APRIL 2020
WWW.E2.ORG
@E2ORG
#CLEANJOBSAMERICA

CLEAN JOBS AMERICA 2020

REPOWERING AMERICA'S ECONOMY IN THE WAKE OF COVID-19

CLEAN JOBS AMERICA 2020[1]

REPOWERING AMERICA'S ECONOMY IN THE WAKE OF COVID-19

As lawmakers and policymakers seek to get America back to work after the COVID-19 health and economic crisis, every job matters, from airline employees and hospitality workers to retail clerks and restauranteurs. We also cannot forget the employment sector that has become one of the biggest, fastest-growing and most beneficial for both our economy and our environment.

The clean energy sector

E2's 2020 Clean Jobs America report details the sheer size of this important employment sector, the troubles it is currently facing due to COVID-19 and how focusing recovery policies on clean energy can get America's economy humming again—quickly and for the long run.

Before the COVID-19 crisis, nearly 3.4 million Americans worked in clean energy—solar, wind, energy efficiency, clean vehicles, and more, according to this new analysis. For perspective, that's more people than worked as school teachers or farmers or real estate brokers in our country, and three times as many as worked in fossil fuels.[2]

Who are these workers? They are technicians and tradespeople who pull on their gloves, lace up their boots and squeeze into attics and boiler rooms to better insulate our buildings and improve our heating, air conditioning and ventilation systems.

They are electricians who design and install LED lighting systems; scurry across hot rooftops to install solar panels; climb into the sky to work on wind turbines and upgrade our electricity grid to make it safer, more reliable and ready for renewable energy.

They are factory workers who build Energy Star appliances and building supplies; high-efficiency HVAC systems; hybrid and electric vehicles and the parts that go in them.

And right now, they are hurting.

COVID-19 hammered the clean energy sector. According to our estimates, more than 106,000 workers are in clean energy-related companies lost their jobs in just the first few weeks after the pandemic began.[3] See details in the sidebar on the next page and read some of their stories in the pages that follow.

As federal and state lawmakers look toward economic recovery, this report shows how clean energy is a major part of the economy of every state, employing workers in inner cities as well as rural areas, regardless of geography, politics or natural resources. Small businesses—the backbones of America's economy—employ nearly two out of three clean energy workers. And clean energy companies hire a greater percentage of veterans than the national average.

Most importantly at this time, Clean Jobs America shows why it's imperative for lawmakers to focus on clean energy in economic stimulus packages and other policies aimed at restarting our economy and keep in mind the benefits that will come with a cleaner, more resilient economy in the future.

This is an industry that simply cannot be ignored. As history shows, it is a proven catalyst for quick job growth in the aftermath of economic meltdown.

After the Great Recession, no part of the 2009 American Recovery and Reinvestment Act (ARRA) was more successful than the $90 billion in federal investments in clean energy. In the years following ARRA, nearly 1 million clean energy jobs were created. Hundreds of new made-in-America businesses—game-changing companies such as Tesla which employed 45,000 workers before the crisis—got their start with ARRA-era Department of Energy loans that were repaid in full. More than 100,000 wind, solar and other clean energy projects were started, bringing new investments and job opportunities to states across the country.[4]

Recovery Act investments also led to the weatherization of more than 1 million homes, expanding energy efficiency work across the country and quickly getting electricians, HVAC technicians and other construction workers—as well as manufacturers of building supplies and Energy Star appliances—back to work. And along the way, consumers and businesses saved billions of dollars, our environment benefitted and our nation became more energy secure.

The right clean energy stimulus policies can once again get this big and game-changing part of America's workforce back on the job. In doing so, we can quickly repower our economy—and in ways that make it cleaner, more resilient and better positioned for continued growth.

THE CURRENT SITUATION

Clean Energy Unemployment Claims Skyrocket in COVID-19 Aftermath

More than 106,000 clean energy workers lost their jobs in the month of March alone, wiping out all the job gains in renewable energy, energy efficiency, clean vehicles and other clean energy sectors in 2019, according to an analysis of unemployment data by BW Research for E2.

The March layoffs were just the first indication of how badly the clean energy industry has been hit by the COVID-19 and economic crises. Much bigger job cuts are expected in the months ahead—making it imperative that Congress and state lawmakers seek ways to get the industry back on its feet, especially since clean energy has a proven history of helping pull the country out of economic crises.

What had been one the nation's fastest-growing jobs sectors at the start of the year by March was experiencing significant job losses every week.

The job losses are across a wide variety of occupations, and in every state. Energy efficiency workers are losing their jobs after being shut out of homes and buildings to prevent the spread of the coronavirus. Solar and wind turbine companies are laying off workers as they're unable to access panels and parts stranded in shut-down factories and as financing disappears. Factory workers are being let go as assembly lines for Energy Star appliances and electric and hybrid vehicles are ground to a halt.

The clean energy economy has previously weathered choppy seas, but this storm is wholly different.

Unemployment Claims by Clean Energy Workers, March 2020[3]

Industry	Unemployment Claims
Energy Efficiency	69,800
Renewable Energy	16,500
Clean Vehicles	12,300
Grid & Storage	4,300
Clean Fuels	3,400
Total	**106,400**

States With Most Clean Energy Job Losses, March 2020[3]

State	Unemployment Claims	Share of Clean Energy Worforce
US TOTAL	**106,472**	**3.10%**
California	19,949	3.60%
North Carolina	6,800	5.90%
Pennsylvania	6,068	6.20%
Massachusetts	5,611	4.40%
Michigan	5,446	4.10%
New York	4,789	2.90%
Ohio	4,719	4.10%
Texas	4,246	1.70%
Washington	3,940	4.40%
Illinois	3,326	2.60%
Florida	2,673	1.60%
Indiana	2,592	2.90%

State	Unemployment Claims	Share of Clean Energy Worforce
Minnesota	2,415	3.70%
New Jersey	2,345	4.10%
Virginia	2,044	2.10%
Wisconsin	2,031	2.60%
Maryland	1,954	2.30%
Kentucky	1,505	3.80%
Tennessee	1,492	1.70%
Louisiana	1,463	4.60%
Missouri	1,462	2.50%
Georgia	1,332	1.50%
Oregon	1,324	2.20%
Colorado	1,080	1.60%
Iowa	1,066	2.90%

Reaction from the Frontlines

Despite how far the clean energy sector has come over the last five years, the economic impact of the COVID-19 crisis is quickly devastating businesses, workers, and project from coast to coast.

As lawmakers look to reinvigorate our economy and get America back to work, E2 surveyed its 8,000 members and supporters nationwide about how they're being impacted, and how public policy could help.

This is the new reality their operations and workers are facing. In their own words:

MARK HALL

Founder, Revalue.io
California

"We had 5 residential retrofit projects that were supposed to begin … but cannot due to the shutdown, as well as 1 warehouse project. Much of our work is in workforce development, as we train high school, college and other adults in energy efficiency technology. We now have to alter our training plans and reduce our outreach and business development."

MICHAEL RUCKER

CEO, Scout Clean Energy
Colorado

"As I talk to banks … they are in a panic situation that I haven't seen since 2008."

EMILY RICE

COO, The Energy Group
Iowa

"We were on track for our best year ever when this happened. We spent over $880k on solar panels from China that have been stuck overseas due to factory shutdowns. Now they are closing schools and we are losing staff due to self-quarantine. I suspect this is only going to get worse."

GREG SMITH

Founder, Energy Optimizers
Ohio

"We have terminated the employment of approximately 25 percent of our personnel. We have had over $10 million of projects halt moving forward, impacting the jobs of at least 150 people."

LLOYD KASS

VP of Policy and Business Development, Lime Energy
New Jersey

"We are devastated by the coronavirus. Nothing we do is considered 'critical service' so installing energy efficiency and solar panels in California is completely shut down. We can't go into apartment units to do energy audits or efficiency upgrades in NYC. We are facing substantial furloughs for staff and pay cuts for the ones who aren't furloughed."

CLEAN ENERGY JOBS OVERVIEW

One of the many benefits of focusing federal and state economic recovery efforts on clean energy is the fact that doing so can preserve and create new jobs in every state: in rural and urban areas, and across a wide variety of occupations.

At the start of 2020, clean energy employment increased for the fifth straight year since this annual report was first released—growing beyond 3.3 million workers nationwide.

While California remained the nation's undisputed leader in clean energy jobs through 2019, states as diverse in size and structure as Texas and Massachusetts also are in the top ten for clean energy jobs. Florida, North Carolina and Georgia continued to lead the South, while Michigan, Illinois and Ohio led the Midwest. On a per capita basis of statewide total employment, the Northeast claimed the top five spots with Vermont, Rhode Island, Massachusetts, Maryland, and Delaware employing the largest share of clean energy jobs per capita in the country.

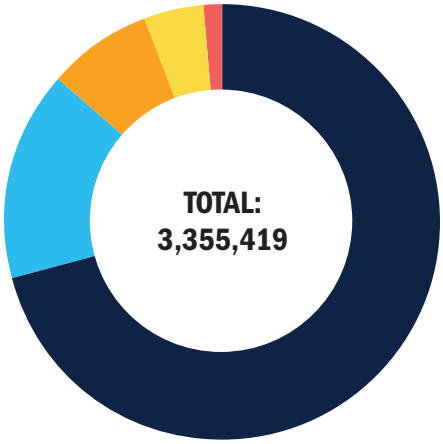
As expected, America's large metro areas—led by New York City, Los Angeles, San Francisco, and Chicago—outpaced the country in total clean energy employment, with metros Denver, Houston, and Philadelphia among the top 20 and Kansas City, Milwaukee, and Raleigh among the top 40. However, small and mid-sized metros dominated when clean energy jobs were analyzed per capita. California's San Luis Obispo-Paso Robles and Michigan's Holland-Grand Haven metro areas led the country with clean energy accounting for over eight percent of their overall employment in 2019. Other metros among the Top 25 per capita included Provo (Utah), Elizabethtown (Ky.) Fort Wayne (Ind.), Wilmington (N.C.), and Boulder (Colo.), while San Francisco and San Diego were the only metros to place among the top 25 in both total and per capita clean energy employment.

Clean energy also proved to be critical to rural economies in 2019: North Carolina leads the country for clean energy jobs in rural areas with nearly 29,000 workers, followed by Michigan and Texas.

Overall, clean energy jobs across the country grew by slightly more than two percent in 2019, slower than its nearly four percent growth in 2018. Jobs in renewable energy grew more than three percent, led in part by a rebound in solar jobs. Clean energy storage and grid modernization jobs increased four percent—faster than any other sector—while clean vehicle employment declined by about two percent after a 17 percent jump in 2018. Energy efficiency remains the single biggest sector of the clean energy economy, growing over two percent in 2019 and adding the most net new jobs (54,000) across the entire energy sector.

As a result of the industry's consistent growth, clean energy accounted for more than 40 percent of America's entire energy workforce and over 2.25 percent of the nation's overall employment at the end of 2019.

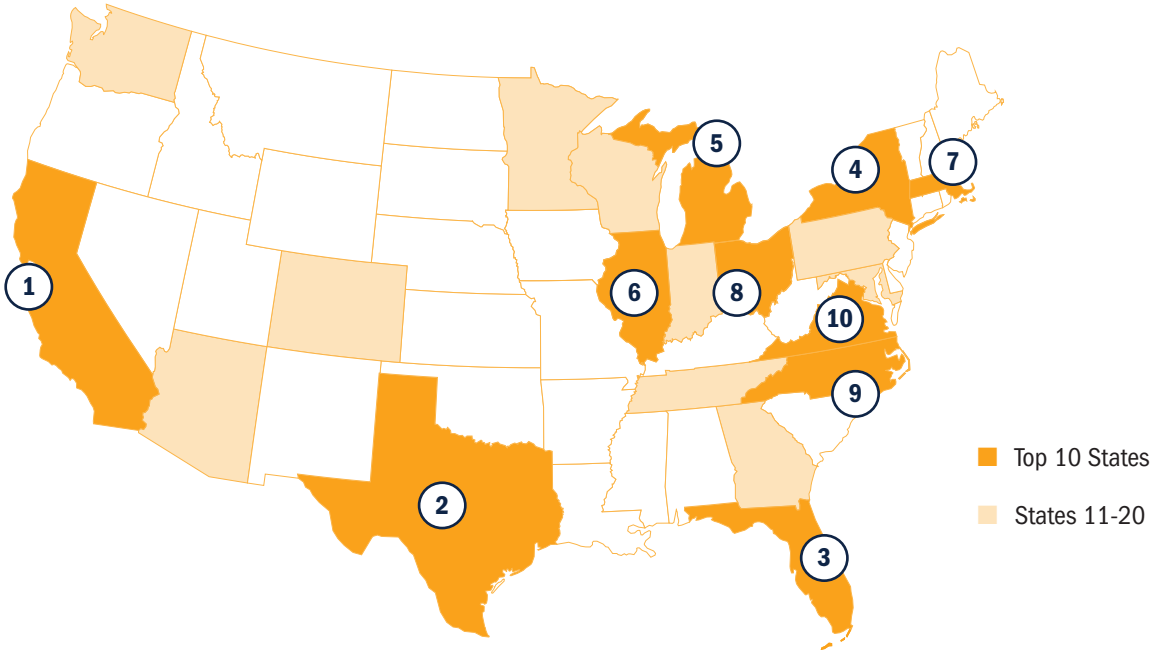
NATIONAL CLEAN ENERGY EMPLOYMENT Q4 2019



- Energy Efficiency: 2,378,893
- Renewable Energy: 522,811
- Clean Vehicles: 266,368
- Grid & Storage: 147,644
- Fuels: 39,704

STATEWIDE CLEAN ENERGY EMPLOYMENT Q4 2019

42 states and the District of Columbia employed more clean energy than fossil fuel workers in 2019.



Rank	STATE	TOTAL*	Renewables	Grid & Storage	Energy Efficiency	Clean Fuels	Clean Vehicles
1	California	536,919	142,957	24,021	323,529	5,785	40,627
2	Texas	241,289	39,303	13,204	169,398	2,073	17,309
3	Florida	166,032	24,987	5,499	123,560	2,897	9,090
4	New York	159,337	18,049	4,290	126,739	1,680	8,579
5	Michigan	125,365	11,447	3,896	85,323	625	24,073
6	Illinois	125,364	17,707	5,077	91,024	1,468	10,088
7	Massachusetts	122,477	21,963	7,050	88,231	569	4,664
8	Ohio	114,388	10,607	3,135	83,165	1,353	16,129
9	North Carolina	112,720	12,349	3,727	88,001	1,538	7,105
10	Virginia	97,305	9,047	2,520	80,181	312	5,245
11	Pennsylvania	93,861	9,744	3,698	71,443	1,436	7,541
12	Indiana	86,892	10,975	3,107	55,663	779	16,369
13	Washington	85,035	11,189	3,628	64,930	1,936	3,351
14	Maryland	84,549	8,203	2,001	71,337	170	2,839
15	Georgia	83,806	8,751	4,241	62,924	467	7,423
16	Tennessee	79,626	5,763	8,778	53,916	1,198	9,971
17	Wisconsin	76,685	5,958	2,175	63,569	368	4,615
18	Colorado	62,420	17,924	3,072	36,092	2,120	3,212
19	Arizona	62,106	11,629	2,273	44,782	345	3,077
20	Minnesota	61,805	7,920	2,899	47,114	681	3,191

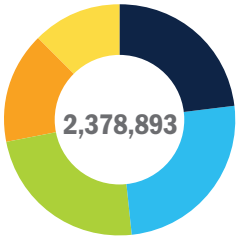
* Total includes renewable energy, energy efficiency, clean vehicles, battery storage, advanced biofuels, low-impact hydro and other sectors.

STATEWIDE CLEAN ENERGY EMPLOYMENT Q4 2019 *continued*

Rank	STATE	TOTAL*	Renewables	Grid & Storage	Energy Efficiency	Clean Fuels	Clean Vehicles
21	New Jersey	57,139	12,569	1,913	37,982	396	4,278
22	Oregon	56,617	7,540	2,873	42,935	776	2,493
23	Missouri	56,486	5,316	1,950	42,537	921	5,762
24	South Carolina	46,527	7,336	2,052	30,794	652	5,693
25	Utah	44,005	8,118	1,079	32,483	109	2,215
26	Alabama	43,828	3,839	1,927	31,546	223	6,294
27	Connecticut	42,455	3,492	761	36,000	337	1,865
28	Kentucky	38,266	2,277	1,380	26,221	289	8,097
29	Nevada	33,788	11,265	9,098	11,988	138	1,299
30	Iowa	32,057	5,796	1,434	21,165	879	2,783
31	Louisiana	31,109	4,352	1,614	23,261	237	1,645
32	Kansas	24,909	3,874	1,059	17,848	288	1,840
33	Oklahoma	22,765	3,199	1,587	15,046	909	2,024
34	Mississippi	20,985	1,508	833	15,668	512	2,464
35	Arkansas	20,377	1,694	806	15,492	565	1,820
36	Nebraska	19,440	3,138	508	13,949	211	1,633
37	Vermont	16,635	2,439	1,024	11,032	688	1,451
38	New Hampshire	16,571	3,377	311	11,913	143	827
39	Rhode Island	16,429	2,066	681	13,028	322	331
40	District of Col.	15,383	1,821	313	12,982	17	251
41	Delaware	13,943	725	233	12,543	76	366
42	Hawaii	13,927	4,830	549	6,083	2,072	394
43	Idaho	13,181	1,763	1,076	9,035	275	1,032
44	Maine	12,798	2,512	472	8,879	213	721
45	New Mexico	12,365	4,614	762	6,099	113	777
46	South Dakota	11,458	2,327	445	7,628	194	863
47	Montana	10,376	464	418	8,838	51	605
48	West Virginia	10,078	1,171	859	7,144	30	873
49	North Dakota	9,192	2,244	566	5,581	154	647
50	Wyoming	8,721	332	445	7,568	79	297
51	Alaska	5,628	342	322	4,701	34	228

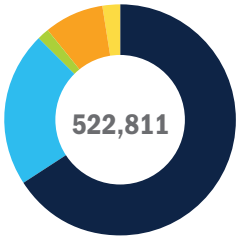
* Total includes renewable energy, energy efficiency, clean vehicles, battery storage, advanced biofuels, low-impact hydro and other sectors.

INDUSTRY BREAKDOWN:
Q4 2019 EMPLOYMENT



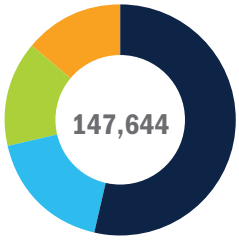
ENERGY EFFICIENCY:

- ENERGY STAR and Efficient Lighting: **552,435**
- Traditional HVAC: **598,375**
- High-Efficiency HVAC and Renewable Heating & Cooling: **566,290**
- Advanced Materials: **366,608**
- Other: **295,185**



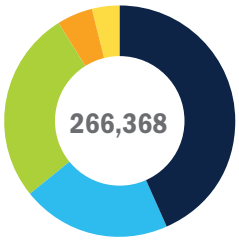
RENEWABLE ENERGY:

- Solar: **345,393**
- Wind: **114,774**
- Geothermal: **8,794**
- Bioenergy/CHP: **41,546**
- Low-Impact Hydro: **12,304**



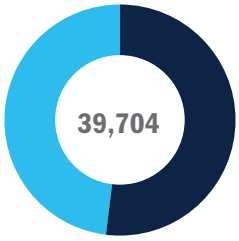
GRID & STORAGE:

- Clean Storage: **76,699**
- Smart Grid: **25,631**
- Micro-Grid: **22,192**
- Other Grid Modernization: **20,122**



CLEAN VEHICLES:

- Hybrid Electric Vehicles: **113,449**
- Plug-In Hybrid Vehicles: **51,619**
- Electric Vehicles: **77,667**
- Natural Gas Vehicles: **12,878**
- Hydrogen & Fuel Cell: **10,755**



FUELS:

- Other Ethanol/Non-Woody Biomass: **20,694**
- Other Biofuels: **19,009**

CLEAN ENERGY VS FOSSIL FUELS

3 to 1

Clean energy jobs (3.36 million) outnumbered total fossil fuel employment (1.19 million) by more than 3 to 1 in 2019

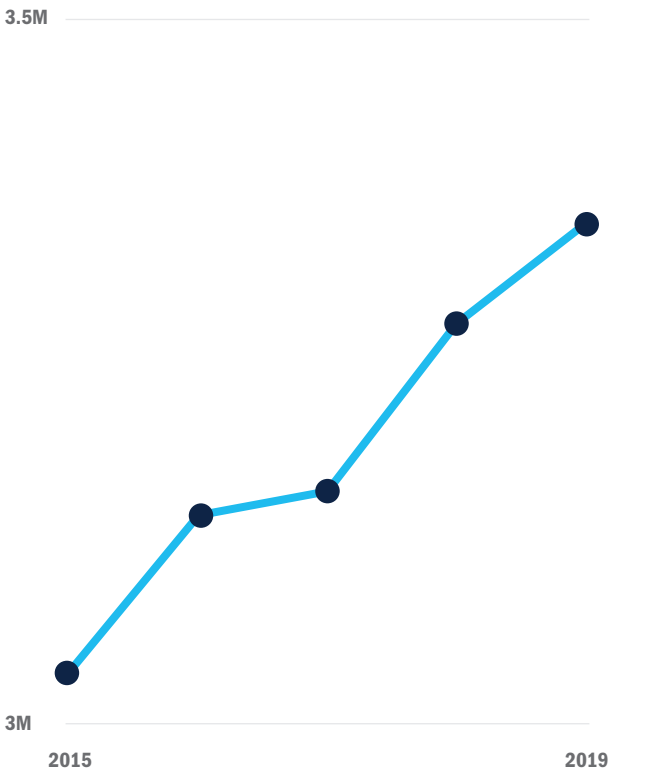
2.5 times more

Renewable generation employed nearly 2.5X more workers than fossil fuel electric power generation

42

States and the District of Columbia employ more clean energy workers than fossil fuel workers

Five-Year Trend 2015–Q4 2019 Employment Growth



THE CASE FOR A CLEAN ENERGY-DRIVEN RECOVERY

POWERING AMERICA'S RECOVERY

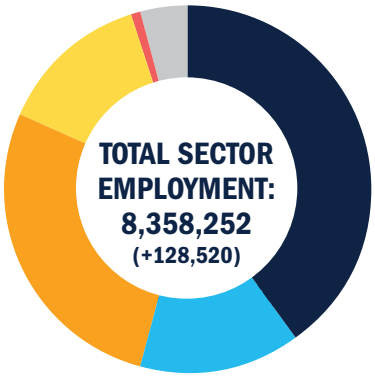
As America looks to recover from the COVID-19 pandemic in 2020 and beyond, no other part of the energy sector can deliver the economic benefits—as quickly or as significantly as clean energy.

Across the entire U.S. energy sector, clean energy jobs now represent about 40 percent of the workforce. Clean energy accounted for more than half (55 percent) of the sector's net employment growth in 2019. Not only does clean energy employ about three times the number of workers as the entire U.S. fossil fuel industry, the number of clean energy jobs added last year was nearly five times greater than fossil fuel jobs added.

Clean Energy: In the Overall Energy Economy

Energy Sector Employment Q4 2019

- Clean Energy Employment: 3,355,419 (+70,819)
- Fossil Fuel Employment: 1,190,183 (+15,440)
- Motor Vehicle Employment: 2,290,124 (+26,363)
- Trad. Transmission & Distribution Employment: 1,114,575 (+12,946)
- Nuclear Energy Employment: 70,323 (-1,823)
- Other Employment: 337,629 (+4,775)



A Closer Look: 2019 Job Growth Breakdown

Employment increased across every sector of the U.S. clean energy sector except clean vehicles, which saw record double-digit growth in 2018.

While the clean vehicle industry's employment decrease was felt in most states, at least two-thirds of all 50 states and the District of Columbia saw growth in every other sector—including all 51 in energy efficiency and 44 in renewable energy.

Small Businesses at Risk

2.2 million clean energy workers—nearly two-thirds of the entire workforce—are employed by businesses with fewer than 19 employees.

Small firms, more dependent on consistent business and access to finance, are some of the most at-risk companies in the U.S. economy due to the impact COVID-19 has had on regular commerce.

- 1–4 employees: 32.9%
- 5–19 employees: 31.5%
- 20–99 employees: 25.0%
- 100–499 employees: 8.1%
- 500+ employees: 2.5%

What is a clean energy worker?

Along with size and geographic diversity, the clean energy sector spans a wide swath of the economy—meaning millions of Americans across an array of occupations and with different skillsets are being affected.

// Energy efficiency companies employ electricians, roofers, plumbers, welders, and technicians who work in mechanical trades.

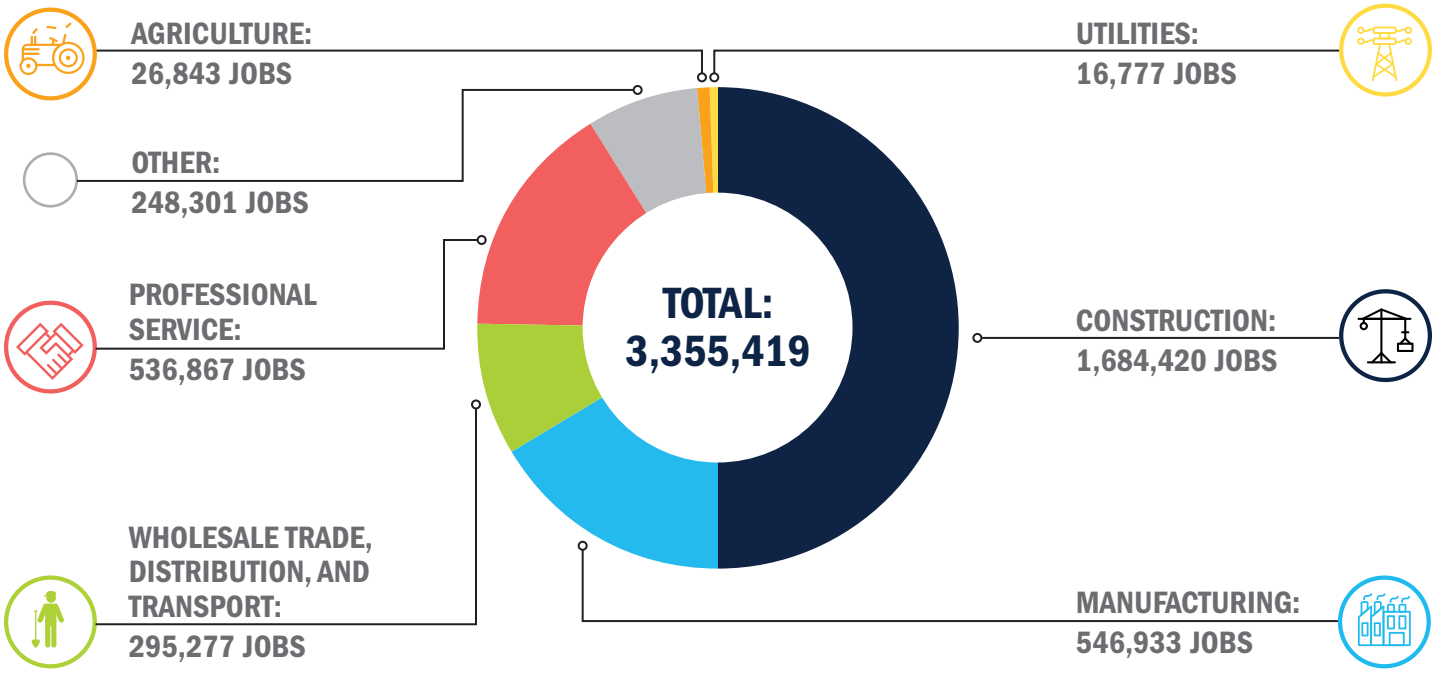
// Solar, wind and geothermal companies employ high-tech engineers as well as hard-hatted construction workers.

// Manufacturers in the clean energy and clean vehicles space put people to work producing everything from Low-E energy efficient windows and LED lighting to the latest energy-sipping dishwashers, clothes dryers and electric and hybrid vehicles.

// Salespeople, marketers, energy auditors, field technicians, inspectors, line workers, mechanics, and service tech are a part of nearly every sector of the clean economy.

CLEAN JOBS: ACROSS THE SUPPLY CHAIN

While construction and manufacturing accounted for the most clean energy jobs in the U.S. economic value chain in 2019, more than 1.1 million other clean energy workers are employed across agriculture, trade, distribution and transportation, professional services and more. Those jobs alone employed as many workers as the entire fossil fuel sector in 2019.



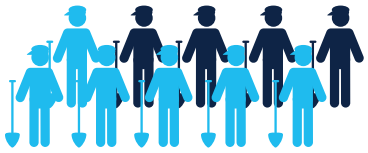
CLEAN ENERGY: AT THE HEART OF AMERICA'S CONSTRUCTION NEEDS

1.7 million workers in the U.S. are employed in construction work across the clean energy sector—installing new renewable energy systems, making buildings and schools more energy efficient, repairing the electric grid, and more.

ONE IN FIVE CONSTRUCTION WORKERS ARE EMPLOYED IN CLEAN ENERGY

43%

43 PERCENT OF SOLAR AND WIND ENERGY JOBS ARE IN CONSTRUCTION

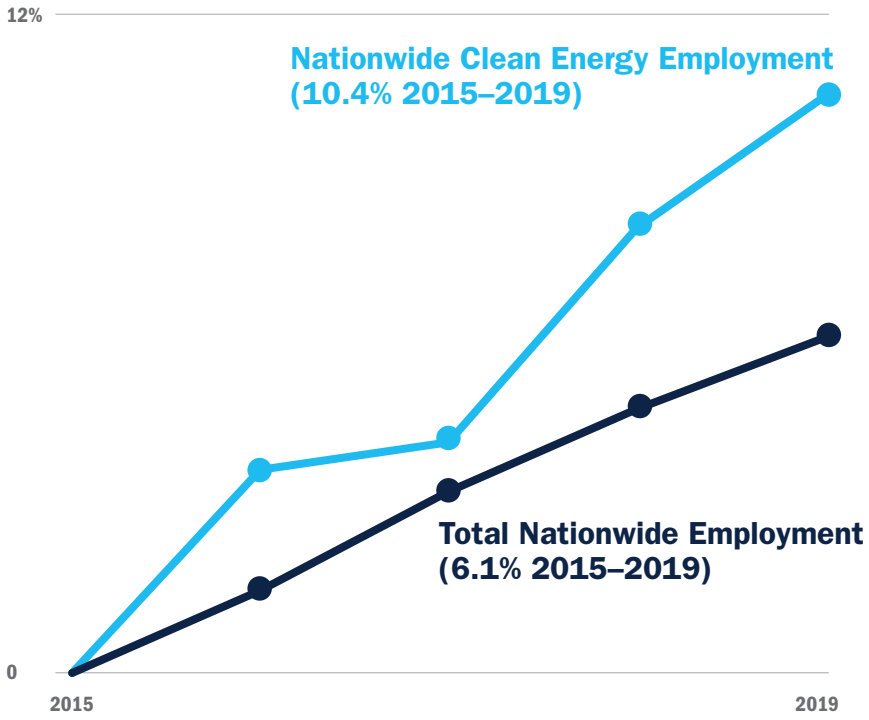


NEARLY SIX IN TEN ENERGY EFFICIENCY EMPLOYEES WORK IN CONSTRUCTION

CLEAN ENERGY: IN THE US ECONOMY

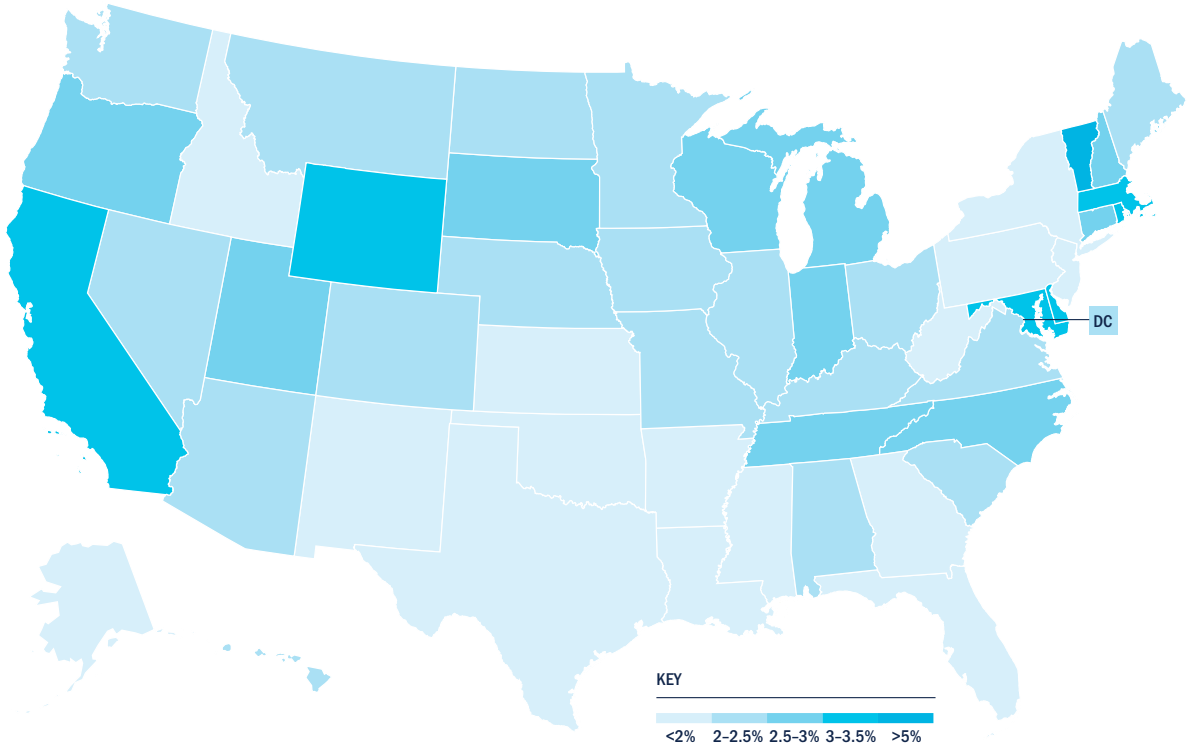
Clean energy is uniquely capable of leading America's recovery post-COVID-19. Not only has the sector proven capable of delivering results during a time of economic depression, it has the room needed to quickly expand and absorb hundreds of thousands of new job seekers, Americans who need employment in order for the economy to fully recover.

In 2019, clean energy employed a record 2.25 percent of U.S. workers nationwide, including more than 3 percent of workers in seven states. Clean energy's share of U.S. total employment was expected to increase even further in 2020. The industry has kept well ahead of total U.S. employment growth over the last five years, adding jobs 70 percent faster than the overall economy from 2015–2019.



Clean Energy Jobs: Share of Statewide Employment Q4 2019

Nationally, clean energy companies employed 2.25% of all workers in the U.S. in 2019.



GETTING AMERICA BACK TO WORK: WITH POLICIES THAT WORK

Given the extent of the economic shutdown, getting America back to work—and in ways that create a stronger, cleaner economy in the future—requires bold ideas, big initiatives and commonsense policies at both the state and federal levels.

Clean Energy Infrastructure Jobs Are Key

Big infrastructure projects have always helped America recover from economic calamity—whether it was the Pacific Railroad Act that helped get America back to work after the Civil War or the highway and public works programs that helped bring the United States out of the Great Depression. Making sure clean energy infrastructure projects are a major part of any economic recovery policies is essential to restarting our economy.

Fixing our power grid is one place to start. Estimates show that America needs to invest $30 billion to $90 billion[5] to upgrade our transmission lines over the next decade in order to properly handle new renewable energy generation and repair aging equipment to prevent costly disasters like wildfires. Doing so could get many of the nearly 148,000 Americans who work in grid and energy storage businesses back to work, and create tens of thousands of new jobs as well.

Building a national electric vehicle charging network also could help get the more than 160,000 American who work in electric and electric-hybrid vehicles back to work, in addition to creating tens of thousands more construction jobs across the country.

Meanwhile, an estimated 70 million American homes and businesses rely on natural gas, oil or propane for heating, cooking, and warming up bath water. Additionally, commercial buildings account for about 40 percent of all energy consumed in the United States and over one-third of the country's carbon dioxide emissions.

A nationwide program to electrify our buildings could help put some of the nearly 2.4 million energy efficiency workers in America back to work and create tens of thousands of new jobs too. One place to start: The nation's 98,000 public schools, most of which will remain closed for students and staff for months because of COVID-19. Tens of thousands of other government-owned buildings at the more than 800 U.S military bases also are badly in need of energy upgrades and electrification.

© Dennis Schroeder/NREL

SPECIFIC CONGRESSIONAL ACTIONS THAT CAN GET AMERICA BACK TO WORK REBUILDING A CLEAN ECONOMY

TREASURY DEPARTMENT

// Reinstate the Section 1603 program to deliver payments directly to clean energy developers and suppliers now, rather than make them wait to claim these credits in tax filings. And expand the program to cover energy storage and energy efficiency projects.[6]

// Extend federal clean energy incentive deadlines to account for COVID-19 related delays and to secure the projects and jobs relying on their funding funding—including "Safe Harbor" and "in construction" deadlines.

INTERNAL REVENUE DEPARTMENT

Extend, expand and reform clean energy incentives, through the following bills:

// H.R. 2096/S. 1142, "The Energy Storage Tax Incentive and Deployment Act of 2019"

// H.R. 3961/S. 2289, "The Renewable Energy Extension Act"

// H.R. 4887/S. 1988, "The Offshore Wind Power Act", and S. 1957/H.R. 3473, "The Incentivizing Offshore Wind Power Act"

// H.R. 2256/S. 1094, "The Driving America Forward Act"

// Extend the Production Tax Credit (PTC) for wind as included in the House Ways and Means Committee's GREEN Act proposal

// H.R. 4506/S. 2588, "Home Energy Savings Act"; H.R.4646/S. 2595, "New Home Energy Efficiency Act".

DEPARTMENT OF ENERGY

Increase funding for:

// The Federal Loan Guarantee Program and the Advanced Research Projects Agency-Energy (ARPA-E), to immediately spur innovation and new opportunities as the economy recovers.

// The Weatherization Assistance Program, which provides funding for cost-saving energy efficiency upgrades for low-income households. The program has supported more than 8,000 jobs and provides weatherization services to 35,000 homes every year.

// Clean energy demonstration programs, including for large-scale energy storage, advanced renewable energy technologies, clean transportation solutions, clean industrial projects, and clean hydrogen and other zero-carbon fuels.

// Advanced construction of net-zero-carbon building retrofits for low-income homes.

// Clean energy job training to help those isolated due to COVID now and to reduce unemployment and help displaced workers find new careers in clean energy during recovery. This should include increasing funding for DOE clean energy job training as well as funding community colleges and other certified institutions or organizations to create and grow clean energy training programs.

// Resurrect the Energy Efficiency and Conservation Block Grant program for states that can be used to immediately launch job-intensive renewable energy projects and energy efficiency programs for K-12 schools and municipal buildings.

DEPARTMENT OF TRANSPORTATION

// Invest in clean cars and clean vehicle infrastructure through legislation such as the Clean Corridors Act of 2019 and the EV Freedom Act to immediately create jobs, expand the nation's electric vehicle charging and clean fuel networks

// Support a nationwide vehicle trade-in program to get cleaner, more efficient and cost-effective cars in production and to consumers.

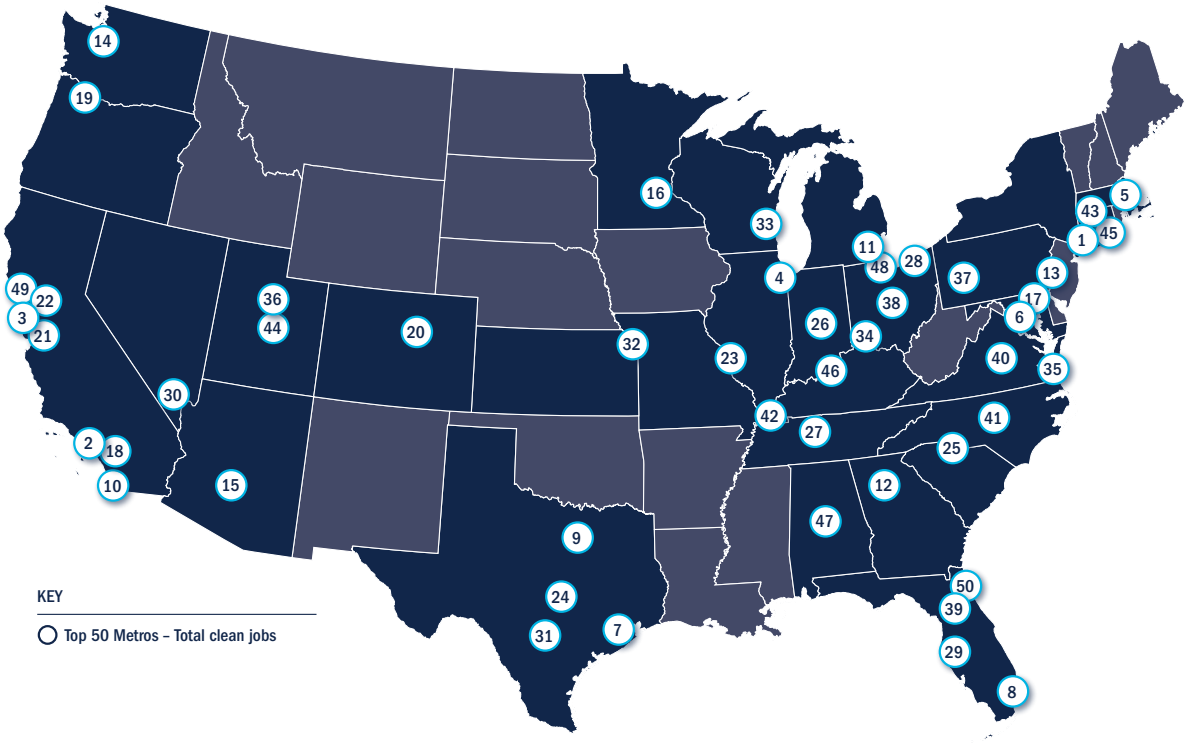
American cities across the country were hubs for growing clean energy jobs and businesses in 2019 while rural districts and small communities increasingly made their mark.

AMERICA'S CLEAN JOB ENGINES IN 2019

35 states and the District of Columbia were home to a Top 50 metropolitan statistical areas (MSAs) for clean energy jobs in 2019, and 15 states had at least two or more metros represented.

In total, the Top 50 metro areas accounted for 1.9 million of the nation's nearly 3.4 million clean jobs at the start of 2020.

Clean Jobs Cities: Top 50 Metros By Total Clean Energy Employment Q4 2019



Rank	Metro	Clean Energy Jobs*
1	New York City, NY-NJ-PA	152,267
2	Los Angeles, CA	146,394
3	San Francisco-Oakland, CA	122,813
4	Chicago, IL-IN-WI	102,850
5	Boston, MA-NH	95,966
6	Washington, DC-VA-MD-WV	88,991
7	Houston, TX	64,924
8	Miami, FL	60,963
9	Dallas-Fort Worth, TX	58,554
10	San Diego, CA	58,094
11	Detroit, MI	55,466
12	Atlanta, GA	55,085
13	Philadelphia, PA-NJ-DE-MD	49,510
14	Seattle, WA	48,345
15	Phoenix, AZ	47,462
16	Minneapolis-St. Paul, MN-WI	42,021
17	Baltimore, MD	38,860

Rank	Metro	Clean Energy Jobs*
18	Riverside-San Bernardino, CA	38,440
19	Portland, OR-WA	35,683
20	Denver, CO	34,823
21	San Jose, CA	32,643
22	Sacramento, CA	32,208
23	St. Louis, MO-IL	27,057
24	Austin, TX	26,297
25	Charlotte, NC-SC	25,001
26	Indianapolis, IN	24,822
27	Nashville, TN	24,168
28	Cleveland, OH	22,399
29	Tampa-St. Petersburg, FL	22,071
30	Las Vegas, NV	22,042
31	San Antonio, TX	21,307
32	Kansas City, MO-KS	20,835
33	Milwaukee, WI	20,505
34	Cincinnati, OH-KY-IN	20,389

Rank	Metro	Clean Energy Jobs*
35	Virginia Beach, VA-NC	18,412
36	Salt Lake City, UT	18,135
37	Pittsburgh, PA	18,116
38	Columbus, OH	16,890
39	Orlando, FL	16,870
40	Richmond, VA	16,424
41	Raleigh-Cary, NC	16,126
42	Memphis, TN-AR-MS	14,921
43	Hartford, CT	14,869
44	Provo, UT	14,842
45	Bridgeport, CT	14,323
46	Louisville, KY-IN	14,186
47	Birmingham, AL	13,298
48	Toledo, OH	12,823
49	Santa Rosa, CA	11,301
50	Jacksonville, FL	11,116

* Total includes renewable energy, energy efficiency, clean vehicles, battery storage, advanced biofuels, low-impact hydro and other sectors.

BEYOND THE BIG CITIES

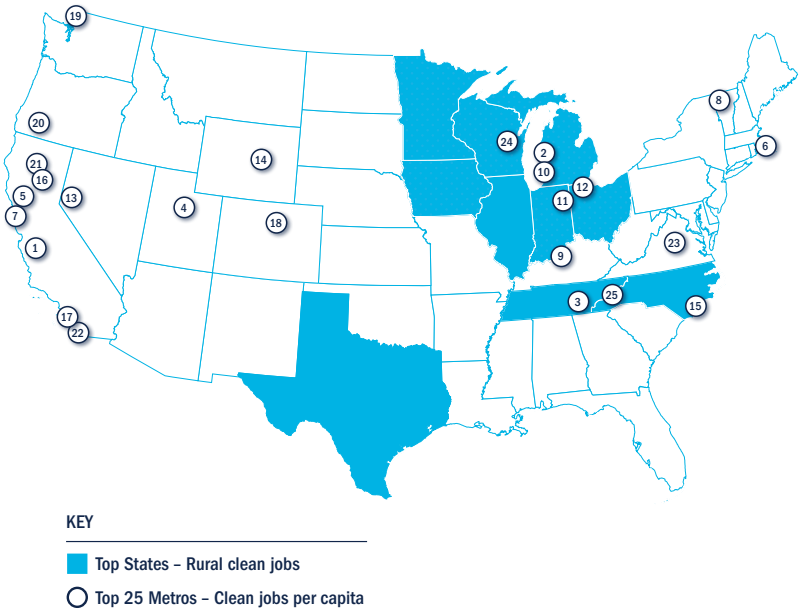
While the largest metros are home to most clean energy jobs, many smaller and mid-sized metro areas are seeing clean energy businesses make an even greater impact per capita. Among the metro areas with the largest share of clean energy jobs in their total workforce, 22 of the top 25 have populations under 500,000.

Clean Jobs Cities: Metros with Largest Share of Clean Energy Workers as Share of Total Workforce[7] Q4 2019

Rank	Metro	Clean Energy Jobs	Share of Total Employment
1	San Luis Obispo-Paso Robles, CA	11,050	8.8%
2	Holland-Grand Haven, MI	3,538	8.6%
3	Cleveland, TN	3,071	6.4%
4	Provo, UT	14,842	5.4%
5	Santa Rosa, CA	11,301	5.2%
6	Barnstable Town, MA	4,953	4.9%
7	San Francisco-Oakland, CA	122,813	4.9%
8	Burlington, VT	5,609	4.3%
9	Elizabethtown, KY	2,541	4.3%
10	Niles-Benton Harbor, MI	2,685	4.2%
11	Fort Wayne, IN	8,625	4.0%
12	Toledo, OH	12,823	4.0%
13	Reno-Sparks, NV	9,807	4.0%
14	Casper, WY	1,571	3.9%
15	Wilmington, NC	5,121	3.9%
16	Chico, CA	3,325	3.8%
17	Santa Barbara, CA	8,094	3.8%
18	Boulder, CO	7,372	3.8%
19	Bellingham, WA	3,638	3.8%
20	Medford, OR	3,387	3.7%
21	Redding, CA	2,532	3.6%
22	San Diego, CA	58,094	3.6%
23	Charlottesville, VA	4,307	3.6%
24	Oshkosh-Neenah, WI	3,403	3.5%
25	Asheville, NC	7,177	3.5%

America's rural communities are also reaping the rewards, accounting for more than 430,000 jobs in 2019 led by Midwestern and Southern states.

City & Country: Top states for rural clean energy jobs; top metros by share of total workforce



Clean Jobs Rural America: Top 10 States for Rural Clean Energy Jobs* Q4 2019

Rank	State	Rural Clean Energy Jobs
1	North Carolina	28,894
2	Michigan	24,954
3	Texas	23,904
4	Wisconsin	19,513
5	Ohio	17,513
6	Indiana	16,009
7	Tennessee	14,725
8	Iowa	14,244
9	Minnesota	13,845
10	Illinois	13,502

*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.[8]

Methodology

The analysis expands on data from the 2020 U.S. Energy and Employment Report (USEER) produced by the Energy Futures Initiative (EFI) in partnership with the National Association of State Energy Officials (NASEO), using data collected and analyzed by the BW Research Partnership. 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 2020 USEER relies on a unique supplemental survey of 30,000 business representatives across the United States. Created and conducted by BW Research and approved by the Office of Management and Budget 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.

E2 is a partner on the USEER, which was first released by the Department of Energy in 2016. The 2020 USEER was released on March 23, 2020 and is available at www.usenergyjobs.org.

An FAQ is also available here to answer any questions.

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. Clean energy jobs have grown every year since the first national report was released in 2016.

For additional insight into E2's Clean Jobs America 2020 or our other annual Clean Jobs America reports, visit e2.org/reports.

THANKS TO SUPPORT FROM:

E2 wishes to express its appreciation to the **National Association of State Energy Officials** (NASEO), the **Energy Futures Initiative** (EFI) and **BW Research Partnership** ("BWRP") who made this report possible by producing the USEER and its underlying data.

ENDNOTES

1 Unless otherwise stated, all data is from the 2020 U.S. Energy and Employment Report (USEER), March 2020, NASEO and EFI. All employment findings in USEER is based on survey and data analysis collected from Q4 2019 prior to any onset of the COVID-19 crisis. See Pages 201-206 for methodology questions, available at www.usenergyjobs.org.

2 https://www.bls.gov/oes/tables.htm.

3 BW Research Partnership: Clean Energy Employment Initial Impacts from the COVID-19 Economic Crisis from, March 2020, available at www.e2.org/reports/clean-jobs-covid-economic-crisis-march-2020.

4 https://obamawhitehouse.archives.gov/the-press-office/2016/02/25/fact-sheet-recovery-act-made-largest-single-investment-clean-energy.

5 https://wiresgroup.com/wp-content/uploads/2019/03/Electrification_BrattleReport_WIRES_FINAL_03062019.pdf.

6 https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/1603-program-payments-for.

7 Economic Modeling Specialists, Intl. (EMSI) 2019.

8 https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural.