# Appendix C
# Monitoring Workforce Impacts of Climate Action in the City of San Diego

**Prepared for**

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## Introduction

The City's Climate Action Plan (CAP) lays out a set of strategies, measures, performance targets and actions the City can undertake to achieve net zero greenhouse gas (GHG) emissions. The CAP is centered on equity – it frames climate action as an opportunity to prioritize underserved communities, quality jobs, and a thriving local economy.

Achieving the City's climate and equity goals requires transformational changes – not only by the City government, but from other government agencies, the private sector, and community-based organizations. Transformational changes are needed to eliminate fossil-fuels and other reduce GHG emissions from most day-to-day economic and social activities, including phasing out natural gas and using electricity to cool, heat, and power homes, businesses, and other buildings; generating electricity from renewable and other zero emission sources; and using electric and other zero emission vehicles to move people and goods. Other transformational changes include developing complete communities featuring affordable housing and proximity to high-quality transit in which walking, biking, and mobility options other than driving are safe and convenient, diverting organic waste away from disposal in landfills, and managing and restoring parks, open space, and natural lands and waters to remove emissions from the atmosphere.

Achieving the City's ambitious climate and equity goals will require, among other things, a strong workforce and high-quality job opportunities to support it. To evaluate the workforce impacts of climate action, the City partnered with the San Diego Regional Economic Development Corporation to identify the best available data and develop replicable and defensible methodologies.

This report outlines the methodologies and summarizes the results for two methodologies: (1) estimating the number of existing green jobs in the energy sector (i.e., green energy jobs) and (2) estimating demand for all green jobs (i.e., energy and non-energy jobs) by analyzing job postings.

## Methodologies Overview

This section outlines the two complementary methodological approaches:

1. **Green energy job counts**: This approach focuses on estimating the existing number of green jobs specifically within the energy sector, using the methodology and data from the 2024 U.S. Energy & Employment Report. This is necessary because no single data source directly measures green employment. The 2024 U.S. Energy & Employment Report provides state-level estimates of employment in green energy technologies, which allows for deriving city-level estimates.
2. **Green job postings**: This approach assesses the market demand for green jobs across all sectors by analyzing job postings using a framework developed by WorkingNation and Lightcast. Job postings are categorized into three sectors—core, enabling, and enabled green jobs—based on required skills and occupational context.

While the first method captures current employment in green energy jobs, the second method identifies trends in green job demand beyond the energy sector, providing a broader view of green jobs more aligned with the City's Climate Action Plan.

Where feasible, the methodologies are structured to support annual updates, enabling the City to track trends over time and inform policy decisions that align climate goals with workforce development and economic inclusion.

## Method 1. Green Energy Job Counts

This method focuses on estimating the existing number of green energy jobs in the city, and uses the following definition of green energy from the 2024 U.S. Energy & Employment Report:

> "Technologies that enable a transition to net-zero emissions. This includes renewables, nuclear, non-fossil storage, non-fossil transmission and distribution, non-fossil energy efficiency, biofuels, and vehicles that do not require fossil fuel." [1]

Under this definition, green energy jobs relate to the following technology types:

- **Electric Power Generation**: All renewable electric power generation technologies including traditional hydropower, nuclear electric power generation & fuel
- **Transmission, Distribution, & Storage (TDS):** microgrids & grid modernization, non-fossil storage
- **Fuels:** All biofuels, including corn ethanol
- **Energy Efficiency:** All energy efficiency
- **Motor Vehicles:** plug-in hybrid, battery electric and hydrogen fuel cell vehicles

The 2024 U.S. Energy & Employment Report, developed by BW Research using 2023 employment data, provides employment counts by technology type at national, state, and county levels.[2] It distinguishes green energy from non-green energy employment, allowing for calculation of the share of jobs focused exclusively on green energy generation, distribution, and storage.

However, there are some discrepancies in the definition and completeness between levels. The USEER notes that the state-level definitions of green energy, energy efficiency, and TDS are more comprehensive and should be used instead of national-level definitions.[3]

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[1] US Department of Energy. 2024. "U.S. Energy & Employment Jobs Report (USEER)." https://www.energy.gov/policy/us-energy-employment-jobs-report-useer.

[2] US Department of Energy. 2024. "U.S. Energy & Employment Jobs Report (USEER)." https://www.energy.gov/policy/us-energy-employment-jobs-report-useer.

[3] US Department of Energy. 2024. "U.S. Energy & Employment Jobs Report (USEER) Appendix A." https://www.energy.gov/sites/default/files/2024-10/USEER%202024%20Appendices_1002_0.pdf

The methodology in the 2024 U.S. Energy & Employment Report categorized seven industry groups by 2-digit and 3-digit North American Industrial Classification System (NAICS) codes to estimate employment counts, as shown below:

- NAICS 21: Mining, Quarrying and Oil and Gas Extraction (Mining and Extraction)
- NAICS 22: Utilities
- NAICS 23: Construction
- NAICS 31-33: Manufacturing
- NAICS 42, 486, and Commodity Flow Data: Wholesale Trade, Distribution and Transport (Wholesale Trade)
- NAICS 51, 52, 53, 54, 55 and 56: Information (Software, etc.), Finance, Insurance, Professional and Business Services (Professional and Business Services)
- NAICS 81: Other Services (Repair and Maintenance/Other)

The employment counts in the report are estimated for each industry (NAICS) and subdivided by energy technology type. Therefore, each industry will have job counts for every type of energy technology (e.g. green energy jobs in the utilities industry in electric power generation).

Total employment for the industries (NAICS) in the city listed above will be obtained through Lightcast's industry report. Lightcast is a proprietary labor market analytics platform that pulls data from several sources. In this instance, the data is built using the third quarter Bureau of Labor Statistics' Quarterly Census of Employment and Wages (BLS QCEW). Third quarter data is also what the 2024 U.S. Energy & Employment Report used for its estimates.

The reason this method does not use the data directly from the QCEW is that the survey results are reported at the County level. Thus, to get the estimates for the city, we will use Lightcast's industry report.

The Lightcast report will yield overall employment counts by industry for the city. We then need to estimate the green energy jobs. The first step is using the California estimates of workers by technology in every industry to estimate the number for the city. For example, out of the 911,333 construction jobs in California, 69,959 jobs are related to construction of electric power generation infrastructure. That ratio is applied to the city's construction workforce data.

The 2024 U.S. Energy & Employment Report estimates that 54 percent of energy efficiency jobs are "net zero," meaning that they do not involve the installation of fossil fuel-burning equipment. This 54 percent national estimate is applied to the city estimate to calculate the number of workers involved in green energy.

The approach of using national estimates to obtain city-level workforce is used in comparable workforce reports such as the *Bay Area Residential Decarbonization Industry and Workforce Overview* done by Movement Economics,[4] as well as academic publications like *National disparities in residential energy tax credits in the United States.*[5]

The 2024 U.S. Energy & Employment Report provides the number of jobs within each subset of a technology on the state level and the county level. We believe using the state level is better because there is more complete data on the subsets, and it will be consistent with the previous steps in the methodology. This method applies the proportion of green jobs within each technology to all jobs within that technology. For example, according to the 2024 U.S. Energy & Employment Report, all energy efficiency jobs are green energy, so the proportion applied is 100%.

## Method 1 Findings: Existing Number of Green Energy Jobs

Between 2022 and 2023, the city added 3,790 new energy jobs, with green energy jobs accounting for nearly half (46%, 1,746 jobs) of this growth. A total of 1,746 green energy jobs were created, with the largest share—over 47%—emerging in the Professional & Business Services sector, aligning with a broader increase in demand for green job postings. While nearly all energy industries experienced growth in green energy employment, the only decline occurred in Mining, Quarrying, and Oil and Gas Extraction, a sector that already only represented a small portion of the city's energy employment. This decline is consistent with national trends, reflecting a broader shift away from fossil fuel extraction and toward sustainable energy industries. Green Energy Job Counts by Industry for 2022 and 2023 are provided in **Table 1**.

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[4] Thomason, Sarah, Chelsey Bryant, Sharon Jan, and Kelly Haines. *Bay Area Residential Decarbonization Industry and Workforce Overview*. Residential Decarbonization Industry Paper Series. Movement Economics and Ponder Analytics for the High Road Training Partnership, July 2024. Residential Decarb Study - Industry Analysis Aug 13 2024.docx

[5] Holt, Emily G., and Deborah A. Sunter. "National Disparities in Residential Energy Tax Credits in the United States." *Energy* 300 (2024): 131449. https://doi.org/10.1016/j.energy.2024.131449.

**Table 1: Green Energy Job Counts by Industry, 2022 and 2023**

| Industry (NAICS) | Green Energy Jobs | | Total Energy Jobs | |
|---|---|---|---|---|
| | 2022 | 2023 | 2022 | 2023 |
| 21 Mining, Quarrying, and Oil and Gas Extraction | 15 | 14 | 108 | 97 |
| 22 Utilities | 4,025 | 4,298 | 4,941 | 5,280 |
| 23 Construction | 6,599 | 6,933 | 7,079 | 7,437 |
| 31 Manufacturing | 3,191 | 3,263 | 5,726 | 5,750 |
| 42, 486 Wholesale Trade, Pipeline Transportation | 2,114 | 2,142 | 3,787 | 3,722 |
| 51-56 Professional & Business Services | 7,552 | 8,381 | 9,533 | 12,430 |
| 81 Other Services (except Public Administration) | 1,506 | 1,989 | 5,054 | 5,301 |
| **Total** | **24,972** | **26,718** | **36,227** | **40,017** |

## Method 2. Green Job Postings

To complement Method 1, which estimates green energy jobs from an industry perspective (NAICS codes), Method 2 was developed to look at the green economy from an occupational perspective by examining trends in occupational job postings to measure existing demand for green jobs and how demand for green jobs has changed over time.

This methodology is based on the framework developed by Lightcast and WorkingNation to categorize green jobs according to the specific requirements listed in job postings.[6] Green jobs are classified into the following sectors:

1. *Core Green*: Jobs that are primarily focused on the green economy (e.g. solar panel installers).
2. *Green Enabled*: Jobs whose primary responsibilities are tangential to the green economy but have increasingly required green skills (e.g., maintenance technicians who work with new energy-efficient systems or industrial engineers who build those systems).
3. *Green Enabling:* Jobs whose work is not related to green energy directly, but support the green economy (e.g., marketing executives at a sustainability firm).
4. *Potential Green*: Jobs that may acquire green responsibilities in the future but do not currently require green skills. For example, an Electrical Engineer may eventually perform green-related work, but unless such skills are explicitly required in a job posting, these roles are not classified as green for this study.

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[6] Working Nation (2022). *Green Jobs Now*. https://www.workingnation.com/green-jobs-now/

By analyzing job postings, this method assesses how demand for green occupations has evolved over time. Job postings are a useful metric because they indicate how the market is reacting in real time to the demand and supply of green skills. This approach of using job postings to measure the green economy has been previously used in the academic study, *Green Energy Jobs in the US: What Are They, and Where Are They?*[7]

Postings are classified using O\*NET codes, a widely used categorization of occupations in the US economy. O\*NET codes are used instead of SOC codes because O\*NET codes provide more granular detail. For example, SOC Codes recognize a Green Core job as "Chief Executive Officer" while O\*NET classifies the same position more specifically as a "Chief Sustainability Officer." Each posting is categorized by both occupation and green sector (i.e., core, enabling, or enabled).

The data used represent the period from 2017 to 2024, enabling analysis of trends in green job demand over time. The job postings data are exclusively for jobs within zip codes in the city.[8] Both occupation-level and green sector-level information are analyzed. The following information is used for the analysis at the occupation level:

- Unique job postings: Counts only distinct job advertisements to prevent double-counting.
- Median advertised annual salary (when available)
- Number of employers competing for applicants: The number of companies actively hiring for roles within each occupation.

At the green sector level (core, enabling, and enabled), the following are used:

- Unique job postings: Deduplicated postings to provide an accurate count of demand.
- Employers competing: The number of companies actively hiring for roles within each sector.
- Median posting duration: Indicates labor market tightness, with longer durations suggesting labor shortages.
- Median advertised salary: Accompanied by a salary distribution range.
- Education level required: Specifies the most advertised educational qualifications.
- Top companies posting: Highlights the main employers driving green job demand.
- Top advertised skills: Identifies key competencies in demand (e.g., project management, environmental mitigation, sustainable design).

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[7] Curtis, E. Mark, and Ioana Marinescu. Green Energy Jobs in the US: What Are They, and Where Are They? NBER Working Paper No. 30332. Cambridge, MA: National Bureau of Economic Research, August 2022. http://www.nber.org/papers/w30332.

[8] ZIPCodes-US (2025). Available at: https://zipcodes-us.com/zip/ca/san-diego#zips
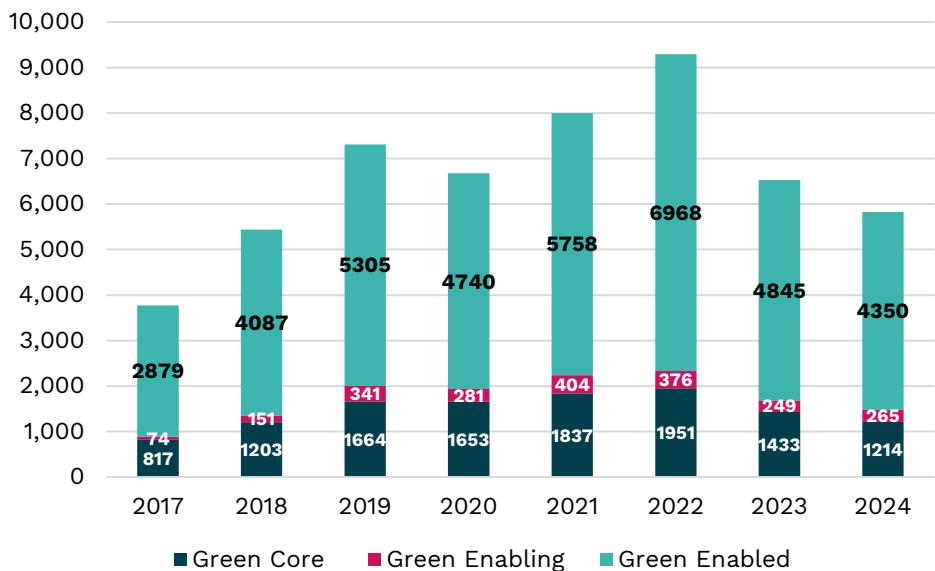
## Method 2 Findings: Demand for Green Jobs

Over the past eight years (2017-2024), San Diego's green job market has seen dynamic shifts in demand, skills, and compensation.

### Overall Demand

The number of employers hiring for green jobs nearly doubled (from 636 to 1,252 employers) from 2017 to 2024, and the number of unique green jobs postings has increased by 55% (from 3,770 to 5,829) (**Figure 1**).

**Figure 1. Unique Green Job Postings in the City of San Diego**



Legend: ■ Green Core   ■ Green Enabling   ■ Green Enabled

Data labels by year:
- 2017: 817, 74, 2879
- 2018: 1203, 151, 4087
- 2019: 1664, 341, 5305
- 2020: 1653, 281, 4740
- 2021: 1837, 404, 5758
- 2022: 1951, 376, 6968
- 2023: 1433, 249, 4845
- 2024: 1214, 265, 4350

Among green jobs, most in-demand are green enabled jobs (75% of postings) followed by core green jobs (21% of postings) and green enabling jobs (5% of postings). Green enabling jobs – in which the work is not directly related to green energy, but supports the green economy (e.g., a marketing executive at a sustainability firm) – experienced the most substantial growth—rising 258% since 2017—and the most volatility, with a 173% increase in median advertised salaries and fluctuating education requirements.

Posting durations for green enabling dropped by 94% since 2018, signaling a higher worker supply. Across all other green jobs, the median posting duration of a job posting increased by 37% on average.

### Salary

For all green jobs, salaries advertised in postings have increased 6.1% annually on average since 2017, outpacing the 3.8% increase across all job postings (**Figure 2**).

**Figure 2. Median Advertised Salary by Type of Job Posting**
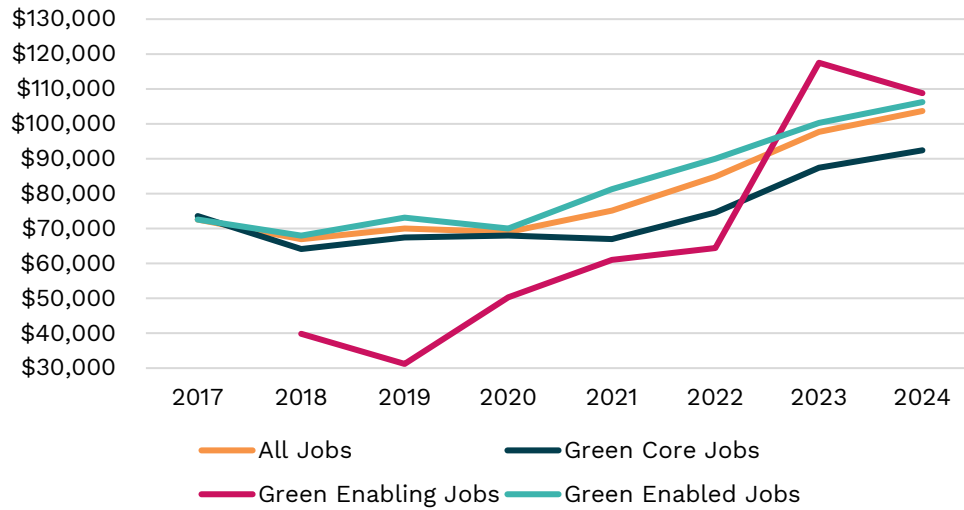


## Education and Skills

More job postings for green enabled jobs required a master's degree or a Ph.D. from 2017 to 2024 from 12% to 29% and 1% to 4%, respectively while all other job postings in other sectors experienced little change in their minimum education requirement The most common educational requirement listed in green jobs postings is a bachelor's degree (56%), followed by no education level (28%) and a master's degree (25%). Across all sectors, job postings requiring a bachelor's degree rose after 2021 but have since returned to pre-COVID levels, in line with all job postings **(Figure 3)**.

**Figure 3. Job Postings that Require Bachelor's Degree**
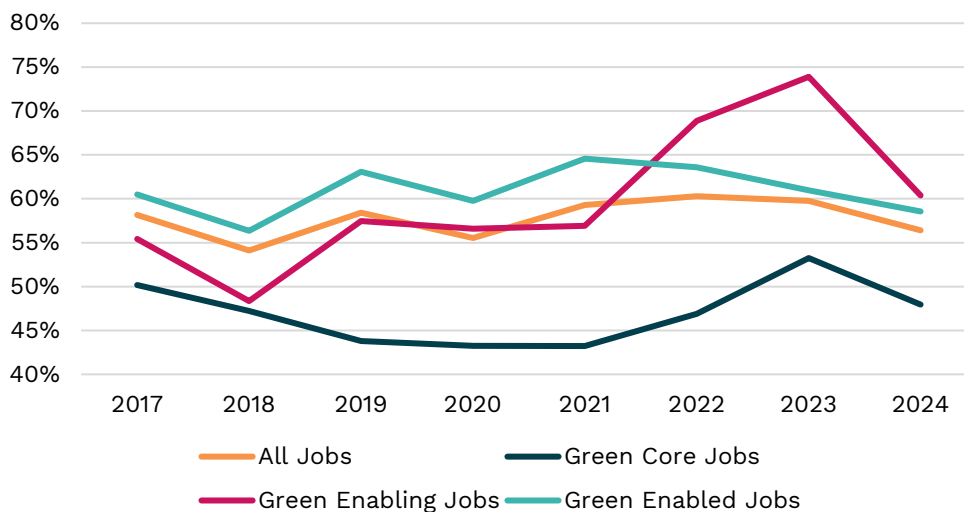
The most in-demand specialized skills across green job postings were project management, mitigation, construction, auditing, and biology. The City of San Diego itself ranked among the top six employers by unique green job postings from 2021 to 2024.

Comparison of San Diego to Los Angeles, San Francisco and Sacramento

When adjusted for cost of living, San Diego has offered the highest median green job salaries among major California metropolitan areas since 2023, a dramatic rise from being second lowest in 2017 (**Figure 4**).

**Figure 4. Comparison of Median Advertised Salary for Total Green Job Postings, Adjusted by Cost of Living Index**
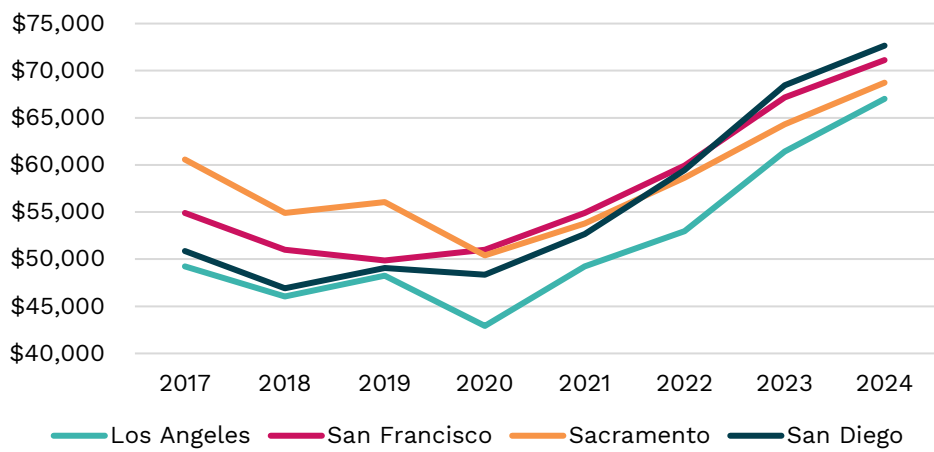


The city's proportion of green job postings most closely mirrors San Francisco, reflecting a strong alignment with the leading green regional economies in California.

# Attachment 1
# Detailed Statistics Regarding Green Energy Job Counts and Demand for Green Jobs

**Table 1**. All energy jobs by industry and technology in the City of San Diego (2022). Industries shown here are selected according to the North American Industrial Classification System (NAICS) codes indicated in the 2024 U.S. Energy & Employment Report. The number of jobs in the city is derived by scaling the total number of energy jobs in the city provided by Lightcast by the proportion of technology jobs in each industry reported in the State of California as a whole.

| | Electric Power Generation | Transmission, Distribution, and Storage | Fuels | Energy Efficiency | Motor Vehicles | Total |
|---|---|---|---|---|---|---|
| **Mining, Quarrying, and Oil and Gas Extraction** | | 0 | 108 | 0 | 0 | 108 |
| **Utilities** | 1,202 | 3,738 | 0 | 0 | 0 | 4,941 |
| **Construction** | 1,858 | 1,035 | 0 | 4,185 | 0 | 7,079 |
| **Manufacturing** | 1,232 | 431 | 775 | 1,214 | 2,073 | 5,726 |
| **Wholesale Trade, Transportation** | 548 | 575 | 388 | 794 | 1,482 | 3,787 |
| **Professional & Business Services** | 1,918 | 1,181 | 1,462 | 4,663 | 309 | 9,533 |
| **Other Services (except Public Administration)** | 234 | 92 | 3 | 204 | 4,521 | 5,054 |
| **Total in San Diego City** | 6,992 | 7,053 | 2,735 | 11,061 | 8,386 | **36,227** |

**Table 2**. Total number of clean energy jobs in the city (2022) by industry and technology. These numbers are derived by scaling the number of energy jobs (see Table 1 above) by the percent of clean energy jobs in each technology in the State of California (2022).

| | Electric Power Generation | Transmission, Distribution, and Storage | Fuels | Energy Efficiency | Motor Vehicles | Total Based on Specific % |
|---|---|---|---|---|---|---|
| **Mining, Quarrying, and Oil and Gas Extraction** | 0 | 0 | 15 | 0 | 0 | 15 |
| **Utilities** | 1,024 | 3,001 | 0 | 0 | 0 | 4,025 |
| **Construction** | 1,583 | 831 | 0 | 4,185 | 0 | 6,599 |
| **Manufacturing** | 1,049 | 346 | 110 | 1,214 | 472 | 3,191 |
| **Wholesale Trade, Transportation** | 466 | 461 | 55 | 794 | 337 | 2,114 |
| **Professional & Business Services** | 1,633 | 948 | 207 | 4,663 | 70 | 7,522 |
| **Other Services (except Public Administration)** | 199 | 74 | 0 | 204 | 1,029 | 1,506 |
| **Total** | 5,954 | 5,662 | 387 | 11,061 | 1,908 | **24,972** |

**Table 3**. All energy jobs by industry and technology in the City of San Diego (2023). Industries shown here are selected according to the North American Industrial Classification System (NAICS) codes indicated in the 2024 U.S. Energy & Employment Report. The City jobs numbers are derived by scaling the total number of energy jobs in the City of San Diego provided by Lightcast by the proportion of technology jobs in each industry reported in the State of California as a whole.

| | Electric Power Generation | Transmission, Distribution, and Storage | Fuels | Energy Efficiency | Motor Vehicles | Total |
|---|---|---|---|---|---|---|
| **Mining, Quarrying, and Oil and Gas Extraction** | | 0 | 97 | 0 | 0 | 97 |
| **Utilities** | 1,293 | 3,987 | 0 | 0 | 0 | 5,280 |
| **Construction** | 1,957 | 1,058 | 0 | 4,421 | 0 | 7,437 |
| **Manufacturing** | 1,249 | 424 | 764 | 1,231 | 2,083 | 5,750 |
| **Wholesale Trade, Transportation** | 561 | 556 | 395 | 813 | 1,396 | 3,722 |
| **Professional & Business Services** | 1,979 | 1,183 | 1,498 | 4,791 | 2,979 | 12,430 |
| **Other Services (except Public Administration)** | 241 | 92 | 3 | 216 | 4,749 | 5,301 |
| **Total in San Diego City** | 7,280 | 7,301 | 2,756 | 11,472 | 11,208 | **40,017** |

**Table 4**. Total number of clean energy jobs in San Diego (2023) by industry and technology. These numbers are derived by scaling the number of energy jobs (see Table 3 above) by the percent of clean energy jobs in each technology in the State of California (2023).

| | Electric Power Generation | Transmission, Distribution, and Storage | Fuels | Energy Efficiency | Motor Vehicles | Total Based on Specific % |
|---|---|---|---|---|---|---|
| **Mining, Quarrying, and Oil and Gas Extraction** | 0 | 0 | 14 | 0 | 0 | 14 |
| **Utilities** | 1,099 | 3,200 | 0 | 0 | 0 | 4,298 |
| **Construction** | 1,663 | 849 | 0 | 4,421 | 0 | 6,933 |
| **Manufacturing** | 1,061 | 340 | 109 | 1,231 | 522 | 3,263 |
| **Wholesale Trade, Transportation** | 477 | 447 | 56 | 813 | 350 | 2,142 |
| **Professional & Business Services** | 1,681 | 950 | 213 | 4,791 | 747 | 8,381 |
| **Other Services (except Public Administration)** | 205 | 74 | 0 | 216 | 1,191 | 1,686 |
| **Total** | 6,185 | 5,860 | 392 | 11,472 | 2,810 | **26,718** |

**Table 5**. Total number and some basic features of all job postings in the City of San Diego (2017-2024). Data was obtained from Lightcast.

| Indicators | Total Job Postings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Unique Job Postings | 184,049 | 279,773 | 355,086 | 305,297 | 348,055 | 394,700 | 252,672 | 214,599 |
| Number of Employers Competing | 8,451 | 21,371 | 26,430 | 23,923 | 28,832 | 29,227 | 21,765 | 18,510 |
| Median Advertised Salary | $54,912 | $46,720 | $46,464 | $49,280 | $50,048 | $56,192 | $67,456 | $69,888 |
| Median Posting Duration (Days) | 20 | 25 | 30 | 30 | 33 | 28 | 29 | 27 |
| **Most Common Education Level Required** | | | | | | | | |
| No Education Level | 44% | 45% | 45% | 44% | 41% | 44% | 45% | 49% |
| High School or GED | 14% | 16% | 15% | 17% | 21% | 17% | 19% | 19% |
| Associate's Degree | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% |
| Bachelor's Degree | 38% | 36% | 37% | 35% | 35% | 35% | 32% | 28% |
| Master's Degree | 12% | 11% | 11% | 11% | 11% | 12% | 11% | 11% |
| Ph.D. | 4% | 4% | 4% | 5% | 5% | 5% | 5% | 5% |

**Table 6**. Total number and some basic features of all Green Job postings in the City of San Diego (2017-2024). Data was obtained from Lightcast.

| Indicators | Total Green Job Postings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Unique Job Postings | 3770 | 5441 | 7310 | 6674 | 7999 | 9295 | 6527 | 5829 |
| Number of Employers Competing | 636.00 | 1025 | 1434 | 1527 | 1740 | 1796 | 1406 | 1252.00 |
| Median Advertised Salary | $72,576 | $66,944 | $70,016 | $68,992 | $75,136 | $84,864 | $97,664 | $103,680 |
| Median Posting Duration (Days) | 19 | 25 | 30 | 31 | 30 | 27 | 29 | 26 |
| **Most Common Education Level Required** | | | | | | | | |
| No Education Level | 28% | 30% | 29% | 29% | 24% | 24% | 24% | 28% |
| High School or GED | 10% | 13% | 11% | 14% | 15% | 13% | 13% | 12% |
| Associate's Degree | 4% | 6% | 5% | 5% | 6% | 5% | 4% | 5% |
| Bachelor's Degree | 58% | 54% | 58% | 56% | 59% | 60% | 60% | 56% |
| Master's Degree | 22% | 20% | 23% | 23% | 24% | 26% | 25% | 25% |
| Ph.D. | 7% | 5% | 5% | 6% | 7% | 7% | 7% | 6% |

**Table 7.** Total number and some basic features of all Green Core Job postings in the City of San Diego (2017-2024). The definition of Green Core jobs can be found in the Method 2 section of Appendix C. Data was obtained from Lightcast. A subset of this data is displayed in Appendix C, Figures 1, 2, and 3.

| | **Total Green Core Job Postings** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicators** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Unique Job Postings | 817 | 1203 | 1664 | 1653 | 1837 | 1951 | 1433 | 1214 |
| Number of Employers Competing | 242 | 402 | 587 | 601 | 705 | 574 | 513 | 379 |
| Median Advertised Salary | $73,600 | $64,128 | $67,456 | $67,968 | $66,944 | $74,624 | $87,424 | $92,416 |
| Median Posting Duration (Days) | 16 | 28 | 28 | 31 | 36 | 30 | 29 | 26 |
| **Most Common Education Level Required** | | | | | | | | |
| No Education Level | 38% | 39% | 42% | 41% | 38% | 37% | 33% | 36% |
| High School or GED | 9% | 14% | 11% | 14% | 16% | 14% | 11% | 11% |
| Associate's Degree | 4% | 5% | 5% | 3% | 4% | 3% | 4% | 3% |
| Bachelor's Degree | 50% | 47% | 44% | 43% | 43% | 47% | 53% | 48% |
| Master's Degree | 24% | 19% | 20% | 19% | 18% | 21% | 24% | 25% |
| Ph.D. | 9% | 4% | 6% | 6% | 6% | 7% | 6% | 7% |

**Table 8.** Total number and some basic features of all Green Enabling Job postings in the City of San Diego (2017-2024). The definition of Green Enabling green jobs can be found in the Method 2 section of Appendix C. Data was obtained from Lightcast. A subset of this data is displayed in Appendix C, Figures 1, 2, and 3.

| | **Total Green Enabling Job Postings** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicators** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Unique Job Postings | 74 | 151 | 341 | 281 | 404 | 376 | 249 | 265 |
| Number of Employers Competing | 19 | 38 | 48 | 49 | 51 | 60 | 41 | 37 |
| Median Advertised Salary | N/A | $39,808 | $31,200 | $50,304 | $61,056 | $64,384 | $117,504 | $108,800 |
| Median Posting Duration (Days) | N/A | 37 | 32 | 26 | 33 | 26 | 29 | 19 |
| **Most Common Education Level Required** | | | | | | | | |
| No Education Level | 35% | 39% | 31% | 30% | 29% | 23% | 17% | 29% |
| High School or GED | 9% | 16% | 9% | 10% | 12% | 5% | 6% | 8% |
| Associate's Degree | 5% | 2% | 6% | 5% | 2% | 2% | 2% | 2% |
| Bachelor's Degree | 55% | 48% | 57% | 57% | 57% | 69% | 74% | 60% |
| Master's Degree | 12% | 17% | 21% | 23% | 22% | 22% | 28% | 29% |
| Ph.D. | 1% | 2% | 2% | 1% | 2% | 4% | 3% | 4% |

**Table 9.** Total number and some basic features of all Green Enabled Job postings in the City of San Diego (2017-2024). The definition of Green Enabled green jobs can be found in the Method 2 section of Appendix C. Data was obtained from Lightcast. A subset of this data is displayed in Appendix C, Figures 1, 2, and 3.

| | Total Green Enabled Job Postings | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Indicators** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Unique Job Postings | 2879 | 4087 | 5305 | 4740 | 5758 | 6968 | 4845 | 4350 |
| Number of Employers Competing | 523 | 931 | 1141 | 1097 | 1183 | 1497 | 1133 | 1007 |
| Median Advertised Salary | $72,576 | $67,968 | $73,088 | $70,016 | $81,280 | $89,984 | $100,224 | $106,240 |
| Median Posting Duration (Days) | 20 | 24 | 30 | 31 | 27 | 27 | 29 | 26 |
| **Most Common Education Level Required** | | | | | | | | |
| No Education Level | 25% | 27% | 24% | 25% | 19% | 20% | 22% | 25% |
| High School or GED | 11% | 13% | 11% | 14% | 14% | 13% | 14% | 13% |
| Associate's Degree | 4% | 6% | 5% | 6% | 7% | 6% | 4% | 5% |
| Bachelor's Degree | 61% | 56% | 63% | 60% | 65% | 64% | 61% | 59% |
| Master's Degree | 22% | 20% | 24% | 24% | 26% | 28% | 25% | 24% |
| Ph.D. | 6% | 5% | 5% | 6% | 7% | 7% | 7% | 6% |

**Table 10**. Annual number of job postings in San Diego and three comparison cities (Los Angeles, San Francisco, and Sacramento) (2017 to 2024). The definition of "Core," "Enabling," and "Enabled" green jobs can be found in the Method 2 section of Appendix C. Data was obtained from Lightcast.

| Total, All Job Postings | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| San Diego | 184,049 | 279,773 | 355,086 | 305,297 | 348,055 | 394,700 | 252,672 | 214,599 |
| Los Angeles | 298,962 | 454,494 | 561,769 | 461,845 | 555,010 | 615,551 | 439,745 | 376,577 |
| San Francisco | 244,471 | 380,423 | 432,275 | 316,074 | 342,039 | 375,886 | 221,441 | 190,730 |
| Sacramento | 80,511 | 131,929 | 151,979 | 141,286 | 152,577 | 170,134 | 126,755 | 115,570 |
| | | | | | | | | |
| **Total, Green Job Postings** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| San Diego | 3,770 | 5,441 | 7,310 | 6,674 | 7,999 | 9,295 | 6,527 | 5,829 |
| Los Angeles | 4,941 | 7,022 | 8,765 | 7,432 | 9,060 | 10,819 | 8,238 | 7,831 |
| San Francisco | 4,484 | 7,538 | 8,472 | 7,344 | 8,111 | 9,266 | 6,671 | 5,371 |
| Sacramento | 2,571 | 4,845 | 5,502 | 4,646 | 4,571 | 5,852 | 4,827 | 4,887 |
| | | | | | | | | |
| **Core Green Job Postings** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| San Diego | 817 | 1,203 | 1,664 | 1,653 | 1,837 | 1,951 | 1,433 | 1,214 |
| Los Angeles | 967 | 1,399 | 1,689 | 1,788 | 2,072 | 2,443 | 1,839 | 1,518 |
| San Francisco | 618 | 1,030 | 1,154 | 916 | 997 | 1,389 | 933 | 748 |
| Sacramento | 664 | 1,327 | 1,503 | 1,332 | 1,315 | 1,662 | 1,192 | 1,061 |
| | | | | | | | | |
| **Enabling Green Job Postings** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| San Diego | 74 | 151 | 341 | 281 | 404 | 376 | 249 | 265 |
| Los Angeles | 85 | 205 | 237 | 210 | 286 | 338 | 261 | 308 |
| San Francisco | 452 | 1,277 | 1,183 | 1,426 | 1,178 | 673 | 531 | 251 |
| Sacramento | 40 | 153 | 257 | 300 | 280 | 255 | 300 | 286 |
| | | | | | | | | |
| **Enabled Green Job Postings** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| San Diego | 2,879 | 4,087 | 5,305 | 4,740 | 5,758 | 6,968 | 4,845 | 4,350 |
| Los Angeles | 3,889 | 5,418 | 6,839 | 5,434 | 6,702 | 8,038 | 6,138 | 6,005 |
| San Francisco | 3,414 | 5,231 | 6,135 | 5,002 | 5,936 | 7,204 | 5,207 | 4,372 |
| Sacramento | 1,867 | 3,365 | 3,742 | 3,014 | 2,976 | 3,935 | 3,335 | 3,540 |

**Table 11**. Median green job salaries in San Diego and three comparison cities (2017-2024). Salaries in each city are adjusted according to the Cost-of-Living Index as follows: San Diego (163.1), Los Angeles (182.5), San Francisco (135.9), Sacramento (142.7). The definition of "Core," "Enabling," and "Enabled" green jobs can be found in the Method 2 section of Appendix C. Data was obtained from Lightcast. Data from the top section of this table ("Total Green Salary") is plotted in Figure 4 of Appendix C.

| Total Green Job Salary[1] | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| Los Angeles | $ 49,234 | $ 46,045 | $ 48,253 | $ 42,918 | $ 49,234 | $ 52,974 | $ 61,435 | $ 67,014 |
| San Francisco | $ 54,904 | $ 51,014 | $ 49,863 | $ 51,014 | $ 54,904 | $ 59,945 | $ 67,178 | $ 71,123 |
| Sacramento | $ 60,559 | $ 54,893 | $ 56,071 | $ 50,405 | $ 53,790 | $ 58,646 | $ 64,312 | $ 68,727 |
| San Diego | $ 50,859 | $ 46,912 | $ 49,065 | $ 48,348 | $ 52,653 | $ 59,470 | $ 68,440 | $ 72,656 |
| | | | | | | | | |
| **Core Green Job Salary[1]** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Los Angeles | $ 41,018 | $ 39,792 | $ 39,301 | $ 33,660 | $ 38,197 | $ 42,918 | $ 54,568 | $ 56,039 |
| San Francisco | $ 58,027 | $ 51,562 | $ 49,315 | $ 46,795 | $ 52,110 | $ 51,178 | $ 54,849 | $ 62,411 |
| Sacramento | $ 44,960 | $ 47,167 | $ 49,669 | $ 49,669 | $ 50,405 | $ 55,261 | $ 57,837 | $ 62,693 |
| San Diego | $ 51,577 | $ 44,939 | $ 47,271 | $ 47,630 | $ 46,912 | $ 52,294 | $ 61,264 | $ 64,762 |
| | | | | | | | | |
| **Enabling Green Job Salary[1]** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Los Angeles | $ - | $ 30,043 | $ 31,147 | $ 31,637 | $ 34,457 | $ 33,538 | $ 38,749 | $ 44,758 |
| San Francisco | $ 37,753 | $ 54,082 | $ 45,918 | $ 41,096 | $ 50,630 | $ 51,178 | $ 73,918 | $ 62,137 |
| Sacramento | $ - | $ 57,174 | $ 53,054 | $ 45,843 | $ 49,669 | $ 53,790 | $ 57,174 | $ 59,308 |
| San Diego | $ - | $ 27,896 | $ 21,864 | $ 35,252 | $ 42,786 | $ 45,118 | $ 82,343 | $ 76,244 |
| | | | | | | | | |
| **Enabled Green Job Salary[1]** | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Los Angeles | $ 52,974 | $ 47,946 | $ 52,361 | $ 50,766 | $ 55,181 | $ 59,227 | $ 64,500 | $ 70,448 |
| San Francisco | $ 54,904 | $ 48,164 | $ 50,411 | $ 52,110 | $ 55,178 | $ 61,644 | $ 69,151 | $ 73,918 |
| Sacramento | $ 63,576 | $ 58,646 | $ 59,455 | $ 53,790 | $ 58,278 | $ 61,295 | $ 66,593 | $ 71,744 |
| San Diego | $ 50,859 | $ 47,630 | $ 51,218 | $ 49,065 | $ 56,959 | $ 63,058 | $ 70,234 | $ 74,450 |

Notes:
1. Salary is adjusted for cost of living.

**Table 12**. Top 10 companies by unique green jobs postings in the City of San Diego (2020-2024)

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| 1 | AECOM | Marriott International | Sempra International | GPAC | EDF Renewables | Northrop Grumman | City Of San Diego | WSP Global |
| 2 | Aerotek | University of California-San Diego | Northrop Grumman | EDF Renewables | University of California-San Diego | University of California-San Diego | Northrop Grumman | EDF Renewable Energy |
| 3 | Qualcomm | Northrop Grumman | Booz Allen Hamilton | Sempra International | Northrop Grumman | City Of San Diego | University of California-San Diego | University of California |
| 4 | Northrop Grumman | County Of San Diego | Vivint | Northrop Grumman | City Of San Diego | AECOM | Actalent | AECOM |
| 5 | University of California-San Diego | CyberCoders | Marriott International | University of California-San Diego | University of California | EDF Renewables | WSP Global | County Of San Diego |
| 6 | EDF Renewable Energy | City Of San Diego | AECOM | Tetra Tech | County Of San Diego | University of California | Calpine | City Of San Diego |
| 7 | Marriott International | Tetra Tech | Tetra Tech | Booz Allen Hamilton | Sunrun | Deloitte | County Of San Diego | EDF Renewables |
| 8 | General Atomics | AECOM | University of California-San Diego | University of California | Aerotek | WSP Global | Stantec | Sempra International |
| 9 | Hawthorne Cat | Illumina | Greenpeace | DNV | DNV | County Of San Diego | AECOM | Calpine |
| 10 | City Of San Diego | Vivint | County Of San Diego | County Of San Diego | Qualcomm | Sunrun | EDF Renewables | Stantec |

**Table 13**. Top 10 specialized skills by total green jobs postings in the City of San Diego (2020-2024)

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| 1 | Project Management | Project Management | Project Management | Project Management | Project Management | Project Management | Project Management | Project Management |
| 2 | Mitigation | Mitigation | Mitigation | Mitigation | Mitigation | Mitigation | Mitigation | Mitigation |
| 3 | Construction | Auditing | Construction | Construction | Construction | Auditing | Construction | Construction |
| 4 | Auditing | Construction | Auditing | Auditing | Auditing | Construction | Biology | Auditing |
| 5 | Risk Analysis | Biology | Biology | Risk Analysis | Biology | Biology | Environmental Science | Biology |
| 6 | Marketing | Marketing | Risk Analysis | Biology | Risk Management | Risk Analysis | Business Development | Environmental Science |
| 7 | Biology | Risk Analysis | Risk Management | Business Development | Risk Analysis | Business Development | Procurement | Business Development |
| 8 | Risk Management | Data Analysis | Marketing | Computer Science | Data Analysis | Marketing | Auditing | Risk Analysis |
| 9 | Business Development | HVAC | Data Analysis | Risk Management | Marketing | Finance | Marketing | Marketing |
| 10 | Computer Science | Business Development | Business Development | Data Analysis | Continuous Improvement Process | Risk Management | Risk Analysis | Data Analysis |