United States Energy & Employment Report 2021

ENERGY.GOV/USEER

U.S. DEPARTMENT OF ENERGY
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United States Energy & Employment Report 2021

Key Findings

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The U.S. Energy and Employment Report (USEER) was first published in 2016 by the U.S. Department of Energy, and the 2021 report represents the sixth installment of the series.

The purpose of the USEER series is to provide a comprehensive overview of the energy labor market, informing policymakers and stakeholders on the importance of the energy sector as a job creation engine in the U.S. economy. The USEER offers unique insights into the individuals who meet the nation’s energy needs, identifies important trends and skillsets for the 21st century energy workforce, and provides longitudinal data on employment trends in five major energy sectors — Electric Power Generation; Transmission, Distribution, and Storage; Fuels; Energy Efficiency; and Motor Vehicles. In addition to employment data, the reports provide details on energy sector demographics, industry composition, employer projections, occupational distribution, and some key wage statistics.

Data collection for this report was completed in the fourth quarter of 2020; annual comparisons reference the fourth quarter of each year.

OVERVIEW

The energy sector was deeply impacted in 2020 by COVID-19 and its resulting economic fallout.

There were more than 7.5 million individuals employed in the energy, energy efficiency, and motor vehicles sectors in the United States in the last quarter of 2020—down nearly 840,000 jobs (10%) from the end of 2019.

Critical investments in infrastructure can reignite job growth in the energy sector.
Prior to the pandemic, energy sector job growth outpaced the overall economy. Key investments that modernize our electric grid, fuels infrastructure, buildings, and transportation can recoup the job losses from 2020 and return the sector to positive growth rates.

Energy investments pay dividends, as workers are more likely to be unionized and paid wages that are significantly higher than the overall median wage.
A recent study demonstrated that energy jobs pay about 34% higher wages on average than the median pay across all industries in the U.S.
The 2021 USEER analyzes the following sectors of the U.S. economy:

<table>
<thead>
<tr>
<th>Sector</th>
<th>Jobs at the End of 2020</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Power Generation, Transmission, Distribution &amp; Storage &amp; Storage</td>
<td>3.1 Million</td>
<td>-9.8%</td>
</tr>
<tr>
<td>Fueals</td>
<td>937,700 Jobs</td>
<td>-18.4%</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>2.1 Million</td>
<td>-11.4%</td>
</tr>
<tr>
<td>Motor Vehicles + Component Parts</td>
<td>2.3 Million</td>
<td>-9.0%</td>
</tr>
</tbody>
</table>
**KEY FINDINGS**

**EMPLOYMENT TRENDS**

Energy, Energy Efficiency and Motor Vehicles sectors in 2020 employed approximately **7.5 MILLION AMERICANS**

-10% Net decline of 10 percent in total energy employment compared to the last quarter of 2019

**IMPACT OF COVID-19**

States with the greatest number of energy job losses from 2019 to 2020:

- Texas 110,018
- California 100,308
- Michigan 61,672
- Ohio 40,057
- New York 38,456

Job loss by state

0 - 110,000
The Electric Power Generation sector employed 833,600, a loss of 63,300 jobs (-7.1%).

**ELECTRIC POWER GENERATION**

**WIND**

Wind energy companies saw an increase in jobs, adding an additional 2,000 employees, an increase of 1.8%. +2,000 jobs

**SOLAR PV**

Solar photovoltaic firms saw the greatest overall decline in jobs, shedding a net 25,700 workers through 2020—a decline of 8.1%. -25,700 jobs

**NATURAL GAS**

Natural gas electric power generation lost the next-highest number of jobs, with a total 12,300 jobs lost (a 10.1 percent decline). -12,300 jobs

**COAL**

Following solar PV, coal electric power generation firms shed the third-highest number of jobs (8,300 jobs lost or a 10.4 percent decline). -8,300 jobs

All sub-technologies with the exception of wind declined from 2019 through 2020.
Transmission, Distribution, and Storage (TDS) employed more than 1.3 million workers, a decrease of 61,500 jobs, representing a 4.4% decline.

Nearly all sub-technologies within the transmission, distribution, and storage sector experienced job losses, with the exception of battery storage.

**Smart Grid**
- Smart grid firms shed 2,500 jobs, for a 9.9% decline.

**Transmission, Distribution, and Storage (TDS)**
- Traditional transmission and distribution shed the highest number of jobs—52,400 jobs lost, for a 5.3% decline.

**Hydropower**
- Pumped hydropower employment declined the most within the storage sector, losing 700 jobs, for an 8.5% decline.

**Battery Storage**
- Battery storage employment grew by 850 jobs (+1.3%).
Although the energy workforce experienced widespread losses, continued investments prevented declines in some areas. Wind generation increased by 2,000 jobs (2 percent) and battery storage by 800 jobs (1 percent). Hybrid electric vehicles increased by 6,000 jobs (6 percent), while electric vehicles also increased by 6,000 jobs (8 percent).

The Fuels sector employed 937,700, a decrease of 211,200 jobs compared to the last quarter of 2019.

All sub-technologies within the Fuels sector lost jobs throughout 2020.

**Oil & Natural Gas**
- Petroleum fuels saw the largest decline in employment, followed by natural gas fuels.
- Oil jobs: 495,200, -19.5% (a loss of 120,300 jobs)
- Natural gas jobs: 210,000, -23.9% (a loss of 66,000 jobs)

**Coal Fuels**
- Coal fuels jobs also declined significantly in 2020.
- Coal jobs: 60,500, -19.9% (a loss of 15,000 jobs)
Energy Efficiency employed 2.1 MILLION in the design, installation, and manufacture of Energy Efficiency products and services.

Energy Efficiency employers lost 271,700 net jobs in 2020—the largest total sum of job losses across each of the five sectors.

TRADITIONAL HVAC
Traditional HVAC firms shed the highest number of jobs, losing 66,700 workers (for an 11.2 percent decline):

-11.2% a loss of 66,700 JOBS

ENERGY STAR HVAC
Efficient lighting technologies, including LED, CFL, and ENERGY STAR-certified lighting, lost 42,000 jobs, for a decline of 11 percent.

-11.4% a loss of 42,000 JOBS
Motor Vehicles (including component parts) employed over 2.3 million, a loss of 231,200 jobs.

All motor vehicles sub-technologies shed jobs with the exception of electric and hybrid electric vehicles.

**Electric Vehicles**
- Employment in the electric vehicle sector grew by 7.8 percent in 2020 (6,100 jobs).
  - +7.8%
  - +6,100 jobs

**Gasoline + Diesel Vehicles**
- Gasoline and diesel vehicles declined by 9.9 percent—a loss of 200,700 jobs.
  - -9.9%
  - -200,700 jobs

**Hybrid Electric Vehicles**
- Employment in the hybrid electric vehicle sector grew by 5.5 percent (6,300 jobs).
  - +5.5%
  - +6,300 jobs

**Plug-in Hybrid Vehicles**
- Employment in the plug-in hybrid vehicles sub-sector declined by 7.3 percent (3,800 jobs).
  - -7.3%
  - -3,800 jobs
**Cross Cuts: Renewable Energy**

### Renewable Electric Power Generation

- **Total Jobs**: 517,000
  - Down 6 percent, or 33,000 jobs

**Number of Jobs**:

- **Solar**
  - Total: 317,000
  - Solar breakdown:
    - Construction: 165,000
    - Pro Services: 49,700
    - Manufacturing: 41,900

- **Wind**
  - Total: 116,800
  - Wind breakdown:
    - Construction: 42,300
    - Pro Services: 29,500
    - Manufacturing: 23,900

- **Hydropower**
  - Total: 51,900
  - Hydro breakdown:
    - Utilities: 17,400
    - Manufacturing: 13,000
    - Construction: 7,800

### Renewable Fuels

- **Total Jobs**: 103,000
  - Down 4.6 percent, or 5,000 jobs

**Number of Jobs**:

- **Corn Ethanol**
  - Total: 33,500
  - Corn Ethanol breakdown:
    - Agriculture: 15,600
    - Manufacturing: 9,000
    - Wholesale Trade: 6,200

- **Woody Biomass**
  - Total: 32,400
  - Woody Biomass breakdown:
    - Agriculture: 17,900
    - Pro Services: 9,400
    - Manufacturing: 4,200

- **Other Ethanol**
  - Total: 19,500
  - Other Ethanol breakdown:
    - Pro Services: 9,100
    - Wholesale Trade: 5,200
    - Manufacturing: 2,600
The 2021 USEER provides four cross-cutting analyses that look at the interrelations of jobs across the entire value chain of the natural gas, petroleum, coal and nuclear industries that were previously segregated in the Fuels, Electric Power Generation, and Transmission, Distribution and Storage chapters.

**NATURAL GAS**

- **Number of jobs:**
  - Utilities: 175,700 (-4.3 percent)
  - Construction: 86,800 (-20.8 percent)
  - Mining and Extraction: 107,900 (-34.8 percent)
- **Total:** 537,300 (down 15.5 percent, or 98,700 jobs lost)

**PETROLEUM**

- **Number of jobs:**
  - Manufacturing: 143,000 (-9.5 percent)
  - Wholesale Trade, Distribution, and Transport: 167,400 (-3.1 percent)
  - Mining and Extraction: 218,300 (-30.4 percent)
- **Total:** 681,500 (down 17.3 percent, or 142,800 jobs lost)

Important investments can reverse these results. The critical nature of investments to modernize our electric grid, fuels infrastructure, buildings, and transportation can return the energy sector to positive growth rates.

* Natural gas consumption declined by 2 percent between 2019 and 2020.
* Petroleum consumption declined by 12.6 percent between 2019 and 2020.
**CROSS CUTS**

**NUCLEAR**

Industry employs **66,800**

- Down 5.1 percent, or 3,600 jobs

Number of jobs:

- **Utilities**: 42,800 (down 3.6 percent)
- **Professional and Business Services**: 13,700 (down 7.0 percent)
- **Manufacturing**: 4,500 (down 9.3 percent)

Nuclear electric power consumption declined by 2.4 percent between 2019 and 2020.

**COAL**

Industry employs **164,700**

- Down 11.3 percent, or 21,000 jobs

Number of jobs:

- **Utilities**: 34,000 (down 10.7 percent)
- **Mining and Extraction**: 42,300 (down 24.0 percent)
- **Wholesale Trade, Distribution, and Transport**: 39,600 (up 5.2 percent)

Coal consumption declined by 18.9 percent between 2019 and 2020.
Historical data demonstrates that energy jobs pay significantly more than the average wage in the United States.

Energy workers’ median hourly wage, 34% higher than national median

$25.60

National median hourly wages across entire U.S. economy

$19.14

Premium of energy job wages over the retail and accommodation and food service sectors, which have been hard-hit by the COVID-19 pandemic

95%-120%

Median wage for energy utility employees, the highest of all industry segments and 115% above the national median. Mining and extraction jobs are next highest at $36.32.

$41.08

The utilities industry supports the highest hourly wage of all industries compared to the national median. Electric power generation and transmission, distribution, and storage are the only sectors with utilities jobs.

UTILITY WORKERS
Across sub-technologies, natural gas generation, coal generation, nuclear generation and traditional transmission and distribution had the highest unionization rates.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percent Union Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas Generation</td>
<td>15.1%</td>
</tr>
<tr>
<td>Nuclear Generation</td>
<td>19.5%</td>
</tr>
<tr>
<td>Coal Generation</td>
<td>14.7%</td>
</tr>
<tr>
<td>Other Renewable Generation</td>
<td>8.8%</td>
</tr>
<tr>
<td>Solar Generation</td>
<td>9.6%</td>
</tr>
<tr>
<td>Wind Generation</td>
<td>9.5%</td>
</tr>
<tr>
<td>Oil Generation</td>
<td>6.7%</td>
</tr>
<tr>
<td>Petroleum Fuels</td>
<td>5.6%</td>
</tr>
<tr>
<td>Coal Fuels</td>
<td>9.8%</td>
</tr>
<tr>
<td>Nuclear Fuels</td>
<td>5.5%</td>
</tr>
<tr>
<td>Natural Gas Fuels</td>
<td>4.9%</td>
</tr>
<tr>
<td>Renewable Fuels</td>
<td>4.1%</td>
</tr>
<tr>
<td>Traditional Transmission</td>
<td>17.0%</td>
</tr>
<tr>
<td>and Distribution</td>
<td></td>
</tr>
<tr>
<td>Grid Modernization</td>
<td>9.9%</td>
</tr>
<tr>
<td>Storage</td>
<td>9.6%</td>
</tr>
<tr>
<td>Advanced Transportation</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

Within each sector, there are specific occupations; these could include welders, electricians, sales representatives, or lawyers.

**ELECTRIC POWER GENERATION**
- Installation and repair: 32.1%
- Administrative positions: 20.8%

**TRANSMISSION, DISTRIBUTION, AND STORAGE**
- Installation and repair: 32.0%
- Administrative positions: 22.1%

**FUELS**
- Production and manufacturing: 33.0%
- Management or Professional: 20.8%

**ENERGY EFFICIENCY**
- Installation and repair: 32.1%
- Administrative positions: 23.5%

**MOTOR VEHICLES**
- Production and manufacturing: 36.9%
- Installation and repair: 29.0%
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