

## Executive Summary

In 2021, U.S. energy sector jobs grew 4.0% over 2020, outpacing overall U.S. employment, which climbed 2.8% in the same time period. The energy sector added more than 300,000 jobs, increasing from 7.5 million total energy jobs in 2020 to more than 7.8 million in 2021.

Energy sector jobs, for the purposes of this report, include all the professional, construction, utility, operations, and production occupations associated with energy infrastructure, production, and use, including the manufacturing of motor vehicles.

Prior to the COVID-19 pandemic, the energy sector was one of the nation's fastest-growing job markets. From 2015 to 2019, the annual growth rate for energy employment in the United States was 3%—double the 1.5% job growth in the U.S. economy.

In 2020, the energy sector was deeply impacted by the COVID-19 pandemic and subsequent economic fallout. The energy sector lost nearly 840,000 jobs, contracting at a faster rate than jobs economy-wide. Last year's United States Energy and Employment Report (USEER) showed that, by the end of 2020, the energy sector was beginning to rebound, adding back 560,000 jobs.

While the energy sector as a whole has not recovered all of the jobs lost in 2020, nearly all technologies added energy jobs in 2021. Employment in transmission, distribution, and storage; energy efficiency; and motor vehicles increased across all technologies. However, energy jobs in the fuels category declined in 2021.

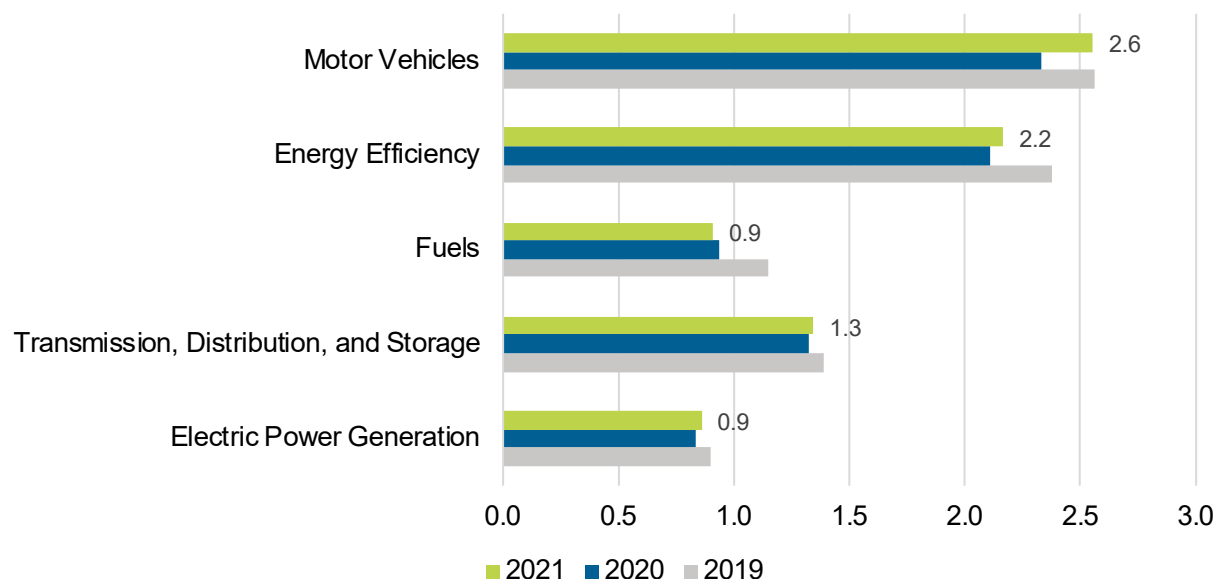
### Jobs in Net-Zero Aligned Areas

The United States has a goal to reach net-zero greenhouse gas emissions by 2050. Net-zero emissions refers to achieving an overall balance between greenhouse gas emissions produced and greenhouse gas emissions prevented or taken out of the atmosphere.

Jobs in net-zero emissions-aligned areas are defined as jobs related to: renewable energy; grid technologies and storage; traditional transmission and distribution; nuclear energy; a subset of energy efficiency; biofuels; and plug-in hybrid, fully electric, and hydrogen fuel cell vehicles and components.

In 2021, there were 3,086,467 jobs in net-zero emissions-aligned areas. These jobs made up 41% of total energy jobs in 2021.

Figure 1. Energy Employment by Technology, 2019–2021 (Millions)



### Motor Vehicles

Motor vehicles and component parts is the largest energy technology group, employing just under 2.6 million workers in 2021. The motor vehicles group added 144,300 jobs in 2021, increasing by 11.9%. Motor vehicle component parts companies added 79,100 jobs, increasing by 7.9%. Jobs in carbon-reducing motor vehicles and component parts technologies grew a collective 25%, led by 23,577 new jobs in hybrid electric vehicles (19.7% growth) and 21,961 jobs in electric vehicles (26.2% growth). In fact, jobs in electric vehicles, plug-in hybrid vehicles, and hybrid vehicles were among the only subcategories of any type of energy jobs that rose in numbers from 2019 to 2021 and that did not decrease from 2019 to 2020.

### Energy Efficiency

In 2021, the energy efficiency technology group added 57,741 jobs and saw positive job growth in all efficiency technologies, especially in traditional heating, ventilation, and air conditioning (HVAC), which added 17,740 jobs and grew by 3.3%. The energy efficiency group was hit especially hard by the COVID-19 pandemic in 2020, resulting in across-the-board declines, amounting to a total loss of 271,719 jobs. Despite modest gains in 2021, energy efficiency grew more slowly than the energy sector as a whole (2.7% vs 4.0%) and did not make up job losses in 2020. However, job gains in energy efficiency still outpaced job growth in U.S. employment overall, and the sector remains one of the largest energy technology groups with over 2.1 million workers.

### Fuels

In 2021, the fuels technology group declined by 29,271 jobs (-3.1%). Fossil fuel jobs accounted for most of the fuel jobs lost. Petroleum—both onshore and offshore—led losses, shedding 31,593 jobs (-6.4%). Coal fuel jobs declined by the greatest percentage, losing 7,125 jobs and decreasing by 11.8%. Fuel extraction jobs overall decreased by 12%. Biofuels, including renewable diesel fuels, biodiesel fuels, and waste fuels, grew by 6.7%, adding 1,180 jobs.

### Transmission, Distribution and Storage

All transmission, distribution, and storage (TDS) technologies experienced employment growth in 2021 with an increase of 21,460 jobs. Smart grids outpaced virtually all other technologies in the TDS technology group in growth rate, increasing 4.9%. Traditional transmission and distribution added the most jobs (13,088) and grew 1.4%. Batteries, for both grid storage and electric vehicles, added 2,949 jobs (4.4%).

### Electric Power Generation

Electric power generation jobs grew 2.9%, adding 24,006 jobs in 2021, slightly faster than U.S. jobs overall. In total, there were an estimated 857,579 electric power generation jobs in the United States in 2021.

The two largest employers in renewable energy technologies, solar and wind, both increased in 2021. Solar had the largest gains, both in terms of new jobs (17,212) and percent growth (5.4%). In 2020, the solar industry lost 28,718 jobs. Wind energy jobs, including land-based and offshore wind, sustained modest growth in terms of new jobs (3,347) and percent growth (2.9%), continuing a trend of steady growth over the last few years.

Other renewable energy technologies for electric power generation also experienced job growth in 2021, including hydropower, which added 1,383 jobs (2.2% growth); bioenergy, which added 349 jobs (2.9% growth); and geothermal, which added 220 jobs (2.8% growth).

Nuclear energy within electric power generation lost 2,440 jobs in 2021, decreasing 4.2% from 2020. In contrast, nuclear fuel jobs added 413 jobs and grew by 4.7%.

Fossil energy for electric power generation jobs either declined or grew at a slower pace than renewable energy jobs. Coal power generation jobs decreased by 572 from 2020 to 2021, down 0.8%, while the natural gas and petroleum grew at slower rates (1.6% and 0.5%, respectively) than overall U.S. employment (2.8%).

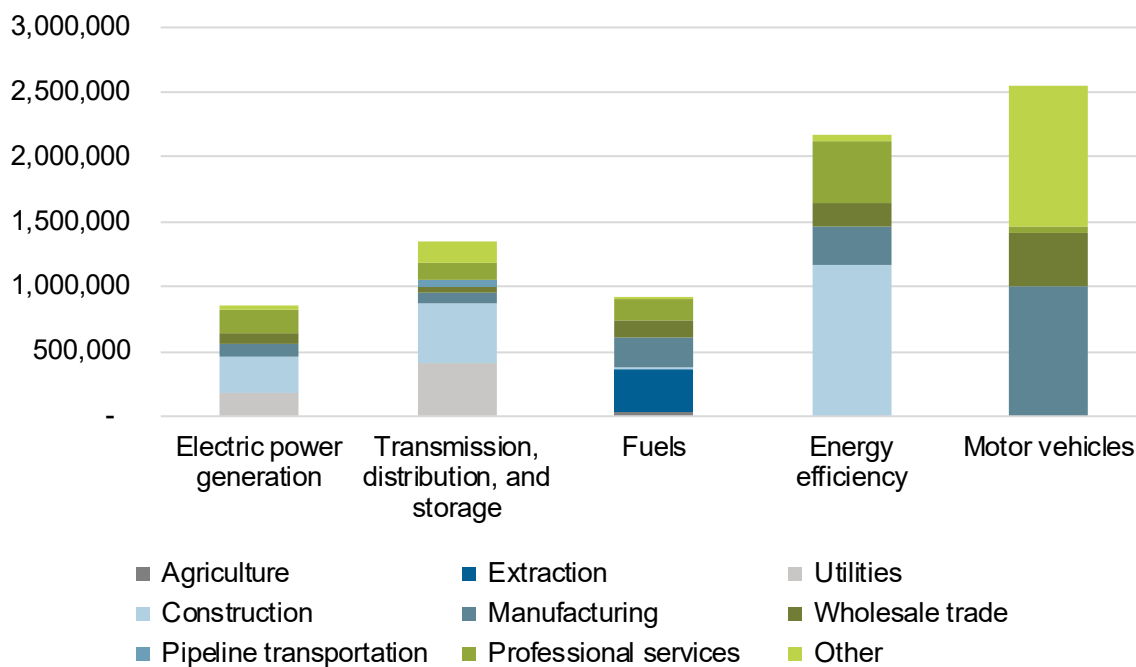
### The Infrastructure Investment and Jobs Act

In November 2021, the Infrastructure Investment and Jobs Act (the Bipartisan Infrastructure Law) was signed into law. The infrastructure law allocates more than \$62 billion for the DOE to revitalize domestic supply chains and strengthen America's manufacturing leadership; expand access to energy efficiency and clean energy for families, communities, and businesses; deliver reliable, clean, and affordable power to more Americans; and build the technologies of tomorrow through clean energy demonstrations. Because the 2022 USEER only includes data from 2021, the impacts of the Infrastructure Investment and Jobs Act are not reflected in this year's report.

## Industry and Occupational Data

- Fuels is the only technology category that contracted in 2021, shedding 29,270 jobs, driven by companies’ reductions in extraction jobs.
- Manufacturing and “other services”<sup>1</sup> jobs showed the biggest increases, with motor vehicles contributing the most new jobs in both industries.

**Figure 2. Energy Employment by Technology Category and Industry**



## Supporting Energy Workers

In 2021, renewable energy jobs grew while fossil energy jobs decreased. These data highlight the need to catalyze economic revitalization and diversification, encourage the growth of the economy characterized by secure and good-paying jobs, and support energy workers and communities across the country as we make the transition to economy-wide net-zero emissions by 2050.

The [White House Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization](#) is of the main locus of action the federal government is currently taking to support coal, oil and gas, and power plant communities and

<sup>1</sup> “Other services” is classified under the North American Industry Classification System (NAICS) code 81. It is defined as containing industry activity not defined elsewhere within the NAICS classification system with the exception of public administration.

Table 1. Change in Energy Jobs by Industry, 2020–2021

	Electric Power Generation	Transmission, Distribution, and Storage	Fuels	Energy Efficiency	Motor Vehicles	Industry Total
Agriculture	0	0	831	0	0	831
Extraction	0	0	-46,007	0	0	-46,007
Utilities	-446	-768	0	0	0	-1,214
Construction	11,333	17,612	773	25,131	0	54,849
Manufacturing	1,058	1,495	1,246	5,878	109,870	119,547
Wholesale trade	3,277	1,686	5,582	7,774	26,296	44,615
Pipeline transportation <sup>2</sup>	0	-4,671	0	0	0	-4,671
Professional services	7,465	7,094	8,215	17,686	-3,129	37,331
Other	1,319	-988	90	1,272	118,074	119,767
Technology Total	24,006	21,460	-29,270	57,741	251,111	

## 2021 Demographic Information and Diversity

- The energy workforce is 74% male, making it less gender diverse than the U.S. workforce average, which is 53% male. Women make up 25% of the energy workforce, much less than the U.S. average, which is 47%.<sup>3</sup>
- There is a higher percentage of non-White workers in energy, 26% compared to 22% of the entire U.S. workforce. However, the energy workforce has a lower-than-average percentage of Black and Latino workers. There are no technologies where Black workers are represented proportionally to their overall representation in the U.S. workforce.
- Workers of two or more races are more represented in nearly every energy technology, composing 8% of the energy workforce, compared to 2% across all U.S. industries. Economy-wide research, however, shows that respondents may answer inconsistently to questions about two or more races.
- The percentage of Asian workers in energy is the same as the national workforce average.
- The energy workforce is younger than average. Only 17% of the energy workforce is older than 55, which is lower than the national employment average of 24%.

<sup>2</sup> This does not include pipeline construction. Pipeline construction falls under the NAICS 23712 code, which is construction.

<sup>3</sup> Percentages do not sum to 100% due to rounding.

**Table 2. United States Energy Workforce Demographics and Characteristics**

	Number of Workers	Energy Average	National Workforce Averages
Male	5,634,389	74%	53%
Female	1,915,191	25%	47%
Gender non-binary	22,723	0%	insufficient data <sup>4</sup>
Hispanic or Latino	1,307,137	17%	18%
Not Hispanic or Latino	6,265,167	83%	82%
American Indian or Alaska Native	125,591	2%	1%
Asian	503,710	7%	7%
Black or African American, not Indigenous	608,433	8%	12%
Black Indigenous	54,869	1%	insufficient data <sup>5</sup>
Native Hawaiian or other Pacific Islander	72,736	1%	<1%
White	5,596,223	74%	78%
Two or more races	610,743	8%	2%
Veterans	651,801	9%	6%
55 and over	1,273,900	17%	24%
Disability	162,570	2%	4%
Formerly Incarcerated	80,857	1%	2%
Represented by a Union or Project Labor Agreement	777,028	10%	6%

National sources: BLS (2022a, 2022b, 2022c, 2022d), Jobs EQ (2021), Prison Policy (2022)

<sup>4</sup> While the USEER asks male, female, and nonbinary, no data from the Bureau of Labor Statistics or Census exists for the number of nonbinary workers within the national workforce.

<sup>5</sup> Data not available from the Census.

### Union Membership

- The proportion of union workers or those covered under a project labor agreement in the energy workforce is higher than the private sector, with 10% of workers represented by a union or covered by project labor agreement, compared to 6% within the private sector nationally.
- The transmission, distribution, and storage technology group had the highest unionization rate at 18%; nuclear was the highest technology with 20%.

### Executive Actions on Worker Empowerment

During 2021, President Biden issued several Executive Orders related to energy jobs:

- Executive Order 14008: Tackling the Climate Crisis at Home and Abroad: Calls for an all-of-government approach to “create well-paying union jobs to build a modern and sustainable infrastructure, deliver an equitable, clean energy future, and put the United States on a path to achieve net-zero emissions, economy-wide, by no later than 2050.”
- Executive Order 14005: Ensuring the Future Is Made in All of America: Increases domestic content requirements on federal procurement.
- Executive Order 14063: Use of Project Labor Agreements for Federal Construction Projects: Requires project labor agreements (PLAs) on large federally contracted construction projects.
- Executive Order 14025: Worker Organizing and Empowerment: Established the *Task Force on Worker Organizing and Empowerment* to identify ways the federal government could fully utilize its authority to encourage worker organizing and collective bargaining. On Feb. 7, 2022, the task force released its report, detailing nearly 70 recommendations for revising labor laws and regulations.
- Executive Order 14052: Implementation of the Infrastructure Investment and Jobs Act: Emphasizes the importance of high labor standards, including prevailing wages and the free and fair chance to join a union in the

### Key State Takeaways

In addition to this national report, USEER data are collected at the state level in a companion report, which includes a brief energy and employment profile for each state and the District of Columbia. The state report includes a high-level snapshot of the electric power generation; transmission, distribution, and storage; fuels; energy efficiency; and the motor vehicle industry, as well as a breakdown by technology application and workforce characteristics. Highlights are provided below. For more information, view the state-level report at [energy.gov/useer](https://energy.gov/useer).

- Michigan added most new energy jobs (35,500) in 2021, followed by Texas (30,900) and California (29,400).
- West Virginia and Pennsylvania fared best nationally for percent growth in transmission, distribution, and storage, with the fastest growth occurring in West Virginia (29%) and Pennsylvania (14%).
- Electric power generation technologies grew fastest in the Midwest, with the highest percent growth in Nebraska (32%), Minnesota (18%), and Iowa (16%).
- The top two states with the highest percent growth in fuels jobs were North Dakota (21%) and Montana (8%).
- Percent growth in motor vehicles jobs was spread across many states, led by Texas (20%), Tennessee (19%), and Indiana (18%).
- Oklahoma and New Mexico were among the top states for percentage growth among all five energy categories. Oklahoma had the third highest per capita growth nationally for transmission, distribution, and storage (11%) as well as energy efficiency (5.3%). New Mexico was first for energy efficiency (7.0%) and third for fuels (5.4%).

### Survey of Future Trends

- Companies in all energy technology groups reported in surveys that they expect job growth from 2021 to 2022 (Figure 3).
- This is led by motor vehicles (3.2% growth expected by employers), followed by fuels (3.0%), electric power generation (2.2%), energy efficiency (1.7%), and transmission, distribution, and storage (1.1%).

**Figure 3. Anticipated Change in Employment by Technology Group, 2021–2022**

