.
[8] 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).
[9] This brief uses a conservative estimate of program supply and only calculates awards from the TOP codes listed in Exhibit 3.

According to TOP and CIP data, no community college or non-community-college institution supplies the region with awards for these occupations (Exhibit 4).

Exhibit 4: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Year 2016-17 through PY2019-20 Average)

TOP or CIP Code	TOP or CIP Program Title	3-Yr Annual Average CC Awards (PY17-18 to PY19-20)	Other Educational Institutions 3-Yr Annual Average Awards (PY16-17 to PY18-19)	3-Yr Total Average Supply (PY16-17 to PY19-20)
0946.10	Energy Systems Technology	**0**	**0**	**0**
	• N/A	0	0	
			Total	**0**

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply[10] suggests that there is a supply gap for these occupations in San Diego County, with 31 annual openings and zero awards. Comparatively, there are 773 annual openings in California and 86 awards, suggesting that there is a supply gap across the state[11] (Exhibit 5).

Exhibit 5: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

	Demand (Annual Openings)	**Supply** (Total Annual Average Supply)	**Supply Gap or Oversupply**
San Diego	31	0	**31**
California	773	86	**687**

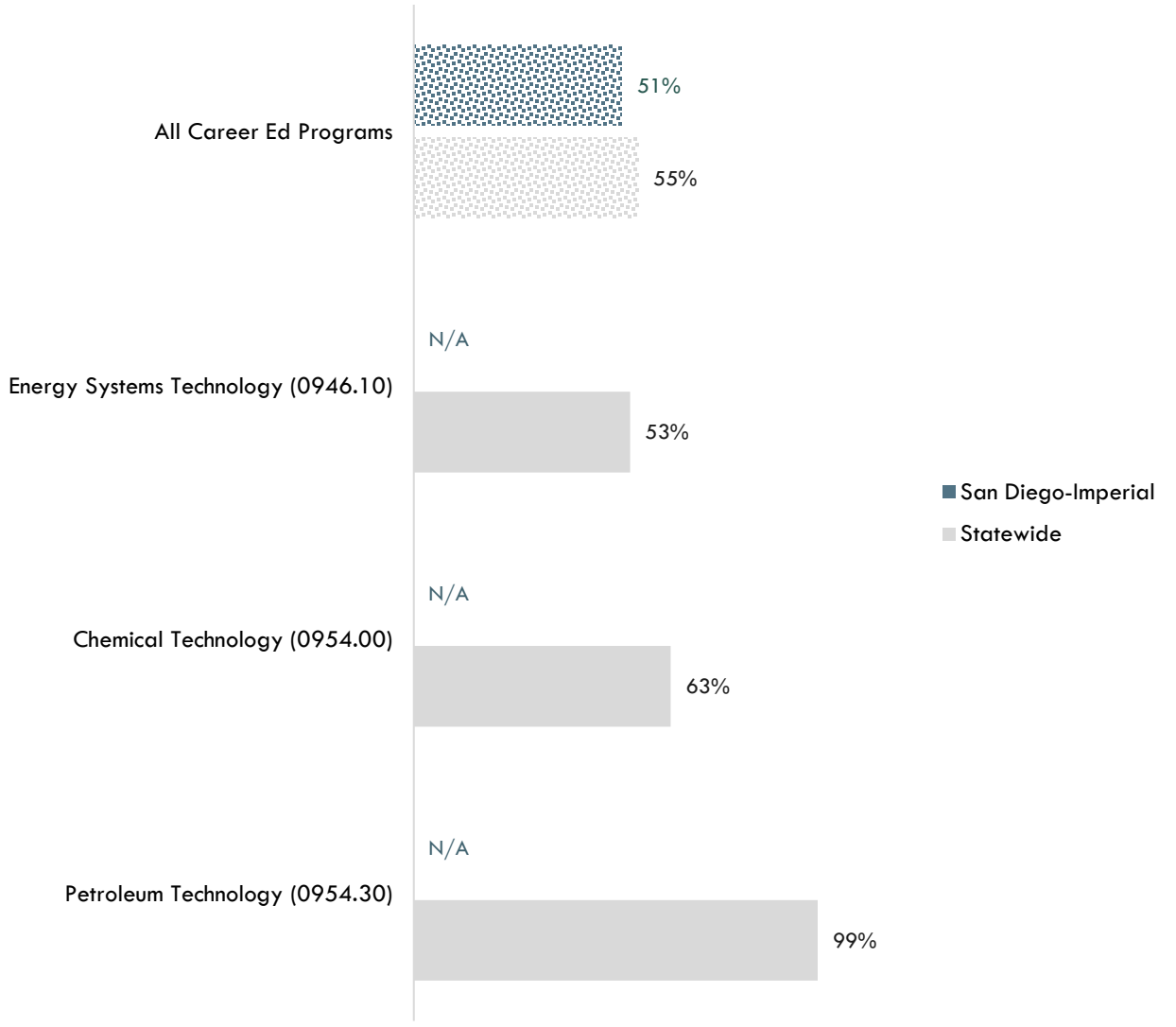
Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

[10] 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.
[11] "Supply and Demand," Centers of Excellence Student Outcomes, coeccc.net/Supply-and-Demand.aspx.

Student Outcomes and Regional Comparisons

According to the California Community Colleges LaunchBoard, 53 to 99 percent of students statewide earned a living wage after completing a program related to *Plant Operator Occupations*, compared to 55 percent of students in Career Education programs in general across the state (Exhibit 6a).[12]

Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program, PY2018-19[13]

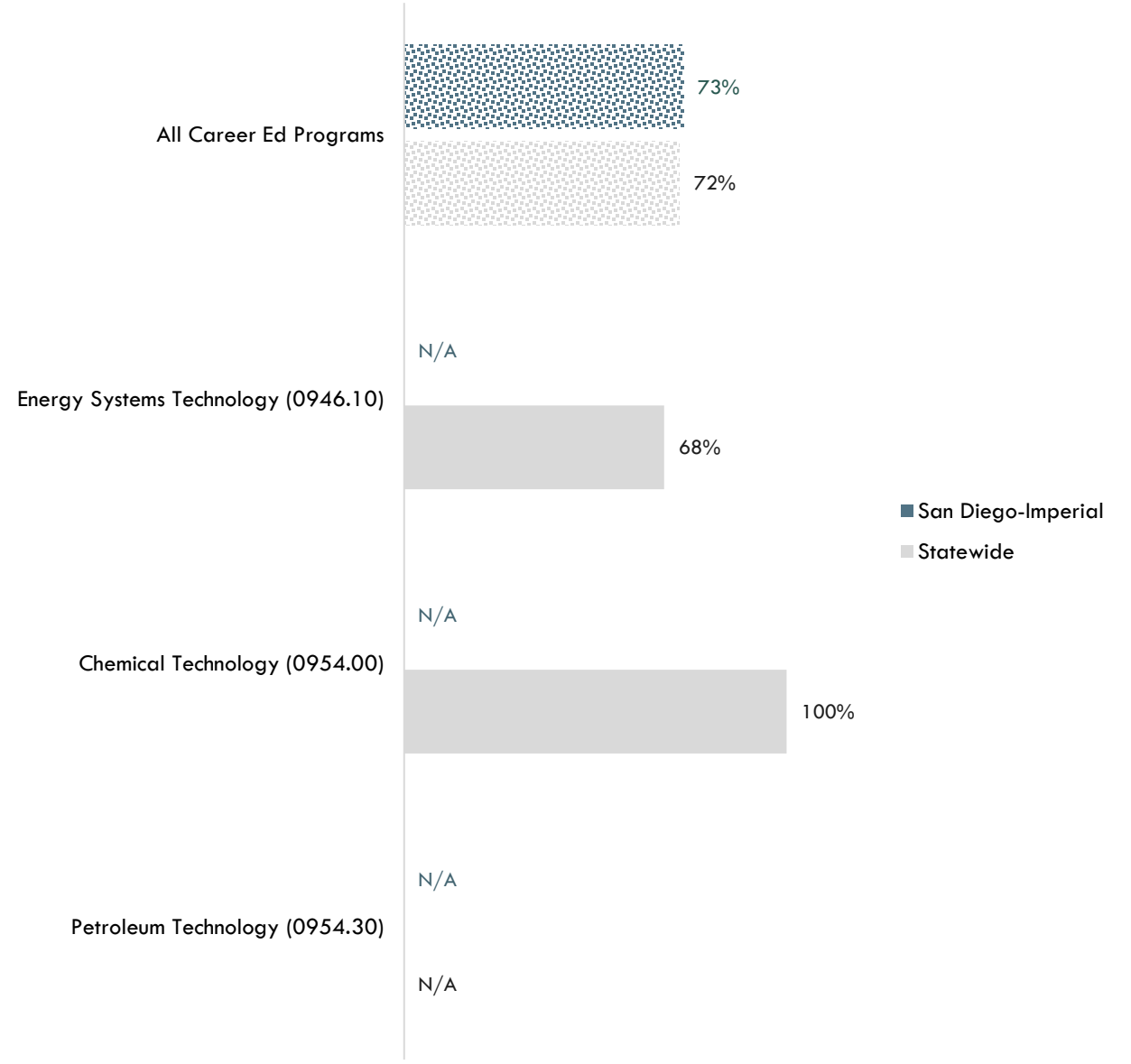


"N/A" indicates insufficient data

[12] "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.
[13] Among completers and skills builders who exited, the proportion of students who attained a living wage.

According to the California Community Colleges LaunchBoard, 68 to 100 percent of students statewide obtained a job closely related to their field of study after completing a program related to *Plant Operator Occupations*, compared to 72 percent of students in Career Education programs in general across the state (Exhibit 6b).[14]

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2017-18[15]



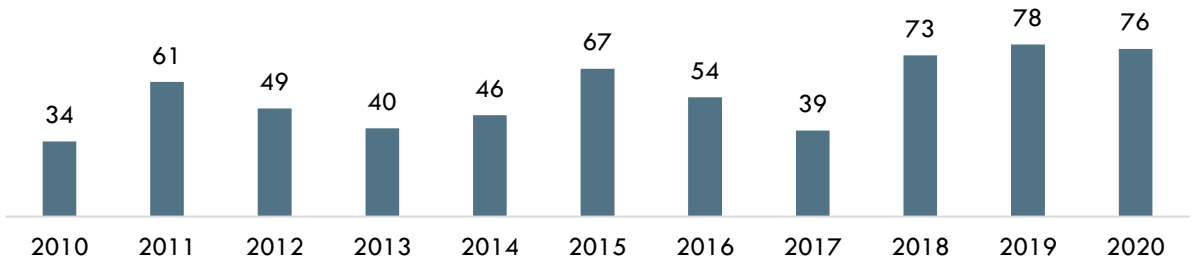
"N/A" indicates insufficient data

[14] "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.
[15] Most recent year with available data is Program Year 2017-18. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2010 and 2020, there was an average of 56 online job postings per year for *Plant Operator Occupations* in San Diego County (Exhibit 7). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1b). Employers may post a position multiple times for various reasons, such as increasing the pool of applicants, for example.

Exhibit 7: Number of Online Job Postings for *Plant Operator Occupations* in San Diego County (2010-2020)[16]



Top Employers

Between January 1, 2018 and December 31, 2020, the top five employers in San Diego County for *Plant Operator Occupations* were University of California San Diego, Vulcan Materials Company, Palomar Health, Lehigh Hanson, and Fluor Corporation based on online job postings (Exhibit 8).

Exhibit 8: Top Employers for *Plant Operator Occupations* in San Diego County[17]

Top Employers	
• University of California San Diego	• Calpine Corporation
• Vulcan Materials Company	• Wuxi Apptec
• Palomar Health	• Swinerton Incorporated
• Lehigh Hanson	• New Leaf Biofuel
• Fluor Corporation	• Halls Culligan Water

[16] Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2020.
[17] Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

Education, Skills, and Certifications

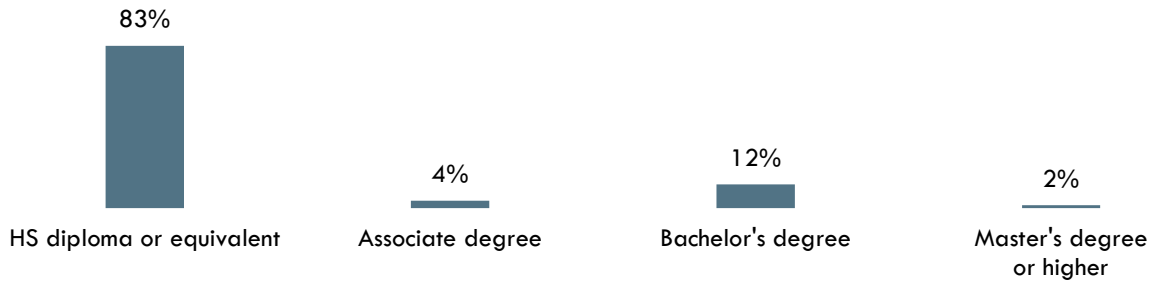
Plant Operator Occupations have a national educational attainment of a high school diploma or equivalent (Exhibit 9a).

Exhibit 9a: National Educational Attainment for *Plant Operator Occupations*[18]

Occupational Title	Typical Entry-Level Education
Chemical Plant and System Operators	High school diploma or equivalent
Gas Plant Operators	High school diploma or equivalent
Power Plant Operators	High school diploma or equivalent

Based on online job postings between January 1, 2018 and December 31, 2020 in San Diego County, employers posted a high school diploma or equivalent as the educational requirement for *Plant Operator Occupations* (Exhibit 9b).[19]

Exhibit 9b: Educational Requirements for *Plant Operator Occupations* in San Diego County[20]



*may not total 100 percent due to rounding

[18] EMSI 2021.4; QCEW, Non-QCEW, Self-Employed.
[19] Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.
[20] "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified April 9, 2021. bls.gov/emp/tables/educational-attainment.htm.

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2018 and December 31, 2020.

Exhibit 10: Top Skills for *Plant Operator Occupations* in San Diego County[21]

Specialized Skills	Soft Skills	Software Skills
• Repair • Boilers • Electrical Distribution Systems • HVAC • Power Plants • Water Treatment • Machinery • Power Plant Equipment • Chemistry • Emissions Control Systems • Natural Gas • Storage Systems • Energy Management • Electrical Systems • Schematic Diagrams	• Troubleshooting • Physical Abilities • Communication Skills • English • Computer Literacy • Problem Solving • Writing • Organizational Skills • Multi-Tasking • Planning • Preventive Maintenance • Teamwork / Collaboration • Typing • Detail-Oriented • Written Communication	• Microsoft Excel • Microsoft PowerPoint • Microsoft Access • SCADA • Microsoft SharePoint • Teradata DBA • Wonderware • Linux • Microsoft Word • SAP • Active Server Pages • Cognos Impromptu • IBM Cognos • Informatica PowerCenter • Lockout / Tagout

[21] Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

Exhibit 11 lists the top certification that appeared in online job postings between January 1, 2018 and December 31, 2020.

Exhibit 11: Top Certification for *Plant Operator Occupations* in San Diego County[22]

Top Certification in Online Job Postings
1. Environmental Protection Agency Certification
2. Wastewater Treatment Plant Operator
3. First Aid CPR Aed
4. Security Clearance
5. CDL Class C
6. Wastewater Treatment Plant Operator Grade Iii
7. Wastewater Treatment Plant Operator Grade Ii
8. Wastewater Treatment Plant Operator Grade I
9. Wastewater Treatment Certification
10. North American Board of Energy Practitioners (NABCEP)
11. Hazwoper
12. Boiler Operator License
13. Airframe and Powerplant (A and P) Certification

[22] Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2018-2020.

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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.

This workforce demand report uses state and federal job projection data that was developed before the economic impact of COVID-19. The COE is monitoring the situation and will provide more information as it becomes available. Please consult with local employers to understand their current employment needs.