Wages, Benefits, and Change

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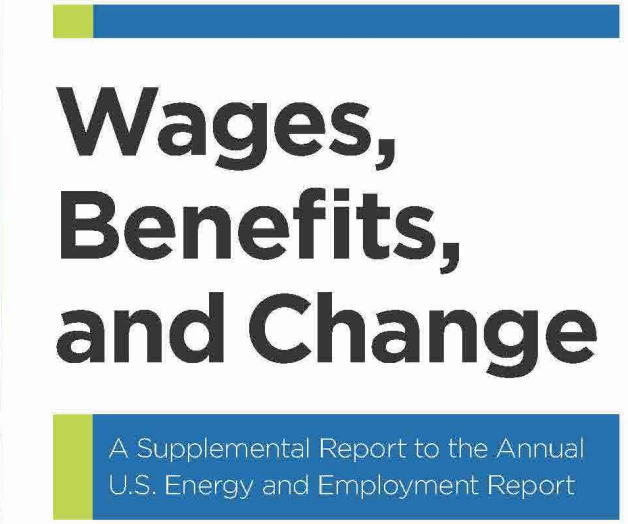
Webinar Presentation by Phil Jordan,
Vice President, BW Research Partnership



The National Association of State Energy Officials (NASEO)

- Membership includes the 56 Energy Governors' Energy Directors and their offices from the states, territories, and the District of Columbia, as well as private-sector Affiliate partners.

- Serves as a resource for and about the states on a number of topics, including workforce development, energy security, innovation, building energy efficiency, clean energy financing, fuels and grid integration, government affairs, transportation, energy policy planning, and climate.

- Works through topical committees to facilitate peer learning across states to improve the effectiveness of energy policies and programs.

- Visit www.naseo.org for more information

The Energy Futures Initiative (EFI)

Mission: The Energy Futures Initiative advances solutions to the climate crisis through building coalitions, thought leadership, and evidence-based analysis. Under the leadership of Ernest J. Moniz, all final EFI analysis is published and publicly available.

Learn more at
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BW Research Partnership

- BW Research is a full-service applied research firm and a national leader in economic and workforce impact research.
- BW Research has substantial experience developing customized research projects and a deep understanding of the energy sector and its employers, workforce, and supply chain dynamics.
- The firm has designed and conducted more than 500 studies for public, private, and not-for-profit organizations globally that have directly impacted federal, state, and local initiatives.
- For more information on BW Research or to view other reports and publications, please visit https://bwresearch.com/.

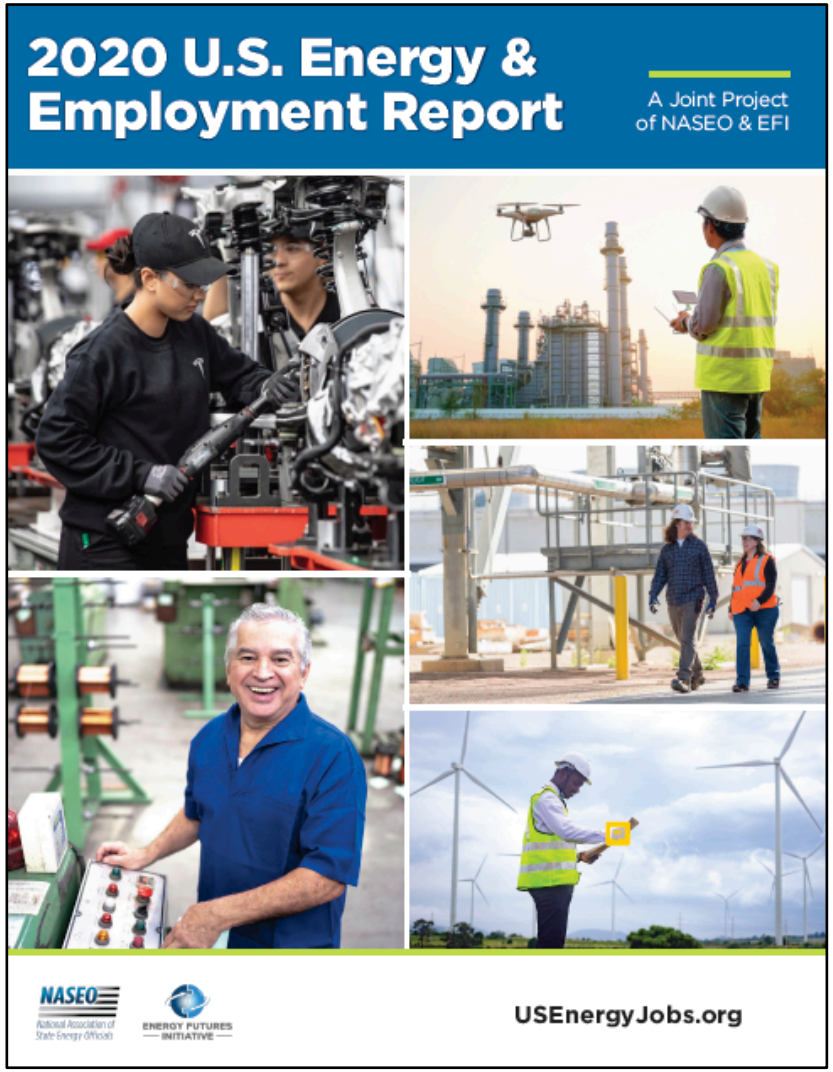
The 2020 U.S. Energy & Employment Report (USEER)

On March 23,2020, the National Association of State Energy Officials (NASEO) and the Energy Futures Initiative (EFI) together with BW Research Partnership (BWRP) produced the 2020 U.S. Energy and Employment Report.

The 2020 USEER project was guided by David Foster, who directed the first four editions of the USEER and now serves as a Distinguished Associate with EFI.

Data collection and analysis was provided by BW Research Partnership, a full-service research firm with offices in California and Massachusetts.

Additional employment research was conducted by Sade Kailani Nabahe of MIT



Overview: 2020 U.S. Energy & Employment Report

The USEER is based on an annual supplemental employer survey, conducted in September- November and integrated with the BLS Quarterly Census on Employment and Wages.

It studies employment in the following sectors:

- Fuels
- Electric Power Generation (EPG)
- Transmission, Distribution, and Storage (TDS)
- Energy Efficiency (EE)
- Motor Vehicles

Fuels, EPG, and TDS make up the Traditional Energy Sector.

USEER Content

The survey covers direct employment in 53 different energy, energy efficiency and motor vehicle technologies across 186 NAICS codes located in seven broad industrial classifications.

The survey determines:

- Employment numbers
- Employer hiring expectations for the next 12 months
- Hiring difficulty by technology and industrial classification
- High demand jobs and skills gaps
- Workforce demographics by race, ethnicity, gender, and veteran's status
- Geographic location by state, county, congressional and legislative districts, and MSA of each technology and industrial classifications

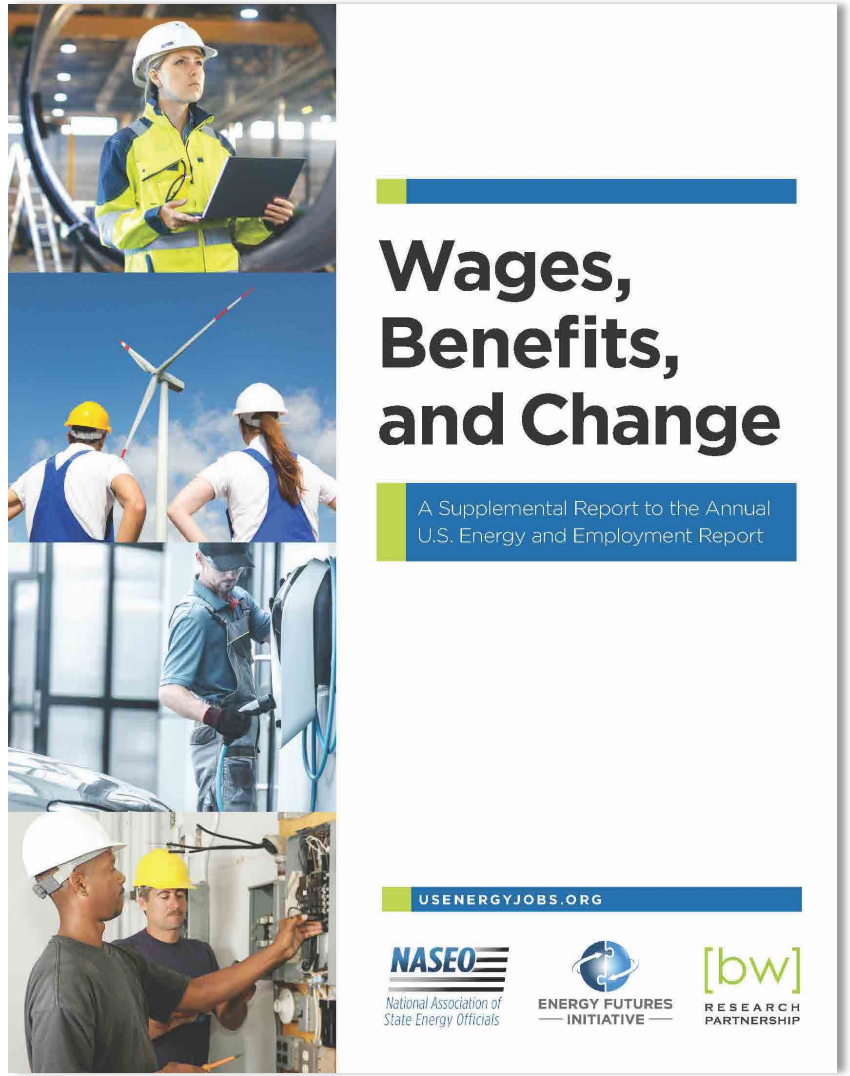
Wages, Benefits, and Change: Research Overview

1. Data in report is based on: USEER Series

   - ✓ Five-Year Trends Report
   - ✓ Supplemental employer wage surveys
   - ✓ Bureau of Labor Statistics

2. Includes wage data for technology sector, sub-technology, crosscuts, and select occupations

3. Plus healthcare & retirement benefits data for select occupations



Key Findings: Production & Employment

1. National Energy Production:
   - ✓ 87 to 106 percent increase in natural gas, renewable energy, and petroleum production from 2000-2019
   - ✓ 37 percent decrease in domestic coal production between 2000-2019

2. National Energy Employment:
   - ✓ US Energy Sector grew by 11 percent between 2015-2019 – an increase of 915,000 jobs
   - ✓ **+73,000** jobs in petroleum and natural gas fuels 2015-2019
   - ✓ **+83,000** jobs in solar and wind electric power generation
   - ✓ **-17,000** jobs in coal fuels sector

Key Findings: COVID-19

COVID-19 PANDEMIC

12%

Decline in energy employment, compared to 20% decline nationwide, at the peak of job losses during April 2020

323,880

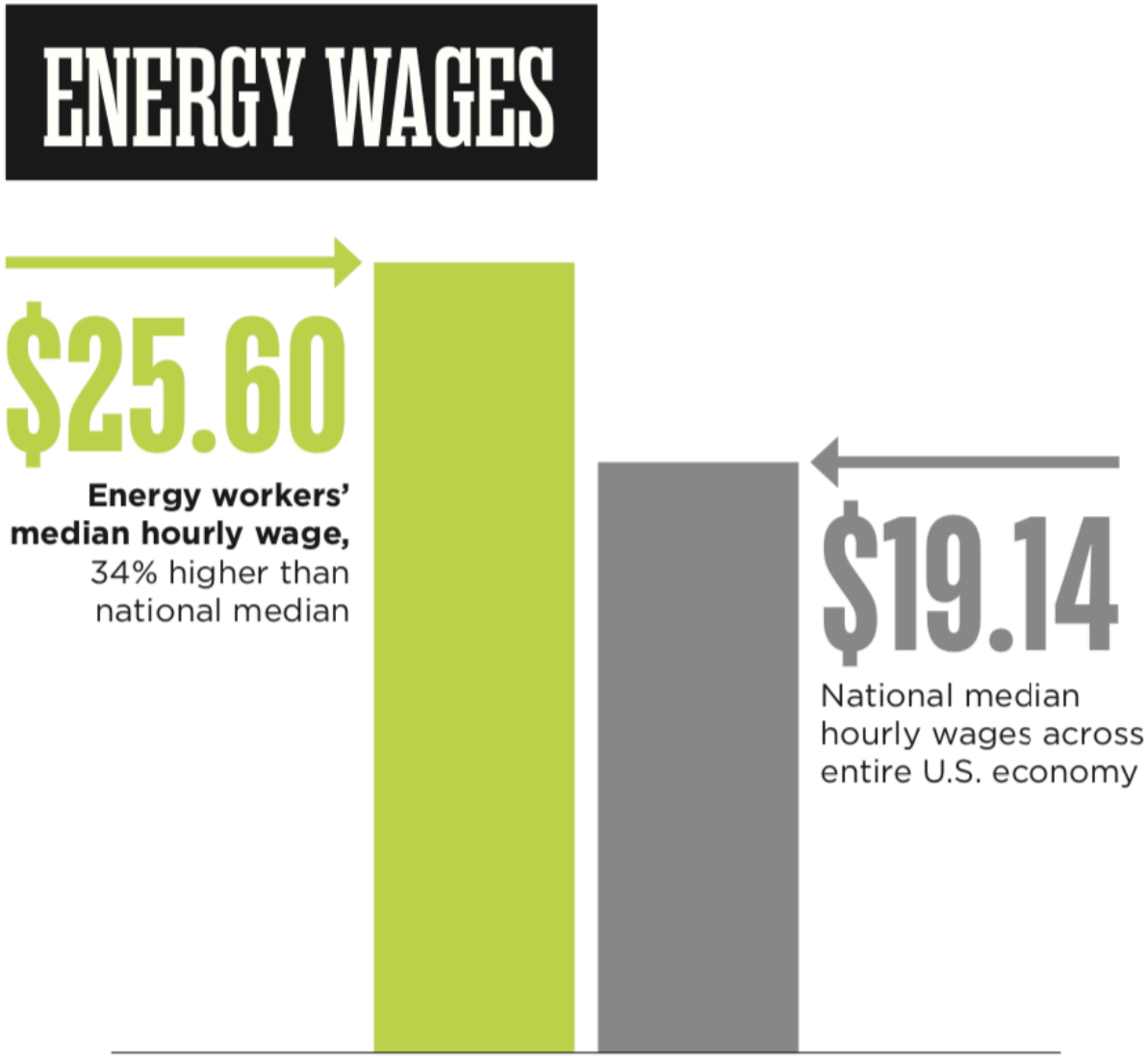
Energy jobs added back over June–December 2020, after losing 1.08 million over March–May

95%–120%

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

Key Findings: Energy Jobs Wages

On average, energy wages are **34 percent higher** than the national median hourly wage



Key Findings: Energy Jobs Wages & Benefits

1. Energy sector employees across all technology sectors and nearly all industry segments earn **higher hourly wages** compared to the national median and other sectors of the economy

2. For crosscut sectors such as solar, wind, coal, nuclear, oil, and natural gas – wages are **27 to 105 percent** above national median hourly wages

3. Energy workers in examined occupations are **more likely** to receive healthcare and retirement benefits compared to national private sector averages

Energy Wages by Crosscuts

Energy Efficiency jobs are found in nearly every county across the US except for 6

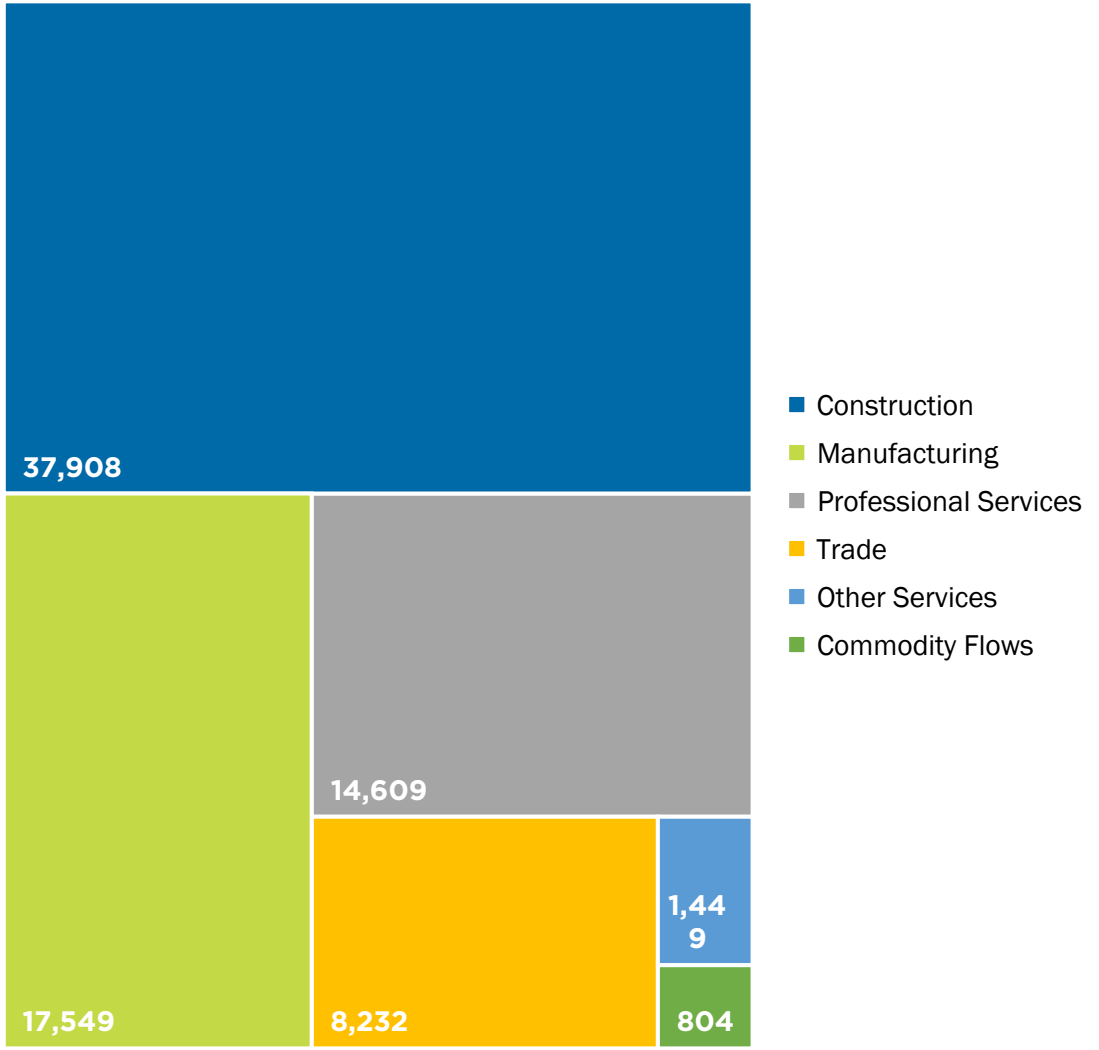
Industry Crosscut	Median Hourly Wage	Premium or Discount Compared to National Median	Total Employment, 2019	Percent of Total Energy Employment, 2019
Nuclear	$39.19	104.8%	70,323	0.8%
Electric Power Transmission & Distribution	$31.80	66.1%	830,291	9.9%
Natural Gas	$30.33	58.5%	636,043	7.6%
Coal	$28.69	49.9%	185,689	2.2%
Hydropower	$26.97	40.9%	67,772	0.8%
Oil	$26.59	38.9%	839,831	10.0%
Wind	$25.95	35.6%	114,774	1.4%
Solar	$24.48	27.9%	345,393	4.1%
Energy Efficiency	$24.44	27.7%	2,378,893	28.4%
Storage (excl. fossil fuels)	$24.36	27.3%	80,550	1.0%
National Median Wage	$19.14			

Energy Wages by Industry

Industry	Median Hourly Wage (Energy Workers)	Median Hourly Wage (Overall Industry)	Premium/ Discount Compared to Overall Industry	Premium/ Discount Compared to National Median of $19.14	Total Employment, 2019	Percent of Total Employment, 2019
Agriculture	$13.18	$13.18	0%	-31%	35,616	0.4%
Mining and Extraction	$36.32	$25.44	43%	90%	535,210	6.4%
Utilities	$41.08	$37.50	10%	115%	601,225	7.2%
Construction	$25.53	$23.57	8%	33%	2,142,087	25.6%
Manufacturing	$23.02	$20.46	13%	20%	1,778,343	21.3%
Wholesale Trade	$19.94	$15.47	29%	4%	860,661	10.3%
Transportation (commodity flows)	$36.08	$34.31	5%	89%	285,375	3.4%
Professional Services	$28.17	$25.95	9%	47%	1,057,995	12.6%
Other Services (incl. Repair and Maintenance)	$19.68	$16.33	21%	3%	1,068,244	12.8%
National Median Wage	$19.14					

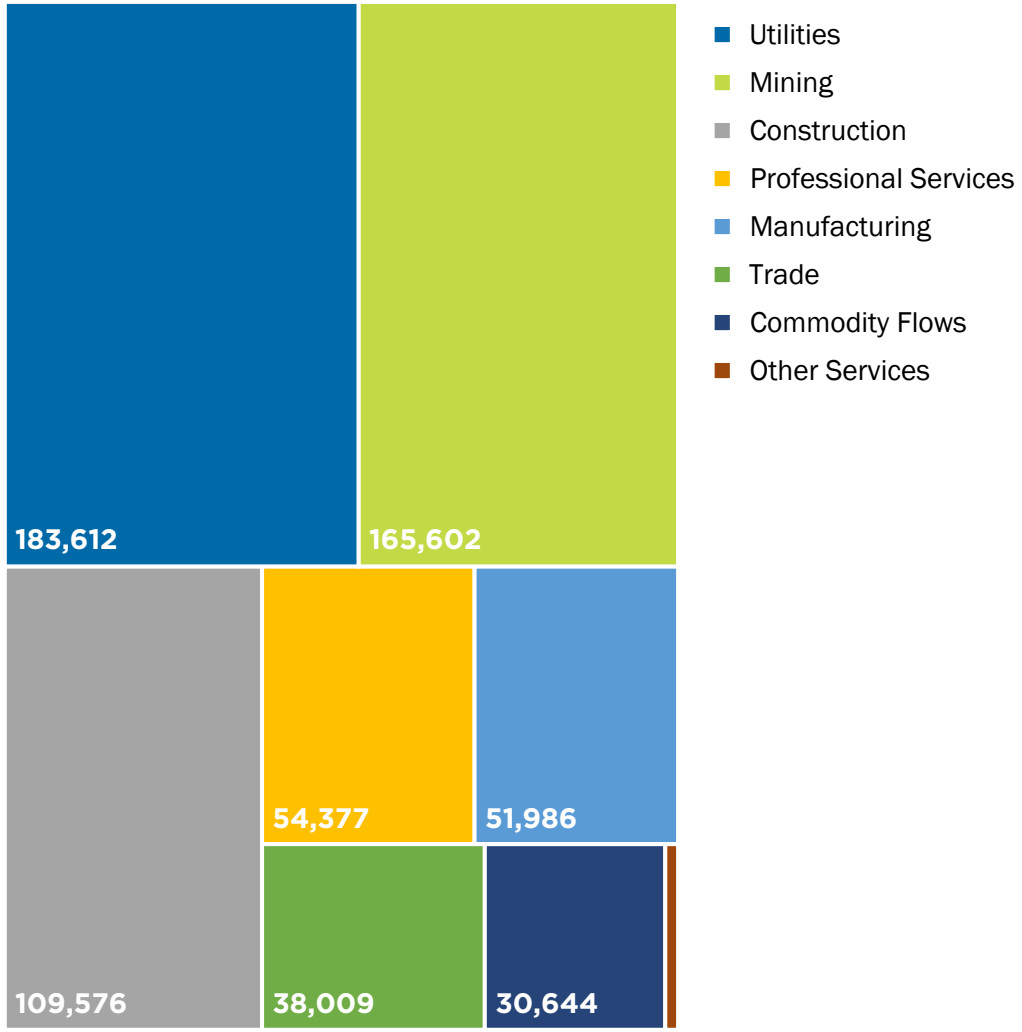
Storage Crosscut (Excluding Fossil Fuels)

Industry	Median Hourly Wage (Storage Workers)	Median Hourly Wage (Nationally)	Premium or Discount
Construction	$25.53	$23.57	8.3%
Manufacturing	$22.16	$20.46	8.3%
Wholesale Trade	$16.76	$15.47	8.3%
Transportation (commodity flows)	$41.22	$34.31	20.1%
Professional Services	$28.10	$25.95	8.3%
Other Services (incl. Repair and Maintenance)	$17.69	$16.33	8.3%
Overall	$24.36	$19.14	27.3%



Natural Gas Crosscut

Industry	Median Hourly Wage (Natural Gas Workers)	Median Hourly Wage (Nationally)	Premium or Discount
Mining	$37.67	$25.44	48.1%
Utilities	$41.03	$37.50	9.4%
Construction	$27.56	$23.57	16.9%
Manufacturing	$22.54	$20.46	10.2%
Wholesale Trade	$17.07	$15.47	10.3%
Transportation (commodity flows)	$35.89	$34.31	4.6%
Professional Services	$28.17	$25.95	8.6%
Other Services (incl. Repair and Maintenance)	$18.28	$16.33	11.9%
Overall	$30.33	$19.14	58.4%



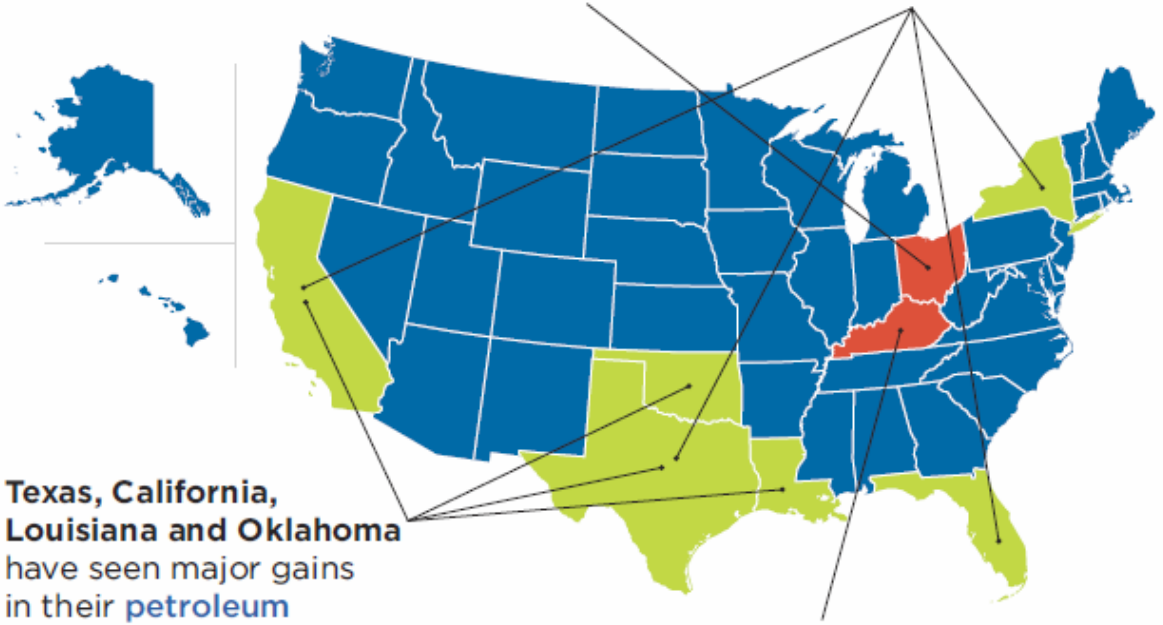
GEOGRAPHIC SHIFTS

Ohio had the highest number of coal electric power generation workers at the end of 2019 but shed 25 percent of its coal generation workforce—just over 4,000 jobs—between 2016 and 2019.

Total jobs, 2019	Jobs lost, 2016–19	Change, 2016–19
12,297	-4,078	▼24.9%

California, Texas, Florida and New York have added thousands of natural gas electric power generation jobs.

Jobs gained, 2016–19		
CA	3,565	▲21.0%
TX	2,966	▲60.4%
FL	2,697	▲22.0%
NY	1,305	▲32.1%



Texas, California, Louisiana and Oklahoma have seen major gains in their petroleum fuels workforce.

Jobs gained, 2016–19		
TX	39,257	▲22.4%
CA	8,737	▲18.0%
LA	6,679	▲14.8%
OK	6,547	▲19.3%

Kentucky's coal fuels sector, which includes mining, extraction, processing, and production, was hard hit between 2016 and 2019, shedding almost 4,400 jobs.

Total jobs, 2019	Jobs lost, 2016–19	Change, 2016–19
7,839	-4,396	▼35.9%

Considerations for Policymakers

1. Wages, job quality, and opportunity are based on a variety of factors, including qualifications, experience, and training, as well as technology and industry segment.

2. Policymakers to prioritize workforce funding and programming to support continued development and expansion of pipelines to gainful energy careers

3. DOE to let an effort for more granular detail on skill competencies of energy occupations, similar level of detail to O*NET

4. Registered Apprenticeship Program refined to include more pre-apprenticeship and apprenticeship funding

5. Local and state policymakers can use data to examine the impacts of and potential responses to energy and workforce transitions

Considerations for Policymakers

1. DOE to consider exploring pathways to increase certification and licensure reciprocity for skilled energy labor

2. Energy employment, wages, and benefits data can be used to understand geographic, industrial, and occupational implications of various energy policy mechanisms and investment strategies

3. National Economic Council to consider convening relevant stakeholders to establish protocols and methodologies for union data

4. Further investigation into COVID-19 impacts and energy transition to understand jobs created, lost, and changed