



U.S. DEPARTMENT OF
ENERGY

**Fossil Energy and
Carbon Management**

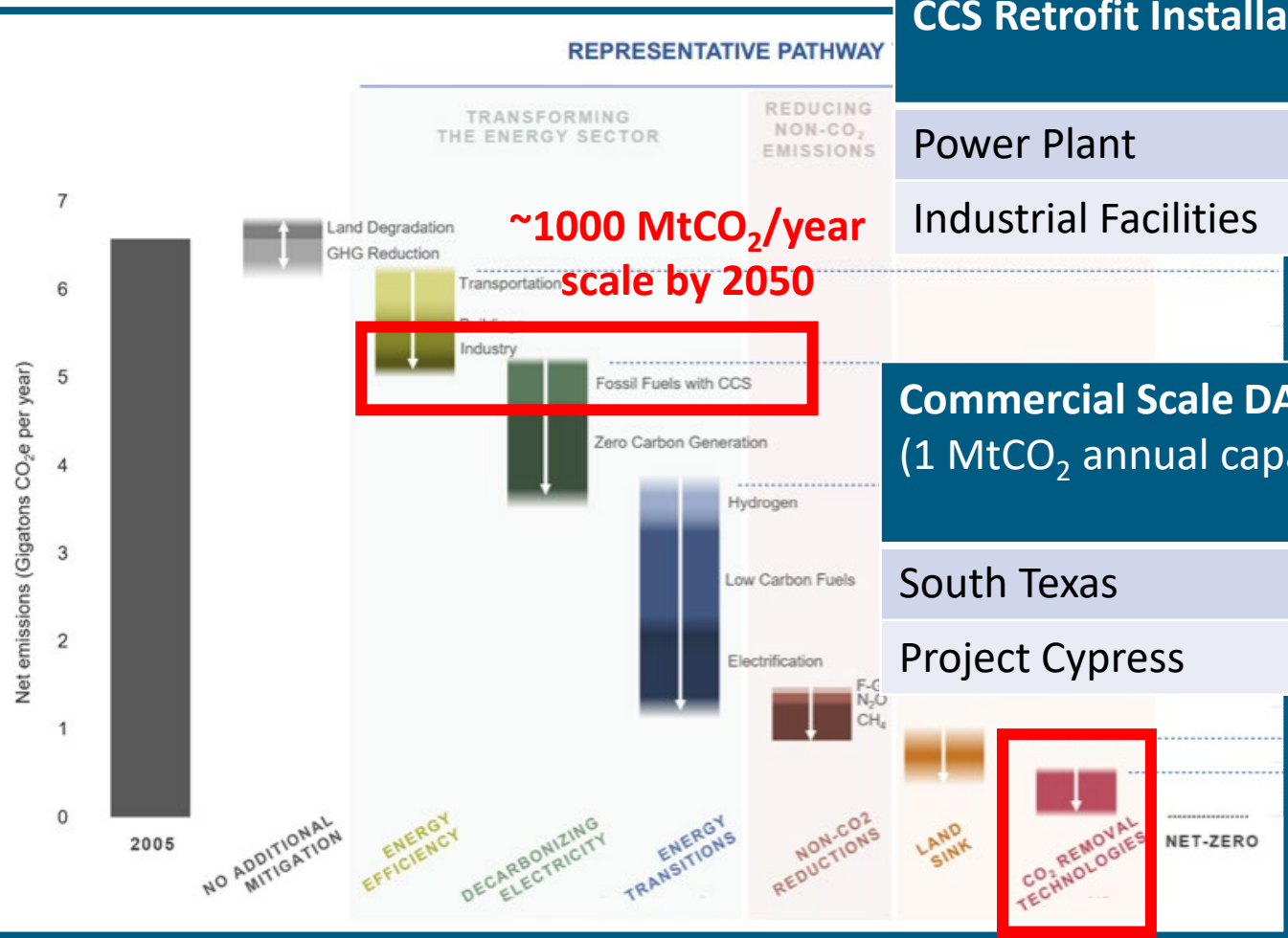
**Regional Decarbonization Series
Alaska Workshop**

May 8, 2024

**Workforce
Opportunities**

Caleb Woodall

Carbon Management Workforce Potential



CCS Retrofit Installation	Plant Investment Jobs (Avg per facility)	Ongoing O&M Jobs (Avg per facility)
Power Plant	382	237
Industrial Facilities	33	28

Great Plains Institute 2020

Commercial Scale DAC Hub (1 MtCO ₂ annual capacity)	Plant Investment Jobs (Avg annual jobs over 5 years)	Ongoing O&M Jobs (Avg annual jobs over plant lifetime)
South Texas	1,180-1,830	260-400
Project Cypress	840-1500	240-450

Rhodium Group 2024

~500 MtCO₂/year scale by 2050

US Dept of State 2021

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*



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University Training and Research (UTR)



Historically Black Colleges & Universities and
Other Minority-Serving Institutions (HBCU-MSI)

University Carbon Research (UCR)

Education and Training Program for Next Generation of Engineers and Scientists



UTR – Program Information

- Nationwide, competitive solicitation
- Projects awarded as Grants
- Duration typically 2-3 years
- Awards range \$250k-\$1.5M
 - Varies based on Area of Interest

UTR Program is traditionally TRL 2-5

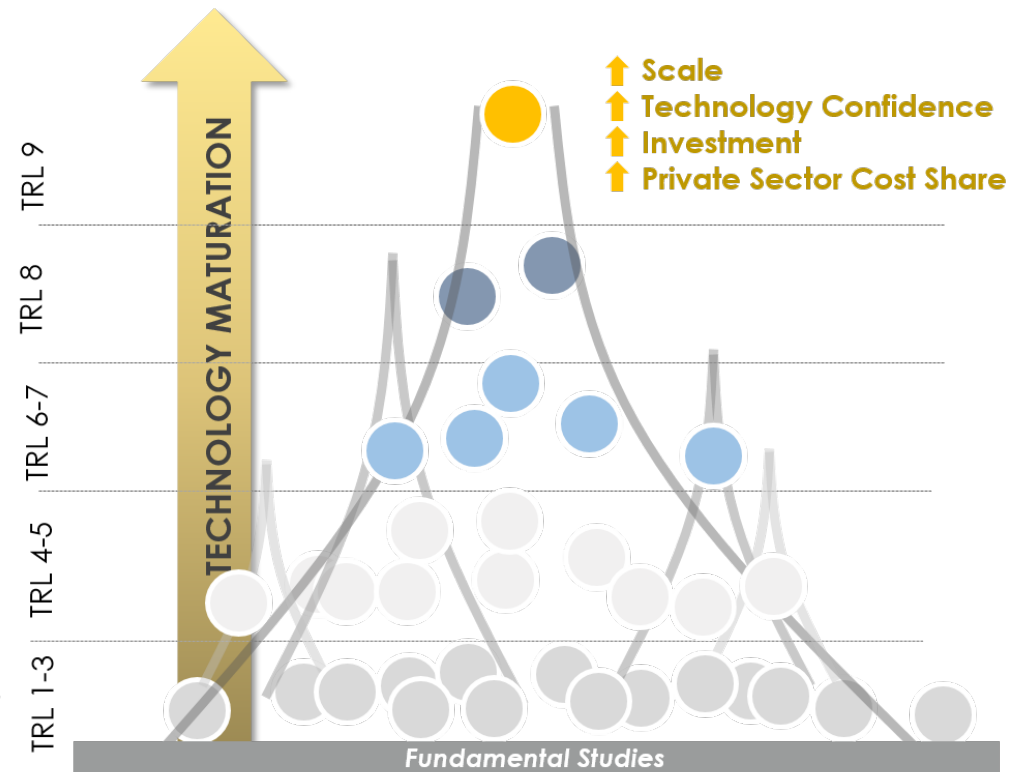
COMMERCIALIZATION
Technology available for wide-scale market use

DEMONSTRATION
System demonstrated in operational environment

SYSTEM TESTING
System performance confirmed at pilot-scale

DEVELOPMENT
Technology component validated/integrated

DISCOVERY
Concept identified/proven at laboratory-scale



UTR – Recent Areas of Interest

FY22 | FOA 2596/2598

- **TEA/LCA** Screening of CCS-Enabled, Waste Coal and Biomass Power Production
- **Infrastructure Self-Assessment** of FECM Research Capabilities
- Biological **Uptake of CO₂ via Algae** for Agricultural Applications
- **Hydrogen storage** materials
- **PGM-free catalysts and electrodes** for fuel cells and electrolyzers
- Value-added **natural gas conversion**
- **Humanities-driven STEM** to enhance FECM R&D priorities

FY23 | FOA 3002

- **Visiting scholar program** to benefit students from minority-serving institutions
- Development of **geoscience education curriculum** at MSIs to prepare a workforce for critical mineral production
- **Humanities-driven STEM** to facilitate interdisciplinary student training and technology development
- Improving **critical minerals and materials recovery** from coal-based resources
- **Energy asset transformation** paper-based studies



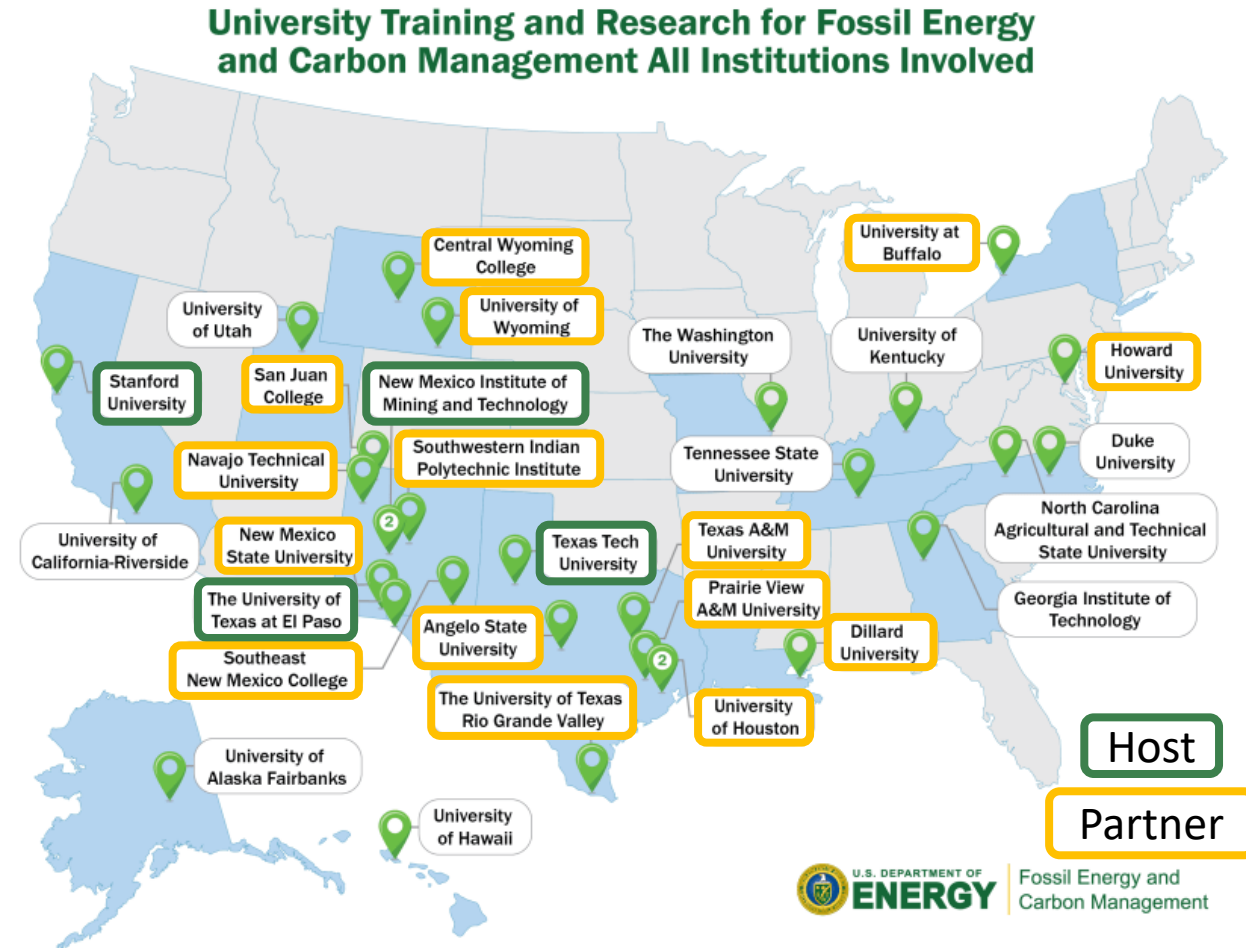
UTR – FY23 Selections

- 19 projects selected to receive \$17.4 million
 - 17 different U.S. universities selected



UTR – FY23 Selections

- 19 projects selected to receive \$17.4 million
 - 17 different U.S. universities selected
- 12 additional institutions involved in “Visiting Scholar Programs”



UTR – FY23 Selections

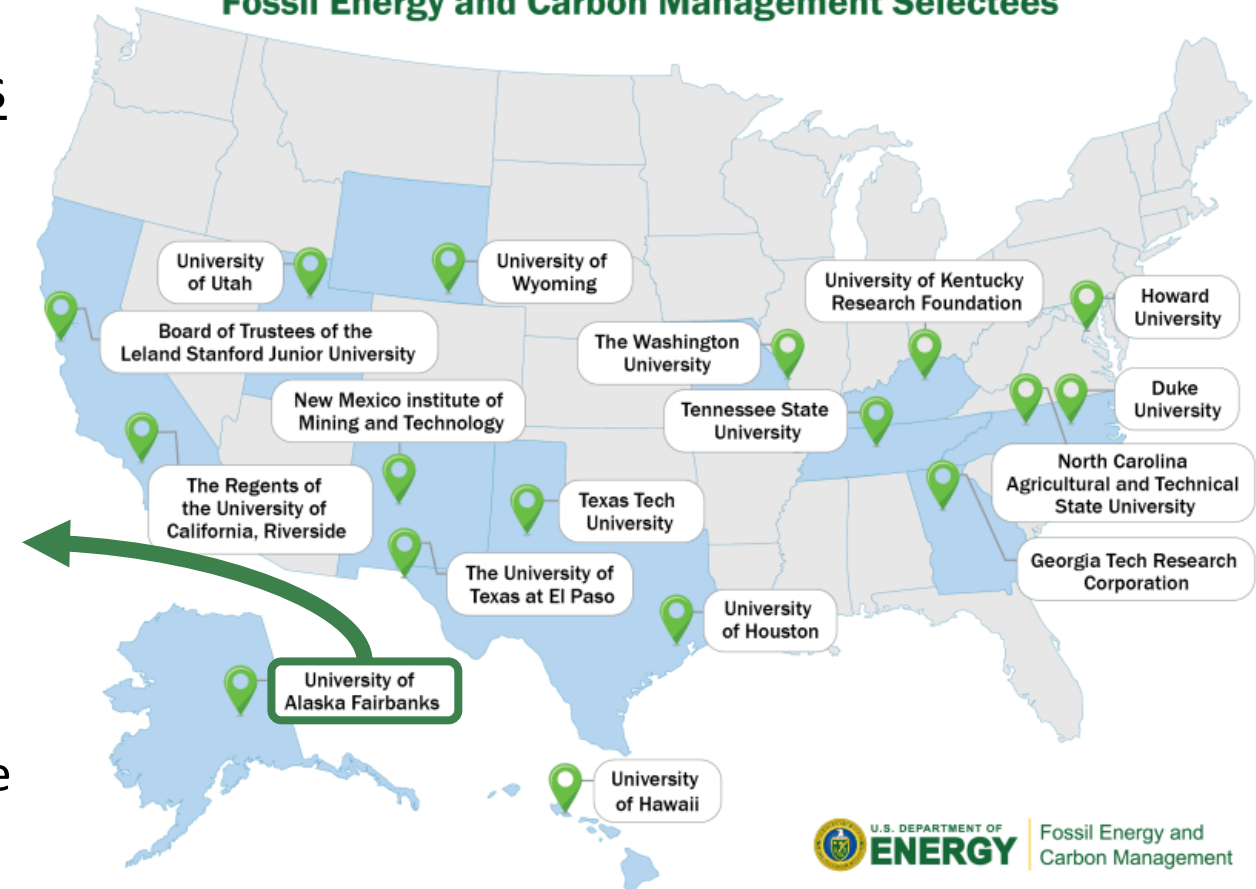
Prospective Fossil Asset Transition for Alaska’s Legacy Pipeline for Distribution of Liquid Hydrogen Carriers

University of Alaska Fairbanks | \$749,165

Public research campaign to understand the community benefit of transforming the Trans-Alaska Pipeline System into a multifunctional, clean energy asset for the efficient distribution of hydrogen energy across Alaska.

The university-led team will foster an inclusive environment that promotes outreach and collaborative opportunities for underrepresented groups.

University Training and Research for Fossil Energy and Carbon Management Selectees



UTR in FY24: Request for Information

Growing Carbon Management Education Capacity at MSIs

Issued November 2, 2023 | Closed January 5, 2024

Purpose: Seek input regarding potential funding for workforce development efforts through new curricula on carbon management

This was only a request for information; DOE may use information collected for internal planning and decision-making purposes

Potential Benefits:

- Develop pipeline of underrepresented students into the carbon management workforce
- Broaden the network of higher-education institutions with curricula focused on carbon management
- Generate learning materials on how carbon management can be enhanced by incorporating perspectives of different cultures and communities

Topical Questions:

1. Curricula Components
2. Staffing
3. Time
4. Recruitment and Accessibility
5. Follow-on Opportunities
6. Cost



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Energy Asset Transformation Program

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.



Capacity Building for Repurposing Energy Assets

Expected Outcomes

1. **Help communities develop baseline plan** on future with stable, high-quality jobs for all and a productive, energy efficient, and climate-positive future will look like
2. Provide opportunity for communities to **evaluate variety of options available** and find right fit based on economic, geographic, and workforce needs
3. **Help DOE understand magnitude of problems that communities are facing** through concept papers gathered from across the U.S.
4. If selected, **provide a report with details** for the workforce development and what is planned by community for energy asset transformation
5. Provide a **3- to 5-minute video** of what community is planning



Capacity Building for Repurposing Energy Assets

Round 1 Awards

(Announced January 11, 2024)

- Beaver County Corporation for Economic Development (Shippingport, PA)
- The City of Beulah, Department of Economic Development (Beulah, ND)
- Associated Governments of Northwest Colorado, Craig CO)
- Grow Rural PA (Ridgeway, PA)
- Floyd County Fiscal Court (Prestonsburg, KY)
- Southeastern Utah Economic Development District (Price, UT)
- Alaska Municipal League (Juneau, Alaska)
- The Center for Applied research and Technology, Inc. (Bluefield, WV)

Round 2

(Application period closed April 18, 2024)

Up to 27 additional projects may be selected



Capacity Building for Repurposing Energy Assets

Round 1 Awards

(Announced January 11, 2024)

Alaska Municipal League

Juneau, AK

Project will support efforts to retire a coal-fired power plant in Healy, Alaska and develop a new battery energy storage system and wind project, providing community engagement, strategies for economic and workforce development activities, and lessons learned.

- Floyd County Fiscal Court (Prestonsburg, KY)
- Southeastern Utah Economic Development District (Price, UT)
- Alaska Municipal League (Juneau, AK)
- The Center for Applied research and Technology, Inc. (Bluefield, WV)

Round 2

Application period closed April 18, 2024)

Up to 10 projects may be selected



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Mickey Leland Energy Fellowship Program



- A **10-week, paid** summer research program for Science, Technology, Engineering, and Math (STEM) students
 - Undergraduate student: \$750/week; Graduate student: \$850/week
- Receive **mentorship** from DOE scientists and engineers
- Provide **hands-on experience** complementing course of study and connect **theory to practice**
- Increase **confidence**, enhance **communications skills**, and promote **critical thinking** and **problem solving**



MLEF Program



ELIGIBILITY

- Be at least age 18
- Be a U.S. Citizen
- Have a minimum 2.8 GPA
- Be enrolled full-time in a STEM degree program at the Associate, Bachelor's or Master's level at the time of application.
- Must be a college sophomore or higher

REQUIREMENTS

- Commit for the full 10-week program
- Attend orientation and present research findings at the Technical Forum

**Summer 2025 applications
will open in September 2024**



DOE STEM

YOUR ONE-STOP SHOP FOR STEM-BASED OPPORTUNITIES FROM THE DOE

<https://www.energy.gov/doe-stem/doe-stem>

- Search opportunities by discipline, location, DOE office, & more
- Access resources across the DOE
- Read about past participants
- See our calendar of events



DOE Faculty Research Opportunities



NETL Faculty Research Program

- Opportunity for faculty to collaborate with principal investigators at **NETL facilities**.
- For full-time regular permanent faculty member at an accredited college/university with a research interest in NETL core R&D areas.

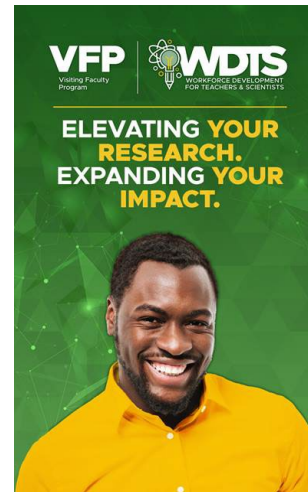


Faculty-Applied Clean Energy Sciences Program

- Opportunity for faculty to collaborate with principal investigators at the **National Renewable Energy Laboratory**.
- For full-time regular permanent faculty member at Minority-Serving Institutions.
- Faculty will develop scalable education modules on topics like community engagement, human behavior, energy and environmental science, and artificial intelligence

Office of Science Visiting Faculty Program

- Opportunity for faculty to collaborate at **one of 15 participating DOE National Labs** for (1) research or (2) teaching initiative.
- For full-time (U.S. citizen) faculty members from institutions historically marginalized in STEM research (non-R1/R2, except for R2 HBCUs).



Research Experience in Carbon Sequestration ("RECS" Program)



Premier CCUS education and training experience and career network for graduate students and early career professionals in the U.S.

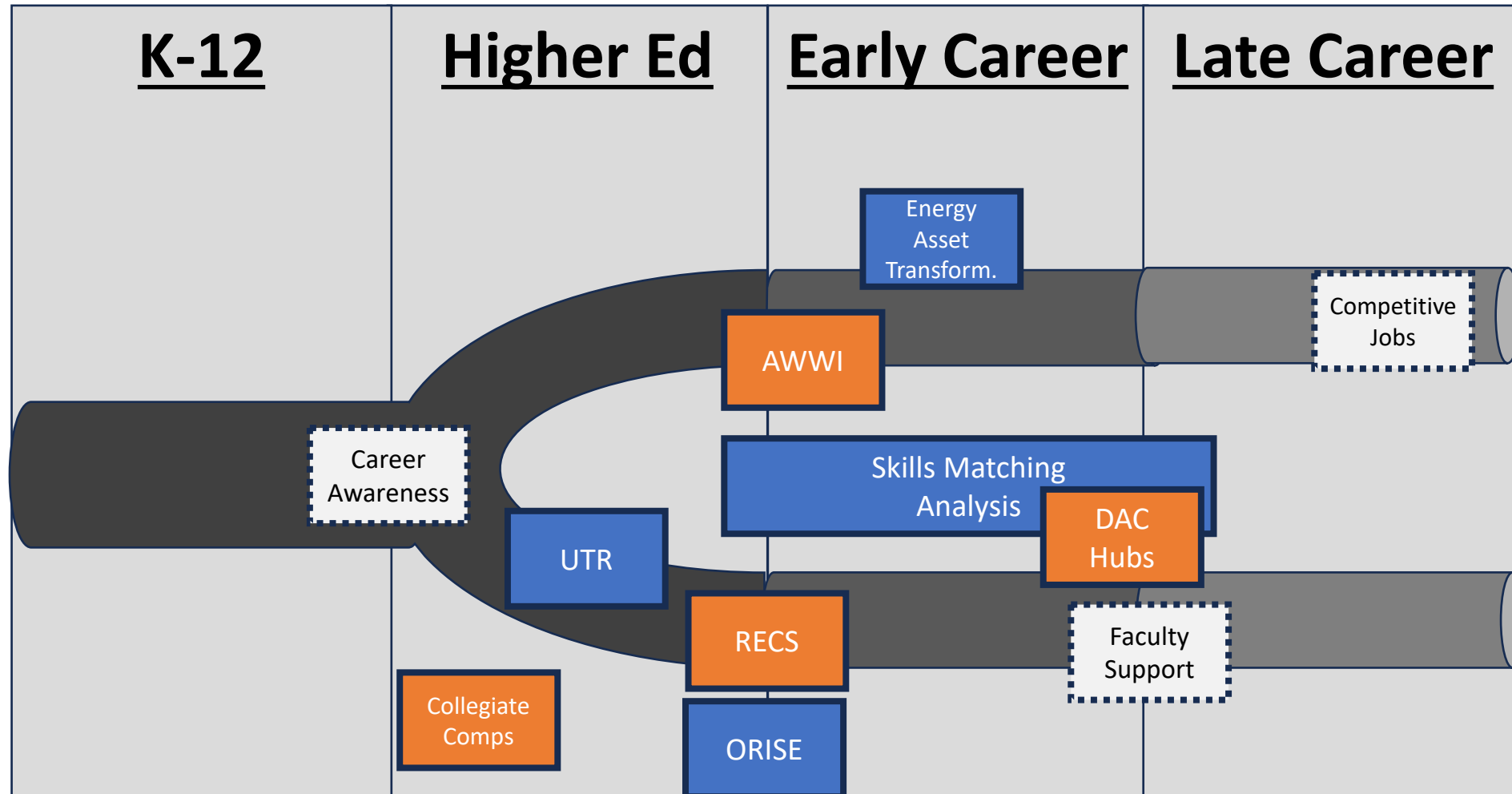
- **Schedule:** Occurs annually, typically lasts 7-10 days.
- **Faculty:** Pioneering CCUS experts from national labs, industry, and academia are part of the RECS faculty and network.
- **Funding:** Covers full tuition for students.
- **Eligibility:** Applicants must be U.S.-based. Early career professionals and PhD or graduate students. Required to commit to the full program.

<http://www.recs-ccus.org/>

RECS 2024 dates: July 21-30

Applications Due May 15, 2024

Carbon Management Workforce Efforts



Questions & Follow Ups



Questions?



Caleb Woodall

Program Manager

University Training and Research

caleb.woodall@hq.doe.gov



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FECM – Workforce Programs:

<https://www.energy.gov/fecm/fecm-workforce-programs>

NETL – University Training & Research:

<https://netl.doe.gov/carbon-management/university-training>

FECM – Email Updates (including UTR)

<https://public.govdelivery.com/accounts/usdoeofe/subscriber/new>



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CBP Template: <https://eere-exchange.energy.gov/FileContent.aspx?FileID=9848d718-ddc3-4b79-ba9c-3d0b0f155844>