

CLEAN JOBS AMERICA 2021

AFTER HARD YEAR, PROMISE OF UNPARALLELED JOBS GROWTH



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Methodology

The analysis is based on preliminary employment data collected and analyzed by BW Research Partnership for the 2021 U.S. Energy and Employment Report (USEER, forthcoming). 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 35,000 business representatives across the United States.

The USEER was developed by BW Research Partnership for the U.S. Department of Energy and its initial methodology was approved by the Office of Management and Budget (OMB). The 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 sixth annual Clean Jobs America 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 America 2021 or our other annual Clean Jobs America 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—including Clean Jobs America—with state-specific reports covering more than 20 states every year.

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CLEAN JOBS AMERICA 2021¹

AFTER YEAR OF DECLINE, POLICIES HOLD PROMISE FOR NEW GROWTH

In 2020, the number of clean energy jobs in America fell for the first time since E2 began tracking nationwide employment across the entire clean energy sector in 2015. Amid the COVID-19 pandemic and related economic contraction and the lingering impacts of policies from the previous administration that encouraged fossil fuels over clean energy, nearly 307,000 jobs were lost in wind, solar, energy efficiency and other clean energy sectors.

About 3 million Americans worked in clean energy at the end of 2020, down from 3.36 million the year before, according to the 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.

- // Jobs in energy efficiency, the biggest part of the U.S. energy sector, took the biggest tumble, falling more than 11 percent last year as COVID-19 pandemic restrictions prevented energy efficiency workers from entering commercial and residential buildings.
- // Wind energy employment increased slightly, while solar employment fell, driven by declines in residential solar sales and installation which were hit hard early in the pandemic and could not fully recover despite growth in the second part of the year.² Overall, renewable energy jobs fell by nearly 6 percent.
- // Jobs in grid modernization, battery and storage occupations dropped nearly 7 percent after two years of rapid growth driven by growing demand in batteries for electric vehicles and commercial and residential energy storage.
- // Clean vehicle manufacturing jobs defied overall energy sector job loss patterns and grew nearly 3 percent as automakers increasingly shifted to cleaner and more efficient electric cars,

trucks and buses. Electric and hybrid electric vehicle employment grew more than six percent adding over 12,000 new jobs in 2020, the biggest increase of any clean energy category.

Despite the overall decline, clean energy remains the biggest job creator across America's energy sector, employing nearly three times as many workers as work in fossil fuel extraction and generation. More Americans still work in clean energy than work as middle and elementary school teachers, bankers, farmers or real estate agents. Median hourly wages for clean energy jobs also are about 25 percent higher than the national median wage, and also pay better than most fossil fuel extraction jobs (See *Clean Energy Wages And Making Good Jobs Even Better* sidebar on page 5).

California, Texas, New York and Florida remain the nation's leaders for clean energy jobs, but smaller states such as Illinois, Massachusetts, Michigan and Ohio all employed more than 100,000 clean energy workers each at the end of last year.

POLICIES COULD CREATE MASSIVE BOOST TO U.S. JOBS AND ECONOMY

While clean energy suffered like many sectors of the economy in 2020, the prospects for growth are greater than ever given the climate policy proposals from the Biden administration, along with leadership

in the states. Whether these job-creating policies get enacted, however, depends largely on Congress and state legislatures.

The shift to a cleaner economy would create major new opportunities for job seekers in every state—including in communities impacted by the ongoing decline of other parts of the energy sector such as coal, oil and gas. It also promises to create consumer and business savings through energy efficiency and lower-cost renewable energy, which is especially impactful for low and moderate income communities, rural communities and communities of color, especially as the economy continues to recover.

Clean energy policies can also help mitigate the human toll and the economic costs of climate change, which in 2020 alone inflicted more than \$100 billion in damage to our country's economy. They also can make the US more globally competitive. 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.

Clean energy is the centerpiece of President Joe Biden's climate strategy and Build Back Better approach including the American Jobs Plan that includes major investments and policy changes to boost renewable energy, clean vehicles and energy efficiency. Nationally, these policies are in essential

infrastructure, tax and federal spending bills that Congress will consider throughout 2021.

Investing hundreds of billions of dollars in grid modernization, energy efficiency and electric vehicle charging networks today will create the backbone of a cleaner, more resilient economy. Other key federal legislation to expand and improve tax credits for renewable energy, increase investments in clean energy research, development and deployment and create new funding sources for clean energy projects, will help restore America's competitiveness in clean energy innovation that was ceded to China and the European Union in recent years.

Proposals by the Biden administration to use federal procurement to buy more clean energy and clean vehicles and expand energy efficiency at government agencies and installations will make government more cost and energy efficient and in turn will ramp up production and jobs at private-sector businesses. And on the international stage, actions like the

United States' commitment to increase its National Determined Contribution (NDC) to reduce U.S. greenhouse gas emissions under the Paris climate agreement, along with new international clean energy finance opportunities, will also create jobs domestically and help U.S. companies compete better overseas.

Given this enormous job creating potential, it is encouraging to see, clean energy is the centerpiece of President Joe Biden's economic strategy and Build Back Better plan that includes major investments and policy changes to boost renewable energy, clean vehicles and energy efficiency. Legislatively, key policies are in essential infrastructure, tax and federal spending bills that Congress will consider throughout 2021. But ambition alone will not suffice.

These new jobs and economic growth depend on the Biden administration living up to its commitments and the will of Congress to pass essential clean energy and climate legislation.

As lawmakers consider these transformational policies, Clean Jobs America 2021 shows that their decisions will have a profound impact on millions of Americans across every state. The clean energy jobs that lawmakers can create involve a wide range of clean energy-related occupations, including electricians, pipefitters, construction laborers, and workers in factories and utilities. They are good-paying career opportunities for Americans regardless of education level, geographic location, or race. And they are jobs that can help the overall economy both by seizing the economic benefits that come with climate action and reducing the economic costs that come with climate change.

In summary, Clean Jobs America 2021 shows that clean energy jobs are not blue state or red state jobs. They're not blue-collar or white-collar jobs. They're red white and blue jobs.

CLEAN ENERGY WAGES AND MAKING GOOD JOBS EVEN BETTER

The median hourly wage for clean energy jobs³ was \$23.89 in 2019, according to an analysis of Bureau of Labor Statistics data (BLS). That was 25 percent higher than the nationwide median hourly wage of \$19.14.

While wages in clean energy as a whole are lower than fossil fuels, some occupations pay just as well if not better than some fossil fuel jobs. For instance, wind turbine technicians in 2020 made about \$56,230 and solar installers made about \$46,470, according to BLS data.⁴ Oil and gas roustabouts made about \$39,420 while oil and gas derrick operators made about \$47,920.

Looking at median hourly wages, wind energy workers earn the highest wages at \$25.95 per hour, compared with \$25.40 for grid modernization, \$24.82 for storage, \$24.48 for solar, and \$24.44 for energy efficiency.

As the Biden administration and Congress advance policies to expand clean energy jobs, they also can make sure these jobs are better and available to even more workers. To do that, policymakers can:

- // Encourage or include requirements for project labor agreements (PLAs) on construction projects whenever possible.
- // Require developers to abide by prevailing wage standards that set minimums for pay, health, and other benefits.
- // Include local hire provisions for clean energy projects.
- // Support education and job training for members of traditionally underserved communities.
- // Enhance and enforce hiring and procurement policies that benefit low-income communities, people of color, and women.
- // Ensure underserved communities that host clean energy facilities directly benefit with jobs and supplier opportunities.
- // Ensure state housing finance agencies make ever-increasing commitments to efficiency and health improvements in Low-Income Housing Tax Credit-funded properties.

U.S. CLEAN ENERGY ECONOMY—STATE OF THE INDUSTRY

Introduction to the Numbers

Economic conditions related to the COVID-19 pandemic, along with the previous administration’s animosity toward clean energy, resulted in the first decline in clean energy jobs in America since E2 began tracking such occupations nearly a decade ago and the only decline on record since E2 began producing its annual Clean Jobs America reports.

Yet data indicates that clean energy jobs were more resilient and are recovering more quickly than overall economy. By June of last year, more than 620,000 clean energy workers 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.⁵ After losses peaked at the end of May 2020, jobs grew by more than 11 percent compared to about 9 percent across the U.S. economy overall. 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 number of clean energy jobs lost since COVID 19 at about 307,000.

Wind energy added about 2,000 jobs by the end of the year, while clean storage companies added nearly 1,400 jobs. The biggest increases were in clean vehicle manufacturing, with about 6,200 jobs being added in hybrid electric vehicle manufacturing and another 6,000 added in fully electric vehicles.

The growth in those areas was in part due to positive policy changes in numerous states to expand clean energy and clean vehicles, as well as the market signal sent by Joe Biden and other candidates for president during the 2020 election, including promises of more electric vehicles and wind energy. It also resulted from increasing demand for electric vehicles and manufacturers’ gearing up to meet that demand.

Still, many clean energy related sectors were hurt badly and are still suffering. No sector or subsector was hit harder than energy efficiency, where nearly 272,000 jobs were lost in 2020. Energy efficiency is the biggest part of the clean energy sector. It also has the widest variety of jobs, employing workers in everyday occupations

such as construction laborers, electricians and HVAC technicians as well as factory workers producing Energy Star appliances and energy efficient lighting and building materials.

Solar employment fell by nearly 29,000 jobs as residential solar companies in particular were sidelined early in the COVID-19 pandemic.

The Biden administration’s plans to increase energy efficiency and weatherization programs; its plans to boost renewable energy and its proposed investments in modernizing the nation’s power grid and transportation system with more electric vehicles and charging stations will also provide a much needed shot in the arm for clean energy companies post-COVID 19. At the same time, President Biden’s plans to invest \$100 billion in workforce training will help create new career paths to clean energy for millions of Americans.

Whether all of that translates to jobs, however, remains dependent on what Congress does with the Biden administration proposals.

FIG. 1 // U.S. CLEAN ENERGY EMPLOYMENT by sector 2020

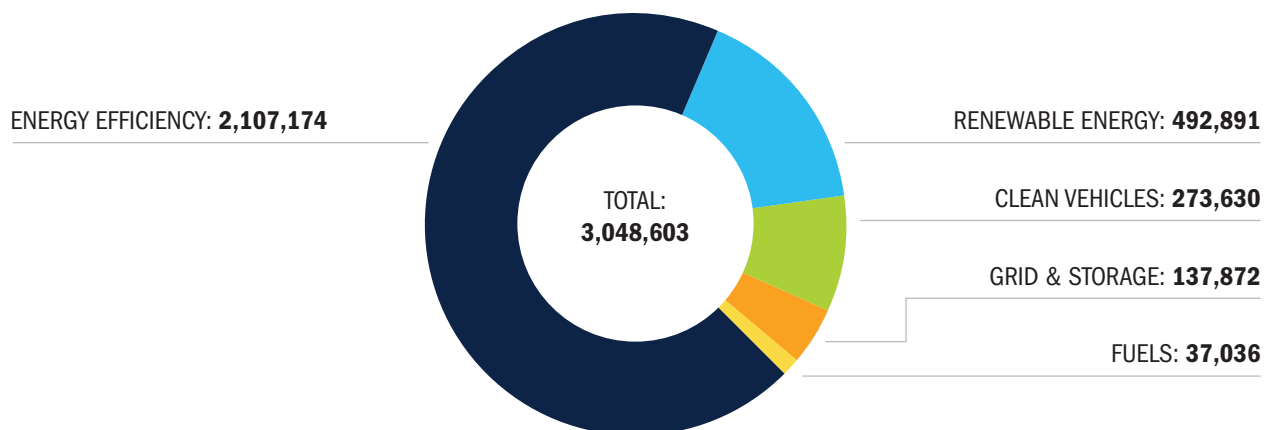
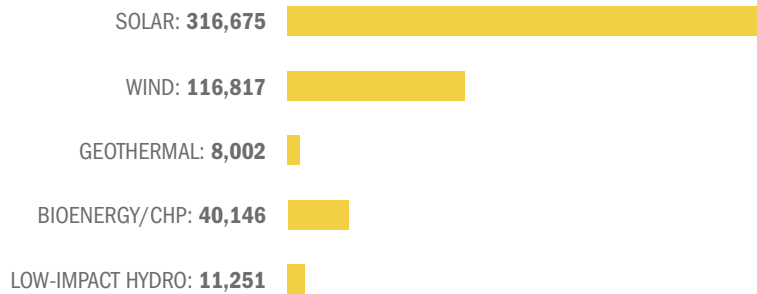


FIG. 2 // U.S. CLEAN ENERGY EMPLOYMENT by subsector 2020

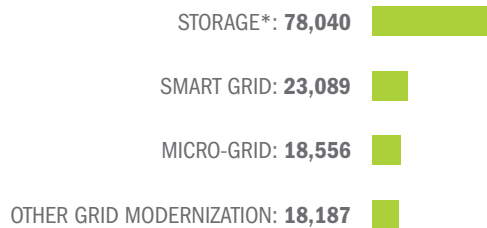
ENERGY EFFICIENCY: 2,107,174



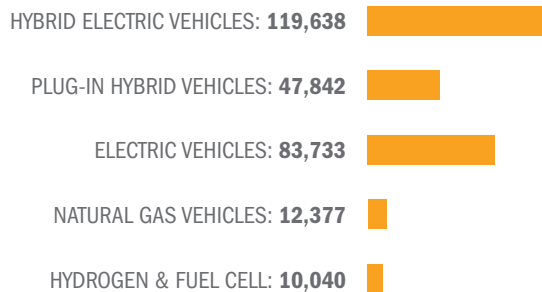
RENEWABLE ENERGY: 492,891



GRID & STORAGE: 137,872



CLEAN VEHICLES: 273,630



FUELS: 37,036

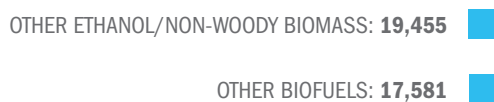


FIG. 3 // U.S. CLEAN ENERGY EMPLOYMENT by value chain 2020

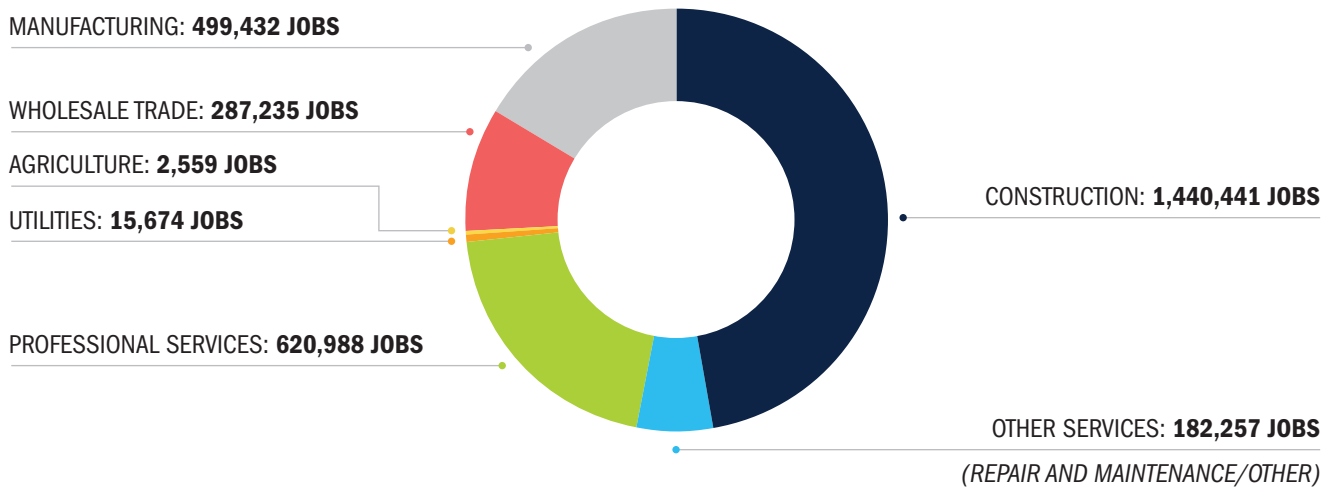
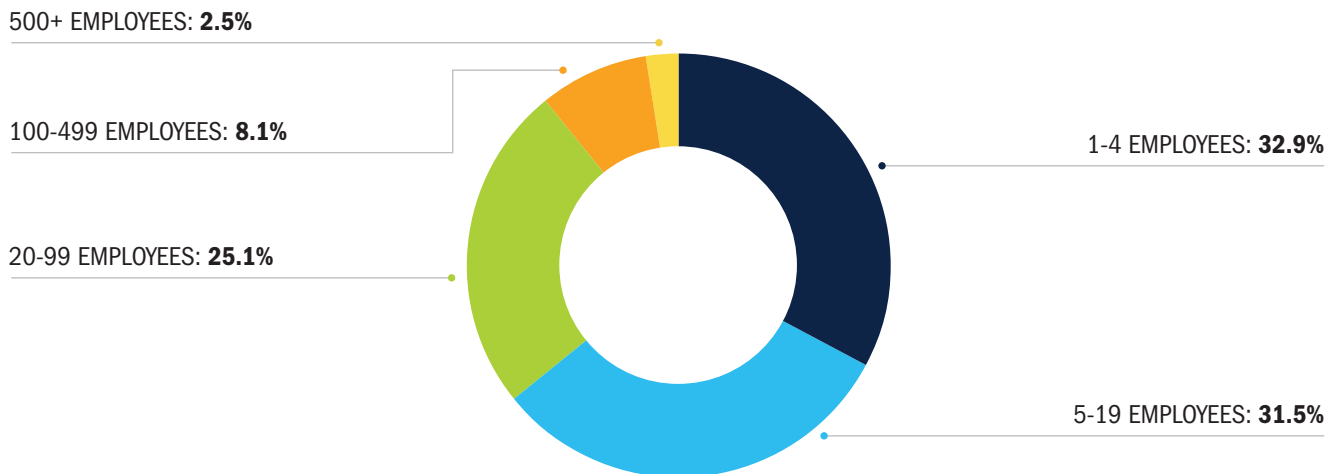


FIG. 4 // U.S. CLEAN ENERGY EMPLOYMENT by establishment size 2020



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.

U.S. CLEAN ENERGY ECONOMY—SECTOR BREAKDOWN & TRENDS

Positioned for Recovery

America's clean energy economy remains in a strong growth position, despite the dip in employment that came with the COVID-19 pandemic related economic downturn of 2020. Before COVID-19, U.S. clean energy employment grew by 6 percent—about twice as fast as the rest of the U.S. economy—and faster than fossil fuels and the rest of the energy sector overall. In fact, clean energy accounted for half of all new jobs in America's energy sector in 2018 and 2019.

Before the pandemic, jobs in 5 clean energy subsectors had increased their nationwide workforces by more than 10 percent since 2017 and 12 by more than five percent. Renewable energy—the most publicly recognizable sector of the clean energy economy—actually saw the slowest growth over that time period. However, wind turbine technician and solar installer continue to rank as the fastest and third-fastest growing occupations over the next decade by the BLS.⁶

Looking past the immediate impact from the COVID-19 employment crisis that left 18 percent of the sector's workers unemployed by May, the clean energy economy has been quickly recovering the jobs led by clean vehicles and renewable energy. From June through the end of the year, clean energy businesses added about 300,000 employees back to the workforce, an 11 percent growth rate that cut the industry's unemployment in half.

FIG. 5 // U.S. CLEAN ENERGY EMPLOYMENT by year 2017–2020

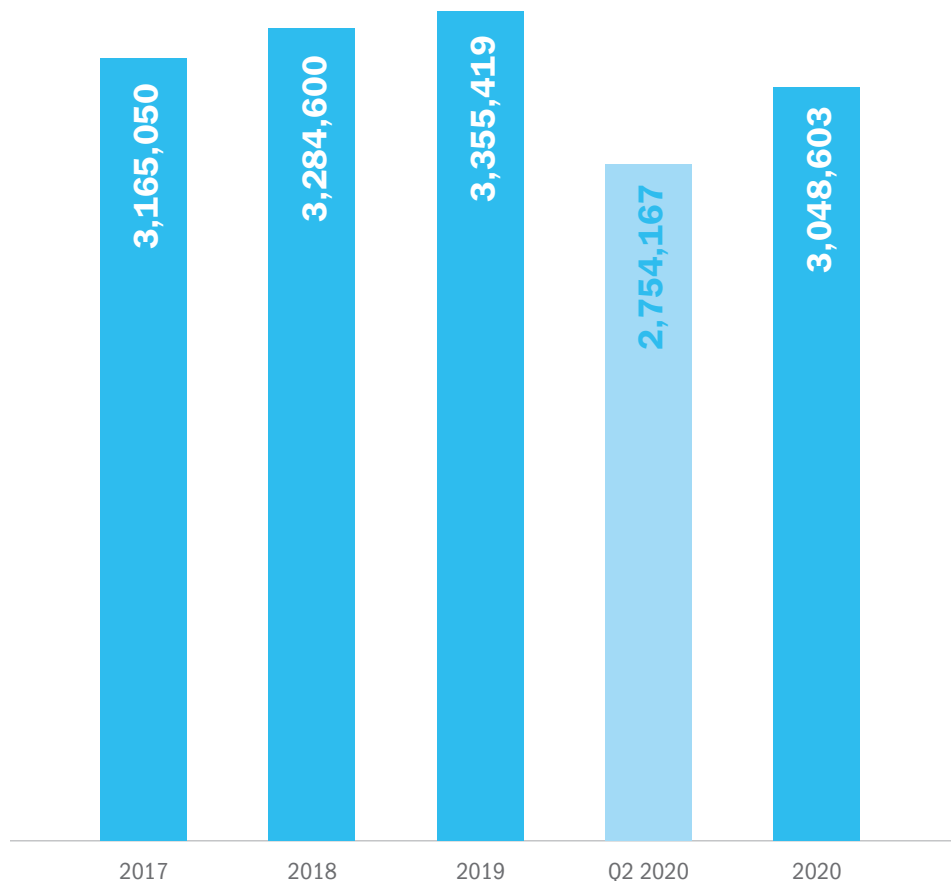
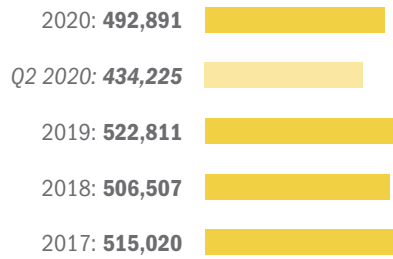


FIG. 6 // U.S. CLEAN ENERGY EMPLOYMENT by sector 2017–2020

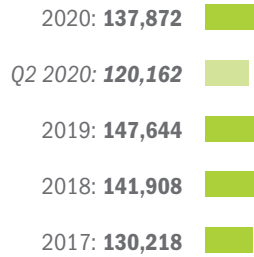
ENERGY EFFICIENCY:



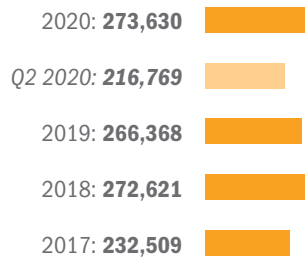
RENEWABLE ENERGY:



GRID & STORAGE:



CLEAN VEHICLES:



CLEAN FUELS:



FIG. 7 // U.S. CLEAN ENERGY EMPLOYMENT GROWTH
by fastest-growing sector 2017–2020

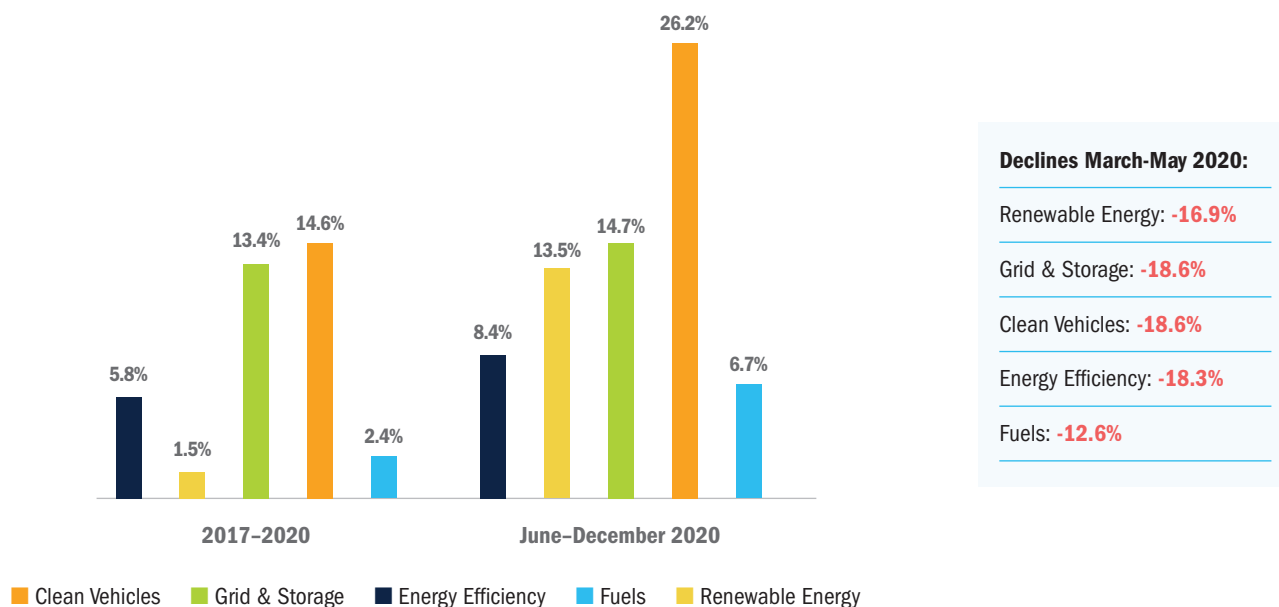
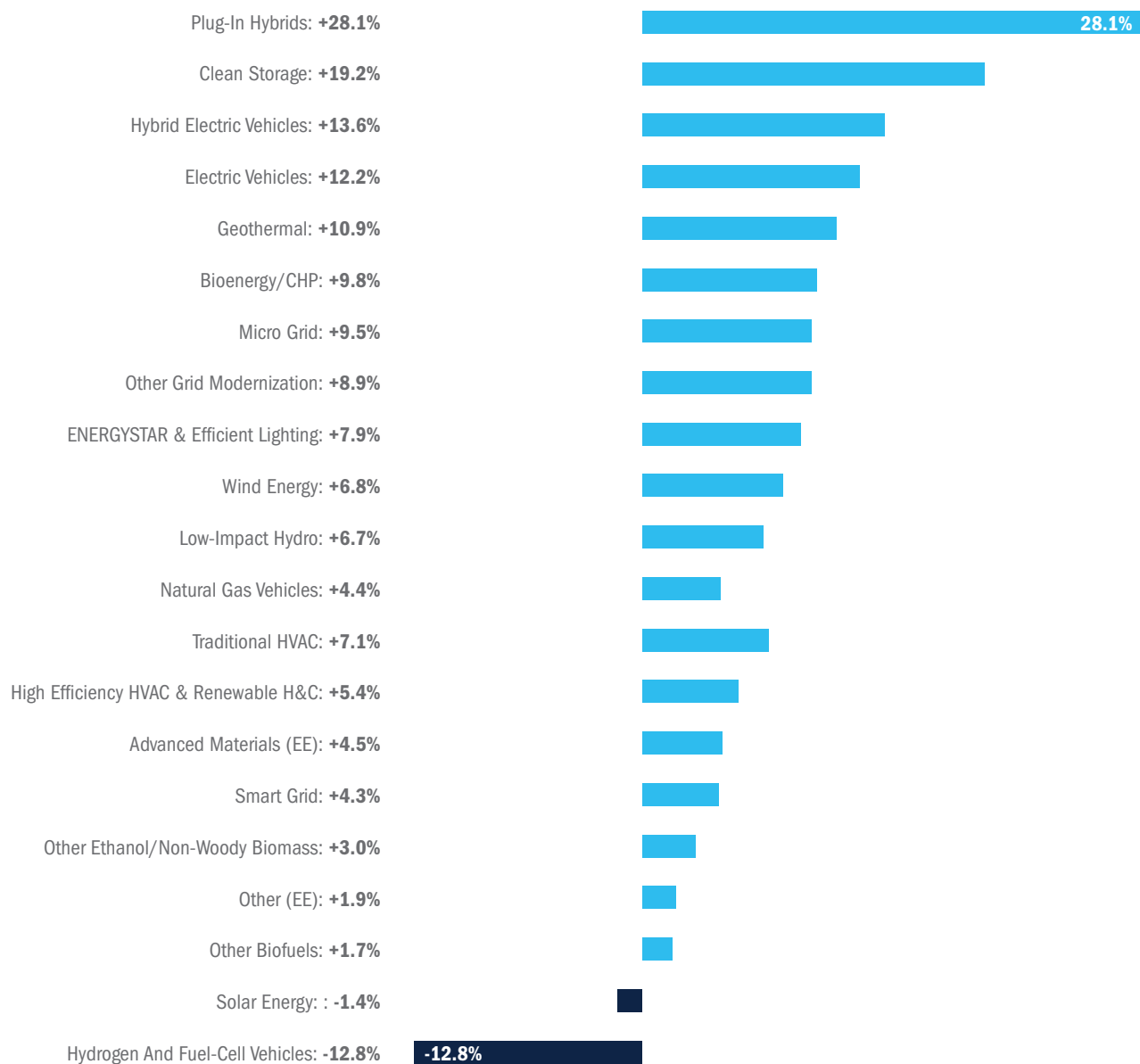


TABLE 1 // U.S. CLEAN ENERGY EMPLOYMENT by subsector 2017–2020

SECTOR	2020	2019	2018	2017
Solar	316,675	345,393	334,992	350,291
Wind	116,817	114,774	111,166	107,444
Geothermal	8,002	8,794	8,526	7,929
Bioenergy/CHP	40,146	41,546	40,245	37,825
Low-Impact Hydro	11,251	12,304	11,578	11,531
Clean Storage	78,040	79,699	76,339	66,874
Smart Grid	23,089	25,631	25,153	24,586
Micro Grid	18,556	22,192	21,559	20,275
Other Grid Mod	18,187	20,122	18,857	18,482
Energy STAR & Efficient Lighting	490,717	552,435	538,390	511,933
Trad. HVAC	531,640	598,375	582,108	558,576
High Efficiency HVAC & Renewable H&C	498,863	566,290	556,399	537,475
Advanced Materials (Energy Efficiency)	324,060	366,608	357,765	350,918
Other (Energy Efficiency)	261,894	295,185	290,203	289,622
Other E/Non-woody Biomass	19,455	20,694	20,074	20,083
Other Biofuels	17,581	19,009	18,625	18,695
Hybrid Electric Vehicles	119,638	113,449	110,984	99,871
Plug-in hybrid vehicles	47,842	51,619	53,221	40,308
Electric Vehicles	83,733	77,667	86,076	69,250
Natural Gas Vehicles	12,377	12,878	12,545	12,338
Hydrogen & fuel-cell vehicles	10,040	10,755	9,795	12,338

FIG. 8 // U.S. CLEAN ENERGY EMPLOYMENT by fastest-growing subsector 2017–2020



* Estimate based on rate of unemployment across all biofuels, which included corn ethanol and woody biofuels which E2 does not count as clean energy.

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

2020 Clean Energy Jobs	Growth Rate	Employment Change
Projected	+5.3%	+177,837
March–May (Peak Unemployment)	-17.9%	-601,252
June–December (Post Peak)	+10.7%	+294,436

U.S. CLEAN ENERGY ECONOMY—ECONOMYWIDE ANALYSIS

Hit Harder, Recovering Faster

Clean energy in 2020 remained a critical component of the economy in 2020, accounting for 2.2 percent of total U.S. employment or more than one in every 50 American workers. But when analyzed by the industries clean energy workers are employed in, the sector makes an even more pronounced impact. Clean energy workers now account for 19 percent of all construction jobs, over 5 percent of jobs in wholesale trade, and more than 4 percent of all manufacturing jobs.

Despite losing nearly 20 percent of its workforce at the mid-year point compared to a nearly 14 percent decline in the overall U.S. workforce, clean energy jobs recovered more than half of its lost jobs by the close of 2020. The sector is also on track to recover faster than the overall national workforce. Clean energy jobs increased about 11 percent since unemployment peaked in May compared with less than 9 percent in the overall national workforce during the same period.

At the state level, the top 10 states for total clean energy jobs did not change from 2019 except for some minor changes in the order. California led all 50 states and the District of Columbia with 485,000 jobs followed by Texas with 223,000. Six other states finished the year with more than 100,000 clean energy workers. Vermont led all states in clean energy jobs per capita, with more than 5 percent of all jobs statewide employed by clean energy businesses. Clean energy jobs accounted for over 3 percent of jobs in five other states.

FIG. 9 // U.S. EMPLOYMENT GROWTH 2017–2020⁷

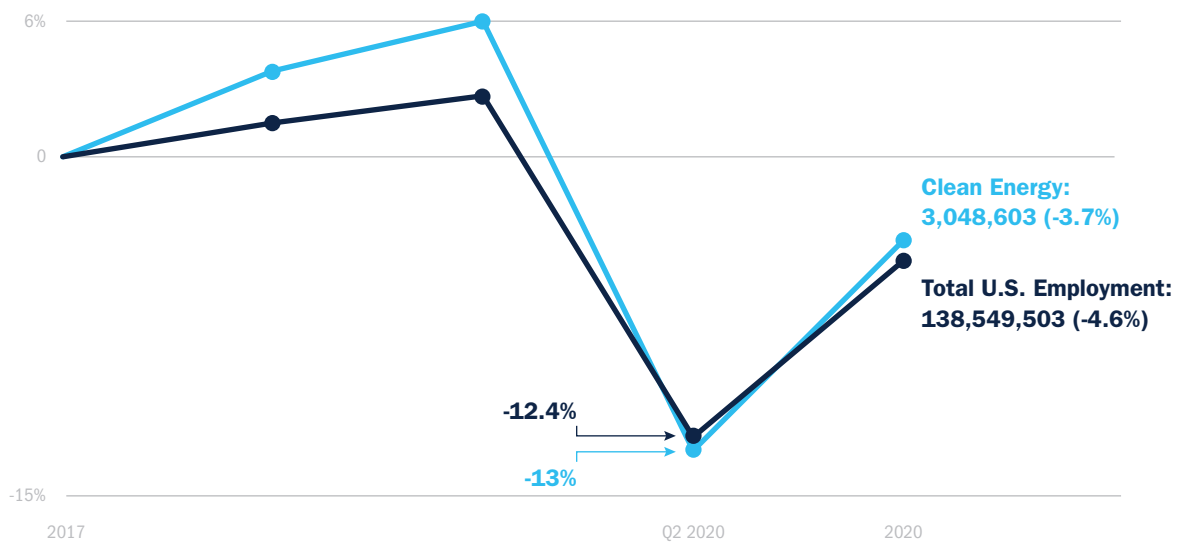


TABLE 3 // U.S. EMPLOYMENT by comparable occupations 2020⁸

OCCUPATION	2020 Employment	2019 Employment	2018 Employment	2017 Employment	2017-2019 Growth
Retail Salespersons	3,659,670	4,317,950	4,448,120	4,442,090	-2.79%
Clean Energy Sectors*	3,048,603	3,355,419	3,284,600	3,165,050	6.01%
Registered Nurses	2,986,500	2,982,280	2,951,960	2,906,840	2.60%
Customer Service Representatives	2,833,250	2,919,230	2,871,400	2,767,790	5.47%
Commercial Banking	2,065,527	2,063,270	2,067,089	2,076,128	-2.79%
Elementary and Middle School Teachers	1,976,050	2,064,680	2,032,880	2,043,520	1.04%
Waiters and Waitresses	1,944,240	2,579,020	2,582,410	2,584,220	-0.20%
Heavy and Tractor-Trailer Truck Drivers	1,797,710	1,856,130	1,800,330	1,748,140	6.18%
Engineers	1,673,440	1,730,720	1,700,880	1,665,220	3.93%
Lawyers	658,120	657,170	642,750	628,370	4.58%

FIG. 10 // TOTAL U.S. INDUSTRY EMPLOYMENT by share of clean energy jobs 2020⁹

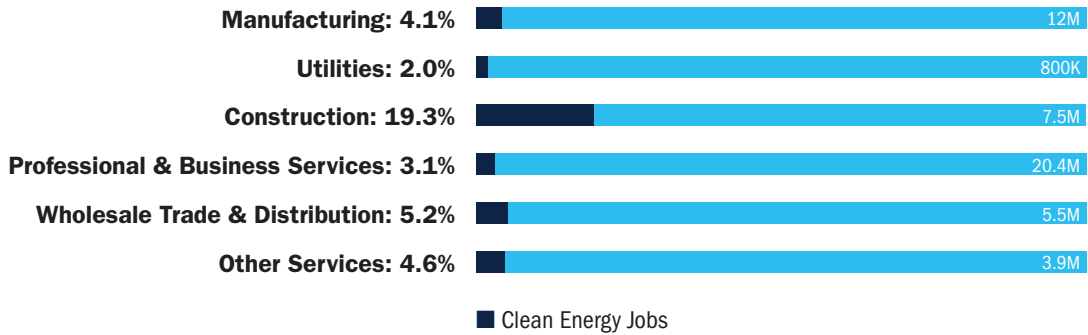


FIG. 11 // U.S. CLEAN ENERGY EMPLOYMENT by industry 2020



FIG. 12 // U.S. CLEAN ENERGY EMPLOYMENT
by share of total statewide employment 2017–2020¹⁰

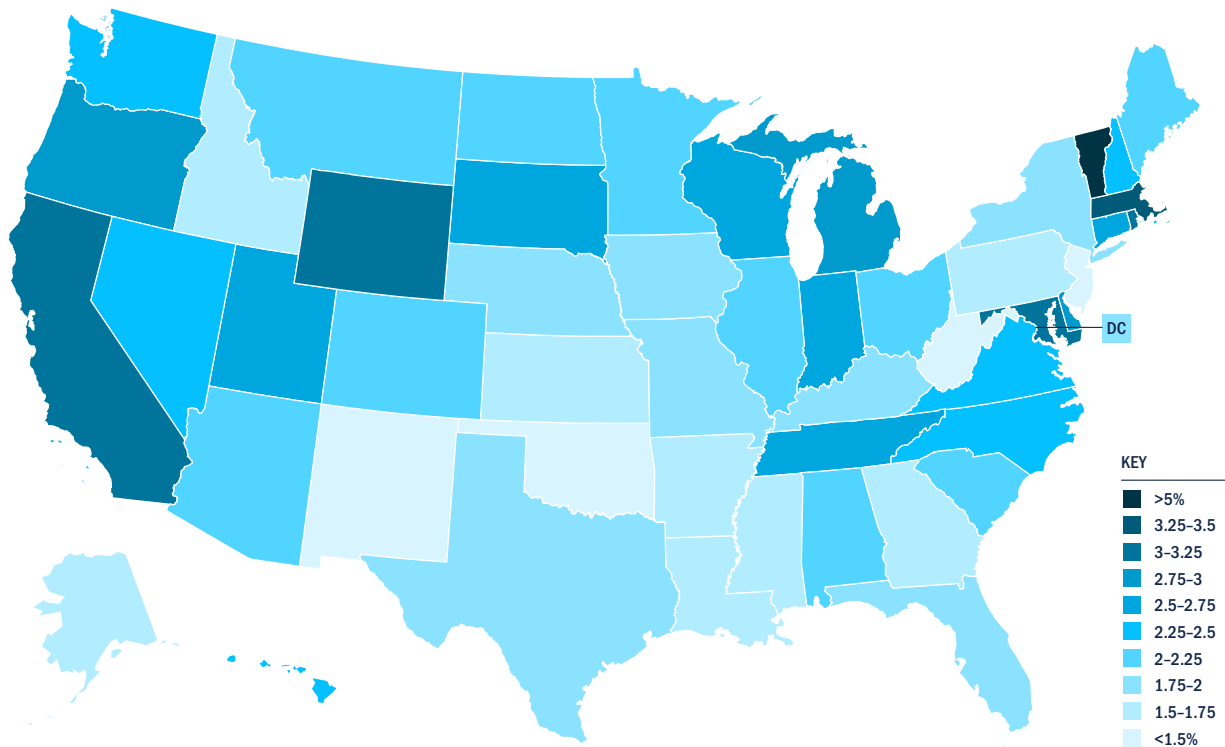


TABLE 4 // U.S. CLEAN ENERGY EMPLOYMENT by state 2020

Rank	State	Total Clean Energy Employment	Share of Statewide Workforce	Renewable Energy	Solar + Wind	Storage & Grid	Energy Efficiency	Clean Fuels	Clean Vehicles	Job Growth 2018-2020	Year-End Jobs Lost (Total)	Job Growth June-Dec. 2020
1	California	484,980	3.01%	130,403	119,317	22,638	283,839	5,597	42,503	2.2%	-9.7% (51,939)	13.5%
2	Texas	223,406	1.87%	38,675	37,225	12,367	152,111	1,988	18,265	9.2%	-7.4% (17,882)	7.2%
3	New York	153,208	1.79%	17,619	16,119	4,024	120,961	1,627	8,977	8.7%	-3.8% (6,129)	10.5%
4	Florida	149,624	1.80%	23,807	16,279	4,922	108,919	2,674	9,302	9.6%	-9.9% (16,408)	12.0%
5	Illinois	115,133	2.07%	17,608	14,631	4,724	80,671	1,435	10,695	5.8%	-8.2% (10,230)	6.7%
6	Michigan	113,456	2.81%	10,767	9,522	3,579	74,242	600	24,268	3.4%	-9.5% (11,909)	20.4%
7	Massachusetts	108,909	3.29%	20,122	17,378	6,458	76,900	550	4,880	3.6%	-11.1% (13,568)	5.9%
8	Ohio	103,437	2.01%	9,427	8,794	2,803	73,291	1,248	16,668	6.4%	-9.6% (10,951)	10.1%
9	North Carolina	99,670	2.31%	11,264	9,103	3,313	76,473	1,423	7,197	5.2%	-11.6% (13,050)	16.6%
10	Virginia	88,370	2.36%	8,831	6,330	2,305	71,505	277	5,452	5.8%	-9.2% (8,935)	6.5%

Rank	State	Total Clean Energy Employment	Share of Statewide Workforce	Renewable Energy	Solar + Wind	Storage & Grid	Energy Efficiency	Clean Fuels	Clean Vehicles	Job Growth 2018-2020	Year-End Jobs Lost (Total)	Job Growth June-Dec. 2020
11	Pennsylvania	87,313	1.59%	9,473	7,930	3,598	65,397	1,243	7,602	9.6%	-7.0% (6,548)	20.9%
12	Indiana	80,614	2.74%	11,019	10,449	2,874	49,068	734	16,919	4.7%	-7.2% (6,278)	12.5%
13	Maryland	77,842	3.12%	7,575	7,036	1,914	65,412	165	2,776	3.5%	-7.9% (6,707)	8.2%
14	Washington	75,684	2.32%	10,571	7,998	3,397	56,721	1,694	3,302	3.8%	-11.0% (9,351)	18.6%
15	Tennessee	72,952	2.50%	5,391	4,985	7,898	47,976	1,166	10,522	3.9%	-8.4% (6,674)	5.7%
16	Georgia	71,111	1.66%	8,934	7,827	3,813	51,123	383	6,858	9.9%	-15.1% (12,695)	29.6%
17	Wisconsin	69,343	2.52%	6,121	5,565	2,081	55,986	347	4,808	2.8%	-9.6% (7,342)	6.2%
18	Colorado	58,182	2.24%	17,324	15,373	2,912	32,595	1,959	3,392	9.6%	-6.8% (4,238)	6.0%
19	Arizona	56,504	2.02%	10,934	10,104	2,176	39,880	325	3,188	7.4%	-9.0% (5,602)	7.0%
20	Minnesota	55,329	2.05%	7,616	6,978	2,681	41,148	632	3,252	6.0%	-10.5% (6,477)	10.1%
21	Oregon	52,150	2.84%	7,120	6,749	3,454	38,262	719	2,596	3.6%	-7.9% (4,467)	10.6%
22	Missouri	51,570	1.92%	5,124	4,170	1,754	37,866	866	5,960	4.0%	-8.7% (4,916)	9.3%
23	New Jersey	50,096	1.33%	10,932	8,771	1,635	32,880	350	4,299	10.8%	-12.3% (7,043)	10.5%
24	South Carolina	41,888	2.07%	6,918	5,160	1,773	26,815	579	5,804	6.0%	-10.0% (4,639)	13.7%
25	Utah	41,514	2.73%	7,861	7,585	1,033	30,150	104	2,365	7.4%	-5.7% (2,491)	3.8%
26	Connecticut	39,898	2.56%	3,278	2,826	730	33,573	325	1,992	4.4%	-6.0% (2,557)	11.1%
27	Alabama	39,486	2.08%	3,567	2,124	1,689	27,668	190	6,371	6.6%	-9.9% (4,342)	13.3%
28	Kentucky	33,150	1.83%	2,080	1,734	1,237	21,910	256	7,668	7.9%	-13.4% (5,116)	26.8%
29	Nevada	31,191	2.49%	9,870	8,853	9,209	10,656	117	1,339	38.9%	-7.7% (2,597)	8.4%
30	Iowa	28,953	1.96%	5,655	4,849	1,326	18,240	852	2,881	6.0%	-9.7% (3,103)	8.2%
31	Louisiana	26,393	1.52%	4,045	3,796	1,409	19,139	211	1,589	11.6%	-15.2% (4,716)	17.5%
32	Kansas	22,572	1.70%	3,577	2,910	985	15,820	276	1,915	8.0%	-9.4% (2,336)	5.9%
33	Oklahoma	20,132	1.31%	3,148	2,981	1,424	12,741	798	2,020	10.7%	-11.6% (2,633)	14.9%
34	Arkansas	18,807	1.59%	1,680	1,310	751	13,934	546	1,896	5.1%	-7.7% (1,570)	9.5%
35	Mississippi	18,750	1.72%	1,416	1,313	727	13,611	481	2,516	5.2%	-10.6% (2,235)	11.7%
36	Nebraska	17,846	1.88%	3,050	2,362	473	12,432	199	1,693	5.8%	-8.2% (1,594)	11.6%
37	New Hampshire	15,323	2.42%	3,215	2,538	278	10,838	124	868	5.1%	-7.5% (1,248)	3.0%
38	Vermont	15,238	5.37%	2,138	2,035	925	10,069	664	1,442	0.8%	-8.4% (1,397)	9.7%

Rank	State	Total Clean Energy Employment	Share of Statewide Workforce	Renewable Energy	Solar + Wind	Storage & Grid	Energy Efficiency	Clean Fuels	Clean Vehicles	Job Growth 2018-2020	Year-End Jobs Lost (Total)	Job Growth June-Dec. 2020
39	Rhode Island	13,874	3.07%	2,069	1,976	564	10,627	276	338	3.4%	-15.6% (2,555)	10.6%
40	District of Col.	13,580	1.90%	1,818	1,676	276	11,214	16	256	5.4%	-11.7% (1,804)	8.8%
41	Hawaii	12,550	2.47%	4,652	4,278	517	5,120	1,885	376	5.0%	-9.9% (1,378)	31.9%
42	Idaho	12,545	1.64%	1,815	1,683	1,082	8,319	253	1,075	9.2%	-4.8% (636)	10.8%
43	Delaware	11,979	2.79%	666	614	204	10,660	71	377	3.3%	-14.1% (1,964)	5.6%
44	Maine	11,922	2.00%	2,497	2,049	453	8,034	199	740	8.1%	-6.8% (875)	12.4%
45	South Dakota	11,406	2.70%	2,747	2,484	435	7,104	192	927	4.4%	-0.4% (51)	9.2%
46	New Mexico	11,116	1.44%	4,223	4,094	669	5,341	98	785	9.1%	-10.1% (1,249)	13.2%
47	Montana	9,460	2.03%	442	385	387	7,968	46	617	7.5%	-8.8% (917)	11.4%
48	West Virginia	8,996	1.39%	986	845	778	6,309	25	899	10.3%	-10.7% (1,081)	9.5%
49	North Dakota	8,258	2.07%	2,170	1,967	496	4,782	145	665	5.8%	-10.2% (934)	12.5%
50	Wyoming	8,042	3.05%	323	290	429	6,900	77	312	3.3%	-7.8% (679)	5.3%
51	Alaska	4,848	1.60%	327	146	295	3,974	31	220	5.2%	-13.9% (780)	17.1%
	United States	3,048,603	2.20%	492,891	433,492	137,872	2,107,174	37,036	273,630	6.0%	-9.1% (306,817)	11.5%

U.S. CLEAN ENERGY ECONOMY—GEOGRAPHIC BREAKDOWN

America's Hubs for Clean Energy Jobs Are Local

Clean energy jobs are one of the most geographically diverse employment sectors in the entire economy with workers in 99.9% of all U.S. counties. As with most industries, the majority of employment is concentrated in America's metropolitan areas. But thanks to clean energy work's inherent localness, rural districts and small communities are also increasingly making their mark.

Nearly half of the nation's clean energy jobs (1.4 million) were concentrated in the 25 metropolitan statistical areas (MSAs) with the most total clean energy jobs. In the top 50 MSAs, that rises to nearly 60 percent of all clean energy jobs (1.8 million). Thirty-four states and the District of Columbia were home to a Top 50 for clean energy jobs in 2020, and 18 states had at least two or more metros represented.

America's rural nonmetropolitan statistical areas now employ nearly 400,000 workers, about 13 percent of clean energy's entire workforce. But for many states, rural clean energy jobs account for significantly more than that. In 21 states, rural areas accounted for more than 25 percent of the state's total clean energy employment and in four states the majority of clean energy jobs were in rural areas.

TABLE 5 // U.S. CLEAN ENERGY EMPLOYMENT by metro 2017–2020¹¹

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
New York-Northern New Jersey-Long Island, NY-NJ-PA	20,912	108,082	144,092	1.62%
Los Angeles-Long Beach-Santa Ana, CA	31,401	83,858	131,023	2.16%
San Francisco-Oakland-Fremont, CA	32,183	53,393	113,024	4.72%
Chicago-Naperville-Joliet, IL-IN-WI	14,292	65,487	94,515	2.10%
Boston-Cambridge-Quincy, MA-NH	16,972	59,683	85,723	3.28%
Washington-Arlington-Alexandria, DC-VA-MD-WV	8,201	66,554	80,789	2.54%
Houston-Sugar Land-Baytown, TX	10,410	40,925	60,113	1.93%
Miami-Fort Lauderdale-Pompano Beach, FL	9,257	39,593	54,994	2.01%
Dallas-Fort Worth-Arlington, TX	8,449	37,617	54,131	1.46%
San Diego-Carlsbad-San Marcos, CA	15,277	31,220	52,371	3.60%
Detroit-Warren-Livonia, MI	5,025	32,651	50,229	2.68%
Atlanta-Sandy Springs-Marietta, GA	6,093	33,338	46,805	1.68%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	4,925	34,577	44,957	1.63%
Phoenix-Mesa-Scottsdale, AZ	9,210	29,809	43,275	2.03%
Seattle-Tacoma-Bellevue, WA	6,708	31,719	43,119	2.09%
Minneapolis-St. Paul-Bloomington, MN-WI	5,974	27,463	37,759	1.98%
Baltimore-Towson, MD	3,674	29,912	35,793	2.70%
Riverside-San Bernardino-Ontario, CA	9,281	21,278	34,552	2.25%
Portland-Vancouver-Beaverton, OR-WA	4,802	23,535	32,752	2.76%
Denver-Aurora, CO	10,496	17,516	32,545	2.10%
San Jose-Sunnyvale-Santa Clara, CA	8,645	17,492	29,437	2.67%
Sacramento-Arden-Arcade-Roseville, CA	8,422	17,346	29,029	2.87%
St. Louis, MO-IL	2,629	18,070	24,723	1.85%
Austin-Round Rock, TX	5,176	15,857	24,432	2.24%
Indianapolis-Carmel, IN	3,511	13,708	23,041	2.20%
Nashville-Davidson-Murfreesboro-Franklin, TN	1,850	14,435	22,164	2.19%
Charlotte-Gastonia-Concord, NC-SC	2,563	16,756	22,153	1.79%
Las Vegas-Paradise, NV	7,799	6,345	20,496	2.13%
Cleveland-Elyria-Mentor, OH	1,772	14,402	20,245	1.99%

* Total includes all clean energy sectors

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
Tampa-St. Petersburg-Clearwater, FL	3,367	14,338	19,920	1.49%
San Antonio, TX	4,193	12,846	19,796	1.87%
Kansas City, MO-KS	2,671	13,423	18,996	1.78%
Milwaukee-Waukesha-West Allis, WI	1,957	14,714	18,574	2.28%
Cincinnati-Middletown, OH-KY-IN	1,498	12,929	18,293	1.71%
Salt Lake City, UT	2,299	13,210	17,043	2.22%
Pittsburgh, PA	2,000	12,403	16,871	1.54%
Virginia Beach-Norfolk-Newport News, VA-NC	1,539	13,604	16,687	2.19%
Columbus, OH	867	11,191	15,230	1.45%
Orlando-Kissimmee, FL	2,547	10,967	15,217	1.20%
Richmond, VA	1,542	12,004	14,924	2.33%
Raleigh-Cary, NC	1,595	10,941	14,256	2.20%
Provo-Orem, UT	4,529	8,603	14,132	5.27%
Hartford-West Hartford-East Hartford, CT	1,523	11,433	13,998	2.31%
Memphis, TN-AR-MS	735	9,300	13,609	2.12%
Bridgeport-Stamford-Norwalk, CT	1,143	11,296	13,462	3.20%
Louisville/Jefferson County, KY-IN	837	8,733	12,477	1.95%
Birmingham-Hoover, AL	1,088	8,348	11,988	2.40%
Toledo, OH	2,635	7,113	11,758	3.87%
Santa Rosa-Petaluma, CA	3,392	5,769	10,244	4.88%
San Luis Obispo-Paso Robles, CA	3,870	5,235	10,090	8.56%
Jacksonville, FL	1,412	7,430	9,996	1.43%
Knoxville, TN	589	6,431	9,648	2.46%
Grand Rapids-Wyoming, MI	839	6,299	9,546	1.75%
New Orleans-Metairie-Kenner, LA	1,502	6,431	9,000	1.65%
Reno-Sparks, NV	1,606	3,654	8,917	3.77%
Fresno, CA	2,174	5,535	8,750	2.19%
Honolulu, HI	2,978	3,834	8,603	2.05%
Buffalo-Niagara Falls, NY	929	6,755	8,500	1.69%
Worcester, MA	1,267	6,228	8,456	2.23%
Oxnard-Thousand Oaks-Ventura, CA	1,895	5,488	8,408	2.58%
Springfield, MA	1,422	6,051	8,403	2.85%
Omaha-Council Bluffs, NE-IA	1,377	5,599	8,095	1.65%
Madison, WI	870	6,385	8,081	2.04%
Fort Wayne, IN	1,137	4,816	7,999	3.87%
Rochester, NY	807	6,413	7,985	1.68%
Charleston-North Charleston, SC	1,385	4,932	7,817	2.18%
Oklahoma City, OK	1,171	4,832	7,611	1.19%
New Haven-Milford, CT	434	6,556	7,583	2.09%
Greenville-Mauldin-Easley, SC	1,426	4,655	7,497	1.83%
Albany-Schenectady-Troy, NY	946	5,758	7,392	1.75%
Bakersfield, CA	2,113	4,350	7,281	2.18%
Santa Barbara-Santa Maria-Goleta, CA	1,631	4,713	7,230	3.51%
Akron, OH	586	4,972	6,963	2.17%
Tucson, AZ	1,046	5,176	6,958	1.83%
Boulder, CO	2,517	3,526	6,913	3.65%
Columbia, SC	1,131	4,349	6,803	1.77%
Greensboro-High Point, NC	527	5,405	6,775	1.91%
Durham, NC	1,295	4,720	6,751	2.05%

* Total includes all clean energy sectors

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
Dayton, OH	357	4,811	6,528	1.75%
Albuquerque, NM	2,590	3,012	6,478	1.70%
Providence-New Bedford-Fall River, RI-MA	910	4,721	6,359	0.93%
Asheville, NC	818	4,792	6,358	3.15%
Cape Coral-Fort Myers, FL	960	4,525	6,188	2.28%
Sarasota-Bradenton-Venice, FL	932	4,446	6,068	N/A
Des Moines-West Des Moines, IA	1,069	3,802	5,924	1.56%
Chattanooga, TN-GA	446	3,827	5,740	2.23%
Tulsa, OK	880	3,599	5,676	1.28%
Poughkeepsie-Newburgh-Middletown, NY	617	4,386	5,546	2.25%
Little Rock-North Little Rock-Conway, AR	494	4,065	5,490	1.60%
Stockton, CA	1,429	3,352	5,411	2.11%
Spokane, WA	565	4,168	5,350	2.18%
Boise City-Nampa, ID	824	3,419	5,233	1.47%
Portland-South Portland-Biddeford, ME	1,029	3,524	5,160	1.81%
Burlington-South Burlington, VT	773	3,357	5,145	4.30%
El Paso, TX	789	3,432	4,957	1.54%
Syracuse, NY	352	4,022	4,853	1.71%
Lansing-East Lansing, MI	451	3,165	4,826	2.16%
Allentown-Bethlehem-Easton, PA-NJ	417	3,618	4,718	1.33%
Eugene-Springfield, OR	552	3,551	4,662	2.99%
Baton Rouge, LA	594	3,468	4,637	1.20%
Wilmington, NC	378	3,574	4,510	3.40%
Jackson, MS	392	3,196	4,463	1.65%
Wichita, KS	600	3,199	4,442	1.50%
Youngstown-Warren-Boardman, OH-PA	393	3,171	4,424	2.14%
Barnstable Town, MA	646	3,255	4,390	4.06%
Ann Arbor, MI	397	2,890	4,387	2.06%
Sioux Falls, SD	996	2,758	4,357	2.75%
Lexington-Fayette, KY	313	2,995	4,355	1.61%
South Bend-Mishawaka, IN-MI	671	2,571	4,321	3.22%
Colorado Springs, CO	944	2,706	4,315	1.40%
Ogden-Clearfield, UT	350	3,546	4,308	1.56%
Mobile, AL	385	3,002	4,272	2.36%
Evansville, IN-KY	528	2,626	4,250	2.79%
Reading, PA	1,042	2,688	4,236	2.46%
Springfield, MO	437	3,052	4,180	1.98%
Huntsville, AL	382	2,919	4,161	1.76%
Charlottesville, VA	626	2,977	3,935	3.57%
Modesto, CA	855	2,582	3,922	2.02%
Winston-Salem, NC	324	3,081	3,886	1.45%
Palm Bay-Melbourne-Titusville, FL	575	2,850	3,867	1.69%
Salinas, CA	819	2,538	3,834	1.86%
Lancaster, PA	556	2,724	3,793	1.51%
Manchester-Nashua, NH	798	2,607	3,710	1.85%
Kalamazoo-Portage, MI	319	2,394	3,629	3.10%
Salem, OR	398	2,764	3,597	2.00%
Corpus Christi, TX	560	2,487	3,580	1.93%
Harrisburg-Carlisle, PA	327	2,707	3,549	1.09%
Scranton--Wilkes-Barre, PA	307	2,680	3,493	1.44%

* Total includes all clean energy sectors

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
Port St. Lucie, FL	489	2,594	3,486	2.25%
Roanoke, VA	359	2,810	3,482	2.32%
Fayetteville-Springdale-Rogers, AR-MO	307	2,578	3,475	1.44%
Montgomery, AL	316	2,425	3,456	2.06%
Flint, MI	319	2,263	3,447	2.57%
Santa Cruz-Watsonville, CA	683	2,362	3,415	3.10%
Canton-Massillon, OH	272	2,387	3,334	2.00%
Fort Collins-Loveland, CO	795	2,011	3,304	1.95%
St. Cloud, MN	809	2,123	3,271	3.11%
Green Bay, WI	243	2,679	3,268	1.90%
Peoria, IL	445	2,335	3,267	1.89%
Bellingham, WA	656	2,271	3,264	3.42%
Naples-Marco Island, FL	467	2,417	3,260	2.18%
Kingsport-Bristol-Bristol, TN-VA	297	2,223	3,201	2.72%
Holland-Grand Haven, MI	270	2,118	3,198	N/A
Augusta-Richmond County, GA-SC	395	2,264	3,192	1.36%
Beaumont-Port Arthur, TX	479	2,192	3,141	1.97%
McAllen-Edinburg-Mission, TX	469	2,183	3,120	1.12%
Medford, OR	361	2,375	3,110	3.38%
Myrtle Beach-Conway-North Myrtle Beach, SC	487	1,986	3,076	1.77%
Oshkosh-Neenah, WI	261	2,493	3,076	3.33%
Davenport-Moline-Rock Island, IA-IL	465	2,053	3,007	1.68%
Chico, CA	812	1,803	2,995	3.73%
Deltona-Daytona Beach-Ormond Beach, FL	427	2,212	2,983	1.45%
Pensacola-Ferry Pass-Brent, FL	408	2,189	2,937	1.59%
Lincoln, NE	470	2,063	2,929	1.59%
Rockford, IL	436	2,055	2,919	2.04%
Tallahassee, FL	394	2,175	2,907	1.65%
Hickory-Lenoir-Morganton, NC	222	2,306	2,888	1.88%
Cleveland, TN	768	1,488	2,864	5.76%
Anchorage, AK	192	2,345	2,848	1.68%
Visalia-Porterville, CA	699	1,717	2,740	1.66%
Appleton, WI	211	2,187	2,679	2.19%
Lubbock, TX	407	1,823	2,621	1.77%
Lynchburg, VA	347	2,039	2,614	2.60%
Vallejo-Fairfield, CA	509	1,721	2,554	1.82%
Cedar Rapids, IA	551	1,560	2,543	1.78%
Amarillo, TX	396	1,755	2,527	2.11%
Olympia, WA	270	1,955	2,514	2.10%
Tyler, TX	412	1,716	2,497	2.28%
Lakeland, FL	349	1,840	2,476	1.05%
Fayetteville, NC	251	1,924	2,476	1.57%
Fargo, ND-MN	558	1,534	2,469	1.79%
Bend, OR	329	1,840	2,459	2.84%
Bremerton-Silverdale, WA	255	1,905	2,442	2.54%
Niles-Benton Harbor, MI	208	1,606	2,428	3.95%
Springfield, IL	418	1,639	2,399	1.84%
Savannah, GA	264	1,767	2,398	1.33%
Elizabethtown, KY	53	624	2,395	4.36%
Shreveport-Bossier City, LA	406	1,700	2,387	1.45%

* Total includes all clean energy sectors

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
Elkhart-Goshen, IN	312	1,451	2,379	1.86%
York-Hanover, PA	192	1,788	2,316	1.30%
Saginaw-Saginaw Township North, MI	197	1,494	2,262	2.81%
Gulfport-Biloxi, MS	142	1,661	2,258	1.43%
Redding, CA	456	1,513	2,254	3.31%
Killeen-Temple-Fort Hood, TX	347	1,540	2,217	1.51%
Spartanburg, SC	316	1,432	2,183	1.48%
Lafayette, LA	308	1,579	2,148	1.07%
Norwich-New London, CT	79	1,896	2,147	1.92%
Glens Falls, NY	532	1,425	2,127	4.04%
Trenton-Ewing, NJ	403	1,437	2,108	0.84%
Bloomington, IN	343	1,233	2,100	3.07%
Macon, GA	367	1,429	2,093	2.06%
Gainesville, FL	398	1,451	2,074	1.40%
Hagerstown-Martinsburg, MD-WV	158	1,668	2,004	1.97%
Midland, TX	371	1,334	1,992	1.81%
Longview, TX	326	1,369	1,988	1.60%
Ocala, FL	312	1,441	1,977	1.76%
Billings, MT	84	1,670	1,974	2.17%
Duluth, MN-WI	125	1,591	1,961	1.51%
Rapid City, SD	536	1,158	1,948	2.85%
Napa, CA	396	1,306	1,948	2.48%
Johnson City, TN	101	1,284	1,909	2.41%
Kennewick-Richland-Pasco, WA	196	1,439	1,848	1.40%
Lafayette, IN	222	1,130	1,832	1.87%
Greeley, CO	401	1,148	1,832	1.54%
Terre Haute, IN	223	1,116	1,813	2.59%
Racine, WI	134	1,470	1,794	2.38%
Clarksville, TN-KY	115	1,201	1,787	1.86%
Champaign-Urbana, IL	247	1,273	1,785	1.89%
Pittsfield, MA	224	1,348	1,779	2.95%
Waco, TX	272	1,237	1,774	1.46%
Yakima, WA	213	1,343	1,755	1.39%
Utica-Rome, NY	151	1,426	1,747	1.53%
Eau Claire, WI	131	1,420	1,735	2.07%
Erie, PA	140	1,234	1,607	1.36%
Odessa, TX	257	1,108	1,603	2.00%
Greenville, NC	225	1,185	1,595	2.08%
Tuscaloosa, AL	146	1,098	1,568	1.48%
Topeka, KS	210	1,129	1,566	1.41%
Muskegon-Norton Shores, MI	185	996	1,562	2.57%
Kingston, NY	166	1,239	1,553	2.59%
Rochester, MN	115	1,237	1,548	1.29%
Brownsville-Harlingen, TX	232	1,078	1,541	1.05%
Binghamton, NY	129	1,259	1,539	1.68%
College Station-Bryan, TX	241	1,067	1,536	1.31%
St. George, UT	129	1,253	1,527	2.09%
Florence, SC	228	986	1,514	1.73%
Jackson, TN	72	1,014	1,501	1.78%
Columbus, GA-AL	167	1,090	1,500	1.23%

* Total includes all clean energy sectors

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
Jackson, MI	137	969	1,477	2.64%
Columbia, MO	121	1,105	1,476	1.43%
Fort Walton Beach-Crestview-Destin, FL	189	1,110	1,471	N/A
Fort Smith, AR-OK	143	1,064	1,463	1.44%
Casper, WY	52	1,249	1,448	3.70%
Iowa City, IA	322	879	1,445	1.59%
Prescott, AZ	136	1,140	1,438	2.08%
Wausau, WI	107	1,163	1,421	1.71%
Santa Fe, NM	523	671	1,388	2.18%
Abilene, TX	220	957	1,382	1.88%
Janesville, WI	106	1,122	1,374	2.04%
La Crosse, WI-MN	101	1,114	1,363	1.85%
Dover, DE	55	1,227	1,347	1.96%
Salisbury, MD	130	1,131	1,344	0.80%
Charleston, WV	178	906	1,328	1.19%
Battle Creek, MI	117	876	1,328	2.53%
Huntington-Ashland, WV-KY-OH	127	919	1,326	1.01%
Dothan, AL	124	925	1,322	2.19%
Winchester, VA-WV	128	1,058	1,315	2.09%
Laredo, TX	218	901	1,312	1.22%
Waterloo-Cedar Falls, IA	236	839	1,308	1.49%
Joplin, MO	113	973	1,307	1.65%
Wichita Falls, TX	228	887	1,304	2.17%
Mansfield, OH	102	926	1,289	2.57%
Burlington, NC	97	1,019	1,275	2.01%
Cheyenne, WY	43	1,101	1,274	2.64%
Anderson, SC	193	825	1,268	N/A
Harrisonburg, VA	118	1,029	1,263	1.97%
Morristown, TN	67	848	1,262	2.47%
Blacksburg-Christiansburg-Radford, VA	119	1,025	1,258	1.88%
Florence-Muscle Shoals, AL	116	870	1,242	2.20%
Jefferson City, MO	114	920	1,242	1.59%
Coeur d'Alene, ID	167	832	1,240	1.78%
Monroe, MI	112	809	1,230	3.09%
Athens-Clark County, GA	133	910	1,229	1.35%
Lake Charles, LA	170	863	1,215	1.14%
Panama City-Lynn Haven, FL	163	910	1,214	1.58%
Flagstaff, AZ	203	883	1,212	1.91%
Sebastian-Vero Beach, FL	167	897	1,203	2.21%
Rocky Mount, NC	89	953	1,191	2.13%
Bismarck, ND	306	692	1,187	1.69%
Victoria, TX	185	822	1,183	2.83%
Gainesville, GA	131	865	1,175	1.28%
Grand Junction, CO	269	724	1,174	1.77%
Merced, CA	270	748	1,158	1.41%
Sioux City, IA-NE-SD	221	744	1,156	1.52%
Punta Gorda, FL	167	855	1,155	2.30%
Bloomington-Normal, IL	161	820	1,151	1.43%
Houma-Bayou Cane-Thibodaux, LA	168	839	1,146	1.35%
Kokomo, IN	136	707	1,143	2.97%

* Total includes all clean energy sectors

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
Mount Vernon-Anacortes, WA	123	887	1,141	2.10%
Bangor, ME	202	792	1,131	1.63%
Lake Havasu City-Kingman, AZ	94	906	1,129	2.13%
Missoula, MT	57	944	1,125	1.78%
Decatur, AL	106	784	1,121	1.93%
Sheboygan, WI	99	905	1,120	1.83%
Idaho Falls, ID	150	744	1,110	1.51%
Columbus, IN	127	681	1,097	2.20%
Bowling Green, KY	62	766	1,096	1.45%
Texarkana, TX-Texarkana, AR	147	777	1,094	1.82%
Hattiesburg, MS	81	792	1,090	1.55%
Michigan City-La Porte, IN	141	659	1,079	2.65%
Wenatchee, WA	113	838	1,076	1.69%
Yuba City, CA	239	701	1,072	2.02%
Ithaca, NY	183	788	1,067	2.24%
Anderson, IN	128	657	1,064	N/A
El Centro, CA	257	658	1,038	1.71%
Pascagoula, MS	66	760	1,034	N/A
Jacksonville, NC	94	806	1,026	2.04%
Fond du Lac, WI	71	834	1,013	2.13%
Parkersburg-Marietta-Vienna, WV-OH	80	692	964	2.70%
Albany, GA	103	710	960	1.56%
Jonesboro, AR	81	705	948	1.63%
Logan, UT-ID	74	774	945	1.49%
Valdosta, GA	97	691	932	1.65%
Madera, CA	201	614	931	1.80%
Muncie, IN	114	562	915	2.01%
Ames, IA	218	545	915	1.55%
Corvallis, OR	124	673	903	2.50%
Auburn-Opelika, AL	82	628	895	1.45%
Atlantic City, NJ	93	671	892	0.72%
San Angelo, TX	146	608	885	1.73%
Monroe, LA	122	654	884	1.08%
Brunswick, GA	98	649	882	1.98%
Bay City, MI	82	575	878	2.57%
Cape Girardeau-Jackson, MO-IL	75	654	877	1.96%
Decatur, IL	116	628	874	1.84%
Lima, OH	51	637	868	1.74%
Springfield, OH	44	634	856	1.81%
State College, PA	101	630	849	1.24%
Owensboro, KY	54	582	840	1.61%
Sherman-Denison, TX	137	576	837	1.66%
Grand Forks, ND-MN	165	542	833	1.62%
Longview, WA	90	634	817	2.04%
St. Joseph, MO-KS	70	599	803	1.44%
Pueblo, CO	173	505	803	1.27%
Danville, VA	76	650	799	N/A
Altoona, PA	66	613	795	1.39%
Mankato-North Mankato, MN	46	644	792	1.46%
Dubuque, IA	151	500	790	1.33%

* Total includes all clean energy sectors

Metro	Renewable Energy Jobs	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Overall Metrowide Employment
Lawrence, KS	107	565	786	1.62%
Kankakee-Bradley, IL	108	546	768	1.71%
Williamsport, PA	64	585	759	1.50%
Wheeling, WV-OH	73	535	756	1.24%
Cumberland, MD-WV	53	646	756	2.13%
Hot Springs, AR	65	560	753	1.94%
Lebanon, PA	78	556	739	1.44%
Alexandria, LA	88	558	739	1.20%
Dalton, GA	76	545	735	1.14%
Manhattan, KS	99	525	730	1.39%
Goldsboro, NC	61	566	716	1.70%
Anniston-Oxford, AL	67	501	716	1.57%
Pocatello, ID	93	470	700	1.74%
Lewiston-Auburn, ME	124	489	697	1.44%
Sumter, SC	100	454	693	1.53%
Yuma, AZ	78	532	685	1.12%
Gadsden, AL	64	474	678	1.85%
Danville, IL	88	453	635	2.32%
Sandusky, OH	59	433	615	N/A
Fairbanks, AK	38	495	598	1.60%
Warner Robins, GA	63	433	587	0.77%
Johnstown, PA	54	445	583	1.18%
Farmington, NM	203	291	579	1.25%
Hanford-Corcoran, CA	141	364	573	1.20%
Ocean City, NJ	92	400	568	1.13%
Great Falls, MT	22	478	563	1.56%
Morgantown, WV	68	386	558	0.88%
Carson City, NV	143	207	558	1.85%
Rome, GA	61	404	549	1.36%
Elmira, NY	49	446	549	1.67%
Lewiston, ID-WA	64	369	522	1.84%
Las Cruces, NM	169	263	509	0.68%
Weirton-Steubenville, WV-OH	42	351	491	1.30%
Pine Bluff, AR	39	328	442	1.39%
Vineland-Millville-Bridgeton, NJ	73	302	433	0.76%
Palm Coast, FL	64	317	430	N/A
Lawton, OK	53	234	365	0.83%
Hinesville-Fort Stewart, GA	20	129	176	0.85%

* Total includes all clean energy sectors

TABLE 6 // U.S. RURAL AREA CLEAN ENERGY EMPLOYMENT by state 2020¹²

State	Renewable Energy	Energy Efficiency Jobs	Total Clean Energy Jobs*	Share of Statewide Clean Energy Jobs
North Carolina	3,020	19,499	25,563	25.6%
Michigan	2,073	14,831	22,574	19.9%
Texas	3,633	15,219	22,115	9.9%
Wisconsin	1,407	14,368	17,630	25.4%
Ohio	996	11,533	15,788	15.3%
Indiana	1,878	9,089	14,828	18.4%
Tennessee	700	9,060	13,463	18.5%
Iowa	2,545	8,082	12,869	44.4%
Illinois	1,740	8,807	12,385	10.8%
Minnesota	750	9,948	12,279	22.2%
Missouri	1,202	8,407	11,514	22.3%
Kentucky	789	7,411	10,790	32.6%
Pennsylvania	925	8,055	10,498	12.0%
Vermont	1,365	6,712	10,093	66.2%
California	2,352	6,182	9,696	2.0%
Oregon	1,120	7,342	9,618	18.4%
New York	850	7,432	9,168	6.0%
Virginia	917	7,116	8,829	10.0%
Georgia	961	6,269	8,526	12.0%
Mississippi	645	6,065	8,369	44.6%
Alabama	665	5,499	7,786	19.7%
Nebraska	1,351	5,310	7,669	43.0%
South Carolina	1,157	4,965	7,631	18.2%
Colorado	1,730	4,460	7,296	12.5%
Washington	799	5,623	7,255	9.6%
Kansas	978	4,960	6,934	30.7%
Oklahoma	1,016	3,966	6,305	31.3%
Florida	762	4,361	5,801	3.9%
Montana	279	4,877	5,798	61.3%
Arkansas	525	4,255	5,756	30.6%
Wyoming	228	4,551	5,319	66.1%
Maine	1,143	3,228	4,933	41.4%
South Dakota	1,167	3,063	4,901	43.0%
New Hampshire	1,010	3,362	4,766	31.1%
Maryland	328	3,911	4,528	5.8%
North Dakota	1,179	2,576	4,459	54.0%
Louisiana	687	3,047	4,238	16.1%
Hawaii	1,674	1,286	3,946	31.4%
Idaho	525	2,561	3,828	30.5%
Utah	489	2,809	3,624	8.7%
Delaware	239	2,633	3,017	25.2%
Connecticut	99	2,392	2,707	6.8%
West Virginia	287	1,881	2,675	29.7%
New Mexico	737	1,103	2,161	19.4%
Arizona	169	1,434	1,806	3.2%
Alaska	97	1,135	1,403	28.9%
Nevada	322	449	1,221	3.9%
Massachusetts	88	483	645	0.6%

* Total includes all clean energy sectors

POLICIES MATTER:

HOW TO CREATE JOBS, DRIVE ECONOMIC GROWTH, POST-COVID-19

There has never been more federal emphasis on policies that will create good-paying clean energy jobs than there is under the Biden administration. And there's clearly the need for such policies. The United States needs to get its economy humming again after COVID-19. It needs to address the growing economic and other costs of climate change. And as experience shows, there's no better way to simultaneously create jobs, drive economic growth and address climate change than by investing in clean energy.

But to create jobs and drive economic growth, Congress must also act. Here are specific steps that members of Congress can take to spur job growth and drive investments in their states, and across the country:

Transportation and Grid Modernization—Pass and fund legislation to create a national car-charging network, expand building efficiency improvements and modernize our electric grid. Specific policies that Congress should consider:

- // Expanding the Department of Energy (DOE) Grid Modernization Initiative including smart grid R&D, transmission reliability and energy storage programs.
- // Passing the Securing America's Clean Fuels Infrastructure Act,¹³ a bipartisan bill to extend US tax credits for EV charging and hydrogen refueling stations.
- // Resurrecting the Energy Efficiency and Conservation Block Grant Program¹⁴ and State Energy Program.
- // Increasing funds for DOE's Weatherization Assistance program and supporting the HOPE for Homes Act¹⁵ to expand energy efficiency and worker training programs.

Tax Policy—Extend, expand and improve accessibility of federal tax incentives for energy efficiency, wind, solar, energy storage and zero-emission vehicles.

Specific policies that Congress should consider:

- // Supporting US manufacturing of clean energy and efficiency products and appliances including through the American Jobs in Energy Manufacturing Act of 2021.¹⁶
- // Modernizing tax incentives for commercial and residential energy efficiency improvements and making energy storage and high-voltage transmission investments eligible for an Investment Tax Credit (ITC).
- // Removing manufacturer caps on tax credits for clean vehicles; provide credits for second hand vehicles and provide a point of sale rebate for low and moderate income buyers.
- // Providing long-term incentives for renewables including solar, wind and other qualifying technologies and provide for direct pay of full credit value.

Innovation—Make federal Investments in clean energy, vehicle and battery storage, energy efficiency, and regenerative and low-carbon agriculture.

Specific policies Congress should consider:

- // Increasing funding for DOE programs such as the Loan Guarantee Program, the Advanced Research Projects Agency-Energy (ARPA-E) and clean energy demonstration programs.
- // Increasing funding for the USDA's Soil Health Demonstration Trial¹⁷ supporting innovations in soil health and carbon sequestration assessment and increasing funding for climate smart agricultural practices.

- // Supporting DOD research and deployment of efficiency, renewable energy and grid enhancements, and setting ambitious goals for clean energy procurement through mid-century for DOD through bills including the National Security Resiliency and Sustainability Act.¹⁸

Workforce Training—Better fund existing programs and pass new programs to create new employment opportunities, improve equity and meet the workforce requirements of a better, cleaner economy. Specific policies Congress should consider:

- // Passing the Blue Collar to Green Collar Jobs Development Act (H.R. 156).¹⁹
- // Increasing funding for the Office of Electricity for workforce training for digital, high tech grid jobs.
- // Reinvigorating a Civilian Conservation Corps to fund work including climate resilience and natural infrastructure and create partnerships with union apprenticeship, pre-apprenticeship programs and other training programs as well as community colleges and non-profit organizations with a focus on expanding opportunity and career pathways for women and people of color.

Clean Energy Finance—Facilitate and leverage privately financed clean energy projects and improve equity. Congress should consider:

- // Passing the bipartisan National Clean Energy & Sustainability Accelerator (H.R.806/S.283)²⁰ to provide technical support and seed capital to finance clean energy projects with 40% funding going to clean energy projects targeting environmental justice communities, rural communities, energy transition communities and low income communities.

CONCLUSION

The number of clean energy jobs in America fell in 2020 for the first time since E2 began tracking clean energy jobs nearly a decade ago, due to the COVID-19 related economic meltdown and previous presidential policies that favored fossil fuels over clean energy. Energy efficiency jobs were hit the hardest, while jobs in wind, energy storage and electric vehicles grew slightly.

The good news is that momentum for federal clean energy policies has never been greater. Numerous policies proposed by the Biden administration that are now up for consideration by Congress could not only bring back lost clean energy jobs, but create millions of new jobs that pay better than most and are available in every state and for every segment of the workforce, regardless of education, location, race or ethnicity. New international climate commitments, provide an additional opportunity for America to regain its competitiveness in the global energy sector while growing jobs in the US.

But in order to create more good-paying clean energy jobs, the Biden administration must live up to its promises and Congress must take action to pass climate-smart infrastructure, tax, finance and workforce development policies. In doing so, lawmakers and policymakers can get Americans back to work, speed up America's transition to a cleaner energy future and help the country make up for lost ground.

ENDNOTES

- 1 Unless otherwise stated, all data and analyses is from the 2021 U.S. Energy and Employment Report (forthcoming), Department of Energy.
- 2 SEIA Solar Market Insight Report 2020 Q4. Available at <https://www.seia.org/research-resources/solar-market-insight-report-2020-q4>.
- 3 BW Research, E2, ACORE. *Clean Jobs, Better, Jobs: An examination of clean energy job wages and benefits*. October 2020. Available at <https://e2.org/reports/clean-jobs-better-jobs>.
- 4 May 2020 National Occupational Employment and Wage Estimates. Available at https://www.bls.gov/oes/current/oes_nat.htm.
- 5 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>.
- 6 U.S. Bureau of Labor Statistics. *Occupational Outlook Handbook. Fastest Growing Occupations*, available at <https://www.bls.gov/ooh/fastest-growing.htm>.
- 7 Quarterly Census of Employment and Wages, Third Quarter 2020. Available at https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables.
- 8 U.S. Bureau of Labor Statistics. *National Occupational Employment and Wage Estimates*, available at <https://www.bls.gov/oes/tables.htm>.
- 9 Quarterly Census of Employment and Wages, Third Quarter 2020. Available at https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables.
- 10 Quarterly Census of Employment and Wages, Third Quarter 2020. Available at https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables.
- 11 Chmura JobsEQ 2020.
- 12 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.
- 13 U.S. Senate Committee on Environment and Public Works: Carper, Burr, Cortez Masto, Stabenow Introduce Legislation to Spur Investments in Clean Vehicle Charging and Refueling Stations, March 25, 2021. Available at <https://www.epw.senate.gov/public/index.cfm/2021/3/carper-burr-cortez-masto-stabenow-introduce-legislation-to-spur-investments-in-clean-vehicle-charging-and-refueling-stations>.
- 14 Office of Energy Efficiency & Renewable Energy: Energy Department Announces Energy Efficiency and Conservation Block Grant Program National Evaluation Results, November 4, 2015. Available at <https://www.energy.gov/eere/articles/energy-department-announces-energy-efficiency-and-conservation-block-grant-program>.
- 15 116th Congress, S.4052 - HOPE for HOMES Act of 2020. Available at <https://www.congress.gov/bill/116th-congress/senate-bill/4052>.
- 16 Office of Sen. Joe Manchin. *American Jobs in Energy Manufacturing Act of 2021*. Available at <https://www.manchin.senate.gov/imo/media/doc/AJEM%20Bill%20Text.pdf?cb>.
- 17 USDA On-Farm Conservation Innovation Trials. Available at <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/cig/?cid=nrcseprd1459039>.
- 18 116th Congress, H.R. 7417 - National Security Resiliency and Sustainability Act of 2020. Available at <https://www.congress.gov/bill/116th-congress/house-bill/7417>.
- 19 117th Congress, H.R. 156 - Blue Collar to Green Collar Jobs Development Act of 2021. Available at <https://www.congress.gov/bill/117th-congress/house-bill/156?s=1&r=6>.
- 20 Coalition for Green Capital. *Bipartisan Legislation for a Clean Energy & Sustainability Accelerator*. Available at <https://coalitionforgreencapital.com/wp-content/uploads/Accelerator-One-Page-21.02.11.pdf>.