

NETL Regional Workforce Initiative Webinar

Welcome to the Webinar



NETL RWFI –2020 US Energy and Employment Report (USEER) Briefing Webinar

Did you know that for the last five years the energy sector created jobs 50% faster than the rest of the economy and in 2019 employed 8.27 million people?

All participants are on mute for the duration of the webinar

NETL RWFI Webinar Archives Page-The webinar will be posted at netl.doe.gov/rwfi

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- We will begin the webinar shortly ~2 minutes

Webinar Agenda

- I. NETL RWFI Introduction – Anthony Armaly, NETL Regional Workforce Initiative, Federal Coordinator
- II. 2020 US Energy and Employment Report Regional and National Briefing –David Foster, Distinguished Associate, Energy Futures Initiative (EFI) & Lead Author of the 2020 U.S. Energy & Employment Report (USEER)
- III. Regional and National Impacts Workforce Discussion

NETL Regional Workforce Initiative (NETL RWFI)



A Focus on Appalachia and the future of Energy and Advanced Manufacturing Regional Workforce Readiness and Economic Development

NETL RWFI Mission Statement

A photograph of a person wearing a dark blue or black jacket, holding a bright yellow hard hat under their arm. The background is blurred, suggesting an industrial or construction setting.

NETL RWFI is a platform for engagement and collaboration with key stakeholders who are critical for the deployment of U.S. DOE and NETL Energy and Advanced Manufacturing technological research.

Supporting Regional Economic and Workforce Development opportunities.

Collaboration, Coordination, and Communication

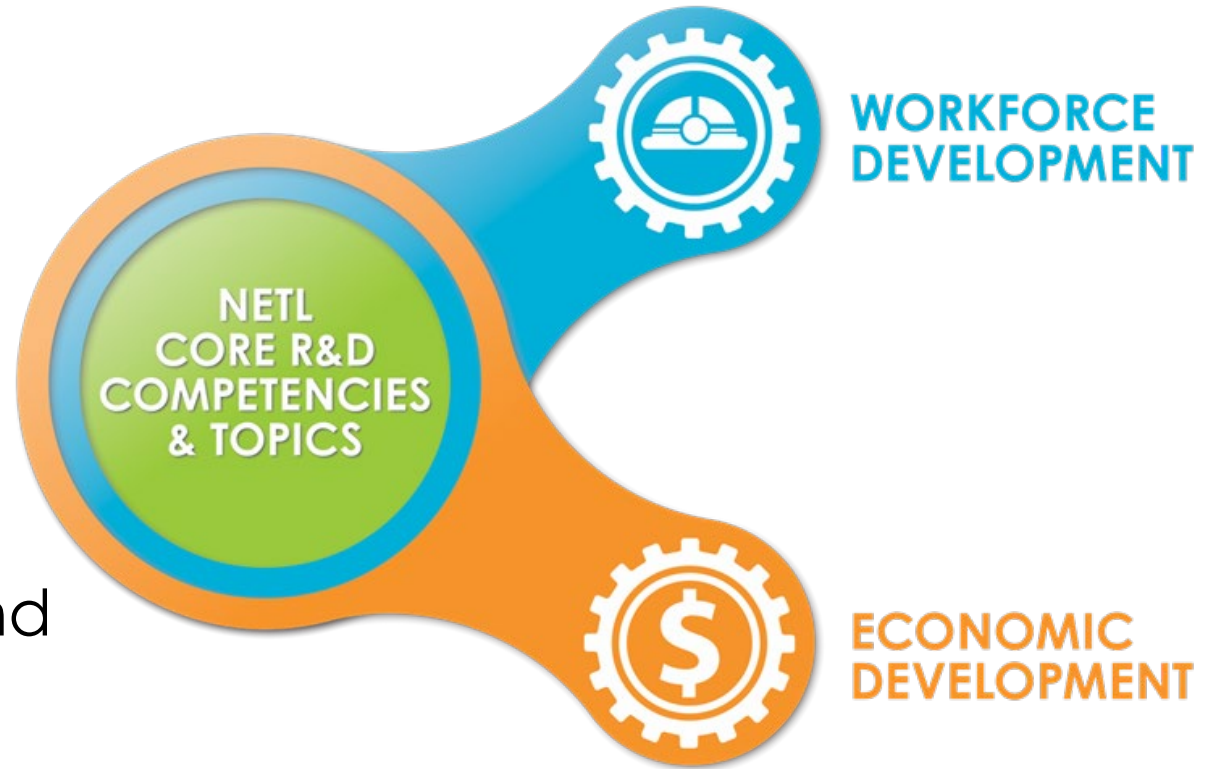
In the Energy and Advanced Manufacturing workforce



Collaboration with stakeholders and partners around workforce readiness and economic opportunities

Coordinating across economic development and workforce development initiatives

Communicating activities, research, and funding opportunities to stakeholders



Responsive to Administration Priorities

RWFI aligns with the Administration's efforts to connect R&D investment to economic growth, job growth, and development of a skilled technical workforce.

- Establishing the President's Council for the American Worker
- Establishing Apprenticeships in America
- Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure



Key NETL RWFI Metrics

400+

individual regional
and national
stakeholders

152

institutions and
organizations
represented

200+

subscribed to the
NETL RWFI e-Note
Monthly Newsletter

700+

registrants to the
NETL RWFI Webinar
Series



Appalachia at a Glance

The Appalachian region is:

- a historically critical region for U.S. energy production, and will continue to be so
- a strategically important area for related technologies in advanced manufacturing and supercomputing
- expected to enjoy a manufacturing renaissance
- an area that has been adversely affected by changes in energy extraction and related manufacturing activity



Source: Appalachian Regional Commission

Key Outcomes to Date



Establishment of a new network
of regional stakeholders



Consistent engagement with key
regional partners



Integration of Workforce Workplan

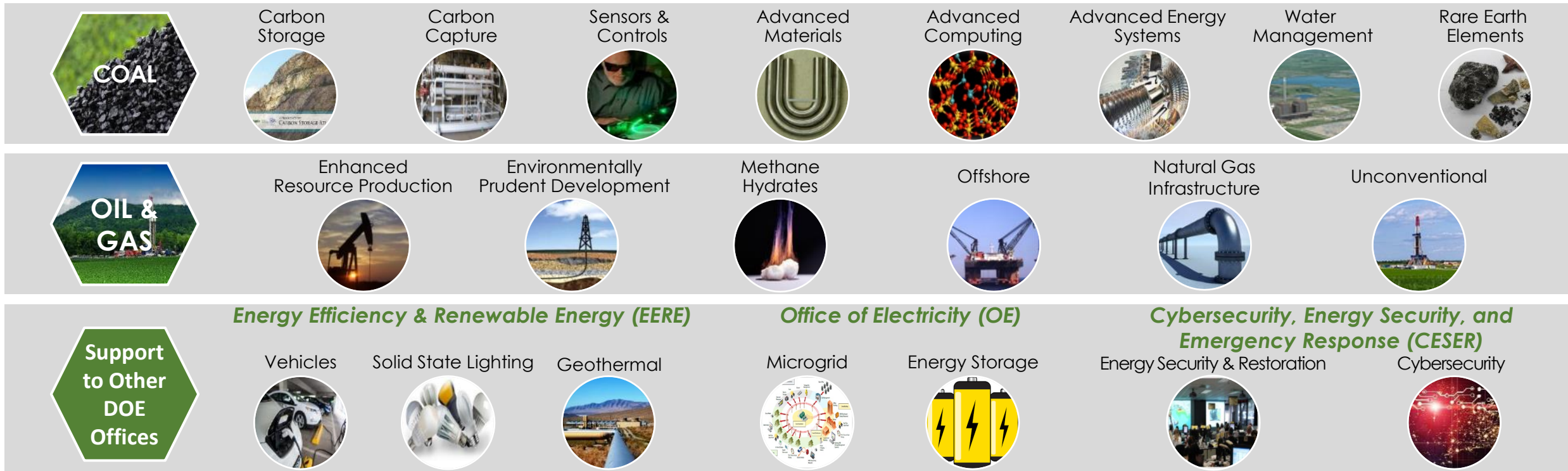
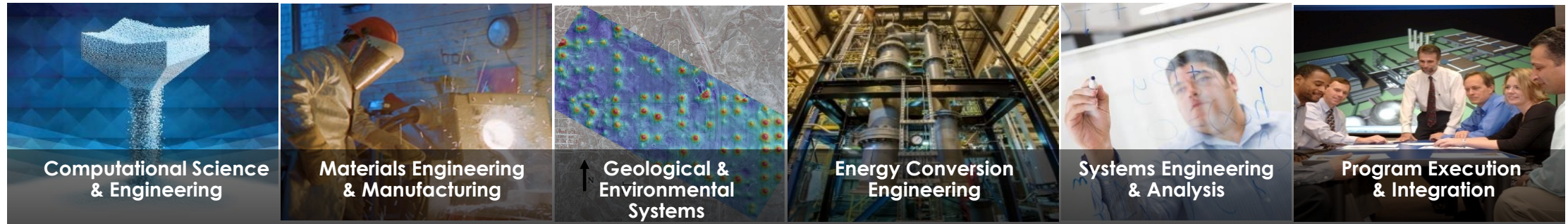


Increased communication of NETL mission



Increased growth for potential collaborative opportunities

Core Competencies & Technology Thrusts



Contact Information



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The Critical Role of Energy Jobs in the American Economy: 2020 U.S. Energy & Employment Report

Date: May 21, 2020, National Energy Technology
Laboratory

Webinar Presentation by David Foster,
Distinguished Associate, Energy Futures Initiative
and Lead Author, USEER



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

On March 23, 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.

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

New Additions to the 2020 USEER

1. Spotlight on real world experience from Tesla, CEWD, Xcel Energy, SMART, UA, and UAW
2. In-depth look at ENERGY STAR-related jobs
3. Utility-run energy efficiency programs
4. Summary of 5-year Trends



FIVE-YEAR TRENDS

THE USEER: 2016-2020

Key Takeaways: 2020 USEER

1. Traditional Energy and Energy Efficiency added 120,000 jobs in 2019, out-performing the economy for the 5th year, in a row by 0.6 percentage point, 1.8% to 1.2%.
2. Energy Efficiency again led the way with 54,000 new jobs, almost 330,000 new jobs in the last 4 years.
3. Fuels production added 26,000 new jobs, 18,000 in oil and natural gas, while coal mining held firm.
4. Solar jobs bounced back, adding 5,700 jobs after declining for two years in a row, while low emissions' natural gas, wind, CHP, and geothermal all continued to grow.



Traditional Energy and Energy Efficiency sectors in 2019 employed approximately

6.8 MILLION AMERICANS

or **4.6 percent** of a workforce of roughly **149 million**

Key Takeaways: 2020 USEER

- 5. Coal generation dropped by almost 8,000 jobs while coal mining increased slightly.
- 6. Motor vehicles added 20,000 jobs, while alternative fuel vehicles declined slightly.
- 7. Overall hiring difficulty continued to rise to over 84%, an increase of 7 percentage points.
- 8. Overall surveyed employers predicted 3.1% growth rate for 2019.



Motor Vehicles (including component parts) employed over

2.55 MILLION

adding

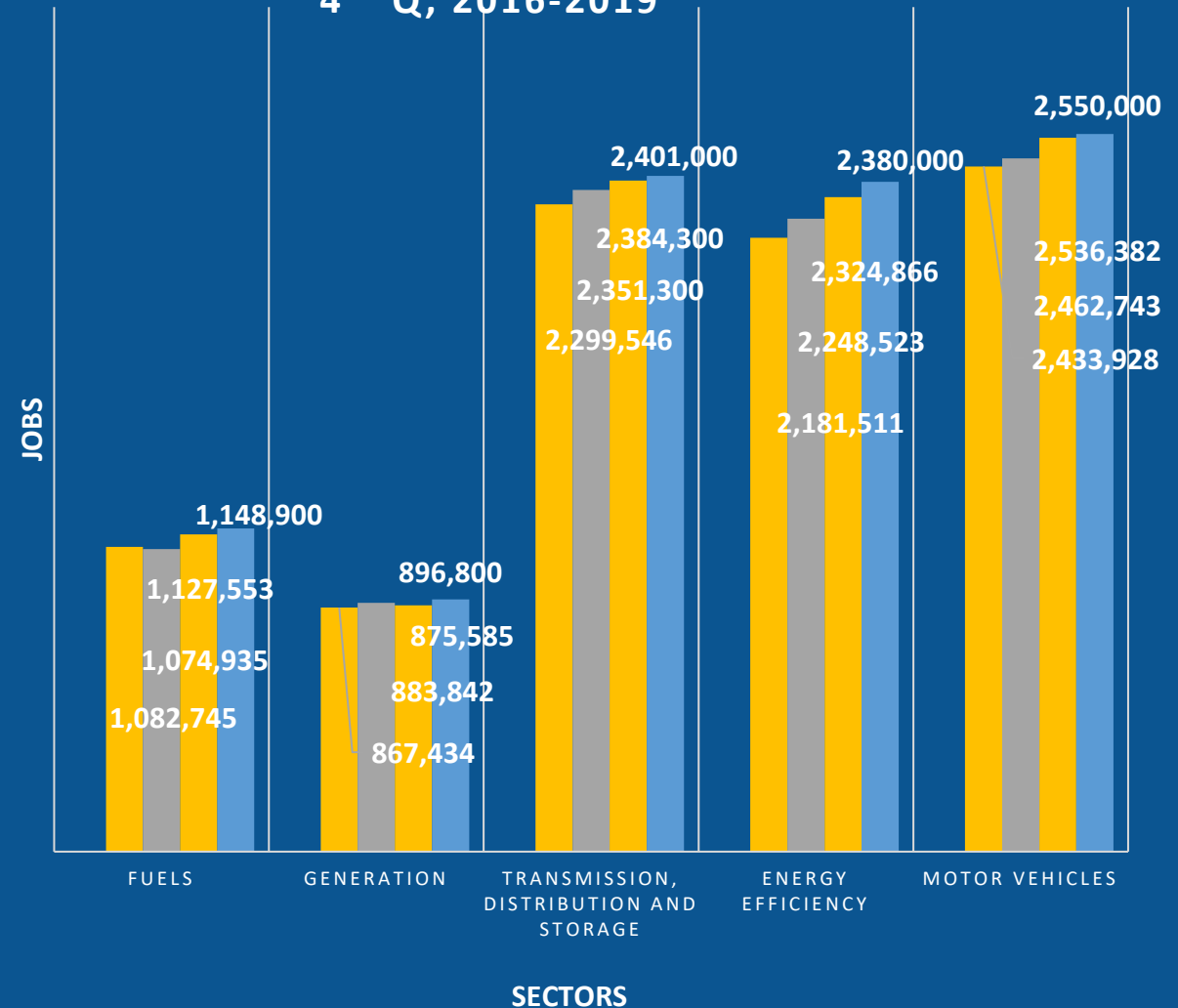
20,000 JOBS

a slight increase of just under 1 percent.

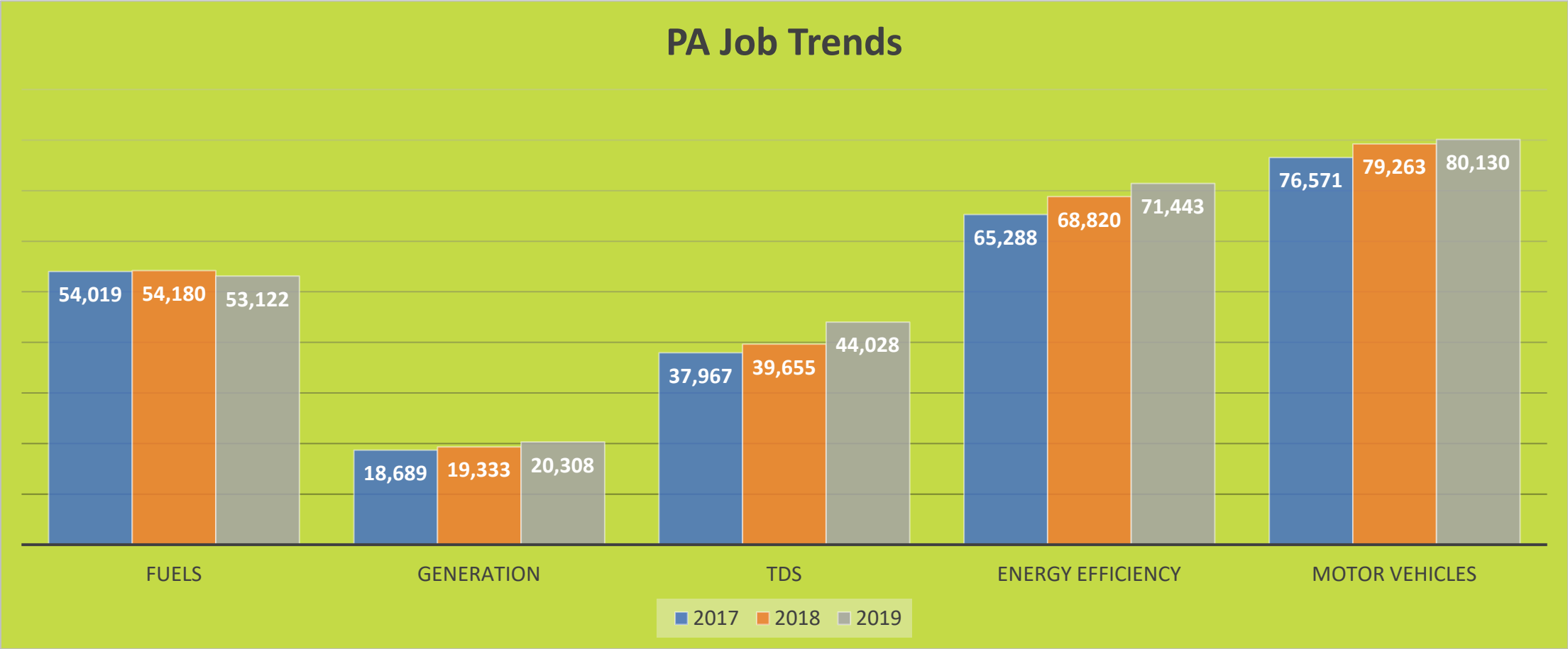
2020 U.S. Energy & Employment Report

- In total, 6.8 million Americans work in Traditional Energy* industries and Energy Efficiency
 - An increase of 120K to 6.8M (excluding gas stations).
- Fuels production directly employs almost 1.15 million workers,
 - 26,000 new jobs in Fuels.
- Electric Power Generation gained over 21,000 jobs
 - EPG employs 896,800. (Includes 97,000 minority-time solar.)
- 2.4 million** Americans work in Transmission, Distribution, and Storage of all energy products
 - 17,100 new jobs (excluding gas stations)
- 2.38 million work in Energy Efficiency
 - A net increase of over 54,000.
- In addition, 2.55 million work in motor vehicles
 - A net increase of 20,000 in 2019.
 - 266,000 work with alternative fuels vehicles, a decline of almost 2%.

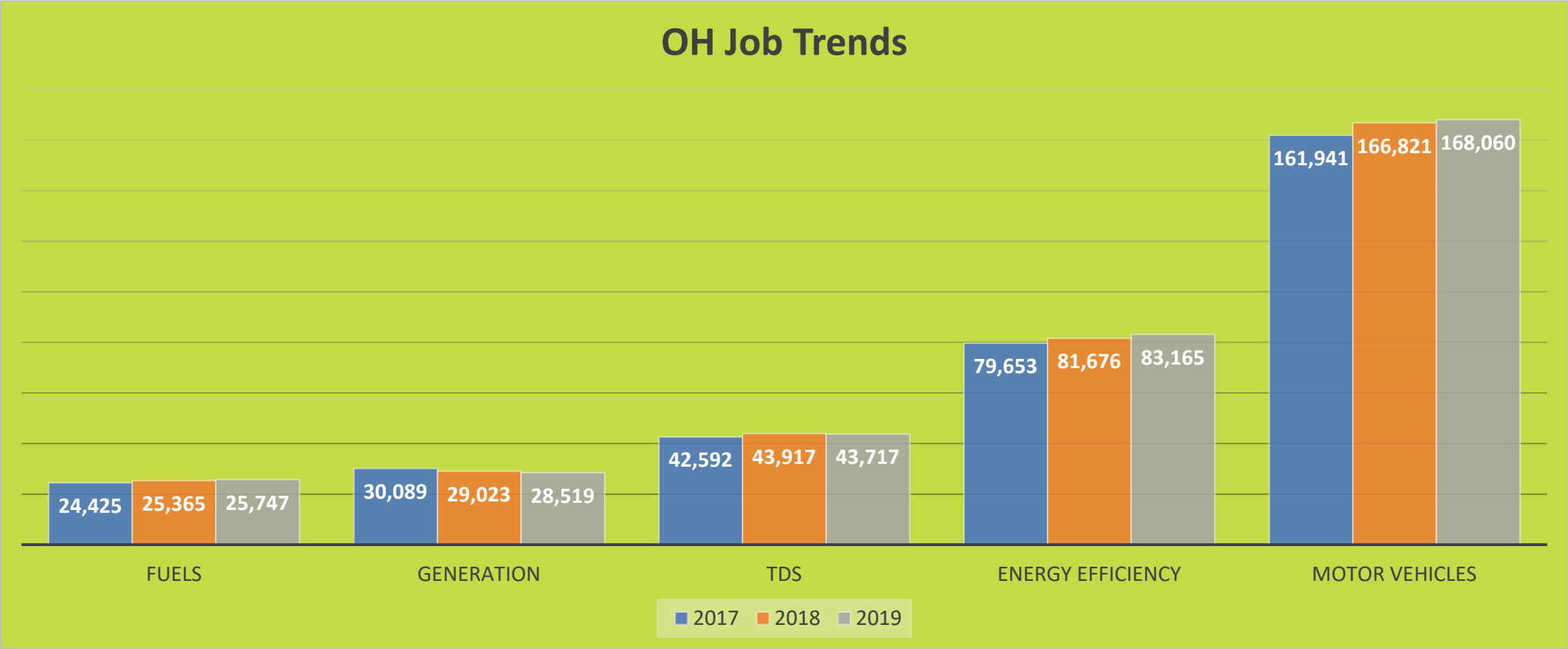
ANALYZED EMPLOYMENT SECTORS:
4TH Q, 2016-2019



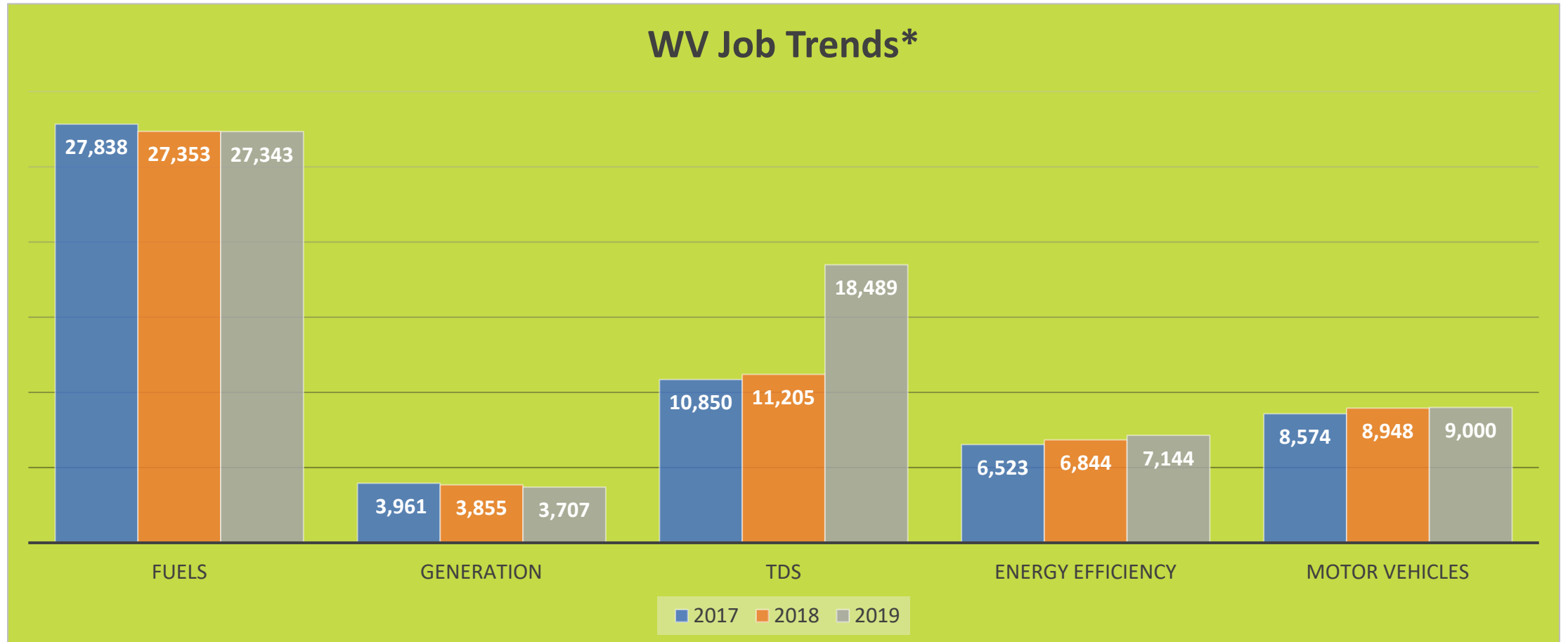
USEER Jobs in Pennsylvania, 2017-2019 Trends



USEER Jobs in Ohio, 2017-2019 Trends



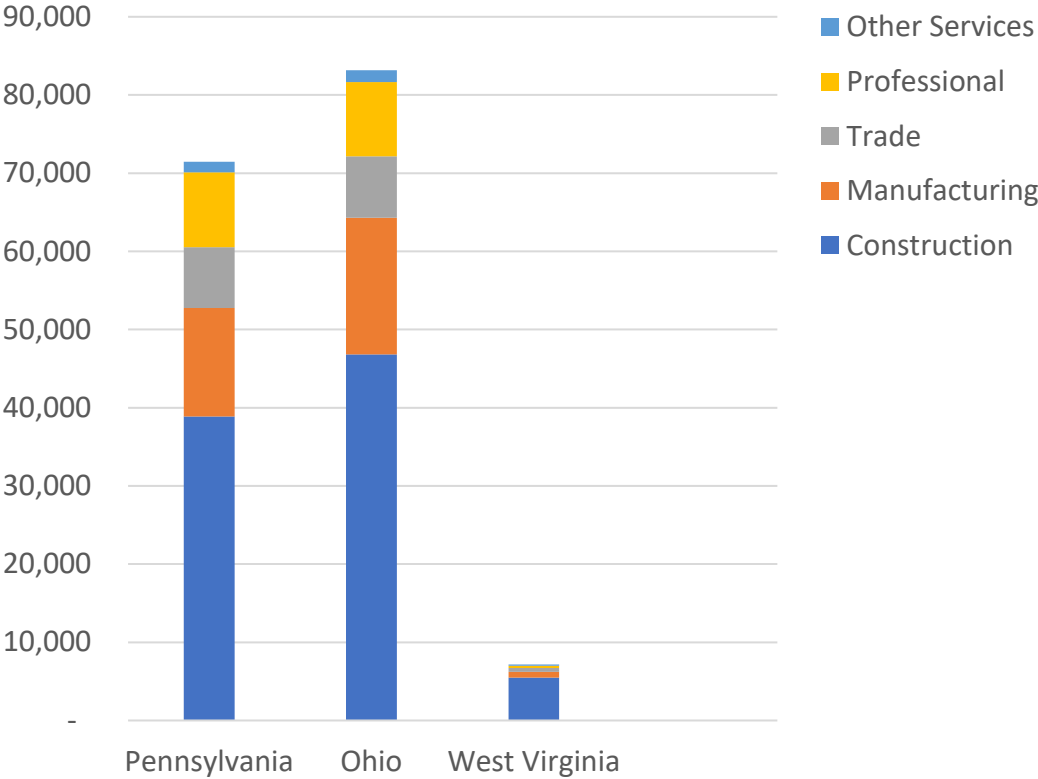
USEER Jobs in WV, 2017-2019 Trends



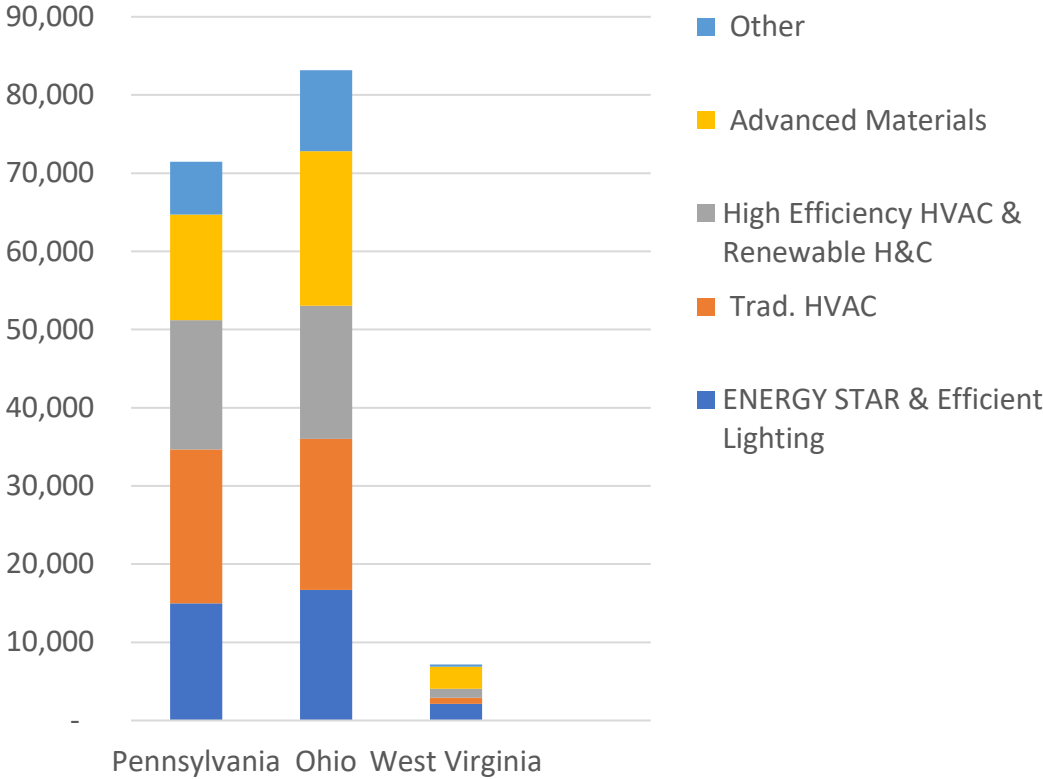
*Data suppression in 2017 and 2018 kept the TDS numbers artificially low.

Energy Efficiency Jobs in PA, OH, WV by Industry and Technology

EE Jobs by Industry

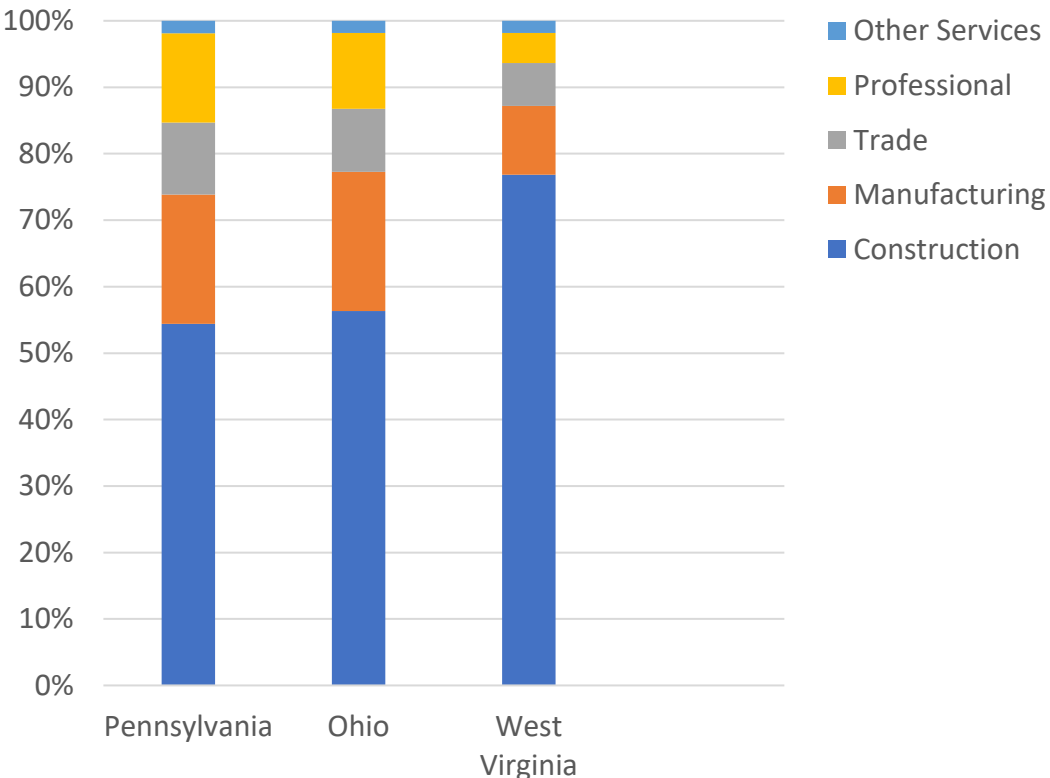


EE Jobs by Technology

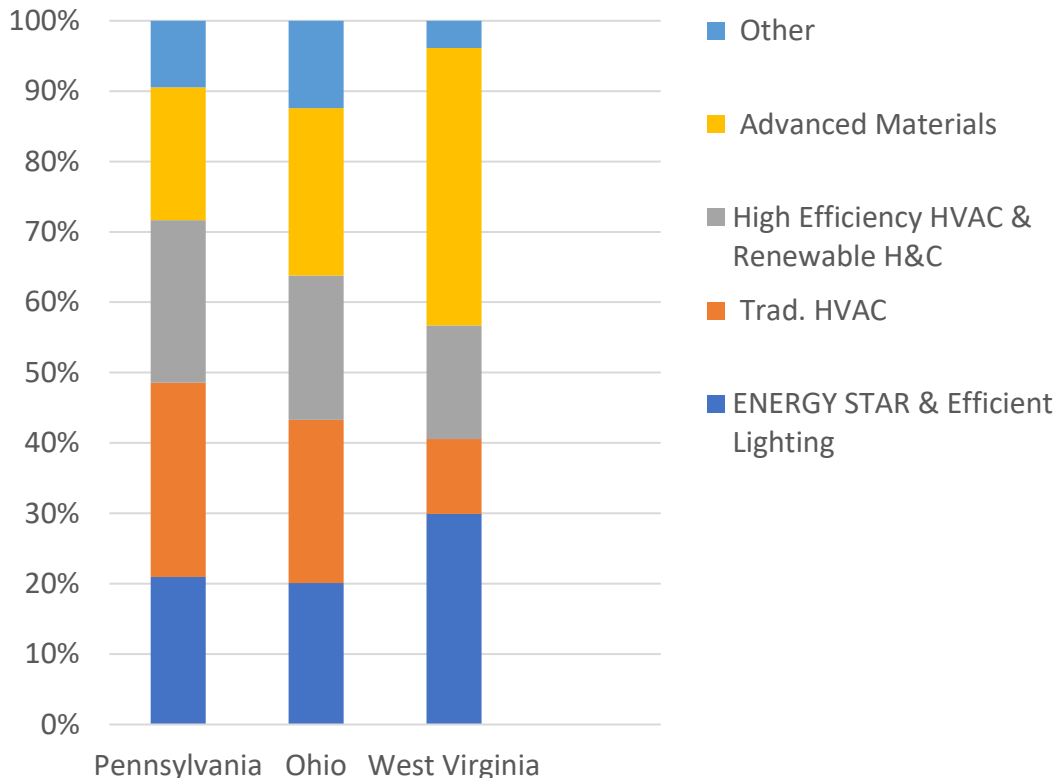


Energy Efficiency Jobs in PA, OH, WV by % of Industry and Technology

EE Jobs by Industry



EE Jobs by Technology





Mike Mulvaney

Director of Energy and Infrastructure, United Association of Plumber, Fitters, Welders, and Service Techs

“It used to be that you graduated from high school on Friday and entered our apprenticeship program on Monday. But high school counselors today are always encouraging kids to go to college. Instead of acknowledging that the trades provide a very good living. Some of our pipeline welders make \$150,000 to \$200,000 a year.

“We are also seeing big increases in energy efficiency technologies. We are just in the first or second inning of ‘smart buildings’”.

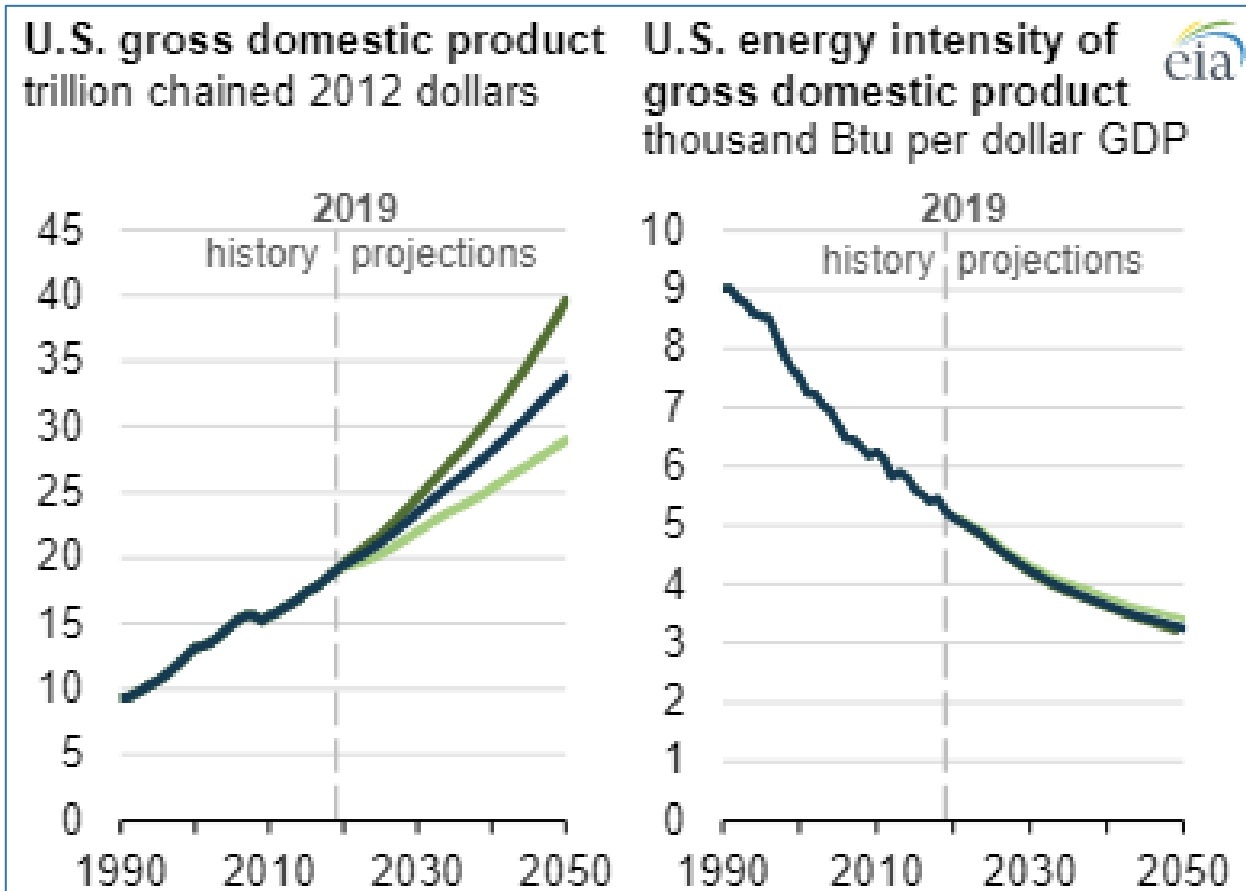
5 Year Trends—Energy Jobs Are Changing



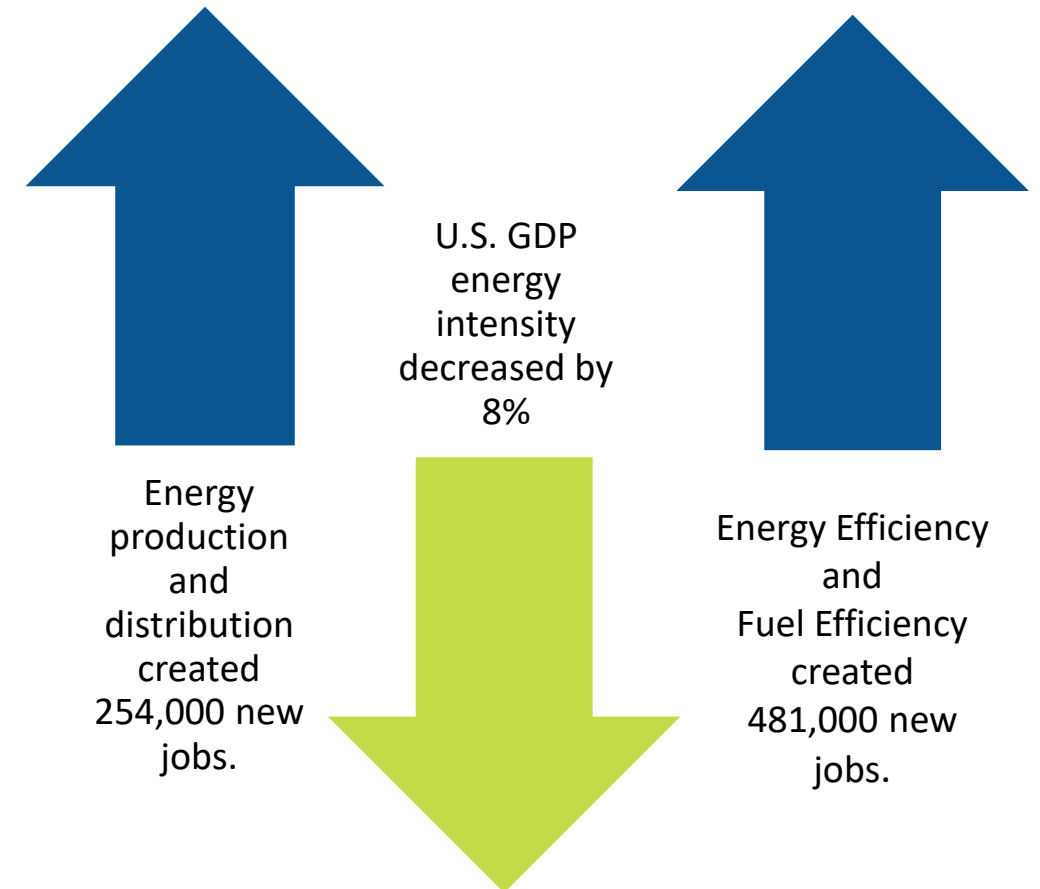
3.3 million Americans work every day to produce and distribute the fuels and electricity that power our lives.

4.9 million Americans in Energy Efficiency and Motor Vehicles work every day to use that energy more efficiently.

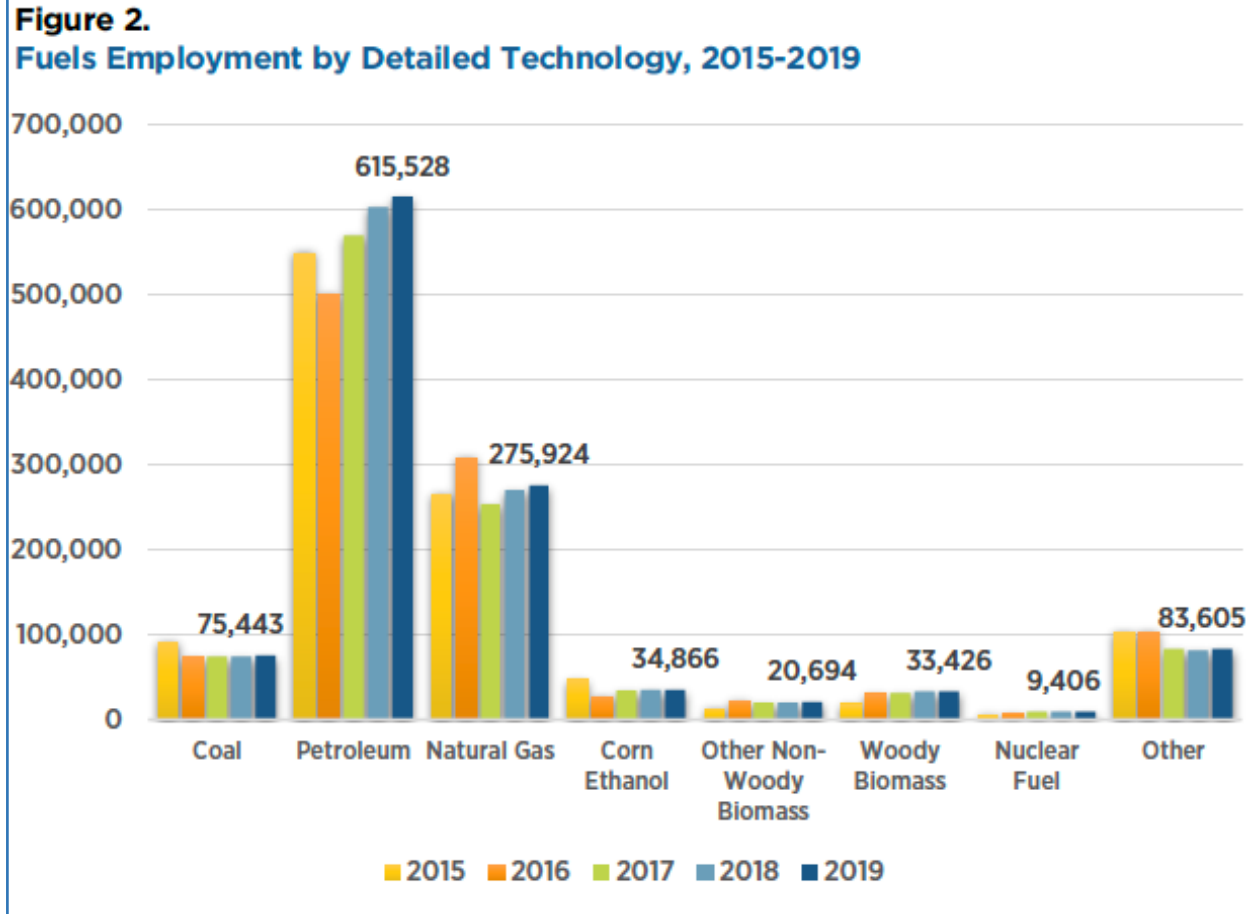
Decoupling of Energy Production and Consumption Has Been Good for Jobs



Between 2015 and 2019:



Trends 2015 – 2019: Fuels



- Oil and gas fuels combined employ over 891,000, adding 73,000 jobs or 8.9%.
- Coal fuels lost 17,000 jobs, a decline of 18%.
- Overall, ethanol and biofuels have declined by 3,600 jobs with corn ethanol down by 12,000 and various biofuels up by 65%.
- Mining and extraction jobs comprise 55% of all fossil fuel jobs; 88% of them are located in just 10 states.

Two Notable Shifts Occurred in Generation Sources

1. Natural Gas Displaced Coal as the Largest Net Power Generator

2. Within Renewables, Wind Displaced Hydro

Figure 3.
Electric Power Generation by Fuel Type, 2015-2019

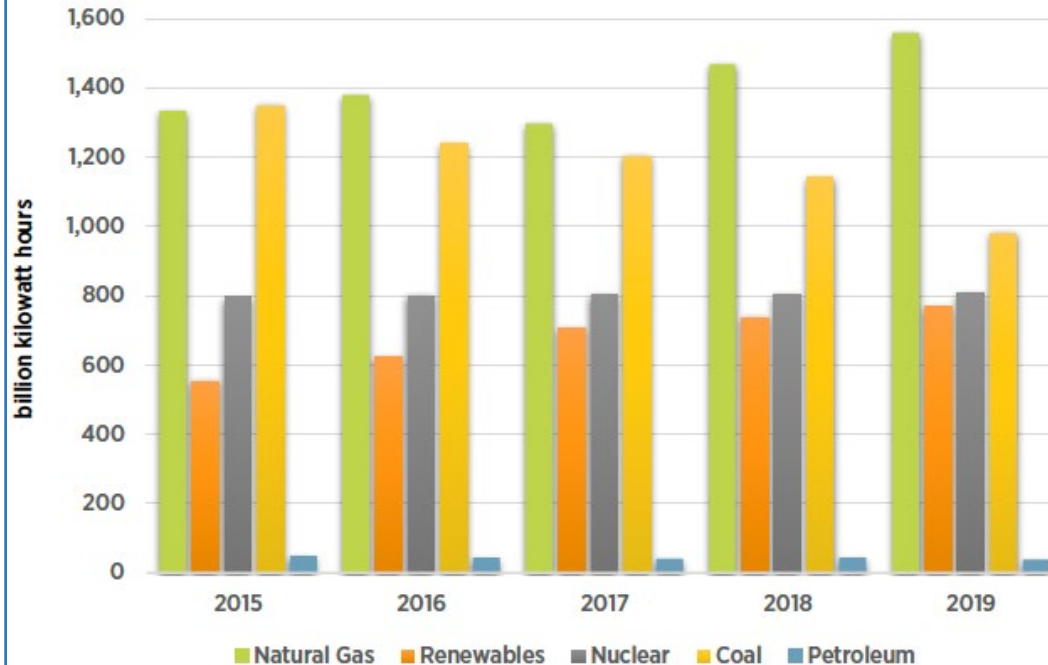
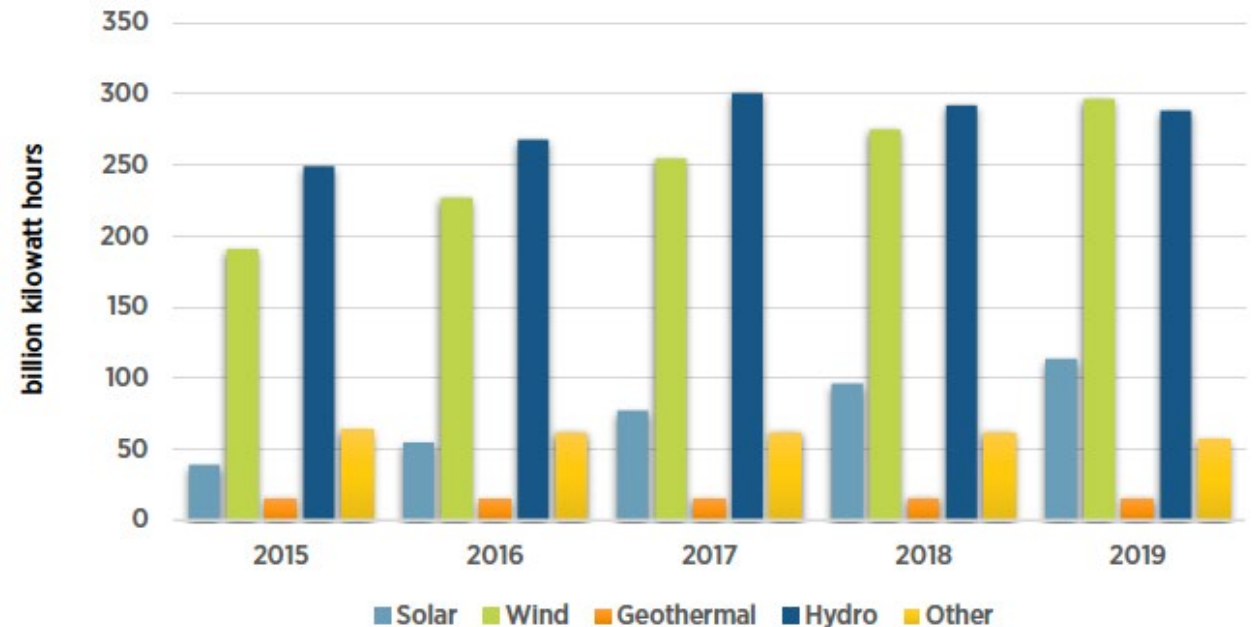
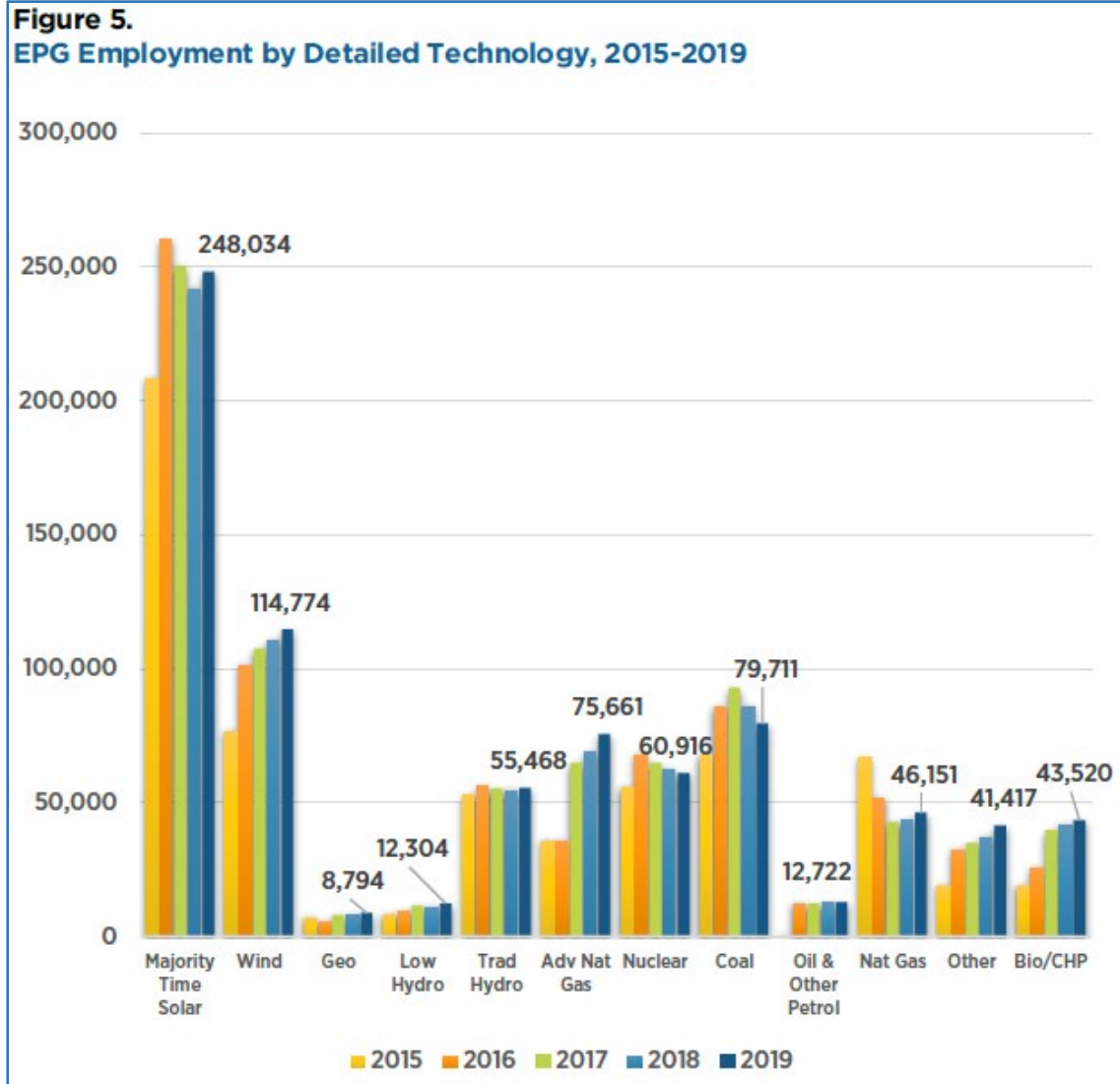


Figure 4.
Renewable Electric Power Generation, 2015-2019



Trends 2015 – 2019: Electric Power Generation

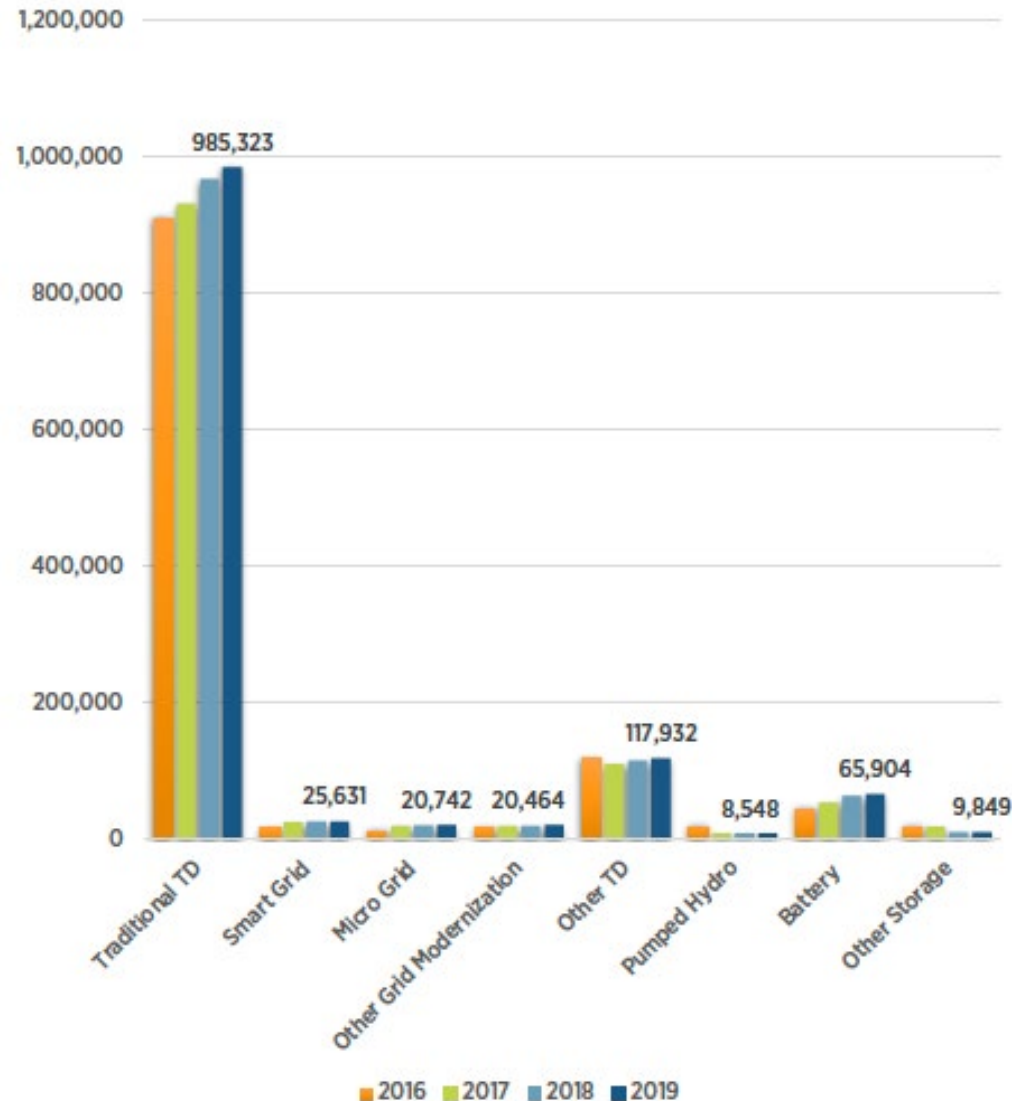


- During the last 4 years, EPG added 52,000 jobs, mostly in natural gas, wind, and CHP.
- Coal generation lost 18,000 job and now employs 79,700 while natural gas employs 121,800.
- Wind is the largest renewable in net generation and second in employment at 114,800.
- Solar has declined from its peak in 2016.

Trends 2015 – 2019: Transmission, Distribution & Storage

Figure 6.

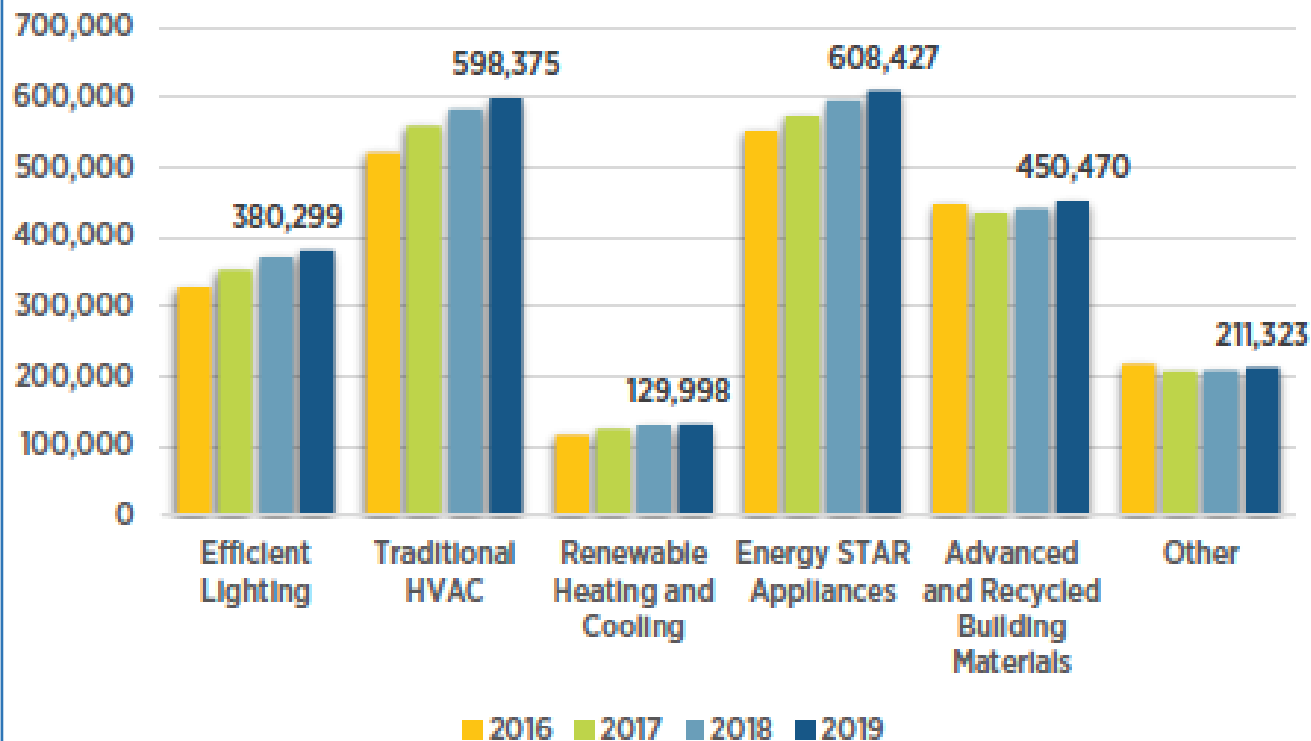
TDS Employment by Detailed Technology, 2016-2019



- TDS added 156,000 new jobs driven by:
 - Expanding oil and gas production
 - Renewables deployment
 - Grid modernization
 - Smart grid
 - Storage demand
- Battery storage added 18,700 jobs.

Trends 2015 – 2019: Energy Efficiency

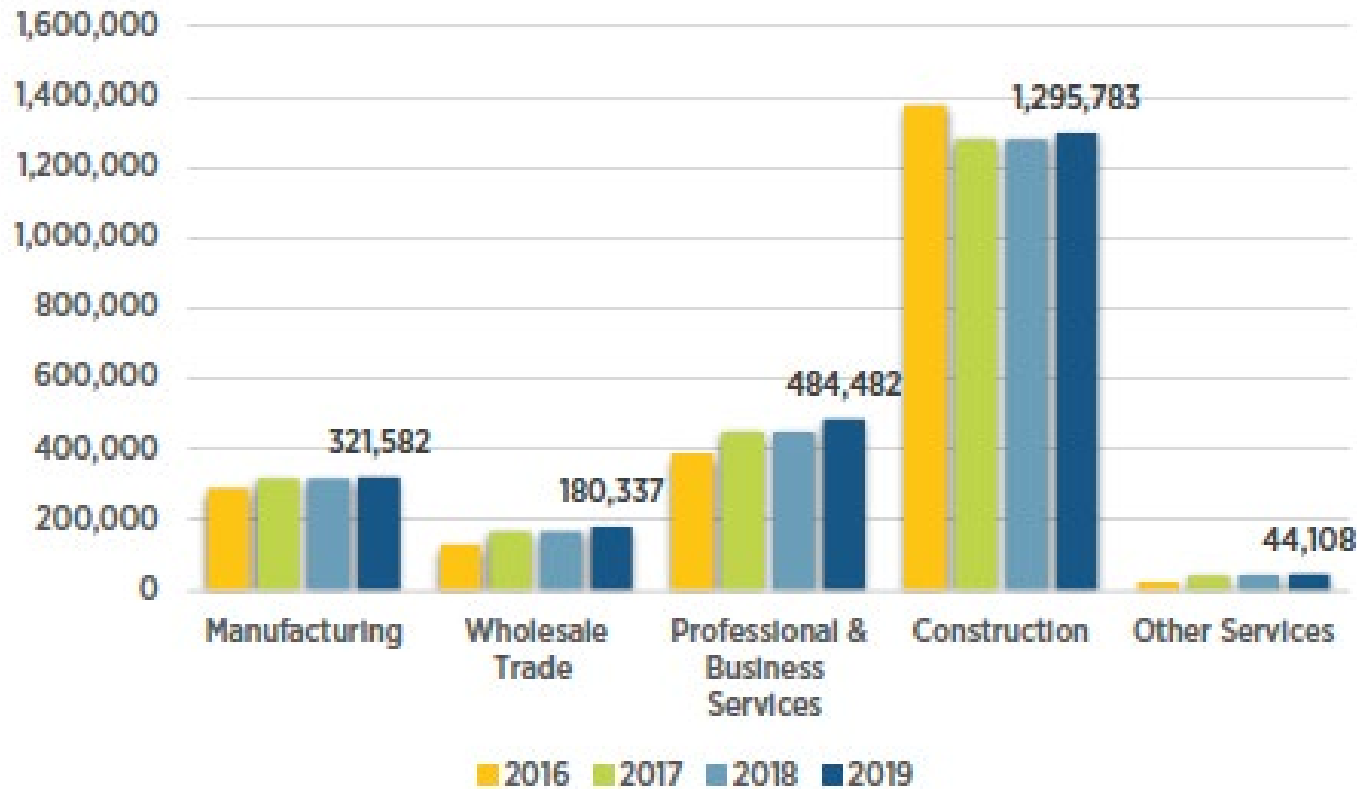
Figure 7.
EE Employment by Detailed Technology, 2016-2019



- Energy Efficiency added the most jobs of any sector—over 400,000.
- Traditional HVAC employers added the most new jobs, 77,800.
- Efficient lighting added 52,500 new jobs.
- In 2019, the USEER identified 826,500 jobs associated with the ENERGY STAR standards.

Trends 2015 – 2019: Energy Efficiency

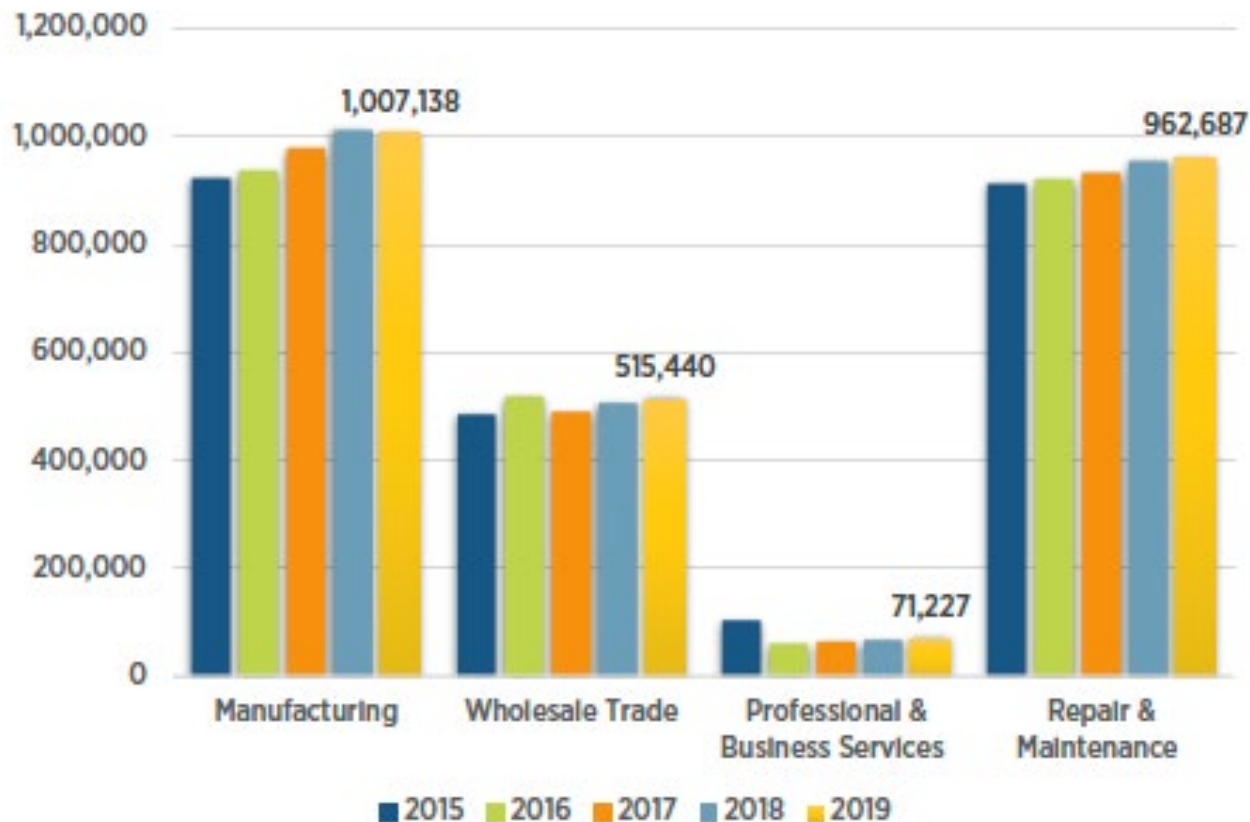
Figure 8.
EE Employment by Industry, 2016-2019



- Construction comprises the largest sector of Energy Efficiency with over 54%. However, extreme hiring difficulty has hampered growth.
- EE construction companies report that 78% of their employees spend the majority of their time on EE technologies, up from 64.8% in 2015.
- Professional services, the second largest sector, has added the most jobs, over 113,000.

Fuel Efficiency and Electrification Are Driving Job Growth

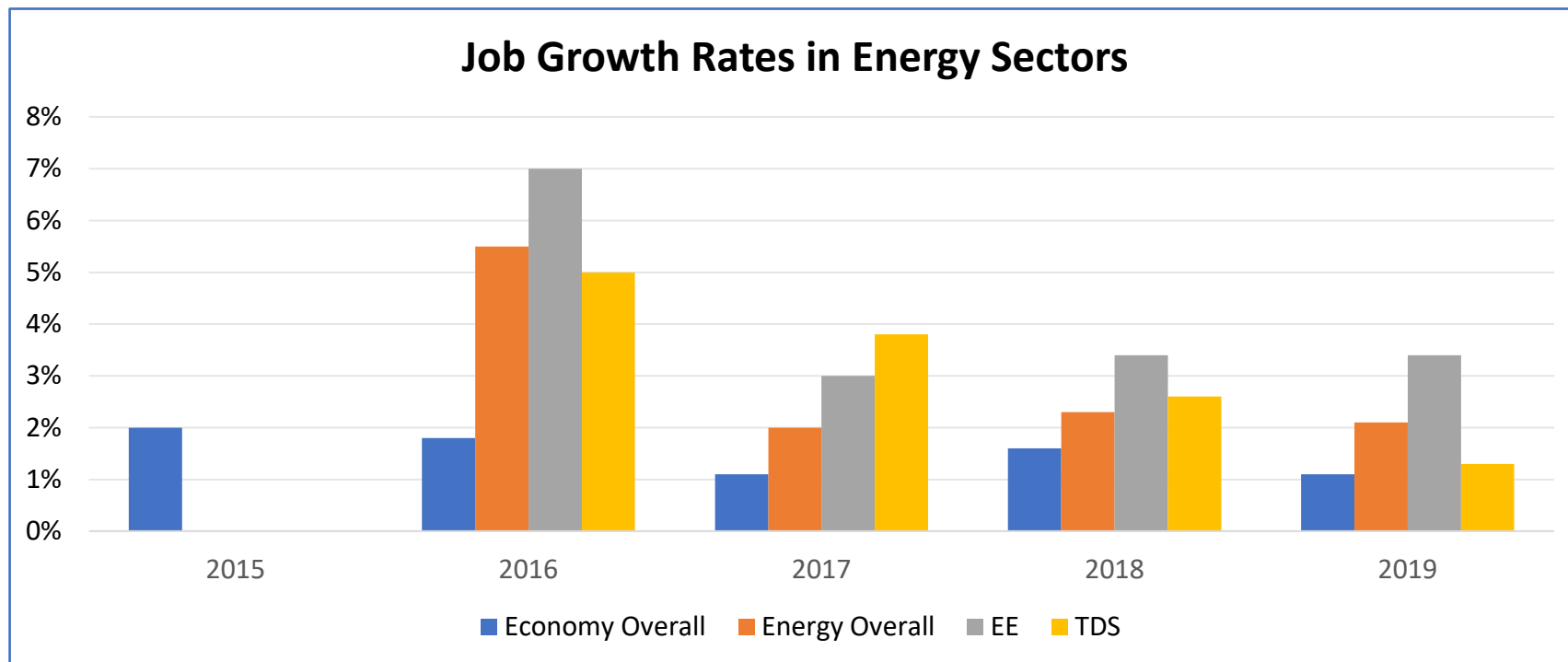
Figure 10.
MV Employment by Industry, 2015-2019



- MV has added 134,300 new jobs. 95,000 were in manufacturing.
- Alternative fuels vehicles now employ 266,000 Americans, adding over 76,000 new jobs since 2015.
- All-electric vehicles added the most jobs, up 36,000.
- 494,000 Component Parts employees now contribute to fuel efficiency.

Trends 2015 – 2019: Conclusions

- Over the last five years, the inexpensive production of energy coupled with its efficient use has outperformed the economy as a whole in creating jobs.
- This combination also stimulates growth in every other sector.



Trends 2015 – 2019: Conclusions–Industry Sectors

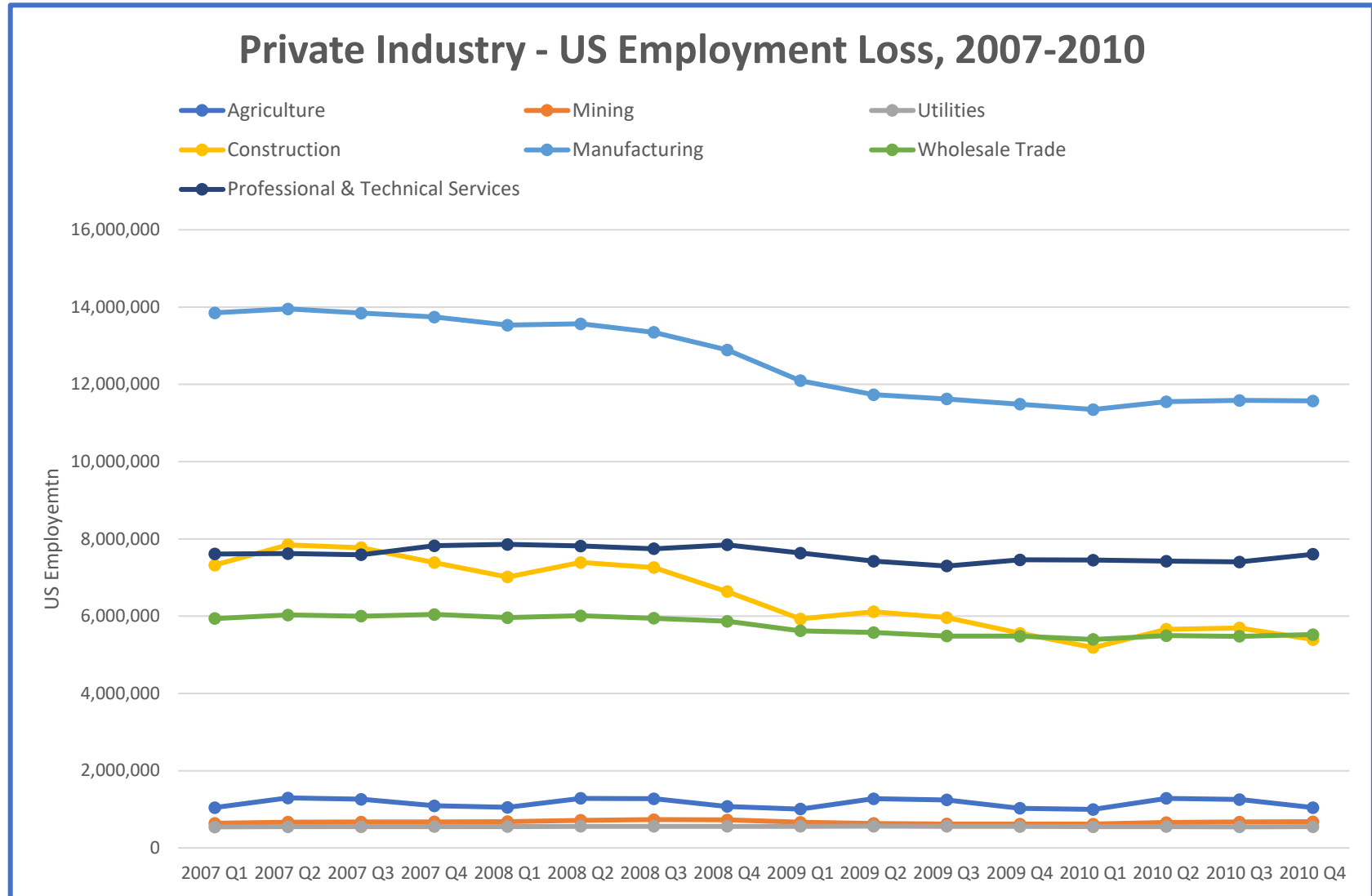
- The energy and energy efficiency sectors employ 5.7 million Americans* in the following sectors:
 - 37% in construction
 - 17% in professional services
 - 13% in manufacturing
 - 11% in utilities
 - 11% in wholesale trade
 - 9% in mining and extraction
 - 1% in agriculture and forestry
 - 2% in other services

| Total | Construction | Professional Services | Manufacturing | Utilities | Wholesale Trade | Mining & Extraction | Agriculture & Forestry | Other |
|--------------|------------------|-----------------------|----------------|----------------|-----------------|---------------------|------------------------|---------------|
| Fuels | 20,409 | 170,514 | 247,336 | - | 137,677 | 535,210 | 35,616 | 2,131 |
| EPG | 242,462 | 182,688 | 101,065 | 183,565 | 74,906 | - | - | 43,134 |
| TDS | 498,841 | 134,306 | 85,469 | 417,660 | 231,185 | - | - | 16,183 |
| EE | 1,323,444 | 499,261 | 325,255 | - | 186,824 | - | - | 44,111 |
| Total | 2,085,156 | 986,769 | 758,125 | 601,225 | 630,592 | 535,210 | 35,616 | 91,059 |

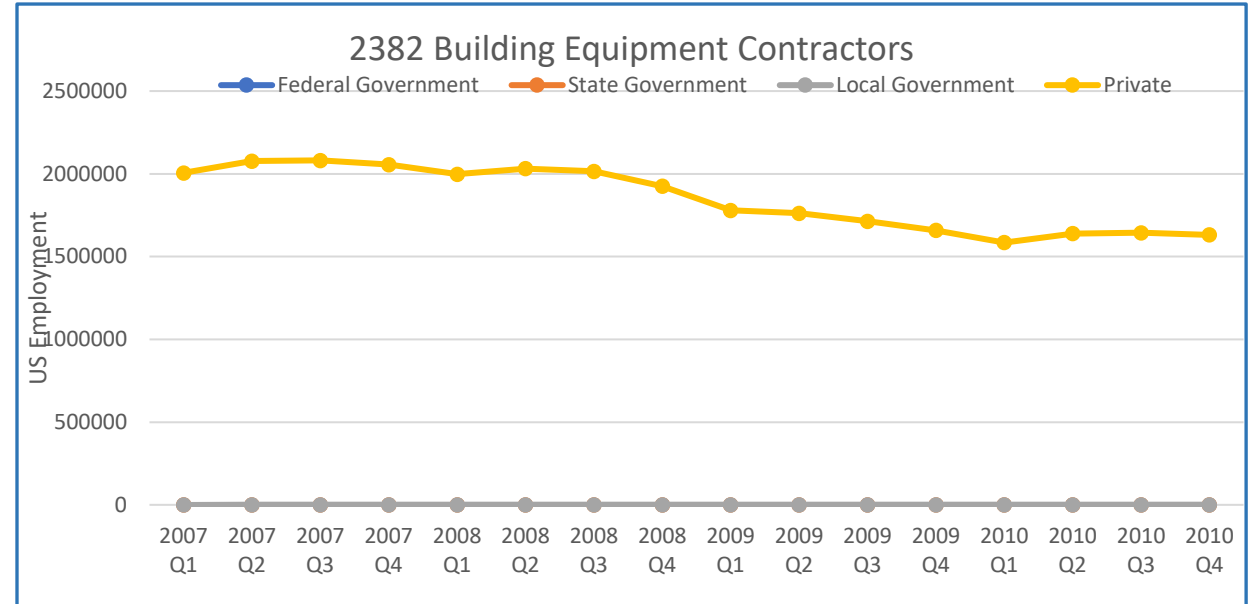
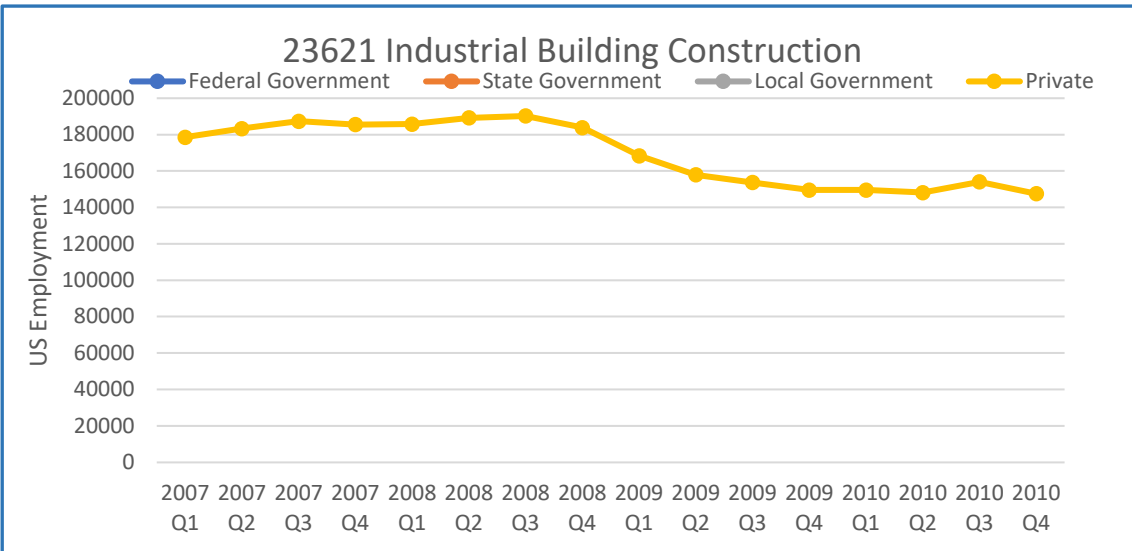
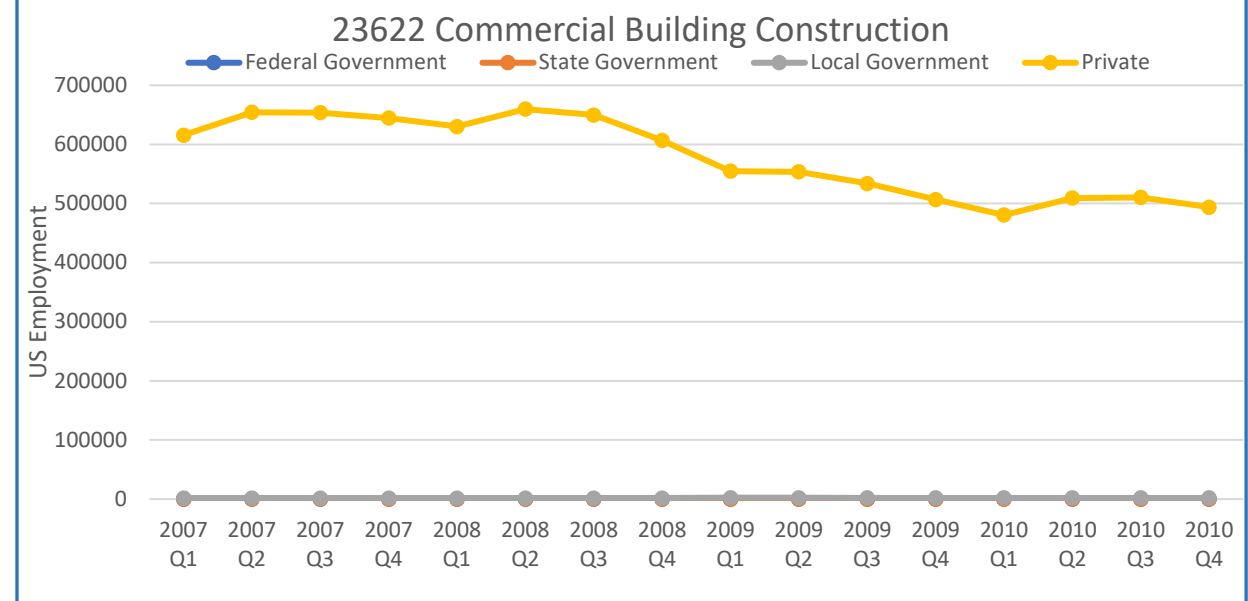
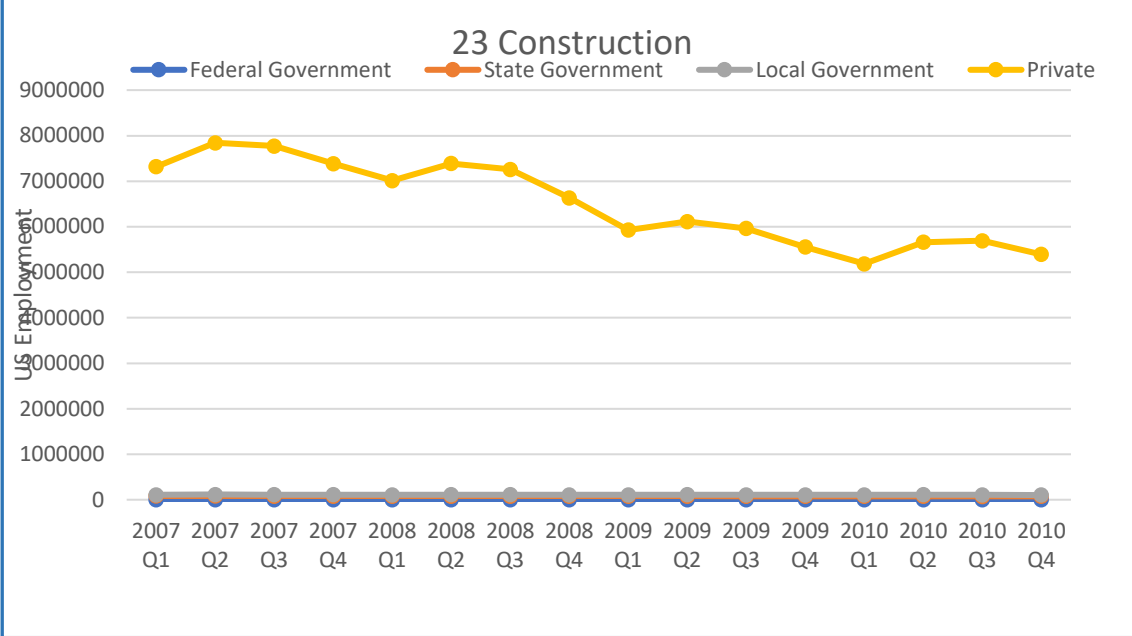
* Excludes gas stations.

Great Recession Job Loss by Industry Sector

- **Manufacturing** declined by 18% in all states. 16 states lost over 20%. 25 states between 10-20%.
- **Professional Services** declined by only 2%.
- **Construction** dropped by 33.2% and was the worst affected.
- **Wholesale Trade** declined by 10% nationally with 23 states over 10% and 19 between 5-10%.
- **Mining** experienced uneven affects with 33 states losing between 15-45% of all mining jobs. However, PA, AK and ND saw increases of 8%, 12%, and 67%.
- **Utilities** were stable throughout
- **Agriculture** saw little impact.



Great Recession Job Loss in Key EE Technology Sectors in Construction



2020 COVID-19 Impacts

- Current unemployment data is incomplete.
- March and April 2020 BLS data showed Leisure and Hospitality had reduced employment by 46% or 8,152,000 jobs.
- Based on job loss in the Great Recession, we see the following risks in the energy sectors:

High = 15-30%, Medium = 5-14%, Low = 0-5%

| Energy Employment | Job Loss by Sector, March & April, 2020 vs. 2009 | Risk Assessment |
|-----------------------------|---|-----------------|
| 37% construction | $(33,000) + (975,000) = 14\% \text{ vs. } 33\%$ | High |
| 17% professional services | $(80,000) + (2,165,000) = 10\% \text{ vs. } 2\%$ | Low |
| 13% manufacturing | $(34,000) + (1,330,000) = 11\% \text{ vs. } 18\%$ | High |
| 11% utilities | $300 + (3,300) = .5\% \text{ vs. } 0\%$ | Low |
| 11% wholesale trade | $(2,900) + (362,800) = 6\% \text{ vs. } 10\%$ | Medium |
| 9% mining and extraction | $(7,000) + (50,000) = 8\% \text{ vs. } 15-45\%$ | High/Sectoral |
| 1% agriculture and forestry | N.A. | N.A. |

* Excludes gas stations.



How an energy jobs coalition can help the US economy bounce back

By Ernest J. Moniz

“The chorus is growing louder: in addition to halting the increases in coronavirus cases, we need an energy stimulus package focused on rebuilding the economy. Job creation and infrastructure development will be key.”

“The recently-released 2020 U.S. Energy and Employment Report underscores this connection: while the energy and auto sectors make up 5.4 percent of the American workforce, they created 10.7 percent of all new jobs since 2015. Translation: 915,000 new jobs, over 40% of them in Energy efficiency alone.”

LINK: <https://bit.ly/3bXIFBj>

Recovery Strategies and Energy Jobs

- Put all America’s energy workers back on the job.
- Invest in high job growth sectors in energy efficiency and energy infrastructure where job loss will be most serious—construction and manufacturing.
- Invest in new energy technologies—CCS, SMR’s, offshore wind, etc.
- Expand existing energy investment tools such as DOE’s Loan Program Office and broaden its mission to include infrastructure and energy efficiency.
- Expand energy tax credits, such as 45Q, 48C, ITC & PTC.
- Invest in energy jobs training and apprenticeship programs.

Thank you!

Questions?

For more information, contact:

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- Natalie Volk at nmvolk@energyfuturesinitiative.org

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Regional and National Impacts Workforce Discussion

NETL Regional Workforce Initiative Webinar

Thank you for your participation



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