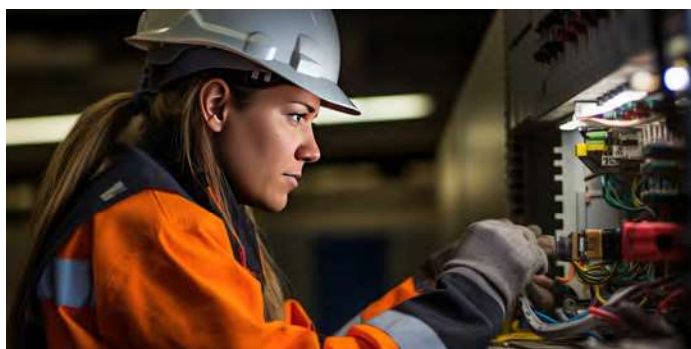




United States Energy & Employment Report 2024

www.energy.gov/USEER



DEPARTMENT OF ENERGY Secretary Jennifer M. Granholm

DEPARTMENT OF ENERGY **OFFICE OF ENERGY JOBS**

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Executive Summary

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EXECUTIVE SUMMARY

In 2023, clean energy investments powered strong overall growth of jobs in the energy sector.¹ Unionization rates in clean energy grew to their highest level yet, driven by large increases in union-dense construction and utility employment. Energy employers reported less difficulty in hiring qualified workers than in the previous year.

U.S. energy sector jobs grew 3% in 2023, outpacing solid overall U.S. employment growth by 50%.² Energy sector employment increased by over 250,000 from 8.10 million total energy jobs in 2022 to 8.35 million in 2023.³

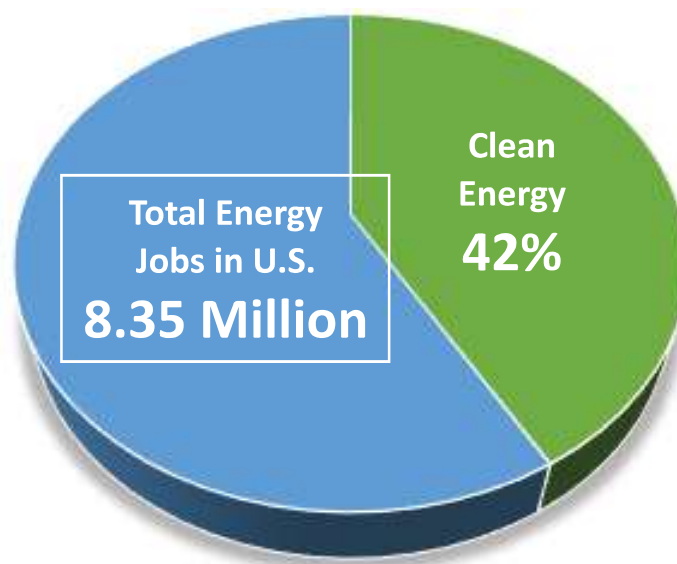
Clean energy employment increased by 142,000 jobs, accounting for more than half (56%) of new energy sector jobs and growing at a rate (4.2%) twice as large as that for the rest of the energy sector and the U.S. economy overall (2.0%).⁴ Just under 5% of all new jobs created in the U.S. economy in 2023 were in clean energy, and clean energy now accounts for 42% of all energy jobs (Figure 1).

The U.S. Energy and Employment Report (USEER) allocates energy employment to five technology areas: electric power generation; energy efficiency; fuels; motor vehicles; and transmission, distribution, and storage. Employment increased across all five of these technology areas in 2023.

What has not historically been counted in the above technology areas (or reported) are the construction jobs associated with building and expanding clean energy manufacturing facilities. A supplemental survey in 2023 found an additional 28,000 jobs

in the construction of new clean energy supply chain facilities, such as new or expanded battery and solar panel factories, ports to service offshore wind, and warehouses used for clean energy materials—all of which are needed to support the onshoring of clean energy supply chains. These jobs data, which are included in USEER for the first time in 2024, are separate from — and in addition — to the reported totals.⁵

Figure 1: Jobs in Clean Energy as a Percentage of Total Energy Jobs (millions of jobs), 2023



KEY STATISTICS

- Clean energy is driving job growth in the energy sector.** Since 2020, jobs in clean energy have grown by 400,000, showing a growth rate of 12.8%. This is faster than the rest of the energy sector, which added more than 427,000 net jobs for a growth rate of 9.7% over the same period.
- Motor vehicle jobs are growing, and the most rapid growth is in clean zero-emission vehicles.** Nationwide, jobs in motor vehicles grew, with clean vehicle employment increasing 11.4%, adding 24,826 jobs.⁶ This does not include employment growth in battery manufacturing (2,800 new jobs), or EV charging (550 new jobs), both of which are covered in the transmission, distribution and storage category. Employment in gas and diesel vehicles, including (non-plug-in hybrids and natural gas vehicles) also rose, but more slowly, at 2% adding 39,305 jobs.⁷
- Jobs in battery electric vehicles are growing more rapidly than hybrid and plug-in hybrid vehicles.** Within clean vehicles, battery electric vehicle employment increased by 17,064 jobs (12.9%), outpacing hybrid and plug-in hybrid growth of 10.5% and 8.4%, respectively.⁸ Hydrogen fuel cell vehicles increased by 2,019 (11.5%).
- Wind and solar employment grew at rates well above average, and solar became more diverse and more heavily unionized.** Wind employment grew 4.6%, adding 5,715 jobs. Solar employment grew 5.3%, adding over 18,000 jobs with employment gains substantially increasing the number and share of Hispanic/Latino workers by 9,400 in the sector. The number of workers in solar represented by unions grew 13.7% by 5,000 jobs.
- Latino and Hispanic workers and Veterans saw significant gains in the energy sector.** Approximately 32% of total new energy jobs, and 33% of new clean energy jobs in 2023 were filled by Hispanic or Latino workers, raising their total representation in the energy workforce by 79,000 to just under 1.5 million, which represents 18% of total energy jobs. Veterans made up 9%

JOBS ADDED
IN 2023

+250,000

IN THE ENERGY SECTOR,
WHICH NOW EMPLOYS

8.35 MILLION



4.2%

INCREASE IN **CLEAN
ENERGY JOBS**,
OUTPACING GROWTH IN
ENERGY JOBS OVERALL

of the U.S. energy workforce, higher than their representation in the overall U.S. economy (5%). More than 34,000 Veterans were added to the energy workforce in 2023.

- Unionization rates in clean energy surpassed traditional energy employment for the first time.** Driven largely by rapid growth in the comparatively highly unionized construction (particularly of transmission and distribution systems) and utility sectors, unionization rates in clean energy grew to 12.4%.⁹ The share of workers represented by unions also increased from 12% to 13% in Electric Power Generation (8,600 workers). Union density in the energy sector (11%) was 50% greater than the private sector average (7%).
- Employers had an easier time hiring qualified workers compared to the previous year, and union employers reported lower difficulty finding workers than non-union employers.**¹⁰ Only 24% of unionized firms reported that it was “very difficult” to find workers compared to 40% of non-union firms. . Both union and non-union firms reported less difficulty hiring relative to 2022.
- Unionized firms show greater commitment to diversity, equity, and inclusion.** Union employers were 50% more likely to offer or require a diversity and/or inclusion training program aimed at advocating workplace diversity and inclusion than non-union employers (36% and 24%, respectively), as well as more likely to report specific strategies, policies, or programs to increase the number of women, ethnic and racial minorities, and LGBTQ+ hires.¹¹
- Traditional transmission, distribution, and storage technologies saw rapid and significant net growth despite a loss of jobs in transportation of fuels.** Traditional transmission, distribution, and storage including electric bulk power transmission and control, electric power distribution, and natural gas distribution, grew 5.4%, adding 52,515 net new jobs. While still comparatively small, the fastest growing segment in transmission, distribution, and storage was electric vehicle charging deployment at 25.1% growth to support more than 550 new jobs. Battery storage, which includes battery storage for electric vehicles as well as for the electric grid, grew 3.8% (+2,779 jobs). Transportation of fuels saw a loss of 16,382 jobs (-11.6%) in this sector.¹²

- **The industry sectors experiencing the highest job growth from 2022 to 2023 were utilities and construction.**

When aggregating jobs across technology categories into traditional industrial sectors, the utilities sector saw the fastest employment growth of 5.0% in 2023, adding nearly 30,000 jobs. The construction sector added nearly 90,000 energy jobs, growing 4.5%, almost double the economy-wide construction employment growth of 2.3%. Driving both increases were robust activities in Electric Power Generation and Transmission, Distribution, and Storage, driven by the expansion and build out of generation facilities and upgrades to the grid.

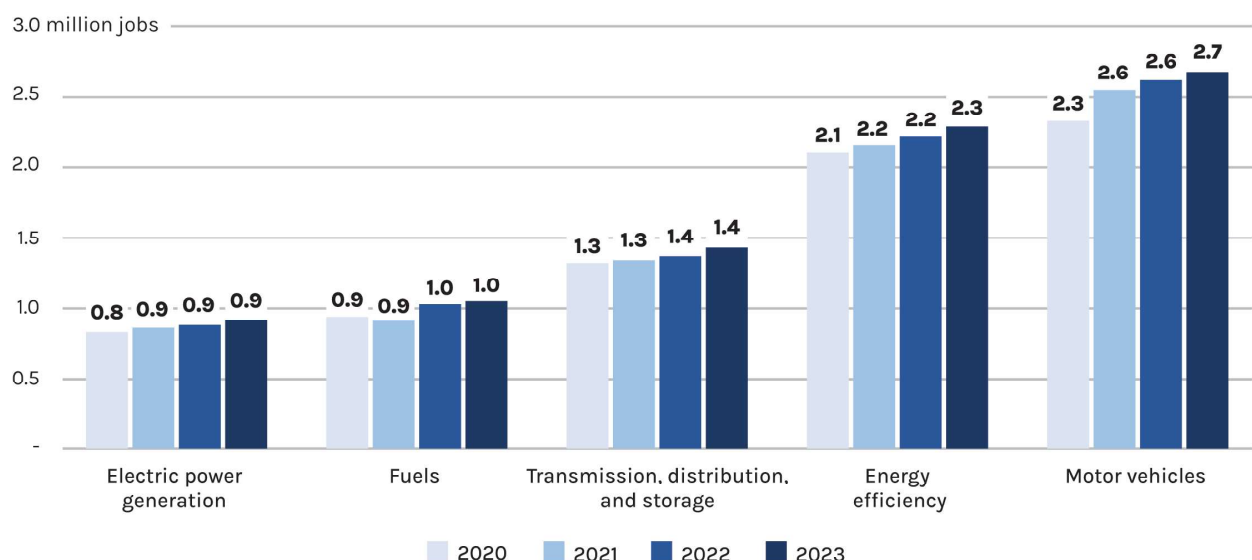
- **Women and Black or African American workers remain under-represented in the U.S. energy workforce.**

Across every major technology and industry category, Black or African American workers are underrepresented, holding just 9% of energy jobs while representing 13% of the U.S. workforce. Women held 26% of energy jobs but make up 47% of American workers. Women filled half of new energy jobs in 2022 but only 17% of new energy jobs in 2023 (42,000 of the 250,000).

EMPLOYMENT BY TECHNOLOGY

Figure 2 shows energy employment job growth since 2020, organized by technology category. Each category experienced growth in 2023. Motor vehicle jobs increased 14.6% since 2020, transmission, distribution, and storage jobs by 7.8%, electric power generation by 10.2%, fuels by 12.1%, and energy efficiency jobs by 8.7%. Each section of the report examines the growth in each technology sector more closely.

Figure 2. Energy Employment by Technology, 2020-2023 (Millions of Jobs)



The Investing in America agenda is driving new investments and jobs across energy production, infrastructure and supply chains



Since taking office in 2021, the Biden-Harris Administration has spearheaded a series of legislative initiatives and driven policy implementation aimed at rebuilding the U.S. economy from the bottom up and the middle out, reversing decades of offshoring and outsourcing, and repositioning the country as a global leader in innovation, technology, and manufacturing.

Three major pieces of legislation passed by Congress and signed into law by President Biden, and collectively known as the Investing in America agenda, include the Bipartisan Infrastructure Law of 2021 (BIL), the Inflation Reduction Act of 2022 (IRA), and the CHIPS and Science Act of 2022. These policies contribute to the Biden-Harris Administration's goal of making the United States a world leader in clean energy innovation, production, and manufacturing, while creating good jobs and reinvesting in American communities.

BIL represents a landmark investment in infrastructure, with a total federal allocation of \$1.2 trillion, spanning advanced transportation, broadband, and energy infrastructure investment.¹³ The CHIPS and Science Act of 2022 represents another strategic investment in science, research, innovation, domestic manufacturing, and workforce development.

The IRA, signed into law on August 16, 2022, makes historic investments to modernize domestic energy infrastructure and make the U.S. a leader in clean and advanced energy production, technology, and supply chains. To work towards reaching President Biden's objective of net-zero emissions economy-wide by 2050, the IRA invests \$370 billion in clean energy projects. At the same time the law combats the drivers of inflation and includes tax provisions that help cut energy costs for American families. It speeds the adoption of clean energy technologies through grants, loans, rebates, and incentives and spurs investment, with bonus credits to projects that meet key wage and training standards or are located in low-income or energy communities.¹⁴

The Biden-Harris Administration has moved rapidly to implement this legislation, and the additional private investments they enable are now underway. As of July 2024, starting with implementation of BIL, the Biden-Harris Administration has announced or awarded \$563 billion in public investments in energy and transportation infrastructure in communities in every state and territory, including \$79.5 billion to accelerate the deployment of clean energy.

These federal investments have spurred significant private sector investment. Companies have announced \$898 billion related to the Investing in America agenda, including \$177 billion for EVs and batteries, \$160 billion for clean power, \$81 billion for clean energy manufacturing and infrastructure¹⁵ and \$44 billion for heavy industry.

The enactment of the IRA created a surge of investments in manufacturing activity within the U.S., with new investments in clean energy, clean vehicles, building electrification, and carbon management technology.

In the EV sector, companies have announced more than 250 new or expanded factories nationwide to produce batteries for electric vehicles and grid storage, and public incentives have attracted investments from the largest international conglomerates to build and expand factories for vehicles and batteries in the U.S.

Looking across the economy, since President Biden took office, a record 17 million business applications have been filed, including over 290,000 in the manufacturing sector.¹⁶ Real private investment in manufacturing structures is at a record high and has more than doubled since January 2021.¹⁷ Since the passage of BIL and IRA, national expenditures on manufacturing construction¹⁸ have rapidly increased, growing from \$70 billion in May 2021 to \$223 billion in March 2024.¹⁹ As a result, private manufacturing construction hit its largest annual growth on record in the fourth quarter of 2023.

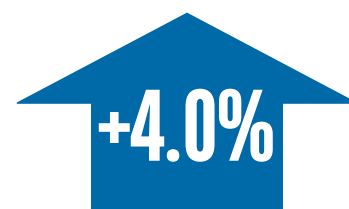
ELECTRIC POWER GENERATION



The Electric Power Generation
(EPG) sector employed

900,000

a gain of
35,600 JOBS


CLEAN ENERGY EPG WORKFORCE GREW BY 4.6% – SOLAR ADDED 18,400 WORKERS (+5.3%)

Electric power generation (EPG) jobs grew the fastest of any major energy technology in 2023 at 4.0%, nearly double the overall U.S. job growth rate. EPG gained 36,458 jobs and lost 870 jobs, with a net gain of 35,588 jobs. In total, there were over 900,000 EPG jobs in the U.S. in 2023.

Clean energy technologies accounted for 79% of net new EPG employment, adding 28,086 jobs. The clean energy EPG workforce grew by 4.6%, which was more than double the growth rate for the economy overall.

Both solar and wind, the two largest employment sectors of EPG technologies, increased from 2022 to 2023, following increases from 2020 through 2022. Solar had the largest number of jobs gained and the fastest growth rate, adding 18,401 workers (5.3%). Land-based wind had the second largest, adding 5,715 workers, for a growth rate of 4.6%.

Employment in other renewable energy EPG technologies also grew in 2023, including traditional and low-impact hydropower employers, which added 2,100 jobs (3.2%) and geothermal employers, which added 235 jobs (2.7%). Though the absolute number of jobs gained for some renewable energy technologies, such as offshore wind and bioenergy, is small, they exhibit above average rates of growth.

Nuclear EPG employment increased by 1,596 jobs in 2023, up 2.8% from 2022. Employment increased and decreased across different categories of fossil energy for EPG. Coal EPG job losses slowed from 2022 to 2023, decreasing by 870 positions (-1.4%) (compared to -9.6% from 2021 to 2022), while natural gas EPG²⁰ jobs increased by 4,713, a growth rate of 4.0%. Oil EPG employment increased by 2.6%, adding 318 jobs in 2023.

TRANSMISSION, DISTRIBUTION AND STORAGE



Transmission, Distribution,
and Storage (TDS) employed

1.42 MILLION

a gain of

52,000 JOBS

+3.8%

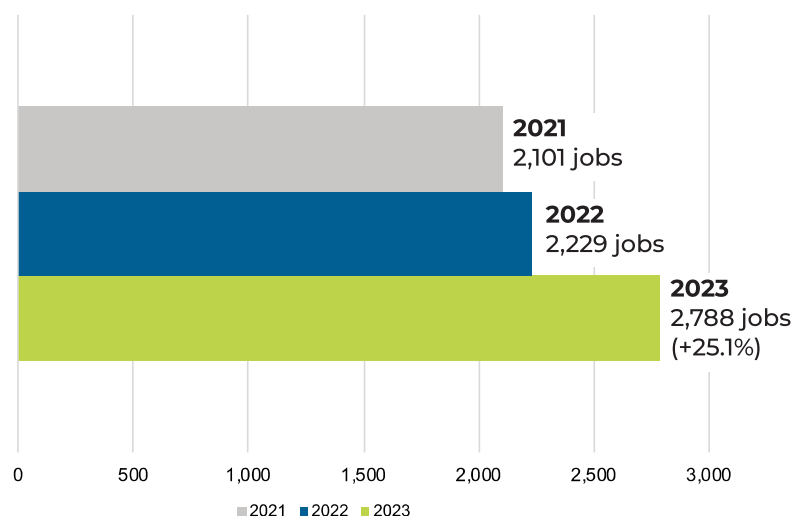
TRADITIONAL TDS ADDED THE MOST JOBS (52,500) AND GREW 5.4% IN 2023

Transmission, distribution, and storage (TDS) employed over 1.4 million workers in 2023. The employment growth rate in TDS from 2022 to 2023 continued to accelerate, growing 3.8% in 2023, up from 2.2% in 2022.

The TDS sector saw a net gain of 52,017 jobs, with the majority of job losses stemming from commodity flows (16,382 jobs). While still an emerging sector, “EV Charging” outpaced all other TDS technologies in growth rate, increasing 25.1% (559 jobs). Traditional TDS added the most jobs (52,515) and grew 5.4%²¹, significantly greater than the 1.9% growth rate from the previous year.

SPOTLIGHT

EV Charging Employment



Storage, which includes batteries for a number of applications: spanning consumer devices, vehicles or other transportation (including electric vehicles), behind-the-meter (buildings or industrial facilities), and front-of-meter (electric grid), added 2,779 jobs (3.8%). In 2023, battery manufacturing represented 15% of all storage jobs (14,028 jobs).

Industries involved in the transportation of coal, petroleum, and other fuels by truck, rail, air, and water (also known as commodity flows) lost a combined total of 16,382 jobs (-11.6%) from 2022 to 2023, the only segment of TDS to have a net decrease in employment.

FUELS



The Fuels sector
employed nearly

1.1 MILLION

a gain of

19,100 JOBS

+1.8%

RENEWABLE DIESEL FUELS EMPLOYMENT GREW AT THE FASTEST RATE (+7.3%)

Fuels employed nearly 1.1 million workers in 2023. From 2022 to 2023, fuels employers added 19,075 net jobs for 1.8% growth. Onshore oil and gas activities added the most jobs in the sector (9,023 in 2023), while renewable diesel fuels and offshore natural gas grew at the fastest rate (7.3% and 4.9% respectively).

Mining and extraction employment within fuels remained relatively flat from 2022 to 2023, adding only 1,765 jobs for a growth rate of 0.4%, maintaining the employment level reached by the rapid increase of 107,029 jobs added and 33.1% employment growth in the segment from 2021 to 2022. Mining and extraction jobs are spread across coal fuels and onshore and offshore petroleum and natural gas.

ENERGY EFFICIENCY



The Energy Efficiency
sector employed nearly

2.3 MILLION

a gain of

74,700 JOBS

+3.4%

ENERGY EFFICIENCY FIRMS ADDED THE MOST JOBS OF ANY TECHNOLOGY IN 2023

Energy efficiency supported almost 2.3 million jobs in 2023. From 2022 to 2023, energy efficiency firms added 74,748 jobs, the most of any technology (3.4%). All energy efficiency technology sub-categories experienced positive job growth, most notably in traditional heating, ventilation, and cooling (HVAC), which added 18,165 jobs and grew by 3.2%.²² ENERGY STAR® certified installation added 5,509 new jobs over the period (5.2%) followed by efficient lighting (+8,853, 4.2%).

MOTOR VEHICLES AND COMPONENT PARTS



Motor Vehicles (MV)²³
and Component Parts
employed nearly

2.7 MILLION



a gain of nearly

73,000 JOBS

MOTOR VEHICLES AND COMPONENT PARTS IS THE LARGEST ENERGY TECHNOLOGY AREA



CLEAN ENERGY VEHICLES

Jobs in clean energy vehicles (BEV, plug-in hybrid, and hydrogen/fuel cell), increased by nearly 25,000.



BATTERY ELECTRIC VEHICLES

Jobs in battery electric vehicles (BEV) grew by 17,065 in 2023.



FUEL CELL ELECTRIC VEHICLES

Jobs in fuel cell electric vehicles grew by 2,019 in 2023.



Jobs in clean vehicles (BEV, plug-in hybrid, and hydrogen/fuel cell) increased by 11%, adding almost 25,000 jobs. This does not include employment growth in battery manufacturing (2,779 new jobs), or EV charging (559 new jobs), both of which are included in the transmission, distribution and storage category.

Employment in battery electric vehicles grew the fastest increasing by 12.9%, adding 17,065 jobs, followed by jobs in fuel cell electric vehicles (11.5%, 2,019 jobs). Employment in gas and diesel-powered vehicles rose, but more slowly, at 2.0%, adding 39,305 jobs.



Supplemental Jobs in Construction and Expansion of Clean Energy Manufacturing and Supply Chain Infrastructures

The BIL, IRA, and CHIPS and Science Act, collectively known as Invest in America, are currently spurring public and private investment in expansion and improvement of energy infrastructure and the onshoring of clean energy manufacturing. Grants, loans, rebates, and tax incentives have stimulated the construction of new factories and energy supply chain infrastructure across the country.

Since 2016, USEER has collected data on employment across the energy sector, including energy efficiency and vehicle production and maintenance, and thus captures any changes in energy sector employment as a result of changing policy and market conditions. Jobs resulting from the construction and upgrades of domestic energy manufacturing facilities or supply chain infrastructure, however, have not previously been tracked or reported in USEER.

This new supplemental section assesses employment in the build out of the domestic energy supply chain, such as construction or upgrades of manufacturing or materials processing facilities, ports, and distribution facilities related to U.S. energy supply chain investments. For more information on the methodology for the domestic energy supply chain estimates, please see Appendix B.

In 2023, more than 28,000 workers were actively building out energy manufacturing and distribution facilities and developing ports for offshore wind and other energy projects. Approximately 1,000 firms across industrial building construction; commercial and institutional building construction; power and communication line and related construction; land subdivision, highway, street, and bridge construction; and other heavy and civil engineering

construction were actively building out energy supply chain infrastructure projects. There is room for employment to grow as an estimated 5,600 additional construction firms in the U.S. have capacity for domestic energy supply chain infrastructure work.

Below we display the total number of firms with capacity to build out domestic energy supply infrastructure, as well as the total number of firms and employment that actively worked on projects in 2023. This data is being included for the first time this year, so we are only able to show current employment levels, not job growth or decline. Accordingly, this information is separated from the rest of USEER and not included in summary energy employment statistics.

Manufacturing Facilities for Clean Energy Supply Chain

- 3,524 total construction firms with capacity
- 368 total construction firms actively building out projects
- 13,278 total workers actively building out projects in 2023

Warehouse and Distribution Facilities for Clean Energy Supply Chain

- 2,374 total construction firms with capacity
- 504 total construction firms actively building out projects
- 9,448 total workers actively building out projects in 2023

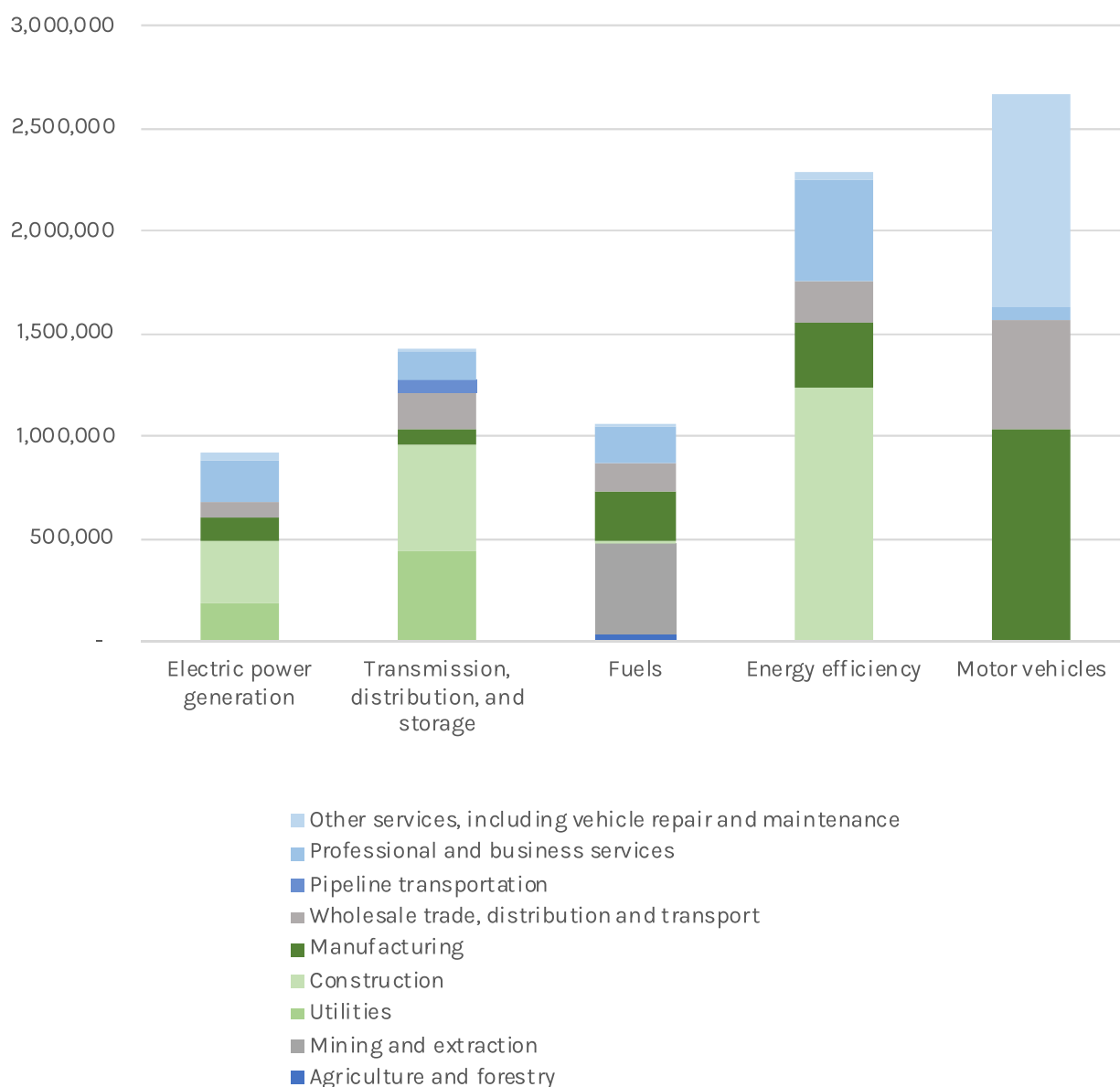
Ports for Clean Energy Projects

- 756 total construction firms with capacity
- 193 total construction firms actively building out projects
- 5,630 total workers actively building out projects in 2023

INDUSTRY DATA

This report also reports employment across different industries (Figures 3 and 4) and the change within each technology sector (Tables 1 and 2). Construction industry jobs grew the most among industry categories, with the majority of new workers employed within energy efficiency. All of the technology sectors added jobs in the manufacturing, professional and business services, and “other services” industries. Manufacturing employment in energy increased by 3% in 2023, adding over 50,000 jobs.

Figure 3. Energy Employment by Technology Category and Industry, 2023



Construction Industry Highlight

With the passage of the Bipartisan Infrastructure Law, Inflation Reduction Act, and CHIPS and Science Act, the construction industry has seen massive new public and private sector investments, driving significant job growth across the U.S. In 2023, growth of jobs in the construction industry outpaced job growth in the overall economy (2.3% compared to 2.1%).

Energy-related construction employment grew by 90,000 jobs, grew at almost twice the rate (4.5%) of otherwise robust construction industry growth (2.3%). When accounting for the additional 28,000 in previously uncounted clean energy manufacturing and supply chain facility construction, 2023 saw an increase of 5.9% growth of energy-related construction industry employment.

Figure 4. Energy Employment by Industry Category and Technology, 2023

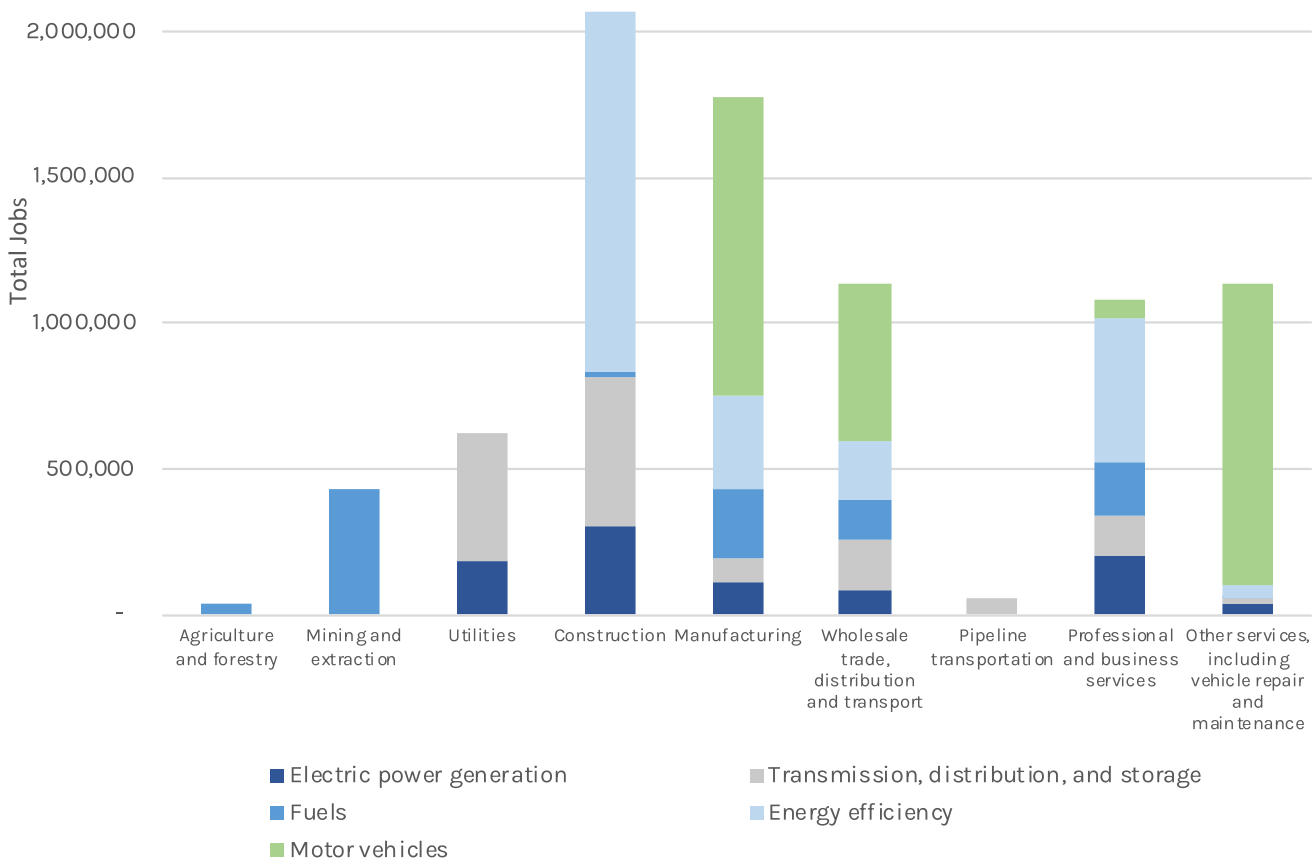


Table 1. Net Change in Energy Jobs by Industry and Technology, 2022-2023

	Electric Power Generation	Transmission, Distribution, and Storage	Fuels	Energy Efficiency	Motor Vehicles	Industry Total
Agriculture and Forestry	0	0	448	0	0	448
Mining and Extraction	0	0	1,765	0	0	1,765
Utilities	11,921	17,965	0	0	0	29,886
Construction	7,046	34,805	1,894	45,334	0	89,078
Manufacturing	1,779	3,716	8,453	15,893	23,594	53,436
Wholesale Trade, Distribution, and Transport	3,849	(14,296) ²⁴	1,910	733	6,702 ²⁵	(1,100)
Pipeline Transportation ²⁶	0	3,026	0	0	0	3,026
Professional and Business Services ²⁷	8,917	6,447	4,583	11,256	2,795	33,999
Other Services ²⁸	2,075	353	21	1,532	39,892	43,872
Total change from 2022	35,588	52,017	19,075	74,748	72,984	254,411

Table 2. Percent Change in Energy Jobs by Industry and Technology, 2022-2023

	Electric Power Generation	Transmission, Distribution, and Storage	Fuels	Energy Efficiency	Motor Vehicles	Industry Total
Agriculture and Forestry	--	--	1.2%	--	--	1.2%
Mining and Extraction	--	--	0.4%	--	--	0.4%
Utilities	6.7%	4.3%	--	--	--	5.0%
Construction	2.4%	7.3%	9.7%	3.8%	--	4.5%
Manufacturing	1.7%	4.6%	3.7%	5.3%	2.4%	3.1%
Wholesale Trade, Distribution, and Transport	5.0%	-7.5%	1.4%	0.4%	1.3%	-0.1%
Pipeline Transportation	--	5.9%	--	--	--	5.9%
Professional and Business Services	4.7%	4.7%	2.6%	2.3%	4.5%	3.2%
Other Services	5.2%	2.4%	1.1%	3.8%	4.0%	4.0%
Total change from 2022	4.0%	3.8%	1.8%	3.4%	2.8%	3.1%

2023 DEMOGRAPHIC INFORMATION + DIVERSITY

As with other data in this report and in previous USEER reports, demographic information and diversity data is collected from surveys with employers and augmented by data from the Bureau of Labor Statistics (BLS), the Quarterly Census of Employment and Wages (QCEW), and the U.S. Energy Information Administration (EIA).²⁹ A summary of the demographics of the U.S. energy workforce is in Table 3.³⁰ The energy sector is younger than the workforce average, and veterans, Native Americans, and Asian workers are well-represented. Job growth among Hispanic or Latino workers was strong in 2023, holding about one-third of new energy jobs. Women and Black or African American workers remain under-represented in the energy sector.

82%

OF THE ENERGY
WORKFORCE IS
YOUNGER THAN 55

**(COMPARED TO 77% OF
OVERALL WORKFORCE)**

31%

OF THE NEW ENERGY
JOBS IN 2023 WERE
HELD BY HISPANIC OR
LATINO WORKERS

- The energy workforce was younger than the U.S. workforce as a whole. Eighty-two percent of the energy workforce was younger than 55 compared to the national workforce average of 77% (Table 3). Motor vehicles and component parts had the largest share of workers aged 55 and over at 22%.
- Veterans accounted for 9% of the U.S. energy workforce, greater than their representation in the overall U.S. workforce (5%). Veterans made up 10% of the motor vehicles and fuels sectors.
- American Indian or Alaska Native workers accounted for 2% of the energy workforce, which was slightly higher than the U.S. workforce average of 1%.
- Hispanic or Latino workers represented 31% of all new energy jobs in 2023, and 33% of all new clean energy jobs in 2023. The proportion of Hispanic or Latino workers in energy (18%) was just below the national average of 19%.
- The percentage of Asian workers in energy was the same as the national workforce average at 7%.
- Black or African American workers continue to be under-represented in the energy sector. Across all energy technologies, the representation of Black or African American workers was less than their proportion in the overall U.S. workforce. Transmission, distribution, and storage had the highest share of Black or African American workers, at 10% compared to the national average of 13%. Black or African American workers are better represented in traditional fossil energy as well as hydropower and nuclear.

Table 3. United States Energy Workforce Demographics and Characteristics³¹

	Number of Workers	Energy Workforce Average	National Workforce Average
Male	5,943,655	73%	53%
Female	2,107,472	26%	47%
Gender Nonbinary	62,148	<1%	n/a
Hispanic or Latino	1,489,313	18%	19%
Not Hispanic or Latino	6,623,961	82%	81%
American Indian or Alaska Native	179,482	2%	1%
Asian	532,880	7%	7%
Black or African American	718,291	9%	13%
Native Hawaiian or Other Pacific Islander	94,326	1%	<1%
White	6,028,835	74%	76%
Two or More Races	389,933	5%	3%
Unknown Race	170,940	2%	n/a
Veterans	744,128	9%	5%
18 to 29	2,390,642	29%	22%
30 to 54	4,256,560	52%	53%
55 and Over	1,466,073	18%	23%
Disability	180,429	2%	5%
Formerly Incarcerated	114,142	1%	2%
Represented by Unions, Collective Bargaining Agreements, and/or Project Labor Agreements	921,494	11%	7%

National sources: BLS (2023a, 2023b, 2023c, 2023d), Jobs EQ (2022), Prison Policy (2022)

- The energy workforce was largely male at 73%, compared to the U.S. workforce average, which was 53% male. Women make up 26% of the energy workforce but held only 19% of the new energy jobs in 2023.
- Individuals requesting accommodations for disabilities were underrepresented in the energy workforce (2% compared to 5% in the overall U.S. workforce). Individuals requesting accommodations for disabilities worked in EE at a higher rate (3%) than the energy workforce average.
- While 2% of the U.S. workforce was formerly incarcerated, these individuals made up only 1% of the energy workforce.

UNION MEMBERSHIP

The percentage of workers represented by a union or covered under a project labor or collective bargaining agreement in the energy workforce (11%) was over 50% higher than the private sector average (7%), although there was considerable geographic variability. The percentage of workers represented by a union or covered under a project labor or collective bargaining agreement in transmission, distribution, and storage (21%) was considerably higher than the overall energy workforce average (11%).



UNIONIZATION & ENERGY JOBS

Union employers³² reported lower difficulty finding workers than non-union employers in 2023, with 24% of union and 40% of non-union firms reporting that it was “very difficult” to find workers. One explanation for union employers’ relative ease of hiring, especially in the construction trades, is that project labor agreements provide multiple avenues for finding qualified talent, including internal permanent employees, members in union hiring halls, and lateral recruitment from skilled trades workers in the area – as well as developed mechanisms in place that can attract “travelers,” which are union trade workers who belong to local unions from other geographic regions.³³

8% fewer non-union firms reported it was “very difficult” to find workers in 2023 compared to the year prior.

48%

40%

2022

2023

5% fewer union firms reported it was “very difficult” to find workers in 2023 compared to the year prior.

29%

24%

2022

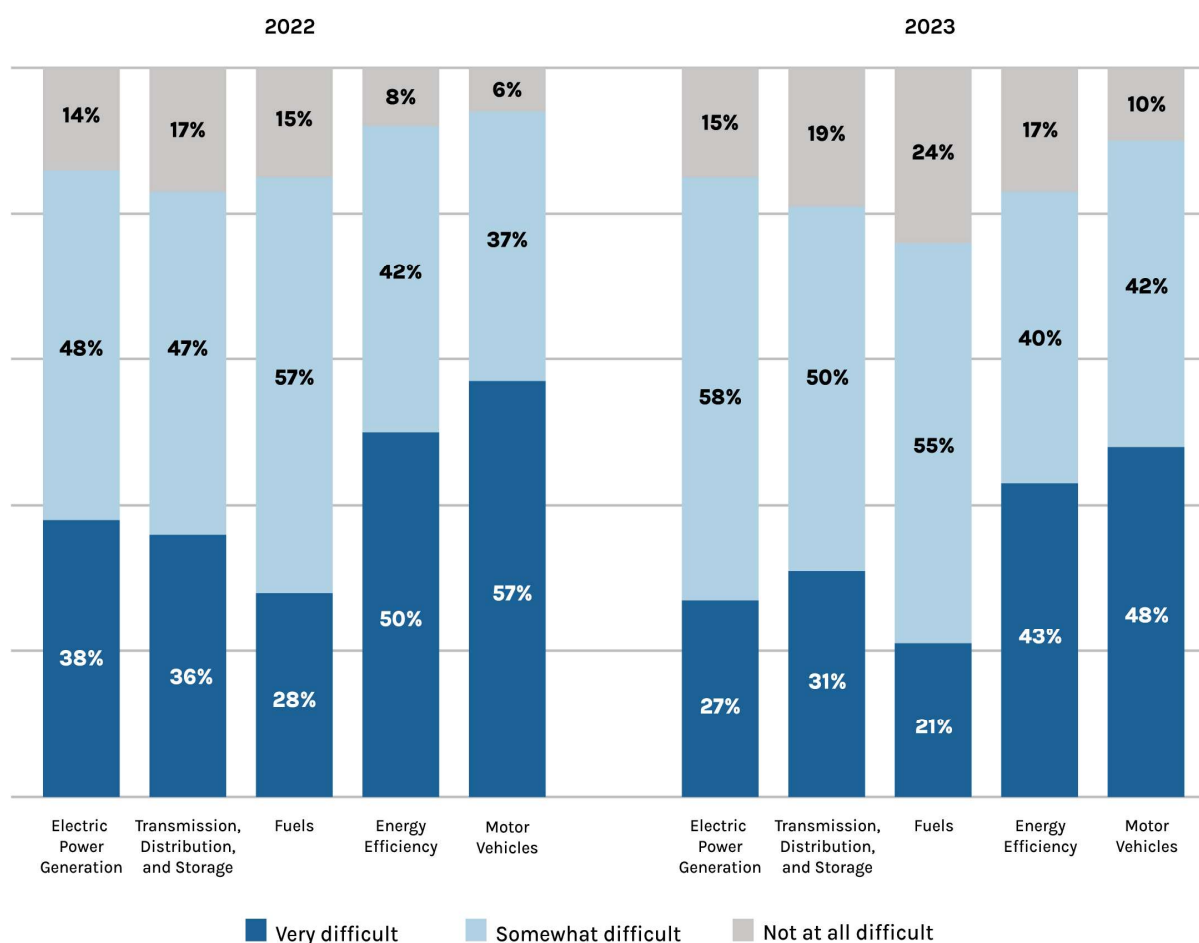
2023

EMPLOYER PERSPECTIVE ON WORKFORCE ISSUES

When asked about their experience “finding qualified workers,” 76% of employers across energy technologies reported at least “some difficulty,” down from 85% in 2022. Motor vehicles (90%) and electric power generation (85%) employers reported the highest overall difficulty among all technologies. Just under half (48%) of all motor vehicles employers indicated that finding qualified workers was “very difficult” in 2023, down from 57% in 2022. Energy efficiency employers had the second largest share of employers responding that it was “very difficult” to find qualified workers at 43%, down from 50% in 2022. (See Figure 5)

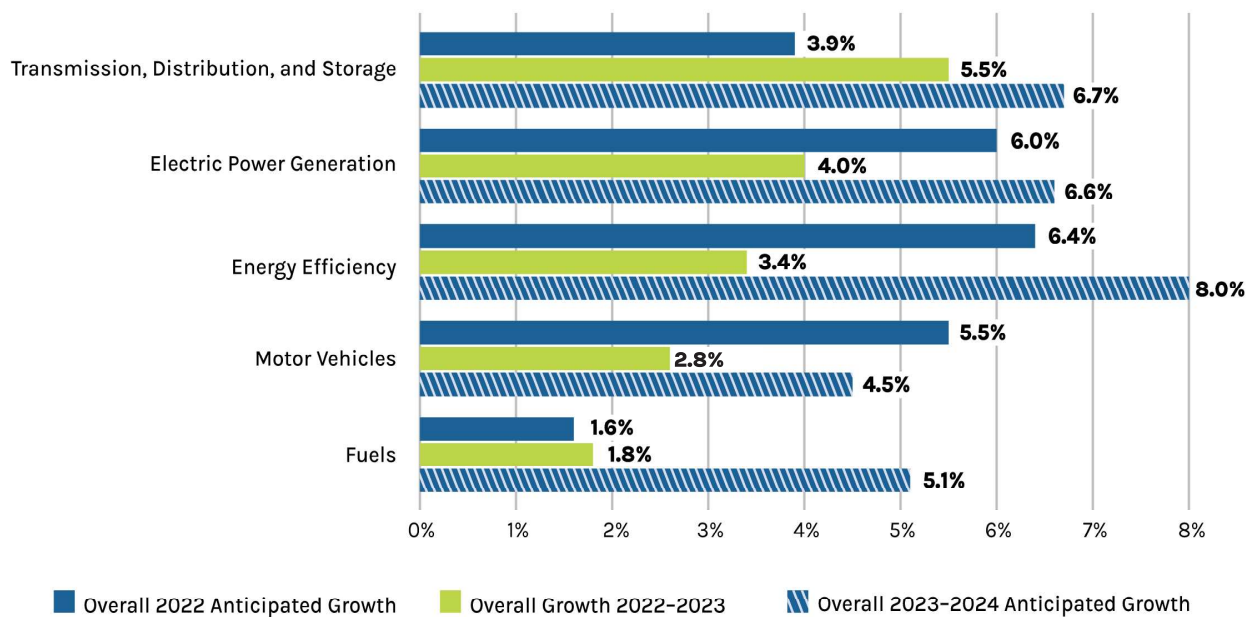
As discussed in a previous section, union employers experienced much lower difficulty finding workers in 2023 than non-union employers (24% of union employers versus 40% of non-union employers reported that hiring was “very difficult”). This difference was also present in the construction industry, where 32% of union construction employers reported that it was “very difficult” to find workers, compared to 47% of non-union employers.

Figure 5. Hiring Difficulty by Technology

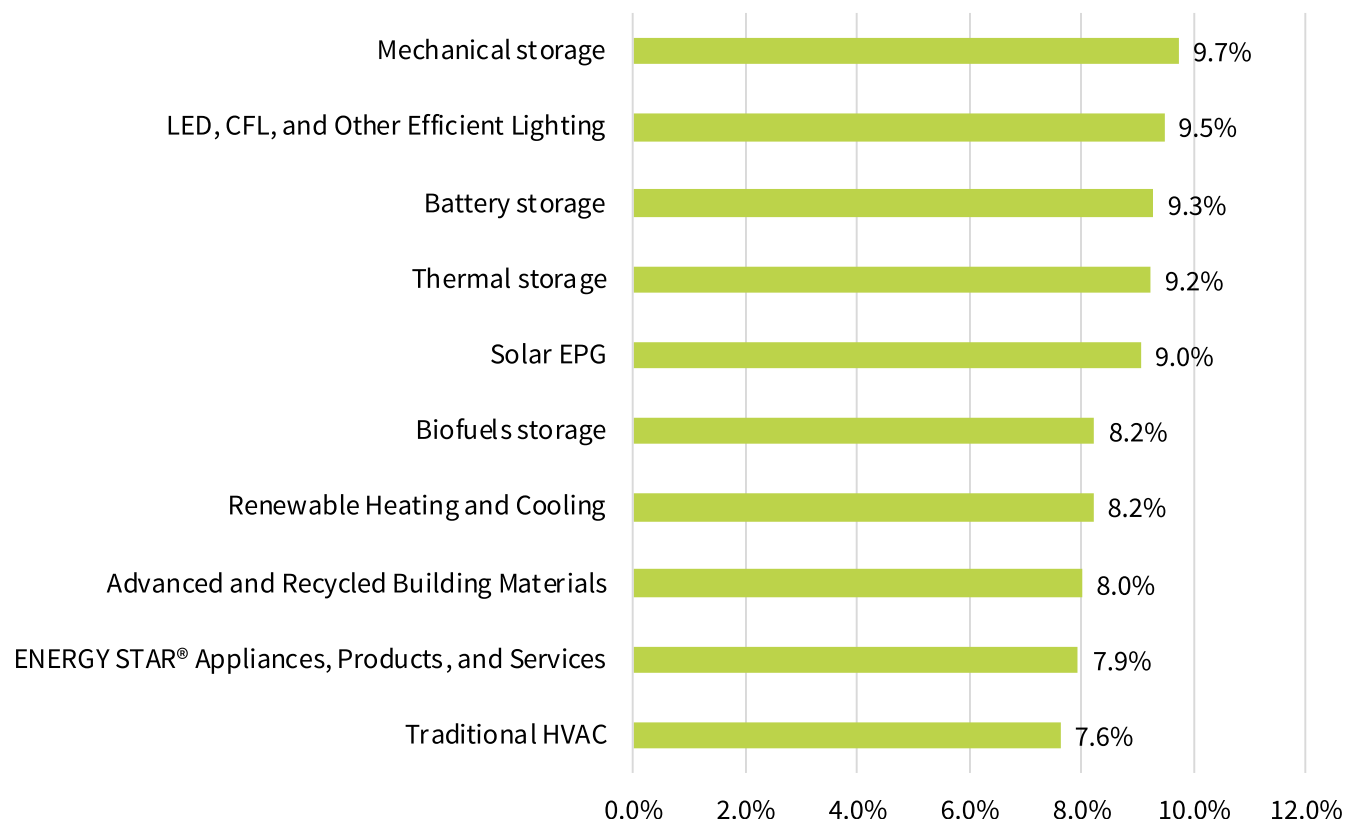


Despite this optimism, past surveys show that employers' expectations are unreliable indicators of the magnitude and direction of such changes. Figure 6 illustrates the actual employment change by technology from 2022 to 2023 compared to employer expectations from the 2022 USEER. Employment in transmission, distribution, and storage and fuels grew more than employer expectations from 2022, with an increase of 5.5% compared to an anticipated growth of 3.9% in transmission, distribution, and storage and 1.8% growth compared to expectations of 1.6% in fuels. Employment in electric power generation, energy efficiency, and motor vehicles grew more slowly than employers had expected from 2022-2023.

Figure 6. Anticipated Employment Change in 2022 and 2023 vs. Actual Employment Change 2022-2023



Surveyed companies in all energy technologies reported that they expect job growth from 2023 to 2024. Companies were asked to report anticipated hiring over the next 12 months, so growth rates are aggregated estimates by each technology area. Anticipated growth was led by energy efficiency (8.0% growth expected by employers), followed by transmission, distribution, and storage (6.7%), electric power generation (6.6%), fuels (5.1%), and motor vehicles (4.5%). Employers in all energy technologies expressed more optimism for future growth this year as compared to last. Figure 7 shows the technologies with the highest projected growth.

Figure 7. Highest Anticipated Growth by Detailed Technology, 2024³⁴

CONCLUSION

In 2023, clean energy investments drove rapid job growth in the energy sector. Just under 5% of all new jobs in the U.S. were in clean energy. Employment in clean energy grew at twice the rate of the otherwise strong growth in the traditional energy sector as well as the overall economy. As jobs expanded, they also got better. The number of workers represented by unions increased, driven by increase utility and construction employment. Employment for military veterans and Latino or Hispanic workers also increased considerably. Latino or Hispanic workers held 1/3 of all new clean energy jobs. The expansion of energy sector employment wasn't only good for workers; it was also good for employers, who reported significantly less difficulty hiring qualified workers than the year prior.

¹ The USEER definition of clean energy is more narrow than most private sector definitions. For the purposes of this report, “clean energy” refers to net-zero emissions aligned technologies. This includes renewable energy, nuclear, non-fossil energy efficiency, zero emission vehicles, and carbon capture, utilization, and storage.

² Bureau of Labor Statistics (BLS) Current Employment Statistics (CES) December 2022 to December 2023 total employment grew 2.1%

³ In USEER, a job is counted in the segment that accounts for the majority (more than 50%) of their qualifying energy-related work time for an energy sector employer, to avoid double counting of energy jobs. So if a worker is spending 60% of their time working in solar and 40% of their time working on EV charging infrastructure, that job would be considered in the solar technology area. If a worker spends 60% of their time on a non-energy technology, such as building data centers, and 40% of their time on energy efficiency, that job would be counted as an energy efficient job in USEER. If a worker performs energy-related work for an employer who is not classified as an energy employer, their job would not be counted — so for example, neither a city building code inspector nor a renewable energy procurement specialist working for a software technology would be counted in USEER.

⁴ Bureau of Labor Statistics (BLS) Current Employment Statistics (CES) December 2022 to December 2023 total employment, not seasonally adjusted.

⁵ Considering all 28,000 supply chain construction jobs as jobs in clean energy, 2023 saw a total of 8.63 million energy jobs, 44% of which are in clean energy. Counting the additional 28,000 construction jobs would mean that clean energy jobs increased by 170,000 in 2023.

⁶ This figure is inclusive of light, medium, and heavy duty vehicles.

⁷ “Other” vehicles, defined as any motor vehicle technology that is not captured in the categories listed previously or a category that is used when unable to split employment into a single motor vehicle category where employees spend “more of their time,” was the only technology category to decrease in employment, losing 4,413 jobs.

⁸ These data do not include battery manufacturing or EV charging, which are included in the Transmission, Distribution, and Storage section. Battery materials processing and manufacturing is not yet included in the USEER survey.

⁹ Union coverage rates among energy workers from the USEER survey mirrored BLS reported statistics in relevant industries. See <https://www.bls.gov/news.release/union2.t03.htm>.

¹⁰ For this analysis, a union employer is defined as one with at least 20% of its workforce as a member of a labor union or covered by either a project labor agreement or a collective bargaining agreement.

¹¹ Question was asked for each demographic group. Union employers were between 43%-150% more likely to have such programs or policies as non-union employers. These findings are consistent with research from other federal agencies in other sectors. See generally, U.S. Department of Treasury, “Labor Unions and the U.S. Economy,” available at: <https://home.treasury.gov/news/featured-stories/labor-unions-and-the-us-economy>.

¹² Commodity flows (air, water, truck, and rail transport of fuels) dropped more than 16,000 jobs between 2022 and 2023, mostly in truck transportation of fuels. According to BLS QCEW, truck transportation (NAICS 484) lost more than 31,000 jobs between Q4 2022 and Q4 2023 economy-wide.

¹³ [A Guidebook to the Bipartisan Infrastructure Law | The White House](#)

¹⁴ [Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action | The White House, cleanenergy.gov](#)

¹⁵ [Investing In America | The White House](#)

¹⁶ <https://www.census.gov/econ/bfs/index.html>

¹⁷ <https://apps.bea.gov/iTable/?reqid=19&step=3&isuri=1&1921=underlying&1903=2031>

¹⁸ Tracked by the U.S. Census Bureau and construction spending on manufacturing defined as all buildings and structures at manufacturing sites. Office buildings and warehouses owned by manufacturing companies but not constructed at a manufacturing site are classified as “office” and “commercial” respectively | U.S. Census Bureau

¹⁹ [Total Construction Spending: Manufacturing in the United States \(TLMFGCONS\) | FRED | St. Louis Fed \(stlouisfed.org\)](#)

²⁰ Includes traditional natural gas generation and advanced natural gas generation (combined cycle, etc.)

²¹ Total electric vehicle charging locations increased from 55,015 in December 2022 to 61,667 in December 2023, a growth rate of 12.1%. Source: U.S. Energy Information Administration (EIA), Monthly Energy Review, April 2024, Appendix F Table F1. Electric Vehicle Charging Infrastructure.

²² Heat pumps are considered ENERGY STAR Appliances, Products, and Services rather than traditional HVAC.

²³ Motor vehicles include light, medium, and heavy duty vehicles, excluding the operations of those vehicles.

²⁴ This includes the addition of 2,086 jobs in wholesale trade and the loss of 16,382 jobs in commodity flows.

²⁵ This includes the addition of 9,811 jobs in wholesale trade and the loss of 5,489 jobs in commodity flows.

²⁶ This does not include pipeline construction. Pipeline construction falls under the NAICS 23712 code, which is construction.

²⁷ Includes companies and organizations in NAICS 51-56 supersectors. Sample for USEER includes R&D at universities, think tanks, and national labs (NREL, NETL, Oak Ridge, etc.).

²⁸ Other services includes repair and maintenance, business and industry associations, and other jobs associated with energy from the BLS NAICS 81 supersector.

²⁹ Depending on an employer’s source of data, the demographic data (particularly for the race and ethnicity of workers) reported by employers could vary from the race and ethnicity individuals would report for themselves.

³⁰ For more information on diversity in the U.S. energy workforce, please see: <https://www.naseo.org/data/sites/1/documents/publications/Workforce%20Diversity%20Data%20Findings%20MASTER%20Final42.pdf>

³¹ For more information about the definition of different demographics categories and how the questions are framed see Appendix B.

³² For this analysis, a union employer is defined as one with at least 20% of its workforce as a member of a labor union or covered by either a project labor agreement or a collective bargaining agreement.

³³ See generally, U.S. Department of Labor, “Project Labor Agreement Resource Guide,” available at: <https://www.dol.gov/general/good-jobs/project-labor-agreement-resource-guide>.

³⁴ Includes the 10 detailed technologies with the highest anticipated growth within the energy sector.