

The COVID-19 pandemic fueled historic job losses in the United States.¹ At the end of 2020, the U.S. unemployment rate was 6.7 percent, and 10.7 million Americans were unemployed,² not including the approximately 17 percent of Americans who held part-time jobs.³

In April 2020, U.S. peak unemployment reached 14.8 percent—the highest since data collection started in 1948;⁴ in fact, these economic declines were the worst seen since the Great Depression. The U.S. energy sector was similarly impacted, shedding nearly one in six jobs by May of 2020.

The energy industry remained at 10 percent below pre-COVID-19 employment levels as of the last quarter of 2020, at roughly 840,000 workers less than during peak employment at the end of 2019. Even so, U.S. energy jobs were less impacted and more resilient compared to other industries. In fact, energy job losses were lower than other industry clusters including: Tourism, Hospitality, and Recreation; Information and Communications; Other Services (including repair and maintenance); Defense, Aerospace, and Transportation Manufacturing; Retail; Professional and Business Services; and Building and Design.⁵

The energy sector is an important contributor to the U.S. economy: not only did it grow twice as fast as the overall economy from 2015 through 2019, but energy jobs also generally pay higher hourly wages compared to the national median and other sectors of the economy across all energy technology sectors and nearly all energy industry sectors. The median hourly wage for all energy workers is \$25.60—this is 34 percent higher than the national median hourly wage at \$19.14. On average, energy jobs also pay more than other specific sectors that have been hit hard by the pandemic. For example, the national median hourly wage for energy is 95 percent

¹ EFI et al., Wages, Benefits, and Change Report, 37. It is also important to note that the oil and gas job losses reflected the impacts of the crash in oil demand and prices. See generally: <https://oilprice.com/Energy/Energy-General/The-US-Lost-120000-Oil-Gas-Jobs-In-2020.html#:~:text=Around%20120%2C000%20jobs%20were%20lost,a%20new%20analysis%20this%20week>.

² Bureau of Labor Statistics, U.S. Department of Labor, "The Employment Situation--December 2020," news release no. USDL-21-0002, January 8, 2021, 2, https://www.bls.gov/news.release/archives/empsit_01082021.pdf.

³ EFI et al., Wages, Benefits, and Change Report, 2.

⁴ Gene Falk et al., *Unemployment Rates During the COVID-19 Pandemic: In Brief—Updated January 12, 2021* (Washington, D.C.: Congressional Research Service, 2021), 1, <https://fas.org/sqp/crs/misc/R46554.pdf>.

⁵ EFI et al., Wages, Benefits, and Change Report, 37.

higher than that for retail (\$13.16) and 120 percent higher than that for accommodation and food service (\$11.64).⁶

First published in 2016 and 2017 by the U.S. Department of Energy, the USEER offers unique insights into the individuals who meet the nation's energy needs; it also identifies important trends and skillsets for the 21st century energy workforce. The USEER portfolio of reports documents the robust job creation record of the energy sector from 2015 through 2019, comparative resilience during 2020, and the energy sector's wages and benefits advantages, underscoring the important role of the energy sector in reinvigorating the U.S. economy and creating the quality jobs Americans need and deserve.

⁶ EFI et al., Wages, Benefits, and Change Report, 6.



Fuels

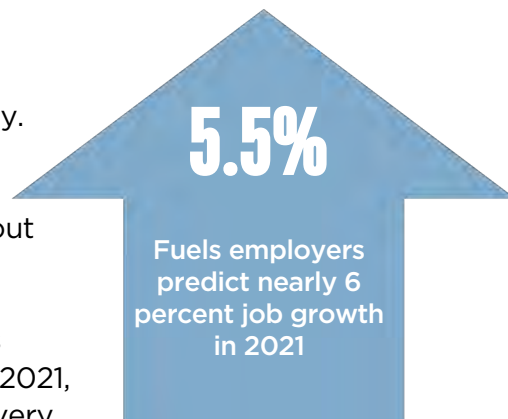
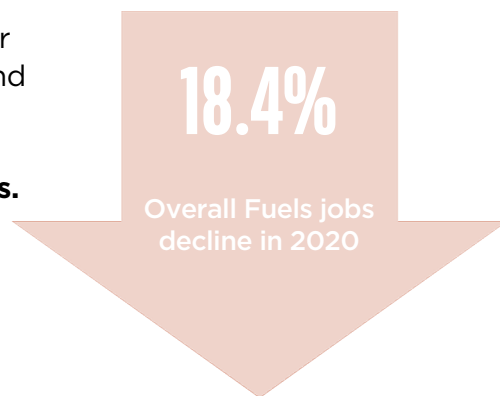


United States Energy & Employment Report

Fuels employment encompasses all work related to fuel extraction, mining, and processing, including petroleum refineries and firms that support coal mining, oil, and gas field machinery manufacturing. Workers across both the forestry and agriculture sectors who support fuel production with corn ethanol, biodiesels, and fuel wood are also included in the fuels employment data. Fuels employment also includes the production of nuclear fuels for power plants.

Trends

- 2020 Job Losses.** In 2020, the Fuels sector lost 211,201 jobs, an 18.4 percent decline, and totaled 937,693 jobs.
- Oil and Gas Experienced Steepest Declines.** Oil and natural gas fuel employers lost the most jobs, more than 186,000 or nearly 21 percent altogether; in 2020 these two sub-sectors employed 495,210 and 209,970 workers, respectively.
- Coal Losses.** Coal fuels jobs declined by 15,005 jobs (nearly 20 percent), totaling 60,438.
- Biofuels.** Biofuels dropped less precipitously. Corn ethanol employment declined by about 4 percent, or 1,360 jobs, woody biomass and other biofuels declined by about 5 percent, or 3,571 jobs.
- 2021 Expectations.** Employers in the Fuels sector anticipate 5.5 percent job growth in 2021, with most of the increase expected in recovery of the petroleum and natural gas industries.



Employment Snapshot

Figure A-1.
Fuels – Employment by Industry, 2019-2020

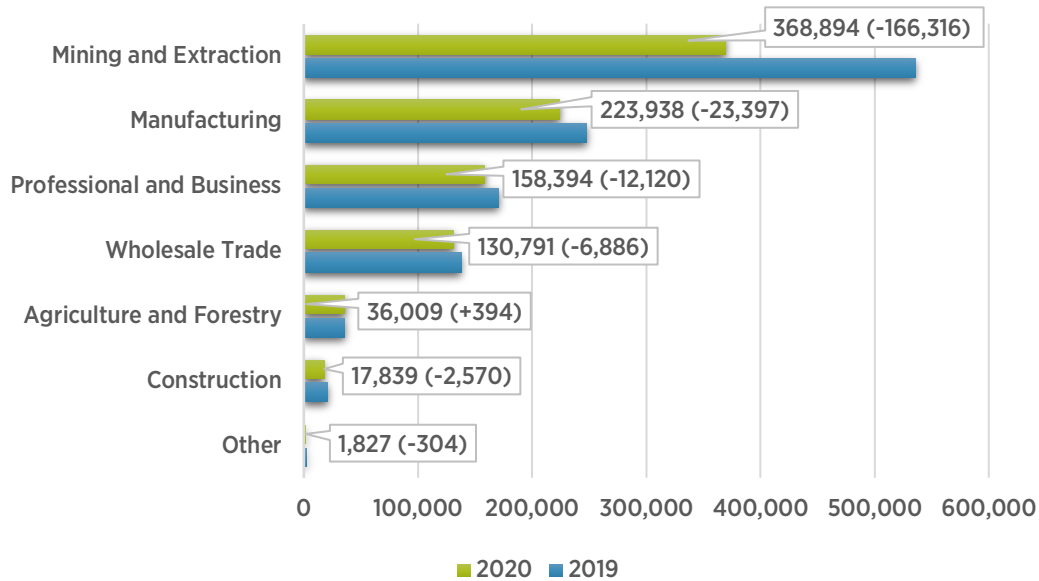
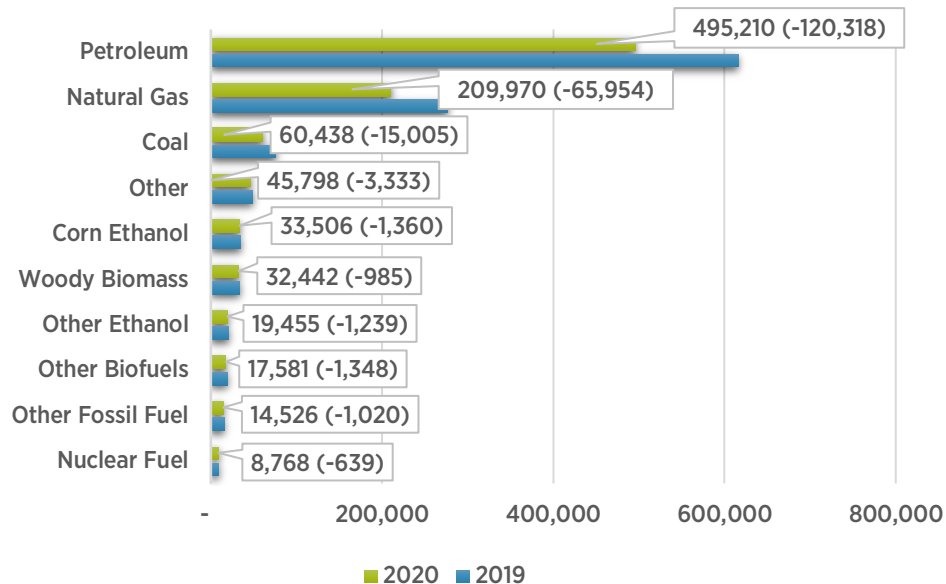


Figure A-2.
Fuels – Employment by Detailed Technology Application, 2019-2020



Note: Other fossil fuels include any other natural fuels such as coal or gas that were formed in the geological past from the remains of living organisms.

Key Takeaways

- Mining and extraction declined by the greatest margin (31 percent), or more than 166,000 jobs.
- Petroleum fuels declined by the greatest amount (a loss of 120,318 jobs or 19.5 percent), followed by natural gas fuels (a loss of 65,954 jobs or 23.9 percent), and coal fuels (a loss of 15,005 jobs or 19.9 percent).

Table 1.7
Fuels Sector – Employment by Detailed Technology Application and Industry, Q4 2020

	TOTAL	AGRI-CULTURE	MINING + EXTRACTION	CONSTR-UCTION	MANU-FACTURING	WHOLESALE TRADE	PROFESSIONAL SERVICES	OTHER SERVICES
Coal ⁸	60,438	0	42,313		9,635	978	7,490	22
Petroleum	495,210	0	218,315	17,839	137,497	56,605	63,762	1,191
Natural Gas	209,970	0	107,925		40,988	28,127	32,777	153
Other Fossil Fuel	14,526	0			2,781	6,839	4,810	96
Corn Ethanol	33,506	15,589			9,005	6,158	2,656	97
Other Ethanol	19,455	2,559			2,566	5,186	9,080	64
Woody Biomass	32,442	17,860			4,176	975	9,391	39
Other Biofuels	17,581	0			1,009	1,570	14,972	29
Nuclear Fuel	8,768	0	341		2,794	882	4,751	-
Other ⁹	45,798	0			13,488	23,469	8,704	137
TOTAL	937,693	36,009	368,894	17,839	223,938	130,791	158,394	1,827

⁷ Column and row totals may differ due to rounding.

⁸ Coal numbers include both thermal and metallurgical coal.

⁹ Other fuels includes employers that are not able to assign their workers to a single detailed technology application.

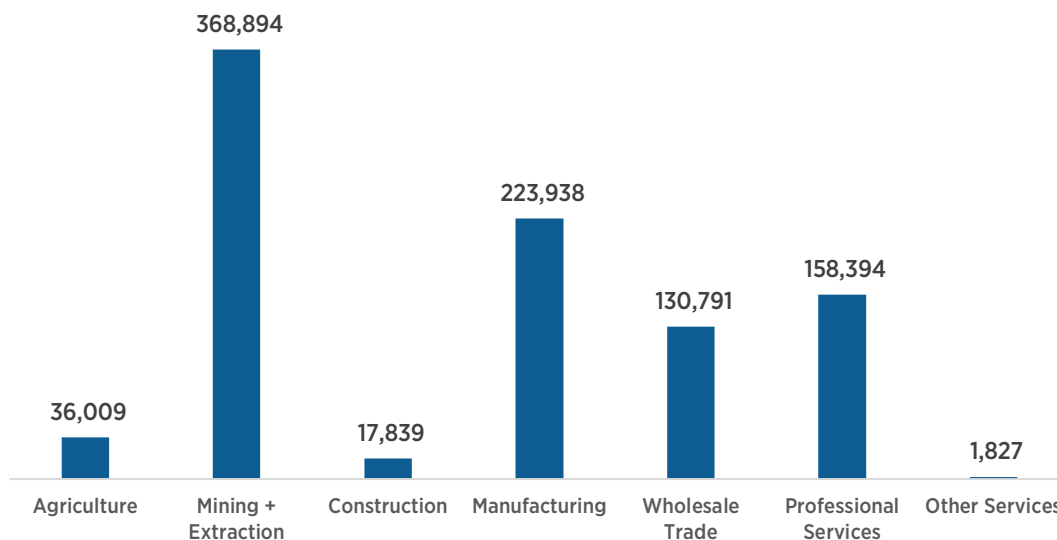
Hiring Difficulty

- **Eighty-nine percent of employers in Fuels** reported that it was somewhat difficult or very difficult to hire new employees. Forty-four percent reported it was very difficult.
- **Eighty-seven percent of manufacturing employers** reported that it was either somewhat difficult or very difficult to hire new employees.
- **Fourteen percent of professional and business services employers in the Fuels sector** reported that it was not at all difficult to hire new employees.
- **Seven percent of employers in Fuels** reported having an inadequate number of employees but were not hiring.

Introduction

The Fuels sector employed 937,693 workers in 2020, compared to the previous year’s level of 1,148,893 jobs. This represents a drop in employment of more than 18 percent. Oil and gas extraction and support services reached its recent peak employment in the fall of 2014 with 541,000 jobs, while coal mining and extraction reached its recent peak in 2012 with just under 90,000 jobs. In the fourth quarter of 2020, these comparable employment figures were at 326,240 and 42,313, respectively.¹⁰ Nuclear mining and extraction employed another 341.

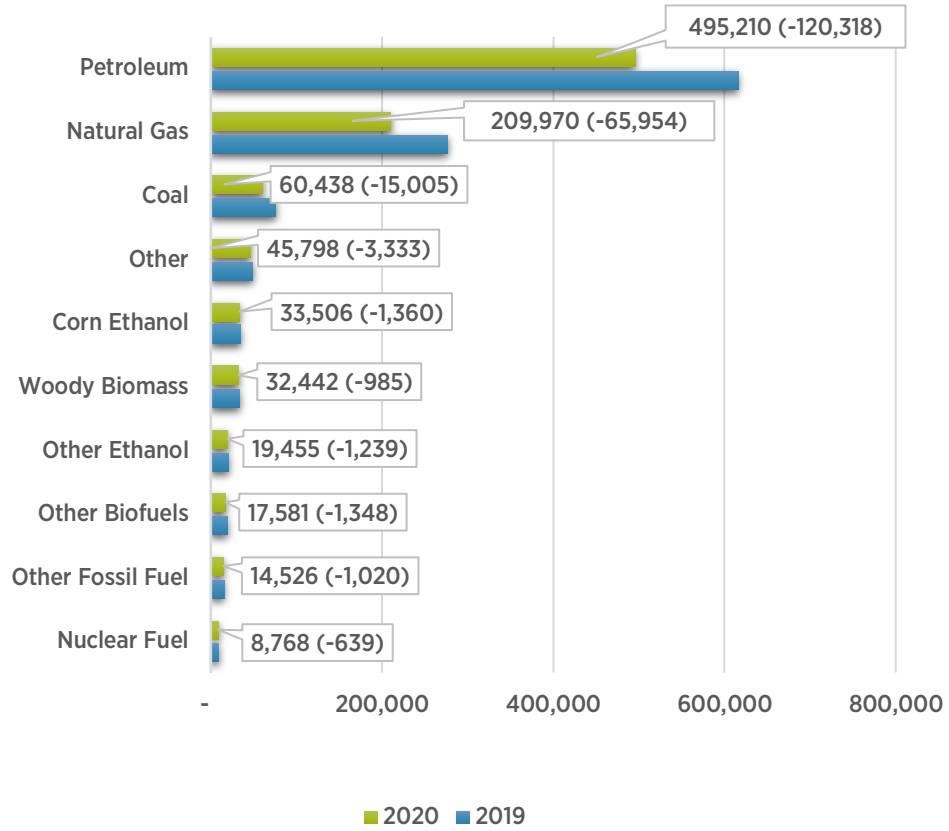
Figure 1.
Fuels Sector - Employment by Industry, Q4 2020



As shown in Figure 2, the 2021 USEER finds declines in 2020 for both petroleum jobs (more than 120,300 jobs lost, for a total of 495,210) and natural gas jobs (nearly 66,000 jobs lost, for a total of 209,970 jobs). Overall, employers in the Fuels sector project to see employment increase by almost 6 percent in 2021.

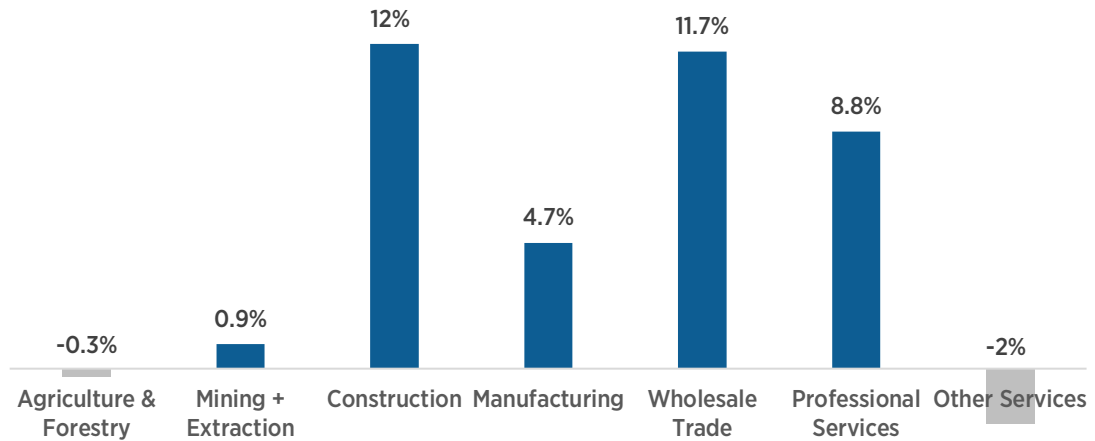
¹⁰ Job figures from BLS Quarterly Census of Employment and Wages (QCEW) data, not USEER extrapolated employment, since comparable USEER data does not exist for 2012 and 2014.

Figure 2.
Fuels Sector - Employment by Detailed Technology Application, 2019-2020



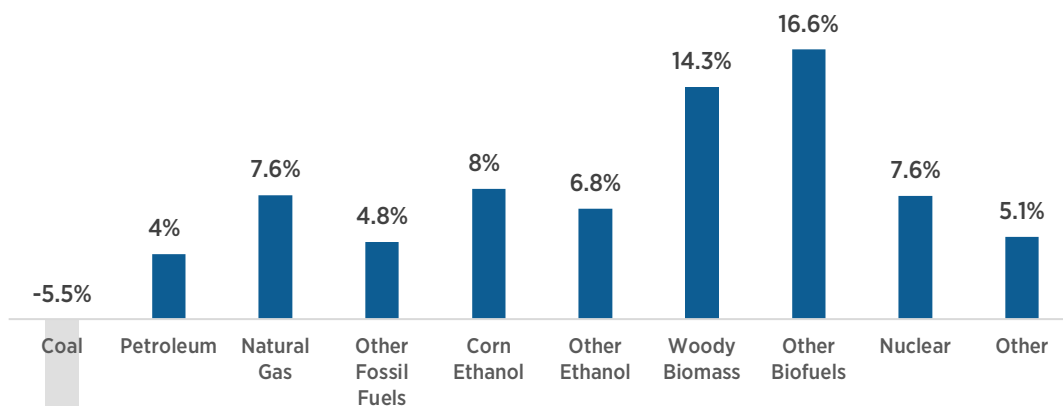
Construction employers and professional services firms in the Fuels sector expect an increase in employment of 12 percent and 9 percent in 2021, respectively, as shown in Figure 3.

Figure 3.
Fuels Sector - Expected Employment Growth by Industry (Q4 2020 - Q4 2021)



Oil and gas firms, the largest source of employment within the Fuels sector, predict continued growth in 2021, as do corn ethanol and other biofuels employers.

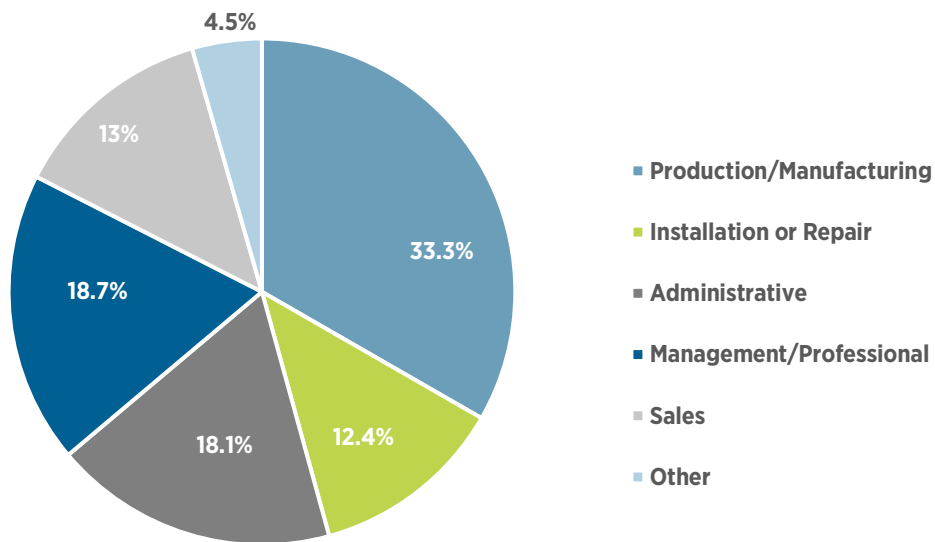
Figure 4.
Fuels Sector - Expected Employment Growth by Detailed Technology (Q4 2020 - Q4 2021)



Workforce Characteristics

About a third of employment within the Fuels sector is concentrated in production and manufacturing positions, followed by management and professional occupations at 19 percent and administrative positions (18 percent). The remaining employment is spread across installation and repair, sales, and other services.

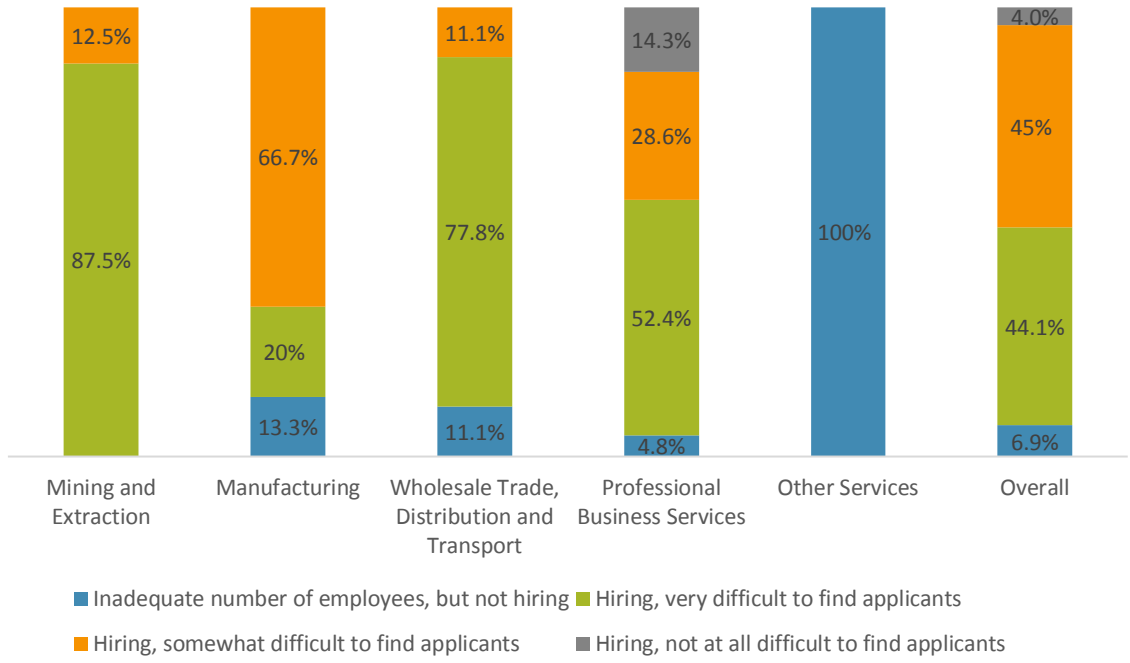
Figure 5.
Fuels Sector – Occupational Distribution, Q4 2020



All mining and extraction employers reported difficulty hiring qualified candidates, and 88 percent found hiring new employees very difficult. In manufacturing, the second largest segment, 87 percent of employers found hiring new employees either somewhat difficult or very difficult in 2020.¹¹

¹¹ It should be noted that hiring difficulty was asked only of employers who indicated that they had searched for new workers in 2020; this was a small sample size of surveyed energy employers, and applies to all sections where hiring difficulty is described throughout the remainder of the report.

Figure 6.
Fuels Sector – Hiring Difficulty by Industry, Q4 2020



Women made up only 26 percent of employment in the Fuels sector. The Fuels sector had lower proportions of both Black or African American and Hispanic or Latino employees, compared to national workforce averages. At 9 percent, the Fuels sector's percentage of employment of veterans exceeded the national average.

Table 2.
Fuels Sector – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages ¹²
Male	694,549	74%	52%
Female	243,145	26%	48%
Hispanic or Latino	111,402	14%	17%
Not Hispanic or Latino	826,292	88%	83%
American Indian or Alaska Native	14,406	2%	1%
Asian	48,347	5%	7%
Black or African American	72,786	8%	13%
Native Hawaiian or other Pacific Islander	6,975	1%	0%
White	722,943	77%	76%
Two or more races ¹³	72,236	8%	2%
Veterans	88,314	9%	6%
55 and over	184,101	20%	23%
Union Coverage	54,946	6%	6%

¹² All demographic information in this table and subsequent demographic tables in this report (except union membership and veteran status) are from data in "Quarterly Workers Indicators," U.S. Census Bureau, U.S. Department of Commerce, [qwexplorer.ces.census.gov](https://www.ces.census.gov). Data reported is the average of four quarters of private workforce ending in Q4 2020.

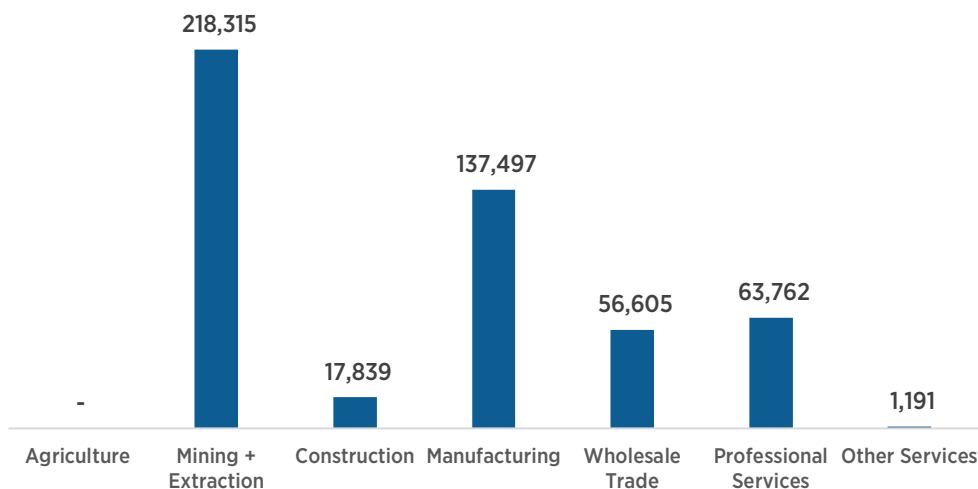
Information on private union membership is from "Table 1: Union affiliation of employed wage and salary workers by occupation and industry, 2019-20 annual averages," in U.S. Department of Labor, Bureau of Labor Statistics, "Union Members Summary," news release, January 22, 2021, <https://www.bls.gov/news.release/pdf/union2.pdf>. Information on veteran status is from "Table A. Employment status of the civilian noninstitutional population 18 years and over by veteran status, period of service, and sex, 2019-2020 annual averages" in U.S. Department of Labor, Bureau of Labor Statistics, "Employment Situation Of Veterans," news release, May 18, 2021, <https://www.bls.gov/news.release/pdf/vet.pdf>.

¹³ While federal guidelines were followed in administering the demographic questions, respondents may have reported two or more races as including Hispanic or Latino ethnicity, inappropriately inflating the total and deflating other racial categories in this and subsequent demographic tables in this report.

Petroleum Fuels

Petroleum fuels employed a total of 495,210 workers across the nation in 2020. Over the course of 2020, petroleum fuels jobs declined by 120,318 jobs, or 19.5 percent. Mining and extraction accounted for nearly half of the industry, while manufacturing made up more than one-third of petroleum fuels employment in 2020.

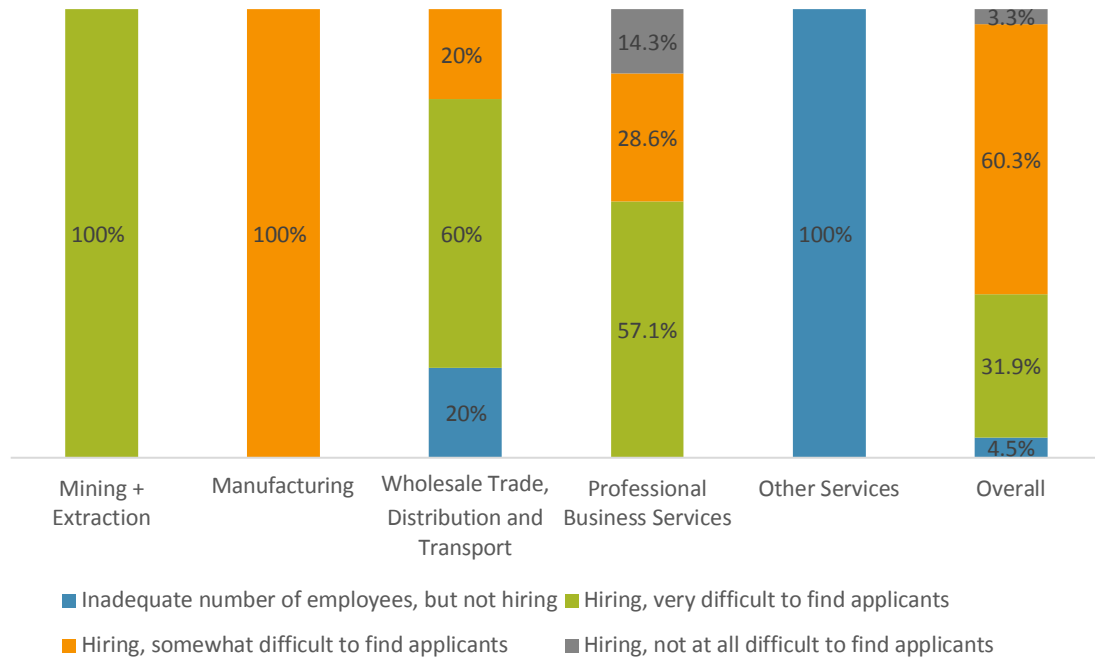
Figure 7.
Petroleum Fuels - Employment by Industry



Employers in the petroleum fuels industrial sectors experienced high degrees of difficulty in hiring new workers in 2020—92 percent of petroleum fuels employers reported that hiring new workers was somewhat difficult or very difficult, and 86 percent of professional business services employers reported that hiring was somewhat difficult or very difficult (with 57 percent reporting that hiring was very difficult).¹⁴

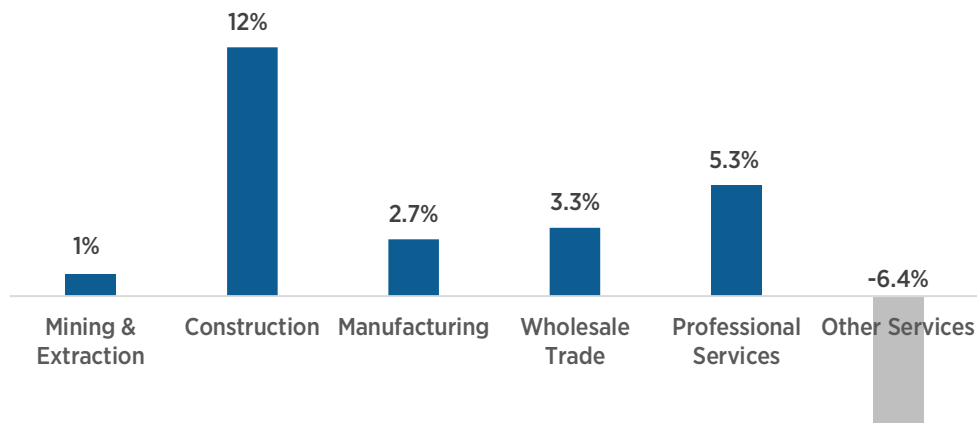
¹⁴ Some industries are omitted from this discussion due to their small sample size in the data contributing to Figure 8. Conclusions have been made only about industries with sufficient sample size.

Figure 8.
Petroleum Fuels - Hiring Difficulty by Industry



Employers in petroleum fuels expect an average of 4 percent growth in 2020. This is led by the construction sector, in which employment growth is projected at 12 percent in 2021. The professional services sector expects roughly 5 percent growth. Mining and extraction, the largest sector, expects moderate additional growth in 2021.

Figure 9.
Petroleum Fuels - Expected Employment Growth by Industry (Q4 2020 - Q4 2021)



In 2020, female employees made up only 25 percent of the workforce in petroleum fuels. Black or African American and Hispanic or Latino workers were also below national workforce averages.

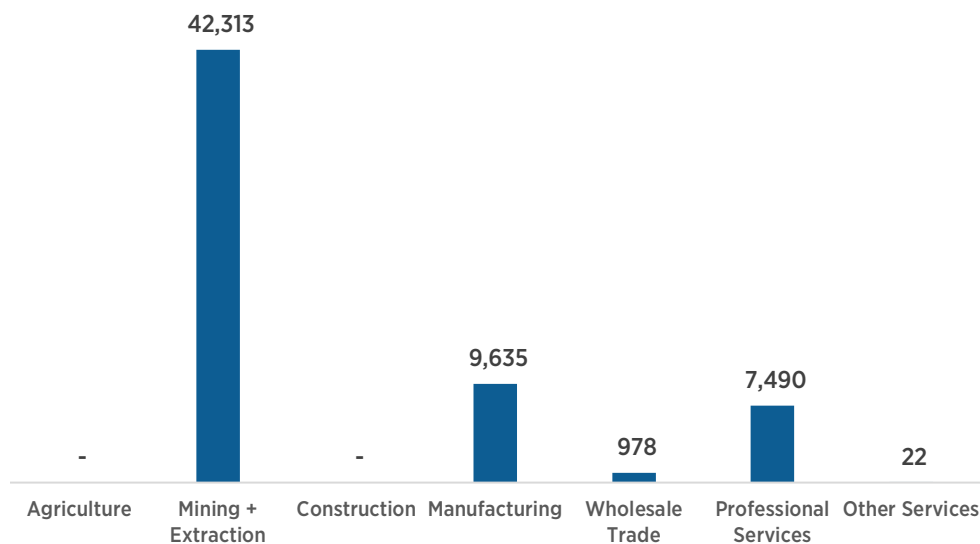
Table 3.
Petroleum Fuels - Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	371,934	75%	52%
Female	123,276	25%	48%
Hispanic or Latino	63,831	13%	17%
Not Hispanic or Latino	431,379	87%	83%
American Indian or Alaska Native	8,618	2%	1%
Asian	28,086	6%	7%
Black or African American	44,846	9%	13%
Native Hawaiian or other Pacific Islander	4,173	1%	0%
White	372,174	75%	76%
Two or more races	37,314	8%	2%
Veterans	42,227	9%	6%
55 and over	93,595	19%	23%
Union Coverage	29,713	6%	6%

Coal Fuels

Coal fuels employed a total of 60,438 workers in the United States in 2020, decreasing by 15,005 jobs, or 19.9 percent compared to 2019. Mining and extraction jobs supported about 70 percent of coal fuels employment in 2020, while manufacturing made up nearly 16 percent. Additional wholesale trade, distribution, and transport jobs that directly support the coal industry are included in the Transmission, Distribution, and Storage chapter and the Coal Industry crosscut on page 100.

Figure 10.
Coal Fuels - Employment by Industry



About nine in ten (88 percent) mining and extraction employers in coal fuels reported that hiring new workers was very difficult during 2020. Eighty-seven percent of manufacturing employers reported that it was very difficult or somewhat difficult. Eighty-nine percent of wholesale trade, distribution, and transport employers reported that hiring was somewhat difficult or very difficult (with 78 percent reporting hiring to have been very difficult).¹⁵

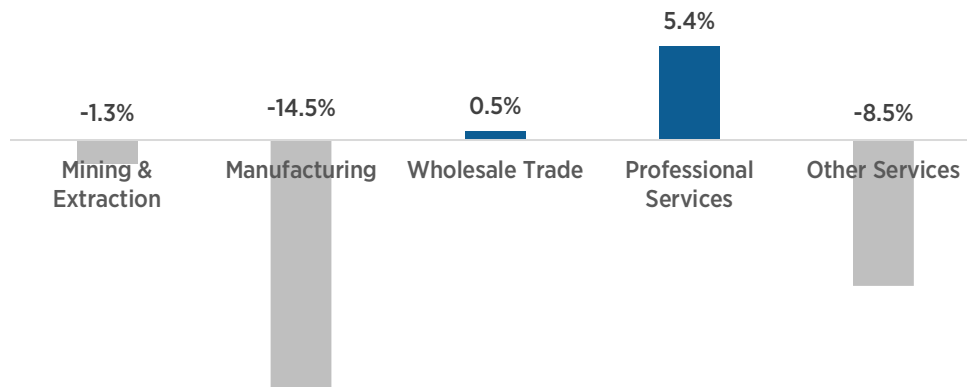
¹⁵ Some industries are omitted from this discussion due to their small sample size in the data contributing to Figure 11. Conclusions have been made only about industries with sufficient sample size.

Figure 11.
Coal Fuels - Hiring Difficulty by Industry



Employers in the coal fuels industry expect to see continued employment decline in 2021. This is led by the manufacturing sector, which expects a nearly 15 percent decline. Professional services and wholesale trade anticipate growth in 2021.

Figure 12.
Coal Fuels - Expected Employment Growth by Industry



Women represented 24 percent of the coal fuels workforce in 2020, up a percentage point for the second year in a row. Black or African American, Hispanic or Latino, and Asian workers were also below national workforce averages. Union coverage is significant, at 10 percent of all coal fuel workers.

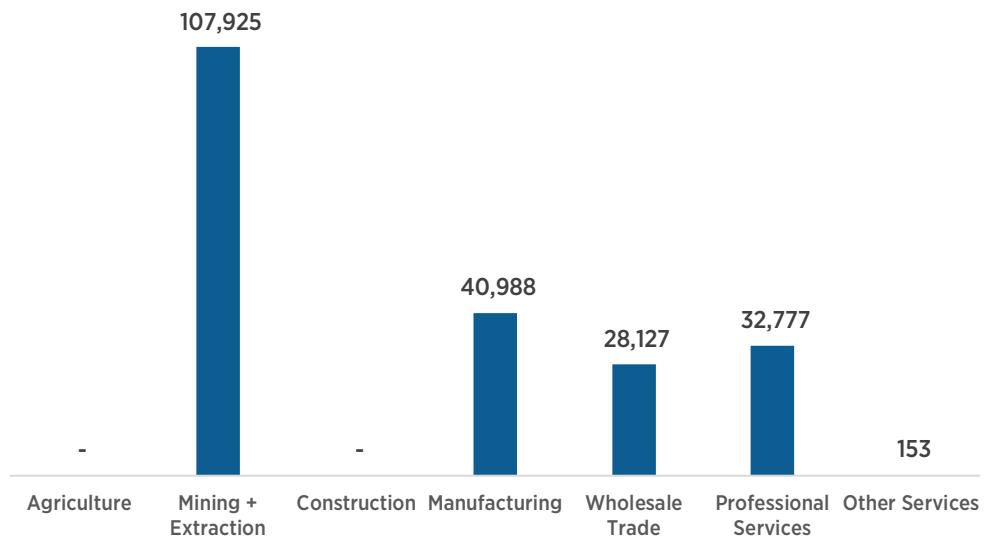
Table 4.
Coal Fuels – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	45,696	76%	52%
Female	14,742	24%	48%
Hispanic or Latino	6,364	11%	17%
Not Hispanic or Latino	54,074	89%	83%
American Indian or Alaska Native	1,092	2%	1%
Asian	2,377	4%	7%
Black or African American	2,374	4%	13%
Native Hawaiian or other Pacific Islander	280	0%	0%
White	50,788	84%	76%
Two or more races	3,527	6%	2%
Veterans	4,895	8%	6%
55 and over	14,185	23%	23%
Union Coverage	6,044	10%	6%

Natural Gas Fuels

Natural gas fuels employed a total of 209,970 workers across the nation in 2020, a drop of nearly 66,000 jobs or nearly 24 percent. Mining and extraction jobs comprised 51 percent of the natural gas fuels industry, while manufacturing jobs comprised about 20 percent of natural gas fuels employment in 2020.

Figure 13.
Natural Gas Fuels - Employment by Industry



The major sectors in natural gas fuels reported difficulty hiring in 2020. Overall, 96 percent of employers reported that hiring new workers had been somewhat difficult or very difficult during 2020. In professional business services, 88 percent of employers reported that hiring new workers had been somewhat difficult or very difficult.¹⁶

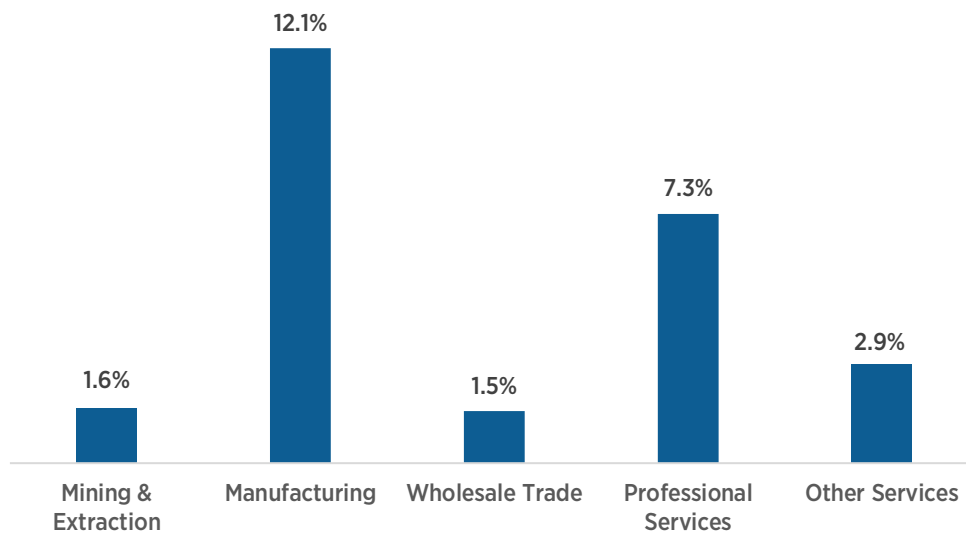
¹⁶ Some industries are omitted from this discussion due to their small sample size in the data contributing to Figure 14. Conclusions have been made only about industries with sufficient sample size.

Figure 14.
Natural Gas Fuels - Hiring Difficulty by Industry



Employers in the natural gas fuels industry expect to rebound with 9 percent growth in 2021. Mining and extraction, the largest sector, predicts moderate growth, while the manufacturing sector expects just over 12 percent growth.

Figure 15.
Natural Gas Fuels - Expected Employment Growth by Industry



Women represented 27 percent of the natural gas fuels workforce. Black or African American, Hispanic or Latino, and Asian workers were below national workforce averages.

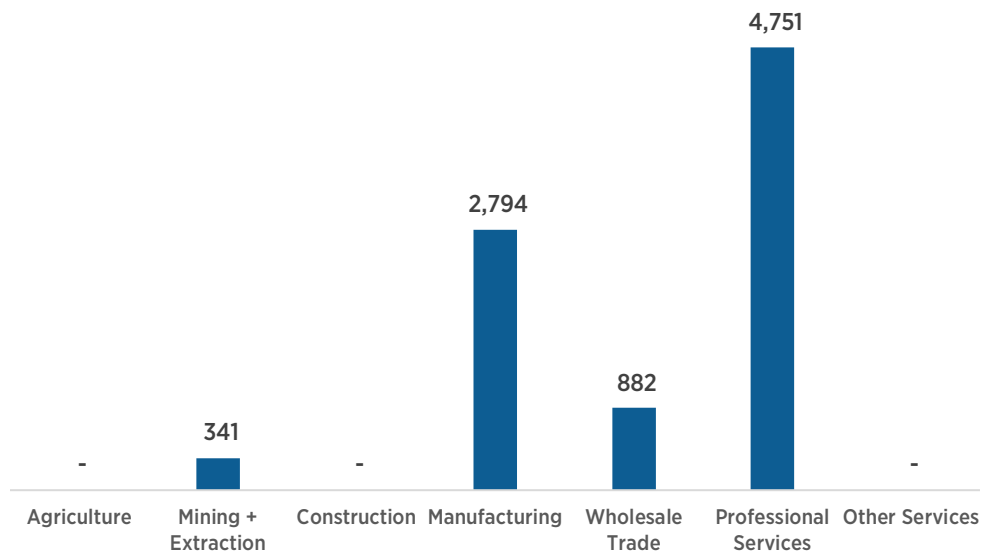
Table 5.
Natural Gas Fuels - Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	153,724	73%	52%
Female	56,246	27%	48%
Hispanic or Latino	24,438	12%	17%
Not Hispanic or Latino	185,532	88%	83%
American Indian or Alaska Native	3,157	2%	1%
Asian	8,617	4%	7%
Black or African American	16,904	8%	13%
Native Hawaiian or other Pacific Islander	1,091	1%	0%
White	157,649	75%	76%
Two or more races	22,552	11%	2%
Veterans	16,728	8%	6%
55 and over	41,740	20%	23%
Union Coverage	10,499	5%	6%

Nuclear Fuels

Nuclear fuels employed a total of 8,768 workers in the United States in 2020. Over the course of 2020, nuclear fuels jobs contracted by nearly 640 positions, or almost seven 7 percent. Professional business services supported more than 54 percent of the nuclear fuels industry, while manufacturing made up nearly 32 percent of nuclear fuels employment in 2020.

Figure 16.
Nuclear Fuels - Employment by Industry



In 2020, 69 percent of nuclear fuels employers reported having an inadequate number of employees but were not hiring. Two-thirds of manufacturing firms reported that hiring new employees was somewhat or very difficult in 2020.¹⁷

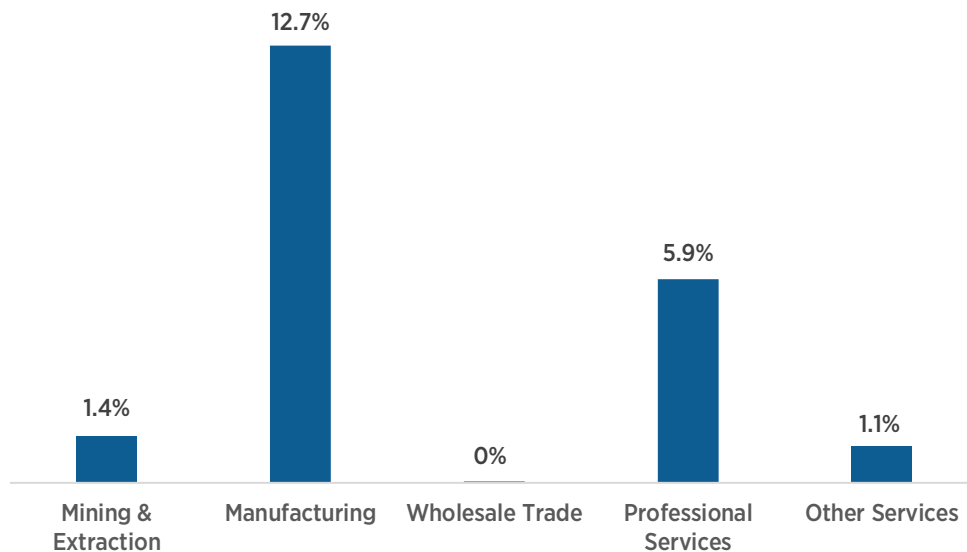
¹⁷ Some industries are omitted from this discussion due to their small sample size in the data contributing to Figure 17. Conclusions have been made only about industries with sufficient sample size.

Figure 17.
Nuclear Fuels - Hiring Difficulty by Industry



Nuclear fuels employers are expecting 7.6 percent job growth in 2021. That growth is driven by expected increases in professional business services employment (5.9 percent growth) and manufacturing employment (12.7 percent growth).

Figure 18.
Nuclear Fuels - Expected Employment Growth by Industry



In 2020, women represented 29 percent of the nuclear fuels workforce. The number of Asian workers in the nuclear fuels industry is above the national average and the number of workers reporting two or more races in the nuclear fuels industry is notably above the national workforce average. Veterans make up 9 percent of the workforce, 3 percentage points higher than the national average.

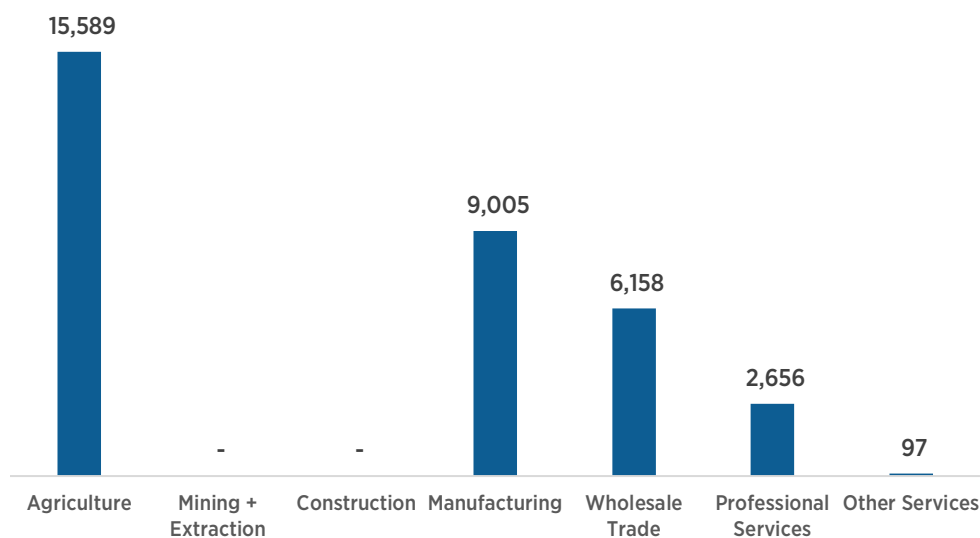
Table 6.
Nuclear Fuels – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	6,195	71%	52%
Female	2,573	29%	48%
Hispanic or Latino	1,218	14%	17%
Not Hispanic or Latino	7,550	86%	83%
American Indian or Alaska Native	85	1%	1%
Asian	714	8%	7%
Black or African American	548	6%	13%
Native Hawaiian or other Pacific Islander	73	1%	0%
White	6,177	70%	76%
Two or more races	1,171	13%	2%
Veterans	799	9%	6%
55 and over	1,292	15%	23%
Union Coverage	526	6%	6%

Corn Ethanol Fuels

Corn ethanol fuels employment represented 3.6 percent of the U.S. Fuels workforce in 2020, accounting for 33,506 jobs, a loss of 1,360 jobs compared to 2019. The largest industrial sector is agriculture, followed by manufacturing and wholesale trade, distribution, and transport. Together these three industries accounted for more than 92 percent of workers, followed by professional and business services at nearly 8 percent.

Figure 19.
Corn Ethanol Fuels - Employment by Industry



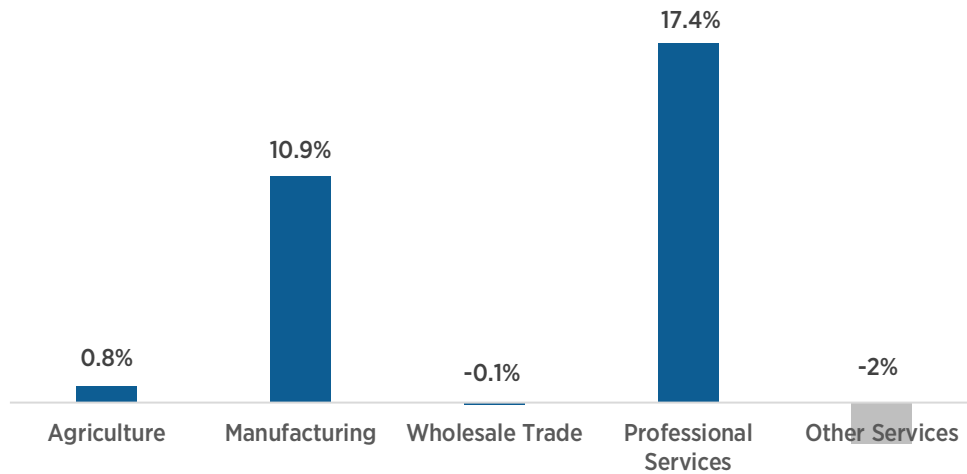
In 2020, 93 percent of employers in corn ethanol reported that hiring was either somewhat or very difficult. In addition, 81 percent of professional business services employers reported that hiring new workers was somewhat difficult or very difficult in 2020.

Figure 20.
Corn Ethanol Fuels - Hiring Difficulty by Industry



Employers in the corn ethanol fuels industry expect 9 percent growth in 2020. Much of that growth is anticipated by employers in the manufacturing and professional services sectors who expect 11 percent and 17 percent growth, respectively.

Figure 21.
Corn Ethanol Fuels - Expected Employment Growth by Industry



In 2020, women represented 30 percent of the corn ethanol fuels workforce. Black or African American, Hispanic or Latino, and Asian workers were also below national workforce averages. A very high percentage (18 percent) of corn ethanol fuel workers are Veterans.

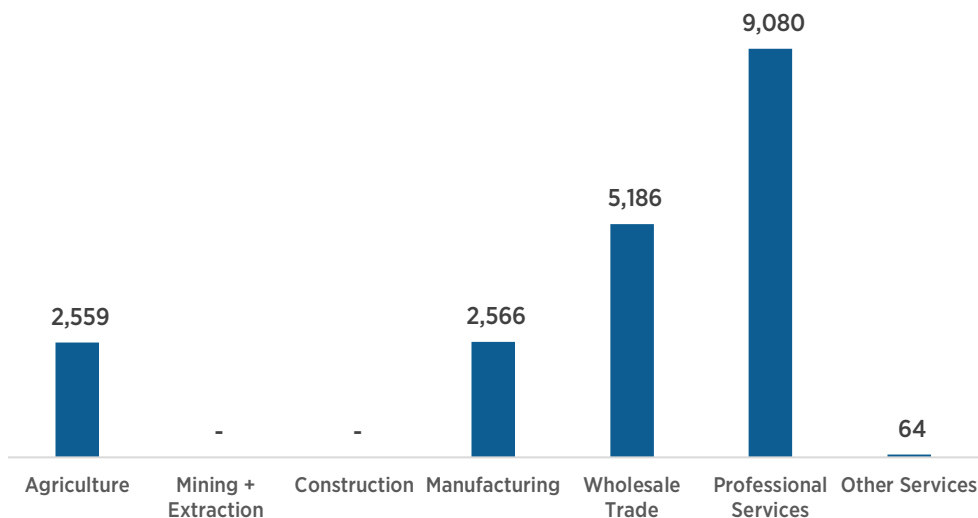
Table 7.
Corn Ethanol Fuels — Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	23,610	70%	52%
Female	9,896	30%	48%
Hispanic or Latino	3,831	11%	17%
Not Hispanic or Latino	29,675	89%	83%
American Indian or Alaska Native	272	1%	1%
Asian	1,806	5%	7%
Black or African American	2,015	6%	13%
Native Hawaiian or other Pacific Islander	221	1%	0%
White	27,390	82%	76%
Two or more races	1,802	5%	2%
Veterans	5,972	18%	6%
55 and over	7,567	23%	23%
Union Coverage	1,675	5%	6%

Other Ethanol and Non-Woody Biomass Fuels, including Biodiesel

Other ethanol and non-woody biomass, including biodiesel,¹⁸ employed about 2 percent of the Fuels workforce in 2020, providing 19,455 jobs, a decrease of 1,239 jobs or 6 percent. Because non-woody biomass represents a small portion of U.S. fuel supply, most of this employment was concentrated in professional and business services, likely research and development and wholesale trade.

Figure 22.
Other Ethanol and Non-Woody Biomass Fuels (Including Biodiesel) - Employment by Industry



In 2020, 81 percent of employers in professional business services reported that hiring was somewhat difficult or very difficult (with 52 percent reporting hiring to have been somewhat difficult).

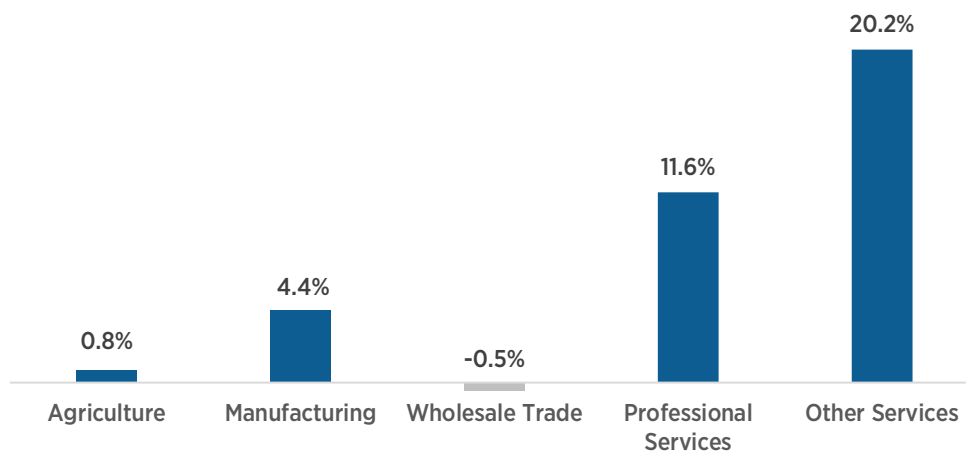
¹⁸ Other Ethanol/Non-Woody Biomass Fuel, including Biodiesel, is fuel made from materials other than cornstarch, such as straw, manure, vegetable oil, and animal fats.

Figure 23.
Other Ethanol and Non-Woody Biomass Fuels (Including Biodiesel) - Hiring Difficulty by Industry



Other ethanol and non-woody biomass fuels employers are expecting nearly 7 percent job growth in 2020, with those hiring growth expectations concentrated in other and professional services.

Figure 24.
Other Ethanol and Non-Woody Biomass Fuels (Including Biodiesel) - Expected Employment Growth by Industry



In 2020, women represented 33 percent of the other ethanol and non-woody biomass fuels workforce. Overall, other ethanol and non-woody biomass employment exceeds national averages for employment of Native Hawaiians or other Pacific Islanders and those reporting two or more races.

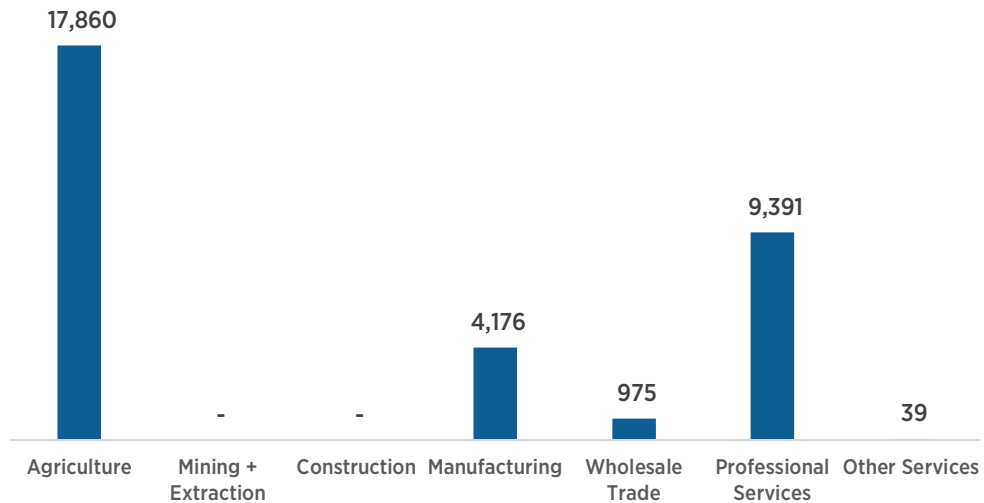
Table 8.
Other Ethanol and Non-Woody Biomass Fuels (Including Biodiesel) –
Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	12,980	67%	52%
Female	6,475	33%	48%
Hispanic or Latino	2,520	13%	17%
Not Hispanic or Latino	16,935	87%	83%
American Indian or Alaska Native	285	1%	1%
Asian	1,428	7%	7%
Black or African American	1,824	9%	13%
Native Hawaiian or other Pacific Islander	313	2%	0%
White	14,564	75%	76%
Two or more races	1,040	5%	2%
Veterans	1,554	8%	6%
55 and over	2,442	13%	23%
Union Coverage	973	5%	6%

Woody Biomass Fuel for Energy and Cellulosic Biofuels

Woody biomass fuel for energy and cellulosic biofuels¹⁹ supported 32,442 jobs across the United States in 2020, nearly 3.5 percent of the Fuels workforce, and lost 985 jobs in 2020. More than half of the employment in woody biomass fuels was found in agriculture, followed by professional services at 29 percent; these two industries accounted for 84 percent of employment.

Figure 25.
Woody Biomass Fuel for Energy and Cellulosic Biofuel – Employment by Industry



For 2020, 81 percent of professional services employers, the second largest industrial sector, reported it was somewhat difficult or very difficult to hire (with 52 percent reporting hiring to have been very difficult).

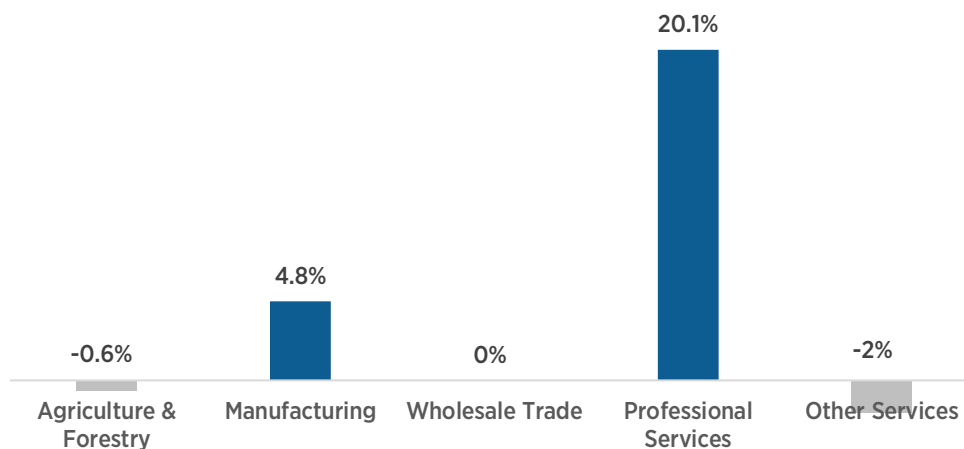
¹⁹ While the survey question asked of respondents covered both woody biomass fuel for energy and cellulosic biofuels, all employment data reported is in woody biomass fuel for energy. Woody Biomass or Cellulosic Biofuel are fuels developed from the by-product of management, restoration, and hazardous fuel reduction treatments, as well as the product of natural disasters, including trees and woody plants (limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment).

Figure 26.
Woody Biomass Fuel for Energy and Cellulosic Biofuel – Hiring Difficulty by Industry



Woody biomass fuels employers are expecting 7 percent job growth in 2021, led by professional business services. However, the largest sector, agriculture and forestry, expects a slight decline in 2021.

Figure 27.
Woody Biomass Fuel for Energy and Cellulosic Biofuel – Expected Employment Growth by Industry



In 2020, women represented 28 percent of the woody biomass fuels workforce. Overall, the workforce for woody biomass fuels is less diverse than the nation as a whole with 6 percent of the workforce reported to be Hispanic or Latino, 5 percent Asian, and 4 percent Black or African American. Similar to corn ethanol employers, a high percentage of employees (15 percent) are Veterans.

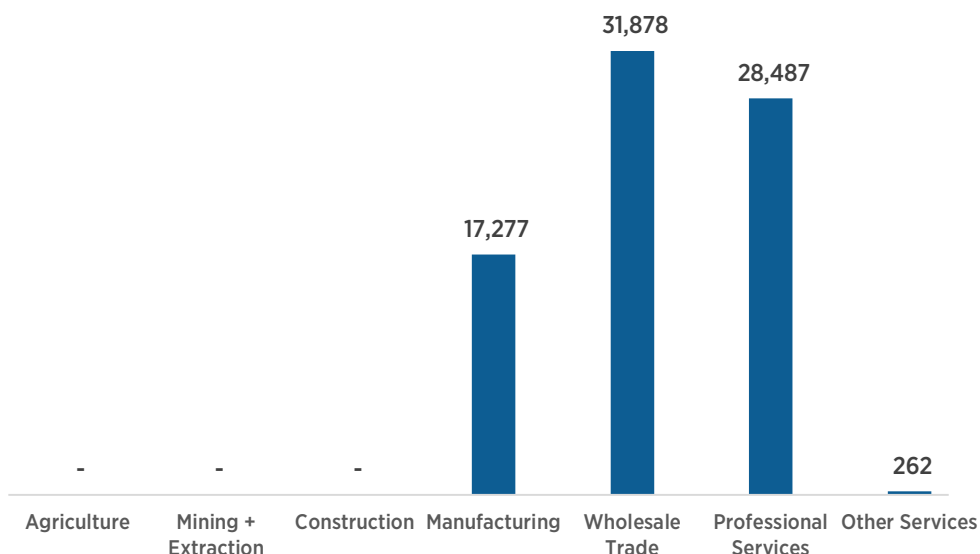
Table 9.
Woody Biomass Fuel for Energy and Cellulosic Biofuel – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	23,322	72%	52%
Female	9,120	28%	48%
Hispanic or Latino	2,056	6%	17%
Not Hispanic or Latino	30,386	94%	83%
American Indian or Alaska Native	273	1%	1%
Asian	1,557	5%	7%
Black or African American	1,246	4%	13%
Native Hawaiian or other Pacific Islander	263	1%	0%
White	27,540	85%	76%
Two or more races	1,562	5%	2%
Veterans	4,713	15%	6%
55 and over	6,645	20%	23%
Union Coverage	1,622	5%	6%

Other Fuels

Other fuels²⁰ comprised 77,904 jobs across the United States in 2020, more than 8 percent of the Fuels workforce, declining by 5,701 jobs. More than 40 percent of that employment was found in wholesale trade, distribution, and transport, followed by professional services with nearly 37 percent of the workforce.

Figure 28.
Other Fuels - Employment by Industry



Employers reported significant difficulty in hiring in other fuels in 2020, with two-thirds of employers reporting that hiring has been somewhat difficult or very difficult (with 61 percent reporting hiring to have been very difficult), and 81 percent of professional service employers reporting similarly.²¹

²⁰ Includes other fossil fuels, other biofuels, and all other fuels. All other fuels includes employers in the Fuels sector that are not able to assign their workers to a single detailed technology application.

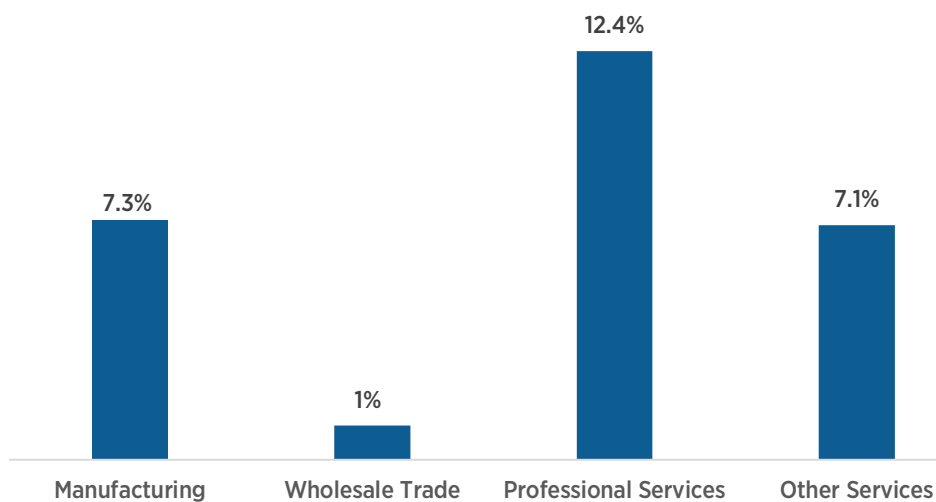
²¹ Some industries are omitted from this discussion due to their small sample size in the data contributing to Figure 29. Conclusions have been made only about industries with sufficient sample size.

Figure 29.
Other Fuels - Hiring Difficulty by Industry



Employers in other fuels expect more than 5 percent growth in 2021. This is influenced by the confidence shown by the manufacturing and professional services sectors, which anticipate just over 7 and 12 percent growth, respectively.

Figure 30.
Other Fuels - Expected Employment Growth by Industry



In 2020, women represented 27 percent of the other fuels workforce. Overall, the workforce for other fuels is less diverse than national workforce averages. It also has a much higher percentage of Veterans than the national workforce average.

Table 10.
Other Fuels - Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	57,089	73%	52%
Female	20,816	27%	48%
Hispanic or Latino	7,145	9%	17%
Not Hispanic or Latino	70,760	91%	83%
American Indian or Alaska Native	625	1%	1%
Asian	3,763	5%	7%
Black or African American	3,028	4%	13%
Native Hawaiian or other Pacific Islander	561	1%	0%
White	66,661	86%	76%
Two or more races	3,268	4%	2%
Veterans	11,426	15%	6%
55 and over	16,634	21%	23%
Union Coverage	3,895	5%	6%



Electric Power Generation



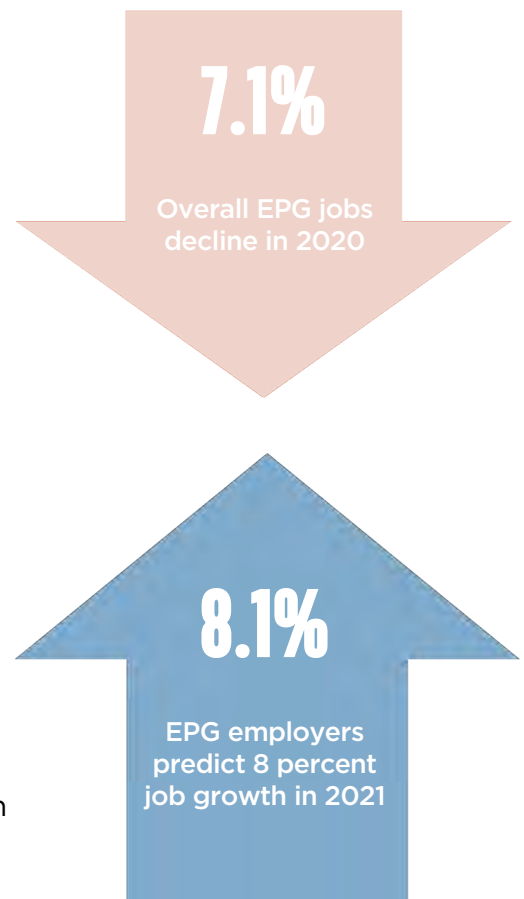
[ENERGY.GOV/USER](https://www.energy.gov/user)

United States Energy
& Employment Report

Electric Power Generation (EPG) covers all utility and non-utility employment across electric generating technologies, including fossil fuels, nuclear, and renewable energy technologies. Also included in the employment totals are any firms engaged in facility construction, turbine and other generation equipment manufacturing, operations and maintenance, and wholesale parts distribution for all electric generation technologies.

Trends

- 2020 Job Losses.** In 2020, the Electric Power Generation sector lost 63,257 jobs, declining by more than 7 percent to a total of 833,573 jobs.
- Wind is a Bright Spot.** Wind generation was the sole growth technology in EPG in 2020, adding 2,043 jobs (1.8 percent growth). All other generation technologies declined. Wind EPG also passed advanced and conventional natural gas generation²² in 2020 to hold the second largest share of employment in the EPG sector (behind solar).
- Solar and Coal Led Declines.** Solar—including PV and CSP—shed almost 29,000 jobs in 2020 (8.3 percent decline) and Coal Generation employment declined by 8,307 (10.4 percent).
- 2021 Expectations.** Electric Power Generation employers anticipated 8.1 percent job growth in 2021, with most of the increase expected in renewable generation construction.



²² Advanced natural gas generation covers efficient, low-emission, leak-free natural gas, including systems that use any of the following technologies: high efficiency compressor, advanced low NOx combustion technology, first application of closed loop steam cooling in an industrial gas turbine, advanced turbine blade and vane materials, high temperature TBC and abradable coatings, advanced row 4 turbine blades, 3-D aero technology, and advanced brush seal. Conventional natural gas generation includes all other technologies that burn natural gas to create electricity.

Employment Snapshot

Figure 31.
Electric Power Generation Sector - Employment by Industry, 2019-2020

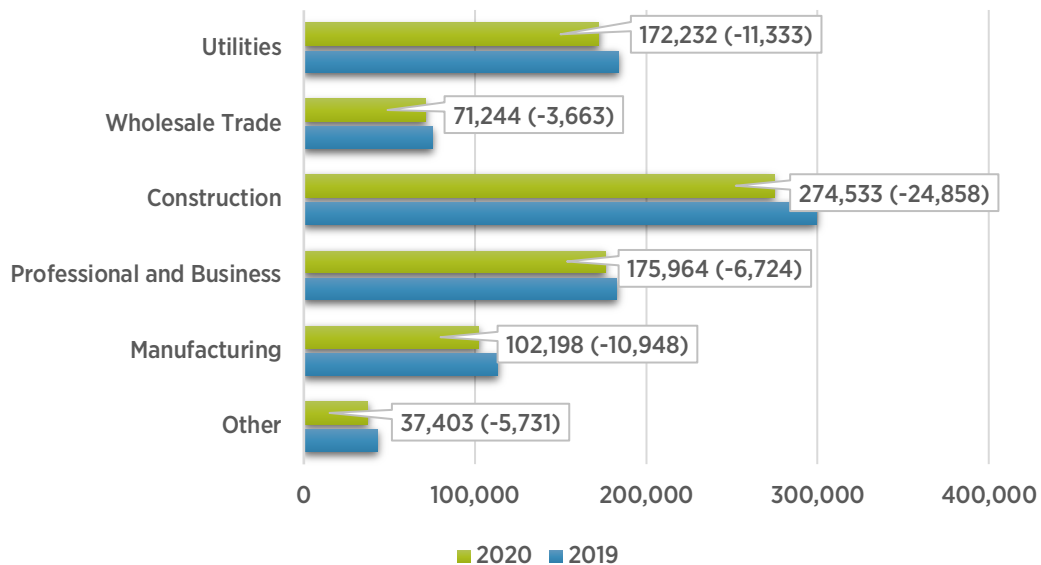
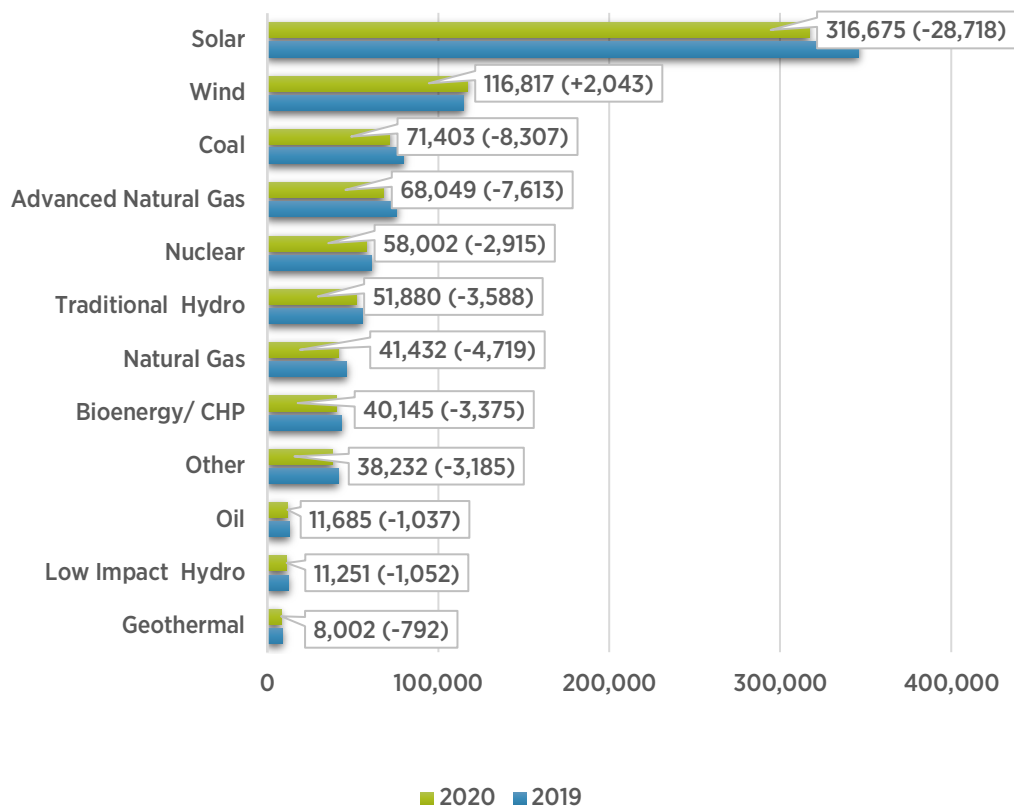


Figure 32.
Electric Power Generation Sector - Employment by Detailed Technology



Key Takeaways

- While solar EPG has the most jobs overall, the utility sector of Electric Power Generation is dominated by natural gas, coal, and nuclear power, which produce nearly 80 percent of the nation's electricity.
- Natural gas and advanced natural gas combined-with nearly 109,480 jobs-have exceeded coal, both in employment and gigawatt-hours produced.
- Solar and wind technologies rank first and second in the construction industry with 164,744 and 42,342 jobs, respectively. Advanced natural gas and natural gas together ranked third, with nearly 18,000 jobs combined.

Table 11. 23
Electric Power Generation Sector – Employment by Detailed Technology Application and Industry, Q4 2020

	Total	Utilities	Construction	Manufacturing	Wholesale Trade	Professional Services	Other Services
Solar	316,675	4,077	164,744	41,870	25,688	49,697	30,600
Wind	116,817	6,882	42,342	23,878	11,730	29,450	2,536
Geothermal	8,002	1,113	4,559	264	342	1,697	25
Bio	12,039	1,938	5,086	1,024	551	3,058	382
Low-impact Hydro²⁴	11,251		1,679	3,125	2,418	3,965	64
Traditional Hydro	51,880	17,352	7,835	13,015	5,778	7,696	204
Advanced Natural Gas²⁵	68,049	42,170	8,450	2,507	4,737	9,399	785
Nuclear	58,002	42,781	1,942	1,722	2,509	8,971	77
Coal	71,403	34,075	7,052	973	5,794	22,645	866
Oil	11,685	423	-	5,234	1,923	3,987	118
Natural Gas	41,432	17,213	9,237	3,270	3,026	7,710	977
CHP	28,107	1,664	3,823	1,887	3,802	16,761	170
Other	38,232	2,545	17,784	3,430	2,945	10,930	598
TOTAL	833,573	172,232	274,533	102,198	71,244	175,964	37,403

Note: The solar employment totals referenced throughout the report include all workers engaged with solar technologies regardless of the amount of labor hours in their work week are spent working with solar-related goods and services. The Solar Energy Industries Association (SEIA) and The Solar Foundation (TSF) provide an estimate for majority-time solar employees, which only includes those solar workers that spend 50 percent or more of their labor hours or work week dedicated to solar goods and services. At the end of 2020, there were a total of 316,675 solar jobs across the U.S.; of these, 231,474 individuals were majority-time solar workers, meaning they spent at least 50 percent of their labor hours on solar-related projects.

²³ Column and row totals may differ due to rounding

²⁴ Low-impact hydroelectric generation includes certification criteria that are aimed at ensuring that the certified dam adequately protects or mitigates its impacts in eight key resource areas: river flows, water quality, fish passage and protection, watersheds, threatened and endangered species, cultural resources, and public access and recreation opportunities. The eighth criterion requires that the dam not have been recommended for removal (LIHI – Low Impact Hydropower Institute).

²⁵ Advanced natural gas generation covers efficient, low-emission, leak-free natural gas, including systems that use any of the following technologies: high efficiency compressor, advanced low NOx combustion technology, first application of closed loop steam cooling in an industrial gas turbine, advanced turbine blade and vane materials, high temperature TBC and abradable coatings, advanced row 4 turbine blades, 3-D aero technology, and advanced brush seal.

Hiring Difficulty

- **Eighty-seven percent of construction employers in EPG** reported that it was somewhat difficult or very difficult to hire new employees, with 43 percent reporting that it was very difficult.
- **Eighty-five percent of manufacturing employers** reported that it was either somewhat difficult or very difficult to hire new employees.
- **Fourteen percent of employers in EPG** reported that they had an inadequate number of employees but were not hiring. Eighty-three percent reporting having difficulty hiring.

Electric Power Generation Mix

The electric power generation mix in the United States continues to evolve, transitioning from coal-fired power plants to natural gas and lower carbon sources of power generation. This transition has involved a significant build-out of new power generation facilities in the United States, requiring a strong presence of construction professionals.

Figure 33 shows net generation of electricity from utility-scale²⁶ facilities in all sectors of the U.S. economy. Electricity generation from coal sources declined by 61 percent between 2006 and 2020, while electricity generation from natural gas increased by 98 percent and from solar by almost 17,800 percent—from 508,000 MWh of solar generation to nearly 90,900,000 MWh.²⁷ As noted, this solar growth only includes utility-scale facilities, as reliable data on smaller distributed²⁸ facilities, such as rooftop systems, was not available until recently. In 2020, distributed solar PV generation increased 19 percent nationwide, while estimated total solar PV generation—both utility-scale and distributed generation—increased by 25 percent.²⁹

The shifts in electric generation sources over the last several years are mirrored in the sector’s changing employment profile, as the shares of natural gas, solar, wind, and combined heat and power (CHP) employment have increased. It is important to note, however, that the majority of U.S. electrical generation continues to come from fossil fuels (coal, oil, and natural gas).

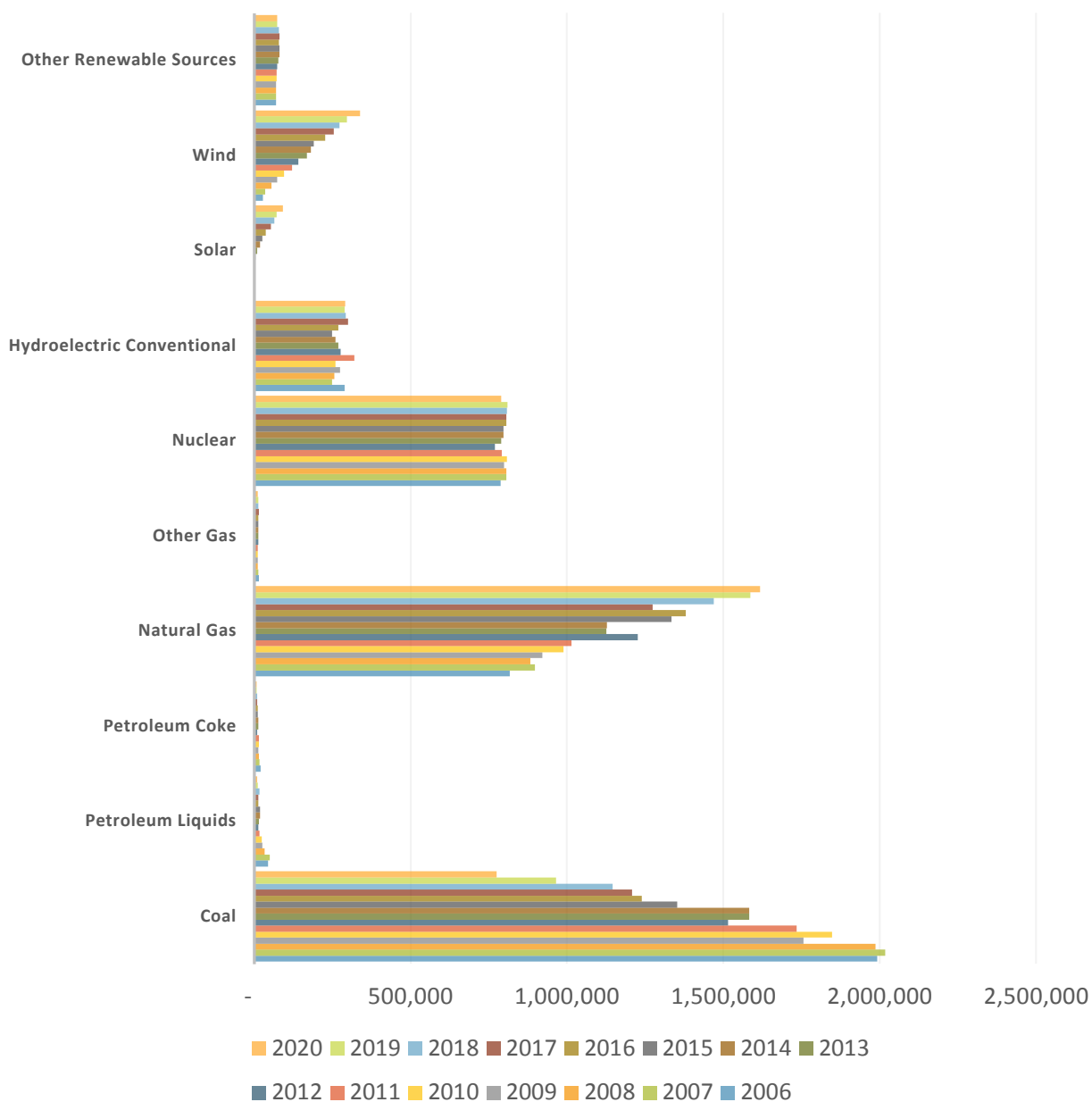
²⁶ One megawatt or greater.

²⁷ DOE, Energy Information Administration [EIA]. *Monthly Energy Review, April 2021*, Table 7.2a, “Electricity Net Generation: Total (All Sectors),” <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>, accessed May 5, 2021.

²⁸ Distributed, on-site, or decentralized energy generation is electrical generation and storage performed by a variety of small, grid-connected or distribution system-connected devices.

²⁹ EIA, *Electric Power Monthly with Data for February 2021, (April 2021)*, Table 1.1.A., “Net Generation from Renewable Sources: Total (All Sectors), 2011-February 2021,” https://www.eia.gov/electricity/monthly/current_month/april2021.pdf.

Figure 33.
Change in Net Generation of Electricity by Energy Source (Thousand MWh),
2006-2020



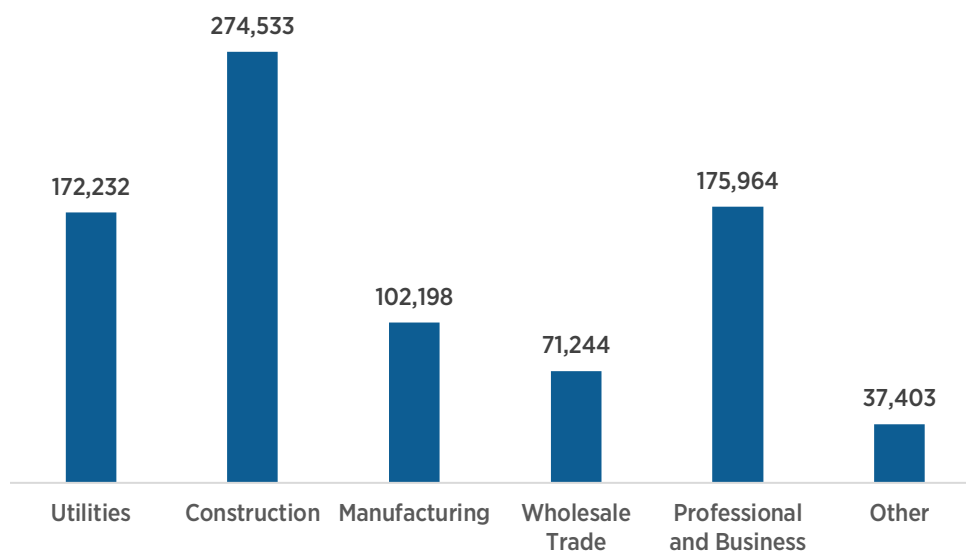
Electric Power Generation accounted for 833,573 jobs in 2020, down nearly 8 percent from the previous year's 896,830 workers³⁰, and employers report a projected 8.1 percent growth in 2021.

³⁰ This number has been revised to account for 2016 coal generation employment in NAICS 4238, Machinery, Equipment, and Supplies Merchant Wholesalers. It also includes 97,359 solar employees who spent less than 50 percent of their time on solar.

Electric Power Generation – Workforce Characteristics

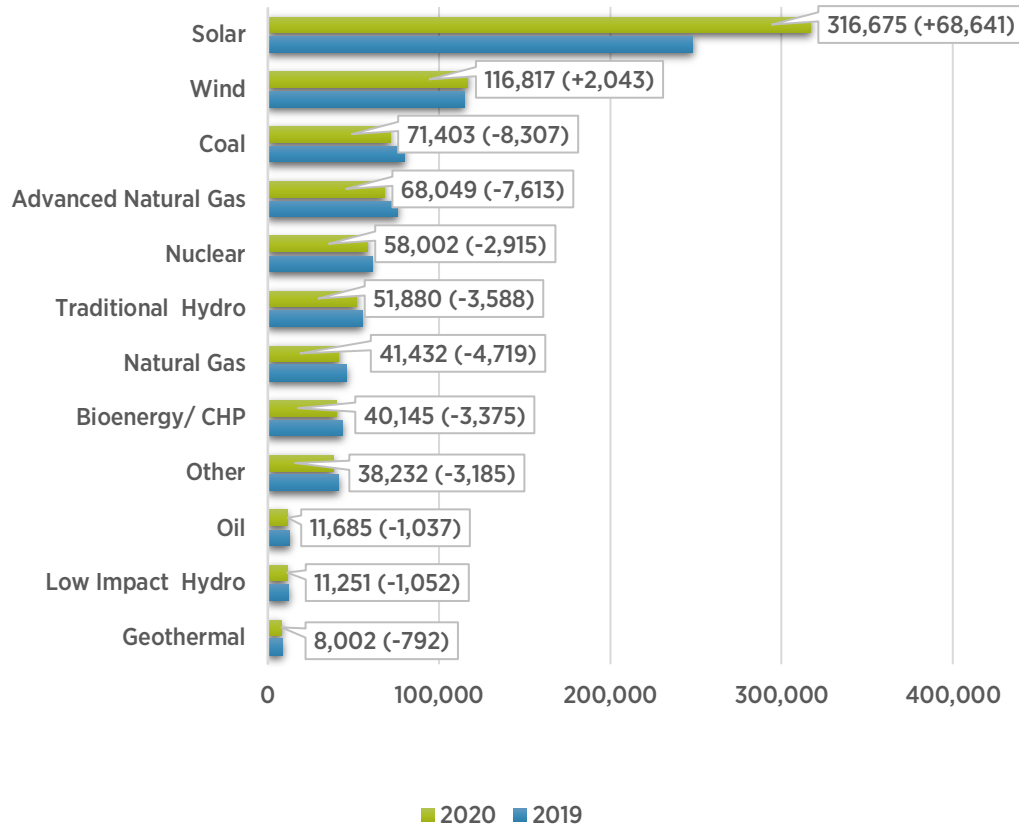
The largest component of the Electric Power Generation workforce is construction (33 percent), underscoring the importance of the construction industry to maintaining our electrical system. Construction is followed by sizable groups of utility industry workers (21 percent) and professional and business service employees (20 percent). Manufacturing is also a significant component, with almost 13 percent of total jobs.

Figure 34.
Electric Power Generation Sector – Employment by Industry, Q4 2020



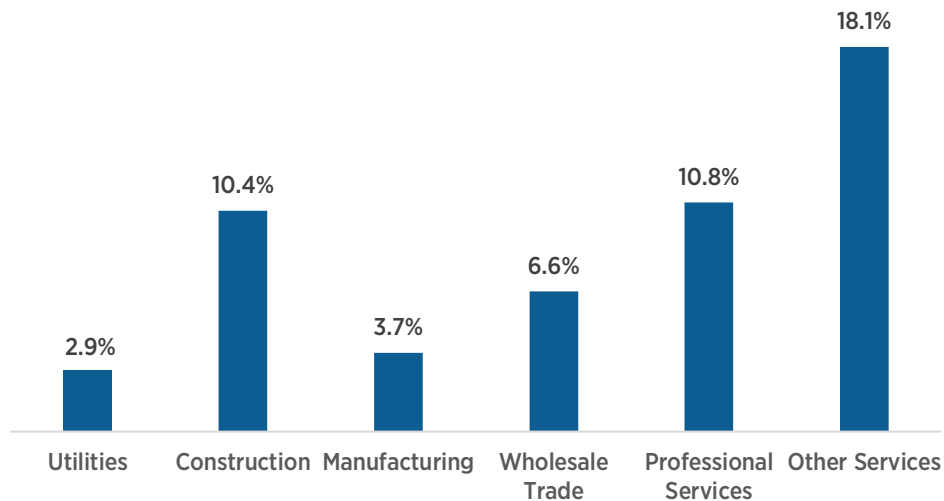
In 2020 employment declined in all energy generation technologies, with the exception of wind, which added 2,043 jobs (1.8 percent growth). Coal generation jobs dropped at the largest rate (10.4 percent or 8,307 jobs), while solar shed the most jobs (27,982 jobs lost or an 8 percent decline).

Figure 35.
Electric Power Generation Sector - Employment by Detailed Technology Application, 2019-2020



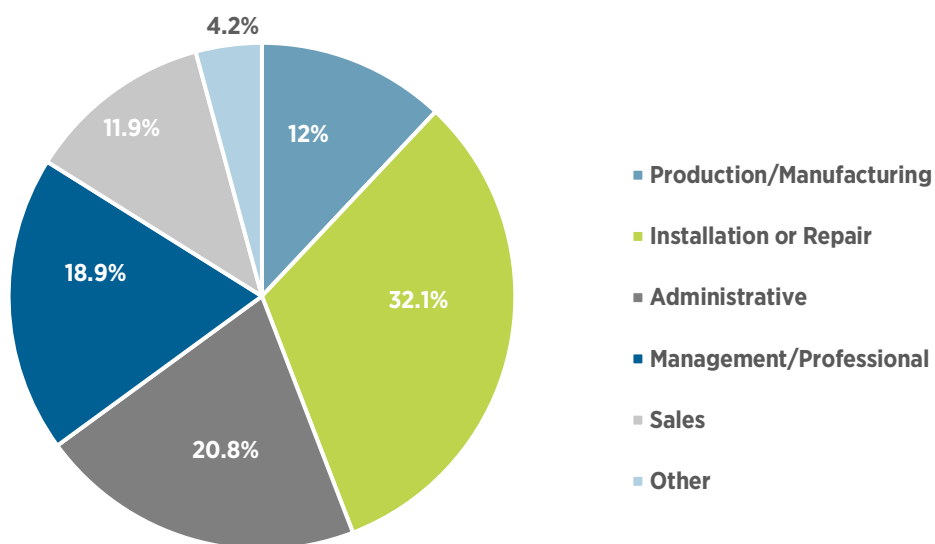
Construction, the largest segment of Electric Power Generation employment, anticipates 10.4 percent growth in 2021, while the next largest segments, utilities and professional services, predict 2.9 percent and 10.7 percent growth, respectively.

Figure 36.
Electric Power Generation Sector - Expected Employment Growth by Industry (Q4 2020 - Q4 2021)



Almost one-third (32 percent) of employment in Electric Power Generation in 2020 was within installation or repair positions. Management/professional positions (19 percent) and administrative positions (21 percent) each comprised around one-fifth of Electric Power Generation employment.

Figure 37.
Electric Power Generation Sector - Occupational Distribution, Q4 2020



In 2020, professional business services reported the greatest hiring difficulty among industry sectors in Electric Power Generation, with 88 percent of companies indicating it was either somewhat difficult (69 percent) or very difficult (20 percent) to find new employees. Construction and manufacturing employers reported comparable figures for these two categories of 87 percent and 85 percent, respectively.

Figure 38.
Electric Power Generation Sector - Hiring Difficulty by Industry, Q4 2019



In 2020, women represented 32 percent of the Electric Power Generation workforce. However, Electric Power Generation is racially more diverse than the workforce as a whole and exceeds the national average for Asian employees. Electric Power Generation had only 14 percent of its employees over age 55 in 2020, far below the national average. Electric Power Generation exceeded the national average for Veterans hiring (9 percent). Union coverage, at 12 percent, is double the national private sector average of 6 percent.

Table 12.
Electric Power Generation Sector – Demographics, Q4 2020

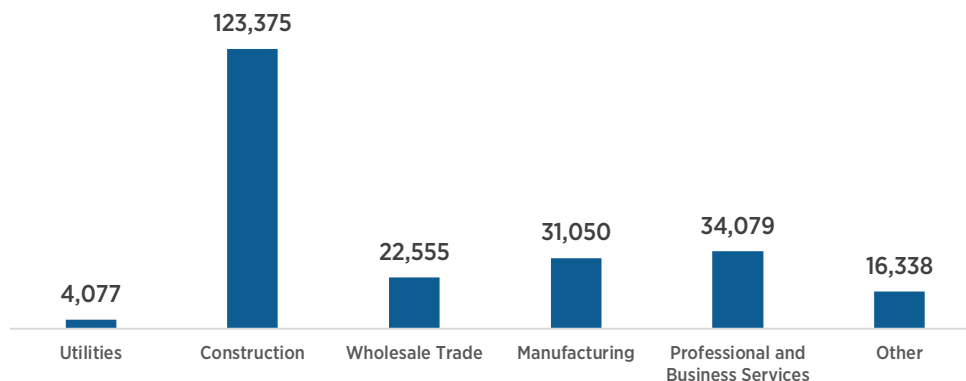
Demographic	Employees	Percent of Sector	National Workforce Averages
Male	569,582	68%	52%
Female	263,992	32%	48%
Hispanic or Latino	150,237	18%	17%
Not Hispanic or Latino	683,337	82%	83%
American Indian or Alaska Native	9,690	1%	1%
Asian	80,374	10%	7%
Black or African American	75,361	9%	13%
Native Hawaiian or other Pacific Islander	9,280	1%	0%
White	578,625	69%	76%
Two or more races	80,244	10%	2%
Veterans	71,056	9%	6%
55 and over	114,671	14%	23%
Union Coverage	101,735	12%	6%

Solar Electric Power Generation

In 2020, there were 231,474 Americans who spent 50 percent or more of their time working to manufacture, install, distribute, or provide professional services to solar technologies across the nation. Another 85,201 employees spent less than half their time on solar work.³¹ These values represent a loss of 6.7 percent, or 16,560 jobs, for workers who spent a majority of their time on solar compared to 2019. Another 12,150 jobs were lost by employees who spent a minority of their time on solar tasks. The majority of solar employment in 2020 was found in construction and installation activities, totaling 123,375 jobs, followed by professional business services with 34,079 workers and manufacturing with 31,050.³²

The solar EPG industry is an example of the difficulties in BLS labor market data to completely capture employment in emerging industries (such as solar) and those that cut across multiple sectors (such as Energy Efficiency). For 2020, the BLS Quarterly Census of Employment and Wages (QCEW) reported that utilities employed just over 3,600 workers for solar-specific generation in the United States. However, this figure does not include any jobs in construction or other value-chain industries for solar projects even when they are financed, owned, or directed by utilities. The data find that utilities are directly responsible for only 1.5 percent of the solar jobs in the United States, since no other NAICS codes yet exist for solar electric generation. Existing labor market data therefore dramatically underestimate the additional workers engaged in solar-related work.

Figure 39.
Solar Electric Power Generation – Employment by Industry



³¹ The Solar Foundation, *National Solar Jobs Census 2020* (Washington, DC: Solar Foundation, 2021), 3, <https://www.thesolarfoundation.org/wp-content/uploads/2021/05/National-Solar-Jobs-Census-2020-FINAL.pdf>. The number of employees spending less than half their time on solar work is calculated from the total employment figure on page 18 of the Census report.

³² This division of solar jobs by industry, depicted in Figure 39, is only for those employees who spend more than 50 percent of their time on solar activities.

Figure 40.
Estimated Percentage of Solar
Generation Installed – 2020

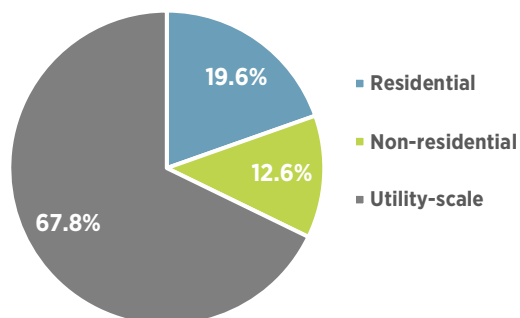
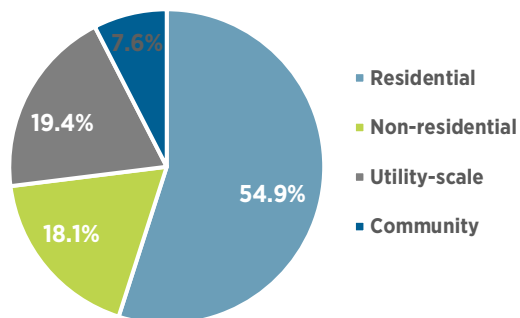


Figure 41.
Majority-Time Solar Employees by
Type of Project – 2020



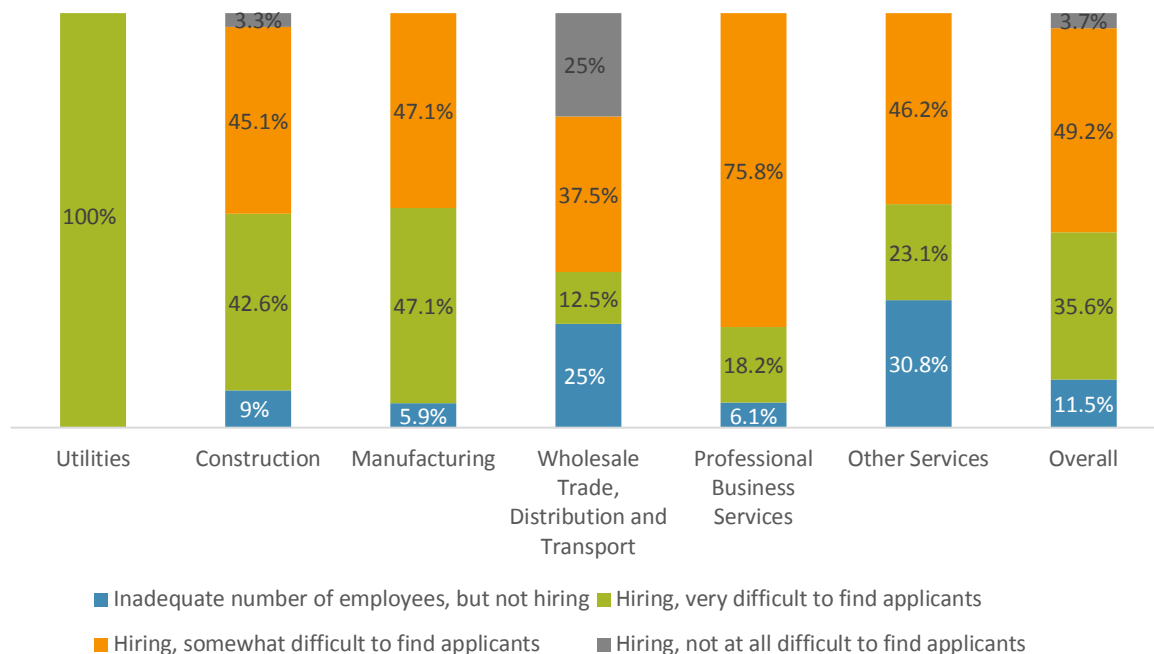
Currently, a majority of U.S. photovoltaic (PV) solar electric power generation is from utility-scale facilities, as shown in Figure 40—roughly 87,743 thousand MWh compared to 41,740 thousand MWh of distributed solar generation in 2020.³³

In 2020, over half of U.S. solar workers were spending the majority of their time working on residential-scale projects, as shown in Figure 41. This represents a decline of 5 percentage points compared to 2019, while the percentage of employees working on non-residential projects nearly doubled from 10 percent in 2019 to 18 percent in 2020.

In 2020, 88 percent of construction employers engaged in the solar industry—who employ the majority of the solar workforce—reported that hiring was either somewhat difficult or very difficult. Ninety-four percent each of both professional services and manufacturing employers also reported that hiring was somewhat difficult or very difficult in 2020.

³³ EIA, *Electric Power Monthly with Data for February 2021, (April 2021)*, Table 1.1.A., “Net Generation from Renewable Sources: Total (All Sectors), 2011-February 2021,” and Table 1.2.E, “Net Generation by Energy Source: Residential Sector, 2014-February 2021.” Data for 2020 for solar PV generation at utility-scale facilities and small-scale generation taken from Table 1.1.A. Data for 2020 solar PV generation in the residential sector taken from Table 1.2.E.

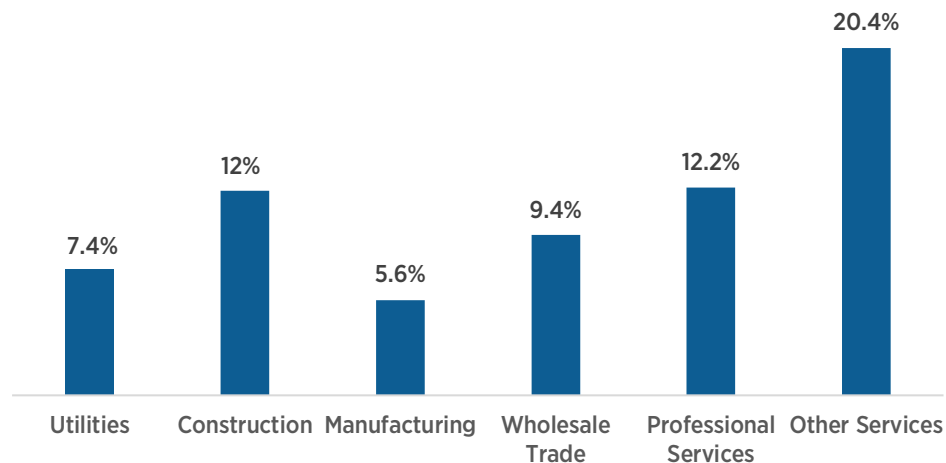
Figure 42.
Solar Electric Power Generation – Hiring Difficulty by Industry



Solar employers reported that they expect to rebound from pandemic workforce loss, estimating an employment increase of 11.7 percent in 2021. Most solar electric power generation employment supports PV technologies, with a small portion—7.2 percent—of workers supporting concentrated solar power (CSP) technologies.³⁴

³⁴ The terms “PV” and “CSP” refer to specific solar electricity production technologies. When references are made to either distributed generation or utility-scale generation, these include both solar PV and CSP technologies.

Figure 43.
Solar Electric Power Generation - Expected Employment Growth by Industry



In 2020, women represented about 30 percent of the solar workforce. Overall, the solar work force is racially more diverse than the national workforce. Roughly two in ten workers are Hispanic or Latino, and one in ten are Asian. Black or African American employees, however, remain underrepresented. Meanwhile, both PV and CSP technologies employed Veterans at a higher rate than the national workforce. At 10 percent, the solar workforce is more unionized than the national private sector average of 6 percent.

There are not major differences in these demographic characteristics between CSP technologies and PV technologies.

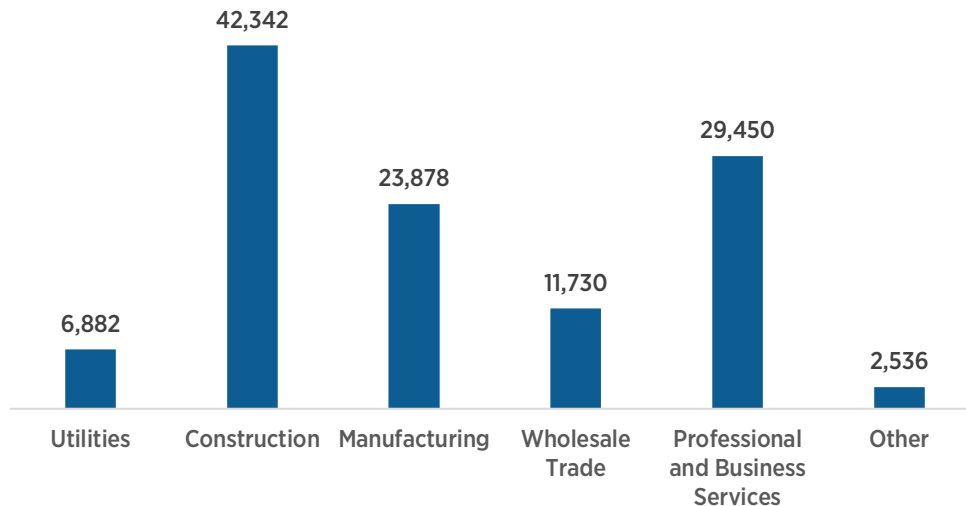
Table 13.
Solar Electric Power Generation – Demographics, Q4 2020

Demographic	Solar Photovoltaic	Concentrating Solar Power	National Workforce Averages
Male	70%	68%	52%
Female	30%	32%	48%
Hispanic or Latino	20%	21%	17%
Not Hispanic or Latino	80%	79%	83%
American Indian or Alaska Native	1%	1%	1%
Asian	9%	9%	7%
Black or African American	8%	7%	13%
Native Hawaiian or other Pacific Islander	1%	1%	0%
White	72%	71%	76%
Two or more races	9%	10%	2%
Veterans	8%	8%	6%
55 and over	11%	10%	23%
Union Coverage	10%	10%	6%

Wind Electric Power Generation

Wind EPG passed advanced and conventional natural gas generation to hold the second largest share of employment in the Electric Power Generation sector (behind solar). In 2020, firms that support the U.S. wind EPG sector employed a total of 116,817 workers—a 1.8 percent increase from 2019 and the only EPG technology to grow over the past year. Like solar EPG, the largest share of employment was in construction; this industry sector accounted for 36 percent of all wind EPG workers in 2020, followed by professional services at 25 percent and manufacturing at 20 percent.

Figure 44.
Wind Electric Power Generation - Employment by Industry Sector



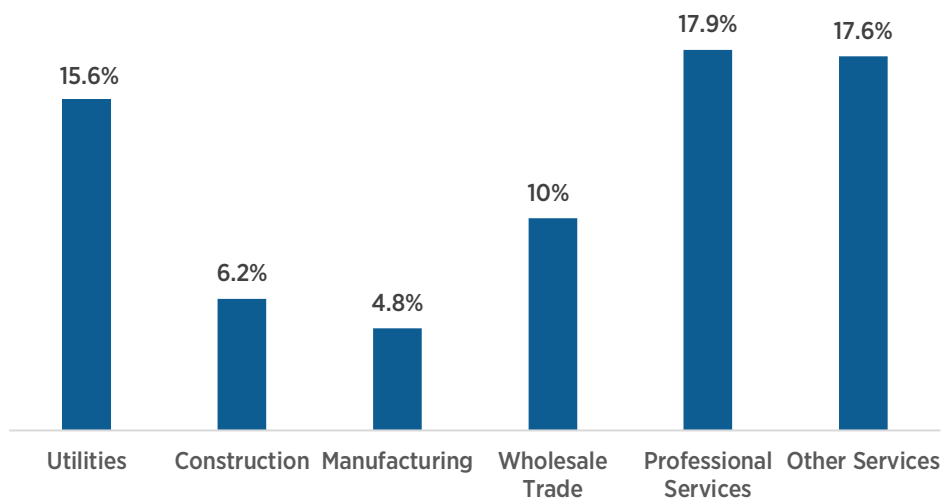
In 2020, 92 percent of construction employers in the wind sector reported that hiring new workers was somewhat difficult or very difficult (with 31 percent reporting that hiring was very difficult). The next two largest segments of the wind industry—professional services and manufacturing—reported overall hiring difficulty of 93 percent and 67 percent, respectively.

Figure 45.
Wind Electric Power Generation – Hiring Difficulty by Industry



Employers in the wind EPG industry expect 10 percent growth in 2021. This is led by expected gains in the professional services sector, an estimated 18 percent growth.

Figure 46.
Wind Electric Power Generation – Expected Employment Growth by Industry



Wind EPG has a demographic distribution that is nearly identical to solar EPG. In 2020, women represented 31 percent of the wind EPG workforce. Wind EPG is also more racially diverse than the national workforce, with higher levels of Hispanic or Latino and Asian workers. About 1 in 10 workers is a Veteran, higher than the national average. Unionization coverage is 10 percent, greater than the national private sector average of 6 percent.

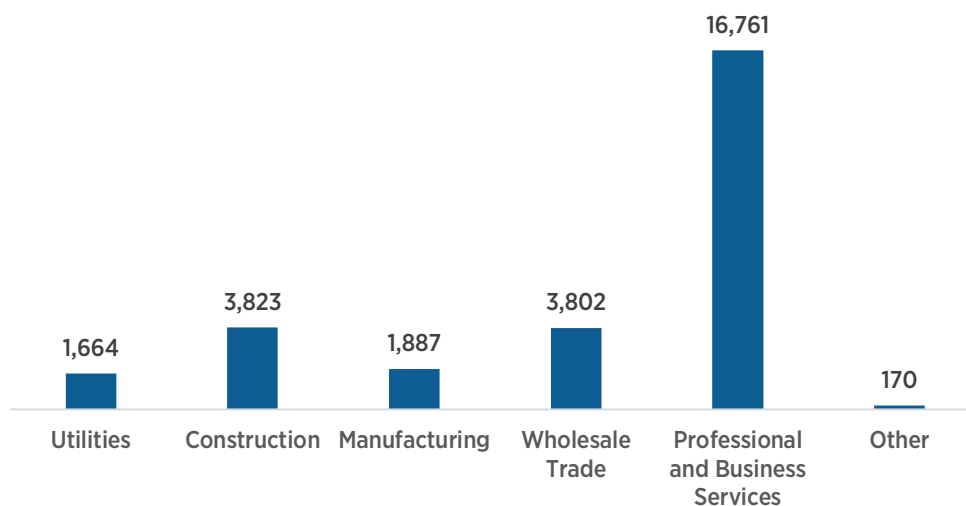
Table 14.
Wind Electric Power Generation – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	80,799	69%	52%
Female	36,018	31%	48%
Hispanic or Latino	21,930	19%	17%
Not Hispanic or Latino	94,887	81%	83%
American Indian or Alaska Native	1,351	1%	1%
Asian	11,427	10%	7%
Black or African American	9,560	8%	13%
Native Hawaiian or other Pacific Islander	1,413	1%	0%
White	81,181	69%	76%
Two or more races	11,886	10%	2%
Veterans	10,768	9%	6%
55 and over	16,750	14%	23%
Union Coverage	11,682	10%	6%

Combined Heat and Power Generation

Combined heat and power (CHP) generation technologies³⁵ employed 28,107 workers, or slightly more than 3 percent of employment in Electric Power Generation. In 2020, CHP shed 2,235 jobs, a 7.4 percent decrease over 2019. With small generation capacities and significant overlap with other sectors (many companies with CHP report according to their underlying fuel source), employment in CHP is mostly comprised of professional service workers. This industry category accounted for 60 percent of CHP jobs in 2020, followed by the construction industry at nearly 14 percent.

Figure 47.
Combined Heat and Power Generation – Employment by Industry



In 2020, 91 percent of CHP employers reported that hiring new workers was somewhat difficult or very difficult (with 43 percent reporting that hiring was very difficult). Fifty-seven percent of CHP wholesale trade, distribution, and transport employers reported that hiring in 2020 was somewhat difficult or very difficult.

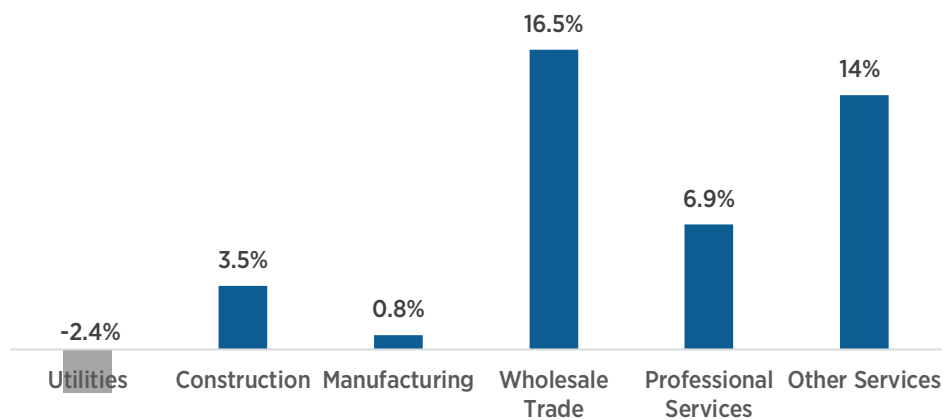
³⁵ Combined heat and power systems capture excess heat from burning fuel, such as natural gas, oil, or biogas, and converts this excess heat into useful thermal energy, typically in the form of steam or hot water.

Figure 48.
Combined Heat and Power Generation - Hiring Difficulty by Industry



Employers in the CHP generation industry expect almost 7 percent growth in 2021. Wholesale trade employment alone is expected to grow nearly 17 percent.

Figure 49.
Combined Heat and Power Generation - Expected Employment Growth by Industry



In 2020, women represented 31 percent of the CHP workforce. As with most other EPG technologies, CHP is also more racially diverse than the workforce as a whole, with non-White workers comprising 28 percent of employment, compared to 23 percent nationally. Unionization coverage at 11 percent is well above the national private sector rate of 6 percent.

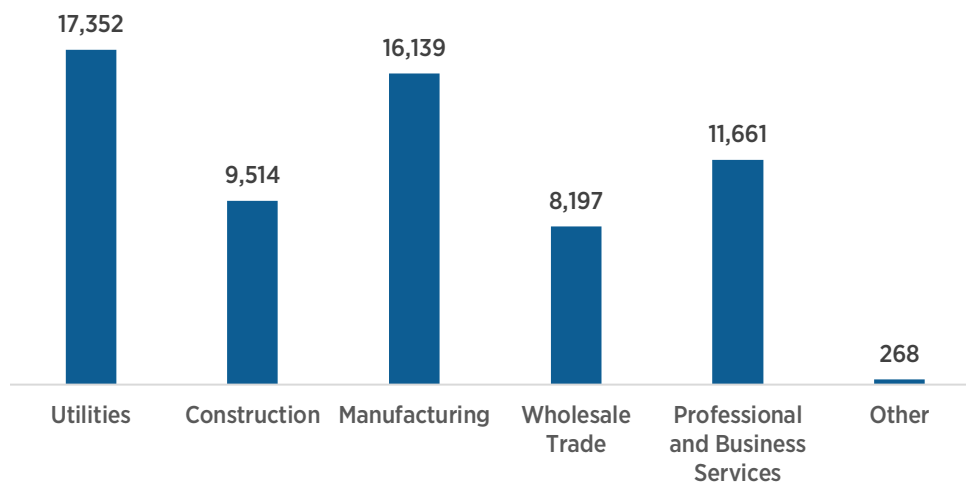
Table 15.
Combined Heat and Power Generation – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	19,301	69%	52%
Female	8,806	31%	48%
Hispanic or Latino	4,761	17%	17%
Not Hispanic or Latino	23,346	83%	83%
American Indian or Alaska Native	256	1%	1%
Asian	2,469	9%	7%
Black or African American	2,193	8%	13%
Native Hawaiian or other Pacific Islander	229	1%	0%
White	20,327	72%	76%
Two or more races	2,632	9%	2%
Veterans	3,252	12%	6%
55 and over	5,740	20%	23%
Union Coverage	3,092	11%	6%

Hydroelectric Power Generation

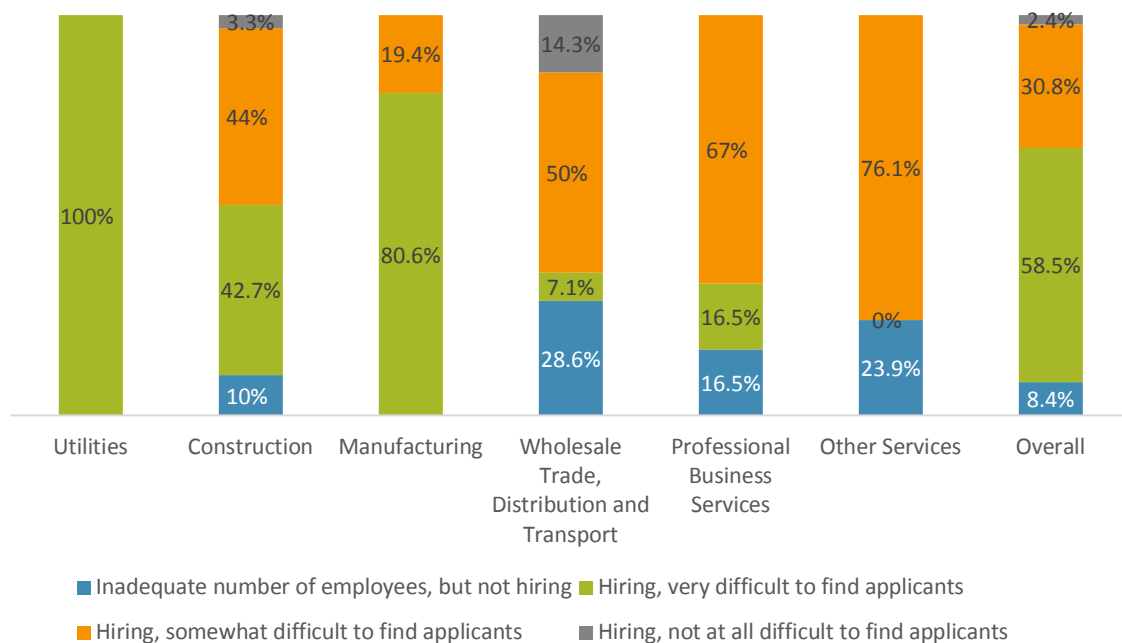
Hydroelectric power generation employed a total of 63,131 workers across the nation in 2020, a decline of 4,640 jobs. Most of this employment (51,880 workers, or 82 percent) was in traditional hydroelectric generation technologies, while the remainder was in low-impact hydroelectric technologies (11,251 workers). Each of these sectors declined in 2020, losing 3,588 and 1,052 jobs, respectively. Utilities make up 27 percent of hydroelectric generation employment in 2020, while manufacturing made up 26 percent and professional business services supported nearly 18 percent and construction supported 15 percent of employment.

Figure 50.
Hydroelectric Power Generation - Employment by Industry



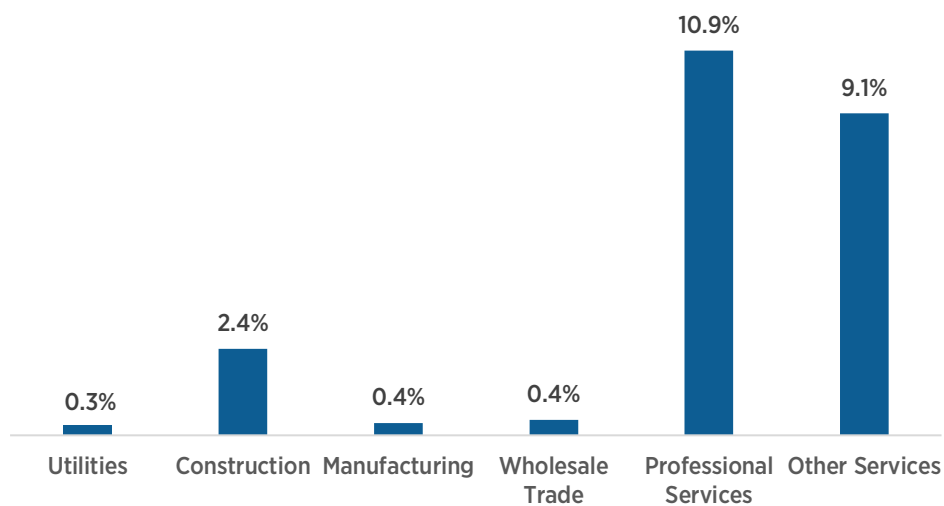
In 2020, 87 percent of construction employers reported that hiring new workers was somewhat difficult or very difficult (with 43 percent reporting that hiring was very difficult). Eighty-nine percent of all hydropower employers reported that hiring new workers was somewhat difficult or very difficult (with 59 percent reporting that hiring was very difficult).

Figure 51.
Hydroelectric Power Generation – Hiring Difficulty by Industry



Overall, hydroelectric employers anticipate 2.6 percent growth in 2021. Professional services expect to grow by about 11 percent while utilities, the largest segment, expected less than 1 percent growth.

Figure 52.
Hydroelectric Power Generation – Expected Employment Growth by Industry



In 2020, women represented 31 percent of the hydroelectric power generation workforce. These technologies—both traditional and low impact—are more diverse than the national workforce average, including higher representation of Asian workers. More low-impact hydroelectric generation workers were Hispanic or Latino than the national workforce average in 2020. The share of Veterans employment also exceeded the national average. Unionization coverage is nearly double the national average in the private sector of 6 percent.

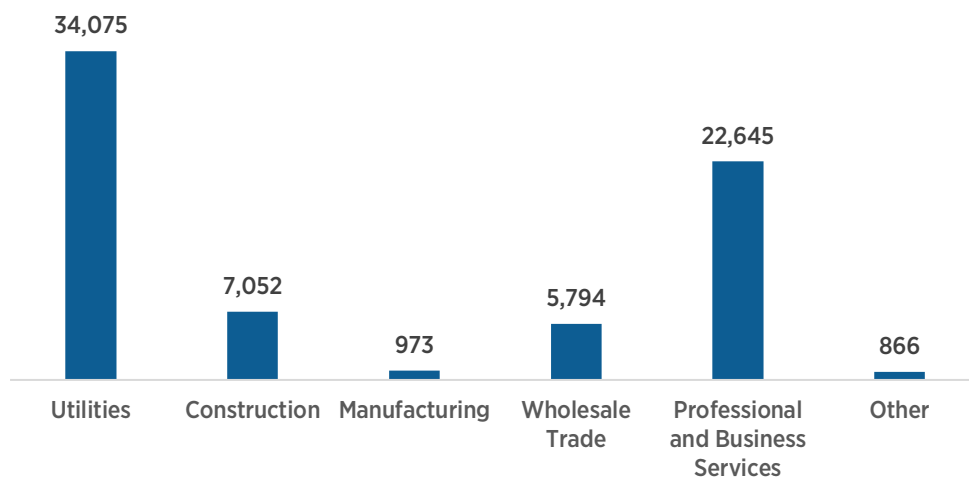
Table 16.
Hydroelectric Power Generation - Demographics, Q4 2020

Demographic	Low-impact Hydroelectric Generation	Traditional Hydroelectric Generation	National Workforce Averages
Male	70%	69%	52%
Female	30%	31%	48%
Hispanic or Latino	18%	16%	17%
Not Hispanic or Latino	82%	84%	83%
American Indian or Alaska Native	1%	1%	1%
Asian	10%	10%	7%
Black or African American	8%	11%	13%
Native Hawaiian or other Pacific Islander	1%	1%	0%
White	71%	69%	76%
Two or more races	8%	7%	2%
Veterans	12%	9%	6%
55 and over	18%	17%	23%
Union Coverage	11%	11%	6%

Coal Electric Power Generation

Coal-fired EPG employed a total of 71,403 workers across the nation in 2020. This is more than a 10 percent decrease from 2019, following an 8 percent decrease in jobs over 2018. Utilities held almost half (48 percent) of coal EPG jobs in 2020, losing more than 4,000 workers over 2019.

Figure 53.
Coal Electric Power Generation - Employment by Industry



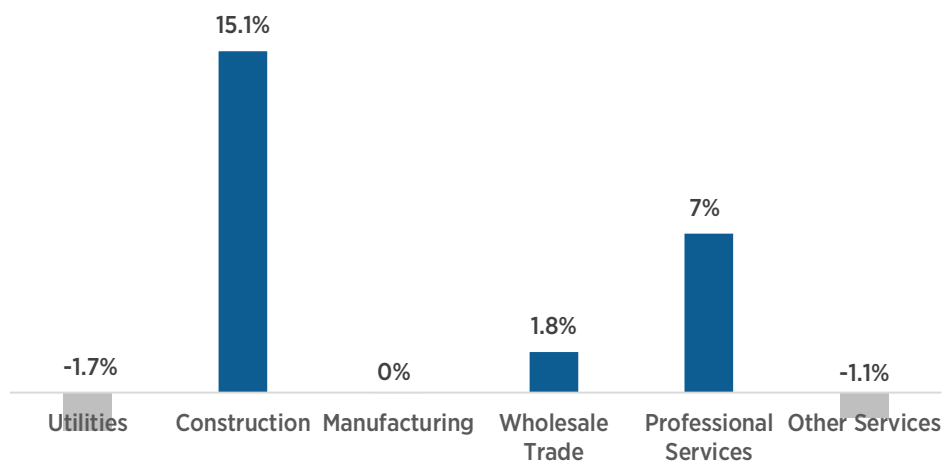
Construction employers reported hiring difficulty, with 43 percent saying it was very difficult and 44 percent saying it was somewhat difficult. Fifty-seven percent of wholesale trade, distribution, and transport employers reported that hiring new workers was difficult.

Figure 54.
Coal Electric Power Generation – Hiring Difficulty by Industry



Despite continued job loss, employers in the coal EPG industry expect 3 percent growth in 2021. This is led by the construction sector, which expects over 15 percent growth, followed by professional services at 7 percent. Utilities, the largest sector, expects employment declines.

Figure 55.
Coal Electric Power Generation – Expected Employment Growth by Industry



In 2020, women represented 33 percent of Coal EPG employees. Coal generation is also more racially diverse than the national workforce, employing 29 percent non-White. The unionization coverage is 16 percent, 10 percentage points higher than the national private sector average.

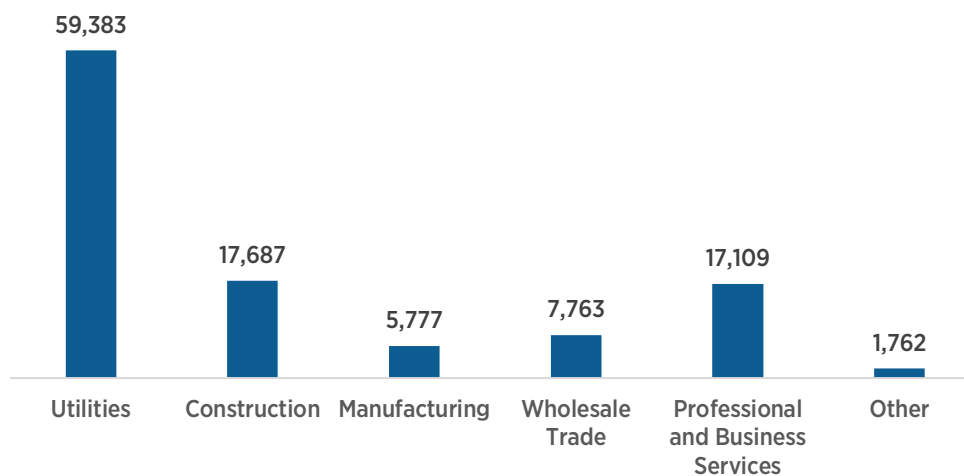
Table 17.
Coal Electric Power Generation – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	47,538	67%	52%
Female	23,865	33%	48%
Hispanic or Latino	9,648	14%	17%
Not Hispanic or Latino	61,755	86%	83%
American Indian or Alaska Native	740	1%	1%
Asian	6,972	10%	7%
Black or African American	8,041	11%	13%
Native Hawaiian or other Pacific Islander	555	1%	0%
White	50,390	71%	76%
Two or more races	4,705	7%	2%
Veterans	5,286	7%	6%
55 and over	12,401	17%	23%
Union Coverage	11,424	16%	6%

Natural Gas Electric Power Generation

Natural gas EPG employed a total of 109,480 workers across the nation in 2020. Of these, 68,049 jobs, or 62 percent, are in the category of advanced/low emissions natural gas generation. Over the past year, more than 12,300 jobs were lost in natural gas EPG—a 10 percent drop over the year. Utilities provided more half of natural gas power generation jobs in 2020, with construction and professional business services each making up 16 percent of the industry.

Figure 56.
Natural Gas Electric Power Generation - Employment by Industry



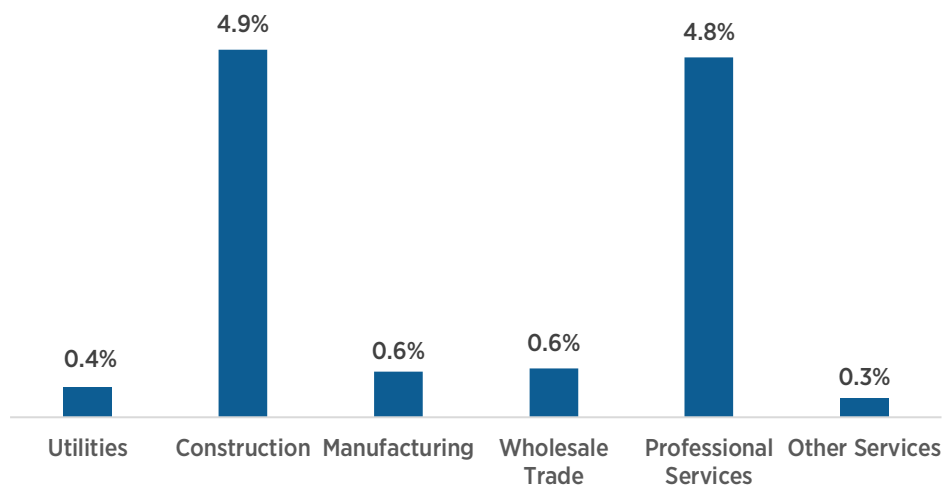
Twenty-six percent of natural gas EPG employers reported having an inadequate number of employees but not hiring in 2020. Two-thirds of employers reported hiring new workers in 2020 was somewhat or very difficult. Three-quarters of professional business services employers reported that hiring new workers was somewhat or very difficult.

Figure 57.
Natural Gas Electric Power Generation - Hiring Difficulty by Industry



Employers in the natural gas EPG industry expect moderate job growth across all sectors, totaling an estimated 2 percent growth in 2021. This is led by the construction and professional services sectors, which expect nearly 5 percent growth each.

Figure 58.
Natural Gas Electric Power Generation - Expected Employment Growth by Industry



In 2020, women represented 36 percent of the natural gas EPG workforce, the highest of any technology in the category. Natural gas EPG is more racially diverse than the national workforce, employing 38 percent racial minorities, also the highest in the electric power generation sector. Nine percent of the sector's employees are Veterans, exceeding the national average by 3 percentage points. Sixteen percent of employees are represented by unions, ten percentage points higher than the national private sector average of 6 percent.

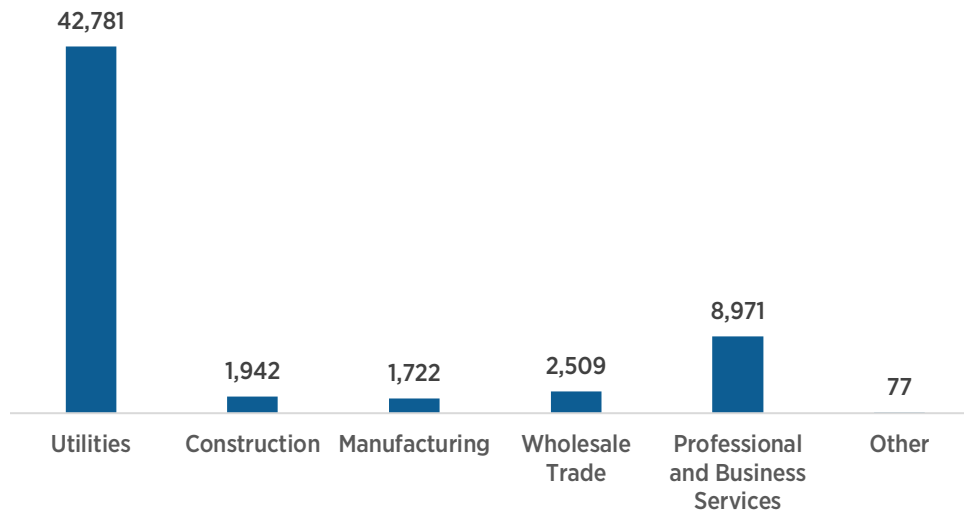
Table 18.
Natural Gas Electric Power Generation - Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	69,789	64%	52%
Female	39,692	36%	48%
Hispanic or Latino	20,308	19%	17%
Not Hispanic or Latino	89,173	81%	83%
American Indian or Alaska Native	1,302	1%	1%
Asian	10,725	10%	7%
Black or African American	10,877	10%	13%
Native Hawaiian or other Pacific Islander	1,008	1%	0%
White	68,325	62%	76%
Two or more races	17,245	16%	2%
Veterans	9,395	9%	6%
55 and over	15,723	14%	23%
Union Coverage	17,517	16%	6%

Nuclear Electric Power Generation

Nuclear EPG employed a total of 58,002 workers across the nation in 2020. Over the past year, 2,915 jobs were lost from nuclear generation—a decrease in employment of nearly 5 percent. Almost 74 percent of nuclear EPG jobs are in utilities.

Figure 59.
Nuclear Electric Power Generation – Employment by Industry



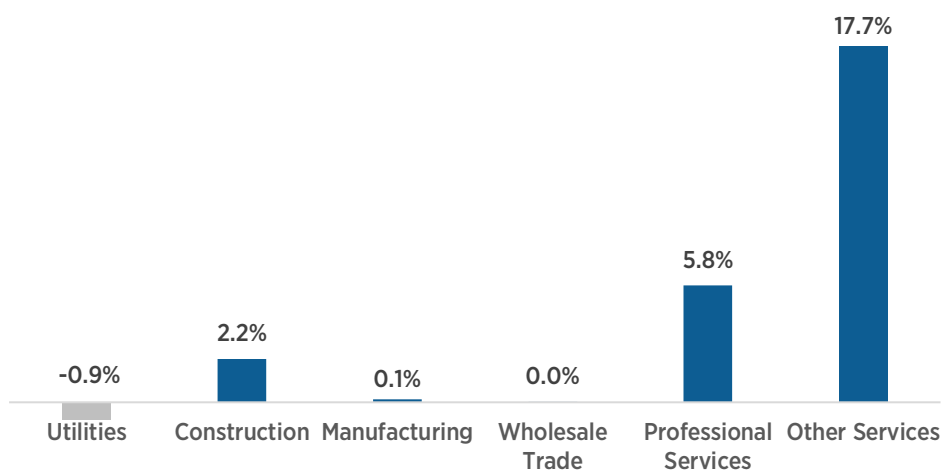
Nearly all nuclear EPG firms (89 percent) reported that hiring was somewhat difficult or very difficult (with 77 percent reporting hiring to have been very difficult) in 2020. Eighty-seven percent of construction employers reported that hiring new workers was somewhat difficult or very difficult.

Figure 60.
Nuclear Electric Power Generation – Hiring Difficulty by Industry



Employers in the nuclear EPG industry do not expect substantial employment growth in 2021. Anticipated employment gains in professional and other services – 6 percent and 18 percent growth, respectively – are countered by continued contraction in utilities, the largest sector.

Figure 61.
Nuclear Electric Power Generation – Expected Employment Growth by Industry



In 2020, women represented 34 percent of the nuclear EPG workforce. Nuclear EPG is also one of the most racially diverse of all generation technologies, employing 34 percent non-White racial minorities, compared to 22 percent in the national workforce. It also employs the highest level of black or African American workers, compared to other generation technologies, at 13 percent, slightly more than the national workforce overall. Unionization coverage in nuclear EPG is the highest of any technology area at 21 percent.

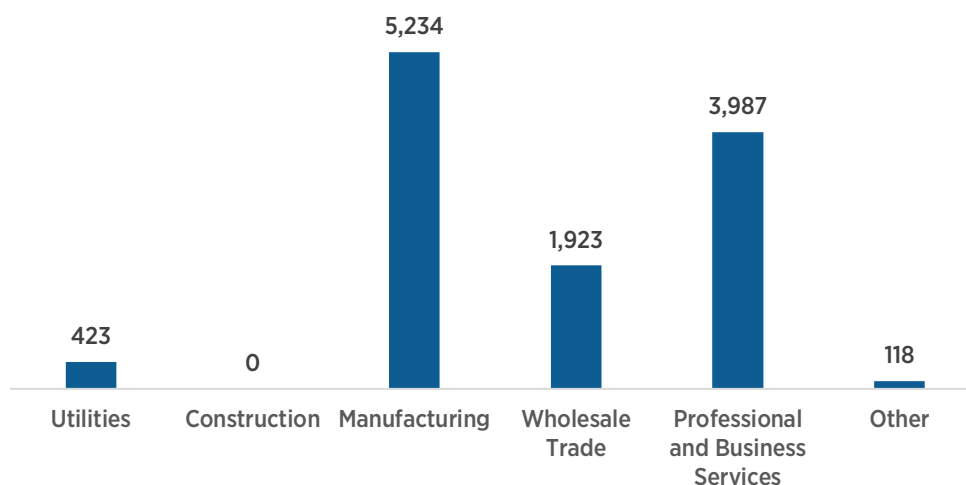
Table 19.
Nuclear Electric Power Generation - Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	38,099	66%	52%
Female	19,903	34%	48%
Hispanic or Latino	8,118	14%	17%
Not Hispanic or Latino	49,884	86%	83%
American Indian or Alaska Native	648	1%	1%
Asian	5,860	10%	7%
Black or African American	7,260	13%	13%
Native Hawaiian or other Pacific Islander	447	1%	0%
White	38,489	66%	76%
Two or more races	5,298	9%	2%
Veterans	3,552	6%	6%
55 and over	8,518	15%	23%
Union Coverage	12,180	21%	6%

Oil Electric Power Generation

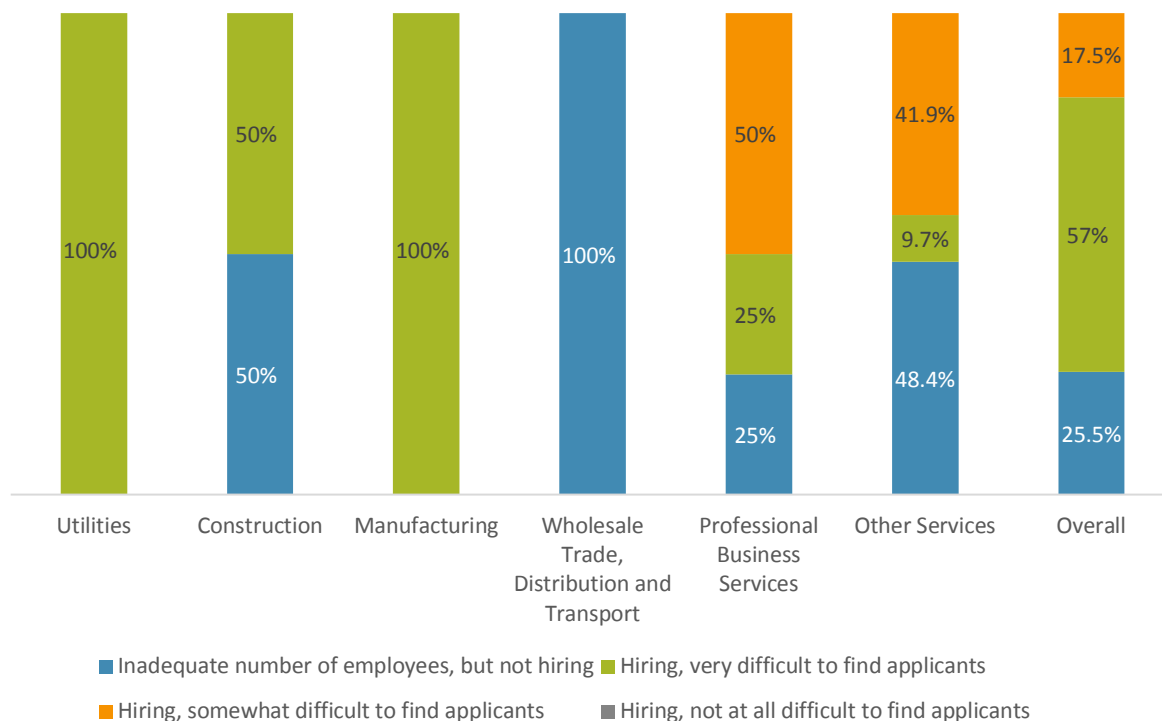
Oil EPG employed a total of 11,685 workers across the nation in 2020. Over the past year, 1,037 jobs were lost in oil generation — a more than 8 percent drop in employment. Manufacturing accounted for almost 45 percent of oil power generation jobs in 2020, while professional and business services supported 34 percent. Unlike other EPG technologies, utilities make up a small portion of employment, with fewer than 4 percent of jobs in the category.

Figure 62.
Oil Electric Power Generation — Employment by Industry



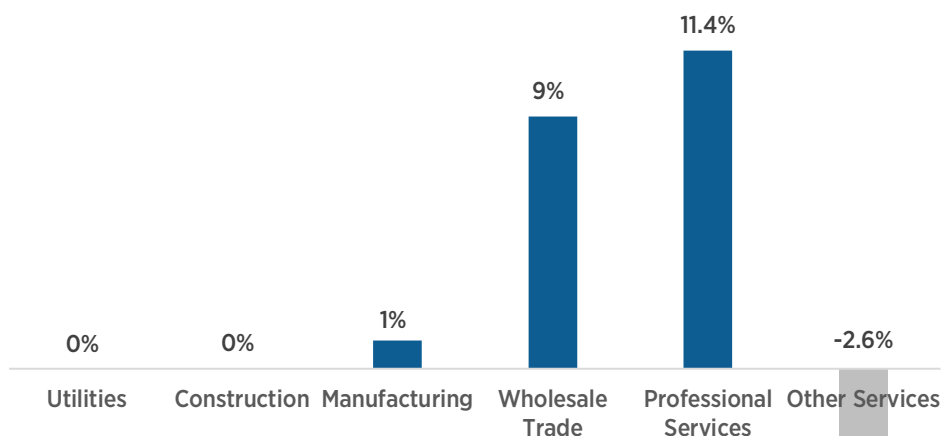
In 2020, 75 percent of oil EPG employers reported that it was somewhat difficult or very difficult to hire employees, with 57 percent reporting it was very difficult. Twenty-six percent reported having an inadequate number of employees but not hiring.

Figure 63.
Oil Electric Power Generation - Hiring Difficulty by Industry



Employers in the oil EPG industry expect almost 6 percent growth in 2021. This is led by the professional services sector, which predicts 11 percent employment growth.

Figure 64.
Oil Electric Power Generation - Expected Employment Growth by Industry



In 2020, women represented 28 percent of the oil EPG workforce. Similar to many other generation technologies, it is more racially diverse than the national workforce, with 29 percent non-White racial minorities. Union coverage, at 7 percent, is slightly above the national private sector average of 6 percent, but remains the lowest of all EPG technologies.

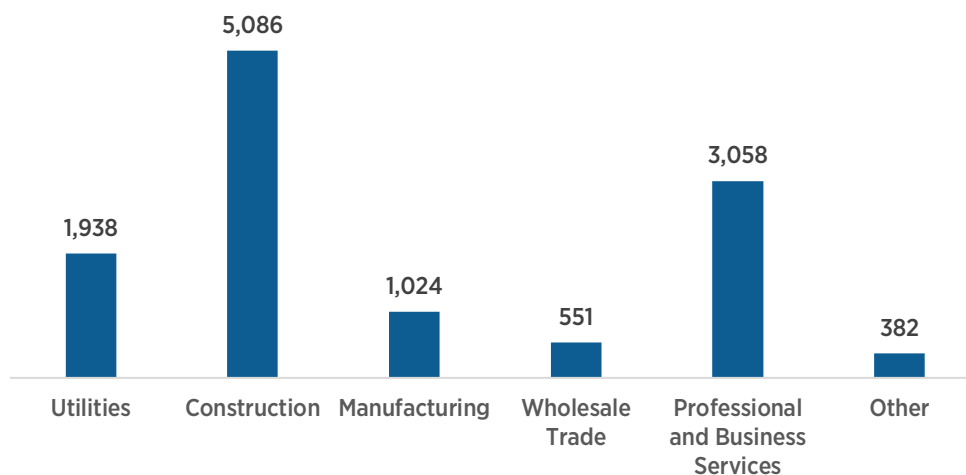
Table 20.
Oil Electric Power Generation - Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	8,376	72%	52%
Female	3,309	28%	48%
Hispanic or Latino	2,046	18%	17%
Not Hispanic or Latino	9,639	82%	83%
American Indian or Alaska Native	137	1%	1%
Asian	1,163	10%	7%
Black or African American	970	8%	13%
Native Hawaiian or other Pacific Islander	124	1%	0%
White	8,299	71%	76%
Two or more races	993	8%	2%
Veterans	1,017	9%	6%
55 and over	1,807	15%	23%
Union Coverage	818	7%	6%

Biomass Electric Power Generation

Biomass EPG employed a total of 12,039 workers across the nation in 2020, a decline of 1,139 jobs, or nearly 9 percent. Construction captured more than 42 percent of biomass power generation jobs in 2020, while professional business services supported just over 25 percent.

Figure 65.
Biomass Electric Power Generation - Employment by Industry



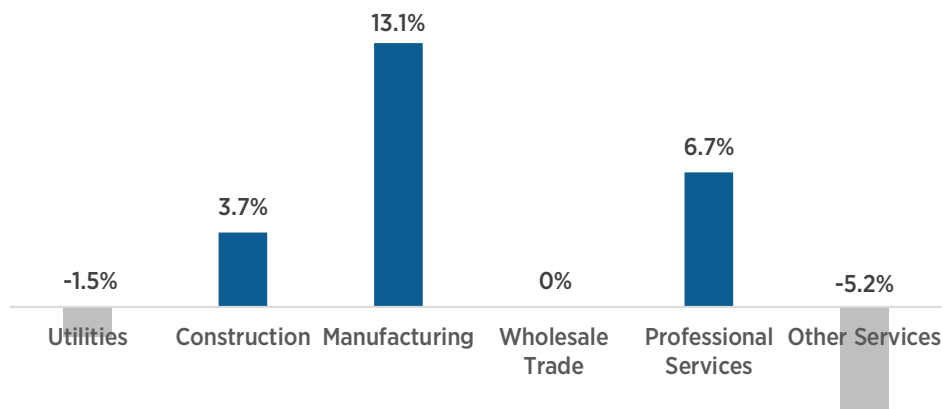
In 2020, 87 percent of biomass EPG employers reported that hiring was somewhat difficult or very difficult, with 34 percent reporting that hiring was very difficult. Eighty-seven percent of construction employers, the largest sector, reported that hiring was somewhat difficult or very difficult. Similarly, 89 percent of professional business services employers reported that hiring new workers was either somewhat difficult or very difficult.

Figure 66.
Biomass Electric Power Generation - Hiring Difficulty by Industry



Employers in the biomass EPG industry expect 4 percent growth in 2021. This is led by the manufacturing sector, which predicts over 13 percent growth. Utilities and other services predict employment declines.

Figure 67.
Biomass Electric Power Generation - Expected Employment Growth by Industry



In 2020, women represented 31 percent of the biomass EPG workforce. Similar to most of the electric power generation workforce, it is more racially diverse than the national workforce, employing 29 percent non-White racial minorities. The unionization coverage rate is 5 percentage points higher than the national private sector average.

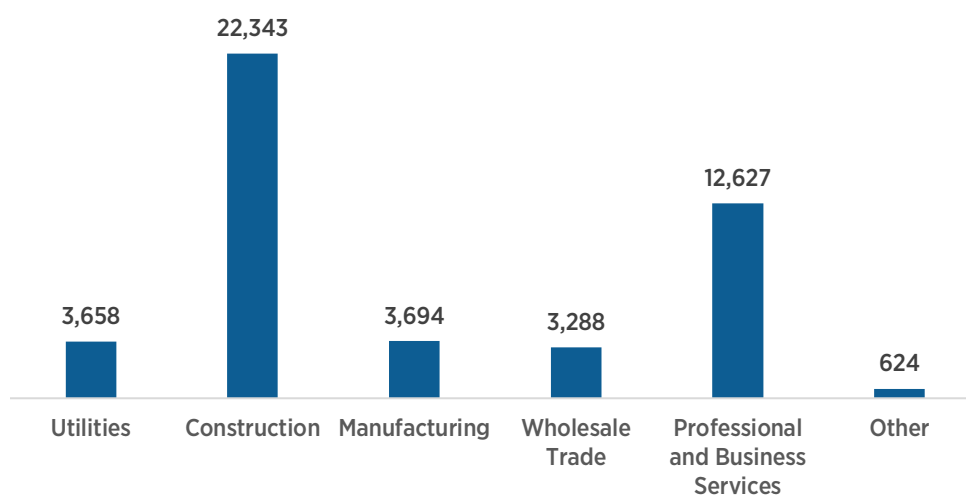
Table 21.
Biomass Electric Power Generation - Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	8,331	69%	52%
Female	3,708	31%	48%
Hispanic or Latino	1,874	16%	17%
Not Hispanic or Latino	10,165	84%	83%
American Indian or Alaska Native	144	1%	1%
Asian	1,155	10%	7%
Black or African American	1,307	11%	13%
Native Hawaiian or other Pacific Islander	134	1%	0%
White	8,528	71%	76%
Two or more races	770	6%	2%
Veterans	1,424	12%	6%
55 and over	2,654	22%	23%
Union Coverage	1,324	11%	6%

Other Electric Power Generation

Other EPG³⁶ technologies employed a total of 46,234 workers across the nation in 2020. Over the past year, almost 4,000 jobs were lost for other generation technologies—a greater than 8 percent decrease in employment, wiping out all of the employment gains from 2019. Construction accounted for nearly half of other EPG jobs in 2020, while professional business services supported more than 27 percent.

Figure 68.
Other Electric Power Generation – Employment by Industry



In 2020, 36 percent of other EPG employers reported that hiring was somewhat difficult or very difficult. Sixty-four percent of other EPG employers reported having an inadequate number of employees but not hiring.

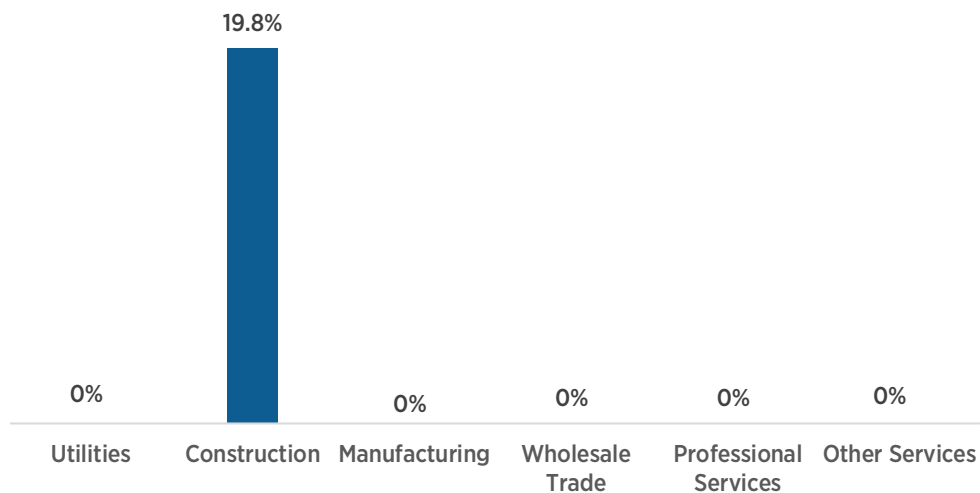
³⁶ Includes generation from incineration of other fuels (waste, etc.), tidal generation, and employment that cannot be classified into a single category. The numbers in this section are the sum of the employment numbers under “Geo” and “Other” in Table 11.

Figure 69.
Other Electric Power Generation - Hiring Difficulty by Industry



Employers in the other EPG industry expect just over 9 percent growth in 2020. This will be led by the construction sector, which predicts nearly 20 percent growth.

Figure 70.
Other Electric Power Generation - Expected Employment Growth by Industry



In 2020, women represented 31 percent of the other EPG workforce. Like most EPG technologies, other EPG is more racially diverse than the national workforce at 28 percent non-White racial minorities. The unionization coverage rate is 5 percentage points higher than the national private sector average.

Table 22.
Other Electric Power Generation – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	31,812	69%	52%
Female	14,422	31%	48%
Hispanic or Latino	9,081	20%	17%
Not Hispanic or Latino	37,153	80%	83%
American Indian or Alaska Native	567	1%	1%
Asian	4,966	11%	7%
Black or African American	3,185	7%	13%
Native Hawaiian or other Pacific Islander	600	1%	0%
White	33,061	72%	76%
Two or more races	3,854	8%	2%
Veterans	3,641	8%	6%
55 and over	5,244	11%	23%
Union Coverage	5,086	11%	6%

Electric Power Generation and Fuels Employment Crosscut

In Table 23, data on Electric Power Generation and Fuels technologies are combined to better understand the employment characteristics and trends of each. Some generation technologies, such as natural gas or nuclear power, require the use of fuels while others, such as wind or hydropower, do not. In addition, some fuels, such as nuclear fuel, are used primarily for electric power generation, while others, such as coal, oil, and natural gas, have multiple purposes.

For example, advanced natural-gas-powered electricity generation and nuclear-powered electricity generation are technology applications that employ roughly the same number of workers, while the underlying technologies used in natural gas and nuclear energy systems are significantly different, as are the associated employment numbers for all energy uses of these resources.

Table 23.
Electric Power Generation and Fuels Employment by Major Energy Technology Application and Detailed Technology Application

	Electric Power Generation	Fuels	Total
Oil/Petroleum	11,685	495,210	506,895
Natural Gas	109,480	209,970	319,450
Traditional Gas	41,432	-	41,432
Advanced Gas	68,049	-	68,049
Majority-Time Solar Employment*	231,474	-	231,474
Coal	71,403	60,438	131,841
Bioenergy	12,039	107,915	119,954
Corn Ethanol	-	33,506	33,506
Other Ethanol/ Non-Woody Biomass, including Biodiesel	-	19,455	19,455
Woody Biomass Fuel for Energy and Cellulosic Biofuels	-	32,442	32,442
Other Biofuels	-	17,581	17,581
Wind	116,817	-	116,817
Other Generation/ Other Fuels	38,232	60,324	98,556
Nuclear	58,002	8,768	66,770
Hydroelectric Generation	63,131	-	67,772
Low Impact Hydroelectric Generation	11,251	-	11,251
Traditional Hydropower	51,880	-	51,880
CHP	28,107	-	28,107
Geothermal	8,002	-	8,002



Transmission, Distribution & Storage

[ENERGY.GOV/USEER](https://www.energy.gov/user)

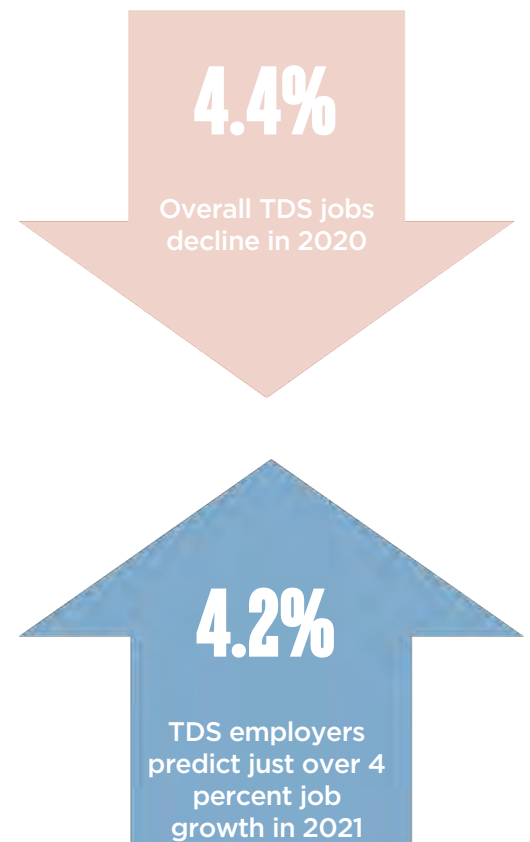
United States Energy
& Employment Report

Transmission, Distribution, and Storage (TDS) infrastructure for electric power and fuel links energy supplies to intermediate and end users. As of 2015, it included the following:

- 2.6 million miles of interstate and intrastate pipelines
- 414 natural gas storage facilities
- 330 ports handling crude petroleum and refined petroleum products
- 140,000 miles of railways that handle crude petroleum, refined petroleum products, liquefied natural gas (LNG), and coal
- 642,000 miles of high-voltage transmission lines
- 6.3 million miles of distribution lines³⁷

Trends

- **2020 TDS Employment:** Excluding retail employees in gas stations and fuel dealers, 1,322,188 workers were employed in Transmission, Distribution, and Storage, a drop of 61,458 (4.4 percent).
- **2021 Expectations:** TDS employers predict 4.2 percent job growth in 2021, led by construction firms who anticipate 6.5 percent growth, or nearly 450,000 additional jobs.
- **Key Industry Sectors:** The construction sector employed 34 percent of all TDS workers, while the utility industry employed another 31 percent.



³⁷ Department of Energy [DOE], Quadrennial Energy Review: Energy Transmission, Storage, and Distribution Infrastructure (Washington, DC: DOE, 2015), 1-2.

Employment Snapshot

Figure 71.
TDS Sector – Employment by Industry, 2019-2020

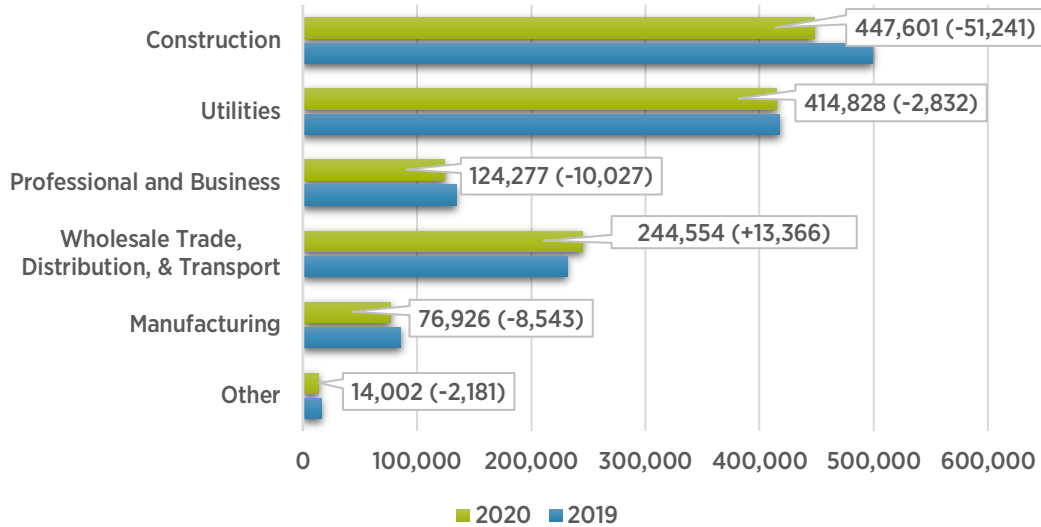
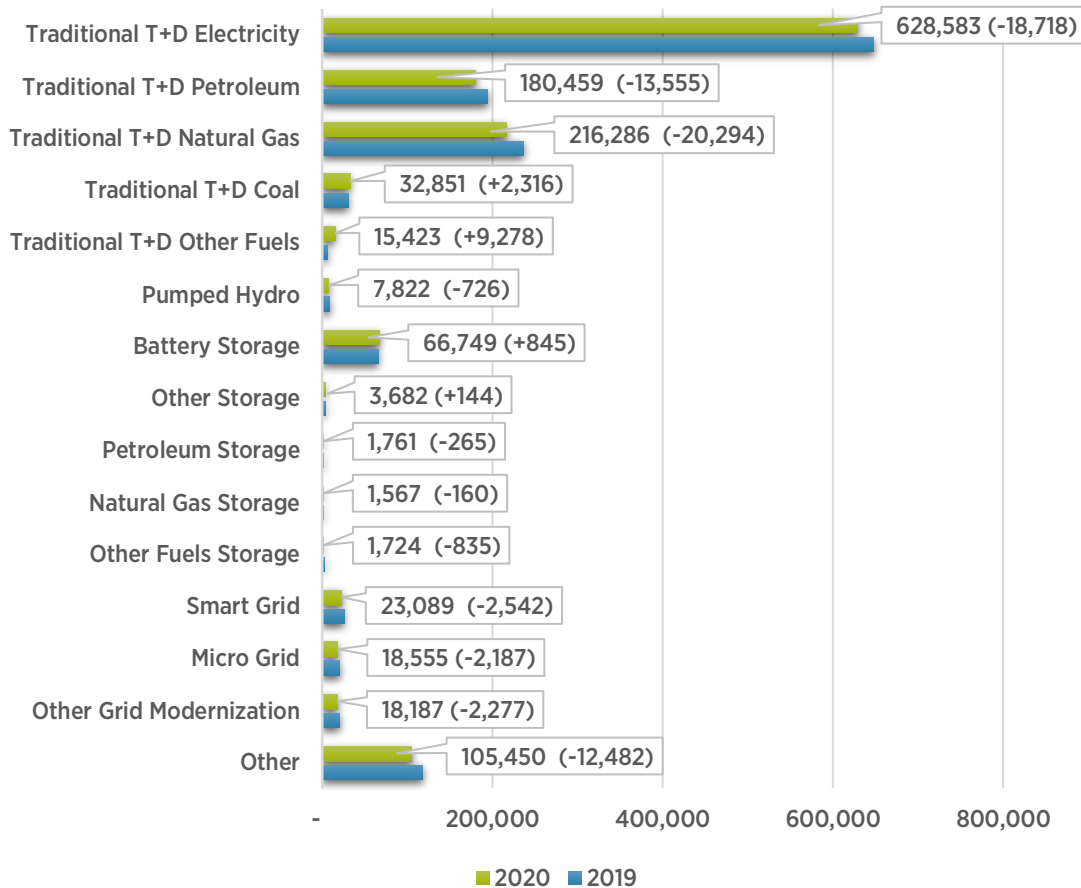


Figure 72.
TDS Sector – Employment by Detailed Technology Application, 2019-2020



Key Takeaways

- **Construction firms employed 447,601 workers** in TDS, a more than 10 percent decline from 2019. Utilities employed 414,828 workers across the United States in 2020, virtually unchanged from 2019. TDS manufacturing employment dropped sharply (10 percent) in 2020.
- **Wholesale trade, distribution, and transport increased** by 13,366 jobs or 5.8 percent in 2020.
- **Utility investments.** Overall, 51.1 percent of respondent employers working in Transmission, Distribution, and Storage reported that a majority of their revenues come from grid modernization or other utility-funded modernization projects (an increase from the 42 percent reported in 2019).
- **Fuels employment.** The transmission, distribution, and storage of fuels employed 450,071 workers in the sector in 2020—a 5.2 percent decline compared to last year's report.

Table 24.
TDS Sector – TDS Employment by Detailed Technology Application and Industry, Q4 2020^{38,39}

	Total	Utilities	Construction	Manufacturing	Wholesale Trade, Distribution, + Transport ⁴⁰	Professional Services	Pipeline Transport	Other Services
Traditional Transmission + Distribution Electricity	628,583	298,473	172,669	39,937	34,512	71,715	--	11,277
Traditional Transmission + Distribution Petroleum	180,459	--	63,981	--	96,355	--	20,123	--
Traditional Transmission + Distribution Natural Gas	216,286	116,355	68,618	--	--	--	31,313	--
Traditional Transmission + Distribution Coal	32,851	--	--	--	32,851	--	--	--
Traditional Transmission + Distribution Other Fuels	15,423	--	--	--	11,442	--	3,981	--
Pumped Hydro	7,822	--	2,938	2,351	248	1,315	894	75
Battery Storage	66,749	--	35,263	11,910	7,549	10,988	--	1,041
Other Storage	3,682	--	1,277	1,551	48	723	--	83
Petroleum Storage	1,761	--	1,066	252	30	--	--	413
Natural Gas Storage	1,567	--	492	258	203	603	--	10
Other Fuels Storage	1,724	--	1,129	--	<10	543	--	52
Smart Grid	23,089	--	10,515	1,559	1,458	9,396	--	160
Micro Grid	18,555	--	10,548	3,221	1,570	2,769	--	447
Other Grid Modernization	18,187	--	13,564	1,818	259	2,335	--	211
Other	105,450	--	65,541	14,068	1,718	23,891	--	234
TOTAL	1,322,188	414,828	447,601	76,926	188,243	124,277	56,311	14,002

³⁸ Employers in the “other” category typically work across multiple technology applications and workers are unable to be assigned to a single technology.

³⁹ Column and row totals may differ due to rounding.

⁴⁰ Traditional transmission and distribution of petroleum, natural gas, and coal only includes commodity flow employment, such as truck, rail, air, water, and pipeline transportation.

Hiring Difficulty

- **Ninety-three percent of TDS construction** employers reported that it was somewhat difficult or very difficult to hire new employees in 2020 (with 45 percent reporting that hiring was very difficult).
- **Ninety-four percent of professional and business services** employers reported that it was either somewhat difficult or very difficult to hire new employees.
- **Nine percent of employers in TDS** reported having an inadequate number of employees but not hiring.

Introduction

For the purpose of the USEER, TDS (Transmission, Distribution, and Storage) encompasses the employment associated with constructing, operating, and maintaining energy infrastructure. It includes workers associated with the entire network of power lines that transmit electricity from generating stations to customers, as well as activities that support pipeline construction, fuel distribution and transport, and the manufacture of electrical transmission equipment.

Several NAICS codes actively track employment across utility transmission—a category that includes natural gas distribution, electrical transmission line construction, and fossil fuel pipeline transportation. As in prior USEERs, traditional transmission and distribution technologies were split between electricity and fuels. Also included this year is employment for the storage of fuels. The TDS sector’s remaining employment is found within energy-related industry subsectors in construction, manufacturing, wholesale trade, professional and business services, and other services.

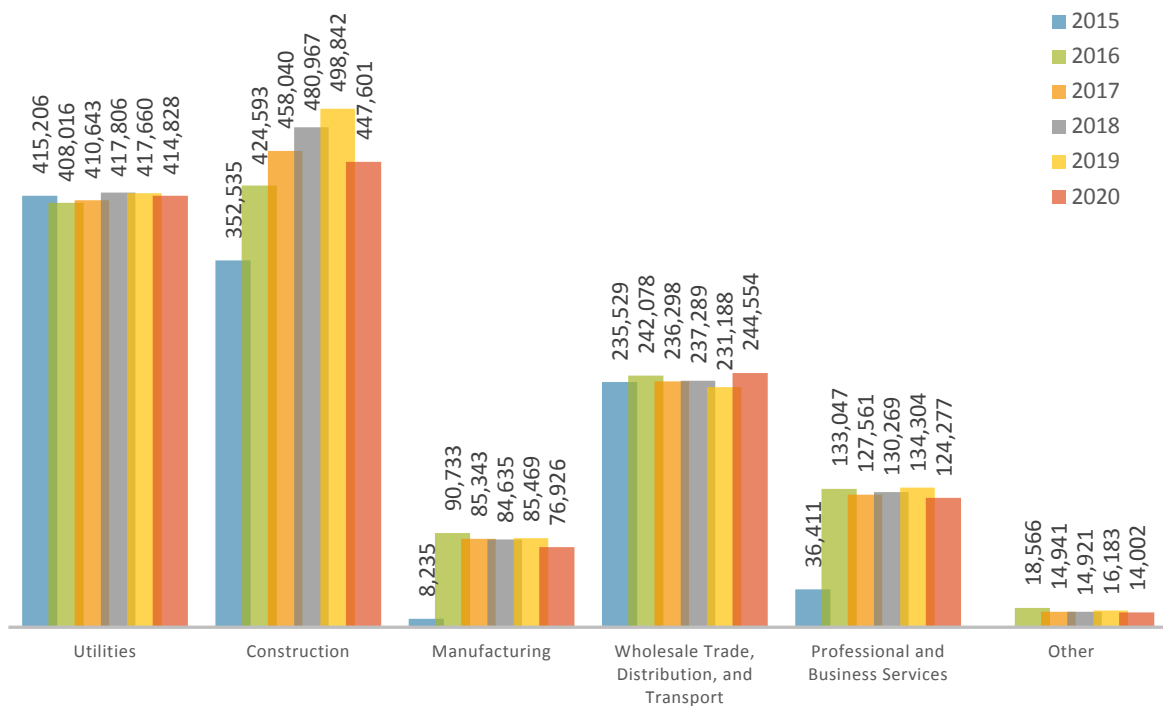
In the broadest possible sense, TDS could also encompass the final retail sale of gasoline and other liquid fuels to consumers; however, the USEER expressly excludes gas station workers from employment totals. Retail sales of gasoline and liquid fuels dealers employ a significant number of workers—in 2020, there were 988,817 such employees, comprising workers in gasoline stations with convenience stores (827,658 employees), other gasoline stations (92,425 employees), and fuel dealers (68,734 employees).⁴¹ These employees are part of the larger universe of 14,801,122 employees in retail trade in the United States in 2020.⁴² For purposes of the USEER, though, this retail trade employment is not included in the scope of this chapter on Transmission, Distribution, and Storage (or in the associated state fact sheets on energy employment that accompany this report). Workers associated with the wholesale trade and distribution of energy commodities, though, are within the scope of this chapter.

⁴¹ BLS, QCEW, 2020 Third Quarter, U.S. Total September Employment for NAICS 44711, NAICS 44719, and NAICS 45431. Available by searching on these codes from https://data.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables.

⁴² BLS, QCEW, 2020 Third Quarter, U.S. Total September Employment for NAICS 44-45. Available at https://data.bls.gov/cew/apps/table_maker/v4/table_maker.htm#type=1&year=2020&qtr=3&own=5&ind=44-45&supp=0.

Transmission, Distribution, and Storage, plus the retail workers discussed above, employed just over 2.3 million Americans in 2020. Excluding these retail employees, 1,322,188 workers were employed in the TDS sector. As shown in Figure 73,⁴³ about 65 percent of this employment was across utilities and construction firms,⁴⁴ including 34 percent in construction companies that construct pipeline and other infrastructure that support the Transmission, Distribution, and Storage, including both fuels and electricity.⁴⁵ Construction firms in the sector shed more than 50,000 jobs, a drop of more than 10 percent in 2020, after several consecutive years of strong growth. Overall, 51.1 percent of respondent employers working in the TDS sector reported that a majority of their revenues come from grid modernization or other utility-funded modernization projects (an increase from the 42 percent proportion reported in 2019). TDS employers project employment growth of just over 4 percent in 2020.

Figure 73.
TDS Sector - Employment by Industry Sectors, Q4 2015 - Q4 2020



⁴³ It should be noted that any changes in the manufacturing industry are not directly comparable to employment totals for 2015 in the 2016 USEER. The 2017 USEER, 2018 USEER, 2019 USEER, and 2020 USEER significantly improved the methodology and scope used, to capture more manufacturing jobs. As a result, changes in the methodology account for most of the apparent and observed growth in 2016, compared to 2015 data.

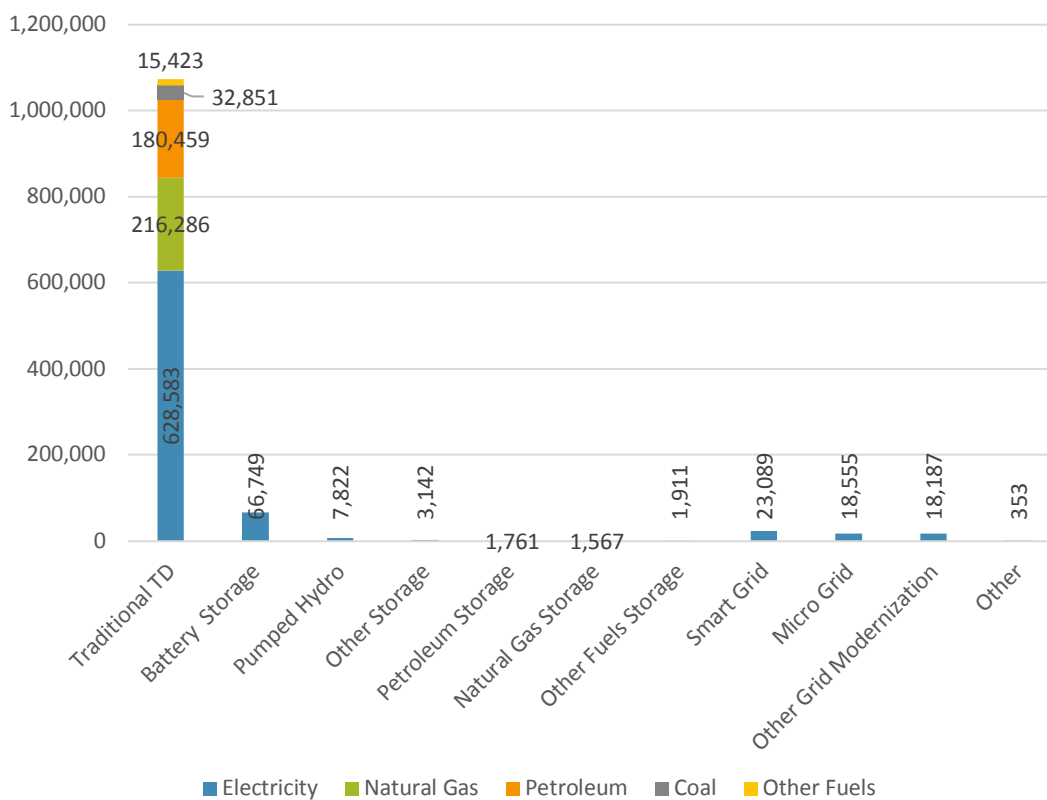
⁴⁴ Hydrogen and fuel cell technologies are split among motor vehicles, storage, and other generation, depending on application—however, the numbers were too small to report separately within the latter two categories.

⁴⁵ This includes transportation employment, which is calculated using commodity flow data and employment data on rail, truck, air, and sea transportation.

Transmission, Distribution, and Storage Employment by Detailed Technology Application

In 2020, about 81 percent of Transmission, Distribution, and Storage employees worked to manufacture, construct, repair, and operate traditional electrical and natural gas transmission and distribution. This includes natural gas pipeline and power line construction. Approximately 83,305 workers were employed with storage technologies (including pumped hydro-storage)⁴⁶ in 2020, while nearly 60,000 worked with smart grid,⁴⁷ micro grid, or other grid technologies.

Figure 74.
TDS Sector - Employment by Detailed Technology, 2020



Construction firms, the largest sector of TDS employment, expect growth of 6.5 percent in 2021, as shown in Figure 7.⁴⁸ All sectors expect to grow

⁴⁶ Hydro-storage is included in this section when it is separate from hydropower generation, which is included in the generation and fuels chapter. The “other” category includes workers that were not able to be assigned to a single technology category.

⁴⁷ Defined as employees that work on an electricity supply network that uses digital communications technology to detect and react to local changes in usage.

⁴⁸ The data in Figure 7 does not include commodity flow employers (truck, rail, air, water, and pipeline transportation), as they were not surveyed for 2020 USEER.

their workforce, though utilities, the second largest sector, predict only moderate growth (1 percent).

Figure 75.
TDS Sector - Expected Employment Growth by Industry (Q4 2020 - Q4 2021)

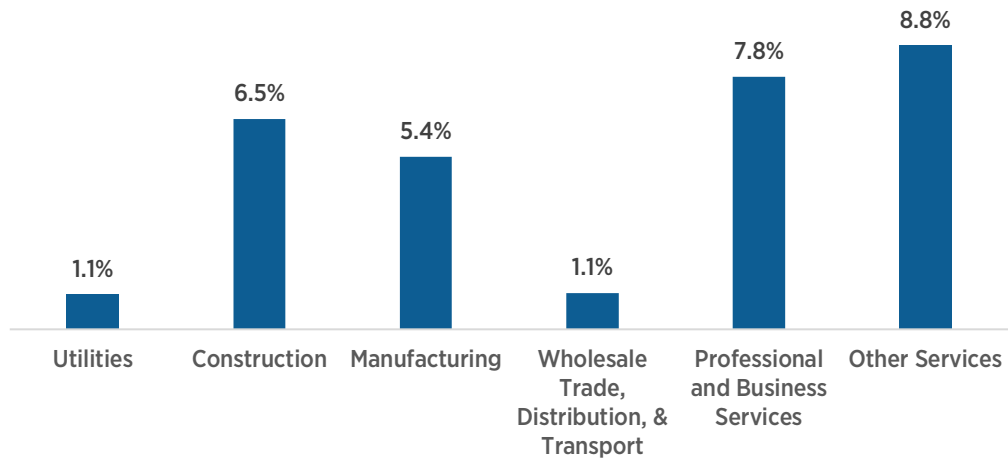
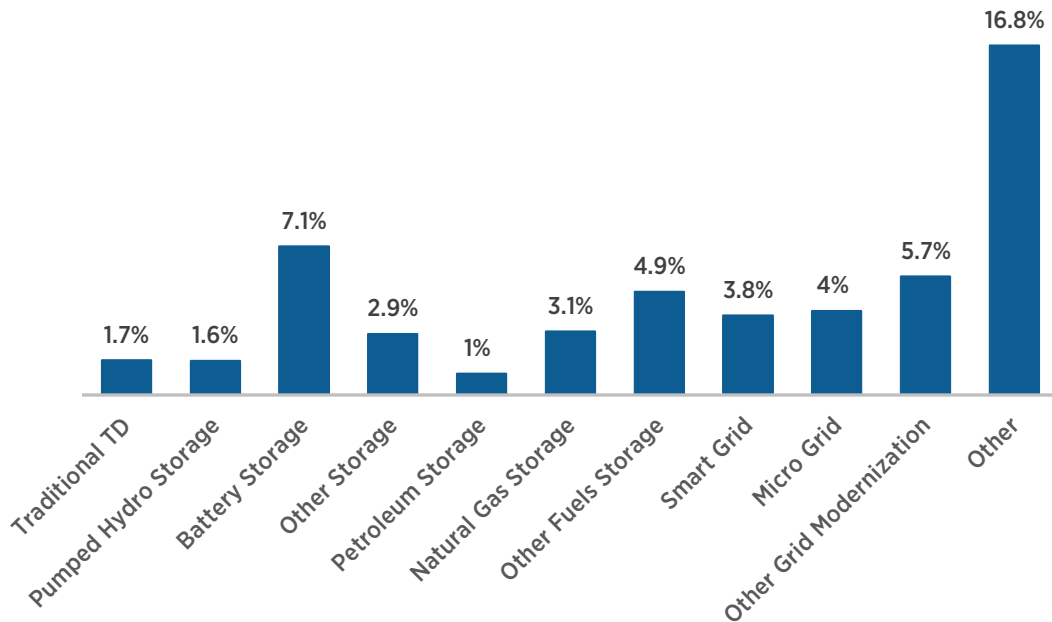


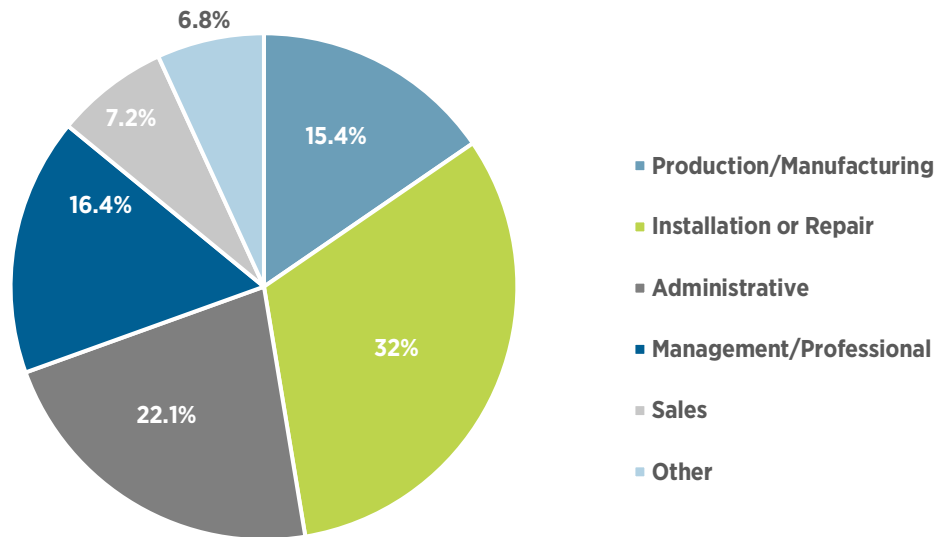
Figure 76.
TDS Sector - Expected Employment Growth by Detailed Technology (2020-2021)



Transmission, Distribution, and Storage – Workforce Characteristics

Nearly one-third (32 percent) of Transmission, Distribution, and Storage workers were employed in installation or repair positions in 2020. Twenty-two percent of workers were employed in administrative positions.

Figure 77.
TDS Sector – Occupational Distribution, Q4 2020

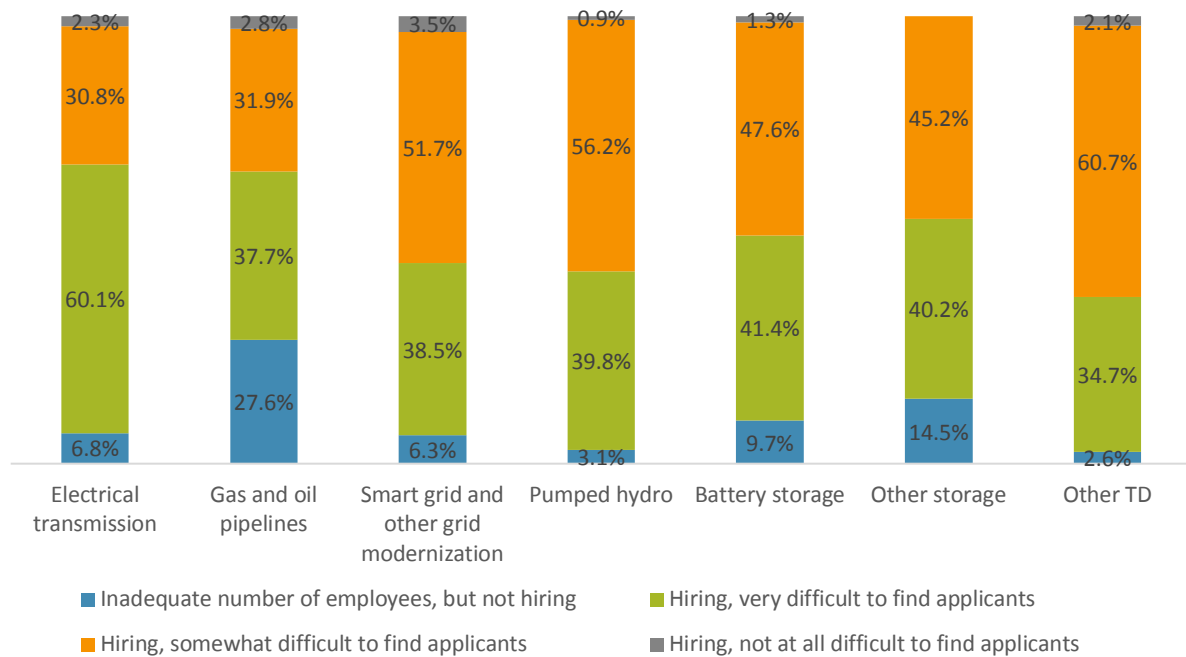


All manufacturing firms in TDS reported hiring difficulty in 2020, followed by professional business services and construction. In construction, which makes up the largest percentage of TDS employment, 45 percent of employers reported that it was very difficult to hire new employees in 2020. Ninety-four percent of professional business services employers reported that it was difficult to hire new employees.

Figure 78.
TDS Sector – Hiring Difficulty by Industry



Figure 79.
TDS Sector – Hiring Difficulty by Technology, Q4 2019



In 2020, women represented 24 percent of the TDS workforce. Sixteen percent of employees were Hispanic or Latino, just below the national workforce average. African-American employment was roughly level with the national workforce average, while overall racial diversity was 9 percentage points above the national average. Unionization rates in TDS are 17 percent, 11 percentage points above the national private sector rate. (As noted earlier in connection with Figure 7, commodity flow employment is not included in this section—or in Table 27—as commodity flow employers were not directly surveyed for the 2021 USEER.)

Table 25.
TDS Sector – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	894,871	76%	52%
Female	286,669	24%	48%
Hispanic or Latino	187,458	16%	17%
Not Hispanic or Latino	994,082	84%	83%
American Indian or Alaska Native	25,370	2%	1%
Asian	104,193	9%	7%
Black or African American	126,931	11%	13%
Native Hawaiian or other Islander	9,561	1%	0%
White	813,244	69%	76%
Two or more races	102,240	9%	2%
Veterans	83,400	7%	6%
55 and over	201,445	17%	23%
Union Coverage	200,862	17%	6%

Natural Gas Industry Crosscut

The natural gas industry has employment in three of the 2020 USEER chapters — Fuels, Electric Power Generation, and Transmission, Distribution, and Storage.

In total, the 2021 USEER finds that the natural gas industry employs 537,302 Americans, spread through the industrial sectors in Table 26 below. Overall, natural gas industry employment decreased by 15.5 percent in 2020, following 1.7 percent growth from 2018 to 2019.

The largest industry sectors in the natural gas industry were the following:

- Utilities - 175,738 jobs
- Mining and Extraction - 107,925 jobs
- Construction - 86,797 jobs

The largest industry sector declines for natural gas were the following:

- Mining and Extraction - 34.8 percent decline
- Construction - 20.8 percent decline
- Manufacturing - 9.5 percent decline

The industry sectors that lost the most jobs in natural gas were the following:

- Mining and Extraction - 57,678 jobs lost
- Construction - 22,779 jobs lost
- Utilities - 7,874 jobs lost

Table 26.
Natural Gas Industry Employment by Detailed Technology Application
and Industry, Q4 2020⁴⁹

	Total	Mining and Extraction	Utilities	Construc- tion	Manufac- turing	Wholesale Trade, Distribution, + Transport (including Pipeline)	Professional and Business Services	Other Services
Fuels	209,970	107,925			40,988	28,127	32,777	153
Conventional Gas Generation	41,432	--	17,213	9,237	3,270	3,026	7,710	977
Advanced Gas	68,049	--	42,170	8,450	2,507	4,737	9,399	785
Fuel Transmission + Distribution	216,286	--	116,355	68,618	--	31,313	--	--
Storage	1,567	--	--	492	258	203	603	10
TOTAL	537,302	107,925	175,738	86,797	47,023	67,406	50,488	1,925

Snapshot of the Natural Gas Industry

- Contribution to GDP in 2020: \$229.8 billion⁵⁰
- Overall employment: 537,302
- Consumption of natural gas by sector: 15.2 percent by residential, 10.3 percent by commercial, 33.1 percent by industrial, 3.0 percent by pipeline and distribution system operations, 0.2 percent as vehicle fuel, 38.1 percent by electric power generation⁵¹
- 1,616,748 GWh of net electricity generation from natural gas⁵²

⁴⁹ Column and row totals may differ due to rounding

⁵⁰ GDP estimates developed by BW Research Partnership using Bureau of Economic Analysis (BEA) RIMS II data and data collected in the employer survey.

⁵¹ Calculated from data in EIA, *Monthly Energy Review, April 2021*, Table 4.3, "Natural Gas Consumption by Sector."

⁵² EIA, *Monthly Energy Review, April 2021*, Table 7.2a, "Electricity Net Generation: Total (All Sectors)."

Workforce Trends

OVERALL DIFFICULTY HIRING

Nine in ten (89.3 percent) natural gas firms had difficulty in hiring in 2020; 67.1 percent reported hiring was very difficult. Eight percent of firms had inadequate number of employees but did not hire.

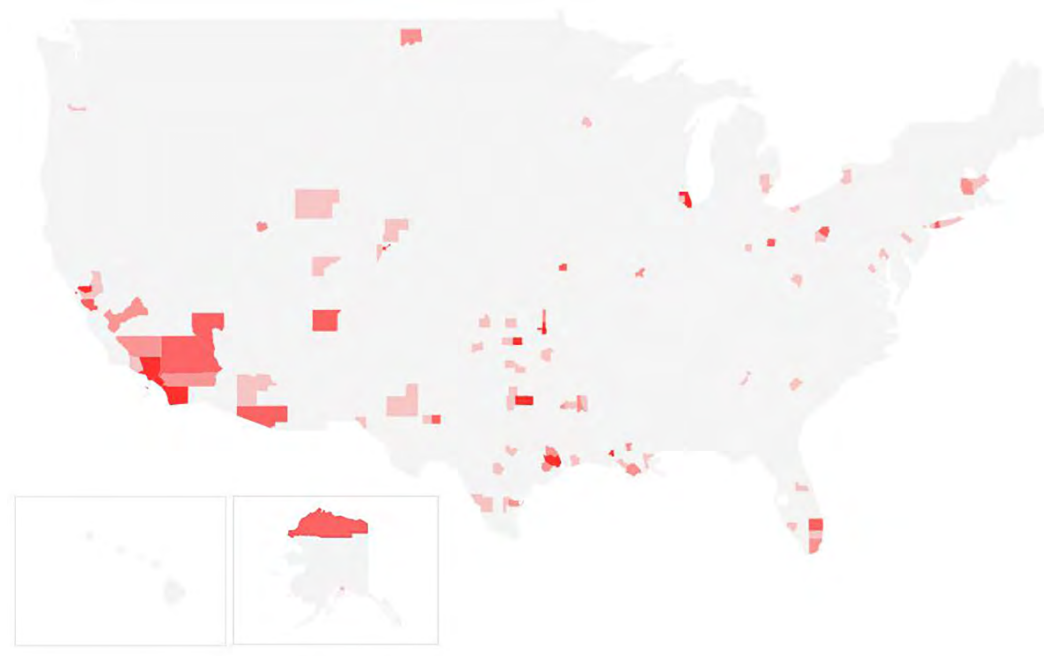
MOST DIFFICULT INDUSTRIES

- Manufacturing (98.2 percent), wholesale trade, distribution, and transport (90.6 percent), and professional and business services (86.8 percent) industries had the most difficulty hiring for natural gas in 2020.
- 49.4 percent of manufacturing firms reported that hiring was very difficult.

WAGES⁵³

- The average reported median full-time hourly wage for all workers is \$30.33/hour, 58.4 percent above the national median wage.
- Top wage-earning sectors in the natural gas industry include utilities (averaging \$41.03/hour), mining (averaging \$37.67/hour), and commodity flows (averaging \$35.89/hour).

Figure 80.
National Heat Map Showing Distribution of Natural Gas Jobs



⁵³ EFI et al., Wages, Benefits, and Change Report

Coal Industry Crosscut

The coal industry has employment in three of the 2020 USEER chapters—Fuels, Electric Power Generation, and Transmission, Distribution, and Storage.

In total, the 2021 USEER finds that the coal industry employs 164,692 Americans, spread through the industrial sectors in Table 27 below. Overall, coal industry employment declined by 11.3 percent in 2019, following a 6 percent decline in 2018.

The largest industry sectors in coal industry were the following:

- Mining and Extraction – 42,313 jobs
- Wholesale Trade, Distribution, and Transport – 39,622 jobs
- Utilities – 34,075 jobs

The fastest shrinking industry sectors for coal were the following:

- Mining and Extraction – 24 percent decline
- Construction – 20.3 percent decline
- Other Services – 14.3 percent decline

The industry sectors that lost the most jobs in coal were the following:

- Mining and Extraction – 13,356 jobs lost
- Utilities – 4,084 jobs lost
- Professional and Business Services – 2,448 jobs lost

Table 27.
Coal Industry Employment by Detailed Technology Application and Industry, Q4 2020⁵⁴

	Total	Mining and Extraction	Utilities	Construction	Manufacturing	Wholesale Trade, Distribution, + Transport	Professional and Business Services	Other Services
Fuels	60,438	42,313	--	--	9,635	978	7,490	22
Coal Generation	71,403	--	34,075	7,052	973	5,794	22,645	866
Fuel Transmission + Distribution	32,851	--	--	--	--	32,851	--	--
TOTAL	164,692	42,313	34,075	7,052	10,608	39,622	30,135	888

⁵⁴ Column and row totals may differ due to rounding

Snapshot of the Coal Industry

- Contribution to GDP in 2020: \$50.8 billion⁵⁵
- Overall employment: 164,692
- Consumption of coal by sector: 0.2 percent by commercial, 8.4 percent by industrial, 91.5 percent by electric power generation⁵⁶
- 773,805 GWh of net electricity generation from coal⁵⁷
- 873 million metric tons of carbon dioxide emissions⁵⁸

Workforce Trends

OVERALL DIFFICULTY HIRING

Eighty-six percent of coal firms had difficulty in hiring in 2020; 57.6 percent reported hiring was very difficult. Thirteen percent of firms had inadequate number of employees but did not hire.

MOST DIFFICULT INDUSTRIES

- Manufacturing (87.9 percent), construction (86.7 percent), and professional and business services (75 percent) industries had the most difficulty hiring for coal in 2020.
- 18.2 percent of manufacturing firms reported that hiring was very difficult.

WAGES⁵⁹

- The average reported median full-time hourly wage for all workers is \$28.69/hour, 50 percent above the national median wage.
- Top wage-earning sectors include utilities (averaging \$41.30/hour), professional services (averaging \$29.17/hour), and construction (averaging \$26.65/hour).

⁵⁵ GDP estimates developed by BW Research Partnership using Bureau of Economic Analysis (BEA) RIMS II data and data collected in the employer survey.

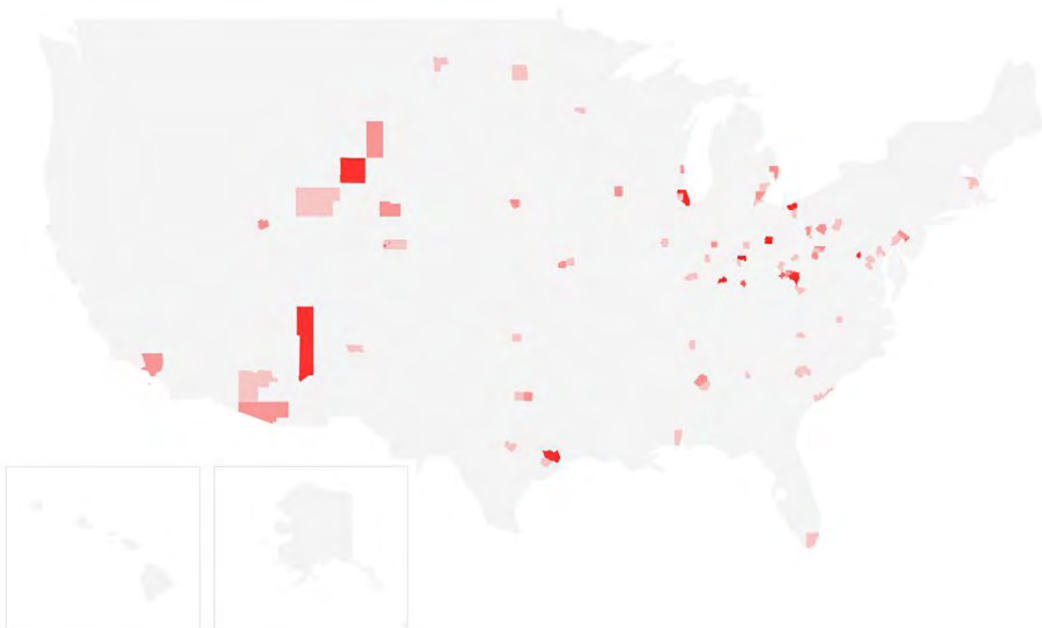
⁵⁶ Calculated from data in EIA, *Monthly Energy Review, April 2021*, Table 6.2, "Coal Consumption by Sector."

⁵⁷ EIA, *Monthly Energy Review, April 2021*, Table 7.2a, "Electricity Net Generation: Total (All Sectors)."

⁵⁸ EIA, *Monthly Energy Review, April 2021*, Table 11.1, "Carbon Dioxide Emissions from Energy Consumption by Source."

⁵⁹ EFI et al., *Wages, Benefits, and Change Report*

Figure 81.
National Heat Map Showing Distribution of Coal Jobs



Petroleum Industry Crosscut

The petroleum industry has employment in three of the 2020 USEER chapters—Fuels, Electric Power Generation, and Transmission, Distribution, and Storage.

In total, the 2021 USEER finds that the petroleum industry employs 681,501 Americans, spread through the industrial sectors.

The largest industry sectors in petroleum industry were the following:

- Mining and Extraction – 218,315 jobs
- Wholesale Trade, Distribution, and Transport – 167,422 jobs
- Manufacturing – 142,983 jobs

The fastest shrinking industry sectors for petroleum were the following:

- Mining and Extraction – 30.4 percent decline
- Construction – 20.7 percent decline
- Other Services – 14.4 percent decline

The industry sectors that lost the most jobs in petroleum were the following:

- Mining and Extraction – 95,276 jobs lost
- Utilities – 21,582 jobs lost
- Professional and Business Services – 14,928 jobs lost

Overall, the industry employment declined by 17.3 percent in 2020, following a 3 percent increase in 2019.

Table 28.
Petroleum Industry Employment by Detailed Technology Application
and Industry, Q4 2020

	Total	Mining and Extraction	Utilities	Construc- tion	Manufac- turing	Wholesale Trade, Distribution , + Transport	Professiona l and Business Services	Other Services
Fuels	495,210	218,315	--	17,839	137,497	56,605	63,762	1,191
Oil & Other								
Petrol	11,685	--	423	--	5,234	1,923	3,987	118
Generation								
Fuel								
Transmission +	172,845	--	--	63,981	--	108,864	--	--
Distribution								
Storage	1,761	--	--	1,066	252	30	--	413
TOTAL	681,501	218,315	423	82,886	142,983	167,422	67,749	1,723

Snapshot of the Petroleum Industry

- Contribution to GDP in 2020: \$560.2 billion⁶⁰
- Overall employment: 681,501
- Consumption of petroleum by sector: 3.1 percent by residential, 2.4 percent by commercial, 28 percent by industrial, 66 percent by transportation, 0.5 percent by electric power generation⁶¹
- 17,495 GWh of net electricity generation from petroleum⁶²
- 2,035 million metric tons of carbon dioxide emissions⁶³

⁶⁰ GDP estimates developed by BW Research Partnership using Bureau of Economic Analysis (BEA) RIMS II data and data collected in the employer survey.

⁶¹ Calculated from data in EIA, *Monthly Energy Review, April 2021*, Table 3.7a, "Petroleum Consumption: Residential and Commercial Sectors;" Table 3.7b, "Petroleum Consumption: Industrial Sector;" Table 3.7c, "Petroleum Consumption: Transportation and Electric Power Sectors."

⁶² EIA, *Monthly Energy Review, April 2021*, Table 7.2a, "Electricity Net Generation: Total (All Sectors)."

⁶³ EIA, *Monthly Energy Review, April 2021*, Table 11.1, "Carbon Dioxide Emissions from Energy Consumption by Source."

Workforce Trends

OVERALL DIFFICULTY HIRING

- Ninety-one percent of petroleum firms had difficulty in hiring in 2020; 33 percent reported hiring was very difficult. About 6 percent of firms had inadequate number of employees but did not hire.

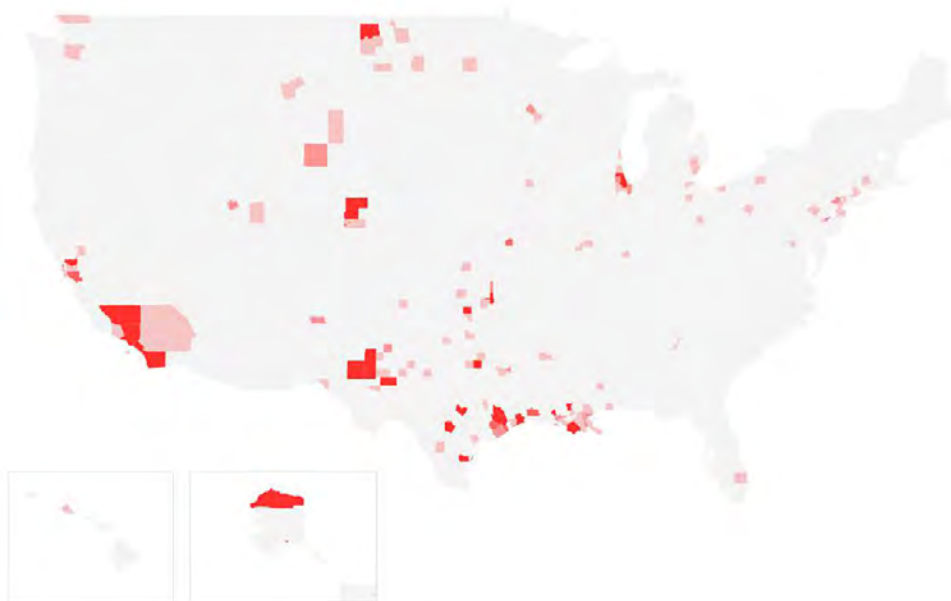
MOST DIFFICULT INDUSTRIES

- Manufacturing (100 percent), construction (99.5 percent), and professional and business services (85.1 percent) industries had the most difficulty hiring for petroleum in 2020.
- Almost 4 percent of manufacturing firms reported that hiring was very difficult.

WAGES⁶⁴

- The average reported median full-time hourly wage for all workers is \$26.59/hour, 38.9 percent above the national median wage.
- Top wage-earning sectors include utilities (averaging \$41.30/hour), commodity flows (averaging \$39.34/hour), and mining (averaging \$37.67/hour).

Figure 82.
National Heat Map Showing Distribution of Petroleum Jobs



⁶⁴ EFI et al., Wages, Benefits, and Change Report

Nuclear Industry Crosscut

The nuclear industry has employment in two of the 2020 USEER chapters— Fuels and Electric Power Generation.

In total, the 2021 USEER finds that the nuclear industry employs 66,770 Americans, spread through the industrial sectors in Table 29 below. Overall, nuclear industry employment declined by 5.1 percent in 2020, following a drop of 2.9 percent in 2019.

The largest industry sectors in the nuclear industry were the following:

- Utilities – 42,781 jobs
- Professional and Business Services – 13,722 jobs
- Manufacturing – 4,516 jobs

The fastest shrinking industry sectors for nuclear were the following:

- Other Services – 13.5 percent decline
- Construction – 12.4 percent decline
- Manufacturing – 9.3 percent decline

The industry sectors that lost the most jobs in nuclear were the following:

- Utilities — 1,585 jobs lost
- Professional and Business Services – 1,035 jobs lost
- Manufacturing – 463 jobs lost

Table 29.
Nuclear Industry Employment by Detailed Technology Application and Industry, Q4 2020

	Total	Mining and Extraction	Utilities	Construction	Manufacturing	Wholesale Trade, Distribution, + Transport	Professional Services	Other
Fuels	8,768	341	--	--	2,794	882	4,751	--
Nuclear Generation	58,002	--	42,781	1,942	1,722	2,509	8,971	77
TOTAL	66,770	341	42,781	1,942	4,516	3,391	13,722	77

Snapshot of the Nuclear Industry

- Contribution to GDP in 2020: \$37.8 billion⁶⁵
- Overall employment: 66,770 jobs
- 789,919 GWh of net electricity generation from nuclear power⁶⁶

Workforce Trends

OVERALL DIFFICULTY HIRING

- Eighty-two percent of nuclear firms had difficulty in hiring in 2020; 69.2 percent have reported hiring was very difficult. Almost 18 percent of firms had inadequate number of employees but did not hire.

MOST DIFFICULT INDUSTRIES

- Construction (86.7 percent), manufacturing (66.7 percent), and wholesale trade, distribution, and transport (65.4 percent) industries had the most difficulty hiring for nuclear in 2020.
 - Forty-three percent of construction firms reported that hiring was very difficult.

WAGES⁶⁷

- The average reported median full-time hourly wage for all mid-wage workers is \$39.19/hour, 104.8 percent above the national median wage.
- Top wage-earning sectors include utilities (averaging \$47.00/hour), mining (averaging \$30.86/hour), and professional services (averaging \$28.86/hour).

⁶⁵ GDP estimates developed by BW Research Partnership using Bureau of Economic Analysis (BEA) RIMS II data and data collected in the employer survey.

⁶⁶ EIA, *Monthly Energy Review*, April 2021, Table 7.2a, "Electricity Net Generation: Total (All Sectors)."

⁶⁷ EFI et al., Wages, Benefits, and Change Report

Figure 83.
National Heat Map Showing Distribution of Nuclear Jobs



Storage Industry

The storage industry has employment in one of the 2021 USEER chapters, Transmission, Distribution, and Storage.

In total, the 2020 USEER finds that the storage industry employs 83,304 Americans, a decline of 1.2 percent over 2020. The storage industry is spread through the construction, manufacturing, wholesale trade, distribution, and transport, professional and business services, and other services as broken down in Table 30 below. It also includes several technologies and fuel types.

Snapshot of the Storage Industry

- Overall employment: 83,304 jobs
- Battery storage, the largest sub-technology, increased by 1.3 percent in 2020 (an increase of 846 jobs).

Table 30.
Storage Industry Employment by Detailed Technology Application and Industry, Q4 2020⁶⁸

	Total	Utilities	Construction	Manufacturing	Wholesale Trade, Distribution, + Transport ⁶⁹	Professional Services	Pipeline Transport	Other Services
Pumped Hydro	7,821	--	2,938	2,351	248	1,315	894	75
Battery Storage	66,749	--	35,263	11,910	7,549	10,988	--	1,041
Other Storage	3,683	--	1,277	1,551	48	723	--	83
Petroleum Storage	1,761	--	1,066	252	30	--	--	413
Natural Gas Storage	1,566	--	492	258	203	603	--	10
Other Fuels Storage	1,724	--	1,129	--	<10	543	--	52
TOTAL	83,304	--	42,165	16,322	8,078	14,171	894	1,673

⁶⁸ Column and row totals may differ due to rounding

⁶⁹ Traditional transmission and distribution of petroleum, natural gas, and coal only includes commodity flow employment.



Energy Efficiency



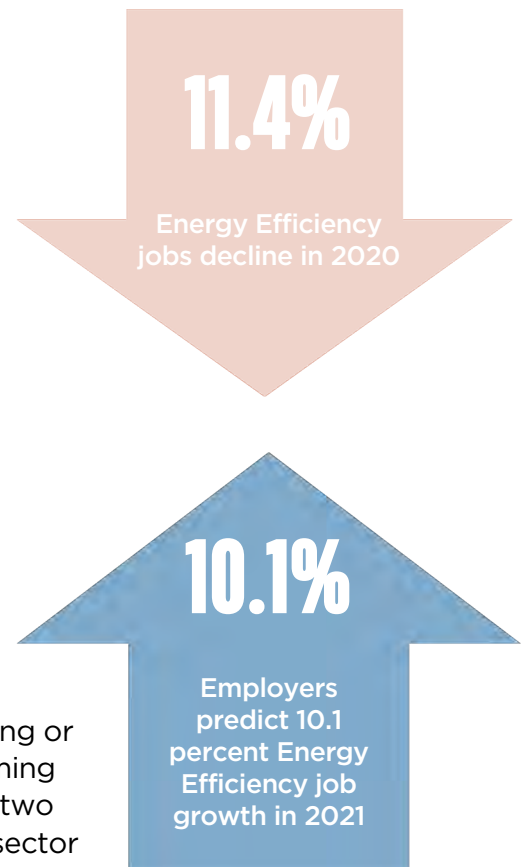
[ENERGY.GOV/USER](https://www.energy.gov/user)

United States Energy & Employment Report

Energy Efficiency employment covers both the production and installation of energy-saving products and the provision of services that reduce end-use energy consumption. These jobs, as specified in the current survey, include the manufacture of ENERGY STAR-labeled products, as well as building design and contracting services that provide insulation, improve natural lighting, and reduce overall energy consumption across homes and businesses.⁷⁰

Trends

- 2020 Job Loss.** In a sharp reversal from prior years, the Energy Efficiency sector lost the most jobs of any sector, down 271,719 (-11.4 percent). Nearly two-thirds of these losses were in construction firms, which dropped by nearly 180,000 workers (-13.5 percent).
- 2021 Expectations.** Energy Efficiency employers report a projected growth rate for employment in 2021 of 10 percent or nearly 214,000 new jobs. Construction employers report expected Energy Efficiency job growth of 12.1 percent (138,000 jobs) by the end of 2021.
- Key Occupations:** The majority (54 percent) of Energy Efficiency employees worked at construction firms in 2020, installing or servicing Energy Efficiency goods or performing Energy Efficiency related services.⁷¹ Twenty-two percent of workers in the Energy Efficiency sector were employed in professional and business services.



⁷⁰ Estimates do not include retail employment. ENERGY STAR is a registered trademark of the U.S. Environmental Protection Agency.

⁷¹ Building control equipment includes electrical equipment to automate, manage, or otherwise control mechanical and electrical building components such as lighting, ventilation, and power systems equipment.

Employment Snapshot

Figure 84.
Energy Efficiency Sector - Employment by Industry, 2019-2020

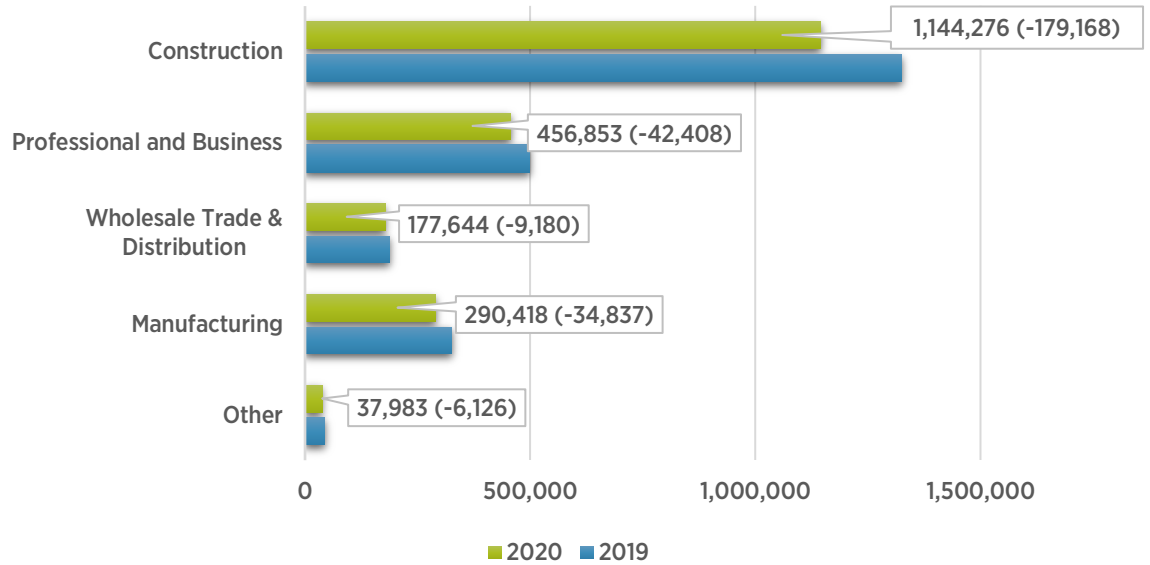
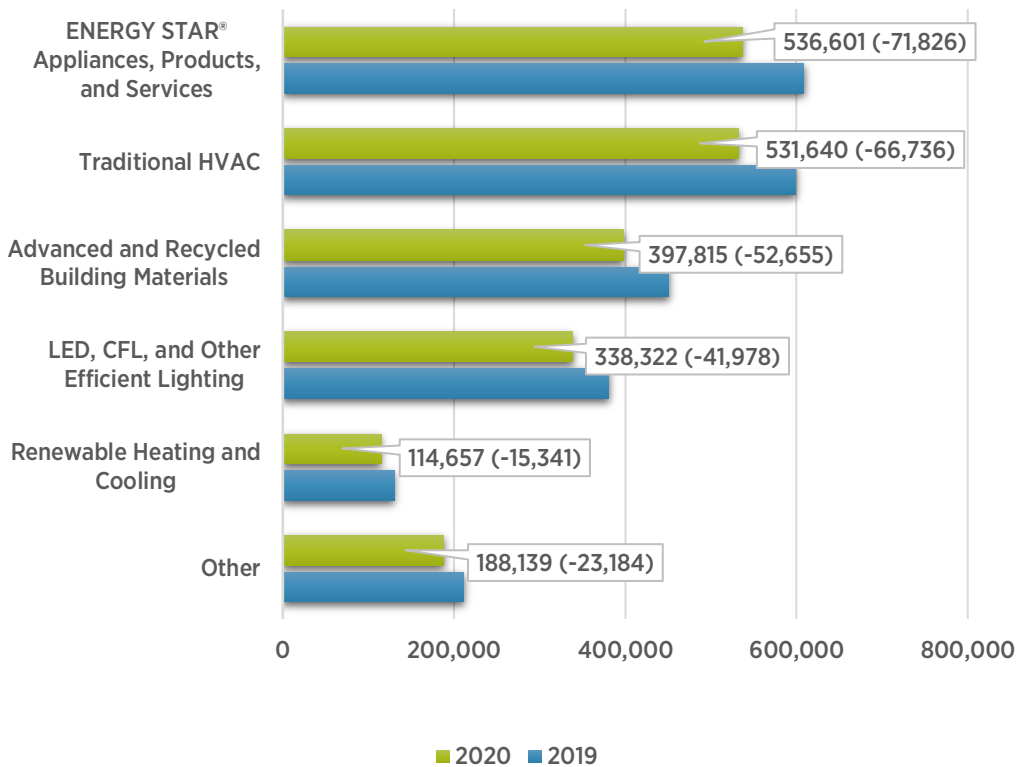


Figure 85.
Energy Efficiency Sector - Employment by Detailed Technology, 2019-2020



Key Takeaways

- The manufacture, installation, design, wholesale distribution, and other services related to ENERGY STAR products employed over 729,622 Americans in 2020.
- The manufacture of Energy Efficiency products employed 290,418 or almost 14 percent of the sector.
- Traditional HVAC firms shed the highest number of jobs (66,736 workers or an 11.2 percent decline), followed by ENERGY STAR HVAC companies (12.2 percent decline or 34,307 jobs lost).

Table 31.
Energy Efficiency Sector – Employment by Detailed Technology
Application and Industry, Q4 2020⁷²

	Total	Construction	Manu- facturing	Wholesale Trade	Professional Services	Other Services
ENERGY STAR Certified Appliances (not including HVAC)	126,021	62,914	11,842	11,692	36,349	3,224
ENERGY STAR Certified Heating, Ventilation, and Cooling (HVAC)	247,721	171,703	35,008	17,665	20,581	2,764
Other high efficiency HVAC that are out of scope for ENERGY STAR certification ⁷³	136,485	70,718	32,600	8,041	23,810	1,317
Traditional HVAC goods, control systems, and services	531,640	285,704	29,115	54,058	148,253	14,510
ENERGY STAR certified water heaters	19,079	13,339	328	1,365	3,967	79
ENERGY STAR Certified Electronics ⁷⁴	6,265	132	3,497	1,445	243	948
ENERGY STAR Certified Windows, Doors and Skylights	23,469	12,452	1,101	2,230	7,356	331
ENERGY STAR Certified Roofing	30,818	20,142	6,597	1,156	2,657	265
ENERGY STAR Certified Insulation	102,795	90,327	6,680	1,053	4,558	178
Air sealing	64,636	33,871	2,200	16,562	11,781	222
ENERGY STAR Certified Commercial Food Service Equipment	26,374	12,678	3,945	899	8,209	643
ENERGY STAR Certified Data Center Equipment	9,980	1,326	3,507	3,019	207	1,922
ENERGY STAR Certified LED lighting	137,100	54,181	12,391	16,779	51,120	2,629
Other LED, CFL, and efficient lighting	201,221	107,809	33,037	22,102	37,781	493
Other renewable heating and cooling ⁷⁵	95,578	59,620	6,578	6,344	22,401	634
Advanced building materials/insulation	102,342	25,003	50,640	1,104	24,486	1,109
Recycled building materials	73,755	41,051	10,797	2,652	16,618	2,637
Reduced water consumption products and appliances	82,378	51,175	5,406	5,145	19,454	1,198
Other	89,515	30,131	35,147	4,333	17,024	2,880
TOTAL	2,107,174	1,144,276	290,418	177,644	456,853	37,983

⁷² Column and row totals may differ due to rounding

⁷³ Includes indirect evaporative coolers, air to water heat pumps, energy recovery systems, etc.

⁷⁴ Includes TVs, telephones, audio/video, etc.

⁷⁵ Includes solar thermal, geothermal, biomass, heat pumps, etc.

Hiring Difficulty

- **Eighty-six percent of construction employers in energy efficiency** reported that it was somewhat difficult or very difficult to hire new employees in 2020 (with 66 percent reporting that it was very difficult).
- **Ninety-seven percent of professional and business services employers in energy efficiency** reported that it was either somewhat difficult or very difficult to hire new employees.
- **Nine percent of energy efficiency employers** reported having an inadequate number of employees but not hiring.

Introduction

There are no individual NAICS codes that can be entirely allocated to Energy Efficiency employment. Thus, BLS has no specific data sets that exclusively count jobs in this sector. A key component of the USEER employer survey is the ENERGY STAR program, which was founded 28 years ago. The ENERGY STAR program is recognized by over 90 percent of American households, while 40 percent of Fortune 500 companies rely on ENERGY STAR to deliver energy-saving solutions.⁷⁶

ENERGY STAR sets definitions of efficiency leadership for 75 different residential and commercial products that in turn cover over 70,000 individual product models. Identifying the jobs that produce and install these products is one of the key tasks of the USEER survey. This year, the 2020 USEER provides more specific data on the scope of these jobs.

ENERGY STAR also administers three additional programs for commercial buildings, and apartments. While the USEER survey does not specifically calculate total jobs associated with these programs, it does identify their construction and maintenance employment. While the USEER survey counts these jobs in its interviews with construction and maintenance firms, the jobs are not necessarily identified with ENERGY STAR. However, in the 2020 USEER we did provide information about a wider range of ENERGY STAR products.

In addition to identifying jobs that manufacture ENERGY STAR-labeled products, the USEER identifies employment in building design and contracting services that provide insulation, improve natural lighting, and reduce overall energy consumption across homes and businesses.⁷⁷ The

⁷⁶ https://www.energystar.gov/about/origins_mission/impacts

⁷⁷ Estimates do not include retail employment.

USEER Energy Efficiency employment figures include only work with these efficient technologies or building design and retrofits. The report does not capture employment related to energy-efficient manufacturing processes. Note also that the USEER EE numbers do not include the direct employees of utility companies who supervise, design, or implement internal efficiency programs. Finally, the USEER does capture employment associated with CHP and waste-heat to power (WHP), though these technologies are included in the Electric Power Generation chapter. In the meantime, please see the Energy Productivity and Economic Prosperity Index for more information on manufacturing process efficiency.⁷⁸

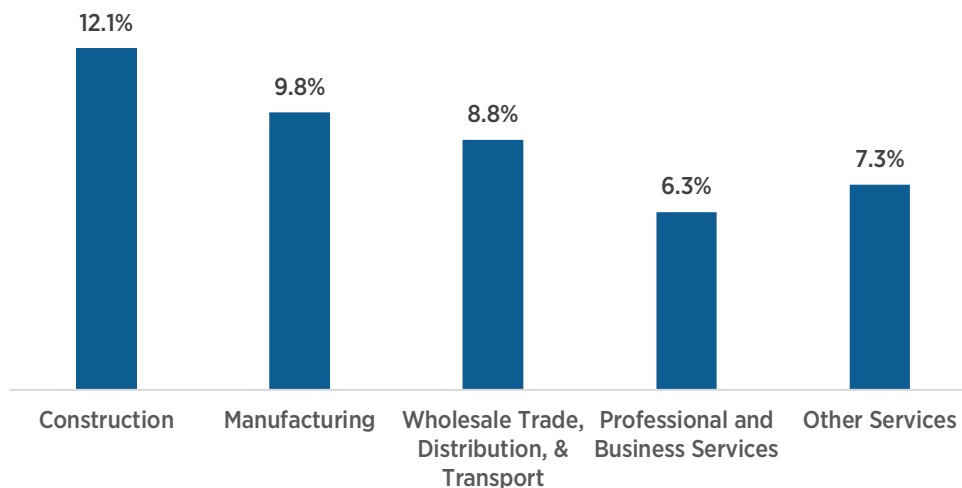
Demand growth for efficient technology and building upgrades has driven expansion across many traditional industries, including construction trades, appliance manufacturing, building materials, lighting, and other energy-saving goods and services. As such, Energy Efficiency workers are found across many subsets of traditional industries.

Energy Efficiency employment dropped precipitously in 2020, by more than 11 percent from 2019. The 2021 USEER has identified approximately 2.1 million workers across the construction, manufacturing, wholesale trade, professional and business services, and other services industries that spent some or all of their time working with energy-efficient technologies and services in 2020, as defined earlier in this report. Nearly 730,000 of these employees were directly involved in the manufacture, installation, design, wholesale distribution or other services of ENERGY STAR products. Later in this chapter, the USEER will identify additional ENERGY STAR jobs related to the program's commercial building, industrial, and new and existing home programs.

Energy Efficiency employers report a projected growth rate for employment in 2021 of 10 percent or nearly 214,000 new jobs. Construction employers report expected Energy Efficiency job growth of 12.1 percent (138,000 jobs) by the end of 2021.

⁷⁸ Kornelis Blok, Paul Hofheinz, and John Kerkoven, *The 2015 Energy Productivity and Economic Prosperity Index* (Brussels: Lisbon Council for Economic Competitiveness and Social Renewal, 2015), <https://lisboncouncil.net/wp-content/uploads/2020/08/The-2015-Energy-Productivity-and-Economic-Prosperity-Index.pdf>.

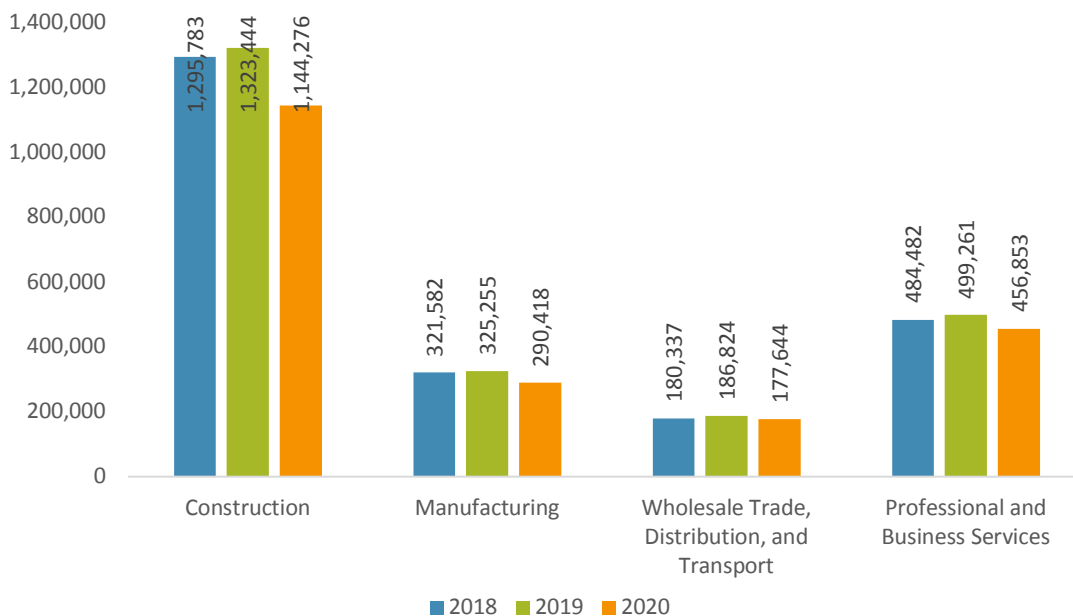
Figure 86.
Energy Efficiency Sector – Expected Employment Growth by Major Industry (Q4 2020 – Q4 2021)



The majority, 54 percent, of Energy Efficiency employees worked for firms in the construction sector in 2020, installing or servicing Energy Efficiency goods or performing Energy Efficiency related services.⁷⁹ More than one in five workers in the Energy Efficiency sector worked in professional and business services. The manufacture of Energy Efficiency products represented a sizable portion of employment in 2020, with 14 percent of the total Energy Efficiency workforce. ENERGY STAR product manufacturing employed 84,898 of the 325,255 Energy Efficiency manufacturing work force, or more than 29 percent.

⁷⁹ Building control equipment includes electrical equipment to automate, manage, or otherwise control mechanical and electrical building components such as lighting, ventilation, and power systems equipment.

Figure 87.
Energy Efficiency Sector – Employment by Major Industry Sectors, Q4 2020



The 2021 USEER does not cover retail trade, but BLS data finds that retail trade industries that sell and distribute ENERGY STAR appliances and building materials (as well as non-qualifying appliances and building materials) employ approximately 4.2 million Americans across several different sectors.⁸⁰

The manufacturer and sales of certified ENERGY STAR products in 2019 represented a market value of more than \$100 billion and included more than 600 million certified products, of which 300 million were light bulbs. In addition to the volume of goods, the variety of ENERGY STAR products contributes to the relevance across a broad number of industries, with product categories including HVAC, lighting, building products, appliances, commercial food service equipment, lighting, and others.⁸¹ A table of products covered by the U.S. Environmental Protection Agency (EPA) ENERGY STAR program is available in Appendix H.⁸²

⁸⁰ These industries include Household Appliance Stores (443141), Electronics Stores (443142), Building Material and Supplies Dealers (4441), Department Stores (452210), and Warehouse Clubs and Supercenters (452311). These are retail establishments that are not defined by their sale of ENERGY STAR appliances or Energy Efficiency products. Some are defined by their sale of appliances in general (i.e., those under NAICS 4431) but even these are not the sole retailers of Energy Efficiency products—they could be general retailers as well such as big box stores that sell wide varieties of items.

⁸¹ This trend can be generally seen by comparing recent annual editions of the *ENERGY STAR Unit Shipment and Market Penetration Report*, available at https://www.energystar.gov/index.cfm?c=partners.unit_shipment_data_archives. When an ENERGY STAR specification for a particular product type is strengthened, there is sometimes a decrease in the market penetration of the products meeting that higher specification in the following year.

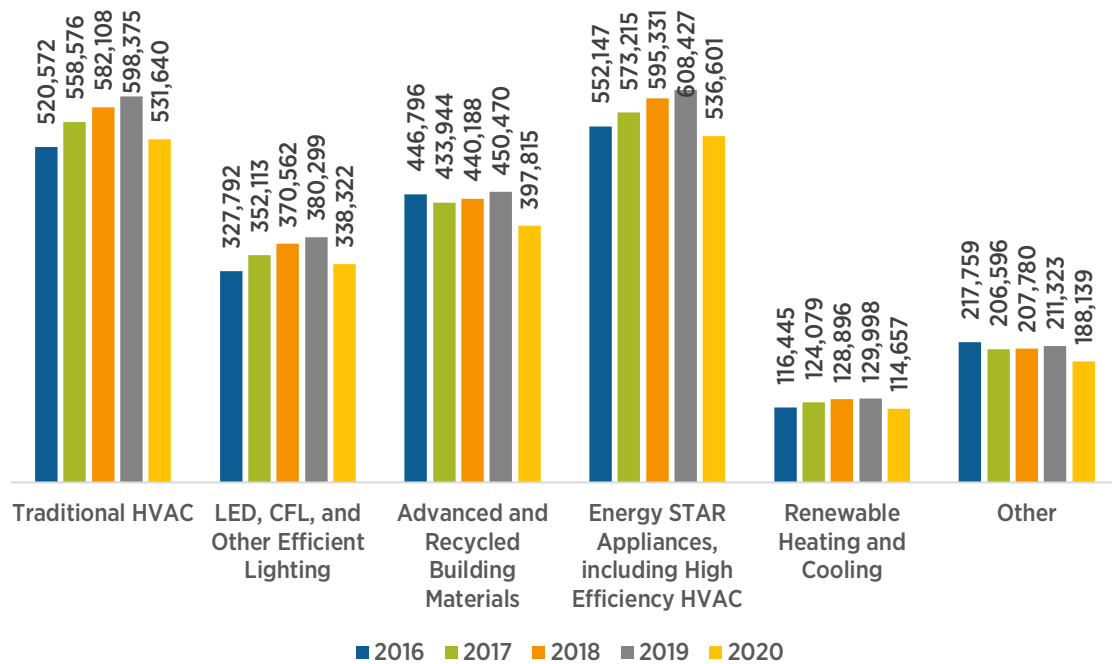
⁸² EPA, *ENERGY STAR Unit Shipment and Market Penetration Report: Calendar Year 2019 Summary* (Washington, D.C., 2019), <https://www.energystar.gov/sites/default/files/asset/document/2019%20USD%20Summary%20Report.pdf>.

Energy Efficiency Employment by Detailed Technology Application

To illustrate historic trends in Energy Efficiency employment by major technology, we have distributed a number of ENERGY STAR products into broader categories. For instance, ENERGY STAR LED lighting is included with Other LED Lighting, CFL’s and Other Efficient Lighting. ENERGY STAR certified building products and insulation are included with Advanced and Recycled Building Products.

As depicted in Figure 88, ENERGY STAR appliances, including high efficiency heating and cooling equipment, was the largest category of employment in the Energy Efficiency sector, employing 26 percent of the Energy Efficiency workforce in 2020. These workers all spend the majority of their time working with these technologies.

Figure 88.
Energy Efficiency Sector - Employment by Detailed Technology Application (Q4 2016 - Q4 2020)



The second largest category of employment was the traditional HVAC industry, with a quarter of the sector's employment in 2020. These employees spent a majority of their time working with traditional HVAC goods and services, but a portion of their time was also dedicated to energy-efficient technologies. This is an important distinction, particularly with installers, because the majority of these employees would also have specific training in high-efficiency HVAC systems.⁸³

The third largest category of employment was advanced building materials, followed by energy efficient lighting. The Other category in Figure 88 includes reduced water consumption products and appliances.

Construction firms working in the Energy Efficiency sector reported that 82.1 percent of their employees spend at least 50 percent of their time on energy efficiency-related work. This is higher than the 78 percent reported in in 2019.

- Construction workers across the Energy Efficiency sector are primarily engaged in both traditional HVAC and high efficiency heating and cooling equipment; together, these two technology applications accounted for 46.2 percent of construction-related work in the Energy Efficiency sector in 2020. Advanced and recycled building materials and insulation technologies also supported a significant amount of construction employment—nearly 156,381 jobs.
- The two largest detailed technologies in the Energy Efficiency manufacturing sector are high efficiency heating and cooling equipment and advanced and recycled building products.
- Three in ten workers in the wholesale trade industry and nearly one-third of workers in professional and business services were mostly working with traditional HVAC goods.

⁸³ Unlike the installation and repair of ENERGY STAR appliances, such as dishwashers, refrigerators, or other energy-efficient products, high-efficiency HVAC systems often have very specific certifications or training requirements in order to properly install and maintain the equipment. Manufacturers often require such certifications for warranty purposes, and EPA has a specific credentialing program for ENERGY STAR heating and cooling (see: http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_hvac_contractors_become).

Table 32.
Energy Efficiency Sector – Employment by Detailed Technology Application and Industry, Q4 2020

	Total	Construction	Manu- facturing	Wholesale Trade	Professional Services	Other Services
ENERGY STAR Certified Appliances (not including HVAC)	126,021	62,914	11,842	11,692	36,349	3,224
ENERGY STAR Certified Heating, Ventilation, and Cooling (HVAC)	247,721	171,703	35,008	17,665	20,581	2,764
Other high efficiency HVAC that are out of scope for ENERGY STAR certification ⁸⁴	136,485	70,718	32,600	8,041	23,810	1,317
Traditional HVAC goods, control systems, and services	531,640	285,704	29,115	54,058	148,253	14,510
ENERGY STAR certified water heaters	19,079	13,339	328	1,365	3,967	79
ENERGY STAR Certified Electronics ⁸⁵	6,265	132	3,497	1,445	243	948
ENERGY STAR Certified Windows, Doors and Skylights	23,469	12,452	1,101	2,230	7,356	331
ENERGY STAR Certified Roofing	30,818	20,142	6,597	1,156	2,657	265
ENERGY STAR Certified Insulation	102,795	90,327	6,680	1,053	4,558	178
Air sealing	64,636	33,871	2,200	16,562	11,781	222
ENERGY STAR Certified Commercial Food Service Equipment	26,374	12,678	3,945	899	8,209	643
ENERGY STAR Certified Data Center Equipment	9,980	1,326	3,507	3,019	207	1,922
ENERGY STAR Certified LED lighting	137,100	54,181	12,391	16,779	51,120	2,629
Other LED, CFL, and efficient lighting	201,221	107,809	33,037	22,102	37,781	493
Other renewable heating and cooling ⁸⁶	95,578	59,620	6,578	6,344	22,401	634
Advanced building materials/insulation	102,342	25,003	50,640	1,104	24,486	1,109
Recycled building materials	73,755	41,051	10,797	2,652	16,618	2,637
Reduced water consumption products and appliances	82,378	51,175	5,406	5,145	19,454	1,198
Other	89,515	30,131	35,147	4,333	17,024	2,880
TOTAL	2,107,174	1,144,276	290,418	177,644	456,853	37,983

⁸⁴ Includes indirect evaporative coolers, air to water heat pumps, energy recovery systems, etc.

⁸⁵ Includes TVs, telephones, audio/video, etc.

⁸⁶ Includes solar thermal, geothermal, biomass, heat pumps, etc.

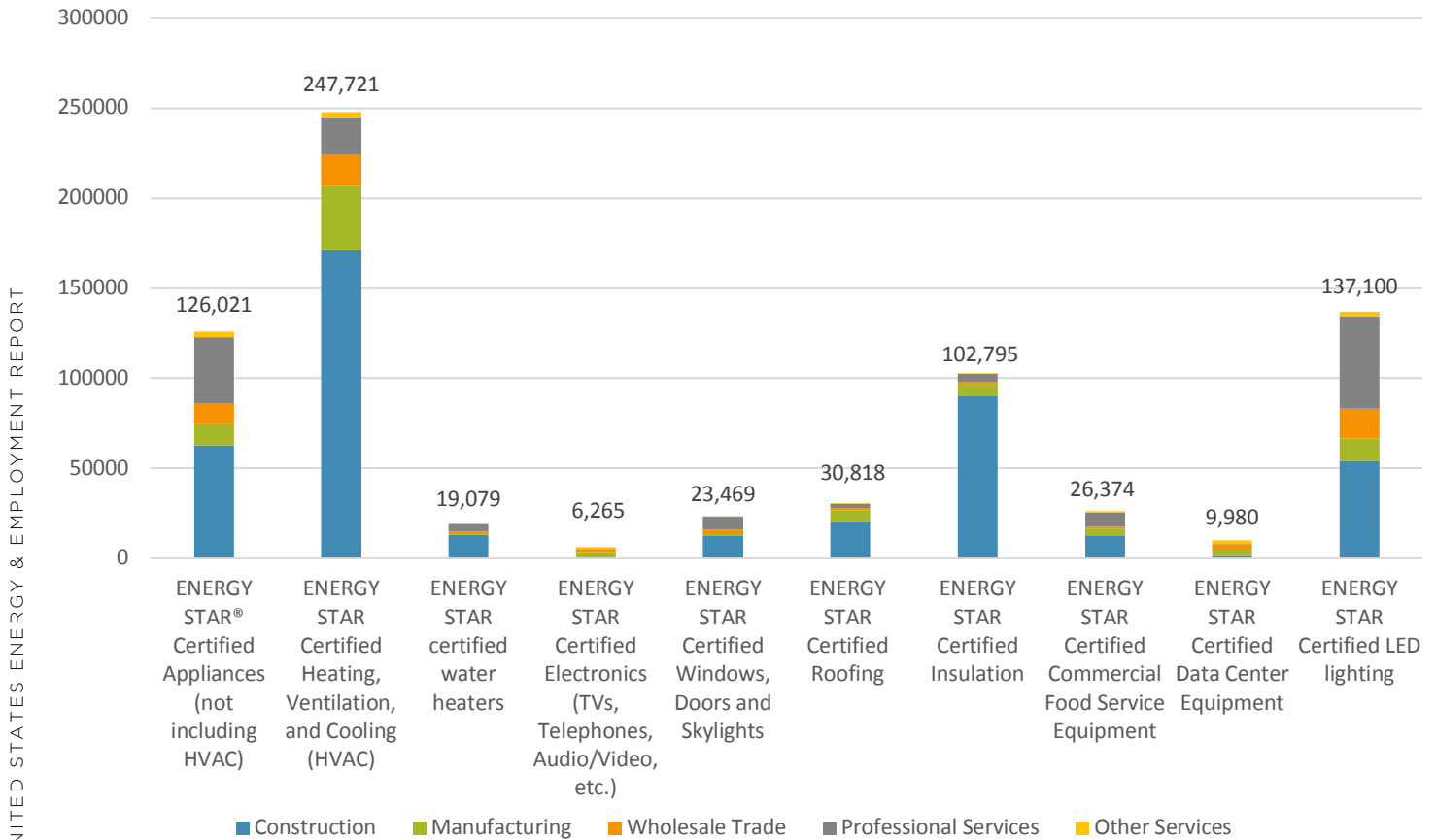
ENERGY STAR Jobs Profile

Beginning in 2020, the USEER includes a more detailed analysis of the jobs associated with producing ENERGY STAR products. Spread across multiple technologies in the manufacture, installation, design, wholesale distribution, and other services, the USEER finds that the ENERGY STAR program was responsible for over 729,622 American jobs in 2020.

The additional detailed technologies included in this edition of the USEER are ENERGY STAR-certified residential electronics, roofing, windows, doors and skylights, insulation, LED lighting, commercial food service equipment, water heaters, and data center equipment. ENERGY STAR-certified appliances and HVAC systems were already counted separately.

In addition, the 2021 USEER identified up to 439,194 construction workers who were engaged in the ENERGY STAR-certified residential, industrial, and commercial building programs. Figure 89 below details the ten ENERGY STAR technologies and their industrial sectors.

Figure 89.
Energy Efficiency Sector – Employment by ENERGY STAR Detailed Technology Applications and Industry, Q4 2020



ENERGY STAR Commercial, Industrial, and Residential Buildings and Homes

According to the EPA, ENERGY STAR is “the government-backed symbol for energy efficiency, providing simple, credible, and unbiased information that consumers and businesses rely on to make well-informed decisions.”⁸⁷ ENERGY STAR maintains certification programs for efficient buildings, industrial plants, homes, and apartments.

Since 1995, ENERGY STAR's Residential New Construction program has established requirements for the certification of energy-efficient homes and apartments. ENERGY STAR certified homes are at least 10 percent more energy efficient than homes built to code and achieve a 20 percent improvement on average. Third-party Home Energy Rating Companies provide independent verification that a home or apartment meets all applicable ENERGY STAR program requirements.

ENERGY STAR for Commercial Buildings relies on tracking of existing building performance. For eligible buildings, the online ENERGY STAR Portfolio Manager will assist in calculating a 1-100 ENERGY STAR score for a facility's energy performance. Buildings must maintain a minimum score of 75 to receive ENERGY STAR certification.

In addition to the certification available for existing buildings, during the building design and construction process, a developer can submit their designs for scoring based on energy modeling software, after which they will receive a “Designed to Earn the ENERGY STAR” recognition or, alternatively, feedback on how to improve energy performance. Then, after construction is completed and the building is operating, a facility's owner/manager has the option to seek ENERGY STAR certification on the basis of its operational energy performance. The responsible party must confirm after a 12-month period that energy performance standards were maintained as expected to earn its first ENERGY STAR certification.

Twenty-nine percent of construction firms who perform Energy Efficiency work are engaged in the construction of ENERGY STAR certified new home construction. Approximately 44 percent of the workers at these firms, or about 201,400 employees, work on ENERGY STAR certified new home construction. This represents 3 percent of all construction employment in the United States.

Thirty-five percent of construction firms who perform Energy Efficiency work are engaged in ENERGY STAR certified buildings and industrial

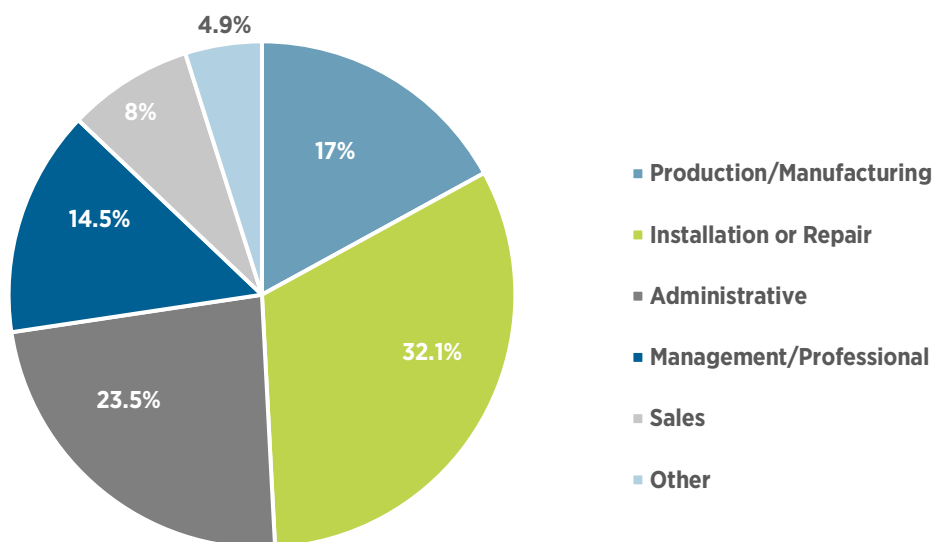
⁸⁷ “What is ENERGY STAR,” About ENERGY STAR, EPA and DOE, accessed May 5, 2021, <https://www.energystar.gov/about>.

plants. At these construction firms, nearly 47 percent of employees work on ENERGY STAR certified buildings and plants, representing more than 236,600 jobs. This also represents more than 3 percent of all construction employment in the United States.

Energy Efficiency – Workforce Characteristics

- 32 percent of all workers in Energy Efficiency were employed in installation or repair positions in 2020, followed by administrative positions (nearly 24 percent).

Figure 90.
Energy Efficiency Sector – Occupational Distribution, Q4 2019



- Eighty-six percent of employers in construction, the largest sector in Energy Efficiency, reported finding qualified job applicants as somewhat or very difficult. Sixty-six percent reported it was very difficult in 2020.
- Ninety-seven percent of professional and business service employers reported that it was somewhat or very difficult to hire new employees.
- Seventy-nine percent of wholesale trade, distribution, and transport employers reported combined difficulty in hiring.

Figure 91.
Energy Efficiency Sector - Hiring Difficulty by Technology, Q4 2020

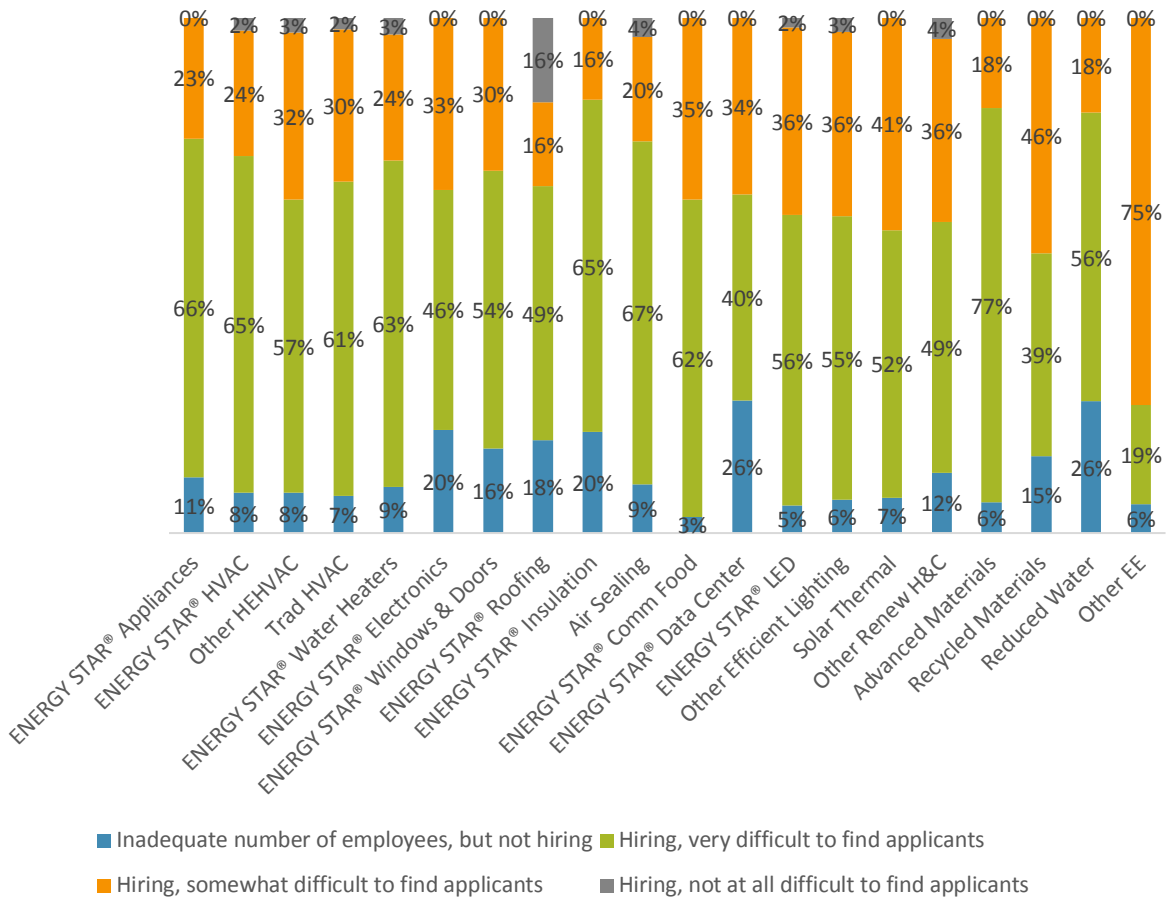


Figure 92.
Energy Efficiency Sector - Hiring Difficulty by Industry, Q4 2020



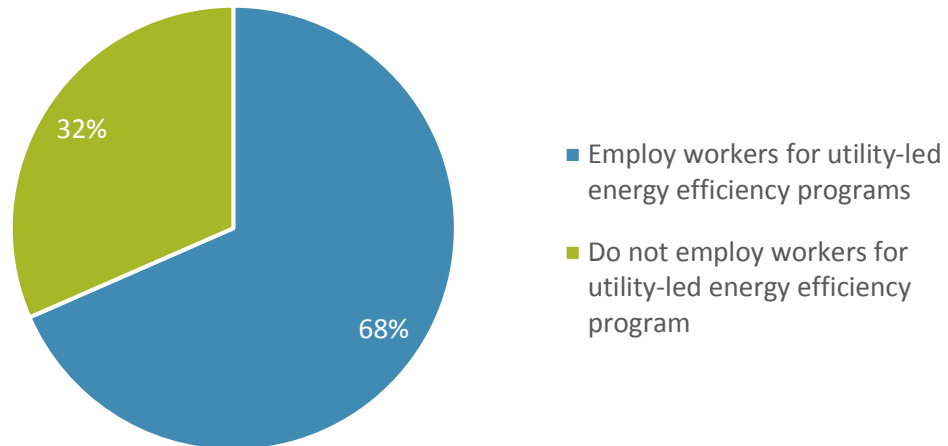
Utility Energy Efficiency Programs

Many electric and gas utilities in the United States sponsor or manage residential, commercial, and industrial energy efficiency programs. However, the direct employees of these utilities who administer their programs are not included in the USEER Energy Efficiency job numbers. Instead, they are included in the numbers reported for “utility” employees in either the Electric Power Generation or TDS sectors. This year, the 2020 USEER performed an additional survey to determine how many of the 601,200 employees working directly for utilities are engaged in delivering energy efficiency services through these programs.

Residential programs often include free or low-cost home energy audits in which utility-provided energy specialists analyze home energy performance and provide suggestions for improvement. Sometimes these auditors work directly for the utility; in other cases, they are employed by a utility-funded contractor. In some cases, utilities run call centers to encourage participation, while in others they might also employ a contractor. Utilities also provide rebates or financial incentives for property owners to take specific energy efficiency measures, including upgrades to HVAC systems, the installation of energy-efficient lighting and appliances, or weatherization. Commercial and industrial energy efficiency programs are also supported by gas and electric utilities. Again, these programs can be run internally by the utilities or in partnership with utility-funded contractors who provide engineering, financial, and regulatory support.

More than two-thirds of electric and gas utilities (NAICS 2211) in the United States employ workers who administer, manage, evaluate, or otherwise support utility-led energy efficiency programs, rebates, and other activities. The 2020 USEER survey determined that approximately 23,300 employees, who work directly for these utilities, are engaged in this energy efficiency work. This represents 4.0 percent of total employment in the electric and natural gas utility sector. However, this figure does not include those employees involved in utility-funded energy efficiency programs who work for contractors. Those employees are included in the overall energy efficiency numbers and are classified according to their primary industrial sector and detailed technology.


Figure 93.
Utilities that Employ Workers who Administer, Manage, Evaluate, or Otherwise Work Directly on Energy Efficiency Programs, Rebates, and Other Activities



- In 2020, women represented 25 percent of the workforce in the Energy Efficiency Sector.
- Overall, the Energy Efficiency sector is slightly more diverse than the national average at 23 percent. However, there are fewer Black or African American workers and slightly fewer Hispanic or Latino workers compared to the national workforce average.
- Unionization rates in the Energy Efficiency sector in 2020, at 10 percent, were significantly higher than the national private sector average.

Table 33.
Energy Efficiency Sector – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	1,581,959	75%	52%
Female	525,215	25%	48%
Hispanic or Latino	321,831	15%	17%
Not Hispanic or Latino	1,785,343	85%	83%
American Indian or Alaska Native	28,012	1%	1%
Asian	127,772	6%	7%
Black or African American	173,840	8%	13%
Native Hawaiian or other Pacific Islander	22,874	1%	0%
White	1,614,213	77%	76%
Two or more races	140,464	7%	2%
Veterans	187,898	9%	6%
55 and over	275,350	13%	23%
Union Coverage	210,717	10%	6%



Motor Vehicles & Component Parts



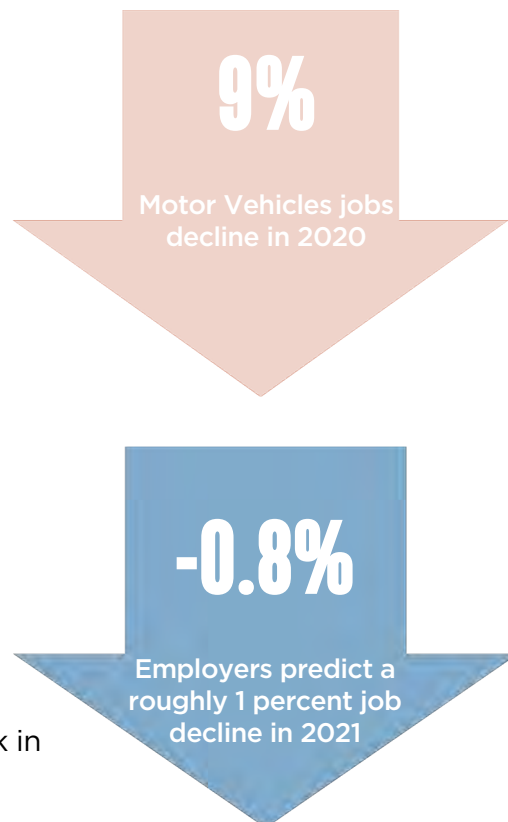
[ENERGY.GOV/USER](https://www.energy.gov/user)

United States Energy
& Employment Report

Though not considered a sector of the Energy industry, the Motor Vehicles and Component Parts sector,⁸⁸ which include cars, light-duty and heavy-duty trucks, trailers, and component parts of the foregoing, are included in this report, given both the high energy consumption of their manufacture and their contribution to end-use energy consumption.

Trends

- 2020 Overall Job Loss.** The Motor Vehicles and Component Parts sector employed 2,325,286 workers in 2020, shedding more than 230,000 workers. This figure excludes dealerships and retailers, which employed roughly 1.89 million additional workers and declined by about 7 percent over the year.
- Manufacturing decline.** Manufacturing employment, the largest industry sector in Motor Vehicles and Component Parts, lost nearly 110,000 jobs, a decline of 11 percent.
- Alternative fuels vehicles and hybrids.** Within the overall total for the sector, alternative fuels vehicles and hybrids employed 273,733 workers in 2020, a net increase of over 7,300 jobs.
- Fuel economy.** Nearly 493,000 employees work in the component parts segment of the sector with products that contribute to fuel economy.
- 2021 Expectations.** Motor Vehicles and Component Parts employers anticipate a roughly 1 percent decline in 2021.



⁸⁸ Motor Vehicle and Component Parts employers are defined as any firm that contributes to the manufacture, wholesale distribution, transport, and repair and maintenance of gasoline, diesel, hybrid, electric, natural gas, hydrogen and fuel cell, or other vehicle technologies.

Employment Snapshot

Figure 94.
Motor Vehicle and Component Parts Sector -
Employment by Industry, 2019-2020

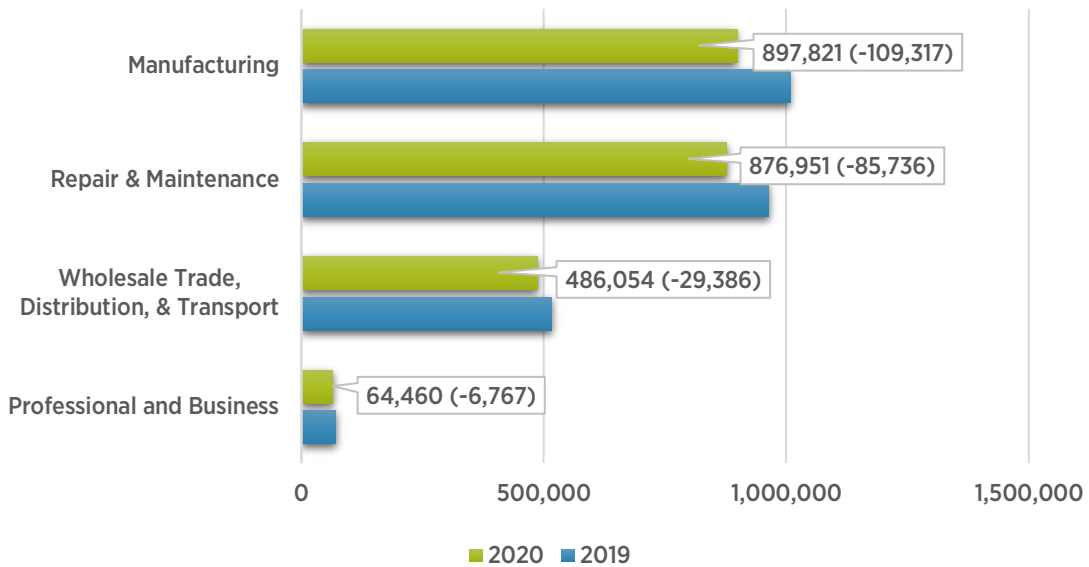
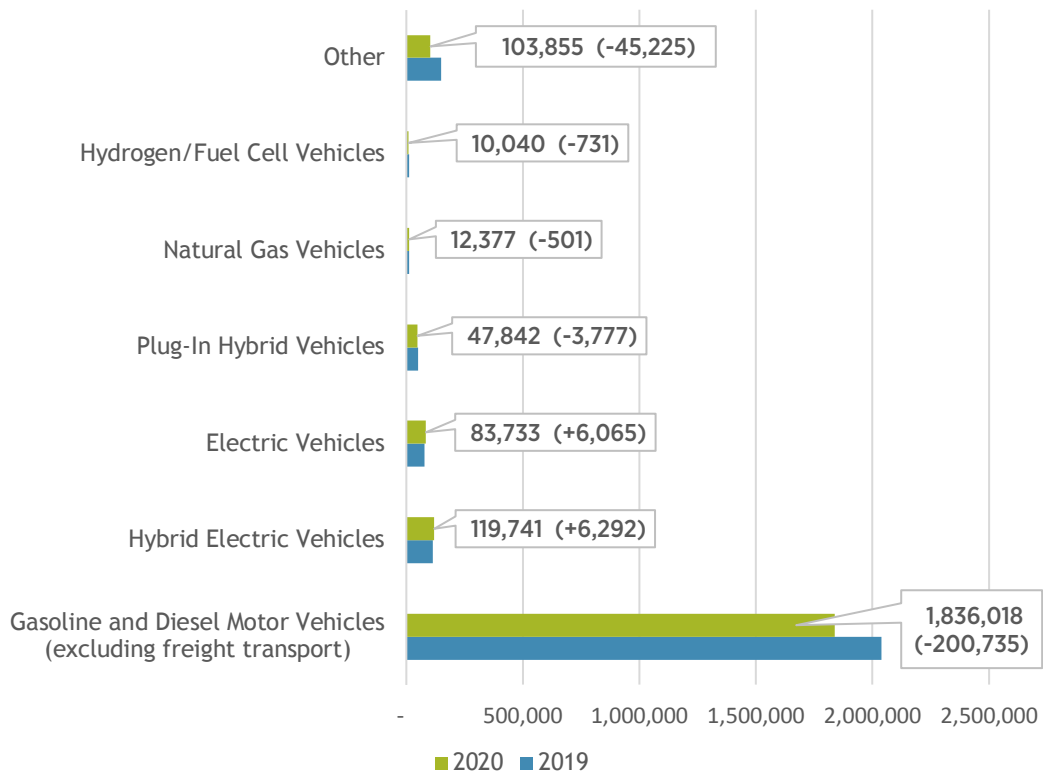


Figure 95.
Motor Vehicles and Component Parts Sector - Employment by Detailed
Technology, 2019-2020



Alternative Fuels Vehicles and Hybrids

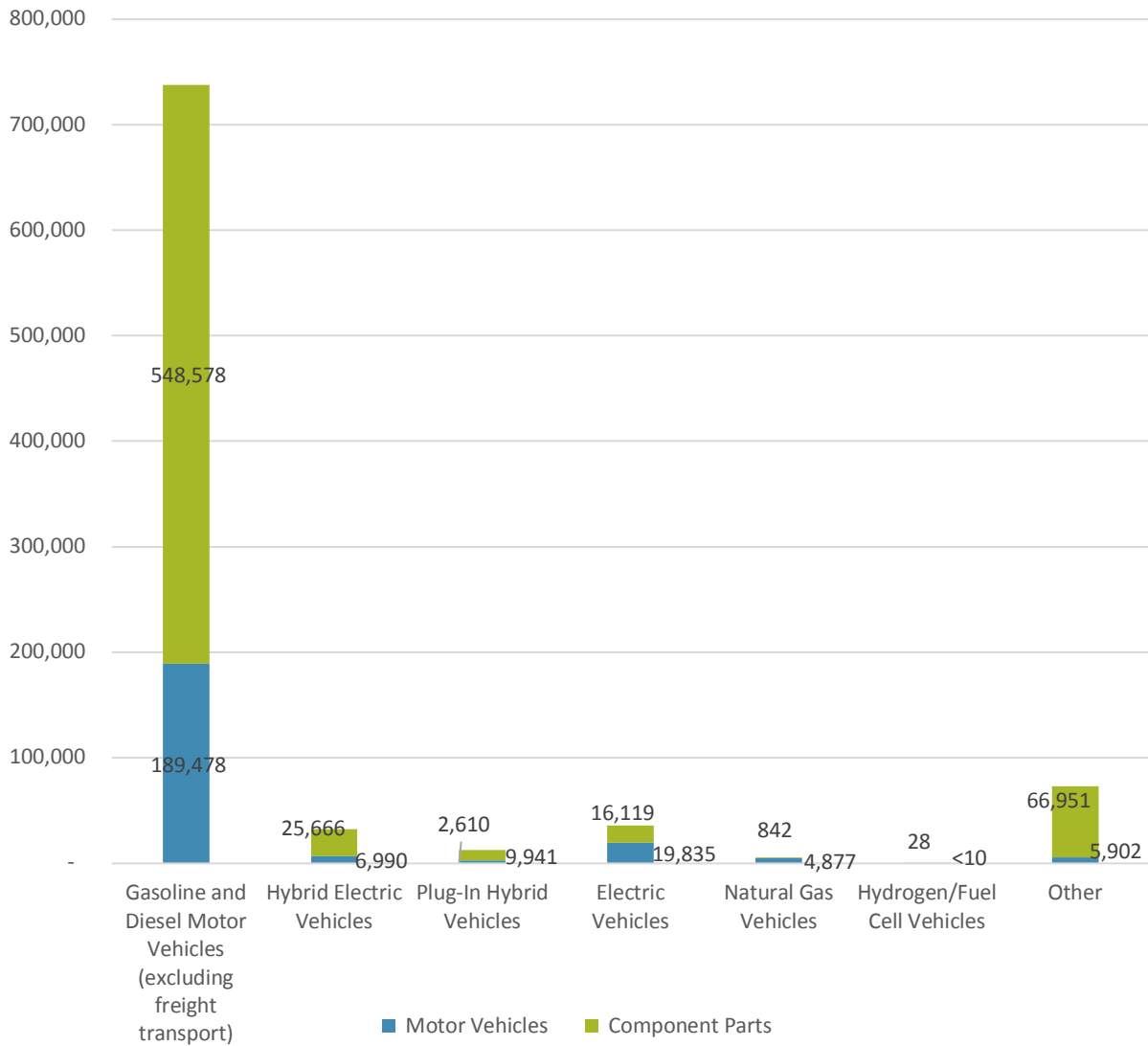
- Alternative fuels vehicles and hybrids include hybrid electric, plug-in hybrid, electric, natural gas, and hydrogen and fuel cell vehicles.
- Twelve percent of employees in the Motor Vehicles and Component Parts sector (or 273,733 employees) worked on alternative fuels vehicles.⁸⁹
- Eighty-three percent of employees in the sector worked with gasoline and diesel fueled motor vehicles.
- Figure 96 shows the division of manufacturing employment in each technology between component parts and other occupations.⁹⁰
- The domestic manufacture of alternative fuels vehicles and hybrids grew between 2019 and 2020 in most technologies, with electric vehicles adding more than 5,000 manufacturing jobs and hybrid and plug-in hybrid vehicles adding nearly 950.
- Domestic sales of electric vehicles declined in 2020 from 2019, however, more charging infrastructure was installed last year.⁹¹

⁸⁹ Percentage is taken from Motor Vehicle employment exclusive of commodity flow employment.

⁹⁰ Of the 376 employees within hydrogen and fuel cell vehicles that worked on component parts, fewer than 10 employees were focused on motor vehicles manufacturing.

⁹¹ Jeffrey Ryser, "US EV sales tumble in 2020, but EV load increases with more charging stations," *S&P Global Platts*, January 29, 2021, <https://www.spglobal.com/platts/en/market-insights/latest-news/electric-power/012821-us-ev-sales-tumble-in-2020-but-ev-load-increases-with-more-charging-stations>.

Figure 96.
Motor Vehicles and Component Parts Sector - Manufacturing Employment
by Detailed Technology Application, Q4 2020



Hiring Difficulty

- **Fifty-eight percent motor vehicle employers** reported that it was somewhat or very difficult to hire new employees.
- **Seventy-seven percent of repair and maintenance employers in motor vehicles** reported having an inadequate number of employees but not hiring in 2020.
- **Forty-two percent of employers in motor vehicles** reported having an inadequate number of employees but not hiring in 2020.

Introduction

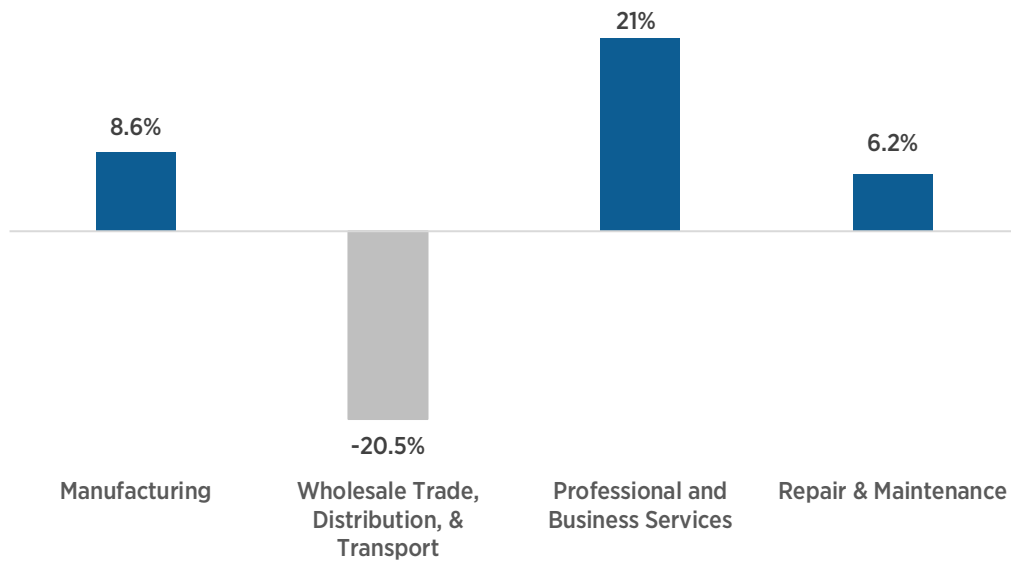
Three NAICS subsectors⁹² capture Motor Vehicles finished product manufacturing, including automobiles, and light- and heavy-duty trucks, parts, body, and trailer manufacturing. Together these three detailed industry sectors employed 897,821 workers in 2020, down from 1,007,138 in 2019 (a decline of 10.9 percent). Motor vehicle and parts wholesalers and air, rail, water, or truck motor vehicle transport represent detailed NAICS subsectors within Wholesale Trade and Distribution, and the QCEW reports the total number of workers who are employed by these firms in 2020 to be 486,054. Similarly, motor vehicle repair⁹³ and maintenance is captured by a single NAICS industry code within the overall repair and maintenance industry sector; motor vehicle repair and maintenance firms employed 876,951 workers in 2020, a loss of about 85,000 jobs over the year. Professional and business services are not motor vehicle-specific, but the USEER survey identified 64,460 workers who spent at least some time supporting the Motor Vehicles sector in 2020. Nearly two-thirds (67.6 percent) of these professional and business services employees spent the majority of their time supporting the Motor Vehicle and Component Parts sector.

⁹² NAICS 3361, 3362, and 3363.

⁹³ The official term for the NAICS category is Automotive Repair and Maintenance, which includes repair and maintenance for light-duty and heavy-duty trucks. This is inconsistent with Manufacturing NAICS, which includes delineations for light-duty and heavy-duty truck manufacturing.

Employers in the Motor Vehicles and Component Parts sector expect a slight employment decline (less than 1 percent) through the end of 2021. Manufacturing, the largest industry in the Motor Vehicle and Component Parts sector, predicted 8.6 percent growth in 2021 but Wholesale Trade, Distribution, and Transport employers expect their workforce to decline by 20.5 percent.

Figure 97.
Motor Vehicles and Component Parts Sector - Expected Employment Growth by Industry (Q4 2020 - Q4 2021)

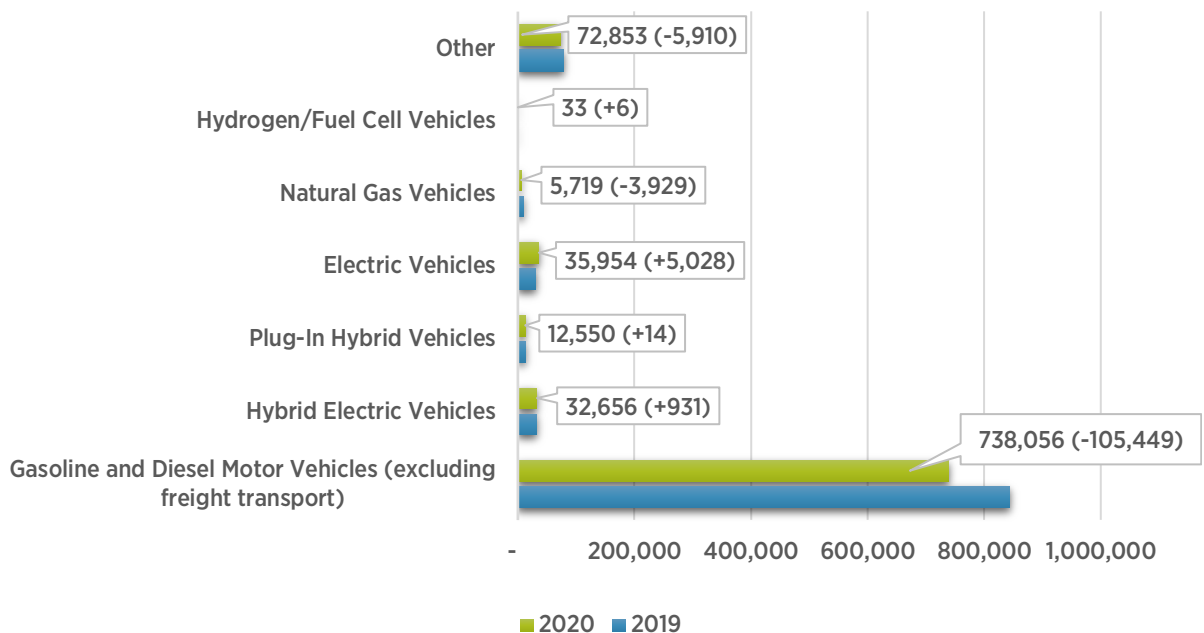


Alternative Fuel Vehicles and Hybrids

While the repair and maintenance industry sector actively works with alternative fuel vehicles and hybrids, there is difficulty delineating primary employment by fuel type for these firms, so it should be noted that employment totals included for repair are based on best efforts by respondents to allocate their workforce by fuel type.⁹⁴

Of the 897,821 Motor Vehicles and Component Parts manufacturing jobs in 2020, 9.7 percent, or 86,912, focused on alternative fuel vehicles and hybrids, while 82.2 percent worked with traditional gasoline- and diesel-fueled motor vehicles.

Figure 98.
Motor Vehicles and Component Parts Sector – Manufacturing Employment by Detailed Technology, Q4 2020



In addition, USEER data identified nearly 493,000 jobs that produce parts that increase fuel economy in the United States. Note that there is some overlap between those who work with alternative fuel vehicles and those that produce parts that increase fuel economy.

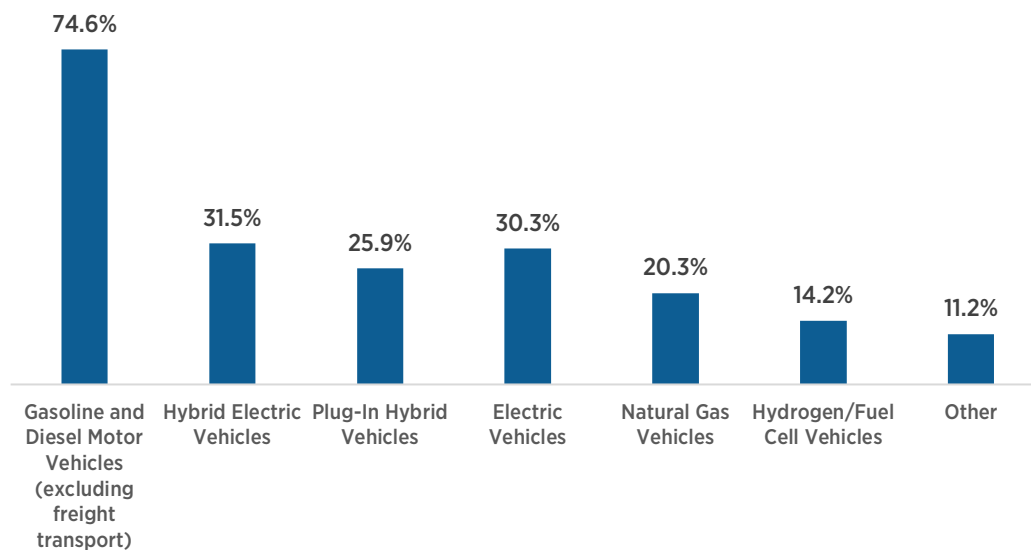
⁹⁴ This analysis was conducted for the chapter; however, it is recognized that Motor Vehicle repair and maintenance establishments may have difficulty assigning primary employment to a worker who is involved in vehicles regardless of fuel type. More research is required into the Motor Vehicle repair and maintenance industry sector in order to understand employment intensity for alternative fuel vehicles.

In addition to the Motor Vehicles and Component Parts industries included in this 2020 USEER, several other transportation industries use alternative fuel technologies, focus on fuel economy, or both. These include aerospace product and parts manufacturing; railroad rolling stock manufacturing; ship and boat building; industrial truck, trailer, and stacker manufacturing; and other transportation equipment manufacturing.

These manufacturing industries employed a total of more than 771,000 workers nationwide in 2020. Approximately 537,000 of these jobs (70 percent) are found in aviation and aerospace industries.

As shown in Figure 99, three-quarters of Motor Vehicle parts firms offered parts in 2020 for gasoline and diesel motor vehicles, while nearly one-third offered component parts for hybrid electric vehicles.⁹⁵

Figure 99.
Percentage of Component Parts Firms Offering Parts for Each Fuel Technology

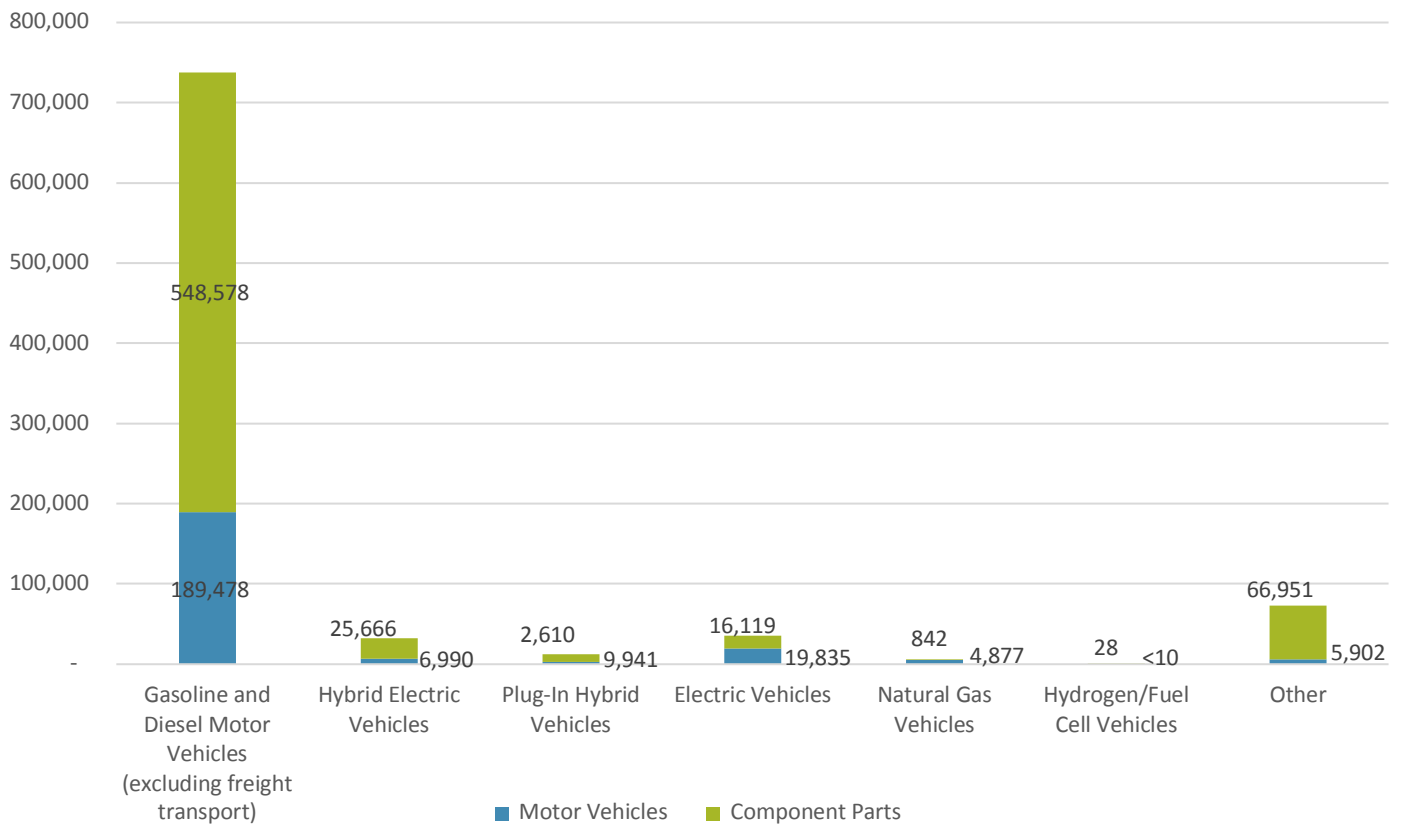


⁹⁵ Firms were permitted to offer multiple responses, percentages sum to over 100 percent.

Manufacturing

Gasoline and diesel motor vehicles represented 82 percent of all 2020 manufacturing employment in Motor Vehicles and Component Parts. Almost 10 percent of manufacturing employment, or 86,912 jobs, were focused on alternative fuel vehicles and hybrids, up 2.4 percent, more than 2,000 jobs, from 2019. Fewer than 40 employees were focused on hydrogen or fuel cell motor vehicle and component part manufacturing.

Figure 100.
Motor Vehicles and Component Parts Sector - Manufacturing
Employment by Detailed Technology Application, Q4 2020



Component Parts and Fuel Economy

In 2020, nearly 493,000 Component Parts employees worked with parts that increase fuel economy for vehicles. This represents 49 percent of the 997,325 workers employed in the Component Parts segment of the sector in that year. The Component Parts segment includes firms focused on vehicle engine and drive parts, exhaust system parts, vehicle body parts, and other vehicle parts (including some battery production). This does not include mining and extraction for minerals used in vehicle parts production; high-strength, lightweight steel or rolled aluminum manufacturing; or production equipment manufacturing.

Almost one-quarter (23 percent) of firms that were involved in the Component Parts segment in 2020 indicated that they derived all their revenue from products that increase fuel economy for these vehicles. In total, more than one-third of firms derive the majority (half or more) of their revenue from products that increase fuel economy.

Figure 101.

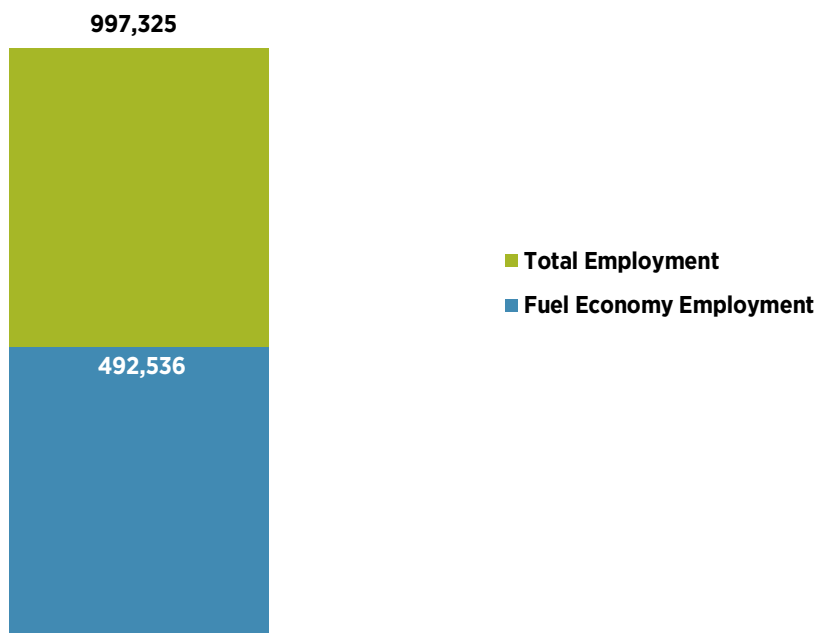
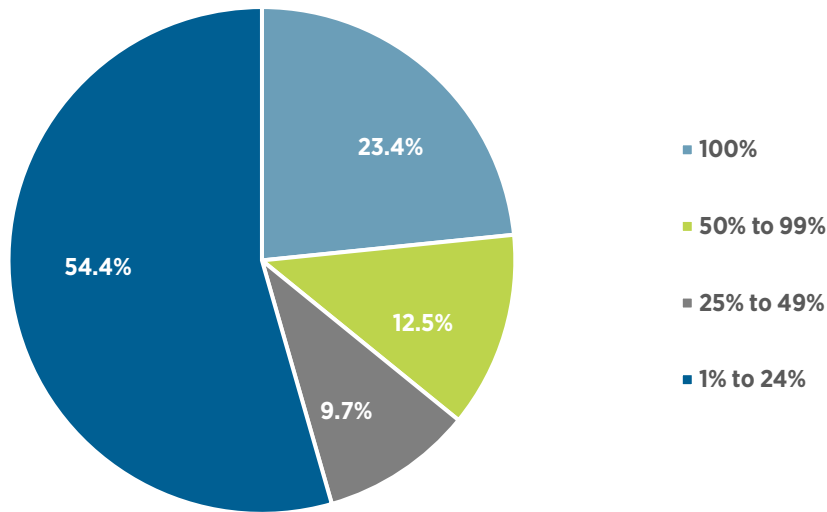
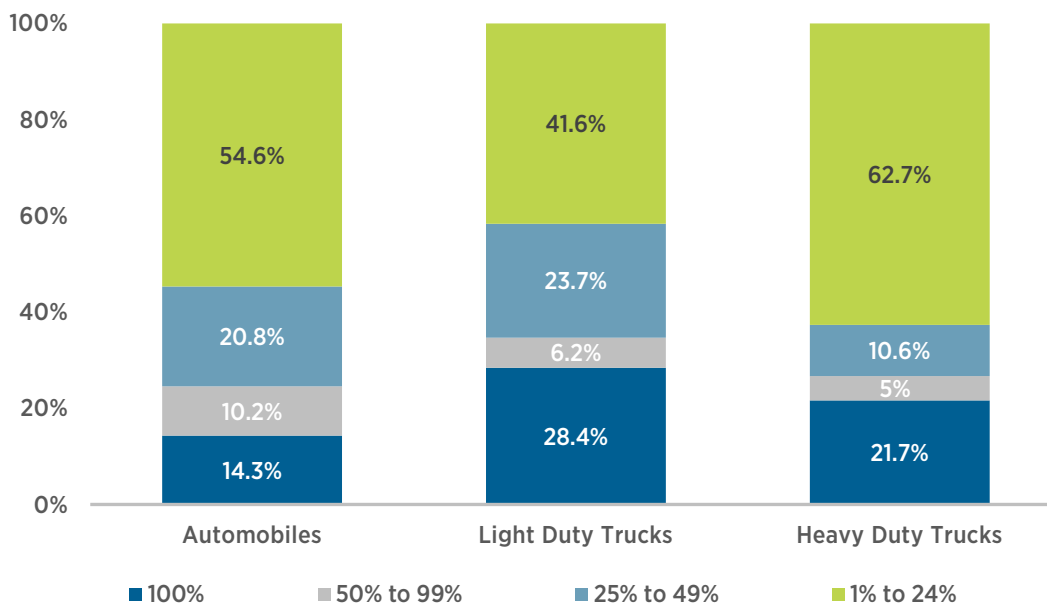


Figure 102.
Revenue Attributable to Products that Increase Fuel Economy



Among firms that primarily provide parts for light-duty trucks, 28 percent received all their revenue in 2020 from products that increase fuel economy. In comparison, 22 percent parts firms that are mainly focused on heavy-duty trucks received all their revenues from products that increase fuel economy, as did 14 percent of automobile parts firms.

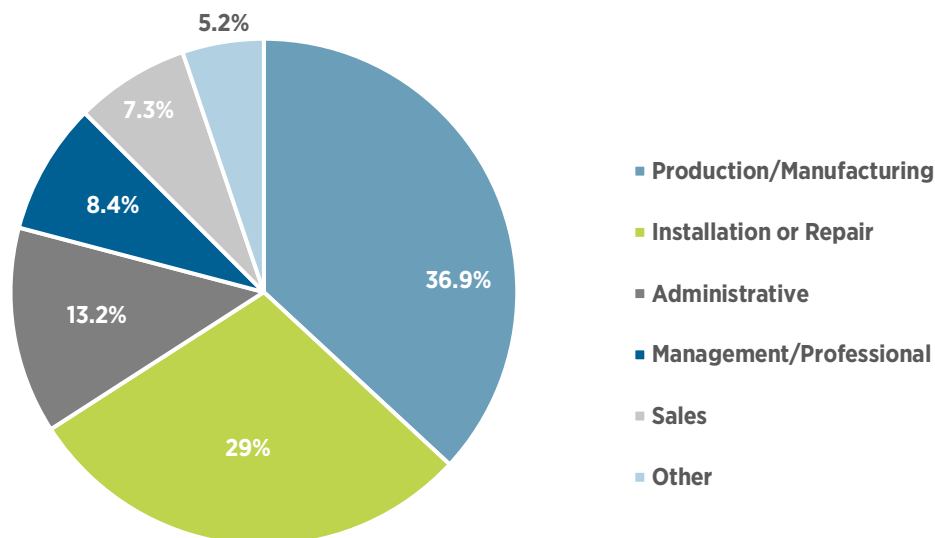
Figure 103.
Revenue Attributable to Products that Increase Fuel Economy by Primary Vehicle Type



Motor Vehicles and Component Parts – Workforce Characteristics

In 2020, about two-thirds of employees in Motor Vehicles and Component Parts were classified as workers in production/manufacturing positions (37 percent) or installation or repair positions (29 percent).

Figure 104.
Motor Vehicles and Component Parts Sector – Occupational



- Fifty-eight percent of employers in Motor Vehicles reported that it was somewhat difficult or very difficult to hire new employees, with 42 percent reporting it was very difficult.
- More than three-quarters of repair and maintenance employers in Motor Vehicles reported having an inadequate number of employees but not hiring.
- Forty-two percent of employers in Motor Vehicles reported having an inadequate number of employees but not hiring.

Figure 105.
Motor Vehicles and Component Parts Sector - Hiring Difficulty by Industry, Q4 2020



- Overall, the Motor Vehicles sector is about as diverse as the U.S. workforce, though not with regards to gender.
- Black or African American workers are about as represented in the industry as in the overall U.S. workforce at 12 percent.
- At six percent coverage, the Motor Vehicles industry is about as unionized as the private sector workforce overall; though automotive manufacturing has fairly high rates of unionization, the lower overall rate for the sector is due to high proportional employment in repair and maintenance, which has a significantly below average unionization rate.

Table 34.
Motor Vehicles and Component Parts Sector – Demographics, Q4 2020

Demographic	Employees	Percent of Sector	National Workforce Averages
Male	1,694,968	77%	52%
Female	518,639	23%	48%
Hispanic or Latino	385,640	17%	17%
Not Hispanic or Latino	1,827,967	83%	83%
American Indian or Alaska Native	33,744	2%	1%
Asian	107,009	5%	7%
Black or African American	182,836	12%	13%
Native Hawaiian or other Pacific Islander	15,659	1%	0%
White	1,695,319	73%	76%
Two or more races	179,040	8%	2%
Veterans	189,591	9%	6%
55 and over	414,999	19%	23%
Union Coverage	132,816	6%	6%