U.S. DEPARTMENT OF ENERGY

Fossil Energy and Carbon Management

Workforce Discussion

NETL Resource Sustainability Project Review Meeting

Wednesday, April 3rd, 2024

Caleb Woodall

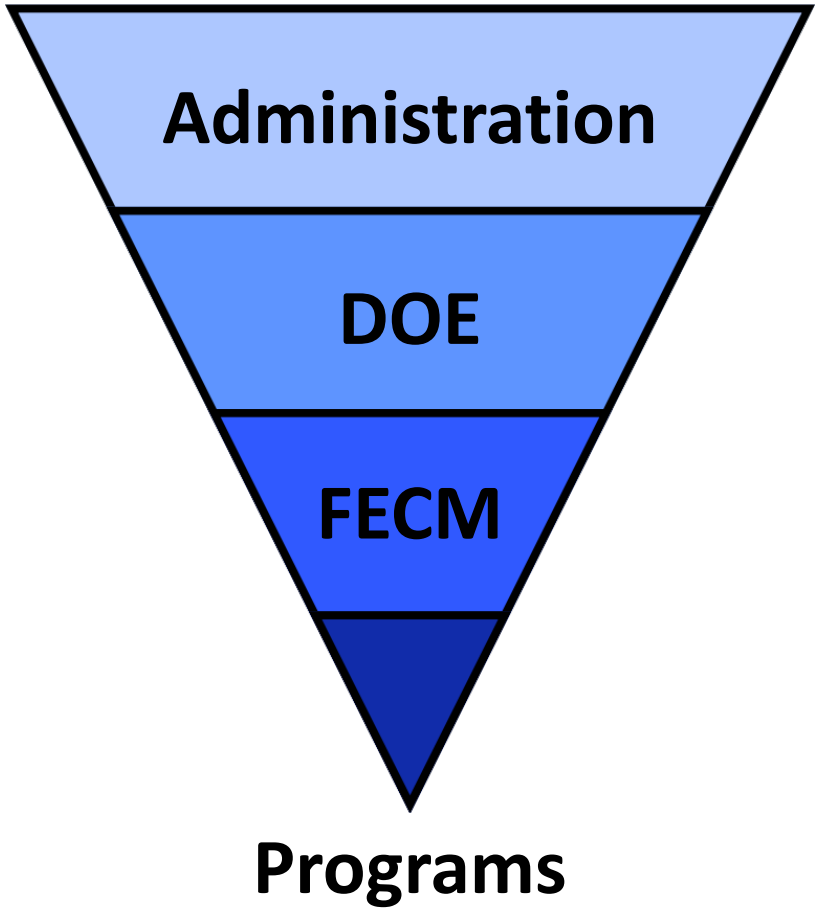
Agenda

1. Broader Context of Workforce Development
2. Workforce Development in Resource Sustainability
3. Interactive Audience Discussion

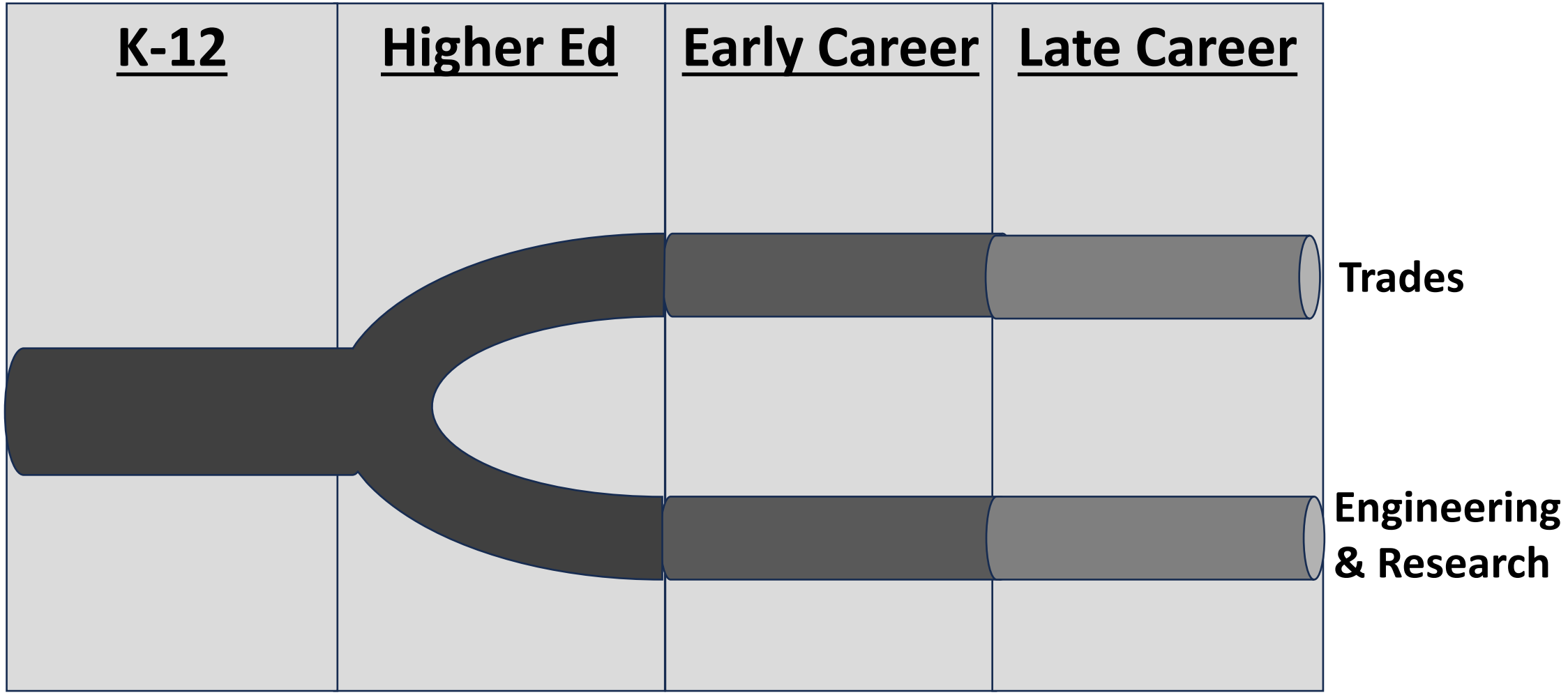
Broader Context of Workforce Development

Setting the stage

Setting the Stage



Workforce Pipeline



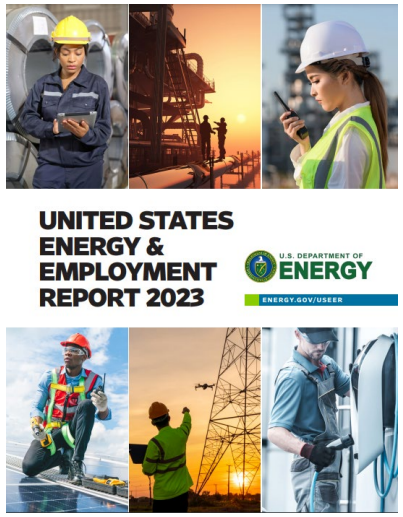
Highlighted Federal Workforce Initiatives

- Exec. Order 14008 – Tackling the Climate Crisis at Home and Abroad
  - Empowers workers to advance infrastructure, agriculture, and energy communities
  - Establishes the IWG on Coal and Power Plant Communities and Economic Revitalization
- Infrastructure Investment and Jobs Act (BIL)
  - Estimated to support >700,000 jobs per year
  - Establishes the 21st Century Energy Workforce Advisory Board
- Inflation Reduction Act (IRA)
  - Estimated to have created > 170,000 clean energy jobs
    - Estimated to create > 1.5 million additional jobs over next decade (Labor Energy Partnership)

Workforce in the DOE

Office of Energy Jobs

- US Energy and Employment Report
- DOE Labor Working Group
- MOU with Dept. of Labor
- Battery Workforce Initiative



21st Century Energy Workforce Advisory Board

Advises the Secretary to support and develop skilled energy workforce to meet evolving sector needs.

DOE STEM

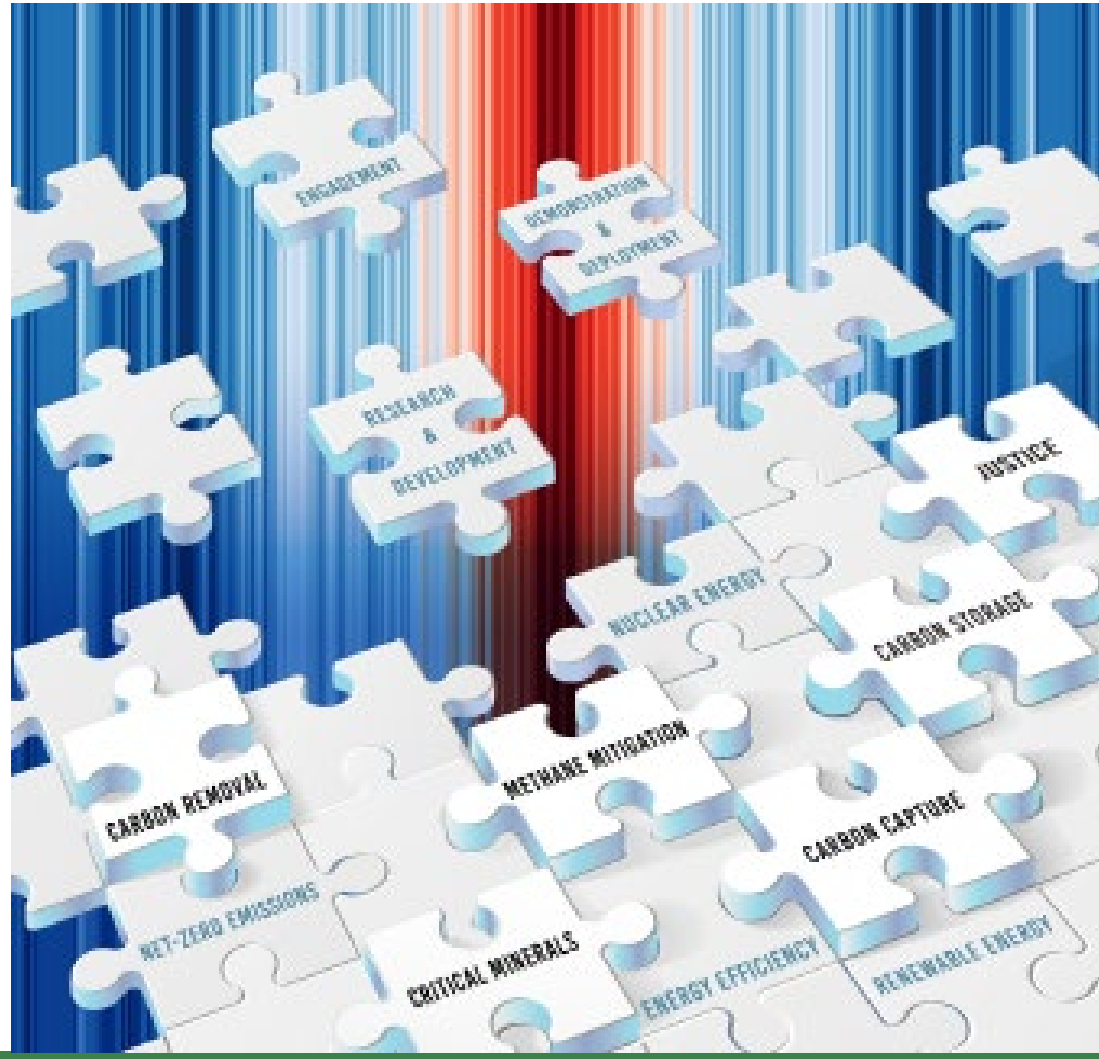
Collaborative effort to share and improve DOE training and education opportunities

FECM Strategic Vision

To “lead a clean energy revolution that achieves a carbon pollution-free power sector by 2035 and puts the United States on an irreversible path to a net-zero economy by 2050”.

Strategic directions and related priorities:

- Advancing Justice, Labor, and Engagement
- Advancing Carbon Management Approaches toward Deep Decarbonization
- Advancing Technologies that lead to Sustainable Energy Resources



FECM Strategic Vision

Justice

Distributive Justice

Equitable allocation of benefits and burdens

Procedural Justice

Community engagement

Workforce Development

Place-based Strategies

Holistic approach and coordination

Stakeholder Engagement

Proactive engagement with labor community

Technical Assistance

Building a skilled workforce to meaningfully contribute to our clean energy goals

FECM Strategic Vision

Justice

Distributive Justice

- Invest in workforce development and training programs that target underserved groups (e.g., funding for MSIs and HBCUs)
- Programs shall be adapted to evolving place-based needs

Procedural Justice

- Workforce development, educational and economic development activities should be responsive and flexible to needs of the community

Workforce Development

Place-based Strategies

- Successful solutions will address both immediate job needs and adaptive long-term community development

Stakeholder Engagement

- Including workers, tribal leaders, labor unions and labor organizations, and community- and place-based organizations

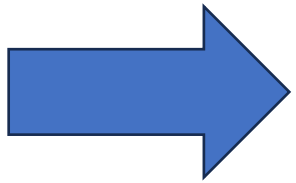
Technical Assistance

- Support a wide array of external and internal training programs
- Support job-readiness programs essential for recruiting people into apprenticeship programs

Community Benefits Plans

Four Priorities

1. Community and Labor Engagement
2. Job Quality and Workforce Continuity
3. Diversity, Equity, Inclusion, and Accessibility
4. Justice 40 Implementation



All of these have workforce implications

CBP – Workforce-Related Tracking

Community & Labor Engagement

Job Quality and Workforce Continuity

DEIA

Justice40 Initiative

CBP – Workforce-Related Tracking

Community & Labor Engagement

Describe engagement with stakeholders and organizations

Job Quality and Workforce Continuity

Articulate future workforce implications of the innovation

DEIA

Illustrate the work's public benefit
Increase DEIA
Plan approaches to retention, engagement, career advancement

Justice40 Initiative

Articulate how project will drive equitable distribution of benefits from successful innovation

Workforce Development in Resource Sustainability

Annual Appropriations

CBPs of BIL/IRA Programs

FECM Crosscutting Workforce Programs

University Training and Research

Education and Training

Early-Stage R&D

Building R&D Capacity

Preparing the Future Workforce

Energy Asset Transformation

Transforming legacy energy assets to clean energy applications

Integrating Workforce, Environmental, Social Justice, and Safety Considerations

ORISE Internship Programs

Hands-On Experience

Mentorship

Connecting Theory to Practice

FECM Crosscutting Workforce Programs

University Training and Research

Program Objectives

- Train next generation of scientists and engineers
- Support novel, early-stage research
- Build R&D capacity in traditionally underrepresented communities
- Equip students with cutting-edge, translatable skill sets

Details

- Annual solicitation, topics vary each year, recently including (FY22-23):
  - Value-added natural gas conversion
  - Critical mineral recovery from coal-based resources
  - Geoscience curriculum development

Energy Asset Transformation

Program Focus

Leveraging and transforming legacy energy assets to clean energy applications

Capacity Building for Repurposing Energy Assets Initiative

Helping communities develop a workforce to repurpose energy assets slated for retirement (2009-2032)

Skills Matching for an Equitable Energy Transition

Analysis by Resources for the Future to ultimately assist training of new graduates and fossil fuel workers to build skills in emerging energy sectors

ORISE Internship Programs

Mickey Leland Energy Fellowship

A 10-week paid summer research program for undergraduate and Master's-level students to:

- Receive mentorship from DOE scientists and engineers
- Gain hands-on experience
- Connect theory to practice

Science, Technology, and Policy Program

A 12-month paid fellowship to contribute to technical and policy-related projects. For current students, recent graduates, and faculty

Methane Mitigation Workforce Activities

Workforce Needs

Commitments to reducing methane emissions necessitate near-term roll-out of measurement and mitigation technologies, along with a workforce to implement them.

An estimated >136,000 job-years will be created through 2035 (Blue Green Alliance).

Some focused workforce needs include (as stated by Texas Climate Jobs Project) :

- Long-term maintenance jobs – (e.g., leak inspection, leak repair, compressor monitoring)
- Short-term replacement and abatement jobs – (e.g., replacing pneumatic controllers, compressors, orphan wells)

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Current Activities

Undocumented Orphaned Wells Program (BIL)

NETL is assessing critical needs, developing technologies, and demonstrating solutions for identifying undocumented orphaned wells.

- Best practices are being developed, which will be coupled with contractor competency certification and personnel training.

Methane Emissions Reduction Program (IRA)

(Notice of Intent released 2/9/2024)

Help oil and natural gas operators cut methane emissions and transition to innovative emission reduction technologies.

Internal Workforce Needs Assessment

Identify training pathways and workforce gaps related to methane emission quantification.

Critical Minerals & Materials Workforce Activities

Workforce Needs

The industry's growth faces several workforce-related challenges (e.g., aging workforce, decrease in relevant university programs, negative social perceptions, foreign competition) (U.S. Dept of Commerce).

Unique challenges among two workforce tracks:

- Engineering & Research – bolster education, facilitate partnerships between industry/academia, improve public outreach
- Trades – embed strong labor standards competitive with similar industries; support for organized labor in regions where relevant (U.S. Dept of Energy)

Critical Minerals & Materials Workforce Activities

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Current Activities

CORE-CM Initiative

Basinal assessments and supply chain development to produce REE, CM, and other products from unconventional and secondary feedstocks.

- Anticipated FOA may involve initiation of workforce development plans. (Notice of Intent released 1/24/2024)

Rare Earth Element Demonstration Facility (BIL)

Developing first-of-a-kind REE/CM extraction and separation refinery.

- CBPs involve quantifying job benefits and stakeholder engagement.

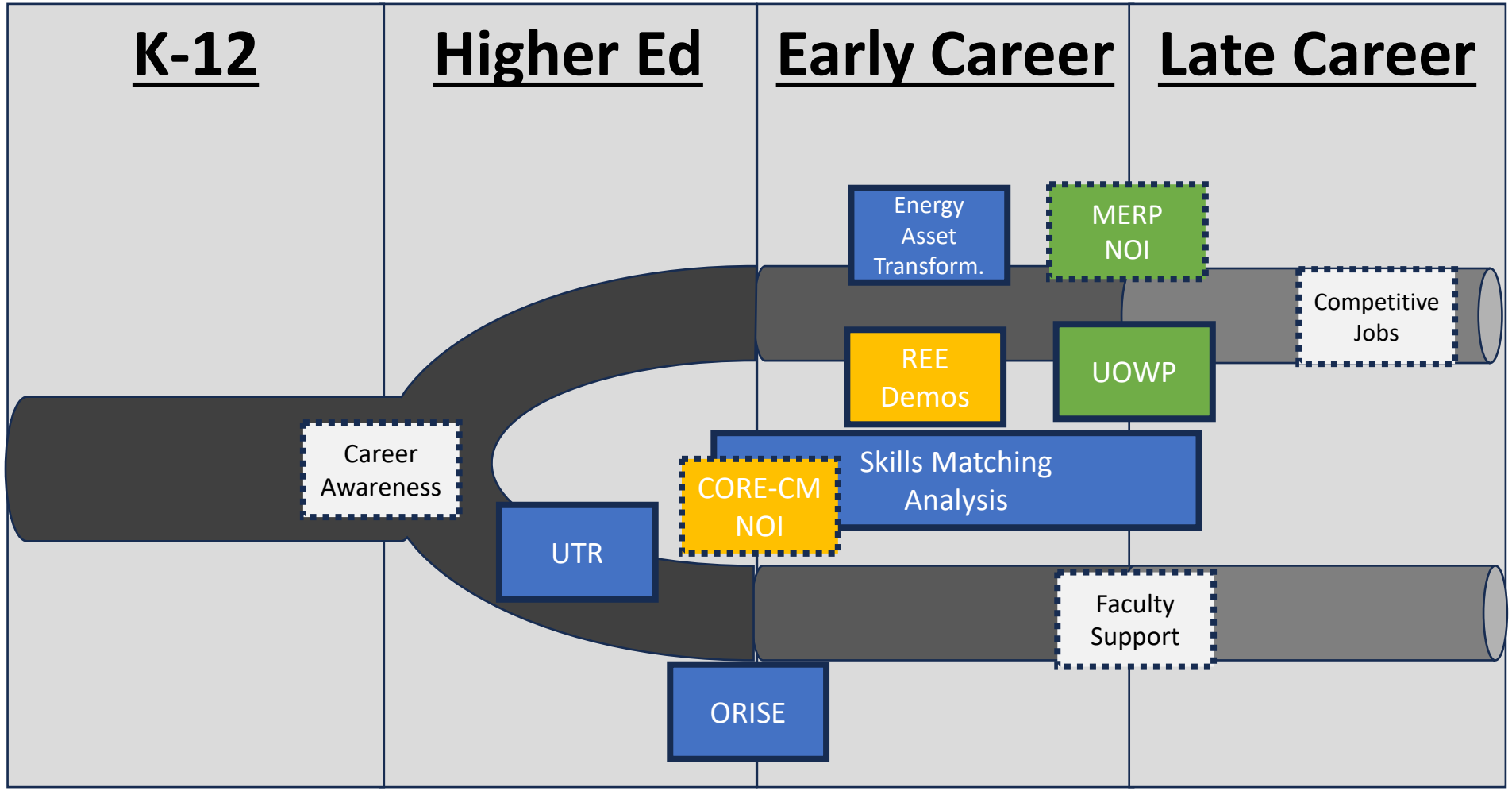
FECM Resource Sustainability Workforce Efforts

Methane Mitigation

Critical Minerals

Cross-cutting

Potential Need?



Interactive Audience Discussion

Audience Questions

You may enter responses on your mobile device

Consider a technology being developed or studied by a member of your group.

1. Skills: What are the skills needed to use this technology at scale? How long might it take to develop these skills for a person new to the field?
2. Training: Describe the characteristics of a program that would effectively train workers to use this technology. Which organizations, if any, have established training programs as described?
3. Impact: Qualitatively rate the impact workforce training would have on adoption of the technology, relative to other challenges.
   - (e.g., additional R&D, policy, market drivers)

Cited Resources

- Cumpton, G. & Agbo, C., Texas Climate Jobs Project (2023) Mitigating Methane in Texas: Reducing Emissions, Creating Jobs, and Raising Standards. (Texas Climate Jobs Project)
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- U.S. Department of Energy (2023) United States Energy & Employment Report 2023.

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Poster Session Tables

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Workforce – Caleb Woodall

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