

Welcome to the NETL RWFI 2023 USEER Webinar Briefing



Please Mute yourself for the duration of the webinar; Slides and Recording will be available sometime after webinar

The energy sector added nearly 300,000 jobs in one year, increasing from 7.8 million total energy jobs in 2021 to more than 8.1 million in 2022. Though women are underrepresented in the U.S. energy sector, they made up more than half of the new workers in 2022. Learn the types and locations of these energy jobs at our 2023 U.S. Energy and Employment Report (USEER) webinar briefing.

Agenda

- **NETL RWFI Introduction and Updates – Anthony Armaly, NETL RWFI, Federal Coordinator**
- **2023 U.S. Energy and Employment Report Regional and National Briefing – Betony Jones, Director, U.S. DOE, Office of Energy Jobs**
- **Regional and National Impacts Workforce Discussion/Online Panel (Please use chat function)**

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



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.

NETL RWFI- Measuring Our Impact - People First

Key Metrics are Levels of Engagement and Outreach



800+

individual
stakeholders

400+

institutions and
organizations
represented

2000+

registrants to the
NETL RWFI Webinar
Series

300+

subscribed to the
NETL RWFI e-Note
Monthly Newsletter

**Catalyzed over 2M in energy/advanced manufacturing
workforce & economic development funding**



Consistent Engagement & Output

Outreach Tools



- Webinars (Energy 101 Series)
- Networking (meetings, lab tours, site visits)
- E-note (monthly) Webinars Archive
- RWFI website and archives
- www.netl.doe.gov/rwfi

REGIONAL WORKFORCE INITIATIVE

The mission of NETL's Regional Workforce Initiative is to create a platform for regional stakeholders to engage the laboratory and other federal agencies in collaborative workforce development efforts. These efforts complement energy and advanced manufacturing innovation and research by addressing the necessary workforce needs and gaps necessary to successfully commercialize and deploy energy technologies. The RWFI works to catalyze research investments into enduring economic development and workforce/job opportunities for the Appalachian region and the nation.

- ▶ [NETL E-Note Archives](#)
- ▶ [Current Events](#)
- ▶ [Webinar Archives](#)
- ▶ [NETL RWFI Fact Sheet](#)
- ▶ [NETL Pilot Workforce Workplan Technical Report](#)

NETL RWFI and Workforce and Economic Development

Energy and advanced manufacturing jobs support millions of direct and indirect jobs in the US economy and ensuring a trained workforce is a critical component of a vibrant economy. Through working with local, state, and national governmental, non-governmental and educational institutions, the RWFI works to identify skills and training gaps with respect to energy and advanced manufacturing jobs. Once identified, RWFI can provide an opportunity to leverage federal activities related to workforce development to the workforce infrastructure of the Appalachian region and all regions where NETL has a presence. The NETL RWFI also strives to connect economic development stakeholders to activities within NETL, as well as to the Department of Energy and other federal agencies that support economic development activities focused on energy and advanced manufacturing.

Key Activities of NETL RWFI

Regional in Focus, National in Reach

400+ Organizations Representing Multiple Stakeholder Groups



Stakeholder groups include:

- Economic Development Organizations
- Federal, State, & Local Governments
- Community Colleges & Universities
- Philanthropic Organizations
- National Laboratories
- Workforce & Other NGOs
- Industry

Appalachian Regional Commission
America Makes
Belmont College
TEAM Consortium
Benedum Foundation
BRITE Energy Innovators
Catalyst Connection
Carnegie Mellon University
Claude Worthington Benedum Foundation
Energy Futures Initiative
National Association of Workforce Boards
Coalfield Development Corporation
Community College of Allegheny College
Westmoreland Community College
PA Department of Economic Development
University of Pittsburgh

Siemens Corporation
Eastern Community College West Virginia
E2 Network
IACMI
ARM consortium
IN-2-Market, Inc.
Manufacturing Extension Partnership
West Virginia University
WVU Industrial Extension/MEP
Allegheny Conference
Charleston Area Alliance
Electric Power Research Initiative
Pittsburgh Regional Alliance
Robert C. Byrd Institute
Oak Ridge National Laboratories
West Virginia University, And more

Latest RWFI Collaborative Efforts/ Funding Awards



- **NETL RWFI, DOE IEDO Industrial Sustainability, Energy Efficiency and Decarbonization (ISEED) Workforce Consortium** (FY24 to FY26)- Awarded 200K (Planned 500K) to work with NREL and ORNL to establish an Industrial Efficiency Workforce Consortium for DOE IEDO.
- **DOE TCF- MSI Connect Program with Brookhaven National Lab (FY 2023-24)**- Awarded a TCF to improve MSI engagement with labs (BNL, LLNL, SNL, PPPL, SLAC). NETL will potentially host students from MSI universities to work on Carbon Management IP commercialization- TCF Extension concept paper for FY2024-25 with partner labs is currently in process.

NETL RWFI- Next Steps

Let's Connect, Communicate and Collaborate!

- Pursuing external funding with stakeholders for opportunities to amplify our impact
- Expand our support of NETL efforts in supporting a regional and national hydrogen economy
- Continuing to work closer with the other national labs, creating a National Lab community of practice and to be collaborative on commercialization, economic development and workforce projects



www.netl.doe.gov/rwfi
netl.rwfi@netl.doe.gov
Anthony.Armaly@netl.doe.gov

Contact Information

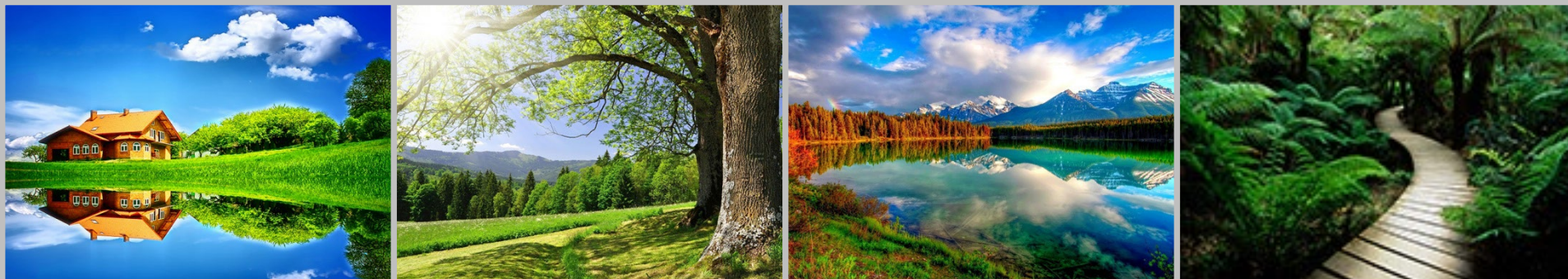


For More Information, Contact Anthony Armaly

anthony.armaly@netl.doe.gov

+1-412-386-6040

www.netl.doe.gov





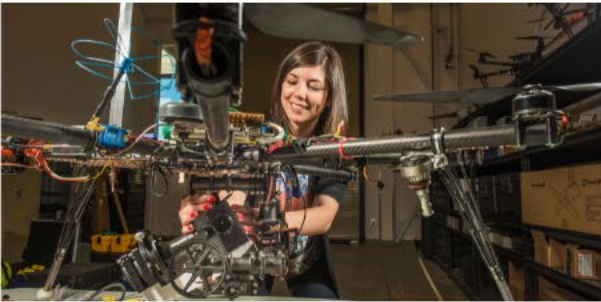
U.S. DEPARTMENT OF
ENERGY

Office of
Energy Jobs

January 31, 2024

2023 United States Energy and Employment Report Summary

Betony Jones | Director, Office of Energy Jobs and Labor Advisor to Secretary Granholm



About the U.S. Energy and Employment Report

- The U.S. Energy and Employment Report (USEER) captures employment, industry, occupation, unionization, demographics, and hiring difficulty by technology group.
- Includes data on electric power generation; transmission, distribution, and storage; fuels; energy efficiency; and motor vehicles.
- Results based on combination of survey done of 34K employers & data from the Bureau of Labor Statistics.
- DOE first published the report in 2016.
- State-level data is available for all 50 states and the District of Columbia.
- Puerto Rico and the U.S. Virgin Islands will be added to the 2024 report.



UNITED STATES ENERGY & EMPLOYMENT REPORT 2023



ENERGY.GOV/USEER



In 2022 there were **8.1 million** energy jobs in the U.S., increasing nearly **300,000** or **3.8%** from 7.8 million jobs in 2021. This is faster growth than total U.S. employment, which increased 3.1%.
Clean energy jobs increased 3.9%

Jobs increased in all technology sectors

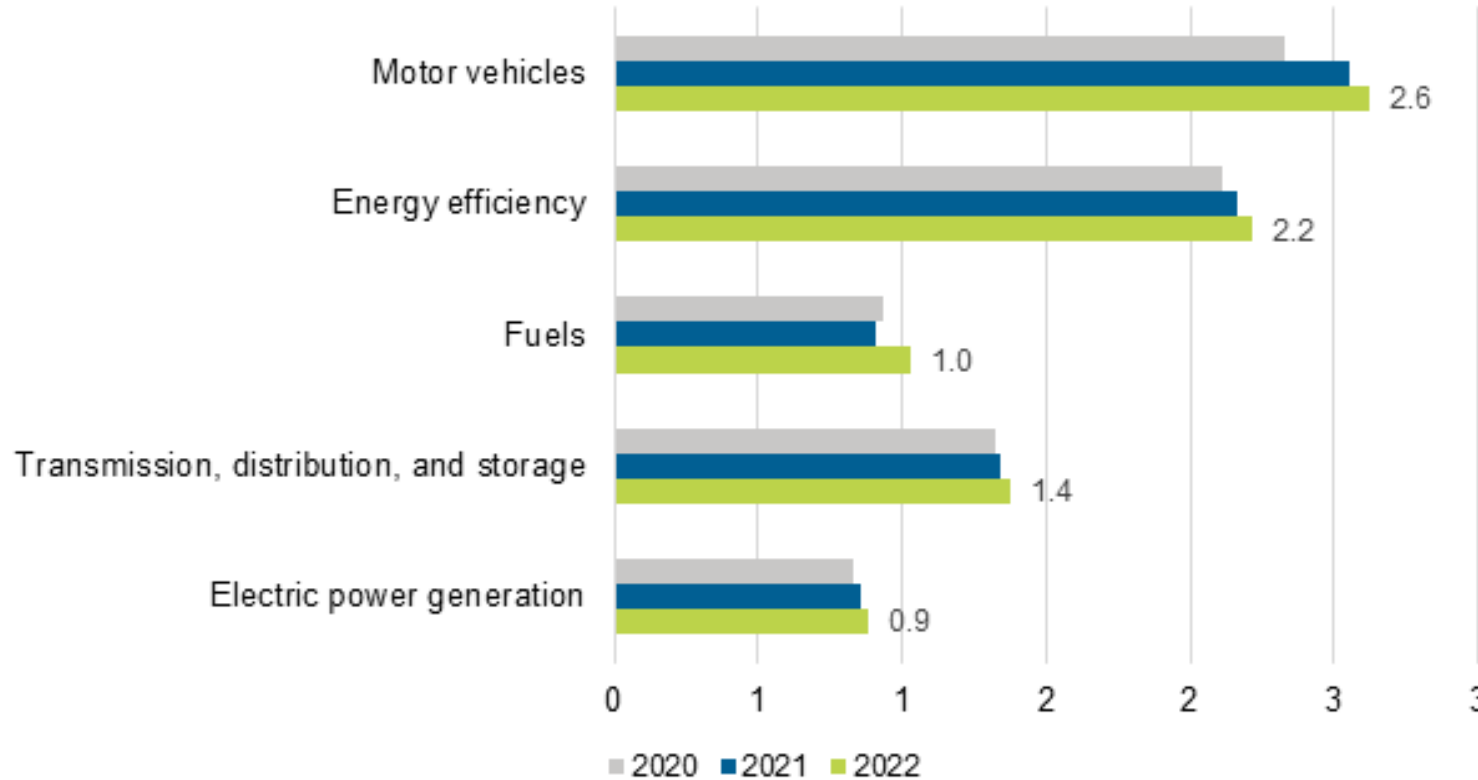


Figure 1. Energy Employment by Technology, 2020–2022 (Millions).

Clean energy is an important driver of energy job growth

Jobs in clean energy were more than **40%** of all energy jobs and increased by more than **114,000**

Full EVs: +26.8%
(+28k jobs)

Fuel cell vehicles: +25.2%
(+4k jobs)

Plug-in hybrid EVs: +10.0% (+6k jobs)

Battery storage: +4.6% (+3k jobs)

Wind: +4.5%
(+5k jobs)

Solar: +3.7%
(+12k jobs)

Geothermal +5.0% (+1k jobs)

Pumped storage hydro +5.5%
(+400 jobs)

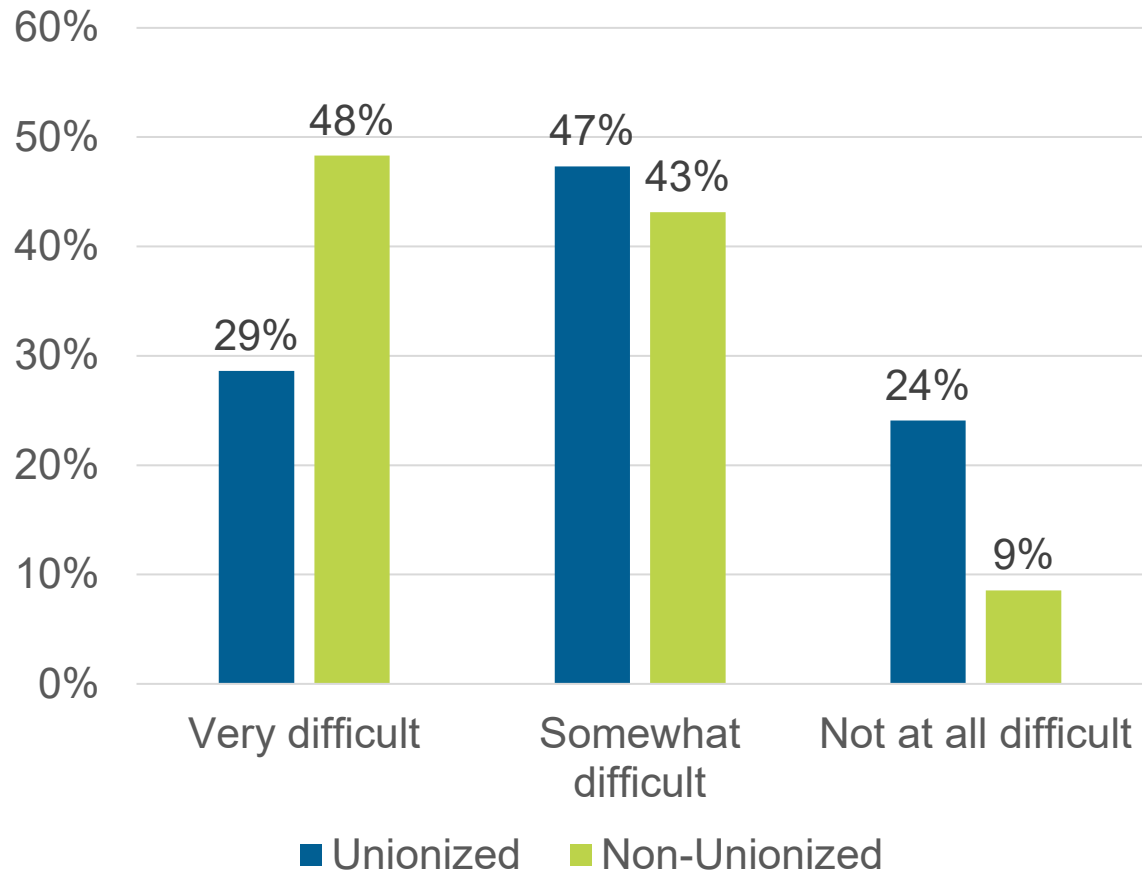
Clean energy is defined as technologies that enable a transition to net zero emissions. This includes renewables, nuclear, non-fossil storage, non-fossil transmission and distribution, non-fossil energy efficiency, biofuels, and vehicles that do not require fossil fuel.

The energy workforce is making progress towards representation

- Women are underrepresented in energy (26% compared to 47%) but increased 7.8% from 2021. Over half of net new hires in 2022 were women, increasing gender parity.
- More non-white energy workers than economy-wide U.S. average (25% compared to 23%). Black/African American are underrepresented across every technology
- Veterans are overrepresented (9% vs 5%). Formerly incarcerated workers are underrepresented (1% vs 2%)
- The energy workforce is younger than the U.S. workforce on average.

Unionized energy employers were much more likely to offer or require diversity or inclusion programs to increase hiring of women, racial and ethnic minorities, and LGBTQ+ workers: **46% compared to 22% non-union companies.**

Unionized employers have an easier time hiring



- Employers in all energy sectors reported hiring difficulty.
- 91% of non-unionized employers reported at least some hiring difficulty compared with 76% of unionized employers.
- Only 31% of union employers in construction reported it was “very difficult” to find workers compared to 59% of non-union employers.

Summary of USEER findings

- **Energy sector jobs grew +3.8% over 2021**, outpacing the growth of U.S. employment overall (+3.1%).
 - Employment increased across all major technologies groups (Motor Vehicles; Energy Efficiency; Fuels; Transmission, Distribution, and Storage; and Electric Power Generation).
 - From 2020 to 2022, the energy sector has **recovered 596,000 of the 840,000 jobs lost in 2019-2020**.
- **Jobs in clean energy were 40% of all energy jobs** (3.3 million of 7.8 million jobs).
 - Clean energy jobs increased by **more than 110,000 since 2021** (+3.5%).
- Mining and extraction saw the largest increase in jobs among the industry categories.
 - The conflict in Ukraine has impacted employment in fuels through increased exports of petroleum and wet gas.

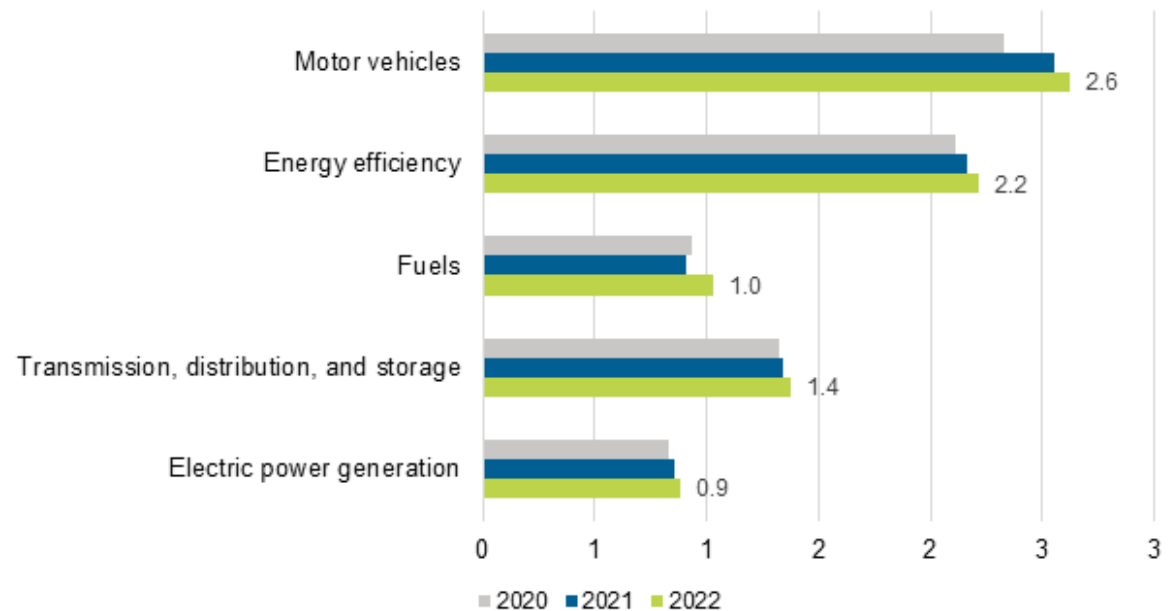


Figure 1. Energy Employment by Technology, 2020–2022 (Millions).

State findings

- West Virginia had the fastest growth in energy jobs, increasing 17.4% (12,600); this was driven by growth in fuels (+28.0% or 5,900) and transmission, distribution, and storage (+20.2% or 6,600).
- Texas had the most energy jobs, with 936,500 – this is a change from 2021 when California had the most (885,500) – this is driven by an increase in fuels (+37,500), although Texas had the second highest additions of motor vehicles jobs (8,000) led only by California (+11,000) and the highest growth in electricity jobs (+3,000).
- Total jobs increased in all states, although there were some declines in all individual technology areas, although these were relatively minor. The largest percentage decrease was in motor vehicles in Alaska (-3.2% or 75 jobs) while the largest decrease in levels was a 1,500 decline in motor vehicles in Indiana (-0.8%).

RWI area key takeaways, 2021 – 2022 growth rates

- West Virginia had the second highest growth rate in fuels (28%), driven by coal fuel. This is likely driven by coal exported out of state, as jobs in coal electric power generation declined.
- Ohio had the fourth highest growth rate nationally in battery electric vehicles, which increased 24%. Pennsylvania also experienced fast growth at 16%.
- Hydropower jobs in Pennsylvania increased 8.4%, the 12th highest in the nation.

RWI area key takeaways, 2021 – 2022 growth levels

- Pennsylvania added the second highest number of traditional transmission and distribution jobs (+4,173) following West Virginia (+6,634).
- Jobs in all of the major technology groups grew in Pennsylvania, Ohio, and West Virginia with two exceptions: electric power generation declined in Ohio (-291) and motor vehicles jobs declined in West Virginia (-61).
- Battery electric vehicles were the source of the most jobs added in Ohio (+1,256).
- Traditional transmission and distribution was the source of the most jobs added in West Virginia (+6,634) and Pennsylvania (+4,173).

U.S. energy workforce demographics

- **Women are 26% of the energy workforce** (similar to 2021), but **there was a 53 percentage point increase** in women in the energy workforce.
- American Indian or Alaska Natives make up 2% of the energy workforce, **much higher than the U.S. average (<1%)**.
- Across all technologies, **Black or African American workers are underrepresented in energy** when compared to their overall representation in the U.S. workforce.
- The energy workforce is younger than average. Only 17% of the energy workforce is older than 55, compared to 24% in the national workforce.
- The proportion of **union workers or those covered under a PLA in the energy workforce (11%) is higher** than the private sector average (7%).

Noteworthy areas of growth: electricity

- Every technology in Transmission, Distribution, and Storage (TDS) gained jobs.
 - Traditional transmission added the most jobs of any category, 17,708 jobs (+1.9%). The grid modernization workforce grew by 2,157 jobs (+11.6%).
 - **18% of workers are covered by a union or PLA in TDS.**
 - TDS is more racially diverse than energy workforce averages. 30% of TDS workers are non-White (compared to 24% of the energy workforce).
 - TDS technologies that enable renewables and increase efficiency added 5,100 jobs (+4%).
 - In 2022, battery manufacturing represented 15% of all storage jobs, up from 14% in 2021.
- Electric power generation:
 - Clean electric power generation added 22,279 jobs (+3.6%).
 - In 2022, solar electric power generation had the largest gains in terms of total new jobs (12,256 jobs, +3.7%), but advanced natural gas electric power generation grew the greatest as a percent (5,300 jobs, +7.7%).
 - Solar utilities jobs grew by 66% from 2021-2022.
 - The only technology in which the workforce shrank was coal, shedding 6,780 jobs (-9.6%).

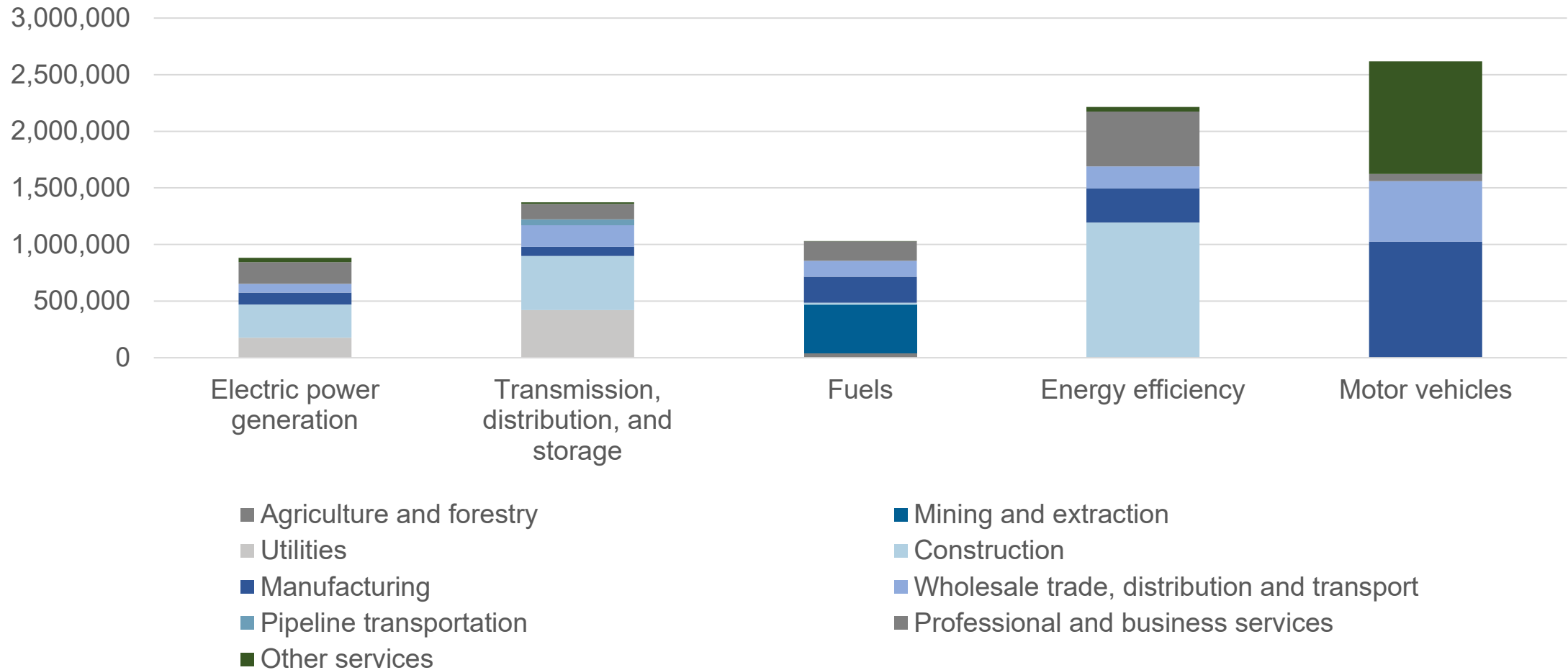
Noteworthy areas of growth: motor vehicles

- Vehicle jobs grew by 64,873 jobs, or +2.5%.
 - Electric vehicle jobs grew the most based on percentage, increasing 26.8% (+28,366 new jobs).
 - Hydrogen or fuel cell vehicle jobs increased 25.2% (+3,573 jobs).
 - Plug-in hybrid vehicle jobs increased 10% (+6,293 jobs).
 - Hybrid electric vehicle jobs increased 6.6% (+9,528 jobs).

Noteworthy areas of growth: fuels

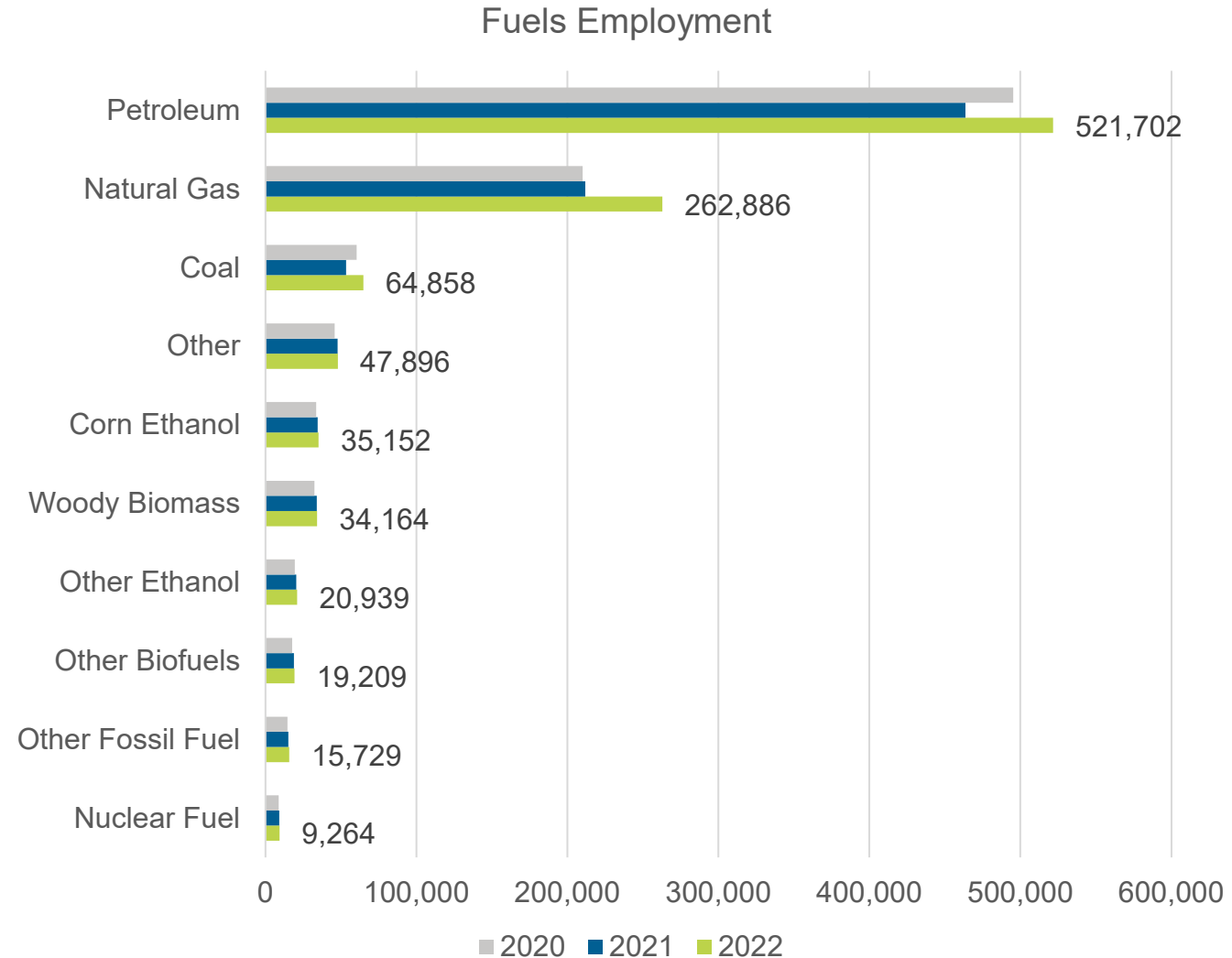
- Petroleum had the largest gains in 2022, increasing by 58,085 jobs (+12.5%).
 - This follows a loss of petroleum jobs in 2021.
- Natural gas gained 51,113 jobs (+24.1%),
- Coal added 11,545 jobs (+21.7%).
- The largest number of fuels employees were in the extraction industry, adding 107,029 jobs (+33.1%).
- Zero-emissions and lower carbon technologies in fuels added 1,962 jobs (+2%).

Energy jobs are split across five technology areas and nine industries



Fuels reversed declines from 2020 - 2021

- Petroleum added 58,100 jobs (12.5% growth) and gas added 51,100 jobs (24.1%). Likely driven by Russian invasion of Ukraine and subsequent petroleum and gas exports combined with extraction catching up with post-COVID consumer demand
- Jobs did not decline in any technologies within fuels.



Thanks for your Participation



Slides and Recording will be available sometime after webinar

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