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CLEAN JOBS CALIFORNIA

2021

RESILIENT: AMERICA'S CLEAN ECONOMY POWERHOUSE IN THE WAKE OF COVID-19



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Methodology

The analysis is based on employment data collected and analyzed by the BW Research Partnership for the 2021 U.S. Energy and Employment Report (USEER). The USEER analyzes data from the U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) to track employment across many energy production, transmission, and distribution subsectors. In addition, the 2021 USEER relies on a unique supplemental survey of 30,000 business representatives across the United States.

Created and conducted by BW Research with a methodology that has been approved by the Office of Management and Budget (OMB) and U.S. Department of Energy (DOE), this survey is used to identify energy-related employment within key subsectors of the broader industries as classified by the BLS and to assign them into their component energy and energy efficiency sectors.

About This Report

This is the fourth annual *Clean Jobs California* report produced by E2 based on analysis of the USEER, which was first released by the DOE in 2016. E2 was an original proponent of the DOE producing the USEER and was a partner on the reports produced by the Energy Futures Initiative (EFI) and National Association of State Energy Officials (NASEO) after the Trump administration abandoned it in 2017.

For additional insight into E2's Clean Jobs California or our other annual clean energy economic reports, visit e2.org/reports.

An FAQ is available at www.e2.org/reports/clean-jobs-america-faq.

About E2



E2 (Environmental Entrepreneurs) is a national, nonpartisan group of business leaders, investors, and professionals from every sector of the economy who advocate for smart policies that are good for the economy and good for the environment. E2 members have founded or funded more than 2,500 companies, created more than 600,000 jobs, and manage more than \$100 billion in venture and private equity capital.

E2 releases more than a dozen clean energy employment reports annually with state-specific reports covering more than 20 states.

CLEAN JOBS CALIFORNIA 2021¹

RESILIENT: AMERICA'S CLEAN ECONOMY POWERHOUSE IN THE WAKE OF COVID-19

Driven by the unforeseeable impact of the COVID-19 pandemic and resulting economic crisis, California experienced its first decline in clean energy jobs in 2020 since E2 began tracking such occupations. California's clean energy economy employed about 485,000 workers at the end of 2020, down from 537,000 the year before, according to analysis of Bureau of Labor Statistics data and the findings of a national survey of more than 35,000 businesses across the U.S. economy.

Yet this data indicates that clean energy jobs were more resilient and recovered more quickly than overall state employment. By May of last year, more than 109,000 clean energy workers in California had lost their jobs since the COVID-19 pandemic began spreading widely three months earlier, according to analysis of unemployment data by E2 and partners.² Since the sector's losses peaked at the end of May 2020, jobs grew back by more than 13 percent—more than double the rate of growth in the state's overall economy. In fact, by the end of 2020 more than half of the clean energy jobs lost between March and May had been regained, leaving the sector down just 9 percent (about 52,000 jobs) since COVID-19.

Thanks to decades of smart state climate policy leadership, California's clean energy economy has proven to be a core part of the state's economy—representing 3 percent of overall state employment—and resilient and robust in the face of crushing economy-wide pressures.

Case in point is the state's electric vehicle industry. Clean vehicle manufacturing jobs defied overall energy sector job loss patterns and grew nearly 5 percent as automakers increasingly shifted to cleaner and more efficient electric cars, trucks and buses. In 2020, EVs were the state's most valuable export, producing nearly \$5.7 billion in revenue and eclipsing California's venerable aerospace industry for the first time. With the right policy direction from Sacramento and local governments, California is positioned to be a global nexus of electric vehicle innovation and manufacturing.

But weathering the global COVID-19 pandemic and subsequent economic shut-down proved challenging for some aspects of the clean economy, especially those that require in-person engagement with customers. Jobs in energy efficiency, the biggest part of California's energy sector, fell more than 12 percent last year as COVID-19 pandemic restrictions prevented energy efficiency workers from entering commercial and residential buildings.

Despite the overall decline, clean energy remains the biggest job creator within California's energy sector, employing nearly six times as many workers as employed in fossil fuel extraction and generation. More Californians work in clean energy than work as registered nurses, accountants, lawyers, software designers, or truck drivers. Median hourly wages for clean energy jobs also are about 29 percent higher than the statewide median wage. More than half of these jobs—244,790—were in construction with the clean energy economy employing 28 percent of the state's construction workforce.

POLICY LEADERSHIP CAN CATALYZE A CLEAN JOBS COMEBACK

While clean energy suffered like many sectors of the economy in 2020, the prospects for growth are greater than ever. Smart public policy leadership created the market environment to position California's clean energy economy as a global leader over the last 20 years. Now, the scale of the recovery from COVID-19 and future growth opportunities will depend on additional innovative public policy from leaders both in Washington D.C. and Sacramento.

Key clean energy policy can create major new opportunities for job seekers across the state—including in communities impacted by the ongoing decline of other parts of the energy sector such as coal, oil and gas. They also can make the U.S. and California more competitive globally. Done right, these policies will create better access to clean energy as well as new job and business opportunities for people of color who have not benefited equally from the cost-savings, health or employment benefits of clean energy to date.

Furthermore, policies that drive clean energy investments and job growth can also help mitigate the human toll and the economic cost of climate change including the over \$100 billion lost to extreme weather events in the U.S. in the last year alone. Climate risk is business risk.

Members of Congress can turn risk into opportunity by passing the Biden administration's Build Back Better plans anchored in clean energy investments to fund grid modernization, energy efficiency and electric vehicle charging networks at scale to form the backbone of a cleaner, more resilient economy. California lawmakers must build on existing state climate policy leadership to ensure the state remains a hub of job growth and innovation. Lawmakers must codify our state's carbon neutrality goals while tightening our emissions mitigation targets, and continue to build out complementary policies to drive climate action to meet these goals.

California's Clean Energy Economy—State of the Industry

Introduction to the Numbers

California's clean energy sector employed about 485,000 workers by the end of 2020. Energy Efficiency continued to lead the field, accounting for about 60 percent of all state clean energy jobs, followed by Renewable Energy and Clean Vehicles (Fig. 1).

Construction accounted for about half of all clean energy employment in 2020, with professional services making up another 20 percent and manufacturing 10 percent. Small businesses were the largest sources of clean energy jobs, employing almost six out of every 10 clean energy workers in California.

Black, Asian, Indigenous, Hispanic or Latino, and multiracial workers accounted for about 45 percent of clean energy jobs in the state, while less than three of every 10 workers were women. Policymakers and business leaders must do more to ensure that the 21st century economy benefits all Californians.

FIG. 1 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by sector 2020

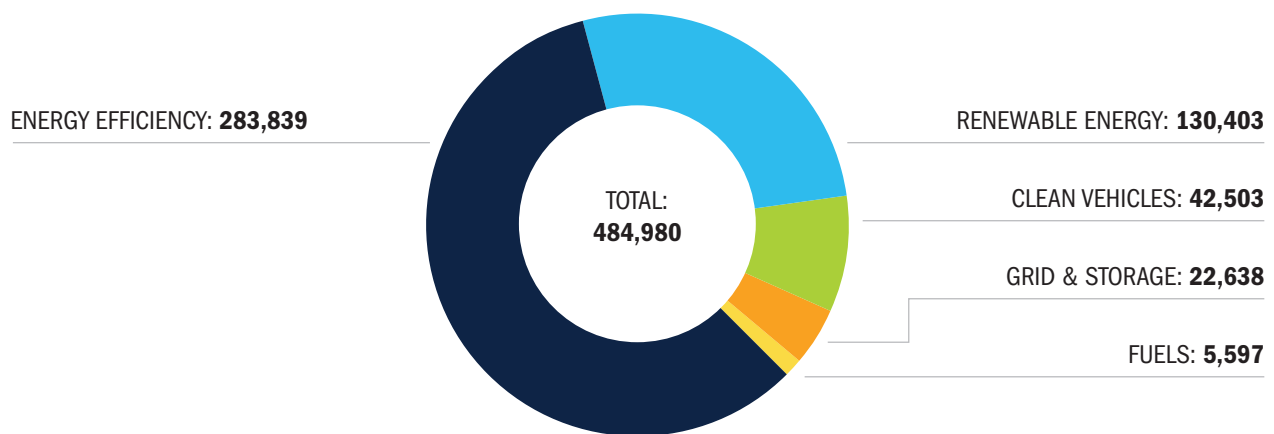


FIG. 2 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by subsector 2020

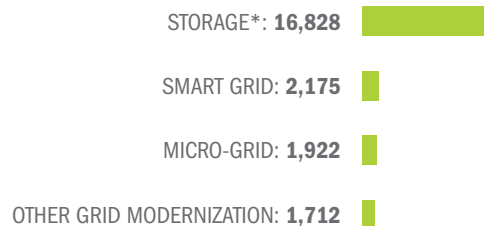
ENERGY EFFICIENCY: 283,839



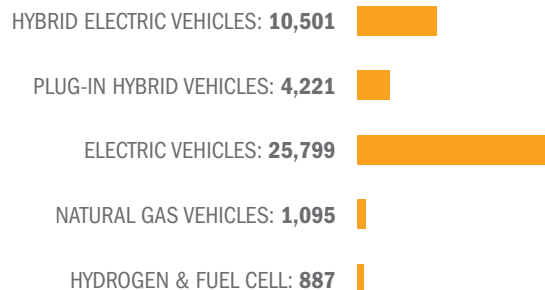
RENEWABLE ENERGY: 130,403



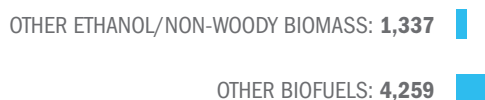
GRID & STORAGE: 22,638



CLEAN VEHICLES: 42,503



FUELS: 5,597



* includes pumped hydro storage, battery storage, thermal storage, and mechanical storage detailed technologies

FIG. 3 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by value chain 2020

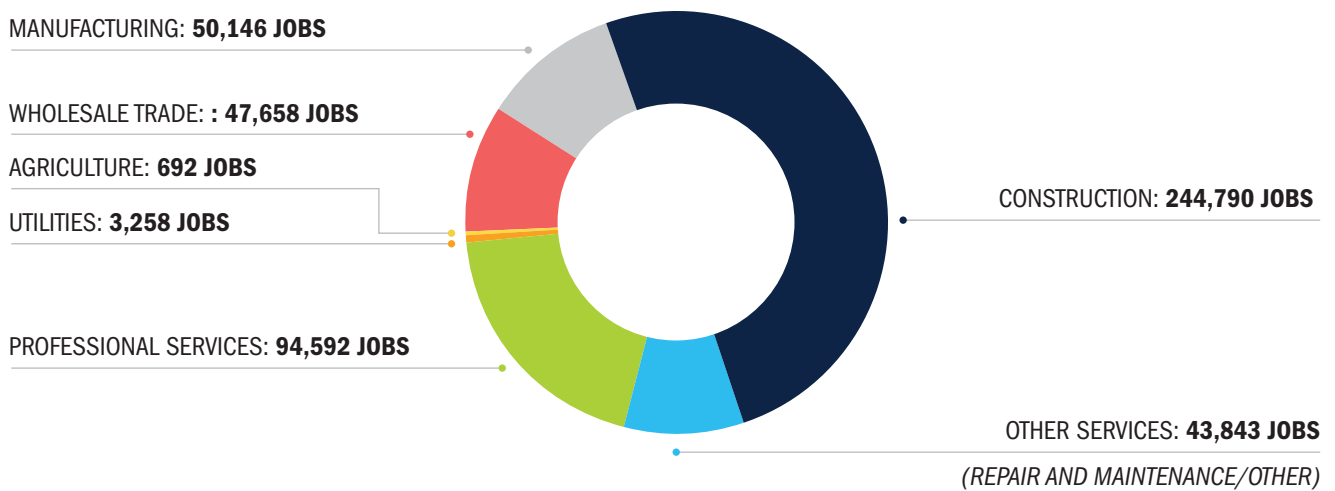


FIG. 4 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by establishment size 2020

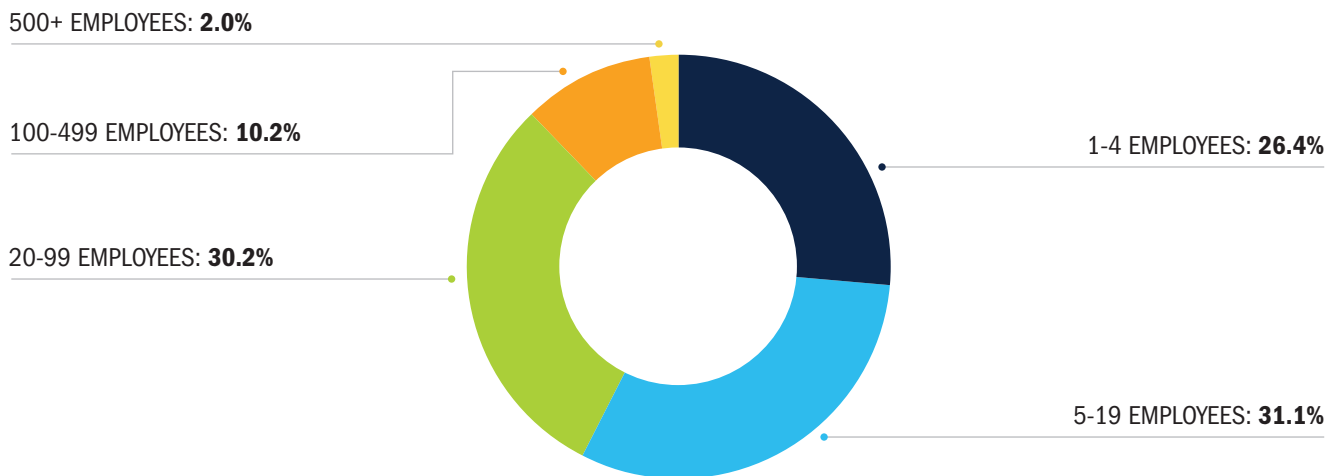
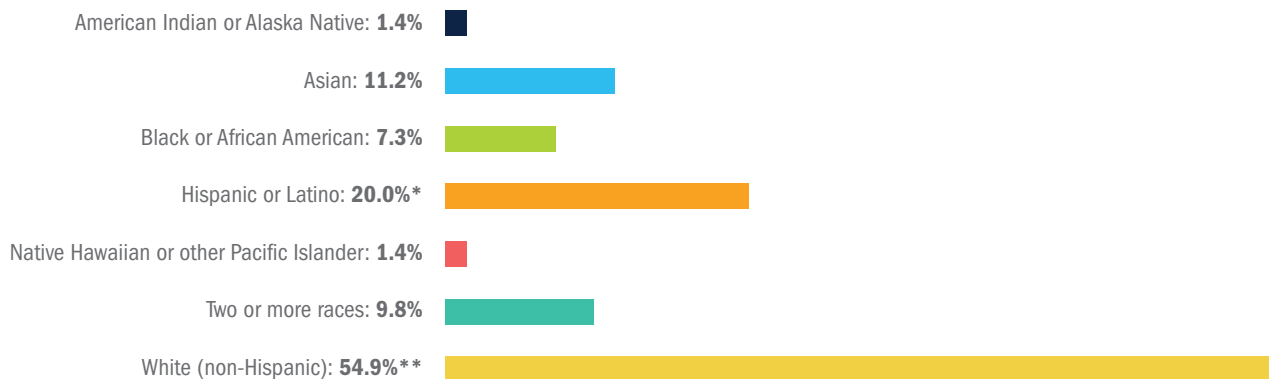


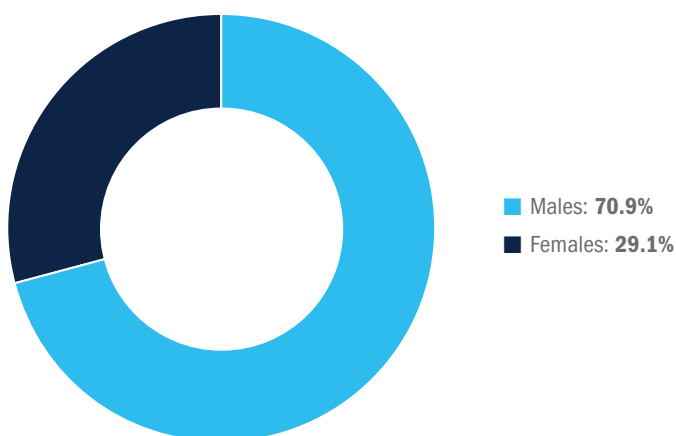
FIG. 5 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by race and ethnicity 2020



* Hispanic or Latino ethnicity is separate from race. Includes respondents who also answered as White, Black, two or more races, etc.

** Total White respondents (not including those answering two or more races) was 69.0%

FIG. 6 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by gender 2020



What we include are jobs in solar energy, wind energy, combined heat and power, bioenergy, non-woody biomass, low-impact hydro power, geothermal, clean vehicle technologies, clean energy storage, smart grid, micro grid, grid modernization, advanced biofuels, and energy efficiency including ENERGYSTAR and high efficiency appliances, efficient lighting, HVAC, renewable heating and cooling, and advanced building materials. The clean energy occupations covered in this report span economic sectors including construction, manufacturing, wholesale trade, transmission and distribution, and professional services.

What we do not include are jobs of workers who may spend some of their time in clean energy but a plurality in another energy sector. For example, workers employed by an excavation business might spend the majority of their time grading and preparing drilling pads for oil or gas rigs, but they also might spend a portion of their time preparing sites for wind turbines or large solar installations. If clean energy does not account for a plurality of their work, those workers would not be counted as being employed in the clean energy economy but would instead be counted as part of another energy sector. We also do not include jobs in corn ethanol, woody biomass, large hydropower, and nuclear because of environmental issues associated with those industries. Jobs in retail trade, repair services, water or waste management, and indirect employment or induced employment are not included.

California Clean Energy Economy—Four Year Trends

Clean Energy Growth & Recovery

California's clean energy economy remains in a strong position despite suffering significant job losses in 2020 due to the COVID-19 pandemic-related economic downturn. The sector continues to be one of California's largest employers, and there are now more people who work in clean energy economy jobs than there are waiters and waitresses, elementary and middle school teachers, and police officers in the state.

Before COVID-19, clean energy jobs were growing about 1 percent a year overall (Fig. 7), with the growth rate slowed due to declines in the state's massive solar energy workforce that was dealing with uncertainty

around federal tariffs. However, jobs across all other clean energy sectors since 2017 had been growing significantly faster than statewide employment—including by 9 percent in clean fuels and nearly 30 percent in clean vehicles (Fig. 8).

While some subsectors were impacted by COVID-19, two defied economywide trends by adding jobs in 2020. Electric vehicles and hybrid electric vehicles added nearly 2,000 jobs (about 5 percent growth) at the close of 2020, despite the sector undergoing massive losses early in the pandemic.

Looking beyond the impact from the COVID-19 employment crisis, the clean energy economy has been quickly recovering. From June through the end of the year, clean energy businesses added more than 57,000 employees back to the workforce—a rate nearly double the industry forecast heading into 2020 when about 37,000 total new jobs were projected (Table 2).

FIG. 7 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by year 2017–2020

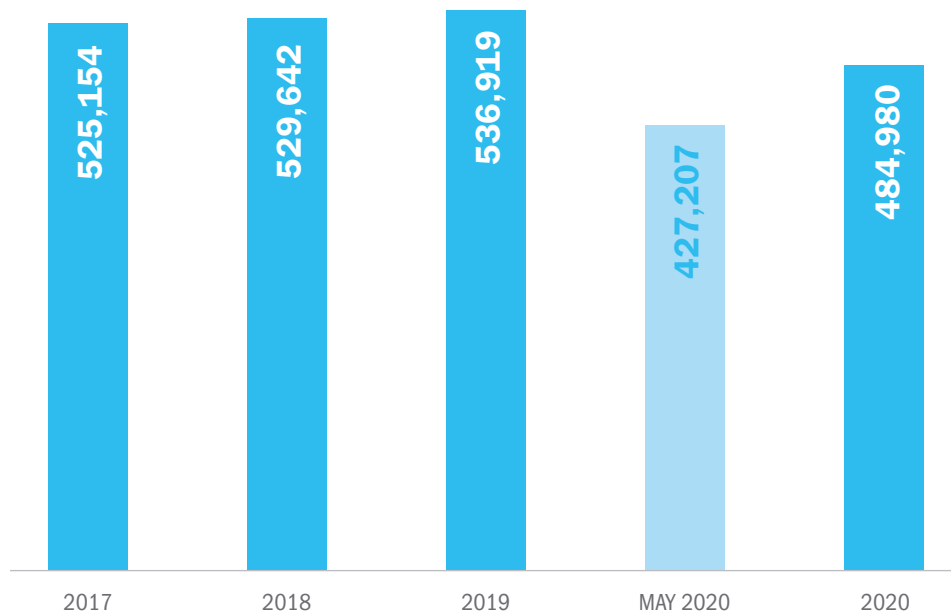
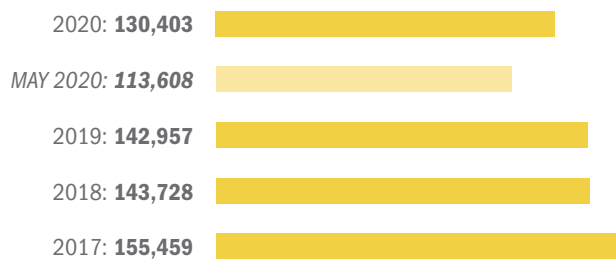


FIG. 8 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by sector 2017–2020

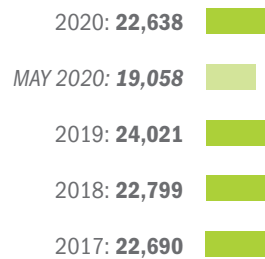
ENERGY EFFICIENCY:



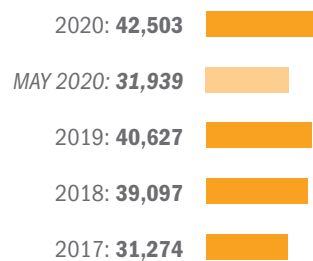
RENEWABLE ENERGY:



GRID & STORAGE:



CLEAN VEHICLES:



CLEAN FUELS:



FIG. 9 // CALIFORNIA CLEAN ENERGY EMPLOYMENT GROWTH
by fastest-growing sector 2017–2020

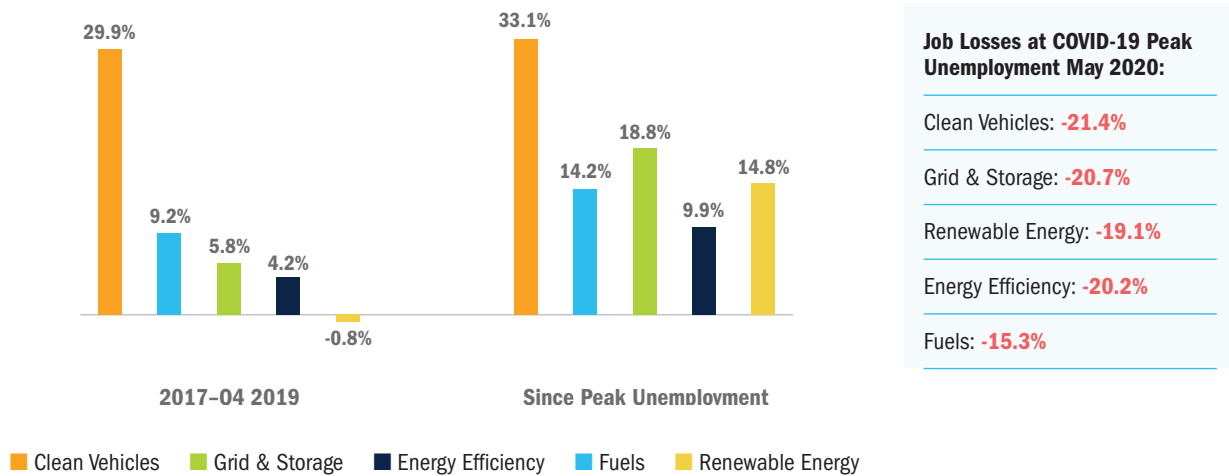


TABLE 1 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by subsector 2017–2020

SECTOR	2020	2019	2018	2017
Solar	113,005	124,817	126,507	138,319
Wind	6,312	6,273	5,785	5,275
Geothermal	2,254	2,520	2,491	2,361
Bioenergy/CHP	7,189	7,525	7,212	7,760
Low-Impact Hydro	1,644	1,822	1,733	1,745
Clean Storage	16,828	17,397	16,633	16,591
Grid Modernization	5,810	6,625	6,165	6,099
Energy STAR & Efficient Lighting	64,529	73,016	71,893	69,011
Trad. HVAC	109,041	124,384	123,678	121,696
High Efficiency HVAC & Renewable H&C	56,266	64,703	63,619	61,582
Advanced Materials (Energy Efficiency)	18,777	21,714	20,074	18,677
Other (Energy Efficiency)	35,225	39,712	39,278	39,468
Other Ethanol / Non-woody Biomass	1,337	1,336	1,149	962
Other Biofuels	4,259	4,449	4,327	4,336
Hybrid and Electric Vehicles	40,521	38,529	37,124	29,326
Natural Gas Vehicles	1,095	1,143	1,108	1,040
Hydrogen & Fuel-Cell Vehicles	887	956	866	1,040

TABLE 2 // CORONAVIRUS IMPACT ON CALIFORNIA CLEAN ENERGY EMPLOYMENT GROWTH
by pre, during, and post initial impacts 2017–2020

2020 Clean Energy Jobs	Growth Rate	Employment Change
Projected	+7.0%	+ 37,454
March–May (Peak Unemployment)	-20.4%	-109,712
June–December (Post Peak)	+13.5%	+57,773

California Clean Energy Economy—Economywide Analysis

Despite losing more than 20 percent of its clean energy workforce by May 2020 (compared to just under 13 percent statewide), California recovered more than half of its clean energy jobs by the close of the year (Fig. 10). The sector has also recovered faster than statewide employment, seeing jobs grow by 13.5 percent since unemployment peaked in May compared to 6.3 percent statewide.

Clean energy continued to account for about three out of every 100 jobs in California in 2020. But when analyzed across industries, the sector's impact becomes even more pronounced. Clean energy workers now account for 28 percent of all construction jobs, 10 percent of jobs in other services (repair and maintenance), 7 percent of wholesale trade occupations, and 4 percent of all manufacturing positions (Fig. 12).

At the national level California's clean energy economy remains unparalleled. The state accounted for about 11.5 percent of all U.S. jobs in 2020. California's clean energy economy accounted for about 16 percent of clean energy jobs—including 26.5 percent of renewable energy occupations (Fig. 11).

FIG. 10 // CALIFORNIA EMPLOYMENT GROWTH 2017–2020⁴

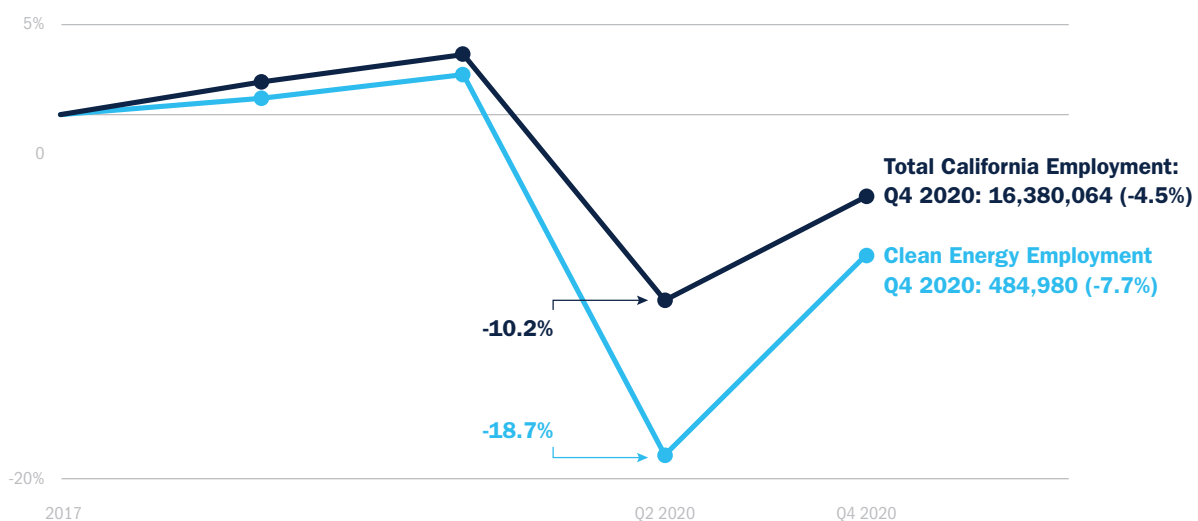
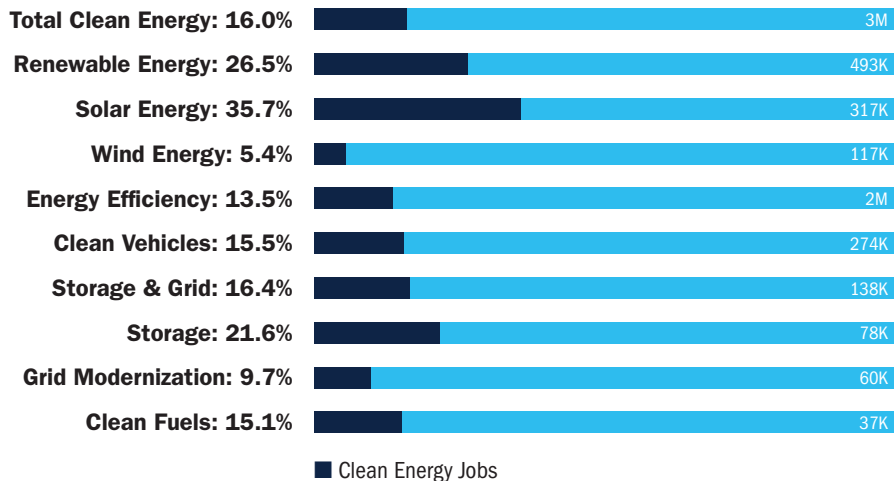


TABLE 3 // CALIFORNIA EMPLOYMENT by comparable occupations 2020⁵

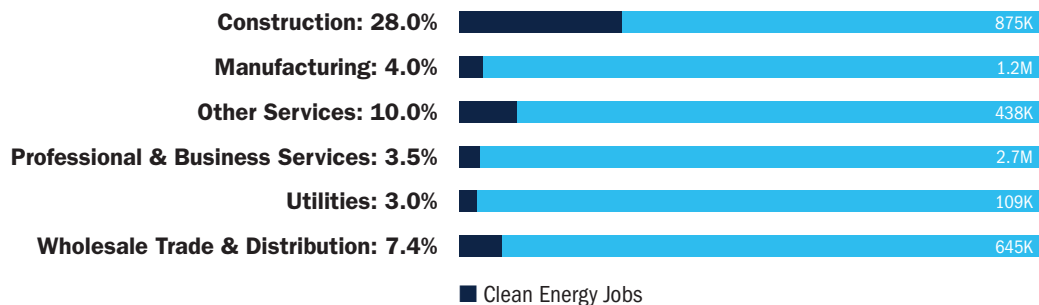
OCCUPATION	2020 Employment	2019 Employment	2018 Employment	2017 Employment	2017-2019 Growth
Home Health and Personal Care Aides	597,500	595,760	582,910	545,840	9.15%
Clean Energy Sectors*	484,980	536,919	529,642	525,154	2.24%
Cashiers	392,230	431,140	420,430	405,030	6.45%
Retail Salespersons	331,020	418,900	436,300	444,820	-5.83%
Registered Nurses	307,060	302,770	294,510	282,290	7.25%
Software Developers, Analysts, and Testers	249,700	249,620	237,460	224,500	11.19%
Waiters and Waitresses	211,700	289,160	286,930	285,470	1.29%
Customer Service Representatives	200,920	208,600	207,100	210,160	-0.74%
Elementary and Middle School Teachers	193,700	204,690	208,940	208,060	-1.62%
Accountant & Auditors	150,050	148,50	148,600	143,670	3.36%
Heavy and Tractor-Trailer Truck Drivers	143,150	146,730	138,380	137,930	6.38%
Police Officers	74,310	72,380	72,680	73,000	-0.85%
Lawyers	84,160	83,750	82,180	79,980	4.71%

*Clean energy is a sector encompassing a wide variety of occupations, including engineers and customer service representatives. This table is meant to provide context on the size of clean energy sector's workforce.

**FIG. 11 // CALIFORNIA CLEAN ENERGY EMPLOYMENT
by share of nationwide clean energy jobs Q4 2020⁶**



**FIG. 12 // CALIFORNIA CLEAN ENERGY EMPLOYMENT
by share of statewide industry jobs Q4 2020⁷**



California Clean Energy Economy—Geographic Breakdown

Clean energy jobs are one of the most geographically diverse employment sectors across the state, with employment in all 58 California counties (Table 5). As with most industries, the majority of employment is concentrated in California's metropolitan areas. But thanks to the inherent localness of many clean energy jobs including energy efficiency upgrades and grid modernization, rural areas and smaller communities are increasingly benefitting economically from the clean energy transition.

About 80 percent of California's clean energy jobs are located in the state's six largest metro areas, including in California's Central Valley and Inland Empire (Los Angeles, San Francisco, Riverside, San Jose, Sacramento, and San Diego), leaving about 100,000 jobs to areas with populations under one million (Table 4). Rural areas are home to nearly 10,000 of those jobs.

Statewide, clean energy occupations account for about 3 percent of all employment in California while in four counties (Yolo, San Luis Obispo, Alameda, and San Francisco) that number rises to 5 percent or higher. Even more, clean energy accounts for 3.6 percent of all occupations in counties with at least 10,000 clean energy jobs.

TABLE 4 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by metro 2017–2020⁸

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs	Share of Overall Metrowide Employment
Los Angeles-Long Beach-Santa Ana	31,901	84,679	132,619	2.19%
San Francisco-Oakland-Fremont	32,696	53,916	114,401	4.78%
San Diego-Carlsbad-San Marcos	13,443	28,746	47,102	3.24%
Riverside-San Bernardino-Ontario	9,429	21,486	34,972	2.28%
San Jose-Sunnyvale-Santa Clara	8,783	17,664	29,796	2.70%
Sacramento-Arden-Arcade-Roseville	8,557	17,516	29,383	2.91%
Santa Rosa-Petaluma	3,446	5,825	10,369	4.94%
San Luis Obispo-Paso Robles	3,932	5,286	10,213	8.67%
Fresno	2,209	5,589	8,856	4.29%
Oxnard-Thousand Oaks-Ventura	1,925	5,542	8,510	2.61%
Bakersfield	2,146	4,393	7,369	2.21%
Santa Barbara-Santa Maria-Goleta	1,657	4,759	7,318	3.55%
Stockton	1,451	3,385	5,477	2.14%
Modesto	869	2,607	3,970	2.04%
Salinas	833	2,563	3,881	1.89%
Santa Cruz-Watsonville	694	2,386	3,456	3.14%
Chico	825	1,821	3,031	3.77%
Visalia-Porterville	711	1,734	2,773	1.68%
Vallejo-Fairfield	517	1,738	2,586	1.84%
Redding	464	1,528	2,282	3.35%
Napa	402	1,319	1,971	2.51%
Merced	274	755	1,172	1.42%
Yuba City	243	708	1,085	2.04%
El Centro	261	664	1,051	1.74%
Madera	204	620	942	1.82%
Hanford-Corcoran	143	368	580	1.21%

FIG. 13 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by metro 2017–2020⁹

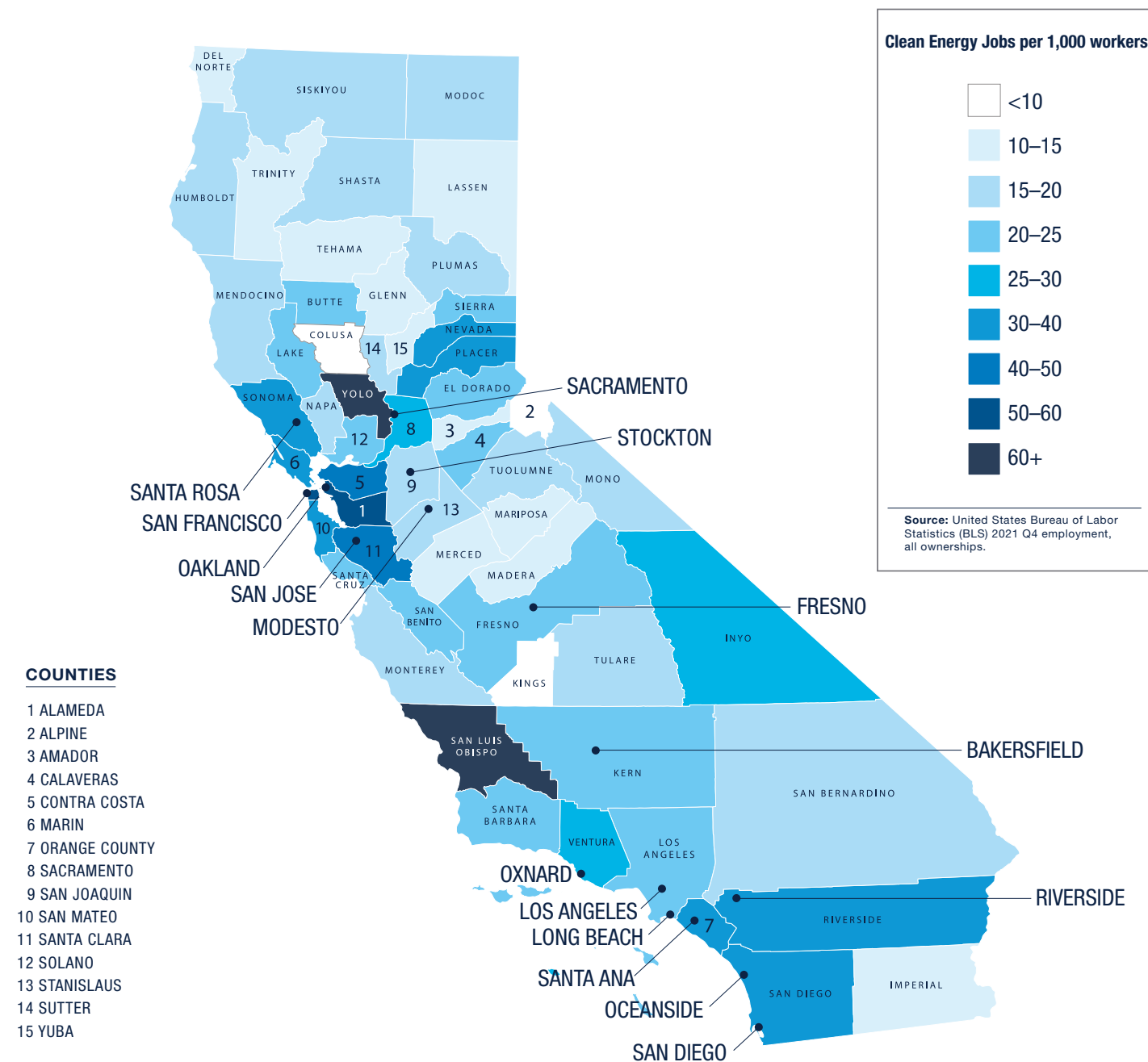


TABLE 5 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by county 2017–2020¹⁰

County	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs	Share of Overall County Employment
Alameda	9,265	15,306	40,167	5.5%
Alpine	3	3	7	0.8%
Amador	35	105	166	1.4%
Butte	671	950	1,835	2.4%
Calaveras	28	159	205	2.1%
Colusa	13	30	85	1.0%
Contra Costa	5,462	7,887	14,584	4.3%
Del Norte	12	60	81	1.1%
El Dorado	142	1,002	1,344	2.5%
Fresno	1,871	4,582	7,748	2.1%
Glenn	16	54	104	1.1%
Humboldt	169	540	811	1.7%
Imperial	283	405	840	1.4%
Inyo	142	53	210	3.0%
Kern	2,308	3,755	7,295	2.3%
Kings	58	234	382	0.8%
Lake	165	137	330	2.1%
Lassen	17	48	97	1.0%
Los Angeles	14,466	59,272	86,646	2.1%
Madera	107	486	731	1.5%
Marin	1,240	2,337	3,944	3.8%
Mariposa	19	42	65	1.5%
Mendocino	74	307	465	1.6%
Merced	237	524	1,000	1.3%
Modoc	10	19	39	1.6%
Mono	13	82	100	1.6%
Monterey	648	1,615	2,920	1.8%
Napa	151	1,017	1,333	2.0%
Nevada	191	651	944	3.1%
Orange	10,400	33,771	51,735	3.4%
Placer	2,098	3,357	5,934	3.6%
Plumas	20	84	116	2.0%
Riverside	6,725	12,828	22,646	3.1%
Sacramento	4,864	10,633	17,214	2.6%
San Benito	22	275	345	2.2%
San Bernardino	1,923	8,640	13,501	1.7%
San Diego	13,443	28,746	47,102	3.4%
San Francisco	15,036	16,863	33,661	5.1%
San Joaquin	1,249	2,758	4,996	1.9%
San Luis Obispo	4,156	1,954	6,481	6.0%
San Mateo	2,454	8,027	11,867	3.1%
Santa Barbara	576	3,032	4,231	2.1%
Santa Clara	17,093	25,994	46,692	4.5%
Santa Cruz	476	1,283	2,165	2.3%
Shasta	235	853	1,293	2.0%
Sierra	5	7	13	2.4%
Siskiyou	73	113	226	1.8%
Solano	194	1,898	2,734	2.1%

County	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs	Share of Overall County Employment
Sonoma	3,230	3,580	7,444	3.9%
Stanislaus	525	2,350	3,529	1.9%
Sutter	42	297	481	1.6%
Tehama	48	112	229	1.2%
Trinity	10	12	27	1.0%
Tulare	449	1,469	2,350	1.5%
Tuolumne	45	182	277	1.8%
Ventura	1,441	5,177	7,888	2.6%
Yolo	5,311	1,124	6,846	6.7%
Yuba	17	153	207	1.1%

TABLE 6 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by congressional district 2020

District	Representative	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs
1	Doug LaMalfa	2,964	7,238	11,603
2	Jared Huffman	5,198	10,675	17,900
3	John Garamendi	2,655	5,799	9,544
4	Tom McClintock	3,214	6,775	11,263
5	Mike Thompson	1,776	3,934	6,449
6	Doris Matsui	2,354	5,535	8,929
7	Ami Bera	1,344	3,087	5,011
8	Jay Obernolte	1,526	3,866	6,119
9	Jerry McNerney	1,818	4,111	6,701
10	Josh Harder	1,453	3,319	5,397
11	Mark DeSaulnier	5,619	9,811	17,275
12	Nancy Pelosi	11,920	17,245	32,414
13	Barbara Lee	4,527	7,700	13,686
14	Jackie Speier	2,283	5,897	9,358
15	Eric Swalwell	3,194	5,395	9,603
16	Jim Costa	1,941	4,400	7,168
17	Ro Khanna	4,678	9,362	33,109
18	Anna Eshoo	2,336	5,982	9,369
19	Zoe Lofgren	981	2,626	4,101
20	Jimmy Panetta	1,110	3,104	4,797
21	David G. Valadao	1,338	3,449	5,435
22	Devin Nunes	933	2,360	3,737
23	Kevin McCarthy	2,030	3,273	5,917
24	Salud Carbajal	4,947	9,957	16,777
25	Mike Garcia	1,216	4,059	6,037
26	Julia Brownley	1,048	3,039	4,651
27	Judy Chu	1,747	6,526	9,500
28	Adam Schiff	2,664	7,090	11,088
29	Tony Cárdenas	872	2,172	3,453
30	Brad Sherman	1,604	4,990	7,532
31	Pete Aguilar	928	2,163	3,498

District	Representative	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs
32	Grace Napolitano	1,528	3,377	5,540
33	Ted Lieu	3,672	9,866	15,393
34	Jimmy Gomez	1,547	4,573	6,980
35	Norma Torres	1,411	4,449	6,684
36	Raul Ruiz	3,109	4,853	8,879
37	Karen Bass	1,225	3,376	5,235
38	Linda Sánchez	1,759	3,707	6,164
39	Young Kim	2,227	6,245	9,645
40	Lucille Roybal-Allard	1,442	2,431	4,330
41	Mark Takano	2,910	5,096	8,964
42	Ken Calvert	1,735	3,136	5,461
43	Maxine Waters	1,563	3,028	5,160
44	Nanette Barragán	582	1,555	2,429
45	Katie Porter	5,568	11,993	19,813
46	Lou Correa	1,114	2,507	4,092
47	Alan Lowenthal	1,368	4,242	6,407
48	Michelle Steel	2,144	4,779	7,821
49	Mike Levin	4,519	10,264	16,713
50	Darrell Issa	1,479	4,130	6,385
51	Juan Vargas	1,472	4,875	7,263
52	Scott Peters	5,239	8,979	15,906
53	Sara Jacobs	578	1,442	2,293

TABLE 7 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by state senate district 2020

District	Senator	Total Clean Energy Jobs
1	Brian Dahle	18,208
2	Mike McGuire	15,212
3	Bill Dodd	18,388
4	Jim Nielsen	7,769
5	Susan Talamantes Eggman	8,177
6	Richard Pan	9,466
7	Steve Glazer	11,105
8	Andreas Borgeas	11,029
9	Nancy Skinner	18,836
10	Bob Wieckowski	40,176
11	Scott Wiener	34,445
12	Anna Caballero	5,703
13	Josh Becker	13,197
14	Melissa Hurtado	8,384
15	Dave Cortese	8,089
16	Shannon Grove	6,397
17	John Laird	16,543
18	Robert Hertzberg	11,439
19	S. Monique Limón	10,645
20	Connie Leyva	9,668

District	Senator	Total Clean Energy Jobs
21	Scott Wilk	5,265
22	Susan Rubio	8,501
23	Rosilicie Ochoa Bogh	6,948
24	Maria Elena Durazo	11,901
25	Anthony Portantino, Jr.	6,278
26	Ben Allen	15,888
27	Henry Stern	10,144
28	Melissa Melendez	10,361
29	Josh Newman	10,521
30	Sydney Kamlager	7,480
31	Richard Roth	6,242
32	Bob Archuleta	5,817
33	Lena Gonzalez	8,221
34	Tom Umberg	12,518
35	Steven Bradford	6,043
36	Patricia Bates	17,437
37	Dave Min	14,518
38	Brian Jones	14,228
39	Toni Atkins	20,086
40	Ben Hueso	3,707

TABLE 8 // CALIFORNIA CLEAN ENERGY EMPLOYMENT by state assembly district 2020

District	Assembly Member	Total Clean Energy Jobs
1	Megan Dahle	8,939
2	Jim Wood	6,954
3	James Gallagher	2,740
4	Cecilia Aguiar-Curry	10,454
5	Frank Bigelow	4,781
6	Kevin Kiley	9,816
7	Kevin McCarty	11,372
8	Ken Cooley	1,802
9	Jim Cooper	1,404
10	Marc Levine	7,185
11	Jim Frazier	2,793
12	Heath Flora	5,373
13	Carlos Villapudua	2,705
14	Tim Grayson	11,643
15	Buffy Wicks	10,607
16	Rebecca Bauer-Kahan	4,036
17	David Chiu	32,987
18	Vacant	8,571
19	Phil Ting	2,532
20	Bill Quirk	8,480
21	Adam Gray	1,613
22	Kevin Mullin	7,390
23	Jim Patterson	7,668
24	Marc Berman	9,525
25	Alex Lee	31,532
26	Devon Mathis	4,148
27	Ash Kalra	2,268
28	Evan Low	4,203
29	Mark Stone	6,623
30	Robert Rivas	2,226
31	Joaquin Arambula	1,470
32	Rudy Salas	2,889
33	Thurston Smith	3,895
34	Vince Fong	3,269
35	Jordan Cunningham	12,094
36	Tom Lackey	3,260
37	Steve Bennett	9,766
38	Suzette Martinez Valladares	6,351
39	Luz Rivas	3,503
40	James Ramos	4,035

District	Assembly Member	Total Clean Energy Jobs
41	Chris Holden	6,720
42	Chad Mayes	7,295
43	Laura Friedman	4,966
44	Jacqui Irwin	2,970
45	Jesse Gabriel	7,547
46	Adrin Nazarian	2,628
47	Eloise Reyes	1,698
48	Blanca Rubio	3,365
49	Ed Chau	2,539
50	Richard Bloom	12,868
51	Wendy Carrillo	3,862
52	Freddie Rodriguez	5,819
53	Miguel Santiago	4,450
54	Isaac Bryan	3,796
55	Phillip Chen	5,300
56	Eduardo Garcia	1,279
57	Lisa Calderon	4,344
58	Cristina Garcia	1,078
59	Reggie Jones-Sawyer	626
60	Sabrina Cervantes	2,510
61	Jose Medina	4,687
62	Autumn Burke	3,483
63	Anthony Rendon	3,975
64	Mike Gipson	3,010
65	Sharon Quirk-Silva	5,196
66	Al Muratsuchi	2,586
67	Kelly Seyarto	4,425
68	Steven Choi	13,040
69	Tom Daly	4,169
70	Patrick O'Donnell	3,281
71	Randy Voepel	6,421
72	Janet Nguyen	3,321
73	Laurie Davies	5,244
74	Cottie Petrie-Norris	7,496
75	Marie Waldron	6,889
76	Tasha Boerner Horvath	5,025
77	Brian Maienschein	20,837
78	Chris Ward	11,041
79	Akilah Weber	2,183
80	Lorena Gonzalez	105

POLICIES MATTER:

How to Create Jobs and Drive Economic Growth Post-COVID-19

California has been a global climate action leader by passing policies that have created the market structures necessary to drive innovation, build the state's clean energy economy and reduce carbon emissions. But to continue to grow that economy, the state and federal government must do more. California's climate policy leadership can also reap in-state benefits from beyond our borders as it serves as a proving ground for global climate action, while also expanding national and global markets for California-made technologies.

STATEHOUSE LEADERSHIP

To capture these economic benefits and maintain a position as a world leader and climate-tech innovation hub, California must codify our state's carbon neutrality goals while tightening our emissions mitigation targets. To reach these goals, the state must advance sector-specific policy to further decarbonize our economy. We need state policy leadership that:

- // Accelerates our transition to a zero-carbon electric grid, including advancing our nascent offshore wind industry and supporting the development of clean firm power.
- // Electrifies our transportation system, including the passage of a strong Advanced Clean Fleets rule and policies that ensure there is adequate funding to drive robust and equitable adoption of passenger electric vehicles and the infrastructure to charge these electric vehicles.
- // Decarbonizes our state's building stock; reducing policy and market barriers to electrify buildings coupled with strong electrification policies are essential to addressing carbon emissions in our built environment, the state's second largest emitter of GHGs.
- // Drives innovation to decarbonize our industrial sector. An exciting opportunity exists to advance low-carbon cement and concrete technology, including storing captured carbon in concrete products.
- // Sets standards and reporting requirements to ensure financial markets properly assess climate-related risks.
- // Incentivizes and supports farmers and ranchers to transition to regenerative agricultural practices to reduce carbon emissions and sequester carbon in soil.

FEDERAL LEADERSHIP

While state policy leadership is essential, federal leadership is needed to avoid catastrophic climate change and avoid the severe economic impacts it will bring. Smart federal policy is also needed for California to realize the full economic opportunity presented by climate action.

The Biden administration's Build Back Better plans present an opportunity for the federal government to help restore the global competitiveness of our economy and leverage the clean energy economy to drive investment in America's and California's future. Congress can seize this opportunity by:

- // Passing and funding legislation to create a national car-charging network, expand building efficiency and decarbonization and modernize our electric grid.
- // Improving the length and accessibility of federal tax incentives for energy efficiency, clean energy, and zero-emission vehicles and infrastructure.
- // Passing national standards to put utilities on a path to 100 percent clean energy by 2035.
- // Increasing federal investments in research and development as well as in procurement of clean energy, vehicle and battery storage, energy efficiency, and regenerative and low-carbon agriculture to spur innovation.
- // Creating new clean energy workforce programs and better funding existing programs to enhance clean energy training opportunities and improve equity to help meet the workforce requirements of a better, cleaner economy.
- // Funding the National Clean Energy and Sustainability Accelerator to leverage private capital, enhance financing of climate-smart projects and address equitable access to clean energy funding for climate-impacted communities and businesses.

ENDNOTES

- 1 Unless otherwise stated, all data is from the 2021 U.S. Energy and Employment Report (USEER), April 2021, Department of Energy (DOE).
- 2 BW Research, E2, E4TheFuture, American Council on Renewable Energy. Clean Energy Employment Initial Impacts from the COVID-19 Economic Crisis, May 2020, available at <https://e2.org/wp-content/uploads/2020/06/Clean-Energy-Jobs-May-COVID-19-Memo-Final.pdf>.
- 3 Clean Energy Employment Initial Impacts from the COVID-19 Economic Crisis, May 2020.
- 4 Quarterly Census of Employment and Wages, Fourth Quarter 2020. Available at https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables
- 5 U.S. Bureau of Labor Statistics. State Occupational Employment and Wage Estimates, available at <https://www.bls.gov/oes/current/oesrcst.htm>
- 6 Quarterly Census of Employment and Wages, Fourth Quarter 2020. Available at https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables
- 7 Quarterly Census of Employment and Wages, Fourth Quarter 2020. Available at https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables
- 8 EMSI Endnote
- 9 Quarterly Census of Employment and Wages, Fourth Quarter 2020. Available at https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables
- 10 Rural clean energy jobs are calculated based on the Bureau of Labor Statistics' (BLS) nonmetropolitan area for every state, which is any area not designated as a metropolitan area by BLS. This is the most commonly used definition to analyze rural and small-town trends, and is available at <https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural>. New Jersey, Rhode Island, and the District of Columbia contain no nonmetropolitan statistical areas.