

NETL Regional Workforce Initiative (RWFI) Presents

2021 US Energy and Employment Report (USEER) Briefing

Attendees will learn about the current state of the energy and advanced manufacturing workforce for the tri-state (Pennsylvania, Ohio and West Virginia) and the broader Appalachian region as well as emerging national trends and national energy jobs data. The webinar will also touch on how the COVID-19 pandemic affected employment in the short and long term in energy and manufacturing.

Webinar Agenda:

- I. NETL RWFI Introduction & Update – Anthony Armaly, NETL Regional Workforce Initiative, Federal Coordinator
- II. 2021 US Energy and Employment Report Regional and National Briefing –David Keyser, Senior Advisor in the Department of Energy Office of Energy Jobs
- III. Regional and National Impacts Workforce Discussion

Attendees on Mute- We will begin Shorty!



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 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.

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

800+

individual
stakeholders

400+

institutions and
organizations
represented

1100+

registrants to the
NETL RWFI Webinar
Series

290+

subscribed to the
NETL RWFI e-Note
Monthly Newsletter

**Catalyzed over 1M in energy/advanced manufacturing
workforce & economic development funding**

The U.S. Skilled Technical Workforce

Expected future challenges to the U.S. Skilled Technical Workforce

Significant shortfall of nearly 3.4 million skilled technical workers by 2022*

Recommendation: Build national and regional coalitions and partnerships of stakeholders to address skills gaps and collaborate and harness shared resources.

Report immediately before the COVID pandemic
2020 USEER report briefing demonstrated a resilient manufacturing and energy sector with some expected downturns

2021 report is the topic of today!



NETL RWFI's Tri-State Energy and Advanced Manufacturing consortium panel on the Workforce of the future.

*The U.S. Skilled Technical Workforce National Science Board Report 2019

Key Outcomes to Date



Increased communication of NETL mission



Consistent engagement with key regional partners



Integration of Workforce Workplan



Establishment of a new network of regional stakeholders



Increased growth for potential collaborative opportunities

1. Supporting a Regional Energy and Advanced Manufacturing Ecosystem

- Lab and Regional Technology Transfer — how to avoid or cut through red tape and Intellectual Property (IP) issues
- Identifying regional strengths and lowering the threshold for industry to tap into strengths
- Branding and Awareness — promoting regional success and deepening and penetrative national and global understanding of regional strengths
- Streamlining the process of identification of research with commercialization potential
- What type of techno-economic analysis would be helpful to the community?

2. Engaging with the National Labs, NETL, and other federal resources

- How do local small to medium businesses and industry engage with NETL and other federal resources?
- How do regional initiatives promoting entrepreneurship and innovation engage with NETL and other federal resources?
- How can NETL and other Federal resources better streamline the tech-to-market pipeline?

3. Promoting Entrepreneurial and Technical Workforce Talent

- Identify both unique and shared opportunities/resources for a cohesive regional strategy
- Identify federal resources to support a high-tech workforce
- Inventory of federal and other workforce resources

4. Identifying and Engaging in Funding Opportunities for Collaborative Activities Around Supporting an Advanced Manufacturing and Energy Regional Innovation Ecosystem

- Proactive networking and collaboration on regional strategies that can be translated into regional funding proposals for supporting a regional innovation ecosystem

5. Addressing issues surrounding regional capital investment in advanced manufacturing regional innovation and entrepreneurship

- Understanding what role NETL could play in increasing startup capital investment in the region

Workforce Workplan



- Series of questions related to the workforce, skills, occupation and education requirements for late stage TLR funding from NETL
- 1st effort netted 16 respondents
- Most skewed towards the ONG sector technologies (as expected)
- Demonstrated a varied and broad technical and professional workforce
- Example: 50 occupations

| | |
|--|---|
| (CAD)/Project Life Cycle Management (PLM) Engineer | Geophysicist |
| Big Data Programmer/Analyst | Geologists |
| Board layout and manufacturing subcontractor | Geomechanicists |
| Chemical Engineer | GIS Mapping Specialist |
| Civil Engineer | HMI/SCADA Automation Engineer |
| Computer-Aided Design1 | Instrumentation Engineer/Technical Specialist |
| Construction Engineer | Machine-learning Experts |
| Construction Safety Officer | Man-machine interface designer/programmer |
| Controls Engineer | Mechanical Engineer |
| Controls Technician | Natural Gas Liquids Fractionation |
| Counsel | Network Designer |
| Data Scientists | Petroleum Engineering |
| Distributed Magnetic and Acoustic Sensing Technology | Packaging engineer |
| Driver (CDL Requirements) | Pipe Fitters |
| Ductile Shale Characterization | Pipeline Installer |
| Electrical engineer | Post-processing software engineer |
| Software Systems Engineer | Production Engineers |
| Electrician | Production manager |
| Electronics technician | Research/Researcher/Entrepreneur |
| Instrument Technicians | Reservoir Engineers |
| Fiber optic technician | Rig Operator |
| Field Engineers | Safety Officer18 |
| Field Operators | Software engineers |
| Fluids Engineer | Survey Crew |
| FPGA programmer | Welder |



Interagency Working Group on
Coal & Power Plant Communities
& Economic Revitalization

- Working to catalyze economic revitalization
- Held a series of 11 in person and virtual community meetings during the summer and fall
- Next one is tomorrow (November 3rd): *Where to Start? Webinar for Energy Communities Starting a Transformation*



Find out more information at the IWG website:
<https://energycommunities.gov/>

Contact Information



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United States Energy Employment in 2020

David Keyser | Senior Advisor



The United States Energy and Employment Report

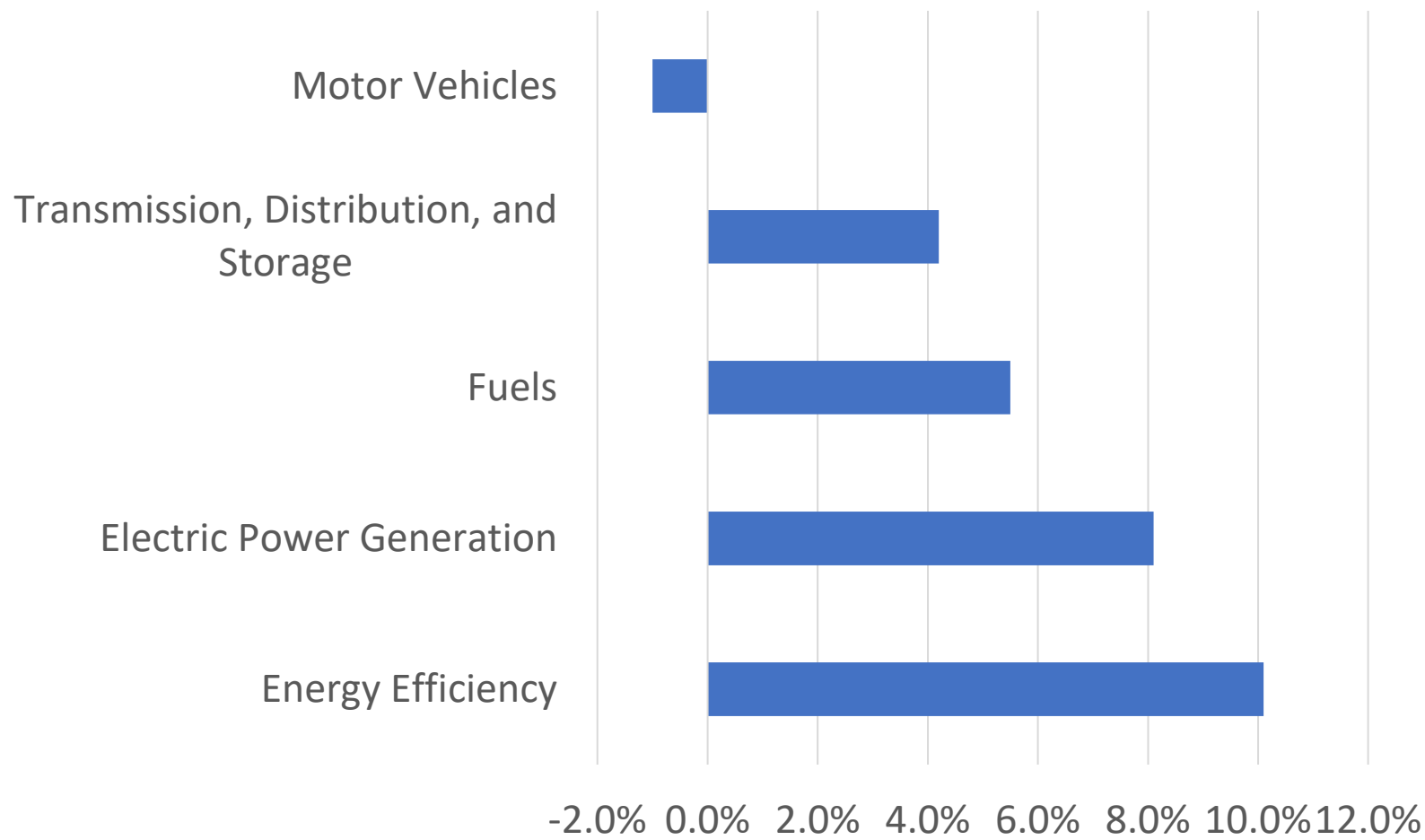
- First published by the Department of Energy in 2016 followed by the 2017 report
- Published by the National Association of State Energy Officials (NASEO) and Energy Futures Initiative (EFI) from 2018 to 2020
- Report returned to the Department of Energy in 2021 and is currently Congressionally mandated
- Future reports may include counties, U.S. territories
- Oversight may expand from DOE to an Energy Jobs Council that includes the Departments of Labor, Commerce, Agriculture, Transportation, and other agencies that collect and report labor data (H.R.3684/Infrastructure Investment and Jobs Act)
- DOE reports (2016, 2017, 2021) online at energy.gov/useer
- NASEO and EFI reports (2018, 2019, 2020) at usenergyjobs.org

Energy Jobs Declined Faster Than Average

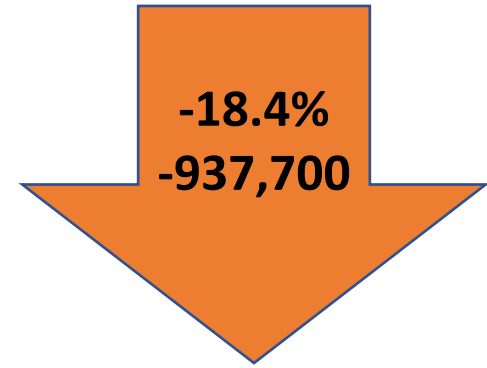
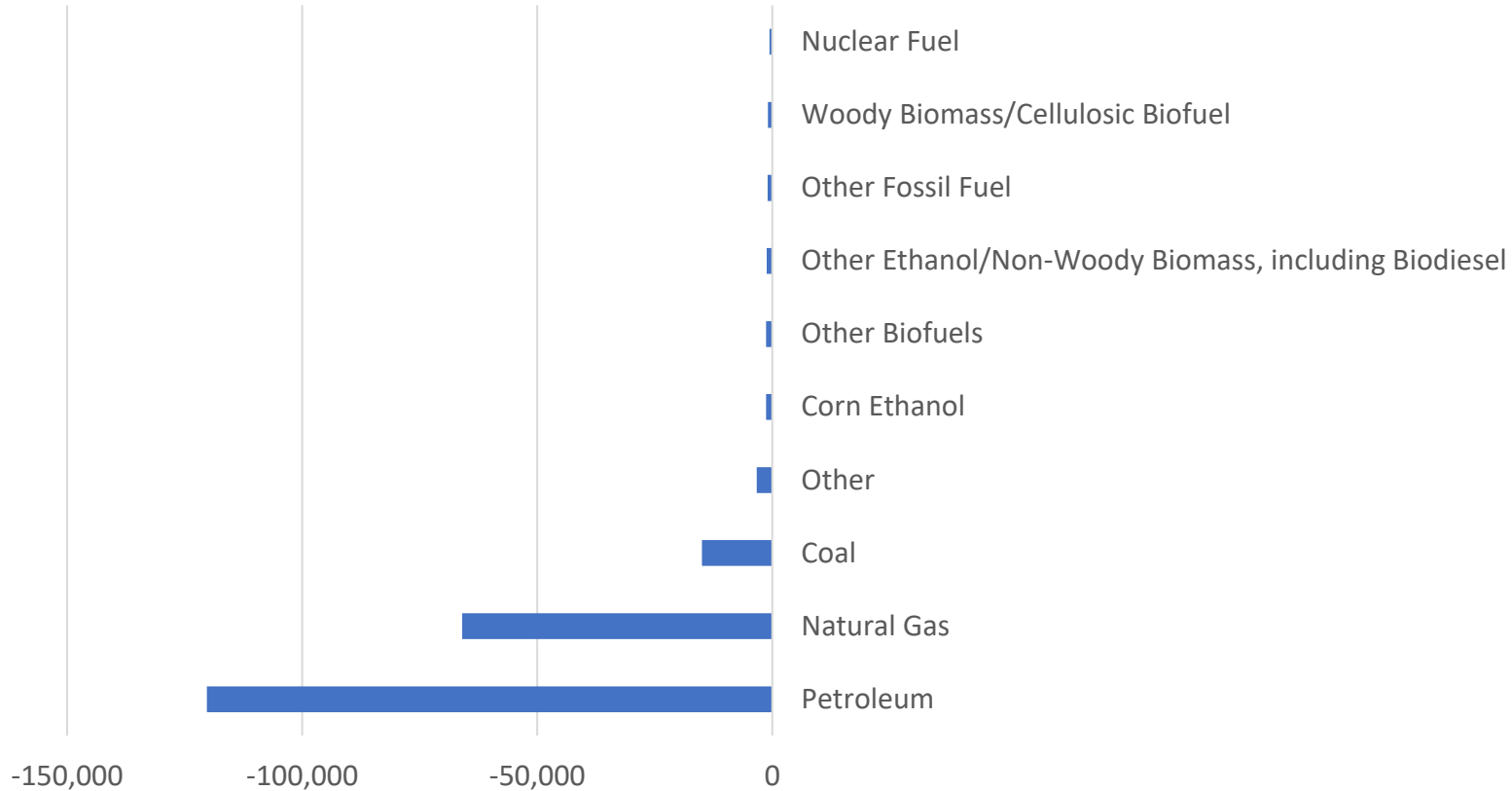
- 7.5 million workers in 2020, down from 8.4 million in 2019
- Overall declines of 10%, or 839,000 jobs
- From 2015 to 2019 energy grew twice as fast than the U.S. economy but declines in 2020 were faster than the rest of the economy, which decreased 6%
- Declines were in the first half of 2020; the rest of the year saw 560,000 jobs added but this was not enough to counter the first two quarters
- Only gains were in hybrid electric vehicles (+6,300 / 5.5%), electric vehicles (+6,100 / 7.8%), wind electric power generation (+2,000 / %1.8), and battery storage (+850 / 1.3%)

Most Sectors Anticipate Growth in 2021

- All but motor vehicles anticipate growth, led by 10.1% in energy efficiency
- All sectors also report hiring difficulty, which could dampen gains



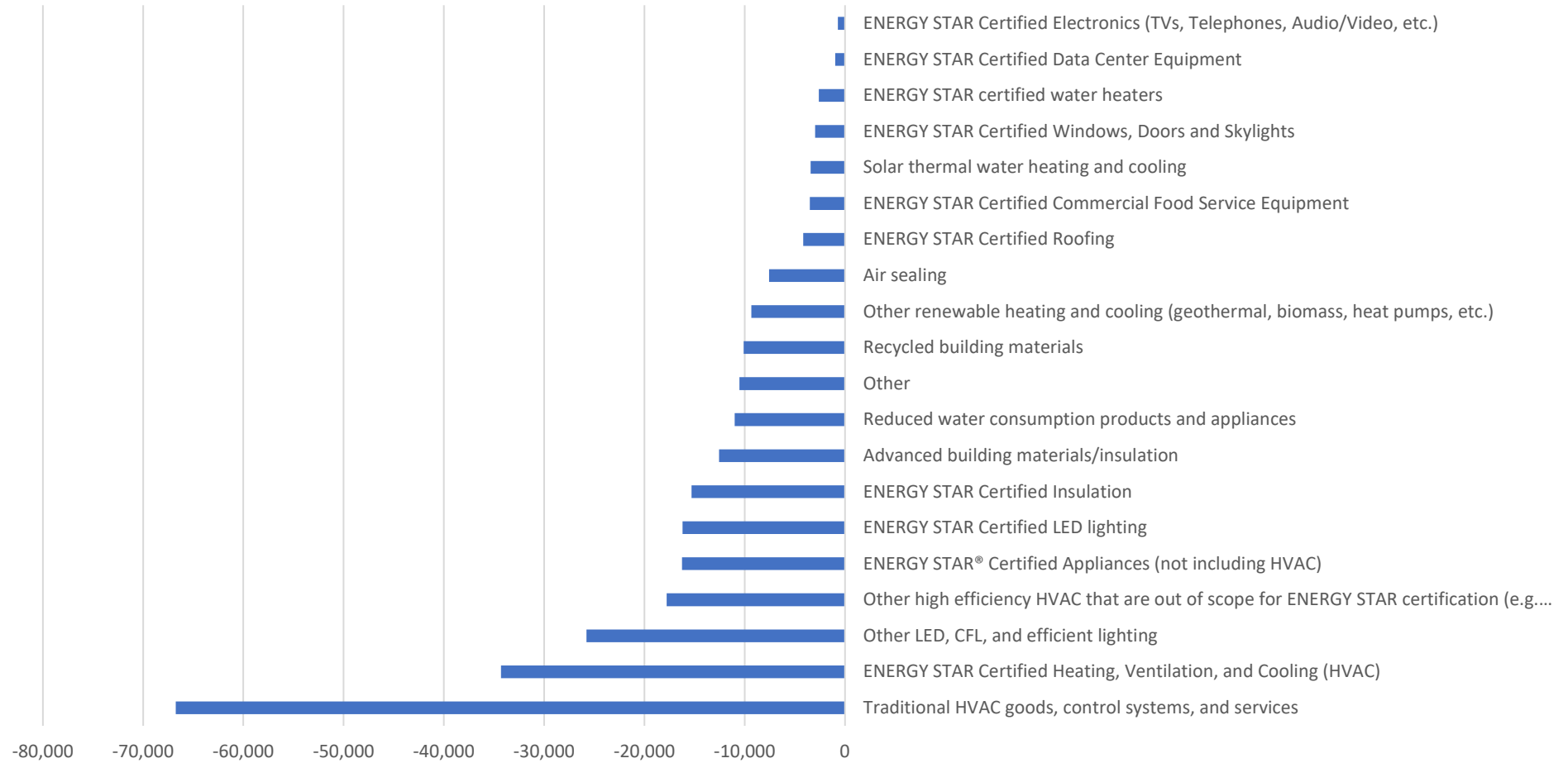
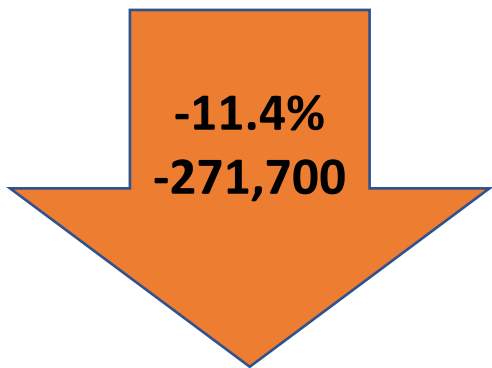
Fuels, 2019 - 2020



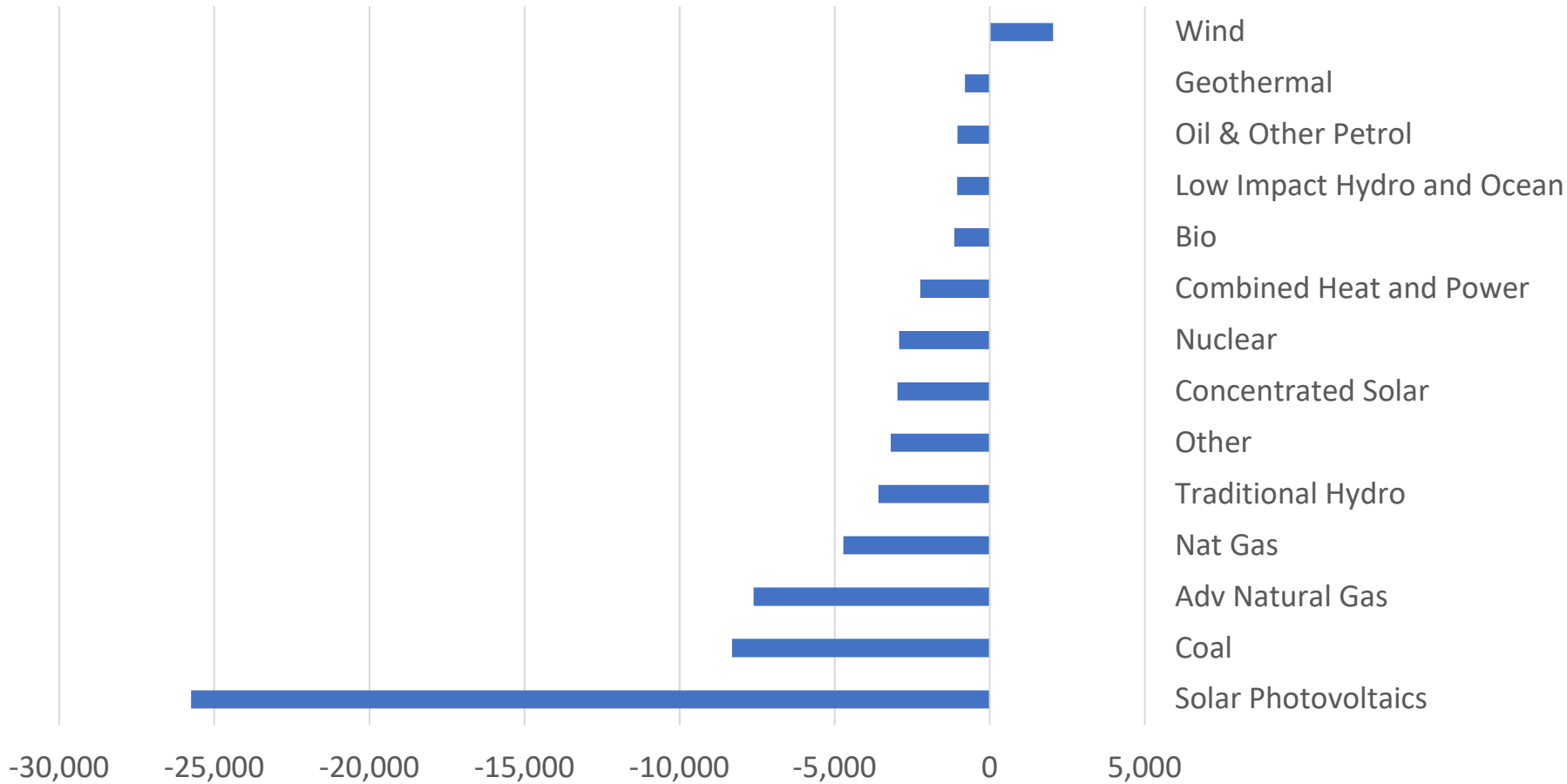
- Most significant losses in percent change among all sectors, although these were not the largest changes in levels
- 2019 – 2020 changes follow the size of sectors, with largest losses in petroleum, natural gas, and coal

Energy Efficiency, 2019 - 2020

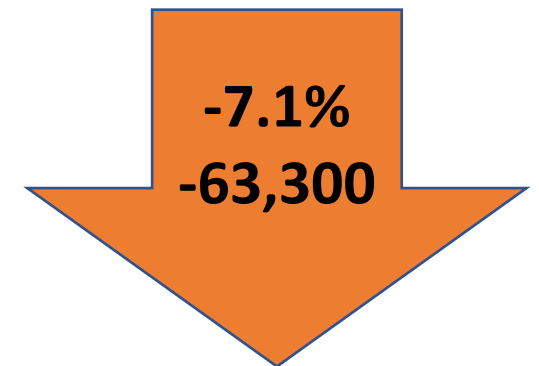
- Largest job losses of all sectors in levels
- Biggest declines in HVAC



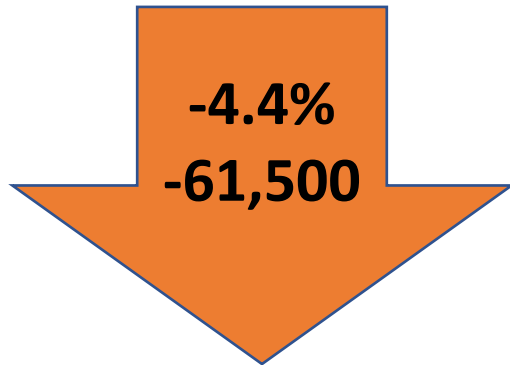
Electric Power Generation, 2019 - 2020



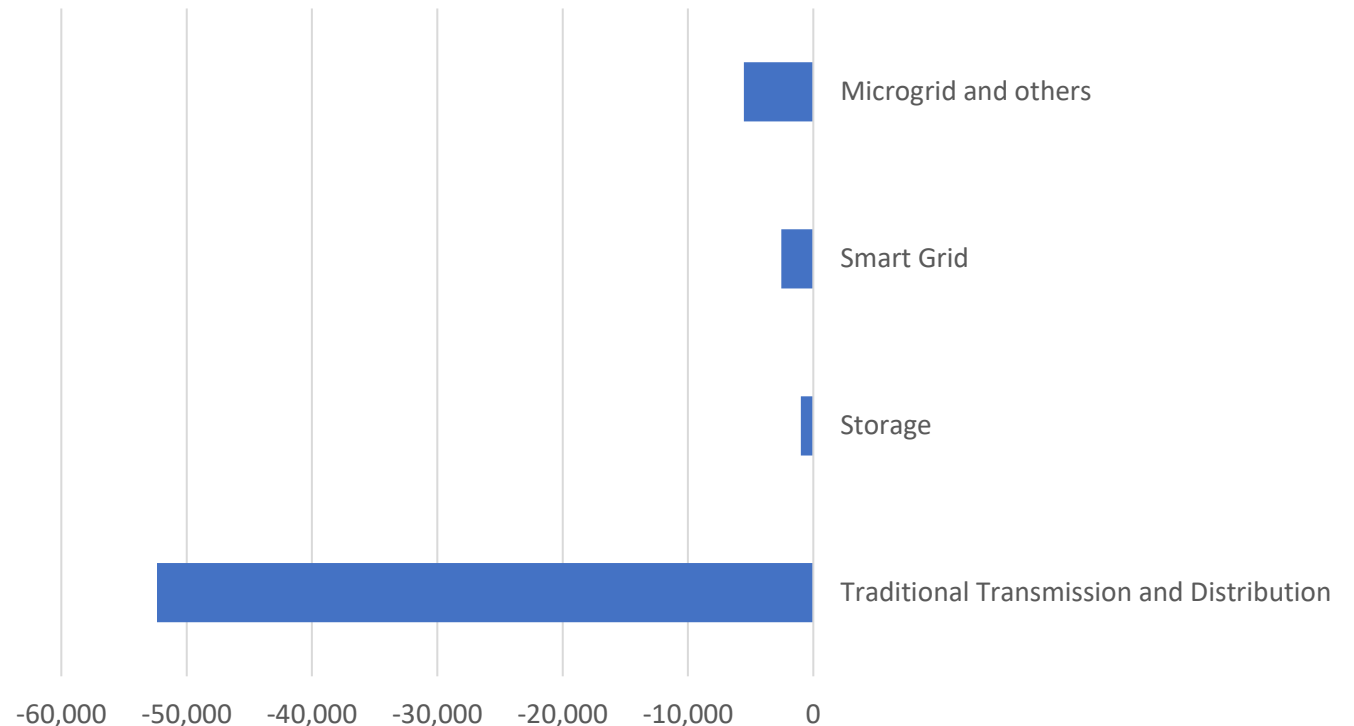
- Solar PV had the greatest decline in levels, shedding 25,700 jobs
- Coal decreased 10.4% or 8,300 jobs



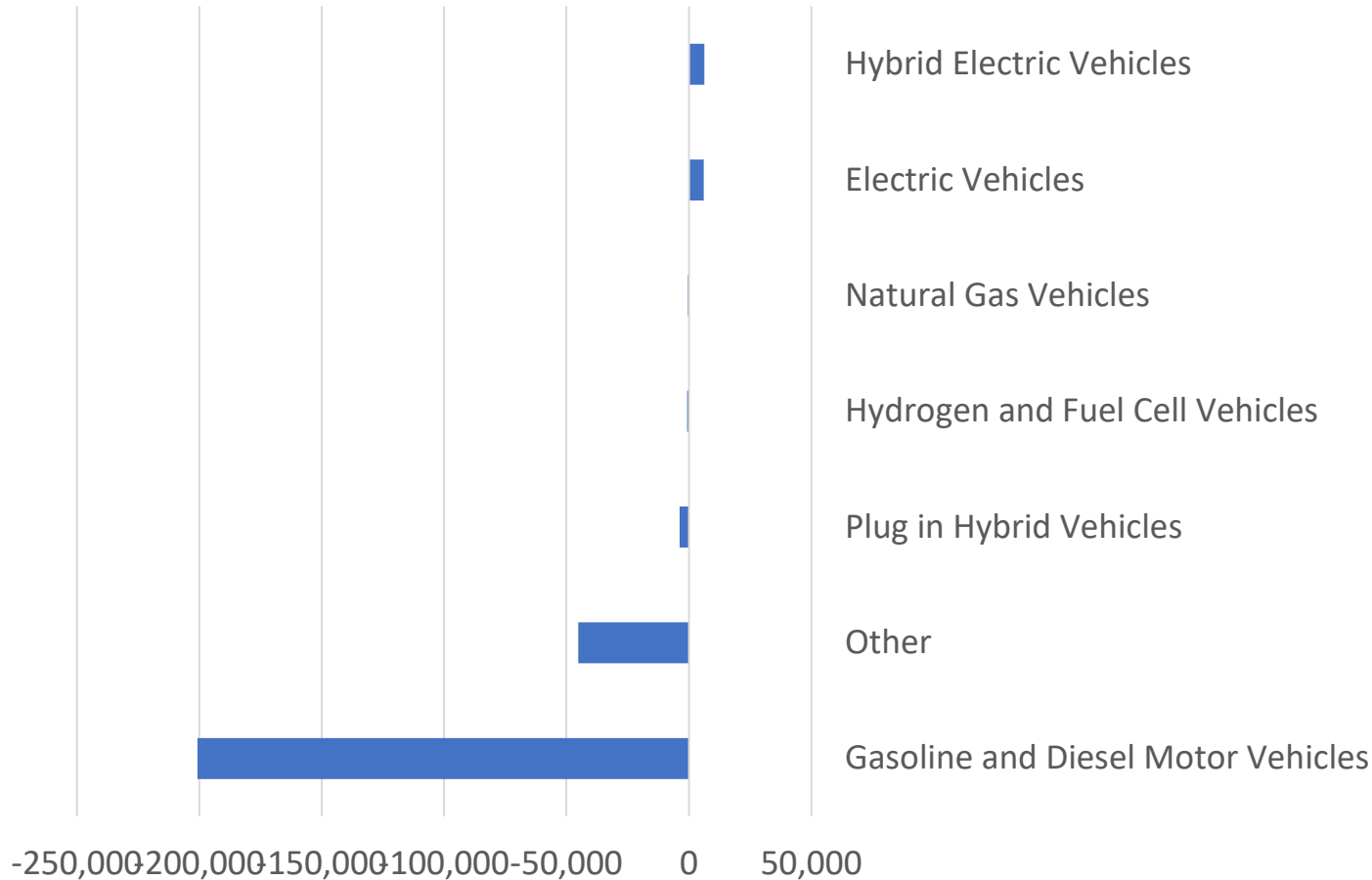
Transmission, Distribution, and Storage



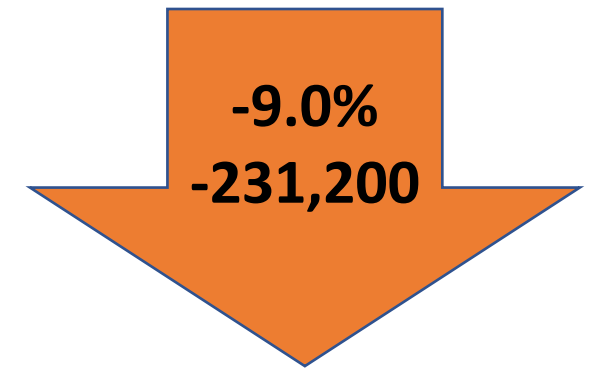
- Traditional transmission, distribution, and storage accounted for nearly all jobs lost, decreasing by 52,400
- Battery storage, which is combined with pumped storage hydropower at the state level due to its current small size, increased 850 jobs



Motor Vehicles and Component Parts

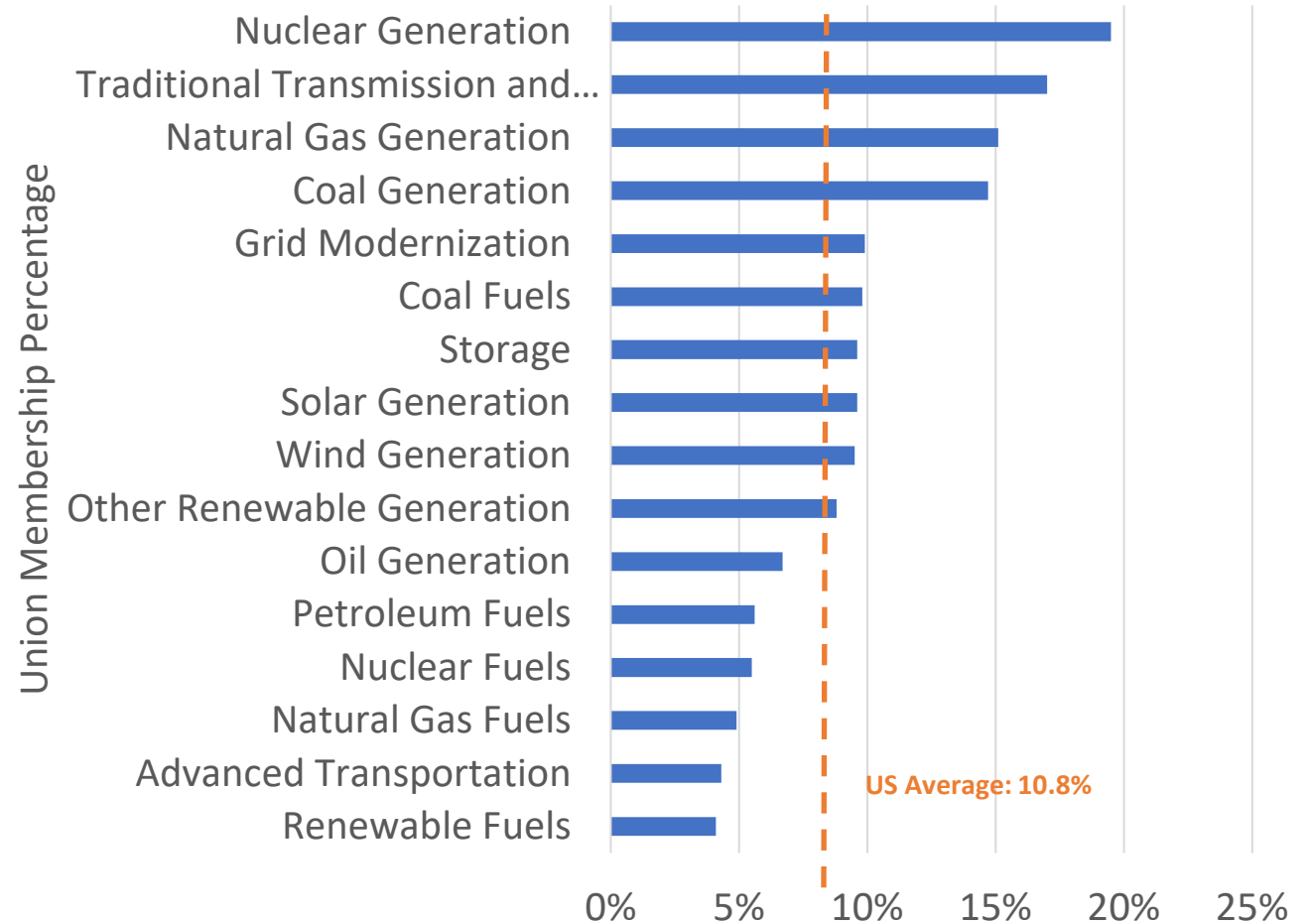


- Majority of losses from gasoline and diesel vehicles, which includes repair and parts manufacturing
- Growth in electric and hybrid electric vehicles
- Survey doesn't ask why employers anticipate growth or decline - supply side issues such as availability of chips can contribute



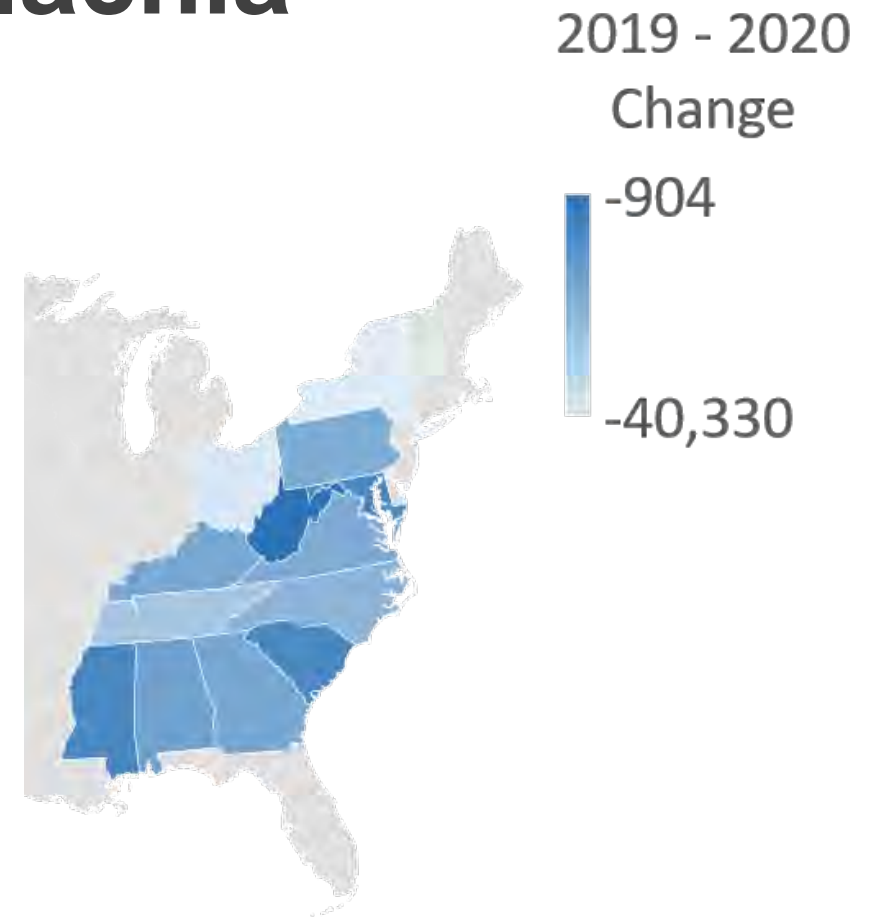
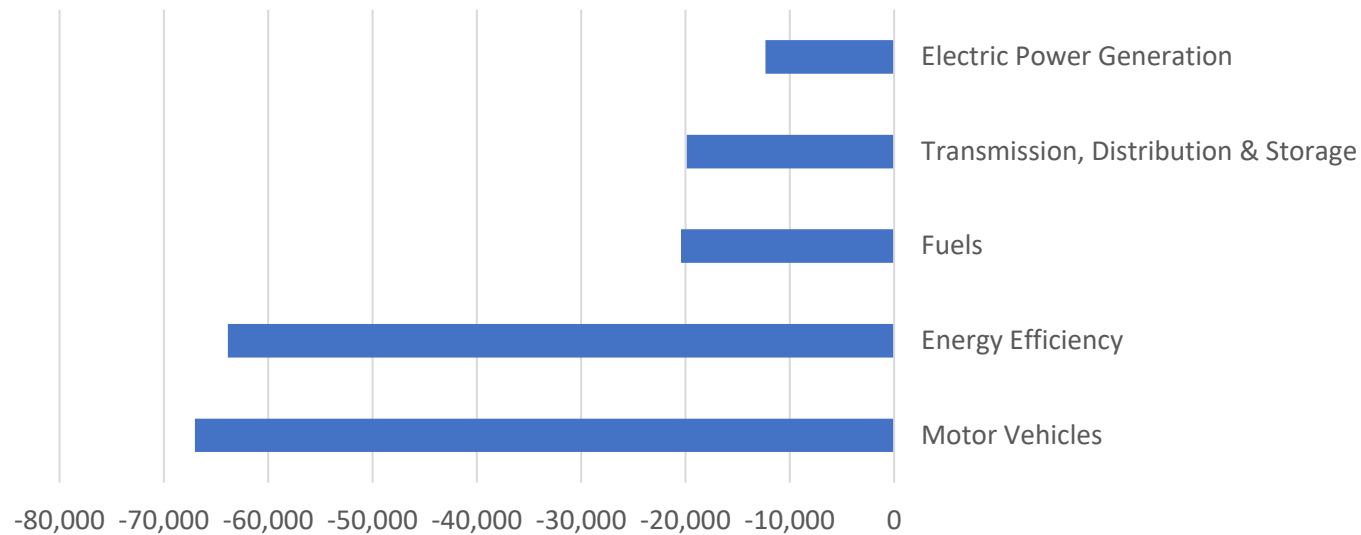
Union Membership in 2020

- Highest in nuclear electric power generation,
- New methodology – not comparable to previous numbers
- Current estimates combined survey responses with Current Population Survey (Bureau of Labor Statistics and Census Bureau) as opposed to previous methodology, which was solely surveys

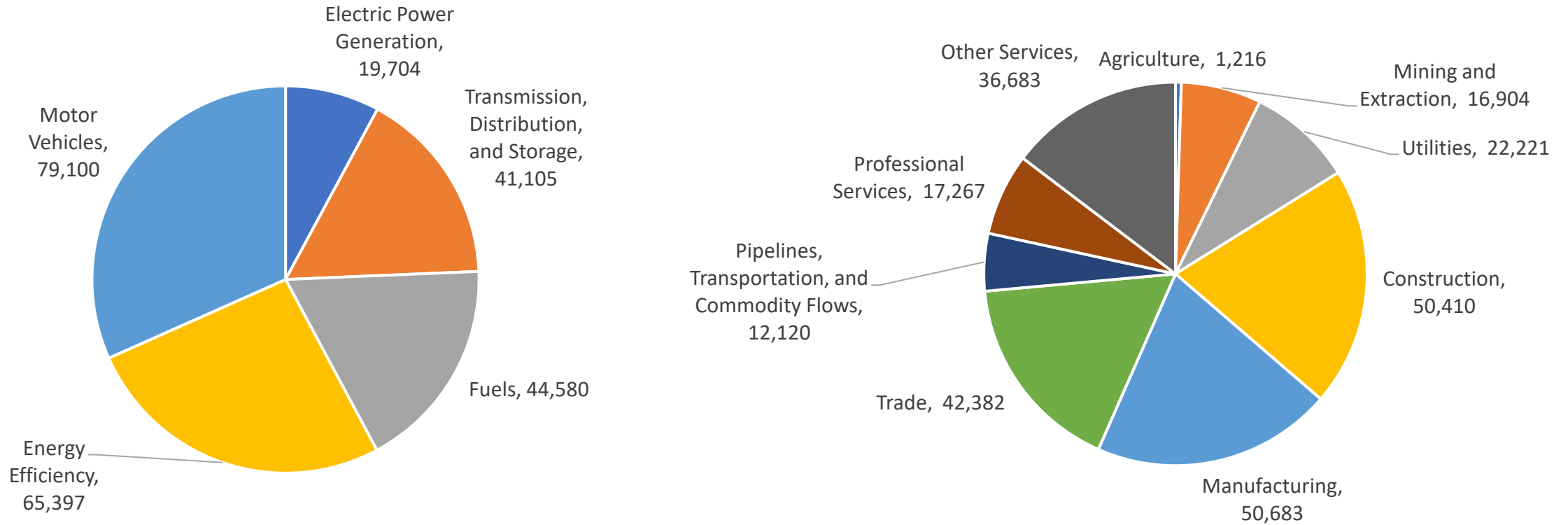


2019-2020 Changes in Appalachia

- Total loss of 183,500 energy jobs
- Largest decline in New York (-40,300), Ohio (-39,000), and Tennessee (-28,000)
- Negative changes in all energy sectors, led by motor vehicles (-67,000)



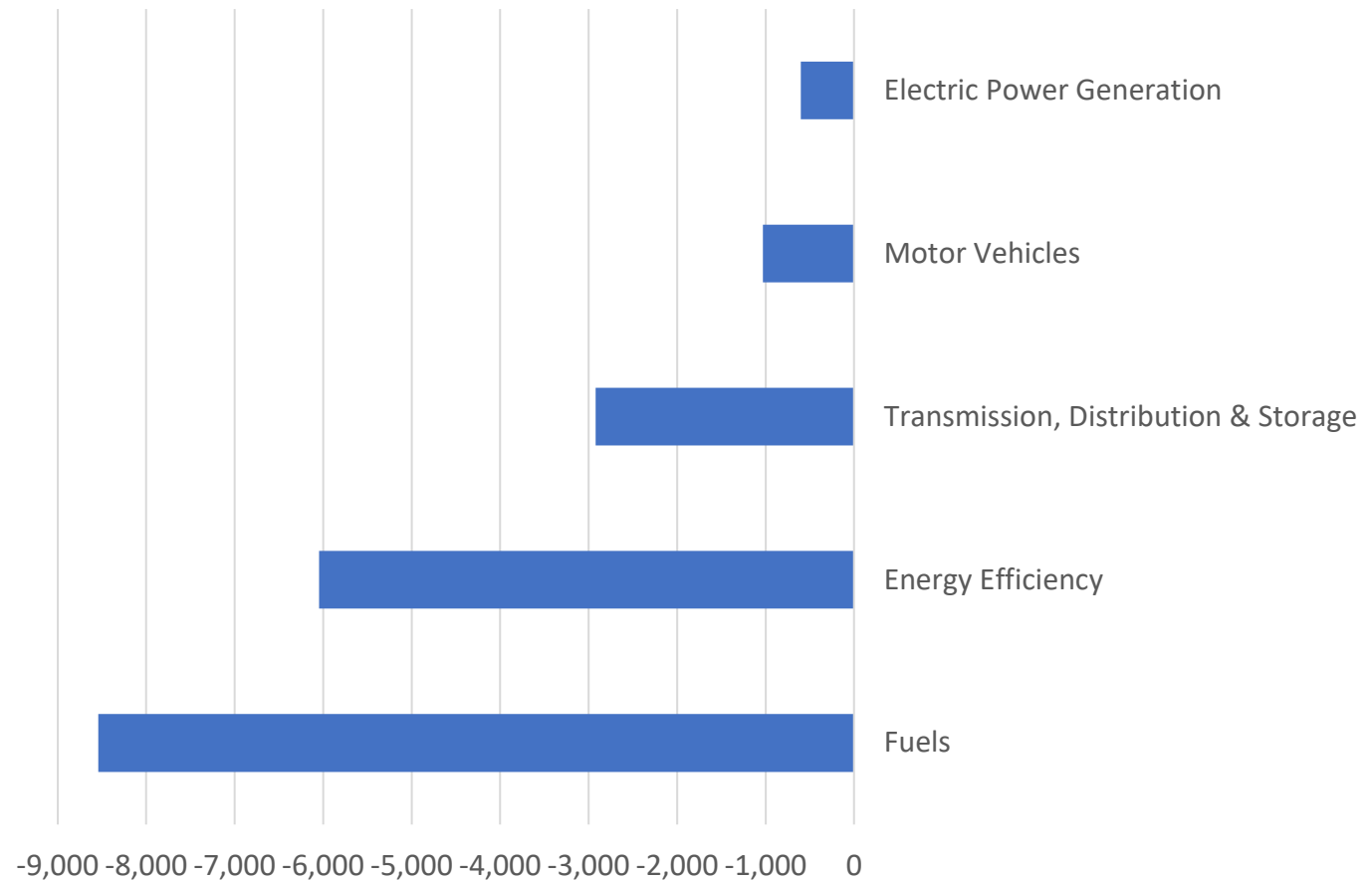
Pennsylvania Employment Distribution



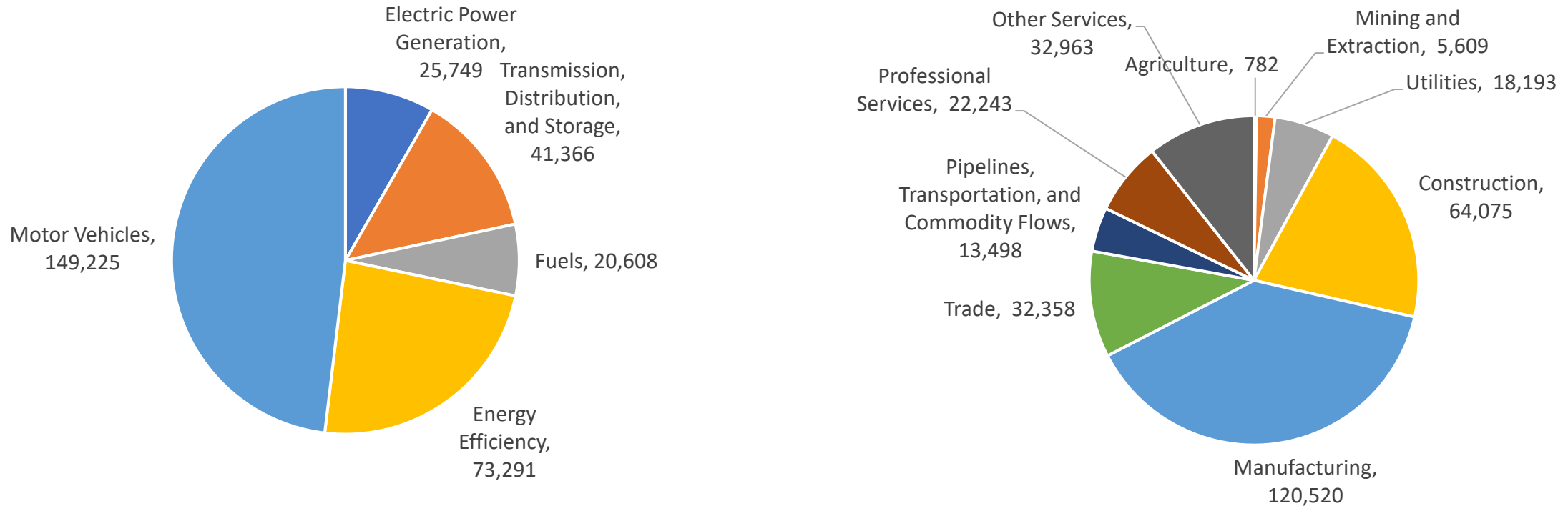
- Primarily motor vehicles, followed by efficiency
- Manufacturing and construction are the largest industries

Employment Changes in Pennsylvania

- All major sectors declined with the largest losses in fuels and smallest losses in electric power generation
- Similar to national trends, hybrid electric vehicles (+180) and electric vehicles (+130) gained jobs
- Losses in fuels primarily oil (-3,100) and natural gas (-2,500)

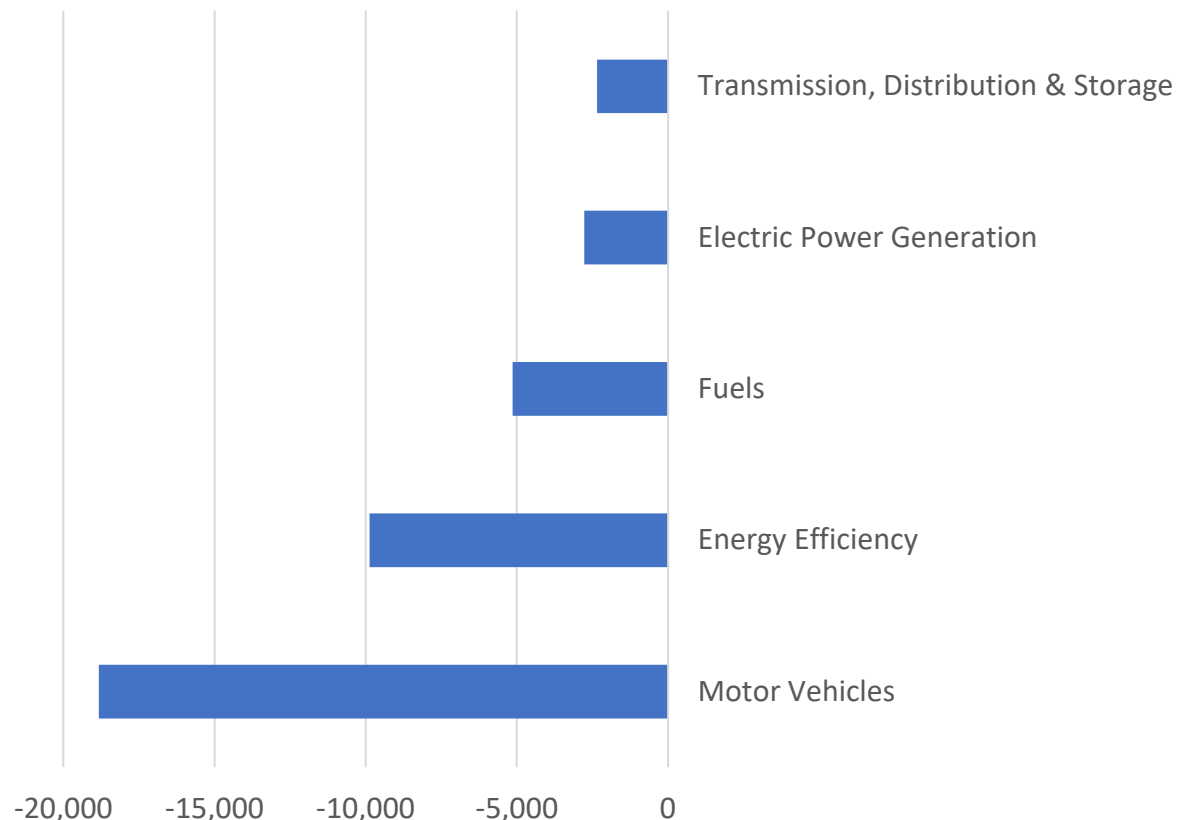


Ohio Employment Distribution



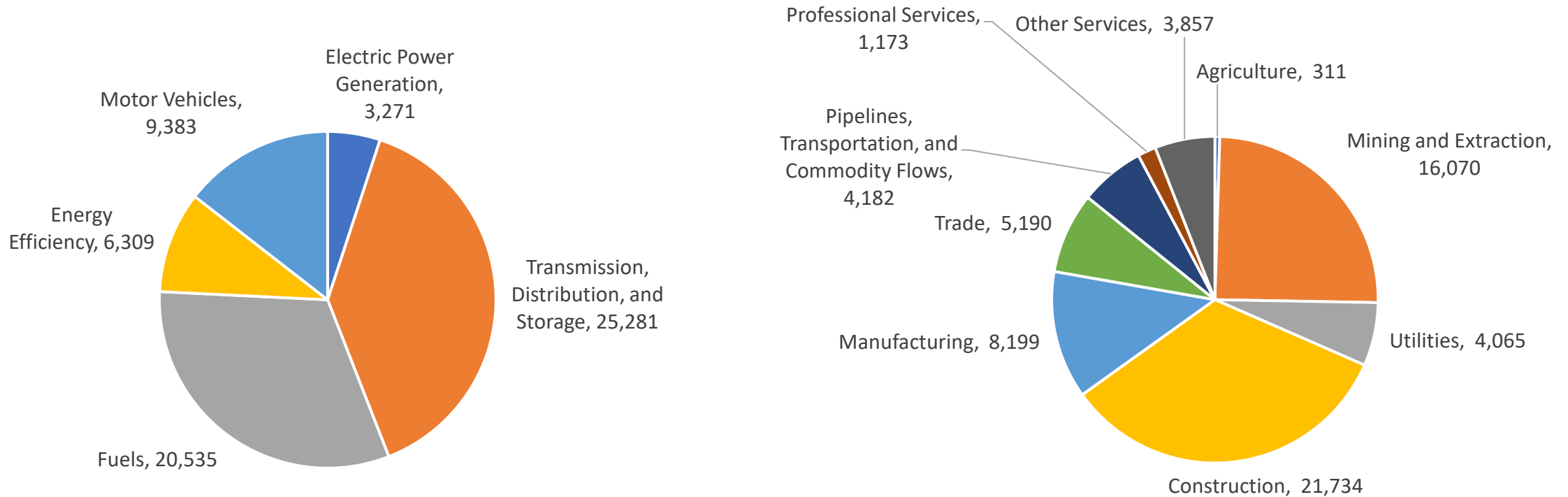
- Motor vehicles is nearly half of all energy jobs while manufacturing is 39%
- Energy efficiency, construction are the second largest sectors

Employment Changes in Ohio



- Largest declines in motor vehicles
- Efficiency decreases are similar across subsectors except “other” (-1,300), ranging from -2,100 for both advanced materials and ENERGY STAR lighting to -2,300 for traditional HVAC
- Fuel declines primarily oil (-2,700)

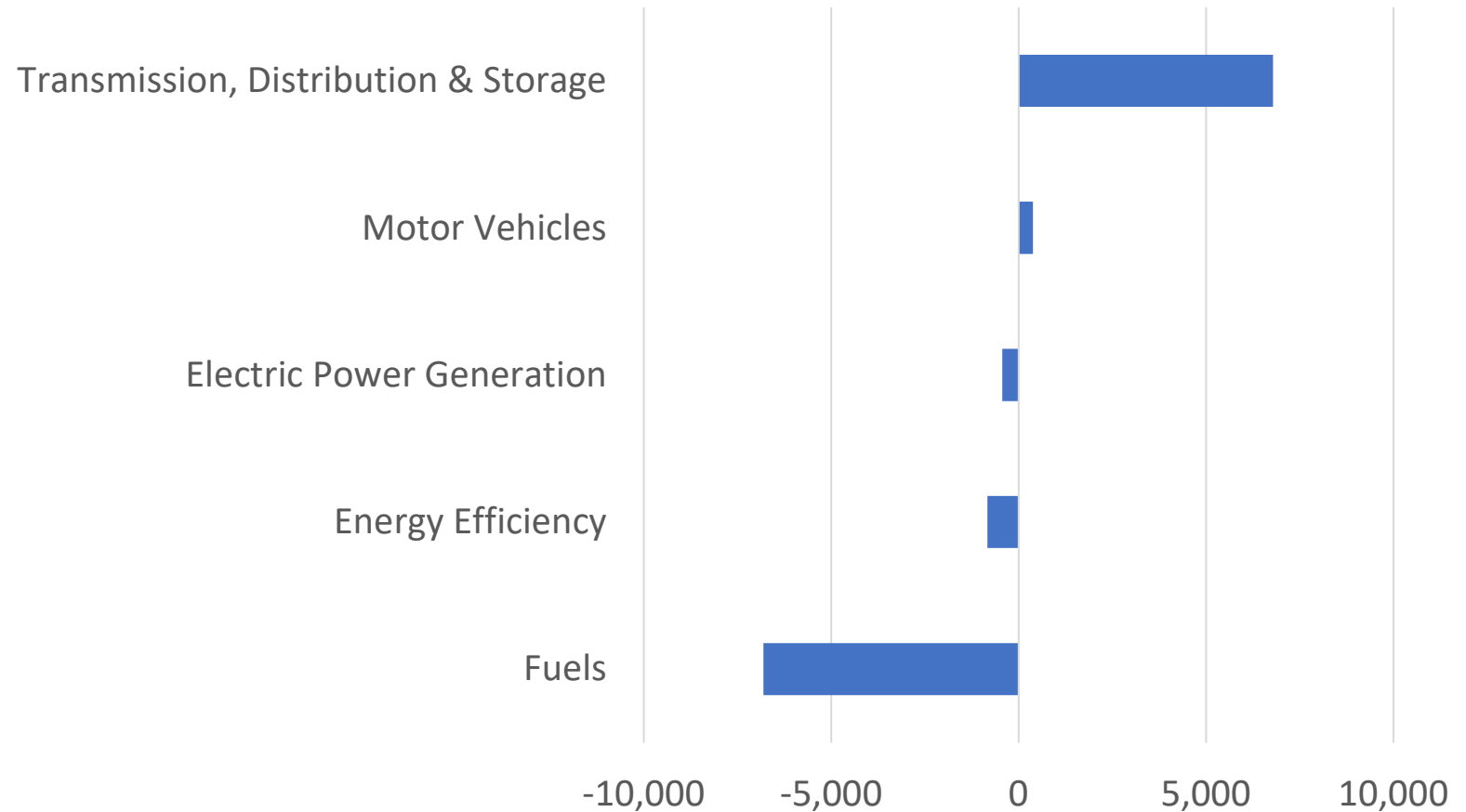
West Virginia Employment Distribution



- Transmission, distribution, and storage is the largest sector and construction is the largest industry followed by fuels, mining, and extraction

Employment Changes in West Virginia

- Total decline of 904 jobs, the lowest decrease in Appalachia
- Growth in transmission, distribution and storage (+6,800) and motor vehicles (+380)
- Largest losses in fuels (-6,800), driven primarily by coal (-3,100)
- Coal losses in electric power generation were much smaller than in fuels (-240)



Thank You



Thank you for your participation!

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Contact us at netl.rwfi@netl.doe.gov

Also send an email to be added to E-note and further
events like the next Energy 101

We welcome continued dialogue and communication

E-note and Past webinars at www.netl.doe.gov/rwfi

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Presentation will be available sometime after webinar

