Council FOLIO

2025

FOURTH QUARTER

Energy Resources Council
Joint Meeting with the UW Board of Trustees

November 20-21, 2025

ACADEMICS | RESEARCH | OUTREACH

University of Wyoming | School of Energy Resources

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CEO, PacifiCorp

Ed Cooper
Wyoming Senate,
District 20

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Executive Director
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Paula Medina
ASUW President

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Energy Resources Council Meeting
November 20-21, 2025

DRAFT AGENDA

Energy Resources Council (ERC)
Cindy Crane, Senator Ed Cooper, Representative Scott Heiner, David Emery, Charlene Russell, Chad Teply, Bill Miller, and Peter Gottfried

Ex-officio members and liaisons: John Koprowski, Randall Luthi, Edward Seidel, and Paul Ulrich

University of Wyoming Board of Trustees (BOT)
Kermit Brown, Michelle Sullivan, Laura Schmid-Pizzato, Brad Bonner, David Fall, Mike Greear, Jim Mathis, John McKinley, Carol Linton, Brad LaCroix, Paul Ulrich, Tom Walters
Ex-officio members: Mark Gordon, Edward Seidel, Megan Degenfelder, Laurel Ballard, and Paula Medina (ASUW)

THURSDAY, NOVEMBER 20

5:00 PM
Energy Resources Council and UW Board of Trustees Cocktail Hour Reception
Hilton Garden Inn, Rooms Birch, Timber & Aspen

6:00 PM
ERC Dinner

7:00 PM
Presentation:
Critical Mineral Fulbright Research and the Critical Mineral Leadership Academy
Erin Phillips, Director of Cross Cutting Programs

Join Zoom Meeting
https://uwyo.zoom.us/j/98244360650
Meeting ID: 982 4436 0650

One tap mobile
+16699006833,,98244360650# US (San Jose)
+17193594580,,98244360650# US

FRIDAY, NOVEMBER 21

7:00 AM
ERC Meeting and Joint Session with UW Board of Trustees - Breakfast Available
Hilton Garden Inn, Birch, Timber & Aspen Rooms

Join Zoom Meeting
https://uwyo.zoom.us/j/93346318215

Meeting ID: 933 4631 8215
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+16694449171,,93346318215# US
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7:30 AM
Welcome and Opening Remarks
Kermit Brown, Chairman, UW Board of Trustees
Cindy Crane, Chairman, Energy Resources Council

7:40 AM
School of Energy Resources Presentation: Building Wyoming's Energy Future: Reflections and the Road Ahead – *Holly Krutka, SER Executive Director*

8:00 AM
Discussion

8:20 AM
Closing Remarks
Kermit Brown and Cindy Crane

8:30 AM
9:00 AM
Joint Executive Session
Conclude Executive Session

9:00 AM
Adjournment of Joint Session

9:00 AM
Morning Break

9:15 AM
ERC Quarterly Meeting Commences
Call to Order
Approval of agenda
Approval of minutes from August meeting

9:20 AM
SER Executive Director Report – *Holly Krutka*

9:40 AM
Questions for Non-Presenting Directors
CERPA – *Matt Fry*
H_2ERC – *Eugene Holubnyak*
EORI – *Lon Whitman*

DRAFT AGENDA

9:50 AM	**Director Updates**
9:50 AM	Research – *Scott Quillinan and Erin Phillips*
10:10 AM	CEGR – *Fred McLaughlin*
10:30 AM	CCCC – *Trina Igelsrud Pfeiffer*
10:50 AM	**Break**
11:05 AM	3D Viz – *Kyle Summerfield*
11:20 AM	Outreach – *Christine Reed*
11:35 AM	Academics – *Kami Danaei*
11:50 AM	**SER Budgets** – *Rachel Ferrell and Holly Krutka*
12:10 PM	**New Business** Review and vote on proposed ERC Code of Conduct and Conflict of Interest form Report format for 2026 ERC meetings
12:30 PM	**Break and Lunch Available**
12:45 PM	**Executive Session (if needed)**
1:15 PM	Conclude Executive Session
1:30 PM	**Adjournment**
3:00 PM	**Happy Hour Farewell to Dr. Krutka** Bonds Brewing Company 411 S. 2nd St., Laramie, WY 82070

Next Energy Resources Council Meeting

Date: April 1-2, 2026

DRAFT AGENDA

School of Energy Resources

Energy Resources Council Draft Minutes

August 15, 2025
7:30 AM - 1:30 PM

DRAFT MINUTES

ATTENDANCE

Energy Resources Council (ERC)
Chairman Cindy Crane, Sen. Ed Cooper, Rep. Scott Heiner, Charlene Russell, David Emery, Chad Teply, Bill Miller, Peter Gottfried

Ex. Officio and Liaisons
President Ed Seidel, Trustee Paul Ulrich, Randall Luthi

School of Energy Resources (SER) and UW
Holly Krutka, Scott Quillinan, Fred McLaughlin, Christine Reed, Jerry Evans, Lon Whitman, Kyle Summerfield, Kristi Russow, Eugene Holubnyak, Trina Igelsrud Pfeiffer, Matt Fry, Erin Phillips, Kami Danaei, Rachel Ferrell, Marie Dudgeon (online), Heather Chandler (online) Thang Tran (online), Kimi Takaki (online), Angela Ver Ploeg (online), Carrie Ver Burg (online), Ayla Carncross (online), Tiffany Bishop (online), James Christensen (online), Sarah Buckhold (online), Pat McLean (online), Esther Wagner (online), David Lucke (online)

Guests
Rob Creager, Raul Ochoa (online), David Madison (online), Jamie Blosmo (online)

ERC REGULAR MEETING: ITEMS BY DETAIL

Call to Order
Chairman Crane called the meeting to order at 7:30 AM

Approval of Agenda
Two amendments were requested to the agenda. The first, that President Seidel give a brief update on UW prior to the Executive Director's report, and the second, that Wyoming Energy Authority Executive Director Rob Creager provide an update on his recent visit to Washington, D.C., to follow the exception funding request review portion of the agenda.

Motion – Chairman Crane made a motion to approve the agenda as amended. Bill Miller seconded the motion.
The motion was approved without objection.

Approval of May 2025 Minutes

Motion – Rep. Heiner made a motion to approve the May 2025 Minutes. Chad Teply seconded the motion.
The motion was approved without objection.

Update from President Seidel

President Seidel highlighted key accomplishments at UW under his tenure including:

- UW being recognized as a Carnegie Tier 1 Research Institution and a Carnegie Elective Classification for Community Engagement,
- UW continues to demonstrate a significant economic impact, contributing over a billion to the state's economy based on a recent study,
- Student enrollment and retention are slowly experiencing increases,
- UW is working to grow capacity in critical mineral research, and
- The UW budget request will include salary raises and state matching funds for endowments.

SER Executive Director Report

Overview and Updates – Holly Krutka

Dr. Krutka provided an update on upcoming events in the fall, and an overview of the total expenditures from FY25, demonstrating the impact of SER's research programs executing projects in the state. She also presented the proposed budget request for the 2026 legislative session for the FY27-28 biennium as follows:

1. Standard Budget (reoccurring) – $21,107,808 (no change compared to enacted FY25-26 biennium)
2. Coal Pyrolysis Demonstration Plant (one-time, accounting for inflation costs) – $2,090,000
3. Matching funds for both philanthropic and research matching (one-time) – $10,000,000 with the following conditions:
    a. These matching funds require 1:1 match from a non-state source (no in-kind).
    b. For the research funding, the match is limited to research focused on the production or consumption of Wyoming coal, oil, natural gas (as defined by the Wyoming Oil and Gas Conservation Commission), rare earth elements and critical minerals (as defined by the US Secretary of Interior). Uses of matching funds must be approved by the Energy Resources Council and the legislative Management Committee.

Motion – Peter Gottfried made a motion to approve the budget request as presented for advancement to the Governor's Office. David Emery seconded the motion.
The motion was approved without objection.

WEA Exception Funding Request Review

Wyoming Energy Social License Survey

In 2022 and 2023, SER replicated a study on Wyoming residents' perspectives on energy. This replication allowed SER to conduct a comparison to the findings from the 2019/2020 study and to begin tracking how Wyoming residents' perspectives about energy are evolving over time. The current request is a proposed follow-up study that will also follow the same methodology used in the first two studies, and update the survey and interview questions to reflect relevant energy topics and technologies.

The ERC Exception Review and Recommendation Committee (ERRC) recommends the project be funded for the requested amount of $16,177 out of the Economic Innovation Subaccount to fully encumber remaining funds in that account.

Motion – Charlene Russell made a motion to approve the funding request for $16,177 out of the Economic Innovation Subaccount. David Emery seconded the motion.
The motion was approved without objection.

WEA Update – Rob Creager

Reports/Motions

Full copies of the following SER reports are available in the August ERC Folio or upon request.

Presenting Director Reports

- Research – Scott Quillinan and Erin Phillips
- CEGR – Fred McLaughlin
- CCCC – Trina Igelsrud Pfeiffer
- CERPA – Matt Fry
- H_2ERC – Eugene Holubnyak
- EORI – Lon Whitman
- COIFPM – Mohammad Piri

SER Financial Report – Rachel Ferrell and Holly Krutka

New Business

Energy Resources Council Bylaws

Draft bylaws were created to enhance governance and structure, and to ensure best practices. These bylaws define the council's purpose, scope, and authority, ensuring that all members are aligned with its core mission as outlined by Wyoming Statute § 21-17-117.

Chairman Crane emphasized the importance of including a Code of Conduct and requiring Council members to complete an annual Conflict of Interest disclosure. She requested that they be included in a future ERC meeting for review and adoption.

Motion – Sen. Ed Cooper made a motion to approve the ERC Bylaws as edited. Chad Teply seconded the motion.
The motion was approved without objection.

Other new business
Peter Gottfried proposed appointing a task force to explore the possibility of UW developing a nuclear engineering degree program. The Council discussed the efforts that SER has already made in developing nuclear-related curriculum – informed by industry partners – and determined that efforts should remain focused on growing opportunities for UW students in other disciplines to enhance employability.

Dave Emery was interested in whether there is any tracking of the utilization of UW's K-12 curriculum.

Executive Session

No executive session.

Adjournment
David Emery made a motion to adjourn the meeting. Charlene Russell seconded the motion.
The meeting was adjourned at 12:29 PM.

TASKS AND ASSIGNMENTS

Craft a Code of Conduct form as well as a Conflict-of-Interest form for review and adoption at the next ERC meeting.

NEXT MEETING DETAILS

November 20-21, 2025, in Laramie, Wyoming
Joint with the UW Board of Trustees

RESPECTFULLY SUBMITTED:

Cindy Crane
Chairman

Ed Cooper
Vice Chairman

WELCOME LETTER

UNIVERSITY OF WYOMING | School of Energy Resources

LETTER FROM THE SCHOOL OF ENERGY RESOURCES EXECUTIVE DIRECTOR

Holly Krutka

Dear Members of the Energy Resources Council and the University of Wyoming Board of Trustees,

As we come together for this joint meeting—the final one I will attend as Executive Director of the School of Energy Resources—I find myself reflecting with deep gratitude and pride. SER has grown tremendously and now stands on a strong foundation that will continue to support Wyoming's energy future.

SER has become a leader among university energy programs nationwide—anchored in Wyoming values, grounded in scientific, legal, and economic excellence, and defined by a culture of respect and collaboration. This year alone, our research portfolio surpassed $120 million in active competitive awards, alongside significant state-supported programs—all focused on advancing Wyoming's energy and extractive future. Our team completed the Wyoming CarbonSAFE project, continued construction on a coal-to-products pilot plant demonstration, expanded Wyoming's expertise in critical minerals, launched new nuclear programs, supported Wyoming's oil and gas sector, and much more.

SER's academic program continues its upward trajectory with strong enrollment growth, 100% student placement, and new credentials that serve both our students and the state's energy industry workforce needs. Our outreach efforts have expanded through events, conferences, social media, the Energy Frontier podcast, and partnerships that connect SER's work with communities, industry, and policymakers across Wyoming.

Most importantly, the strength of SER lies in its people—the faculty, staff, students, and partners who will ensure that SER's momentum continues well into the future—under the careful governance of the ERC. The team I will leave behind is, without question, my greatest source of pride.

It has been an honor to serve the people of Wyoming, this University, and this Council. I am deeply grateful to each of you—particularly Chair Cindy Crane, President Ed Seidel, and the members of the ERC—for your vision, guidance, and trust. Together, we have built a School positioned to continue leading in innovation, collaboration, and real-world impact—in Wyoming, for Wyoming.

With sincere appreciation and confidence in what lies ahead,

Warm regards,

Holly Krutka

Holly Krutka, Ph.D.

FINANCIAL REPORT

University of Wyoming | School of Energy Resources

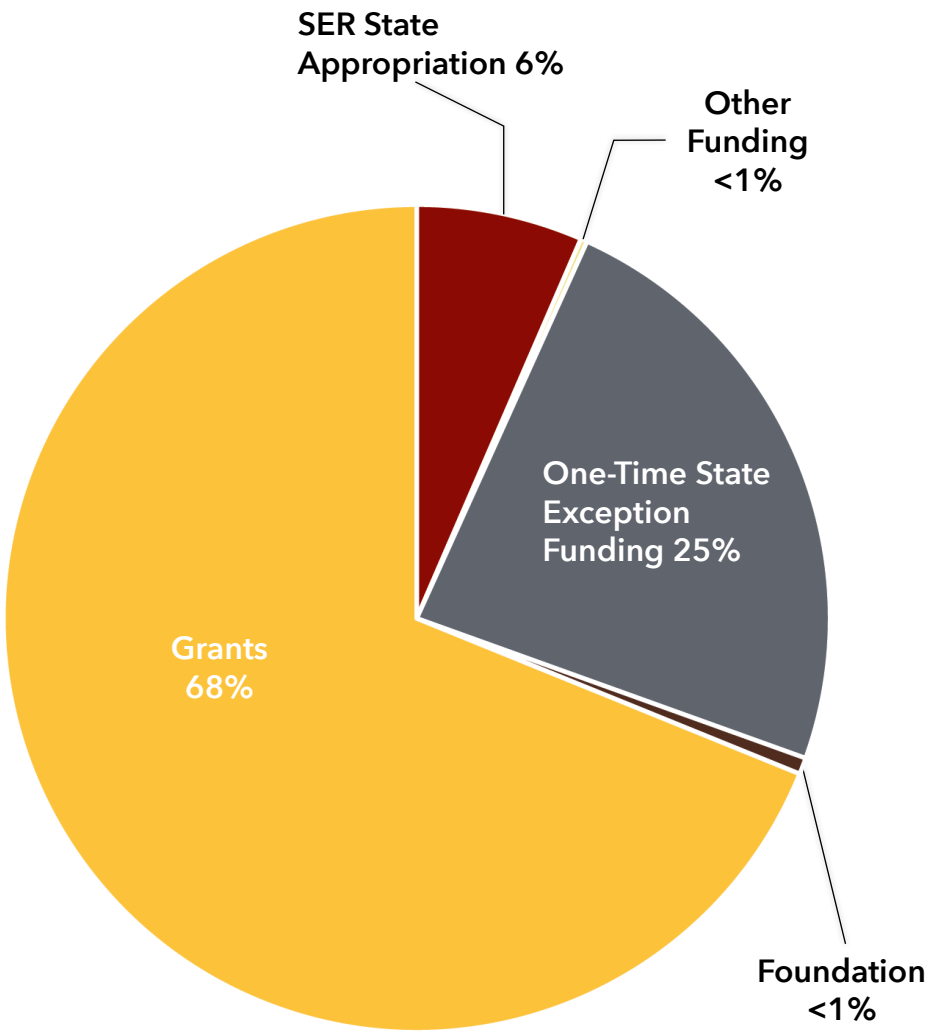
FINANCIAL REPORTS

Holly Krutka
Rachel Ferrell

School of Energy Resources Fiscal Year 2026 Q1 - Spending by Fund Type

	Fiscal Year 2026 Spending through Q1
SER State Appropriation	$2,023,492
Other Funding	$80,057
One-Time State Exception Funding	$7,977,793
Foundation	$200,511
Grants	$21,416,962
Total	**$31,698,816**

Notes:
Other funding includes spending on income from a variety of sources.



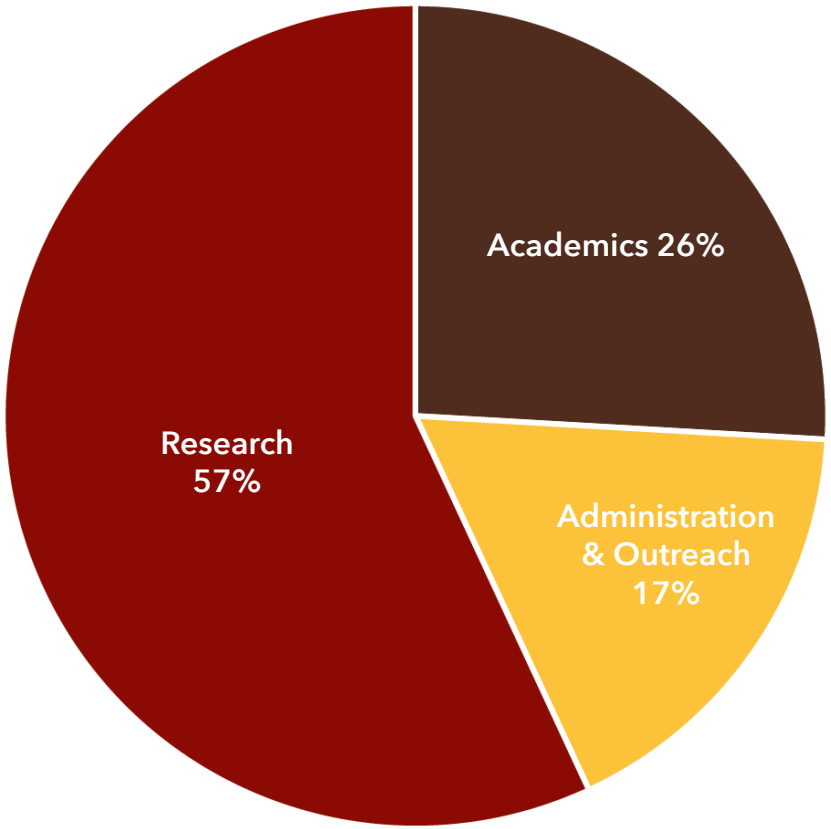
School of Energy Resources Fiscal Year 2026 - Standard Appropriation

Fiscal Year 2026	
Standard Block Appropriation	$10,553,904

	Fiscal Year 2026 Spending through Q1	Fiscal Year 2026 Budget
Academics	$611,535	$2,734,666
Administration & Outreach	$369,912	$1,812,561
Research	$1,042,045	$6,006,677
Total	**$2,023,492**	**$10,553,904**
% Spent	**19%**	

Spending through September 2025	Totals
Center of Innovation for Flow Through Porous Media	$46,775
College of Agriculture, Life Sciences & Natural Resources	$2,164
College of Business	$77,950
College of Engineering and Physical Sciences	$439,980
College of Law	$64,091
Ellbogen Center for Teaching & Learning	$1,609
Haub School of Environment & Natural Resources	$57,226
Total	**$689,795**

SER Spending	**$1,333,697**
Total through September 2025	**$2,023,492**



School of Energy Resources Combined Exception Funding

Exception Funding Areas	Spending through Fiscal Year 2026 Q1	Exception Funding
FY23 Carbon Engineering/Field Demo Pyrolysis Plant	$7,798,514	$8,000,000
FY23 Hydrogen Center of Excellence	$1,741,919	$2,000,000
FY23 Nuclear Energy Collaboration (Allocation 1)	$1,528,242	$2,000,000
FY24 Carbon Engineering/Research & Solvent Extraction Detailed Design	$9,098,144	$12,250,000
FY24 Mowry	$1,855,354	$2,500,000
FY25 Carbon Engineering/Solvent Extraction Field Demonstration Plant	$4,355,754	$17,000,000
FY25 Nuclear Energy Collaboration (Allocation 2)	$99,578	$2,000,000
FY25 Lithium Extraction Competition/XPRIZE	$273,757	$750,000
Total	**$26,751,261**	**$46,500,000**
% spent	58%	

Spending through September 2025	Totals
College of Agriculture, Life Sciences and Natural Resources	$39,675
College of Business	$400,738
College of Engineering and Physical Sciences	$6,376,344
College of Law	$104,717
Haub School of Environment & Natural Resources	$11,384
Western Research Institute	$3,617,502
Total	$10,550,360
SER Spending	$16,200,902
Total through September 2025	$26,751,261

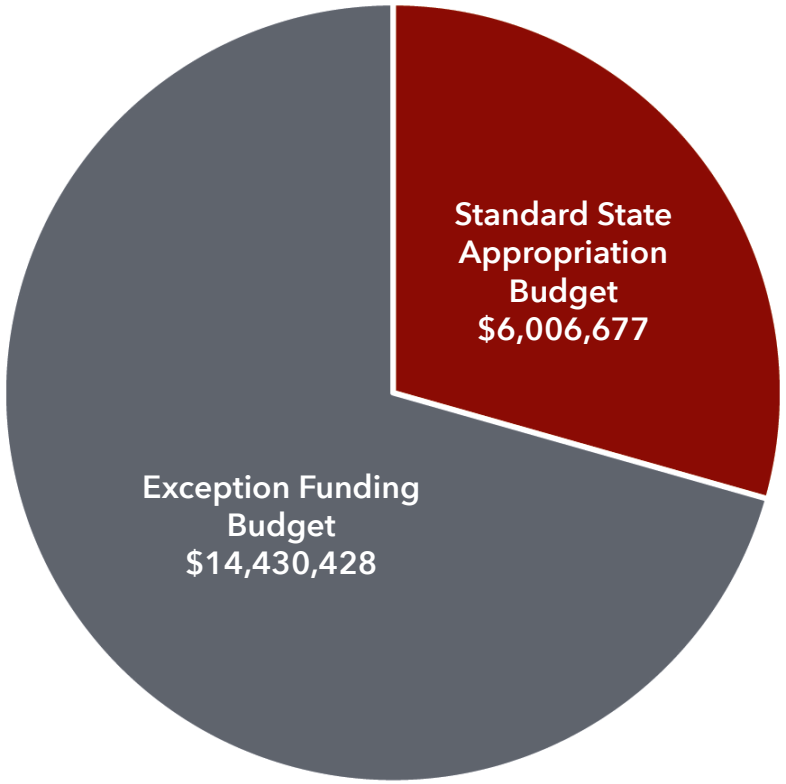
Exception Funding Key

FY23 Carbon Engineering / Field Demo Pyrolysis Plant: $8,000,000	$8M to be used for "coal refinery research, pyrolysis demonstration, or large scale pilot project through the University of Wyoming School of Energy Resources with further conditions and approval as determined by the governor. Expenditure of funds under this subsection shall not be conditioned upon receipt of matching funds, provided that a good faith effort to match the funds is made." (Section 321 b. Energy Matching Funds of SF0001 66th Legislative 2022 Budget Session)
FY23 Hydrogen Center of Excellence: $2,000,000	$2M to be used for "energy policy development at the University of Wyoming specifically including a Hydrogen Center of Excellence." (footnote 5 of Section 067 of SF0001 66th Legislative 2022 Budget Session)
FY23 Nuclear Energy Collaboration: $2,000,000 (Allocation 1)	$2M to be used for "a nuclear energy collaboration and training program." (footnote 4 of Section 067 of SF0001 66th Legislative 2022 Budget Session)
FY24 Carbon Engineering/ Research & Solvent Extraction Detailed Design: $12,250,000	$12.25M to be used for Carbon Engineering "to 1) operate the pyrolysis unit field demonstration (construction was previously appropriated) near Gillette; 2) demonstrate the major pyrolysis products in real-world conditions (pyrolysis products include coal char-based building materials, soil amendment products, and rubber-carbon products); 3) detailed engineering of the solvent extraction process; 4) advancement of solvent extraction products such as coal-based asphalt products" (see Wyoming Supplemental Budget 23-24, pgs 488 and 501)
FY24 Mowry: $2,500,000	$2.5M to be used for research "targeted at solving challenges related to production in the Mowry Formation" (see Wyoming Supplemental Budget 23-24, pgs 488 and 502)
FY25 Carbon Engineering/ Solvent Extraction Field Demonstration Plant: $17,000,000	$17M to be used for "demonstrations of coal solvent extraction and a coal-derived asphalt road." (per the 67th Legislature of the State of Wyoming 2024 Budget Session, HB0001, Enrolled Act 50, Section 067, Footnote 6)
FY25 Nuclear Energy Collaboration: $2,000,000 (Allocation 2)	$2M to be used for "building and continuing nuclear energy scholarship, research and training capacity at the University of Wyoming." (per the 67th Legislature of the State of Wyoming 2024 Budget Session, HB0001, Enrolled Act 50, Section 067, Footnote 8)
FY25 Lithium Extraction Competition/XPRIZE: $750,000	$750k to "administer, develop and implement an incentive innovator competition related to lithium extraction, development or use." (per the 67th Legislature of the State of Wyoming 2024 Budget Session, HB0001, Enrolled Act 50, Section 067, Footnote 9)

School of Energy Resources Fiscal Year 2026 - State-Funded Research Programs

Funding Source	Fiscal Year 2026 Spending through Q1	Fiscal Year 2026 Budget
Standard State Appropriation	$1,042,045	$6,006,677
Exception Funds	$7,977,793	$14,430,428
Total	**$9,019,839**	**$20,437,105**

Research Programs Funded	56
Departments Funded	11
Principal Investigators & Co-PIs Supported	
External	32
Internal	13
Total	**45**



Fiscal Year 2026 State-Funded Research Programs

Title	PI(s)	UW Department/ College	Topic Area	Funding Source	FY26 Budget
Research Administrative Support	Scott Quillinan	ADMIN/SER	SER Research	SER Standard Biennium Budget	$4,698,827
Dr. Ahn Startup Engineering	Juhyeon Ahn	Chemical & Biomedical Engineering, CEPS	Energy Storage	SER Standard Biennium Budget	$62,700
Dr. Hoon Choi Startup Engineering	Hoon Choi	Chemical & Biomedical Engineering, CEPS	Rare Earth Elements & Minerals Added Value	SER Standard Biennium Budget	$70,000
Energy ELC	Erin Phillips	EELC/SER	Cross-Cutting Program Director to Manage Grant Execution & Projects	SER Standard Biennium Budget	$74,000
Subsurface Digital Energy Innovation Center	Soheil Saraji	Energy & Petroleum Engineering, CEPS	Innovative Research and Finding Solutions to Energy Development Challenges	SER Standard Biennium Budget	$80,000
Placer Heavy Mineral Deposits	Brandon McElroy & Joseph Biasi	Geology & Geophysics, CEPS	Generate Novel Approaches to Exploring, Assessing, and Extracting Placer Mineral Deposits	SER Standard Biennium Budget	$124,000
Biogenic Hydrogen	Michael Urynowicz	Civil & Architectural Engineering & Construction Management, CEPS	Production of a Biohydrogen Mixed Gas in Coal Seams	SER Standard Biennium Budget	$40,000
Center for Economic Geology Research	Fred McLaughlin	CEGR/SER	Applied Geologic Research	SER Standard Biennium Budget	$177,000
Center for Energy Regulation and Policy Analysis	Matt Fry	CERPA/SER	Energy Policy and Economics	SER Standard Biennium Budget	$120,000
Center for Produced Water Management	Jonathan Brant	Civil & Architectural Engineering & Construction Management, CEPS	Produced Water Management	SER Standard Biennium Budget	$40,000
Shell 3D Visualization Center	Kyle Summerfield	3D Viz/SER	Visualization	SER Standard Biennium Budget	$480,150
Wind Energy Research Center	Jonathan Naughton & Michael Stoellinger	Mechanical Engineering, CEPS	Wind Energy	SER Standard Biennium Budget	$40,000
A Multiscale Computing Framework for Advancing Hydrogen Transportation Infrastructure	Haibo Zhai	Civil & Architectural Engineering & Construction Management, CEPS	Hydrogen	FY23 Exception Appropriation ($2M H_2ERC)	$104,067
Developing a Smart, Safe, Sustainable, Resilient (SSSR) Hydrogen Transport Ecosystem in Wyoming	Charlie Zhang & Selena Gerace	Civil & Architectural Engineering & Construction Management, Mechanical Engineering, CEPS/SER	Hydrogen	FY23 Exception Appropriation ($2M H_2ERC)	$64,726

Title	PI(s)	UW Department/ College	Topic Area	Funding Source	FY26 Budget
Hydrogen Energy Research Center	Eugene Holubnyak	H_2ERC/SER	Hydrogen	FY23 Exception Appropriation ($2M H_2ERC)	$104,317
Hydrogen Production through Coal Gasification – State of the Art and Future Directions	Saman Aryana	Chemical and Biomedical Engineering, CEPS	Hydrogen	FY23 Exception Appropriation ($2M H_2ERC)	$67,389
Economic Study of Adopting or Becoming a Manufacturer of Components of SMR	Charlie Zhang & Selena Gerace	Civil & Architectural Engineering & Construction Management, CEPS/SER	Nuclear	FY23 Exception Appropriation ($2M NERC)	$95,064
Establishing a Nuclear Chemistry Core Facility at UW	Caleb Hill	Chemistry, CEPS	Nuclear	FY23 Exception Appropriation ($2M NERC)	$181,113
Nuclear Energy Research Center	Caleb Hill, Tara Righetti & Scott Quillinan	Chemistry, CEPS/Law/SER	Nuclear	FY23 Exception Appropriation ($2M NERC)	$227,618
Pilot Study of Integrated Geophysical Method Characterization of Deposition/Roll Front Uranium Deposits in the Shirley Basin, Wyoming	Bradley Carr	Geology & Geophysics, CEPS	Nuclear	FY23 Exception Appropriation ($2M NERC)	$5,010
Pyrolysis	Trina Igelsrud Pfeiffer & Eli Ellis	CCCC/SER	Pyrolysis	FY23 Exception Appropriation ($8M)	$256,676
Rare Earth Elements Extraction	Trina Igelsrud Pfeiffer	CCCC/SER	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$13,003
Development of Graphitic Materials from Coal Char	Jonathan Brant	Civil & Architectural Engineering and Construction Management, CEPS	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$292,953
Evaluation of Carbon-Based Filtration Membranes for Furthering Municipal Water Reuse in Wyoming	Jonathan Brant	Civil & Architectural Engineering & Construction Management, CEPS	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$190,077
Solvent Extraction	Trina Igelsrud Pfeiffer	CCCC/SER	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$105,340
Coal Residues and Terrestrial Algae as a Soil Amendment	John Oakey	Chemical & Biomedical Engineering, CEPS	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$119,721
Coal Construction Materials	Kam Weng Ng	Civil & Architectural Engineering & Construction Management, CEPS	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$203,065
Soil Amendment	Resham Thapa	CCCC/SER	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$74,991

Title	PI(s)	UW Department/ College	Topic Area	Funding Source	FY26 Budget
Demo House Brick Wall Construction/2nd Generation Bricks	Kam Weng Ng	Civil & Architectural Engineering & Construction Management, CEPS	Coal to Non-energy & Fuel Products Processing	FY24 Exception Appropriation ($12.25M)	$15,045
Coal Refinery Lease	Trina Igelsrud Pfeiffer	CCCC/SER	Center for Carbon Capture and Conversion	FY24 Exception Appropriation ($12.25M)	$64,800
Wood (Pyrolysis Demonstration Plant)	Trina Igelsrud Pfeiffer	CCCC/SER	Center for Carbon Capture and Conversion	FY24 Exception Appropriation ($12.25M)	$4,876,308
Wood (Pyrolysis Demonstration Plant I&E Purchases)	Trina Igelsrud Pfeiffer	CCCC/SER	Center for Carbon Capture and Conversion	FY24 Exception Appropriation ($12.25M)	$48,405
A Mechanistic Understanding of the Influence of Ex-situ Fluids and In-situ Stresses on Flow and Transport in Mowry Shale Facies	Saman Aryana, Kam Weng Ng, & Vladimir Alvarado	Chemical & Biomedical Engineering; Civil & Architectural Engineering & Construction Management, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$135,773
Assessing Controls on Dynamic Redox Conditions in the Cretaceous Mowry Seaway Using High-resolution Chronology and Organic Geochemistry	Jamie McFarlin	Geology & Geophysics, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$33,063
Data-driven Design of Optimal Stimulation Fluid Chemistry	Vladimir Alvarado, Saman Aryana, & John Kaszuba	Chemical & Biomedical Engineering; Geology & Geophysics, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$141,887
Drilling Fluids Stability and Compatibility with Mowry Shale-Bentonite Layers	Tawfik Elshehabi	Energy & Petroleum Engineering, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$16,828
Economics of the Mowry Shale	Tim Considine	College of Business	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$21,128
Exploring Well-log-Based Geochemical Mapping of Mowry Shale Using Attention U-Net	Po Chen	Geology & Geophysics, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$35,367
Fundamental Investigation of Fluid Phase Transition Confined in Mowry Shale	Hertanto Adidharma & Morteza Dejam	Energy & Petroleum Engineering, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$10,465
Modeling and Design of Hydraulic Fractures for Reduced Uncertainty and Increased Productivity in Mowry Petroleum System	Xiang Zhang	Mechanical Engineering, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$75,185
Mowry Shale Geology, Sweet Spot Delineation, and Production Evaluation in the Powder River Basin, Wyoming	Matthew Johnson & Zunsheng Jiao	CEGR/SER	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$69,553
Oil and Gas Production Optimization and Performance Improvement through Understanding the Geomechanics of Mowry Shale	Kam Weng Ng & Saman Aryana	Civil & Architectural Engineering & Construction Management, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$69,629

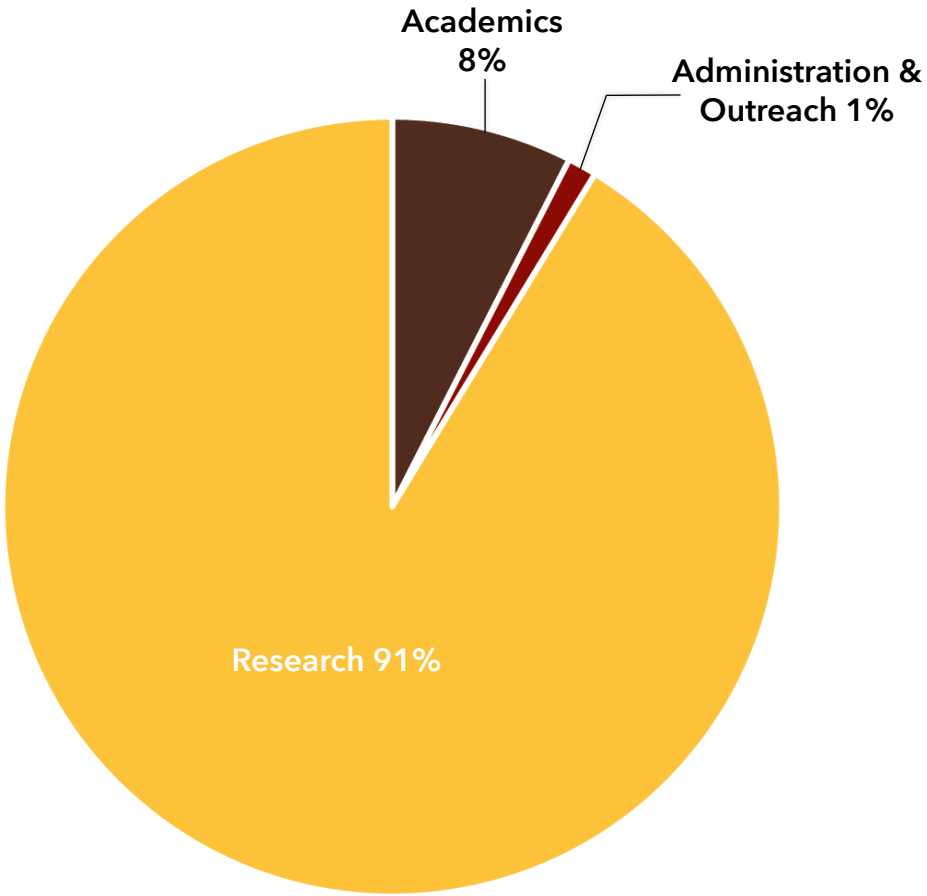
Title	PI(s)	UW Department/ College	Topic Area	Funding Source	FY26 Budget
Spatiotemporal GNN-Based Model to Forecast Production in Mowry Shale	Minou Rabiei	Energy & Petroleum Engineering, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$29,849
Sweet Spot Identification in the Mowry Formation: A Synergistic Laboratory	Soheil Saraji	Energy & Petroleum Engineering, CEPS	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$65,736
Mowry Administration	Tim Fischer	CEGR/SER	Oil & Gas	FY24 Exception Appropriation ($2.5M Mowry)	$161,207
Coal-Based Asphalt Products	Jeramie Adams	WRI	Coal to Non-energy & Fuel Products Processing	FY25 Exception Appropriation ($17M)	$1,000,062
Solvent Extraction	Trina Igelsrud Pfeiffer	CCCC/SER	Coal to Non-energy & Fuel Products Processing	FY25 Exception Appropriation ($17M)	$690,823
Wood - Field Demonstration (Solvent Extraction Detailed Engineering)	Trina Igelsrud Pfeiffer	CCCC/SER	Coal to Non-energy & Fuel Products Processing	FY25 Exception Appropriation ($17M)	$3,500,000
Lithium Research	Scott Quillinan	ADMIN/SER	Minerals	FY25 Exception Appropriation ($750k)	$548,861
NREL Cost Share	Jonathan Brant	Civil & Architectural Engineering & Construction Management, CEPS	Minerals	FY25 Exception Appropriation ($750k)	$63,399
Nuclear Energy Research Center 2.0	Caleb Hill, Tara Righetti, & Scott Quillinan	Chemistry / Law / SER	Nuclear	FY25 Exception Appropriation ($2M NERC 2.0)	$355,000
Combining Shallow Seismic Reflection, Magnetotelluric and Full Waveform Induced Polarization Geophysical Imaging of Sedimentary Uranium Deposits in Wyoming	Bradley Carr	Geology & Geophysics, CEPS	Nuclear	FY25 Exception Appropriation ($2M NERC 2.0)	$55,556
Multiscale Thermal Transport Modeling of UO_2 in the Presence of Fission Products	Laura Rita de Sousa Oliveira	Chemistry, CEPS	Nuclear	FY25 Exception Appropriation ($2M NERC 2.0)	$51,018
Systems Analysis of Advanced Nuclear Reactors for Powering AI Data Centers	Haibo Zhai	Civil & Architectural Engineering & Construction Management, CEPS	Nuclear	FY25 Exception Appropriation ($2M NERC 2.0)	$44,444
Improve Nuclear Safety and Lower Operating Cost through Multiscale Computational Modeling: Study of Combined Thermal & Irradiation Creep of Stainless Steel Fuel Cladding	Xiang Zhang	Mechanical Engineering CEPS	Nuclear	FY25 Exception Appropriation ($2M NERC 2.0)	$43,018

Title	PI(s)	UW Department/ College	Topic Area	Funding Source	FY26 Budget
Building and Accessing a Digital Twin for Repurposing Nuclear Fuel for Community and Industry Engagement	Katie Dongmei Li-Oakey	Chemical & Biomedical Engineering, CEPS	Nuclear	FY25 Exception Appropriation ($2M NERC 2.0)	$55,556
Public Perceptions, Public Policy: A Mixed-methods Study of a Wyoming Nuclear Power Host-Community	Daniel Auerbach & Amanda Lynn Sikirica	Criminal Justice & Sociology, A&S	Nuclear	FY25 Exception Appropriation ($2M NERC 2.0)	$47,333
					$20,437,105

School of Energy Resources Fiscal Year 2026 - Foundation Funds

	Fiscal Year 2026 Spending through Q1	Fiscal Year 2026 Budget
Academics	$32,935	$268,223
Administration & Outreach	$1,165	$43,003
Research	$166,410	$3,260,906
Total	**$200,511**	**$3,572,131**

Spending through September 2025	Totals
College of Business	$32,648
College of Engineering and Physical Sciences	$121,348
College of Law	$14,082
Total	**$168,078**
SER Spending	$32,432
Total through September 2025	**$200,511**

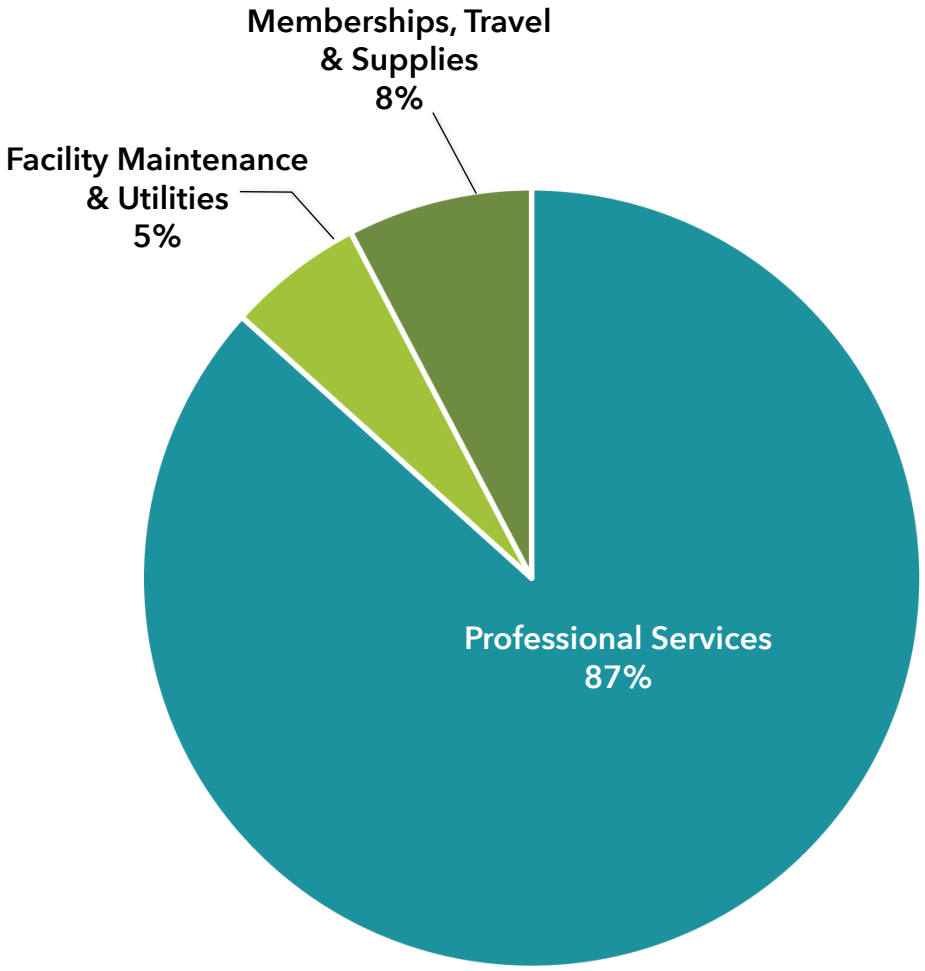


Wyoming Integrated Test Center Fiscal Year 2026

ITC Income and Expenditures

Fiscal Year 2025 Ending Balance	$1,908,575
Less: Reclamation Encumbrance	$(700,000)
Available Cash as of July 1, 2025	$1,208,575
Add: Fiscal Year 2026 Interest Earned through Q1, Net	$26,119
Less: Fiscal Year 2026 Spending through Q1	$(89,405)
Balance as of September 30, 2025	$1,145,289

ITC Expenses	Fiscal Year 2026 spending through Q1	Fiscal Year 2026 Budget
Professional Services	$83,535	$954,550
Facility Maintenance & Utilities	$4,758	$62,260
Memberships, Travel, & Supplies	$1,112	$84,500
Total ITC Expenses	**$89,405**	**$1,101,310**

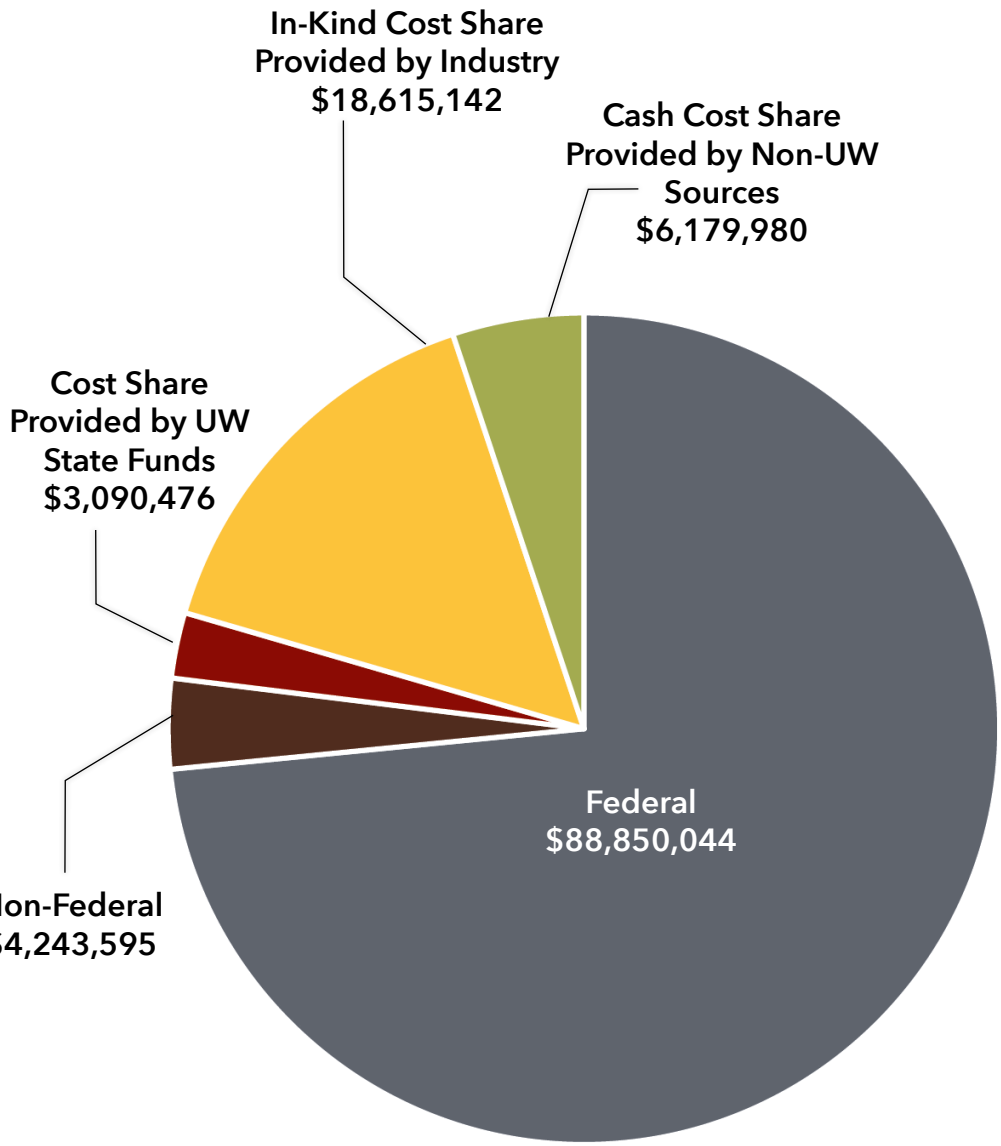


School of Energy Resources Fiscal Year 2026 - Active Awards

	Start	End
Funding Period	7/1/19	6/30/28

	Spending through Fiscal Year 2026 Q1	Fiscal Year 2026 Active Awards
Federal	$66,401,622	$88,850,044
Non-Federal	$1,609,598	$4,243,595
Cost Share Provided by UW State Funds	$2,235,807	$3,090,476
In-Kind Cost Share Provided by Industry	$12,147,137	$18,615,142
Cash Cost Share Provided by Non-UW Sources	$3,220,202	$6,179,980
Total	**$85,614,365**	**$120,979,238**

Awards Funded	46
Departments Funded	8
Principal Investigators Supported	
External	10
Internal	15
Total	**25**



Notes:

In-kind cost share does not involve an exchange of money, rather, outside entities provide services at no-cost to UW.

School of Energy Resources Fiscal Year 2026 Q1 Active Awards - Project Financial Summary Report

Project Number	Project Name	Project Type	Project Start Date	Project End Date	Principal Investigator	Grant Funding Type	Project Funding Amount
1004308B	Fluid-Rock Interactions between Frac Fluid and Delaware Basin/ Wolfcamp Fm	UW Grant	2023-06-01	2027-12-31	Kaszuba, John	Non-Federal	$556,930
1004308C	Fluid Rock Interactions in Geothermal Systems SOW3	UW Grant	2025-01-01	2027-12-31	Kaszuba, John	Non-Federal	$532,828
1004332A	Developing CO_2-EOR and Associate Storage Within the Residual Oil Zone Fairways of the Powder River Basin, Wyoming (CEGR account)	UW Grant	2019-07-01	2025-12-31	Jones, Nicholas	Federal Direct	$325,362
1004709	Plains CO_2 Reduction Partnership Initiative to Accelerate Carbon Capture, Utilization and Storage Deployment	UW Grant	2020-05-01	2025-08-31	McLaughlin, Fred	Federal Passthrough	$1,491,791
1004709CS	Plains CO_2 Reduction Partnership Initiative to Accelerate Carbon Capture, Utilization and Storage Deployment - Cost Share	UW Grant Cost Share - Designated	2020-05-01	2025-08-31	Phillips, Erin	Non-Federal	$261,194
1004740	Bayesian Learning Consortium	UW Grant	2020-07-01	2028-06-30	Grana, Dario	Non-Federal	$250,000
1004866	Wyoming CarbonSAFE: Accelerating CCUS Commercialization and Deployment at Dry Fork Power Station and the Wyoming Integrated Test Center	UW Grant	2020-10-01	2025-09-30	Quillinan, Scott	Federal Direct	$17,190,829
1004866A	Wyoming CarbonSAFE: Accelerating CCUS Commercialization and Deployment at Dry Fork Power Station and the Wyoming Integrated Test Center - Basin Electric CS	UW Grant Cost Share	2020-10-01	2025-09-30	Quillinan, Scott	Non-Federal	$1,199,696
1004866B	Wyoming CarbonSAFE: Accelerating CCUS Commercialization and Deployment at Dry Fork Power Station and the Wyoming Integrated Test Center	UW Grant Cost Share	2024-12-17	2025-09-30	Quillinan, Scott	Non-Federal	$375,000
1004866CS	Wyoming CarbonSAFE: Accelerating CCUS Commercialization and Deployment at Dry Fork Power Station and the Wyoming Integrated Test Center CS	UW Grant Cost Share - Designated	2020-10-01	2025-09-30	Quillinan, Scott	Non-Federal	$986,245
1004866 - In-kind CS	Wyoming CarbonSAFE: Accelerating CCUS Commercialization and Deployment at Dry Fork Power Station and the Wyoming Integrated Test Center CS	UW Grant In-kind Cost Share	2020-10-01	2025-09-30	Quillinan, Scott	Non-Federal	$2,184,304
1004964B	SMART Phase 2 ML Tools to Accelerate and Complement Geologic Carbon Storage CO_2	UW Grant	2024-07-22	2025-12-30	McLaughlin, Jonathan	Federal Passthrough	$122,000

Project Number	Project Name	Project Type	Project Start Date	Project End Date	Principal Investigator	Grant Funding Type	Project Funding Amount
1005271TCS	Evaluation of Critical Minerals (CMs) Deposits, Mainly Lithium (Li) and Rare Earth Elements (REEs), in Wyoming as well as the Economic Visibility of Mining those Resources 2024-2025 - Fan CS	UW Grant Cost Share	2024-09-01	2025-08-31	Fan, Maohong	Non-Federal	$808
1005412	REE Extraction from Powder River Basin Coal Byproducts and Mining Waste in Response to DOE's Technology Commercialization Fund, Gillette	UW Grant	2020-12-02	2025-03-31	Bagdonas, Davin	Non-Federal	$187,500
1005412A	REE Extraction from Powder River Basin Coal Byproducts and Mining Waste in Response to DOE's Technology Commercialization Fund	UW Grant	2020-12-02	2025-03-31	Bagdonas, Davin	Non-Federal	$187,500
1005412CS1	REE Extraction from Powder River Basin Coal Byproducts and Mining Waste in Response to DOE's Technology Commercialization Fund - Designated Op. General	UW Grant Cost Share	2020-12-02	2025-03-31	Bagdonas, Davin	Non-Federal	$183,140
1005426CS	Multiscale Investigations of Two- and Three-Phase Flow in Porous Media of Varying Wettability States Using Experimental and Digital Rock Technologies - SER CS	UW Grant Cost Share	2021-12-28	2025-12-28	Piri, Mohammad	Non-Federal	$800,000
1005803	Energy Science Graduate Stipends and Fellowships AY22-23	UW Grant	2022-08-18	2027-06-30	Mankin, Madison	Federal Passthrough	$310,539
1005885	Open Architecture for Nuclear Cost Reduction	UW Grant	2022-10-01	2026-09-30	Righetti, Tara	Federal Passthrough	$200,000
231620A0001	Bipartisan Infrastructure Law (BIL)- The Williams Echo Springs CarbonSAFE Storage Complex Feasibility Study	UW Grant	2024-10-01	2026-09-30	Nye, Charles	Federal Direct	$8,997,490
231620A0001 - In-kind CS	Bipartisan Infrastructure Law (BIL)- The Williams Echo Springs CarbonSAFE Storage Complex Feasibility Study	UW Grant In-kind Cost Share	2024-10-01	2026-09-30	Nye, Charles	Non-Federal	$1,950,482
231620A0002	Cost Share CarbonSAFE Phase II Echo Springs	UW Grant Cost Share	2024-12-17	2026-05-31	Nye, Charles	Non-Federal	$300,000
231647A0001	Wyoming Class VI Site Characterization Database	UW Grant	2024-03-01	2026-02-28	Eakin, Autumn	Federal Direct	$998,968
231647A0002	Wyoming Class VI Site Characterization Database - CS	UW Grant Cost Share	2024-05-02	2026-02-28	McLaughlin, Jonathan	Non-Federal	$999,925

Project Number	Project Name	Project Type	Project Start Date	Project End Date	Principal Investigator	Grant Funding Type	Project Funding Amount
231741A0001	HERO Basalt CarbonSAFE Hermiston Oregon Basalt Carbon Storage Assurance Facility Enterprise	UW Grant	2023-10-01	2025-09-30	Eakin, Daniel	Federal Direct	$8,407,697
231741A0001CS	HERO Basalt CarbonSAFE Hermiston Oregon Basalt Carbon Storage Assurance Facility Enterprise - CS	UW Grant Cost Share	2023-10-01	2025-09-30	Eakin, Daniel	Non-Federal	$115,732
231741A0001 - In-kind CS	HERO Basalt CarbonSAFE Hermiston Oregon Basalt Carbon Storage Assurance Facility Enterprise - CS	UW Grant In-kind Cost Share	2023-10-01	2025-09-30	Eakin, Daniel	Non-Federal	$1,950,000
231764A0001	Coal-derived Graphene Materials for Industrial Applications	UW Grant	2023-09-01	2025-08-31	Igelsrud Pfeiffer, Trina	Federal Passthrough	$202,836
231764A0001CS	Coal-derived Graphene Materials for Industrial Applications - CS	UW Grant Cost Share	2023-09-01	2025-08-31	Igelsrud Pfeiffer, Trina	Non-Federal	$71,350
231771A0003	Work order #3 Bayesian Time-lapse Seismic Inversion	UW Grant	2024-03-11	2025-07-31	Grana, Dario	Non-Federal	$81,816
231771A0004	Work order #4 Bayesian Time-lapse Seismic and Rock Physics Inversion	UW Grant	2024-10-11	2025-08-30	Grana, Dario	Non-Federal	$80,120
231771A0005	Work order #5 Seismic Inversion with Frequency Dependent Rock Physics Models	UW Grant	2024-10-10	2025-12-31	Grana, Dario	Non-Federal	$104,779
231771A0006	Work order #6 Bayesian Full Waveform Inversion	UW Grant	2025-07-01	2025-12-31	Grana, Dario	Non-Federal	$81,630
231797A0001	Integration of Produced Water Thermal Desalination and Steam Methane Reforming for Efficient Hydrogen Production	UW Grant	2023-11-01	2026-06-30	Nye, Charles	Federal Direct	$4,997,679
231797A0001CS	Integration of Produced Water Thermal Desalination and Steam Methane Reforming for Efficient Hydrogen Production - CS	UW Grant Cost Share	2023-11-01	2026-06-30	Nye, Charles	Non-Federal	$380,623
231797A0002	Integration of Produced Water Thermal Desalination and Steam Methane Reforming for Efficient Hydrogen Production - CS	UW Grant Cost Share	2024-04-15	2027-03-31	Nye, Charles	Non-Federal	$2,750,000
231797A0001 - In-kind CS	Integration of Produced Water Thermal Desalination and Steam Methane Reforming for Efficient Hydrogen Production	UW Grant In-kind Cost Share	2023-11-01	2026-06-30	Nye, Charles	Non-Federal	$1,700,456
231849A0001	Bipartisan Infrastructure Law - Sweetwater Carbon Storage Hub	UW Grant	2024-08-15	2027-07-31	Jiao, Zunsheng	Federal Direct	$43,298,228
231849A0001 - In-kind CS	Bipartisan Infrastructure Law - Sweetwater Carbon Storage Hub - Frontier Carbon Solution	UW Grant In-kind Cost Share	2024-08-15	2027-07-31	Jiao, Zunsheng	Non-Federal	$10,829,900

Project Number	Project Name	Project Type	Project Start Date	Project End Date	Principal Investigator	Grant Funding Type	Project Funding Amount
240003A0001	The NERC Faculty Scholars Program	UW Grant	2023-04-13	2027-04-12	Hill, Caleb	Federal Direct	$600,000
240003A0001CS	The NERC Faculty Scholars Program - CS	UW Grant Cost Share	2023-04-13	2027-04-12	Hill, Caleb	Non-Federal	$69,204
240118A0001CS	Transforming Carbon Fiber Reinforced Polymer Wastes into Recyclable Structural Automotive Components - Fan CS	UW Grant Cost Share	2024-08-01	2025-11-30	Fan, Maohong	Non-Federal	$26,285
240374A0001CS	SABER-Site-Air-Basin Emissions Reconcilliation-CS	UW Grant Cost Share	2023-08-01	2026-10-29	Murphy, Shane	Non-Federal	$100,283
240430A0001	Understanding Pore Space Values: A Technical, Legal, and Economic Analysis of Valuation Methodolgies and Contractual Structures for Pore Space Acquisitions for Geologic Storage	UW Grant	2023-08-01	2025-11-30	Righetti, Tara	Federal Passthrough	$500,000
240430A0003	Critical Minerals Leadership Academy (CMLA)	UW Grant	2024-09-26	2025-12-31	Phillips, Erin	Federal Passthrough	$206,000
240475A0001	Catalyst-Enhanced Sustainable H_2 Production from FE-Rich Rocks: An Experimental and Quantitative Resource Assessment	UW Grant	2024-06-13	2026-06-12	Nye, Charles	Federal Passthrough	$649,822
240576A0001A	Time's Ticking: Embarking on the Wyoming Trails Carbon Hub ("WyoTCH")- SER Portion	UW Grant	2023-10-01	2026-03-31	Righetti, Tara	Federal Passthrough	$541,342
240582A0001CS	Uinta Basin CarbonSAFE II: Storage Complex Feasibility - CS	UW Grant Cost Share	2023-10-01	2025-12-29	Fan, Maohong	Non-Federal	$19,223
240613A0002	Wyoming-Sourced Rare Earth Elements as Neutron Poisons	UW Grant	2024-09-01	2025-08-31	Kirby, Andrew	Non-Federal	$25,492
240613A0002A	Wyoming-Sourced Rare Earth Elements as Neutron Poisons - AI State Match	UW Grant	2024-09-01	2025-08-31	Kirby, Andrew	Non-Federal	$25,492
240629A0001	Unlocking the Potential for Critical Minerals Development in Energy Communities	UW Grant	2024-07-01	2027-07-31	Lewis, Madeleine	Non-Federal	$620,303
240629A0001PC	Unlocking the Potential for Critical Minerals Development in Energy Communities - Participant Costs	UW Grant	2024-07-01	2027-07-31	Lewis, Madeleine	Non-Federal	$25,329
240691A0001	Asphalt Binder Production from PRB Coal using Solvent Extraction Pilot Plant Scale-up and Operation Project	UW Grant	2024-06-20	2026-06-19	Igelsrud Pfeiffer, Trina	Federal Passthrough	$120,000

Project Number	Project Name	Project Type	Project Start Date	Project End Date	Principal Investigator	Grant Funding Type	Project Funding Amount
240691A0001A	Asphalt Binder Production from PRB Coal using Solvent Extraction Pilot Plant Scale-up and Operation Project- WYDOT State Match	UW Grant	2024-06-20	2026-06-19	Igelsrud Pfeiffer, Trina	Non-Federal	$30,000
240870A0001CS2	Project WyoTCH: Developing a Roadmap for a Sustainable Carbon Hub CS2 - Fan	UW Grant Cost Share	2024-03-01	2026-05-29	Fan, Maohong	Non-Federal	$30,154
240986A0001	Expand Markets for Climate-Smart Sugar as a Bundle with Carbon Offset in CO, MT, NE, WY and Crow Tribe and Support Farmer Implementation and Monitoring of Climate-Smart Practices	UW Grant	2024-04-01	2025-12-31	Igelsrud Pfeiffer, Trina	Federal Passthrough	$0
240986A0001CS	Expand Markets for Climate-Smart Sugar as a Bundle with Carbon Offset in CO, MT, NE, WY and Crow Tribe and Support Farmer Implementation and Monitoring of Climate-Smart Practices-CS	UW Grant Cost Share	2024-04-01	2025-12-31	Igelsrud Pfeiffer, Trina	Non-Federal	$34,602
250073A0001	WE Soda | Master Research Agreement	UW Grant	2024-09-01	2027-08-31	Quillinan, Scott	Non-Federal	$1
250154A0001	Wyoming Innovation Partnership (WIP) VR Development Services	UW Grant	2025-01-27	2025-06-30	Summerfield, Kyle	Non-Federal	$140,625
250154A0002	Plant Growth and Phenotyping Lab	UW Grant	2025-01-27	2025-06-30	Summerfield, Kyle	Non-Federal	$121,875
250347A0001CS	Scalable and Efficient Membrane Distillation and Absorption Process for High-Purity Water and Lithium Recovery from Produced Water in New Mexico - Fan-CS	UW Grant Cost Share	2024-08-16	2026-06-30	Fan, Maohong	Non-Federal	$11,633
250389A0001	Partnering for Progress: Stakeholder Insights into Industrial Carbon Strategies	UW Grant	2025-02-03	2026-01-31	Eakin, Autumn	Non-Federal	$54,356
250426A0001	WIP Augmented Reality for Educators, Old Faithful Inn VR Program, Wallop Civic Engineering 360 Program & Plant Lab & Phenotyping VR Experience	UW Grant	2025-01-29	2025-08-01	Summerfield, Kyle	Non-Federal	$85,187
250522A0001	Sierra Madre Geo-Hydrogen Project	UW Grant	2025-04-01	2027-03-31	Buckhold, Sarah	Non-Federal	$506,942
250522A0001A	Sierra Madre Geo-Hydrogen Project - AI State Match	UW Grant	2025-04-01	2027-03-31	Buckhold, Sarah	Non-Federal	$499,867
250730A0001	2025 Sweetwater Management CEGR Project	UW Grant	2025-09-12	2027-09-11	Brown, Tyler	Non-Federal	$151,865
250799A0002	2025 EnWyo Center of Excellence for Biogenic Natural Gas Project (CEBNG) v2.0	UW Grant	2025-07-15	2026-10-31	Huang, Zaixing	Non-Federal	$80,408

Project Number	Project Name	Project Type	Project Start Date	Project End Date	Principal Investigator	Grant Funding Type	Project Funding Amount
260106A0001	2025 CORE Natural Resources - Black Thunder Sample Analysis	UW Grant	2025-09-01	2025-11-30	Brown, Tyler	Non-Federal	$32,570
260165A0001	Conversion of Coal Char to Nanomaterials	UW Grant	2025-08-01	2026-07-01	Brant, Jonathan	Non-Federal	$25,000
							$120,979,238

Notes:
The highlighted row reflect in-kind contributions.
There are currently over $43 million awarded grants pending final negotiations and set-up.

UNIVERSITY OF WYOMING | School of Energy Resources

DIRECTOR REPORTS

ITC | Scott Quillinan

EORI | Lon Whitman

Academics | Kami Danaei

Research | Scott Quillinan

Cross-Cutting Programs | Erin Phillips

CERPA | Matt Fry

CEGR | Fred McLaughlin

CCCC | Trina Igelsrud Pfeiffer

H_2ERC | Eugene Holubnyak

3D Viz | Kyle Summerfield

Outreach | Christine Reed

Wyoming Integrated Test Center

Scott Quillinan, Senior Director of Research

The ITC continues to serve as a critical site for carbon capture innovation and demonstration, despite ongoing uncertainty surrounding federal project funding. Following the DOE issuance of project termination letters to ITC tenants on October 2, operational adjustments are underway to reduce costs and plan for potential decommissioning scenarios.

While DOE negotiations for the ITC Enhancement Funding remain paused, the project retains strong state support. The Wyoming Energy Authority has committed $5.5M in EMF contingent upon a finalized DOE contract.

FACILITIES & OPERATIONS

- Routine maintenance and infrastructure improvements continue at the site. Notably, work is progressing to upgrade the fused disconnect for the 750kVA transformer at STC bay D, bringing it up to the same functional level as other STC bays.

TENANT UPDATES

- *Membrane Technology Research (MTR)*
  - MTR has achieved over one year of continuous operation on coal-based flue gas, a major technical milestone.
  - It is the world's largest membrane-based carbon capture facility, designed to capture 55,000 tonnes of CO_2 annually.
  - The project has drawn significant international attention; delegations from several global companies have toured the facility to evaluate MTR's membrane-based carbon capture system.
  - These visits highlight Wyoming's global relevance in carbon capture research and demonstration.
- *TDA Research, Inc.*
  - Testing has been on hold since mid-August while the TDA Carbon Capture Pilot Plant process module is being upgraded.
- *GTI Energy*
  - A new sublease is in place with an expiration of December 31, 2029.

OUTREACH

- On September 25, members of the Wyoming Energy Authority and state legislators from regional states, including Utah, Nebraska, Arkansas, Iowa, Missouri, and Texas visited the ITC. The visit showcased Wyoming's leadership in advancing carbon management technologies and fostering multi-state collaboration around the continued use of Wyoming coal.

  SER Associate Project Specialist David Lucke provided an overview of the ITC and the School of Energy Resources, with a particular emphasis on the numerous projects conducted in support of Powder River Basin coal, including the Carbon Engineering Initiative and the Wyoming CarbonSAFE project.

Enhanced Oil Recovery Institute

Lon Whitman, Director

EORI OVERVIEW

- Since its creation in 2004, EORI projects have returned over ten dollars for every dollar provided by the state. With a total investment between 2004 and June 2024 of $53 million, projects in which EORI has participated have generated tax revenue of $558 million for the state and Wyoming citizens.
- The mission of EORI is to work collaboratively with the Wyoming oil and gas industry and provide technical expertise to minimize stranded oil reserves, extend field life, and add revenue to the state of Wyoming through additional taxes from incremental production.
- EORI, funded directly by the Wyoming State Legislature through the Enhanced Oil Recovery Commission (EORC – Agency 070), is the only state institute exclusively focused on improving and enhancing oil recovery in Wyoming fields.

TEAM DEVELOPMENT

- The EORC FY27/28 Biennium Budget process continues following the Governor's budget hearing last month. The EORC has requested exception funding of $558,802 for 2 additional staff members. The Joint Appropriations Committee budget hearing is scheduled for January 7, 2026.
- Planning is underway to advance team development based on the learnings from the Clifton Strengths team building and development process this year. Future focus will be on strategic planning and the principles of sustained excellence and professionalism, understanding and developing what sets EORI apart.

PROJECT HIGHLIGHTS

- EORI-industry collaborative projects continue to be the focus of the EORI team. Currently, EORI is working on 23 projects in collaboration with 15 Wyoming operators.

  Highlights include:

  - Three CO_2-EOR projects
  - Three nitrogen-EOR projects
  - One enriched air-EOR project
  - One NGL-EOR project
  - Two regional geology/reservoir studies in the Minnelusa and Muddy formations

ENHANCED OIL RECOVERY INSTITUTE – COLLABORATIVE INDUSTRY PROJECTS - NOV 2025

Project	Description	Partners	Basin
IOR			
Gelled-Polymer for Water Diversion (EORI Cost Share Project)	Using polymers to control water to improve oil production	Merit Energy	BHB
NGL Near Wellbore Clean-Up – Jiggs Thompson Field	Improve near wellbore flow paths	Sunshine Valley	PRB
Advancements in 3D Seismic Interpretation (EORI Cost Share Project)	Improving effectiveness of 3D Seismic for mapping reservoir complexity in the Minnelusa	6 Industry Partners	PRB
Water Compatibility Solutions for Effective Waterflooding	Comprehensive study including core analysis to develop waterflooding in the Muddy Formation	Kennedy Oil and Maxximus	PRB
Geologic Characterization using Sequence Stratigraphy – Alpha Field	Improve geologic interpretations using Sequence Stratigraphy	ATR Partners	PRB
Reservoir Characterization – Kitty Field	Develop a full field waterflood	Kennedy Oil	PRB
Full Field Development Plan – Black Bank Field (EORI Cost Share Project)	Geology and reservoir characterization for a full field development plan including core analysis	Montana WY Oil Company	PRB
Field Development Plan - Hirsch Field	Update geology, reservoir characterization and modeling to improve the field waterflood	Maxximus	PRB
Minnelusa Formation Regional Geology	Develop clear regional geology models to 0ptimize production in individual fields	7 Industry Partners	PRB
Muddy Formation Regional Geology	Develop clear regional geology models to 0ptimize production in individual fields	9 Industry Partners	PRB
CO_2– EOR			
CO_2-EOR- Raven Creek, Dillinger Ranch, and Halverson Fields	Reservoir characterization to optimize the developing CO_2-EOR flood	TR Operating	PRB
CO_2 - EOR - Cole Creek Field	Reservoir characterization	Teton East	PRB
CO_2-EOR Linch Project- Sussex, Sussex West and Meadow Creek Fields	Assimilate data and provide reservoir characterization for a 3-Field CO_2-EOR flood	Contango	PRB
Residual Oil Zone (ROZ) CO_2 - EOR	Investigate CO_2-EOR in an ROZ	Contango	PRB
CO2-EOR in WY 2025 Update	Report		Full State
WY Trails Carbon Hub CO_2 Pipeline Feed Study	Multi-Partner project to look at a potential CO_2 pipeline routing	DOE, EORI and others	Full State
Other EOR Technologies			
Nitrogen-EOR Project – Big Muddy Field – South Glenrock B Unit	Reservoir characterization and modeling for a nitrogen-EOR project	Big Muddy Operators	PRB
Nitrogen-EOR Project – Morton Field	Geologic and reservoir characterization for a nitrogen-EOR project	XOil	PRB
Enriched Air-EOR – Alpha Field (EORI & WEA EMF Cost Share Project)	Geologic and reservoir characterization and modeling; Incorporate new 3D Seismic	ATR Partners	PRB
NGL-EOR Project – Skull Creek Field (WEA EMF Cost Share Project)	Geologic and reservoir characterization/modeling for an NGL-EOR pilot	Sunshine Valley Petroleum, XOil	PRB
Unconventionals			
Unlocking Tight Oil Formations	Improving results in unconventional wells	DOE, EORI ,OXY	PRB
Natural Gas			
Triangle Unit – Reduced Carbon Natural Gas (WEA EMF Cost Share Project)	Generating differentiated natural gas from coal bed seams using microbes generated from sugar beet syrup	Cowboy Clean Fuels	PRB

PROFESSIONAL AND COMMUNITY ENGAGEMENT

- EOR Insights Quarterly Platform for Interactive Industry Meeting
  - 2025 4th Quarter meeting was held on October 28 featuring eSal - low salinity technology
  - The 2026 schedule is nearly fully developed
  - We are grateful for the hospitality of True Companies who allow us to hold our EOR Insights meetings at their River Cross Commons facility in Casper
- Joint Minerals Interim Committee Work - The three EOR incentives developed during the 2025 interim meetings continue to move forward:
  - Revision to SF 17 (passed in the last session) from $10/ton to $5.00/ton for captured CO_2 in Wyoming sold for EOR. With the passage of the Big, Beautiful Bill, the 45Q tax credit is now $85/ton for captured CO_2 sold for EOR. If SF 17 is revised to $5.00/ton, this will put Wyoming ahead of all states on incentives to sell captured CO_2 for enhanced oil recovery. Both SF 17 and the Federal 45Q Tax Credit are incentives for the capturer of CO_2.
  - Updating HB 54 from 2003 and putting the bill back in statute. HB 54 provides a full severance tax exemption for EOR incremental production for 5 years. This will provide a direct incentive to the operator of EOR projects in Wyoming.
  - Development of an EOR "support" funding pot which operators developing EOR projects can submit proposals for 1:1 financial support. $250 million was the proposed funding pot allocation.
- Wyoming Energy Authority - Lon Whitman continues to attend and support quarterly Wyoming Energy Authority Board Meetings as an ex-officio member of the board.
- The Carbon Utilization Research Council (CURC) Fall Membership Meeting - Lon Whitman will serve on a panel for CO_2-EOR at the CURC Fall Membership meeting on November 12, in Washington, DC. Senator Barrasso will be the keynote speaker at the meeting.

Wyoming Enhanced Oil Recovery Commission

Enhanced Oil Recovery Institute

Enhanced Oil Recovery Institute Industry Forum

Academics

Kami Danaei, Senior Assistant Dean

STAFFING

SER Faculty in Chemical and Biomedical Engineering

The job posting will close on November 15, 2025, and application review will begin the week after (as of 10/30, there were 65 applicants). The committee will have its first meeting in the first or second week of December. First round of interviews may happen in the middle of January. The campus visit for the top candidates could occur at the beginning of February.

SER Associate Lecturer, Non-Tenure Track

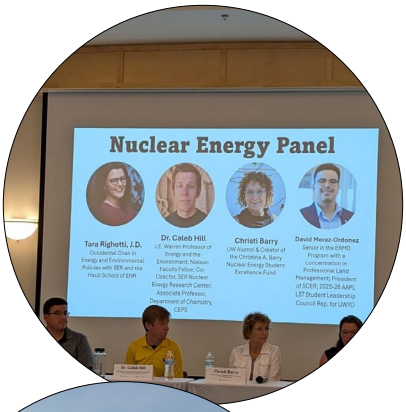
The job posting has a priority review of applications received by November 20, 2025. Application review will begin the first week of December. First round of interviews may happen in the middle of January. The campus visit for the top candidates could occur at the beginning of February.

STUDENT UPDATES

ERMD Student Placement Updates

From May 2025-December 2025, graduates from BS-Energy Resource Management and Development secured 100% placement into jobs or continued education within six months of graduation.

Nuclear Panel Sept. 10



University of Wyoming students, faculty, staff and community members joined a panel on nuclear energy organized by the School of Energy Resources student chapter. This event saw over 70 attendees, included thoughtful questions, and exceptional panelists Caleb M. Hill, Christine Barry, and Tara Righetti - moderated by student President David Meraz Ordonez (BS-ERMD, PLM).

Idaho National Laboratory Sept. 7-9

Students and staff from the School of Energy Resources and the College of Engineering and Physical Sciences traveled to Idaho National Laboratory for an in-depth tour of its world-class research facilities. The visit offered a behind-the-scenes look at INL's cutting-edge work in energy innovation, nuclear science, and advanced materials. Participants had the opportunity to engage directly with scientists and professionals, gaining valuable insight into real-world applications of their classroom learning and potential career paths in the energy sector.

Continental Resources Field Day Oct 2

University of Wyoming students participated in a comprehensive field trip, hosted by Continental Resources, to a drilling and production site in Wyoming. The immersive experience provided twenty-two students (engineers, geologists, lawyers, and energy professionals) and two SER staff members an end-to-end view of an oil well's operational life cycle, from initial permitting and site location through production and reclamation.

STEM Career/Alumni Panel Oct 9

The School of Energy Resources and College of Engineering and Physical Sciences recently hosted a STEM Career Panel showcasing outstanding SER/CEPS alumni now working across diverse energy industries (nuclear-INL, oil and gas-EOG, environmental consulting-Trihydro, renewables-NextEra Energy, geology-Tallgrass). Alums shared insights about their career paths, lessons learned, and advice for current students preparing to enter the workforce. The event offered an engaging opportunity for students and staff to connect classroom learning with real-world experiences and to network with successful professionals who once stood in their shoes. This event had more than 60 attendees.

Record-Breaking Attendance at Energy Day Tailgate Oct 11

The Student Chapter of Energy Resources celebrated its highest-attended Energy Day tailgate event during the UW football game, bringing together students, alumni, industry partners, and friends of the program. The event provided an energetic and welcoming space for guests to network, reconnect, and celebrate the strong community surrounding Wyoming's energy programs. Students especially benefited from the chance to engage directly with professionals and alumni, building meaningful connections that support their academic and career goals. Our very own Holly Krutka was also the winner of their raffle!

Moab Field Course

Students at the University of Wyoming completed a one-credit field course in Moab, Utah, to study rock formations that are direct analogs to those being explored for carbon management in Wyoming. This course, open to all UW students, led by Autumn Eakin, assistant director of the Center for Economic Geology Research (CEGR) in the School of Energy Resources (SER), focused on understanding the geological properties of sedimentary rock layers that could potentially store vast amounts of captured carbon dioxide.

PROGRAMMATIC UPDATES

Industry Advisory Board Meeting

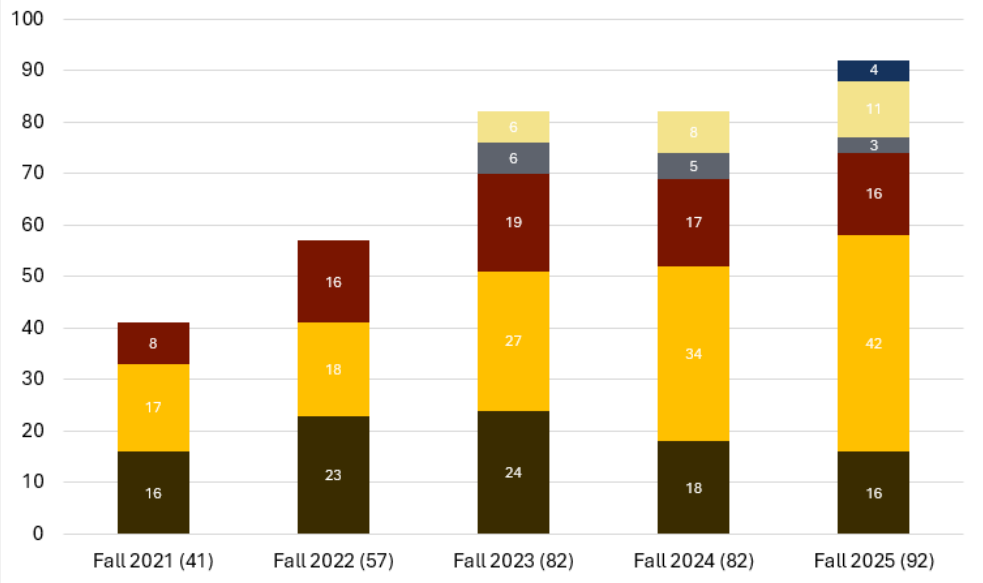
As part of SER's AAPL accreditation, the academic program is required to have a standing Industry Advisory Board (IAB). This group, currently 13 voting members, meets at least once each fall/spring semester to review any curriculum changes or other AAPL standards/accreditation for this concentration within SER's BS degree. The IAB met on October 10 for its fall 2025 meeting. This Advisory Board will meet again in April 2026. PLM students attended a luncheon with the IAB during their meeting.

Program Review Update

Academic Program Reviews provide an opportunity for UW to examine the quality of academic programs, to affirm ways that a program is working well, and to implement improvements. These also serve as a mechanism for demonstrating a commitment to continuous improvement and thus meet accreditation requirements of the Higher Learning Commission (HLC). SER was selected for review in January 2024. ERC was provided with an executive summary of our findings in August 2024. The site visit with external reviewers was delayed by Academic Affairs from fall 2024 to fall 2025, and took place on October 6, 2025. External reviewers Dr. Bryan Willson from CSU and Dr. Phillip Crossley from WCU served as the two external reviewers and spent a day meeting with SER staff, faculty, students, and UW administrators. A report of their findings is expected.

Enrollment Census Data

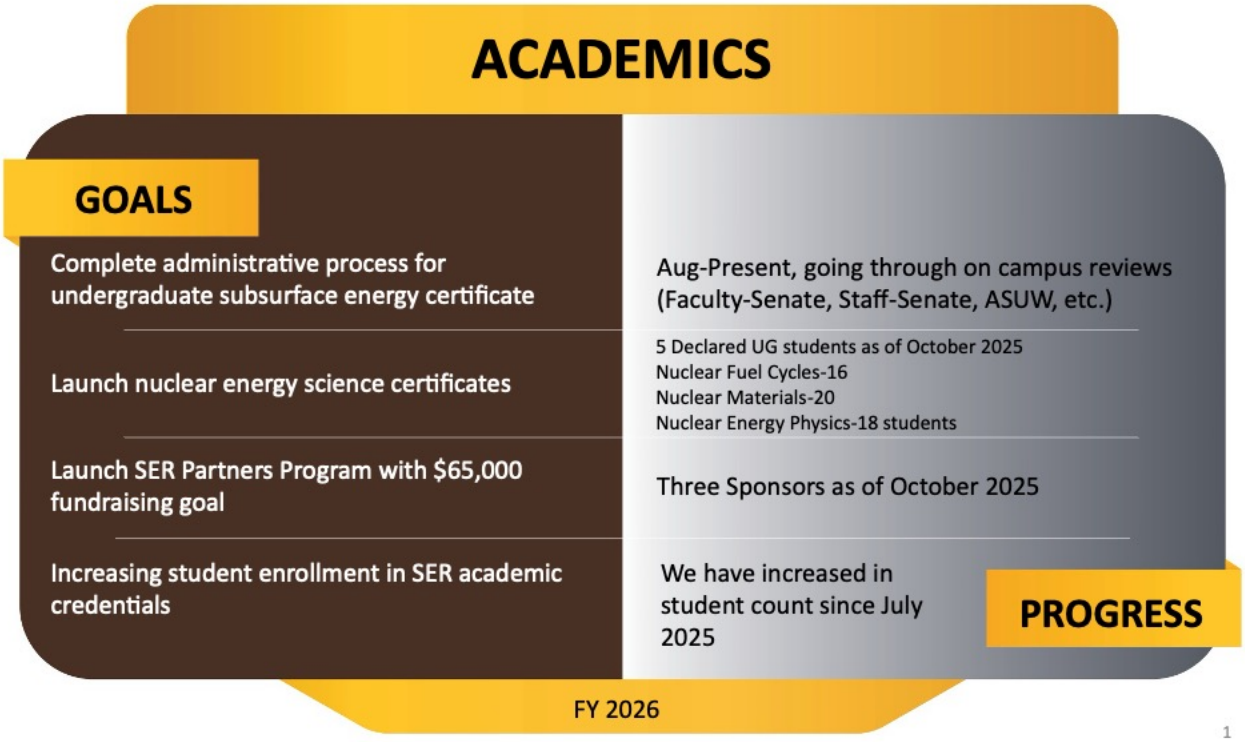
The table below illustrates SER's recent enrollment. While overall growth is evident, it's important to note that last year's recruitment cycle was impacted by the recruiter position being vacant for six months. With Larissa Rutz, Academic Coordinator, now fully engaged for the entire 2026–27 recruitment cycle, we anticipate renewed momentum and continued enrollment growth in Fall 2026.

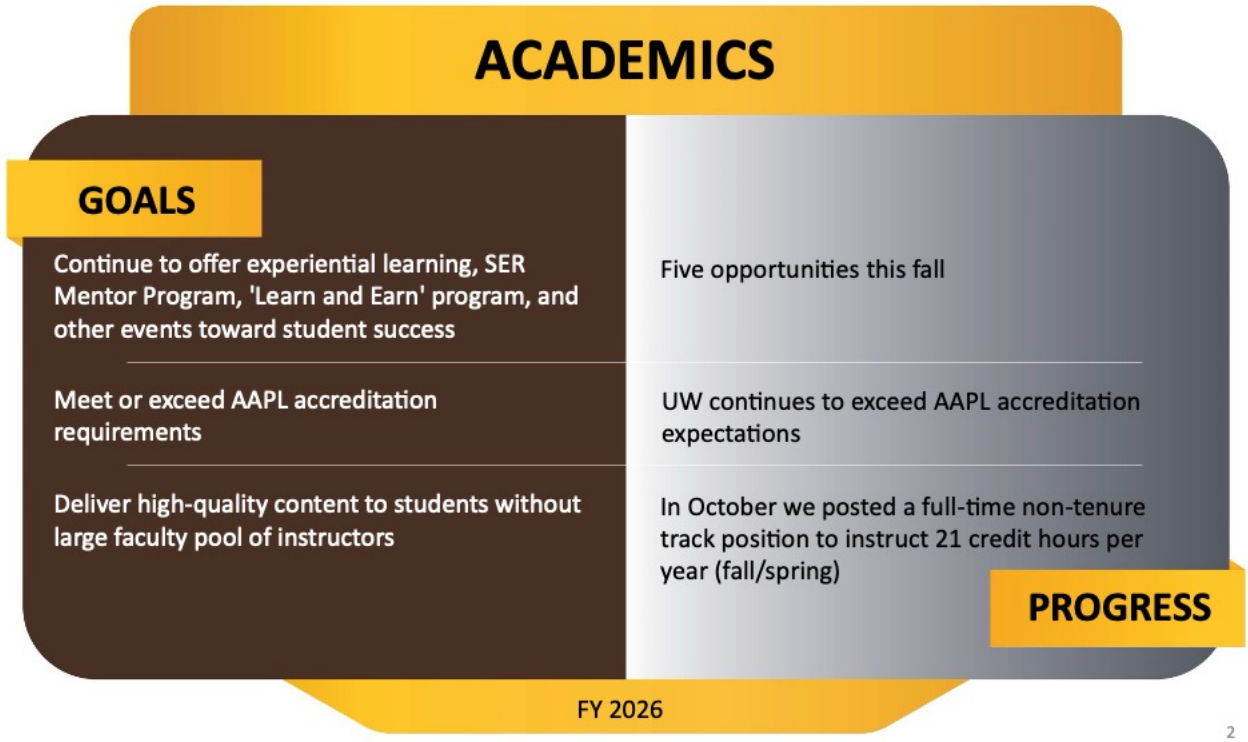


Fall 2025 also marks the official launch of our nuclear certificate programs, which are already contributing to increased student interest. As of the census date, SER had 92 students enrolled in an academic credential; as of early November, that number has risen to 96. The previous record for total enrollment in SER programs was 96 (fall 2014), and based on current trends, SER aims to surpass that milestone in the coming year.

ERC Annual Goals Update

In May 2025 Executive Director, Dr. Holly Krutka presented goals for each area for the upcoming year. Below are updates regarding the Academics goals, as of this November meeting.





Research

Scott Quillinan, Senior Director

Erin Phillips, Director, Cross-Cutting Programs

The SER Research Report provides a broad update on SER Research initiatives, highlights from the SER Centers of Excellence, and detailed reports provided by the SER Center Directors.

FEDERAL FUNDING UPDATES

Overview

The U.S. Department of Energy (DOE) has indicated plans to reduce or cancel funding for select clean energy projects previously awarded under the Infrastructure Investment and Jobs Act (IIJA) and annual appropriations. This review affects several programs focused on carbon management and large-scale demonstration projects, including the CarbonSAFE Program and related pilot initiatives.

Implications for SER

Two important projects led by the SER appeared on DOE's unofficial termination list. Both are key projects for Wyoming and important for supporting SER staff:

- CarbonSAFE Phase III: Sweetwater Carbon Storage Hub (FE0032343)
  $43.3M federal / $54.1M total with cost share
- Williams Echo Springs CarbonSAFE Feasibility Study (FE0032448)
  $9.0M federal / $11.2M total with cost share

These projects are entering final technical phases that include data analysis, reservoir modeling, and permitting, critical steps for understanding Wyoming's subsurface potential and supporting future commercial opportunities.

Several other DOE-supported projects at the ITC including efforts led by MTR, TDA Research, and GTI Energy, are also at risk.

The University of Wyoming and the School of Energy Resources remain committed to working collaboratively with DOE to find constructive solutions, whether through revised scopes of work, data sharing, or transition strategies, that preserve public investments and maintain progress toward shared national energy goals.

Projects in Negotiations

The following DOE-selected projects remain paused pending program review:

- **CORE-CM Phase II**: SER leads one and participates in two additional projects.
- **Wyoming Integrated Test Center Capital Improvements**: Funding negotiations on hold.
- **Wyoming Technical Assistance Collaboration for Carbon Management (WYTAC-CM)**: Selected for award negotiation.
- **Steamboat Carbon Storage Hub**: SER serves as sub-awardee to Meridian Carbon.

Quarterly Submissions: Proposals and Requests for Information

Utility Infrastructure for Coal Refinery Demonstration Plant and Subsequent Product Development: Concept paper submitted to the Wyoming Energy Authority (WEA) by Eli Ellis and Trina Igelsrud Pfeiffer (CCCC). Submitted to WEA ($2.9M request); not recommended for funding.

Wyoming Integrated Test Center Enhancement Funding - WEA EMF: Concept paper, led by Scott Quillinan, Kaleb Peterson, and David Lucke submitted to WEA ($5.5M request); recommended contingent on DOE award finalization.

TRACE: Targeted Critical Metals Recovery using Electrochemically Activated Crown Ethers: J. Brant (CEPWM). DOE proposal, $316,992 request, not recommended for funding.

Consolidated Interim Storage Facility Design Concept: K. Summerfield (3D Visualization Center), C. Zhang (CAE). DOE quote recommended for full application, $100,000 request.

Third Social License Study: S. Gerace (Energy ELC). Approved by WEA; total project $149,874 (joint WEA/SER funding).

Conversion of Coal Char to Graphitic Nanomaterials: J. Brant (CEPWM). Funded by The Nature Conservancy; $25,000 award.

HIGHLIGHTED PROJECTS

Mowry Project: This quarter saw excellent progress in industry-SER relationships surrounding the Mowry Project. Representatives from Continental Resources visited campus in October to discuss their upcoming Surveillance, Analysis, & Optimization (SA&O) program. In 2026, they will drill a new Mowry well in the Powder River Basin (PRB) and intend to conduct research and analysis on that core at UW. To conduct this work we have submitted a joint concept paper for EMF.

Anschutz Exploration Company (AEC) also visited campus in October to discuss a wide range of topics they hope to address in 2026. As a result, we have signed an NDA with AEC and are scoping out a broad work plan, including modeling, core analysis, and stratigraphic research. This will bring in funding over time and we hope to have a robust partnership with AEC.

SER's oil and gas program manager Tim Fischer attended a field trip with industry and academic professionals in September. The 3-day trip was focused on the Mowry Shale and its changing relationships across the state of Wyoming.

Geology and Geophysics student Benard Oppong's paper, "Missing Well-Log Data Prediction Using a Hybrid U-Net and LSTM Network Model Available," was published in the October issue of Petrophysics.

The Multidisciplinary Advanced Stimulation Laboratory (MASL), a joint effort with the department of Energy and Petroleum Energy (EPE) was officially opened with a ceremony in October. This opening celebrated the excellent and expanding relationship between SER and EPE.

^ Danny Dale, Vamegh Rasouli, and Holly Krutka during the ribbon cutting ceremony.

Uncovering Wyoming's Lithium Potential: Resource Assessment of Produced Waters, Geologic Materials, and Technology Solutions: The team has completed an extensive literature review and data compilation, analyzing over 70,000 records, including 27,000 with lithium measurements from key sources such as the USGS, NURE, and the Wyoming State Geological Survey. This work has produced one of the most comprehensive lithium databases for Wyoming.

Next steps include acquiring new state-of-the-art data and expanding sampling at prospective sites, clay deposits, coal mines, pegmatites, produced waters, and tuffaceous formations. Samples collected during recent drilling and mine visits are already contributing valuable insights.

On October 22, Bob Gregory presented project highlights to 35–40 attendees at the 2025 Geological Society of America Conference in San Antonio, underscoring Wyoming's growing importance in U.S. lithium research.

Critical Minerals Leadership Academy (CMLA): SER hosted the inaugural Critical Minerals Leadership Academy (CMLA) August 3-10, 2025, in Laramie and the Powder River Basin. SER, in partnership with Entech Strategies, LLC, was awarded noncompetitive funding from the Department of Energy to lead the CMLA, which brought together a cohort of 19 graduate students and early career professionals from across the U.S. The CMLA program consisted of lectures, activities, and field excursions. The program incorporated engagement with industry partners including Rare Element Resources, Dry Fork Mine, American Rare Earths, and Southern Company.

CENTERS OF EXCELLENCE AND RESEARCH PROGRAMS

Center for Air Quality (Shane Murphy and Dana Coulton, Atmospheric Science)

- Worked with oil and gas industry partners to develop measurement-informed inventories that can be run on the NCAR-Wyoming Supercomputer.
- Collected data from methane sensors in Wyoming and began analysis to determine basin-level methane fluxes to validate the measurement-informed inventory.
- Started planning a winter deployment to Salt Lake City to determine urban methane emissions in collaboration with the University of Utah.

Wind Energy Research Center (Jonathan Naughton and Michael Stoellinger, Mechanical Engineering)

- Stoellinger and Naughton chaired sessions at the North American Wind Energy Academy (NAWEA)/WindTech 2025 Conference in Dallas, October 15–17, where Stoellinger also served as scientific co-lead for the Wake Modeling track.
- WERC-supported students who presented research at the conference:
  - Mostafa Ojaghloo (PhD) – "Combined POD-LSA Analysis of the Swirling Wake"
  - Tyler Miller (MS) – "Machine Learning Prediction of Dynamic Stall Loads using a Modal Approach"
- Stoellinger also submitted two Air Force STTR proposals with Airloom Inc., each including a $33,000 WERC share, strengthening partnerships between Airloom and WERC.

- Stoellinger additionally conducted two media engagements with Cowboy State Daily on August 28, discussing Wyoming wind energy and the Horse Creek Wind Project.

Nuclear Energy Research Center (Caleb Hill, Chemistry, and Tara Righetti, SER Professor of Law)

^ Liane Moreau

- Liane Moreau, the new Nuclear Energy Research Center (NERC) faculty member (Chemistry) started this semester.
- NERC is continuing their search for a Mechanical Engineering faculty member.
- SER Senior Assistant Dean Kami Danaei took a group of students to Idaho National Laboratory.
- Righetti attended the OECD-Global Forum on Nuclear Education at the University of Michigan and presented on NERC's new nuclear energy science certificates.
- Righetti attended an Electric Power Research Institute–Department of Energy (EPRI-DOE) workshop in Charlotte in August on research priorities related to spent fuel and a permanent repository.
- Hill presented some of UW's work in the nuclear chemistry space at the "REACh: Rare Earths and Actinide Chemistry Symposium" in Orlando, Florida.
- The actinide lab core facility is now functional and actively supporting research at UW.

Subsurface Energy and Digital Innovation Center (Soheil Saraji, Energy and Petroleum Engineering)

- Soheil Saraji was awarded NCAR supercomputing resources for a Subsurface Energy and Digital Innovation Center (SEDI) project titled: Developing Digital Twin for Subsurface Reservoirs Using AI-Augmented Multiscale Workflows.
- A conference paper by a SEDI PhD student was accepted for presentation at the 8th International Conference on Blockchain Technology and Applications, to be held in Kanazawa, Japan (December 2025). Title: Decentralized Physical Infrastructure Networks (DePIN): A Comprehensive Survey and the Privacy-Preserving zk-D3 Framework.

- A PhD student presented his research titled "Data-Driven Sweet Spot Identification in the Mowry Formation: Integrating Machine Learning and Geostatistical Modeling" at the 2025 RMS-AAPG Annual Meeting (October 5–7, Keystone, Colorado).
- Soheil Saraji was invited to deliver a talk on SEDI and its blockchain-related projects to graduate law students at the Blockchain Law and Innovation Club (BLIC), College of Law, on October 23.
- Two new PhD students joined SEDI this fall, focusing on projects related to digital twins for subsurface assets and digital mineral mapping using machine learning.

Jurisprudence of Underground Law & Energy (Tara Righetti, Madeleine Lewis, and Scarlett Forrest

The team currently have two law review publications forthcoming in the next several months:

- "Just Nuclear," forthcoming in the Ohio State Law Journal (Righetti, Lewis, and Forrest, along with other co-authors)
- "CO_2 Pipelines as Common Carriers," forthcoming in the Oil and Gas, Natural Resources, and Energy Journal (ONE-J) (Lewis and Righetti)

The team completed the regulatory plan for CarbonSAFE Phase III.

In October, Forrest presented on post-closure liability for CCUS at the University of Calgary's Closure Liabilities in the Energy Sector conference.

At the Energy Law & Policy Conference (Oct 16), all members participated: Righetti moderated Spent Nuclear Fuel Management, with Forrest as panelist; Lewis moderated a panel on Federal Permitting Reform.

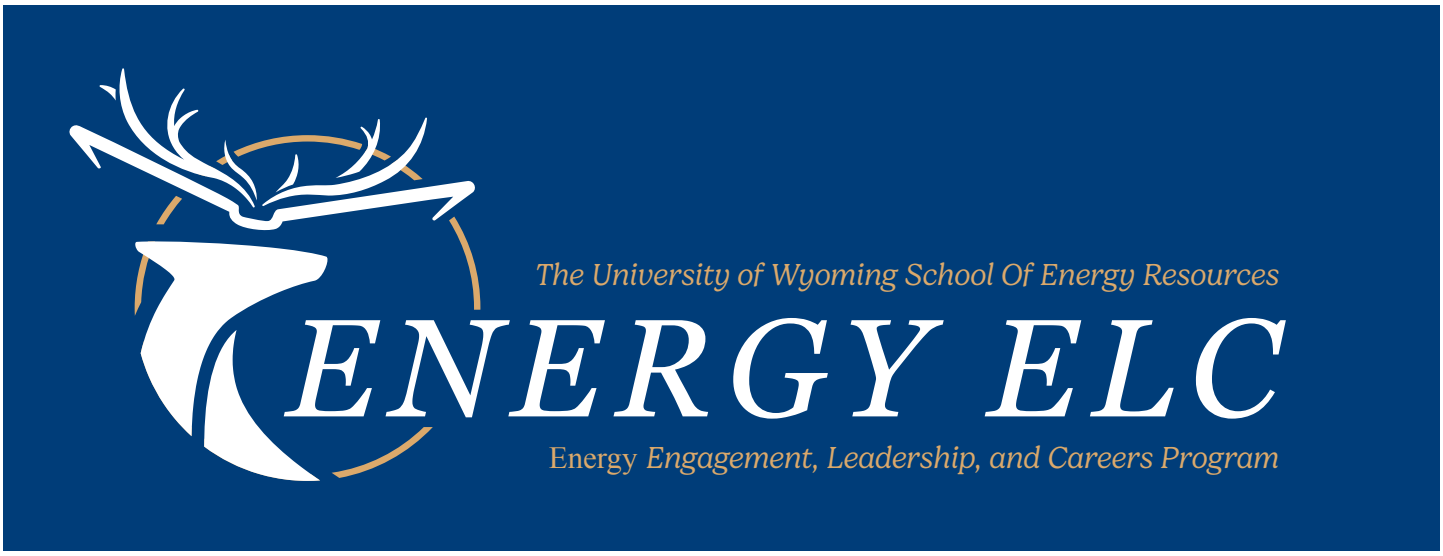
Righetti also organized and hosted the Subsurface Futures Symposium (Laramie, Oct. 21–23), uniting international scholars to examine subsurface legal frameworks and energy transition. The symposium included field trips to the U.S. Gold site near Curt Gowdy and Tallgrass's SE Wyoming sequestration project.

^ Subsurface Futures Symposium Cohort

SER Energy Engagement, Leadership, and Careers (ELC) Program (Erin Phillips and Selena Gerace)

- E. Phillips and M. Mankin presented at the Geological Society of America Annual Meeting (San Antonio, Oct). Phillips discussed her Fulbright research comparing critical minerals supply chains in Norway and Wyoming, while Mankin presented her Community and Stakeholder Analysis Methodology for assessing Wyoming community dynamics and needs.
- S. Gerace leads Task 1 of the Evaluation of Low-Carbon Strategies project with The Nature Conservancy, developing and conducting interviews with Wyoming industry representatives to identify barriers and opportunities for low-carbon technology. Mankin will lead Task 2, focused on documenting findings and developing outreach materials.
- Gerace and Mankin are supporting the WyoTCH project (led by JOULE), managing stakeholder engagement, IRB protocols, and survey development for Wyoming counties and municipalities.
- M. Mankin is leading the development of high school-level nuclear curriculum modules called the Knowing Nuclear Lesson Plans. SER faculty, staff, and partners have been invited to develop nuclear curriculum modules using provided templates for a teacher's guide, activities, resources, and a slide deck presentation. We are partnering with the Science Initiative to align these to state teaching standards, and we anticipate lesson plans being completed in the spring.

- The ELC team is collaborating with JOULE and the Academics Team to launch a Norway study abroad course focused on the social, economic, and policy dynamics of emerging energy industries. In June, Lewis and Gerace met with Norwegian partners alongside Phillips to finalize plans and partnerships.
- Finally, the ELC will lead the third phase of the Social License for Wyoming's Energy Future study, co-funded by WEA and SER, beginning this quarter. The team also played a key role in delivering the Critical Minerals Leadership Academy.



Center for Energy Regulation & Policy Analysis (CERPA)

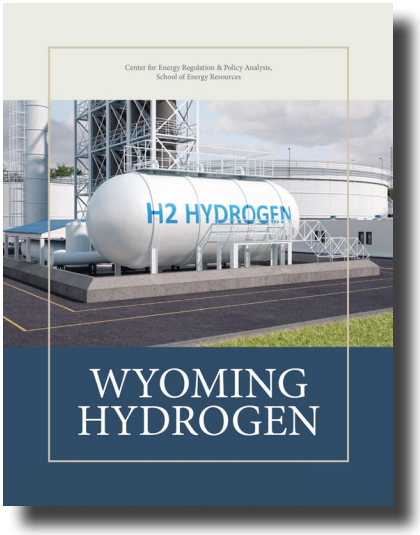
Matt Fry, Director

CERPA is conducting research on a wide array of policy and regulatory issues, providing policy support to Wyoming elected and appointed officials, the Governor's Office, and the Wyoming Energy Authority, while engaging with external stakeholders to ensure we are producing high-quality, meaningful research to advance Wyoming's energy-driven economic development.

RESEARCH

Papers Published:

- *Consolidated Review of Energy in Wyoming (CREW) Report* (authored by Maryam Lakjaa and Bryan Broadhurst). The CREW Report summarizes key takeaways from current economic indicators; provides an overview of Wyoming's energy sectors, including crude oil, natural gas, coal, uranium, wind energy, soda ash, and electricity generation; details employment trends and provides updates on state tax collections. The CREW Report is updated each month.
- *Wyoming Hydrogen* (authored by Esther Wagner and Dawson Kluesner). This paper provides a comprehensive report on the potential markets, economics, and policies associated with commercial scale deployment of hydrogen in Wyoming. This includes providing detailed descriptions and existing legal and regulatory frameworks associated with hydrogen production, transportation, and storage. The paper also contains an in-depth analysis of potential markets for Wyoming hydrogen and potential jobs and economic benefits, as well as policy recommendations and incentives to support the state's efforts to become a competitive hydrogen provider.



White Papers in the Pipeline:

CERPA continues to explore other areas of research to advance energy-driven economic development for Wyoming. The team is constantly brainstorming with colleagues and stakeholders about issues they believe are important for CERPA to address. While many concepts are in development, below is a summary of the papers that have been scoped and are underway.

- Oil Drilling Cost Structure Analysis
- National Analysis of State Oil and Gas Tax Rates
- Wyoming's Geothermal Opportunities – Markets, Regulatory and Policy Environment and State Revenue Potential
- Environmental, Health and Economic Advantages of Low Emission Natural Gas

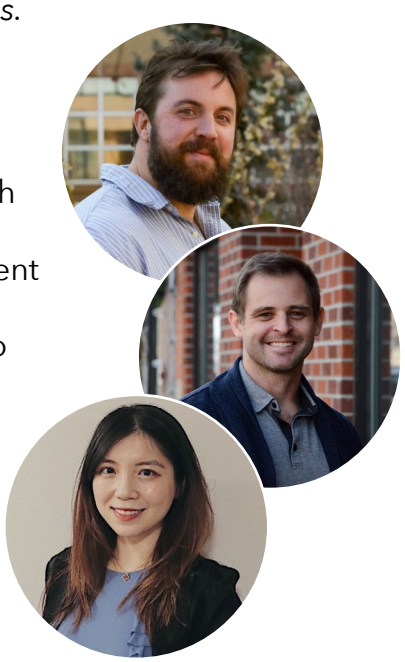
POLICY SUPPORT

- CERPA is participating in a national effort, facilitated by Columbia's Center for Global Energy Policy to identify low emission-firm energy resources that will be needed to address projected power demand. The group is looking at ways to encourage utilization of energy resources that were previously omitted from the "clean power" discussion. These will include EOR, low emission natural gas and CCUS.

Center for Economic Geology Research (CEGR)

J. Fred McLaughlin, Director

The SER Center for Economic Geology Research (CEGR) is focused on three programmatic areas: carbon capture utilization and storage (CCUS), energy-related rare earth elements (REE) and critical minerals (CM), and regional geologic assessments and oil and gas resources.



STAFFING

CEGR continues to advance its mission and meet project objectives through career advancement. CEGR had advanced three potential Research Professional hires through the interview stage of the hiring process in this reporting period, but opted to pause the hiring process in lieu of Department of Energy program reviews. Internally, Dr. Tyler Brown was promoted to Program Manager of the Minerals team and Dr. Dan Eakin was promoted to Program Manager of the Subsurface team.

Yun Yang joined the CEGR team as an Assistant Research Professional with subsurface and petroleum engineering expertise.

NEW PROJECTS AND PROPOSALS

CEGR received a seed grant from The UW Research and Economic Development Division (REDD) via the NSF-funded Accelerating Research Transition Grant titled "Exploration of Potential Uses for Tailings, Byproducts, and Co-products in the Burgeoning Domestic Rare Earth Element Industry" which is a collaboration with industry partner Wyoming Rare (formerly American Rare Earths) to understand value-added uses for geologic resources at their Halleck Creek mine.

In September, CEGR's Minerals Team completed a small project for Core Natural Resources on the critical mineral potential of their coal assets in Wyoming's Powder River Basin. This research was announced in the Q3 report to their investors under the subject line: Potential Future Opportunity in the Rare Earth Elements and Critical Minerals Arena. This project has led to two smaller-scale projects and potential avenues to propose federal monies.

In October, CEGR completed a small project for Pete Lien & Sons. The project addressed a year-long company question about their limestone quarry resource. This work and previous relations with H_2ERC are leading to a potential collaboration in the proposal for federal monies.

The CORE-CM Phase II awards and the Wyoming Technical Assistance Collaboration for Carbon Management (WYTAC) are in award negotiations, which are currently paused by the DOE.

CURRENT PROJECTS

Carbon Capture, Utilization, and Storage Projects:

- *Wyoming CarbonSAFE Phase III*: The project team provided a final project report in a virtual meeting to the Department of Energy on September 9. We are currently working, and are on schedule, to complete the final report for submission before the end of the year. This project is nearly commercially ready, with completed permits, economics, and a technical and commercial strategy. The team met with Basin Electric Power Cooperative on November 6 to provide a final update and discuss next steps.

- *HERO Basalt CarbonSAFE (Hermiston, Oregon Carbon Storage Assurance Facility Enterprise):* The stratigraphic test well permit is currently in the technical and interagency review period as per the regulations of the State of Oregon. To progress with the permit approval process, the Oregon Department of Geology and Mineral Industries (DOGAMI) requires final bond and certain Surface Use Agreements (SUAs). Proceeding with both the bond payment and execution of SUAs are dependent on DOE programmatic approval and approval of a project no-cost extension.

  This project is currently paused (as of October 1) awaiting a decision from the Department of Energy on a no-cost extension. As previously reported, the project team submitted a no-cost extension request to the DOE to address the year-long lag between the official project start date and full release of project funding on May 27, 2025. At the time of project expiration, the project team was in the last, critical phases of permitting and materials procurement for field operations planned for October 2025.

- *Sweetwater Carbon Storage Hub:* Following the drilling completion, CEGR researchers (John Jiao, Autumn Eakin, Matt Johnson, and David Lucke) joined project partners, Frontier Carbon Solutions, in Houston, TX to review core and sidewall core samples recovered while drilling J1-15. The team assessed the recovered core and selected samples to bring back to Laramie for core flood and rock mechanics analysis. These activities are currently underway.

  Petrophysical modeling from the two wells indicates a small amount of fair reservoir quality within the Nugget Formation sandstones, and several intervals of favorable reservoir quality within the Mississippian Madison Formation dolostones, which can be used to inform facies modeling and reservoir simulation. These zones within the Madison Formation appear laterally continuous across the project area. The petrophysical models will be further calibrated and refined as results from the core analysis program become available.

  Progress has been made to develop the static earth model, the foundation for running simulations. Integration of a regional 3D seismic volume allows the team to upscale and propagate petrophysical properties across the model area. A preliminary round of simulations is expected for next quarter.

  In addition to the geological modeling efforts, baseline environmental monitors have been deployed, and the first round of data is currently under analysis. Parallel to field activities, the engineering Front-End Engineering Design (FEED) study is nearing completion. Preparation of the Environmental Information Volume (EIV) for the SCS Hub also continues to advance, with approximately 85% of the document now in draft form.

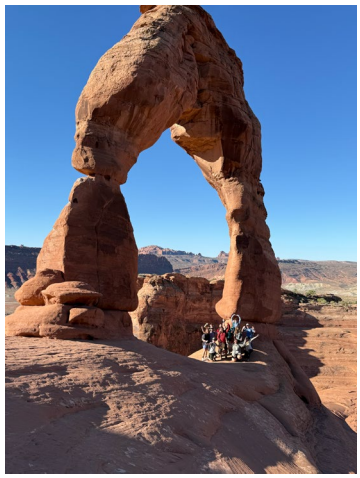
- *CarbonSAFE Echo Springs:* The team completed safe drilling to 19,089 feet below land surface, reaching a total depth within the Jurassic Morrison Formation. It was a successful campaign with advanced wireline logging and acquisition of 85 rotary sidewall cores (RSWC) for characterization of prospective geologic storage and hydrocarbon recovery systems.

  Currently, the RSWCs are under analysis with Core Laboratories in Houston, TX. Petrophysical and geocellular models are in preliminary stages awaiting integration of rock analysis data. Results will assess prospective storage potential for CO_2 as well as provide insights into local petroleum systems.

- *Wyoming Class VI Database:* The data foundation and schema design is near completion. The team is working to finalize the user interface and design a system that is intuitive and meets the needs of operators and regulators alike.

Student Engagement:

- In September, SER offered a five-day, one-credit field course on Geologic Systems in Moab, Utah, led by CEGR's Autumn Eakin. The course was open to all students and brought together six undergraduates from SER's Energy Resource Management and Development (ERMD) program and five graduate students in Geology and Geophysics. Through this applied learning experience, students explored how subsurface processes connect to surface geology, land use, and resource management considerations.



- CEGR supports students in multiple programs and departments on campus. In this past quarter, students worked directly on core samples acquired from the Sweetwater Storage Hub CarbonSAFE Phase III project, where they conducted triaxial rock mechanics analyses. In addition to rock mechanics in Petroleum Engineering, CEGR research supports students in Geology, Chemical Engineering, Law, Economics/Business and Computer Science.

PENDING GRANT APPLICATIONS

CEGR was especially focused on funding diversification opportunities during the last reporting period. Several of these proposals are being developed directly with Wyoming's oil and gas, mining, and energy generation industries.

Publicly submitted proposals include: Two concept papers that address the Wyoming Energy Authorities Energy Matching Funds call for proposals. One paper was developed with Continental Resources and will seek Energy Matching Funds for an expansion of a Mowry Shale characterization well the company will drill in 2026. Funding will support advanced core, petrophysical, and operation/completion analysis and modeling of their first production well to be co-dedicated to science and characterization. This concept proposal supports the goals and objectives of a next-phase Mowry Project. Another concept paper was developed in partnership with Strata Energy and proposes to use Energy Matching Funds for a study on co-production of Critical Minerals and Materials from an existing uranium in-situ recovery mine. This study would assess if Strata's unique in-situ recovery mining technology results in value-added critical mineral/minerals recovery and would expand upon their scheduled 2026 in-field resource evaluations.

Team leaders from CEGR's Minerals team addressed new opportunities in the Department of Energy's Critical Minerals programs by contributing to three concepts for the National Lab-led portion of the Mine of the Future Initiative, as well as working to develop industry-led Mine of the Future proposals with Wyoming industrial mineral mines, and mining technology companies. The Minerals Team also started work, in partnership with major Wyoming mining partners, on four studies that are prerequisites for Department of Energy's Notice of Intent(s) project announcement focused on the Critical Minerals Supply Chain.

OUTREACH

CEGR continued outreach efforts for all projects. Outreach highlights include:

- Tim Fischer attended a three-day field trip focused on the Mowry Shale in September. The field trip was organized by Wexpro and attended by personnel from Wexpro, Colorado School of Mines, the University of Wyoming, the Wyoming Geological Survey, and former EOG and Exxon-Mobil geologists. The learnings from this field trip will be used to develop company-specific field trips in the spring for industry partners and University of Wyoming Mowry Shale Project-supported students.
- The 2025 AAPG-Rocky Mountain Section Annual meeting was held in October. Autumn Eakin delivered a talk titled "Beyond Injectivity: What Really Drives Pore Space Value?" in a session focused on CCUS. A major focus was an all-day Mowry workshop developed by CEGR's Tim Fischer to increase engagement with industry partners on the Mowry Project. As session chair, Tim delivered opening remarks in a talk titled "The Full Value Chain Sweet Spot in the Mowry Shale: A Cross-Disciplinary Research Initiative at the University of Wyoming" and provided valuable insights to guide conversation through the day. Seven of the talks during the session were presented by UW students funded by the Mowry Project. CEGR researcher Matt Johnson presented his work titled "Mowry Shale Geology, Sweet Spot Delineation, and Production Evaluation in the Powder River Basin, Wyoming", while Tim Fischer presented on behalf of Maryam Lakjaa; her talk was titled "Production Forecast for Major Unconventional Reservoirs in Wyoming: A Focus on the Mowry Shale". Mowry Shale students also presented posters on their work. In attendance were senior geologists from most of the major operators in Colorado, Utah, and Wyoming. To cap off the session, a panel consisting of two academic researchers and one industry representative discussed ways to improve industry-academic relationships in research.

- Autumn Eakin was an invited speaker for the Pittsburgh Geological Society's monthly meeting, where she delivered a presentation on applied learnings from SER's carbon management and utilization portfolio.
- Robert Gregory presented the CEGR Critical Minerals Team's research for a talk titled "Lithium Resources and Potential Technology Assessments in Wyoming" at the Annual Geological Society of America Meeting in San Antonio, Texas.
- In October, Tyler Brown (and Daniel Cooley from Center for Business and Economic Analysis) gave an invited presentation on "Critical Minerals and Rare Earth Elements" at the quarterly CEO Meeting for Tri-State Generation & Transmission in Westminster, Colorado.
- Tyler Brown was invited to be on a panel at the Colorado Rural Energy Authority's 16th Annual Energy Innovation Summit in Westminster, Colorado (held the first week of November). The panel titled "Critical Minerals: Will the Supply Chain Support the Energy Transition", included Brown and two representatives from the Energy industry.
- Robert Gregory, participated in a stakeholder follow-up event for the panel he served on in spring 2025 for the Environmental Monitoring and Remediation Technology Assessment Initiative (EMRTAI).

Center for Carbon Capture and Conversion (CCCC)

Trina Igelsrud Pfeiffer, Director

CURRENT ACTIVITY

Budget

Efforts are underway to obtain funding for research through philanthropic activities, competitive funding opportunities, and potential state funding requests.

PROJECT UPDATES

Carbon Engineering

COAL-TO-PRODUCTS PROCESS DEVELOPMENT

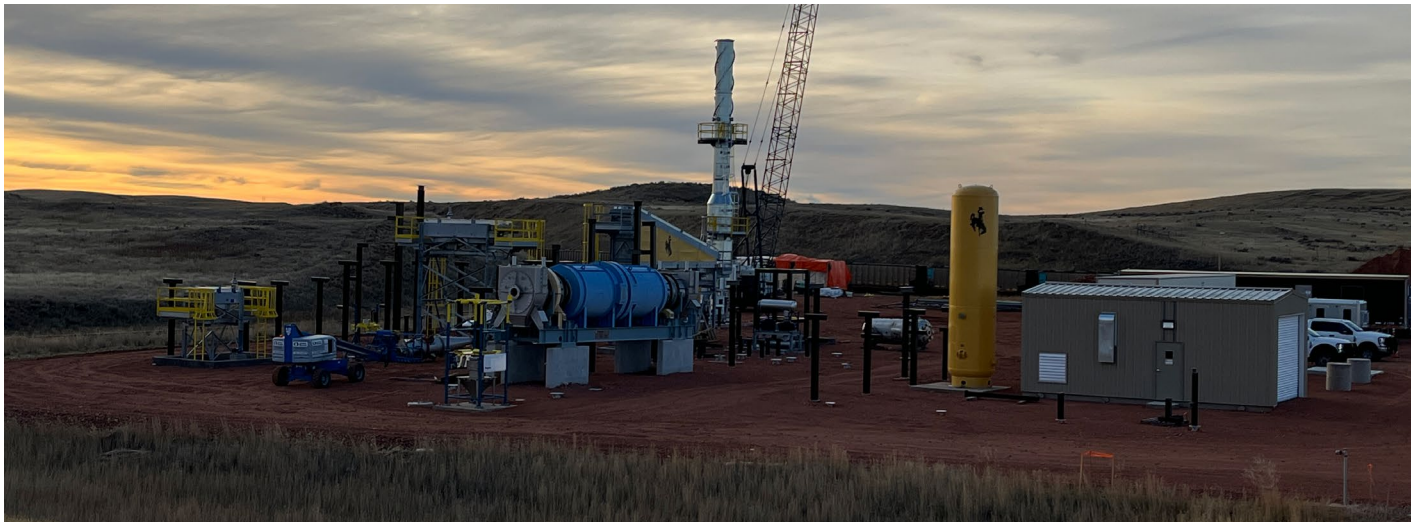
Coal Refinery Field Demonstration Plant with Wood Engineering Group

Pyrolysis Unit Fabrication:

Fabrication of the pyrolysis unit is now scheduled for January/February of 2026, following a change in ownership of the contracted fabrication company. While this has shifted the timeline, it will not have an impact on construction costs. The pyrolysis unit is scheduled to arrive onsite at the Wyoming Innovation Center in April/May 2026, and the construction team is planning to install the pyrolyzer prior to the construction of the solvent extraction plant. If the timing coincides with the start of the solvent extraction plant construction, it will not increase mobilization costs due to the delay.

Construction Activities:

Construction of the shared plant and pyrolysis infrastructure for the Coal Refinery Field Demonstration Plant is well underway. Except for the pyrolyzer and some field routed instrumentation, all other components are moving ahead as planned. The team remains committed to maintaining momentum and ensuring readiness for the next phase of integration. The construction team plans to have the structural steel supports and subsequent equipment installed prior to the winter holiday break.



Solvent Extraction Plant: Procurement and Engineering:

To support cost-effective delivery of the solvent extraction plant, UW procurement and CCCC met and identified a reasonable procurement path forward. The plan is to have UW procurement be responsible for the RFP bidding process. Once pieces of equipment are selected, UW procurement will issue a PO for the equipment. The post-PO activities will be within CCCC and Wood to ensure the equipment is manufactured correctly and shipped to site. SER/CCCC is working to reduce costs for the overall plant procurement and construction activities. Wood has been supportive of all ways to reduce costs on this project.

Detailed engineering for the solvent extraction portion of the Coal Refinery Field Demonstration Plant has been pushed back a few months. This minor delay allows the team to pursue innovative ideas that could significantly increase profitability while providing decreased capital costs. There are also research developments that could significantly change the back-end of the process that would ensure lower operating costs. The team would like to test these as well before starting detailed engineering.

Solvent Extraction Pilot Plant (Laramie Campus – Lutz building)

Over the last few months, CCCC has made strong progress in commissioning the Solvent Extraction Pilot Plant. As expected with a new process such as this, there have been a few challenges during commissioning, but the team continues to troubleshoot and address challenges as they arise.

Process development focus has shifted to cost reduction efforts, both on an expected operational cost front, but also potentially intercepting some capital cost reductions with the Gillette solvent extraction plant design. There is a short window of time within which some improvements can be made without having to build more flexibility into the Gillette plant design. Alternative solvents are being investigated as well as the impact on potential by-product usage for Rare Earth Element (REE) extraction.

Commissioning and Operational Progress:

After the production runs over the summer, modifications were made to further optimize operations and to produce enhanced operating data which will enable a more streamlined design process for the Gillette Field Demonstration Unit.

The pilot plant continues to conduct operational runs, with the objective of achieving multi-day operations by January when student staffing is available. At that point, the facility will transition to continuous-feed operational mode, aligning its processes with those anticipated for the Gillette Field Demonstration Unit.

Important to note, the student involvement over the summer has been highly successful. The students have had an opportunity to have hands-on experience. Their contributions have been vital to initial operations and troubleshooting.

Our graduating seniors have reported that their work experience at the pilot plant has been a major advantage during job interviews. As a result, they have very strong employment prospects, with all of them currently engaged in follow-up interviews with companies based in Wyoming. This underscores the value of the hands-on expertise our students acquire and highlights how their skills will continue to contribute to Wyoming's workforce and economic development.

In addition to the graduating cohort, the current student workforce is comprised of three juniors who are expected to assume more advanced responsibilities as the academic year progresses. Additionally, two students (a sophomore and a freshman), are in the process of joining the project team, ensuring continuity of the program for the future.

Looking ahead, there is strong interest in exploring continued use of the pilot plant as an educational platform. The CCCC hopes to engage with the Chemical and Biomedical Engineering and Mechanical Engineering departments to assess additional opportunities for students after we have completed our work. It would be a great way to provide hands-on, Wyoming-relevant experience for UW students.

Product Development and Industry Engagement

This plant has begun producing much needed samples for roofing and paving industrial research facilities to vet the product for wide industrial use. Western Research Institute (WRI) is working to formulate the extract that is generated and will be assisting with the post-processing formulation efforts for the Coal Refinery Field Demonstration Plant.

The pilot facility is already serving as a bridge between lab-scale and field-scale validation and is delivering critical data and samples to support commercialization efforts.

Pyrolysis Pilot Plant (Laramie Campus)

The Pyrolysis Pilot Plant has successfully operated with various coal feedstocks to collect design data and produce material for the downstream product utilization technologies. This includes both PRB and GGRB coals to produce the char precursor for synthetic graphite and critical mineral extraction, as well as a high-ash PRB coal to analyze the REE content in what is generally considered a coal waste.

The plant is being modified to study the effect of residence time of the pyrolysis vapor as well as analyzing the effect of steam. Both efforts aim to produce different products with either small changes in the plant or to utilize other readily available infrastructure to produce other products for downstream uses. Diversifying the product portfolio of the pyrolysis technology increases the operational flexibility and potential for a commercial refinery.

Coal Refinery Exhaust Gas Management System

The membrane separation development is ongoing. Further testing is ongoing to confirm the membrane separation results. The separation allows the resulting pyrolysis gases to provide a CO_2 stream and a hydrogen stream. In a commercial installation, hydrogen could be sold or used as an internal input, and the CO_2 could be used for EOR or sold for other industrial applications. Using membrane technology (coal-char-based) could make the economics of the coal refinery more favorable.

COAL-DERIVED PRODUCTS TECHNOLOGY DEMONSTRATIONS

Building & Construction Materials

- **Char Bricks**: The independent consulting firm has concluded their data collection of the second-generation bricks on the demonstration house. Data is being analyzed and will be shared once the analysis is completed. Research is ongoing to ensure that the char bricks are waterproof and not prone to cracks.
- **Block Paver, Thin Brick and Stone Veneer**: The block paver, thin brick, and stone veneer show comparable compressive strengths, water absorption, free-thaw durability, and abrasion resistance to their concrete counterparts. The team is working to improve the products' coloring to provide a variety of choices in addition to waterproofing efforts.
- **Char-based Aggregate for Concrete**: The char aggregate is thought to prevent concrete cracking due to long-term alkali-silica reactions caused by reactive natural aggregates. Long-term alkali-silica reaction experiments are being conducted, which started in October 2024 and will conclude in October 2025. Data is being compiled and will be shared once the analysis is complete.

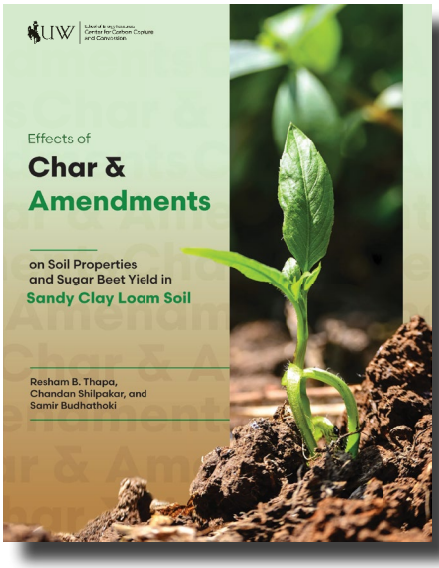
Asphalt Paving and Roofing Materials

The CCCC has continued to increase collaborative efforts with WRI to accelerate development of the asphalt binder research. The exploration of a more economical solvent and post-processing work for the completed asphalt binder product is progressing.

More information needs to be gathered in the research areas of mixing, oxidation, and aging, in addition to scale-up data for the field demonstration plant. WRI is working closely with the CCCC staff to solve the chemistry issues. As funding allows, there will be a test section of road paved using the asphalt formulated with binder from this process.

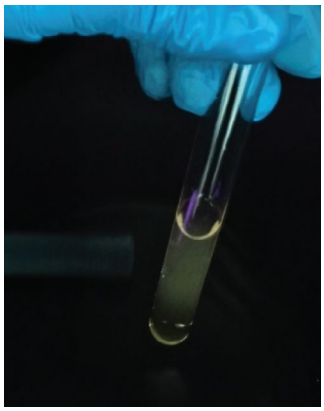
Agricultural Soil Amendment Product Augmented with Wyoming-sourced Nutrient

- In summer 2025, coal char study extended to the non-irrigated dryland site at the Sustainable Agriculture Research and Extension Center (SAREC), Lingle, to evaluate coal char's impact in a water-limited agroecosystem. This study aims to enhance soil health and crop productivity by improving soil water retention, nutrient availability, and organic carbon content.
- Resham Thapa received a grant from the Wyoming Department of Agriculture-USDA, for the project titled "Carrot production using coal char as a soil amendment". The project will start in early 2026 with soil amendment being applied in the spring of 2026.
- The soil amendment research team is collaborating with the Wyoming Department of Environmental Quality (WY DEQ). The team is working on a research proposal development that aims at evaluating the use of coal char as a soil amendment for the reclamation and remediation of abandoned uranium mine sites in the Shirley Basin. This collaborative project is planned for a five-year period, with the potential for an extension as needed, to assess the long-term effects of Wyoming-derived coal-based soil amendments on post-mining soil restoration, ecosystem recovery, and wildlife habitat rehabilitation in mine-disturbed areas.



- In mid-October 2025, the soil amendment team submitted a USDA-NIFA grant proposal titled "Advancing Sustainable Soil Health in Semi-Arid Systems through Coal Char and Biochar Amendments."
- A research collaboration is currently underway with the Department of Plant Sciences at the University of Wyoming to investigate the use of coal char as a soil amendment for high-quality grass seed production. Resham Thapa is actively contributing to the development of the project proposal and will serve as a Co-Principal Investigator (Co-PI) in the study.
- The soil amendment team is monitoring the reclamation work at NTEC's Cordero Rojo Mine which had coal char applied in August 2024 and at Peabody's North Antelope Rochelle Mine (NARM) which had coal char applied in August 2024.
- Lab work is ongoing to assess the soil health in the reclamation sites after using coal char as a soil amendment at NTEC and Peabody mines where the coal char was applied.
- In semi-arid Wyoming reclamation settings, establishing native plant communities is a multi-year process. For example, one study (Waitkus 2022) found that while native plants may begin to appear within 2–3 years, full development of productivity, species diversity, and soil structure comparable to undisturbed reference sites often takes 10 years or more.

Graphitic Material from PRB Coal and GGRB Coal



- Center of Excellence for Produced Water Management Director, Dr. Jon Brant, has been working on a way to purify the graphitic material that can then be used to make graphite and carbon quantum dots. The Greater Green River Basin coal has a higher carbon content than the Powder River Basin coal, making it superior for graphitic materials research.
- CCCC/CEGR has received a commitment funding from the Kemmerer mine to help with the characterization of the coal seams and process engineering efforts for making synthetic graphite.

Rare Earth Elements from PRB Coal and GGRB Coal

- The CEGR minerals team supplied two samples of higher ash, higher REE coal, typically considered mine-waste, for use in the solvent extraction and flash pyrolysis processes. The samples were run and were found to have higher REEs than expected. Additionally, there was not a negative impact on solvent extraction yield; flash pyrolysis is still in investigation.
- Solvent extraction and flash pyrolysis can utilize normal and high-ash PRB coals to produce an enriched REE stream whilst producing other valuable organic products, that can subsidize downstream REE separation. Further, resulting from the two UW SER proprietary processes, there appears to be some extraction selectivity between "light" and "heavy" REEs. This effect will be further investigated and the upstream processes optimized since it could have a major positive impact on downstream REE separation processing when using Wyoming's coal-based resources.

OUTREACH

Trina gave a talk about the Carbon Engineering program at the Coal Trends conference in October in Pittsburgh.

Hydrogen Energy Research Center (H_2ERC)

Eugene Holubnyak, Director

CURRENT ACTIVITY

- *Integration of Produced Water Thermal Desalination and Steam Methane Reforming for Efficient Hydrogen Production:* The project consists of two parts, the Supercritical Water Desalination and Oxidation (SCWDO) unit and the Steam Methane Reforming (SMR) unit. The SMR unit was fully assembled this October, on a fresh concrete pad poured for outdoor testing at EP&C's shop in Cheyenne, Wyoming. This portion of the pilot plant is now ready for testing. The SCWDO unit has been sent out to bid in a formal RFP to industrial partners. The team has selected winning bidders for two unique and critical components inside the SCWDO unit, but a fabricator for the rest of the SCWDO unit has not been selected.

The SMR unit was fully assembled and ready for testing at the EP&C's shop in Cheyenne, Wyoming

- *Geologic Hydrogen: Sustainable H_2 Production from Abiotic Catalyst-enhanced Stimulation of Iron-rich Rocks:* This subawarded project from UT-Austin involves four UW faculty members and one of their students each. The team has started experiments in pressure vessels to determine whether adding the UT-Austin-identified catalyst enhances production beyond what we observed in the Wyoming Banded Iron Formation (BIF). Samples of the gas and water will be tested throughout the reaction, and the rock will be tested before/after. The rock mechanics team collected additional BIF samples to perform additional mechanical tests, including a post-reaction sample with water.

Machines running experiments on Wyoming's unminable iron rock samples

- *Wyoming Geohydrogen Exploration:* The team has been working with graduate students to digitize historical data, including well logs, to analyze geologic hydrogen presence and has completed a literature review of other geologic hydrogen sources, such as those from overmature organic matter and hydrocarbon source rocks.

  This August, the team also organized and facilitated a 6-day geologic hydrogen field camp designed for students who are interested in the future of energy exploration. This experience was offered free of charge to interested undergraduate students, graduate students, postdocs, faculty, and staff. In total, nine students, one faculty member, and four School of Energy Resources staff attended the field camp. This camp included learning AI/ML techniques and working through guided exercises to show how these techniques could be applied to geologic hydrogen exploration. It brought attendees into the field to learn how to identify different geology that could apply to geologic hydrogen development and exploration, and how to use the field equipment, test for geologic hydrogen, and digitize the data into the models.

(left) The attendees are guided through AI/ML exercises in the classroom during the day, and (right) they learn about measuring geologic hydrogen in the field during the AI/ML field camp.

- *Building Capacity at UW: Hydrogen: Make, Move, Use or Store Project Updates:* Gisella Mena successfully defended the topic proposal for her PhD: Supercritical Water Gasification of an Organic-rich Materials for Low-Carbon Hydrogen Production.

FEASIBILITY STUDIES: EXPLORING NEW OPPORTUNITIES

Integrated Techno-Economic and Life-Cycle Assessment of Methane Pyrolysis for Hydrogen Production: This study develops a harmonized techno-economic analysis (TEA) and lifecycle assessment (LCA) framework to identify the most feasible technological pathways for hydrogen production via methane pyrolysis, supporting Wyoming's advancement in clean hydrogen development.

Methods: A meta-analysis approach was employed, incorporating data from ~50 real-world methane pyrolysis projects worldwide and synthesizing insights from over 1,000 peer-reviewed publications. The harmonized TEA-LCA model integrates process design, cost analysis, and environmental performance metrics across multiple methane pyrolysis technologies, including thermocatalytic, plasma, redox, and photocatalytic systems.

Results: Preliminary results indicate that reactor design and operating temperature, which vary significantly among these technologies, strongly influence both technical maturity and process efficiency. In addition, the selection and market value of the carbon co-product (e.g., carbon black, graphite, or nanocarbon) are shown to be critical drivers of economic feasibility, directly affecting the levelized cost of hydrogen (LCOH).

Impacts: This study provides actionable insights to guide large-scale deployment of methane pyrolysis in Wyoming, enabling the state to expand its hydrogen production capacity through cost-effective and low-emission pathways. These findings highlight Wyoming's opportunity to leverage its abundant natural gas resources while positioning itself as a national leader in clean hydrogen innovation and carbon co-product valorization.

OUTREACH

- Eugene Holubnyak traveled to Estonia as a part of the Department of State Visiting Scholar Program. During the trip, Eugene met with Estonia's Applied Research Center, Central Metrology Authority, the Environmental Investment Center, the Ministry of Climate, the Estonian Hydrogen Cluster, the Estonian CleanTech Association, and Acting Deputy Chief of Mission Joseph Bernath at the US Embassy in Tallinn. Eugene also gave a lecture on hydrogen in Wyoming at TalTech.

3D Visualization Center Report

Kyle Summerfield, Program Manager

CURRENT ACTIVITIES

The 3D Visualization Center has been focused on several key efforts this quarter, with heavy emphasis on hyperspectral data, the Class VI Site Characterization Database, development efforts across platforms, and pursuing new funding.

In addition to ongoing committed projects, the 3D Visualization Center team continues to improve and refine its available development tools to enable rapid deployment across domains and data sources.

- Cole James continues to lead the internship program and is spearheading the creation and maintenance of our web-based visualization toolsets.
- Ayla Carncross has taken over lead development for several projects, including the Mine Safety application and the Hololens-based chemistry education tool (ARSolution), and planning for the large tracking system we acquired when Gillette College retired it from their program.
- Phil Black is leading development and modeling for the Greenhouse Digital Twin project and audio design work for a reusable sound library for the 3D Visualization Center.
- Rachel Toner is now the Primary Investigator for the Class VI Site Characterization Database project and has been responsible for the Class VI relational database schema and quality control efforts.
- James Amato has led everything related to GIS, remote sensing, and hyperspectral imaging in addition to seeking funding opportunities and supporting ongoing work throughout the whole of SER.
- Jerry Evans continues to support all AV and technical issues in the Energy Innovation Center and beyond. He has also coordinated recent display and computer upgrades throughout the building.

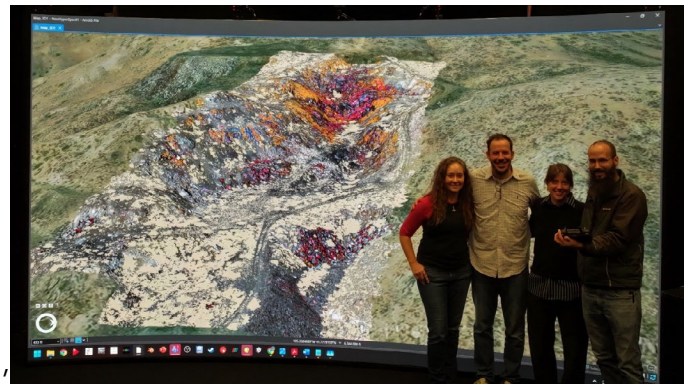
HIGHLIGHTS FROM ONGOING AND RECENTLY COMPLETED PROJECTS

Hyperspectral Data Research, Processing, and Interpretation

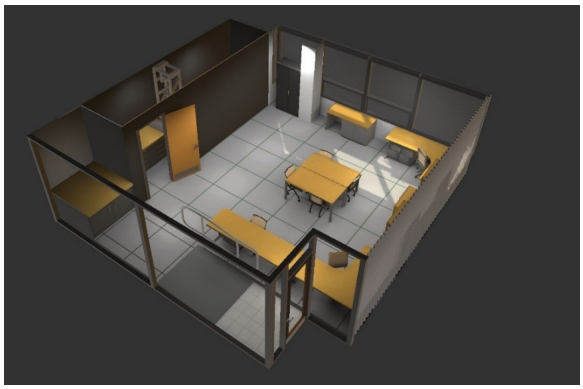
- **Remote Sensing team attends international workshop on hyperspectral core scanning:** James Amato and Kyle Summerfield attended the 2nd Meeting of the International Hyperspectral Core Scanning Working Group at Colorado School of Mines in October 20-21. The program featured industry, academic, and government speakers on operational drill-core workflows, spectral fidelity and QC, mineral abundance estimation, standardization for non-specialists, global case studies, education

and outreach, and AI/ML advances. The event blended technical talks, discussions on lowering adoption barriers, and a reception at the Mines Geology Museum, underscoring a community push toward reproducible methods and practical deployment of hyperspectral core scanning.

- **Dr. Friederike Körting from Norway visits the School of Energy Resources**: Dr. Körting is a spectral geologist with HySpex, who produces the Mjolnir VS-620 hyperspectral camera procured by the Visualization Center earlier this year. Originally from Berlin and now based in Norway, Dr. Körting specializes in hyperspectral imaging for mineral characterization and exploration. During her visit to SER from October 22 through the 25th, she collaborated with the 3D Visualization Center on hyperspectral workflows, delivered a Distinguished Speaker Series talk entitled "From Promise to Practice: Hyperspectral Imaging Across the Mining Value Chain", and appeared on the Wyoming Energy Frontier podcast with James Amato. With her assistance, the remote sensing team produced its first mineral map from hyperspectral data collected over the non-operational Cobar No. 1 pit in Sybille Canyon early this summer.



- **Remote Sensing team begins darkroom construction plans and acquires field spectrometer**: The hyperspectral imaging spectrometer is a versatile system that can be mounted on a laboratory rack and used in the off season to scan drill core and hand samples. To support this lab-based imaging, we are seeking to construct a dedicated dark room in EIC 278. The rack and proposed space for its installation are designed for standard core boxes holding three 3-foot core sections, enabling efficient scanning and processing. The model shown here, created by Cole James and deployed using the custom web viewer he developed, illustrates the proposed modifications to the existing space.



  The team has also been working on acquiring a field (point) spectrometer for ground-truthing airborne hyperspectral campaigns. A new instrument and accessories were quoted at $91,711.42. Over the summer, we located an existing ASD FieldSpec4 in UW Biodiversity; however, its spectral sampling interval does not match our airborne imager. Rather than purchase new, the OEM has agreed to upgrade the unit with required accessories for $25,602.82, delivering ~72% savings while meeting our specifications. Biodiversity is graciously transferring the instrument to SER, enabling the upgrade and allowing SER to steward the instrument going forward. This instrument is critical to developing and executing hyperspectral surveys statewide.

- **Remote Sensing team submits ART/STAR proposal aimed at using hyperspectral technologies to examine uranium mine waste**: James Amato and Kyle Summerfield submitted a proposal to UW's competitive Accelerating Research Translation (ART) / Seed Translational Acceleration of Research (STAR) program, in partnership with DISA Technologies, to advance commercialization-focused research. The project—Drone-based VNIR–SWIR Hyperspectral Imaging to Reduce False Positives in Legacy Uranium Waste Detection and to Prioritize Feedstocks for DISA's HPSA Processing—aims to deploy airborne spectroscopy and analytics to improve the accuracy of legacy uranium waste identification while ranking candidate materials for high-pressure slurry ablation (HPSA). If awarded, the work will integrate field validation and data-driven prioritization to accelerate DISA's feedstock selection and reduce processing risk.

Hyperspectral Data Research, Processing, and Interpretation

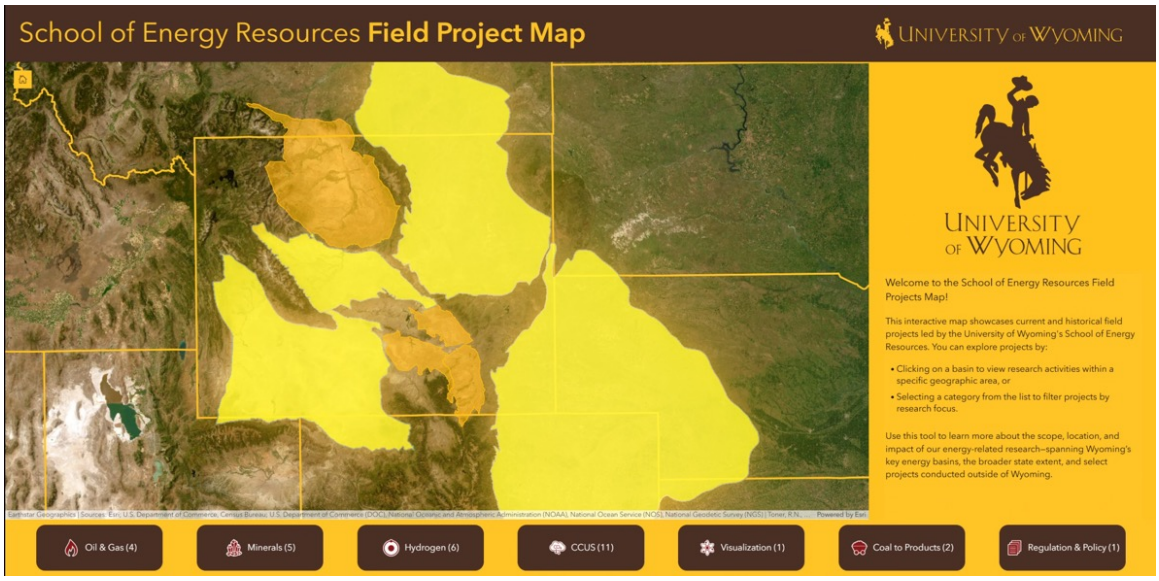
Substantial progress has been made on the Class VI site characterization database, now lead by Rachel Toner at the 3D Visualization Center. An annual progress presentation was delivered to the DOE in September and the Q4 2025 quarterly report was submitted the end of October 2025. Except for minor ongoing refinements to optimize compatibility with the diverse Class VI datasets, the relational database schema has been largely finalized. The schema has been populated with subsets of the geotechnical datasets to validate schema structure, assess analytical functionality, and confirm interoperability with the front-end web map interface. Concurrently, the design phase of the web map application has been initiated to support visualization, query, and interactive analysis of the Class VI geotechnical and spatial datasets. Although these efforts continue to advance the project toward a fully integrated data management and visualization platform, a no-cost extension (NCE) will be requested and submitted to DOE during the first quarter of 2026. An NCE would provide additional time for subawardees to complete their task requirements while accommodating competing internal workloads, ensure that all project deliverables are finalized without compromising technical integrity or regulatory compliance, and mitigate the impacts of project communication and approval delays resulting from the government shutdown.

Research on Innovative Technologies for Enhanced Learning (RITEL)

Kyle Summerfield, in collaboration with Amy Banic from the Computer Science department, submitted a grant proposal for this funding opportunity entitled Advancing Immersive Technology in Pedagogical Workflows. If successful, this grant will secure approximately $900,000 to continue educational and workforce training efforts across the state which were established through the Virtual Reality subcomponent of the Wyoming Innovation Partnership program, led by Kyle Summerfield. These efforts support workforce training in many fields, with particular emphasis on mine safety and digital twins. The proposal represents a collaborative effort spanning all nine higher education institutions in Wyoming and three departments on campus (SER, Computer Science, and the School of Teacher Education). It is important to highlight the contribution of SER's Project Management Team in this effort as well, who have made this process significantly easier to navigate.

SER Field Project Map

This web-based application aims to demonstrate the breadth of field projects at the School of Energy Resources. Using a map of the basins around the state, users can see the projects associated with each individual basin or view them by category, providing short descriptions, funding sources, contact details, and links for further information.



GIS team publishes CORE-CM technical documentation

In August the 3D Visualization Center internally published technical documentation on a database schema for the Carbon Ore, Rare Earth, and Critical Minerals (CORE-CM) initiative. Designed to enhance data integration, storage, and visualization across regions, the CORE-CM extension lays the groundwork for advanced geoscientific modeling and collaborative data sharing. While initially focused on carbon-based resources, the schema is adaptable to a wide range of unconventional and secondary sources and will continue to evolve in response to technological progress and stakeholder needs. While originally developed for internal use, the goal is that the schema could eventually support broader, potentially national adoption.

- *Amato, J.A., Toner, R.N., Brown, T.C., and Bagdonas, D.A., 2025, CORE-CM extension for GeMS (Geologic Map Schema)—A standard format for the digital publication and analysis of Carbon Ore, Rare Earth, and Critical Minerals: University of Wyoming, School of Energy Resources, 3D Visualization Center, Data Series 2025-1, ver. 1.0, 22 p., https://doi.org/10.15786/wyoscholar/10120.*

Simulation Suite Upgrades and Configuration

Jerry Evans and Cole James have coordinated significant upgrades to the 3D Viz Center's primary teaching environment, the Simulation Suite. While not a computer lab in the traditional sense (it is not available for general student use), this room is outfitted with high-end computers and used to teach students in the internship and Research Experience for Undergraduates programs, Computer Science capstone groups, private industry, or internal groups seeking short courses for targeted skillsets (3D modeling, data capture, software development, GIS workflows, etc).

Outreach

Christine Reed, Director

CURRENT ACTIVITY

Continuing Engagement Activities

- **Internal newsletter and external quarterly newsletter:** The second quarterly newsletter for 2025 was released in August and the third quarterly newsletter is forthcoming in November.
- **Electronic news blog and collaborative press releases**
- **Photos and videos**
- **Social media**
- **Website**
- **UWyo Magazine stories and ads**
- **"Energy Frontier: The Wyoming Landscape Podcast":** With the departure announcement of Dr. Krutka, Dr. Erin Phillips, SER Director of Cross-Cutting Programs, will take over as the podcast host. The Outreach team will continue to coordinate scheduling and logistics. Since the last ERC meeting, episodes have included the following guests:

Episode #58	Angela Ver Ploeg	Senior Director of Corporate Engagement, UW Foundation and Office of Industry and Strategic Partnerships
Episode #59	Tim Considine	SER Professor of Energy Economics
Episode #60	Richard Axelbaum	Professor of Energy, Environmental and Chemical Engineering at Washington University in St. Louis & Director of the Consortium for Clean Coal Utilization
Episode #61	Joe Miller	President, Government Operations at BWXT
Episode #62	Sarah Buckhold and Charles Nye	Research Professionals, SER Hydrogen Energy Research Center
Episode #63	Matt Babcock	Chief Commercial Officer, Navajo Transitional Energy Company
Episode #64	Friederike Körting and James Amato	Hyperspectral Geologist, HySpex, and Associate Research Professional School of Energy Resources 3D Visualization Center

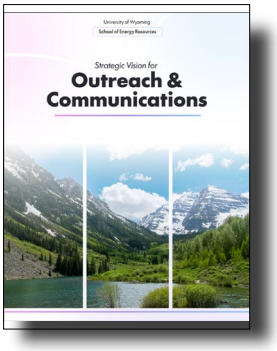
2025 Annual Report

The Outreach team compiled the FY25 Annual Report for SER. Annual reports are submitted on Oct. 1 of each year to the Joint Minerals, Business and Economic Development Interim Committee, Joint Appropriations Interim Committee, and the Joint Education Interim Committee. It is also posted and available to download from the SER website.

This report highlights SER's significant achievements from July 1, 2024, through June 30, 2025, in academics, research, newly emerging areas of focus, and engagement to keep UW and Wyoming at the forefront of the energy sector.

Outreach Strategic Plan and Vision Document

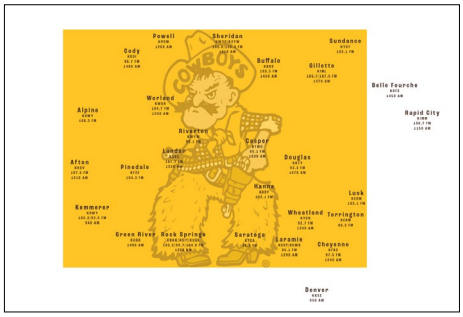
The Outreach team put together a strategic plan and vision document to address some of the growth within SER as it relates to public-facing engagement. The objective of the document is to clearly communicate services provided by Outreach, as well as to manage expectations from the research and academic units.



EVENTS AND ADVERTISING

Advertising

- **Cowboy State Daily Digital Ads** - current digital ads running promote the SER academic program as well as the Energy Frontier podcast.
- **Energy Frontier: The Wyoming landscape radio commercial** - SER recorded a 30-second radio ad to use in other media to promote the podcast. It was aired on November 24, on the Cowboy Sports Network (locations indicated on the map on the right), as well as in 2 spots that played pre-game, in-game, and post-game for CSU game broadcast.



- **UWyo Magazine** - Outreach continues to promote SER through a full-page ad in UWyo Magazine. The upcoming edition will feature experiential learning opportunities in SER's Academic Program.

Completed Fall Events

Completed fall events include the Fall Distinguished Speaker Series, Energy Day football game and ancillary activities including the grand opening of the Multidisciplinary Advanced Stimulation Laboratory, the special 'Cowboys and Coal' football game, and the Gina Guy Landscape Discussion on Energy Law & Policy in the Rockies.

Upcoming Events

- **Spring Distinguished Speaker Series** - speakers are currently being schedule
- **Rocky Mountain Land and Resources Management Conference (RMLRMC)** - April 14-15, 2026

  Formerly the Rocky Mountain Professional Landman (PLM) Conference, this annual, student-led event is being rebranded to be more inclusive of the Energy and Environmental Systems concentration. In alternating year, the conference will either focus on PLM or EES issues. The 2026 conference will be held in collaboration with the College of Agriculture, and will also feature a joint poster session and networking reception with the Haub School of Environment and Natural Resources.
- **Wyoming's Energy Future Symposium** - save the date, October 22, 2026

OUTREACH

- The Outreach team and the Energy ELC team continue to collaborate with the UW Science Initiative on the STEM Roadshow. Members of SER participate to provide the "Energy Bingo" activity to K-12 students in Wyoming schools. Completed and upcoming fall activities include:

October 8	Sabrina Summerfield	Black Butte High School, Rock Springs
October 27	Christine Reed	Big Piney Elementary School, Big Piney (Cancelled due to bad weather)
November 14	Madison Mankin	Douglas Rural Schools, Douglas
November 19	Selena Gerace	Wind River Elementary School, Pavillion

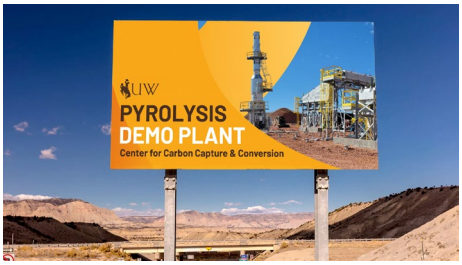
- The Outreach team continues to coordinate and provide tours of the Energy Innovation Center and the STEM Corridor for interested stakeholders and community members. Recently completed and upcoming building tours include:
  - Tour provided to Melissa Sanderson of American Rare Earths, Ltd. (Parent company to Wyoming Rare Earths) - November 5, 2025.
  - Guest lecture and provide tour to "Climate Change Responses" (UW course, Haub School of Environment and Natural Resources), November 10, 2025.
  - Solar Cells Lab Tour for Laramie Montessori 4-6 graders - November 19, 2025.

UNIT-SPECIFIC PROJECTS

Outreach has continued to support unit-specific projects, usually with graphic design, content, and document layout, as well as event logistics and planning.

Center for Carbon Capture and Conversion

- Designed research brief for most recent soil amendment publication.
- Designed signage for the various demonstration facilities.
- Working on a time-lapse video of the construction of the Field Demonstration Plant.



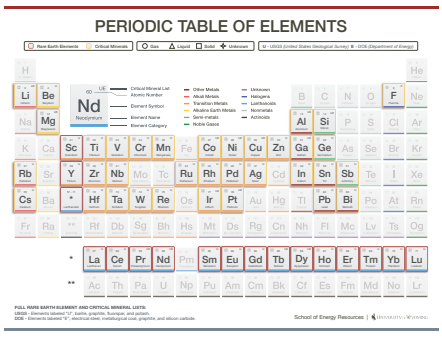
^ Mock up image

Center for Energy Regulation and Policy Analysis

- Graphics, formatting and layouts of all CERPA white papers and research briefs including the recently released Wyoming Hydrogen white paper.

Center for Economic Geology Research

- Christine Reed is writing a substantial portion of the Outreach chapter for the final Wyoming CarbonSAFE report.
- Sabrina Summerfield is providing the design, layout, and formatting for the Wyoming CarbonSAFE final report.
- Designed graphics to utilize in proposals and reports.



Academics

- Providing logistical support on the RMLRMC conference in the spring.
- Provided free professional headshot sessions to SER students.

Hydrogen Energy Research Center

- Designed a cover for submission to *Environment and Technology* to accompany a forthcoming publication by Haibo Zhai.

Energy Engagement, Leadership, and Careers Program

- Helped post and distribute the educational modules for K-12 students.

School of
Energy Resources