Annual REPORT 2025

Strategic Academic Offerings

Innovative Research

Stakeholder Outreach

ACADEMICS **RESEARCH** **OUTREACH**

University of Wyoming | School of Energy Resources

Prepared for the Wyoming Legislature

Joint Minerals, Business, and Economic Development Committee
Joint Appropriations Committee
Joint Education Committee

THE UNIVERSITY OF WYOMING SCHOOL OF ENERGY RESOURCES (SER) ANNUAL REPORT FISCAL YEAR 2025

July 1, 2024 through June 30, 2025

WHO WE ARE

SER LEADERSHIP

Holly Krutka, Ph.D. | Executive Director
Scott Quillinan | Senior Director, Research
J. Fred McLaughlin, Ph.D. | Director, Center for Economic Geology Research
Trina Igelsrud Pfeiffer | Director, Center for Carbon Capture and Conversion
Eugene Holubnyak | Director, Hydrogen Energy Research Center
Matt Fry | Director, Center for Energy Regulation and Policy Analysis
Kami Danaei, Ed.D. | Director, Academic Programs
Erin Phillips, Ph.D. | Director, Cross-Cutting Programs
Kyle Summerfield | Program Manager, 3D Visualization Center
Rachel Ferrell | Director, Business Operations
Christine Reed | Director, Outreach

ADMINISTRATIVE SUPPORT

Kristi Russow | Executive Administrative Assistant
Pat McLean | Office Associate, Sr.

OUR MISSION

To advance energy-driven economic development for the state of Wyoming.

CONTACT US

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ABOUT THE SCHOOL OF ENERGY RESOURCES

The University of Wyoming (UW) School of Energy Resources (SER) was created in 2006 to enhance the University's energy-related education, research, and engagement. SER directs and funds cutting-edge energy research and technology development, which integrates with the formulation and conduct of academic programs at UW and bridges academics and industry through targeted engagement efforts. The partnerships formed between academics and industry ensure programs are relevant, current, and deliver impact and high value to stakeholders and the state.

Since its inception, SER has maintained flexibility in its focus and structure to meet the changing needs of Wyoming's energy industries and the state's economy—which is now more critical than ever.

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.

TABLE OF CONTENTS

GLOSSARY OF ACRONYMS

#
3D Viz - 3D Visualization Center

A
AAPL - American Association of Professional Landmen
AI - Artificial Intelligence
ATR - Advanced Technology Resources

B
BLM - Bureau of Land Management
BOT - Board of Trustees

C
CALSNR - College of Agriculture, Life Sciences, and Natural Resources
CAQ - Center for Air Quality
CarbonSAFE - Carbon Storage Assurance Facility Enterprise
CAVE - Cave Automatic Virtual Environment
CBEA - Center for Business and Economic Analysis
CBNGR - Center for Biogenic Natural Gas Research
CCCC - Center for Carbon Capture and Conversion
CCF - Cowboy Clean Fuels
CCUS - Carbon Capture, Utilization and Storage
CEGR - Center for Economic Geology Research
CEPS - College of Engineering and Physical Sciences
CEPWM - Center of Excellence for Produced Water Management
CERPA - Center for Energy Regulation & Policy Analysis
CM - Critical Minerals
CMLA - Critical Minerals Leadership Academy
CO_2 - Carbon Dioxide
COE - Centers of Excellence
CORE-CM - Carbon Ore, Rare Earth and Critical Minerals
CPL - Certified Professional Landman

D
DFS - Dry Fork Station
DOE - Department of Energy

E
EES - Energy and Environmental Systems
EIC - Energy Innovation Center
Energy ELC - Energy Engagement, Leadership and Careers
EORI - Enhanced Oil Recovery Institute
ERC - Energy Resources Council
ERM - Energy Resource Management (minor)
ERMD - Energy Resource Management and Development
ERS - Energy Resources
ESA - Endangered Species Act

F
FEED - Front End Engineering Design
FY25 - Fiscal Year 20245
FY26 -Fiscal Year 2026

G
GGRB-WRB - Greater Green River Basin and Wind River Basin
GRSG - Greater Sage Grouse
GTI - Gas Technology Institute

H
Haub School - Haub School of Environment and Natural Resources
H_2ERC - Hydrogen Energy Research Center
HERO - Hermiston, Oregon
HSI - Hyperspectral Imaging

I
IAMG - International Association for Mathematical Geosciences
INL - Idaho National Laboratory
ITC - Integrated Test Center

J
JCOAL - Japan Carbon Frontier Organization
JETRO - Japan External Trade Organization
JOULE - Jurisprudence of Underground Law and Energy

K
KHI - Kawasaki Heavy Industries

L
LANL - Los Alamos National Laboratory
LST - Landman Scholarship Trust

M
MAES - Mechanistic Air Emissions Simulator
MTR - Membrane Technology and Research

N
NAPE - North American Petroleum Expo
NEDO - New Energy and Industrial Technology Development Organization
NEPA - National Environmental Protection Act
NERC - Nuclear Energy Research Center
NETL - National Environmental Technology Laboratory
NOW - Nuclear, Onshore, Wind and more
NREL - National Renewable Energy Laboratory
NSF – National Science Foundation
NTEC - Navajo Transitional Energy Company
NWSC - NCAR-Wyoming Super Computer

O
OSC - Outer Continental Shelf

P
PLM - Professional Land Management
PNNL - Pacific Northwest National Laboratory
PRB - Powder River Basin

R
RMP - Resource Management Plan
RNG - Renewable Natural Gas

S
SABER - Site-Air-Basin Emissions Reconciliation
SAREC - UW Sustainable Agriculture Research and Extension Center
SEDI - Subsurface Energy and Digital Innovation Center
SER - School of Energy Resources

T
TAP - Technology Associated Program
TRECCS - Triangle Unit Renewable Energy and Carbon Capture and Storage

U
USFWS - United States Fish and Wildlife Service
USGS - United States Geological Survey
UW - University of Wyoming

V
VNIR-SWIR - Visible Near-Infrared, Short Wave Infrared
VR - Virtual Reality

W
WERC - Wind Energy Research Center
WOGCC - Wyoming Oil and Gas Conservation Commission
WRI - Western Research Institute
WyIC - Wyoming Innovation Center
WYTAC-CM - Wyoming Technical Assistance Collaboration for Carbon Management

LETTER FROM THE EXECUTIVE DIRECTOR


Dr. Holly Krutka
Executive Director

Greetings from the School of Energy Resources (SER)!

As we reflect on fiscal year 2025, it is clear that this has been a year of extraordinary achievement for the School of Energy Resources and our many partners across the university and the Wyoming energy sector. From welcoming new faculty and students to advancing major research demonstrations and expanding outreach, SER continues to fulfill its mission to advance Wyoming-driven economic development. This year has also underscored the importance of adaptability. Delays in competitive grant negotiations have created uncertainty around the timing of several large research awards, requiring our teams to remain nimble, creative, and resilient. Even amid those challenges, SER has delivered impressive results that continue to position Wyoming at the forefront of energy innovation.

A highlight of the year was welcoming new SER faculty members, including Dr. Bryan Leonard, SER Associate Professor in Environment and Natural Resources, and Dr. Jennifer Bell, SER Assistant Professor of Soil Science and Reclamation. Their expertise reflects how SER supports other UW colleges and schools to recruit faculty with expertise central to Wyoming's future. SER's student enrollment, and expansion of educational credentials offered, has been equally inspiring. Enrollment in the Energy Resource Management and Development program has more than doubled since 2021, supported by new certificates and academic offerings. This year, the first student in our 3+3 program was admitted to the UW College of Law, and others gained new opportunities through internships in the Governor's Office, undergraduate research roles, and expanded engagement across the state. These examples affirm that SER students are building the skills and networks needed to lead in tomorrow's energy workforce.

The research portfolio remains strong, with more than $126 million in active non-state awards during the fiscal year and nearly $54 million in state-sponsored projects. These funds are advancing Wyoming energy innovation, including drilling one of the first and deepest stratigraphic wells in Wyoming to assess CO_2 storage potential, pilot-scale demonstrations of rare earth element and critical mineral recovery from coal byproducts at the Wyoming Innovation Center, and the coal refinery demonstration project in Gillette, where equipment was purchased and research into non-energy products continues. Our carbon engineering group showed remarkable ingenuity in adapting demonstration projects despite constrained federal resources, and international collaborations expanded SER's carbon mineralization research. State resources also supported faculty, staff, and students working across UW on Wyoming-specific challenges, including oil and gas production, produced water, air quality, nuclear energy, and critical minerals.

Beyond research, SER strengthened its outreach program. The Distinguished Speaker Series, Energy Day at UW football, the Tribal Energy Summit, and a conference in collaboration with the Wold Foundation were among the many events that drew strong participation. Our outreach extended through conferences, news, social media, and the Energy Frontier podcast, ensuring that SER's work is accessible and relevant to communities, industry, and policymakers. These efforts also help keep Wyoming at the center of national and international energy conversations.

We are always mindful that SER is entrusted with public funds, and we take that responsibility seriously. Under the governance of the Energy Resources Council, we are focused on managing the resources provided to us in a transparent and responsible manner.

The accomplishments of FY25 were possible only through the dedication of SER's faculty, staff, and students, and through the support of partners across Wyoming and beyond. Wyoming remains the best place in the world to advance energy innovation, and SER is proud to be a leader in that effort.

Sincerely,

Holly Krutka

Holly Krutka, Ph.D.

ENERGY RESOURCES COUNCIL

The University of Wyoming Energy Resources Council (ERC) was established by Wyoming statute 21-17-117(e) to guide SER in setting priorities for energy-related academics, research, and outreach. The ERC, consisting of leaders from industry, the legislature and UW, provides direction for responsive, internationally recognized, interdisciplinary energy-related programs that are integral constituents of the university's identity.

Required by provision (c)(iv) of WY Stat § 21-17-117 and in accordance with WY Stat § 9-2-1010 through 9-2-1014, SER submits its budget directly to the ERC for review and approval before final submission to the governor.

The ERC contributes a unique business perspective on the diverse research and workforce demands of both Wyoming's private and public energy sectors, and is responsible for producing a valuable return on the state's investment in UW's energy programs.

The ERC currently consists of thirteen members and liaisons. Seven members represent diverse sectors of Wyoming's energy industries and are appointed to three-year terms by the governor with confirmation by the Senate.

Additional members include one member from the Wyoming Senate (appointed by the President of the Senate), one from the House of Representatives (appointed by the Speaker of the House), and four ex-officio members and liaisons: the President of the University of Wyoming, the Director of the Haub School of Environment and Natural Resources, a representative from the Wyoming Governor's office, and an informal seat is occupied by a member of the UW Board of Trustees.

COUNCIL MEMBERS

Cindy Crane, *Chairwoman*
CEO, PacifiCorp

Ed Cooper, *Vice Chairman*
Wyoming State Senator, District 20

Scott Heiner
Wyoming House of Representatives, District 18

David Emery
Retired Chairman and CEO, Black Hills Corporation

Charlene Russell
Vice President of Commercial Development for North America, Baker Hughes

Chad Teply
Senior Vice President, Transmission and Gulf of Mexico at Williams

Mark Doelger
President and co-owner, Barlow & Haun, Inc.

Bill Miller
Executive Vice President, The Anschuz Corp.

Peter Gottfried
President, Natural Systems Analysts Inc.

EX-OFFICIO MEMBERS AND LIAISONS

Edward Seidel
President, University of Wyoming

Paul Ulrich
Trustee, University of Wyoming

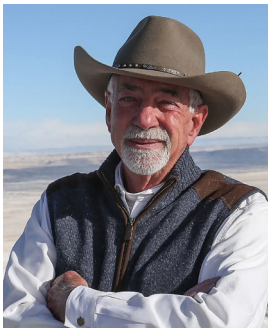
Randall Luthi
Senior Policy Advisor, State of Wyoming

John Koprowski
Dean, UW Haub School & Ruckelshaus Institute

INCOMING MEMBERS

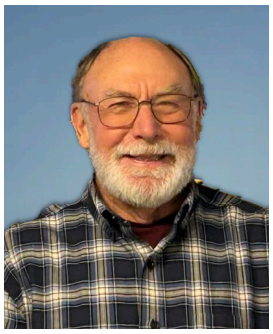
Energy Resources Council

In FY25, the Energy Resources Council (ERC) welcomed four new members and one new liaison. **Bill Miller**, executive vice president of the Anschutz Corp., and **Peter Gottfried**, president of Natural Systems Analysts Inc., were both appointed by **Gov. Mark Gordon** and confirmed by the Wyoming Senate.



Bill Miller

Miller, a Wyoming native now living in Denver, Colo., is a seasoned executive with a distinguished career in the energy industry. His extensive background in oil and gas, land work, renewable energy, finance and navigating federal regulations will be invalable as SER navigates serving Wyoming in the complex energy landscape. Miller's understanding of market dynamics, technological advancements, policy considerations and Wyoming energy will provide critical insights to the ERC.



Peter Gottfried

A long-term resident of Dubois, Gottfried is an environmental scientist and GIS expert with more than 47 years of experience in the field. Throughout his career, he has cultivated expertise in environmental assessments, habitat analyses and GIS mapping for various projects, including those related to energy development. His understanding of environmental science and GIS technology will be crucial in guiding SER's research and outreach efforts, particularly in ensuring responsible resource development and environmental stewardship.

In addition to the governor-appointed positions, the ERC is statutorily required to include representatives of the Wyoming Legislature to ensure that SER's work is relevant, impactful and aligned with the needs of Wyoming and the Nation. Serving a minimum of a two-year term, one member comes from the Wyoming Senate, appointed by the President of the Senate, and the other from the House of Representatives, appointed by the Speaker of the House.

Sen. Ed Cooper

New to the ERC, beginning in 2025, are **Sen. Ed Cooper** and **Rep. Scott Heiner**.

Representing District 20, Cooper has deep roots in both the energy and agricultural sectors in Wyoming. Hailing from Ten Sleep, he started his own oil and gas consulting firm in 1972 and owns Cooper Land and Livestock, a company rooted in farming and cattle operations. Cooper was elected to the Legislature in 2021 and is now in his second term. Among several other committees, he serves on the Joint Minerals, Business and Economic Development Committee.

Rep. Scott Heiner

Representing District 18, Heiner, from Green River, is the House majority leader and chair of the Minerals, Business and Economic Development Committee. An engineer by trade, Heiner enjoyed a long career in the oil and gas industry before moving into public service as an elected official in Wyoming's citizen legislature in 2021.

Energy Resources Council Liaison

Paul Ulrich was appointed as a member of the UW Board of Trustees (BOT) in 2025 and will represent the Board at Energy Resources Council meetings.

Ulrich is a 25-year veteran of the oil and gas exploration and production industry, currently serving as vice president for Jonah Energy LLC, which operates the Jonah Field in Wyoming, one of the largest natural gas fields in North America. He recently served as chairman of the Wyoming Energy Authority, is a member of the Board of the Wyoming Chapter of the Nature Conservancy and is past chairman of the Petroleum Association of Wyoming.

OUTGOING MEMBERS

Energy Resources Council

Vello Kuuskraa is the president of Advanced Resources International and has over 40 years of experience with energy technologies and economics. Initially appointed to the ERC in 2016, his expertise and contributions have helped SER become a recognized leader in energy research and education.

The president of C.O. Bauer Consulting Inc., **Carl Bauer** has over thirty years of leadership experience with technical, strategic, and operational business and facility management in both industry, R&D and as Director of the U.S. Department of Energy's National Energy Technology Laboratory (NETL). He has served on the ERC since 2010.

Sen. Jim Anderson has served in the Wyoming Legislature since 2013, representing District 28. He currently sits on the Senate Minerals, Business & Economic Development Committee. Sen. Anderson was appointed to the ERC in 2013 and has served as Co-Chairman. A Vietnam veteran, Sen. Anderson worked as the Director of Wyoming Machinery Company before being elected to the legislature.

A former Representative for District 15, **Don Burkhart, Jr.** served fourteen years in the Wyoming Legislature. He chaired the House, Minerals, Business & Economic Development Committee during his tenure, and served on the ERC beginning in 2022. His work experience includes Wyoming's energy industries, mainly in the oil & gas sector.

Energy Resources Council Liaison

A former member of the UW Board of Trustees, **Dave True** served 2 terms from 2013-2025, serving as chairman from 2018-2019. He represented the BOT at Energy Resources Council meetings during his tenure. True is a joint partner/owner and senior manager for the True Companies headquartered in Casper.





Pictured left to right:
Vello Kuuskraa
Carl Bauer
Sen. Jim Anderson
Rep. Don Burkhart
Dave True

ACADEMIC PROGRAM

NUCLEAR ENERGY SCIENCE CERTIFICATES

In FY25, SER, in collaboration with the College of Engineering and Physical Sciences (CEPS), launched the new nuclear energy science certificates available to students beginning fall 2025.

Both certificates (Undergraduate/Graduate) received final approval from the Higher Learning Commission, and the UW Board of Trustees.

The interdisciplinary certificate programs allow undergraduate and graduate students to earn a credential grounded in nuclear energy science and technology. The programs will give students a strong understanding of the scientific principles underlying nuclear energy and related technological applications across various sectors.

The certificates require 15 credit hours of in-person course offerings, typically completed over two academic years.

QUICKSTART PROGRAM SUCCESS

First 3+3 Energy Resources Management and Development Student Accepted to UW College of Law

Ryan Fogg, of Carpenter, Wyo. in the Energy Resource Management and Development (ERMD) degree program, is the first student to be accepted into the UW College of Law as part of SER's 3+3 accelerated degree program.

The Quickstart 3+3 program allows UW students to earn a bachelor's degree in ERMD through SER and a Juris Doctor through the College of Law, following the standard application requirements. If accepted into law school, students gain the combined professional credentials in six years instead of the traditional seven, with the first year of law school concurrently satisfying the final year of the undergraduate degree.

A resounding success story, Fogg took his foundational knowledge of property interests and energy development and built upon them in SER's program that prioritizes hands-on training and experiential opportunities. He credits the rigorous discussions and analytical thinking fostered in the classroom as the best preparation for the next chapter of his education.

WHO WE ARE

Kami Danaei, Academic Director

Larissa Rutz, Academic Coordinator

Heather Chandler, Office Associate, Sr.

Kristen Pritchett, Director, Professional Land Management (PLM) Concentration

Randall Violett, Director, Energy and Environmental Systems (EES) Concentration

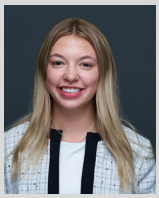
Ashli Tomisich, Director, Student Success and Experiential Learning

MAJOR ACCOLADES

Kristen Pritchett earned her Certified Professional Landman (CPL) credential through the American Association of Professional Landmen (AAPL).

STUDENT ACCOLADES

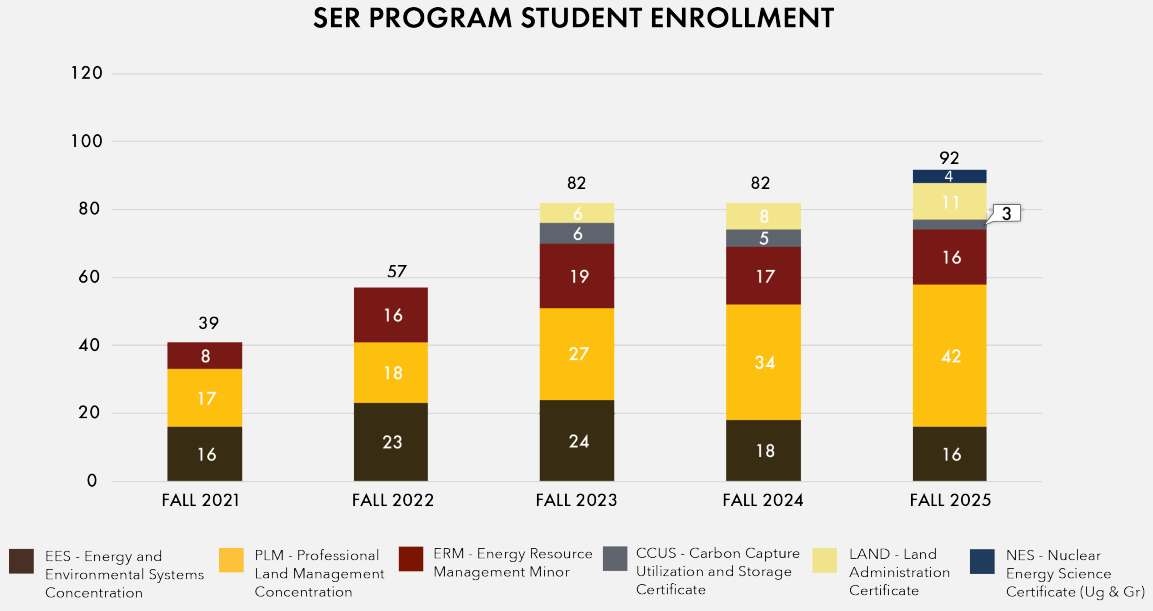
Rachel Reese Gaukel represented the class of 2025 as the student commencement speaker at the undergraduate ceremony for the College of Arts and Sciences, College of Education, CEPS, and SER.



Addison Potts was nominated and named as a finalist to receive the Tobin Memorial and Rosemarie Martha Spitaleri Awards, UW's prestigious recognition for outstanding graduates. She was one of 28 students to be considered for the honor, and one of 14 finalists.

Kendall Klos, was the runner-up for the American Association of Professional Landmen (AAPL) Outstanding Graduate Award as part of the Landman Scholarship Trust (LST). The LST nominates a student from each of the AAPL-accredited PLM programs for consideration.

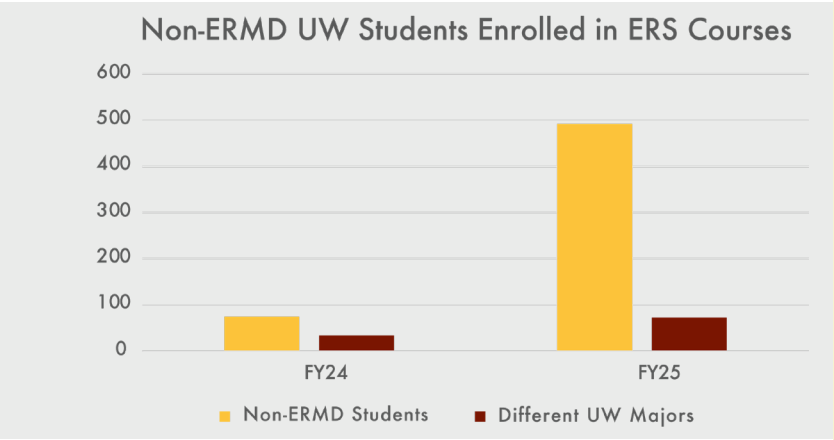
BY THE NUMBERS



Enrollment in Energy Resources (ERS) Courses

Impacts on UW Community

In addition to students pursuing a major in ERMD, there were an additional 491 non-ERMD students enrolled in energy resources (ERS) classes over the fall and spring semesters representing 73 different majors. This significantly increased energy exposure to UW students across campus in interdisciplinary fields.



In fall 2024 and spring 2025, 26 ERS courses were offered, meeting the curriculum requirements or electives for ERMD majors, ERM minors, CCUS certificate, LAND certificate, and other UW majors.*

**21 undergraduate courses, 5 dual listed graduate level courses*

Top non-ERMD Majors taking ERS classes

Energy and Petroleum Engineering	44
Mechanical Engineering	32
Agricultural Business	29
Environmental Systems Science	26
Geology	26
Exploratory Studies	24
Chemistry	23
Criminal Justice	20
Civil Engineering	16
Finance	14
Chemical and Biomedical Engineering	12
Accounting	11
Construction Management	11
Business Economics	10
Economics	10
Management	10
Political Science	10

BY THE NUMBERS

NIELSON TEXTBOOK SCHOLARSHIPS

Fall 2024 Textbook Scholarship | 38 Awards
Spring 2025 Textbook Scholarship | 32 Awards

Through the James E. Nielson Energy Excellence Fund, highly talented students planning a career in energy are supported through textbook scholarships, experiential learning and industry field visits, as well as career and professional development opportunities.

> *I have been grateful to receive the Nielson Family Textbook Scholarship every semester during my time at the School of Energy Resources. It has allowed me to excel in the challenging classes that comprise the Professional Land Management program.*
>
> *~Addison Potts*
> *Class of 2025*

GRADUATES

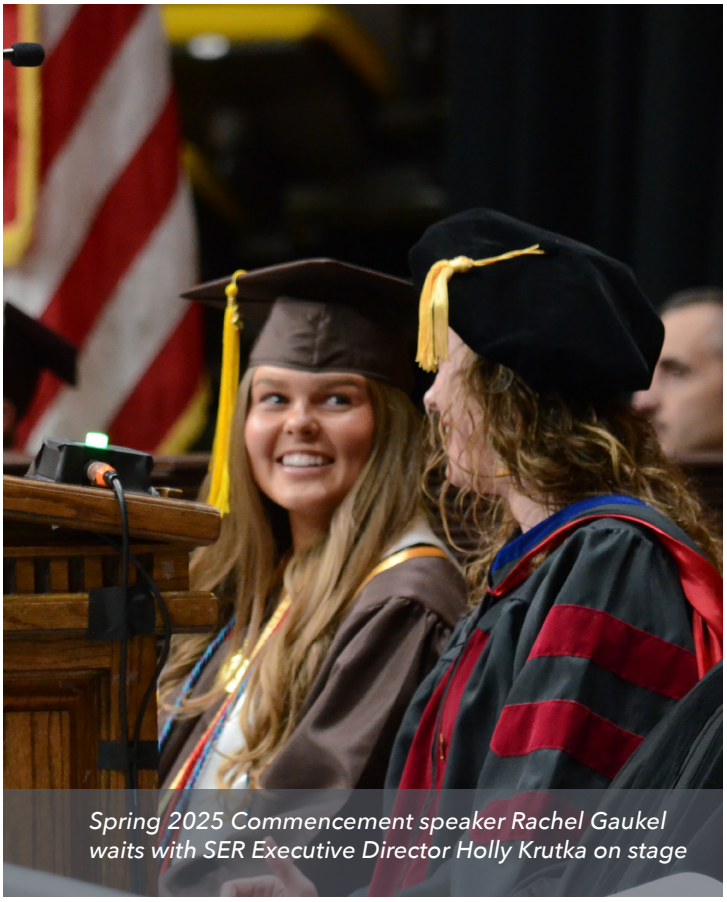
School of Energy Resources Academic Programs: FY25 Graduates

TOTAL GRADUATES 17

Fall 2024		**3***
ERMD Major	*PLM Concentration*	*1*
ERMD Major	*EES Concentration*	*0*
	ERM Minor	*1*
	Land Admin. Cert.	*2*
Spring 2025		**13**
ERMD Major	*PLM Concentration*	*6*
ERMD Major	*EES Concentration*	*1*
	ERM Minor	*4*
	Land Admin. Cert.	*2*
Summer 2025		**1**
ERMD Major	*PLM Concentration*	*1*

*Number denotes students graduating, not credentials earned

ERMD students at spring 2025 Commencement



Spring 2025 Commencement speaker Rachel Gaukel waits with SER Executive Director Holly Krutka on stage

EXPERIENTIAL LEARNING OPPORTUNITIES

Students Represent UW at 2025 NAPE Summit

Eight students in the SER Academic Program attended the 2025 North American Petroleum Expo (NAPE) Annual Summit.

In addition to the immense expo and unmatched networking opportunities, the NAPE summit hosts a variety of educational events throughout the week. The Governor's Forum featured Wyoming **Gov. Mark Gordon** in a conversation with Continental Resources founder and Chairman **Harold Hamm**, discussing energy policy, the future of energy demand and strategies to meet those needs.

Pictured left to right: Ashli Tomisich, Tara Righetti, Ryan Fogg, Addie Potts, Rachel Gaukel, Lars Quinlivan, Gov. Mark Gordon, Kendall Klos, Connor Fleming, David Meraz-Ordonez, Gwen Andela and Scott Quillinan. (Mud Productions Photo)

Students Visit Carbon Capture, and Storage Drill Site

As part of the SER mentorship program, students in SER and CEPS visited an active drill site for the Tallgrass Southeast Wyoming CO_2 Sequestration Project.

Students Tour Oil & Gas Drill Site and Wyoming Oil and Gas Conservation Commission

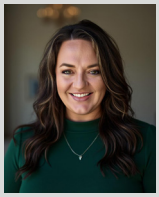
Seventeen students in SER and CEPS attended the March session of the Wyoming Oil and Gas Conservation Commission (WOGCC) and visited an active drill site to gain firsthand insight into the regulatory framework and operational realities of Wyoming's oil and gas industry.

The annual attendance at the WOGCC meeting, coordinated with the Commission, allows students in the ERMD degree program to participate in a full day of activities, including examiner hearings, a tour of the facilities and the chance to observe the full Commission deliberating on issues related to oil and gas development in the state.

PRACTICAL TRAINING

FEATURED INTERNSHIPS

Harper Pollock, an ERMD student in the Energy and Environmental Systems concentration, served as an intern with the Wyoming Office of the Governor, playing a key role during the 2025 legislative session. Pollock is also pursuing a certificate in Land Administration.



McKinzie Barnes, an ERMD student in the Professional Land Management concentration, completed a summer internship, gaining significant hands-on experience in the field of land management.

Under the supervision of **Joe Icenogle**—an oil and gas land and regulatory manager, and a member of the Professional Land Management Industry Advisory Board at SER—Barnes worked to determine the land, and oil and gas assets for a Wyoming family trust.

INDUSTRY ENGAGEMENT

Industry Partners Program Professional Land Management

SER launched the Industry Partners Program, which invites collaboration with industry and business leaders to enhance the academic and experiential learning opportunities for students in the PLM concentration of the ERMD undergraduate degree program.

Through the program, partners ensure the continued success and relevance of the PLM program.

Learn more and become a partner.

SER FACULTY

SER recruits and retains multidisciplinary faculty with expertise relevant to Wyoming's energy industry. Housed in 8 different departments across 6 UW Colleges and Schools, SER professors are internationally recognized energy experts who are actively involved in both energy research and teaching. Committed to achieving top learning outcomes, SER faculty develop students' curiosity and capacity for complex problem solving. Demonstrating its collaborative nature and focus on Wyoming energy education, outreach and research, SER also has many adjunct faculty who collaborate closely with both SER faculty and staff.

FACULTY ACCOLADES

Professor Dario Grana was named the 2025 recipient of the Felix Chayes Prize for Excellence in Research in Mathematical Petrology.

The prize, awarded in alternating years by the International Association for Mathematical Geosciences (IAMG), is presented to recipients with exceptional potential and proven research ability, and for outstanding contributions to statistical petrology or related applications of mathematics or informatics.

Professor Tara Righetti was recognized by UW President **Ed Seidel** as a recipient of the 2025 Presidential Scholarly Achievement Award in recognition of her high achievement in scholarship.

Professor Maohong Fan was given the UW Distinguished Innovator Award at UW's annual Celebration of Excellence in Research and Innovation awards event.

NEW FACULTY MEMBERS

Housed in the Haub School of Environment and Natural Resources (Haub School), **Bryan Leonard** joined the faculty as an SER associate professor of Environment and Natural Resources.

Jennifer Bell joined UW as an SER assistant professor of Soil Science and Reclamation in the College of Agriculture, Life Sciences and Natural Resources (CALSNR) where her efforts focus on the soil aspects of land reclamation.

FACULTY MEMBERS

Tim Considine, SER Professor of Economics

Craig Douglas, SER Professor of Mathematics and Statistics

Maohong Fan, Carrell Family and SER Professor of Chemical and Biomedical Engineering

Subhashis Mallick, SER Professor of Geology and Geophysics

Bruce Parkinson, *Emeritus* SER Professor of Chemistry

Po Chen, SER Associate Professor of Geology and Geophysics

Dario Grana, SER Professor of Geology and Geophysics and Wyoming Excellence Chair

John Kaszuba, John and Jane Wold Centennial Chair in Energy, SER Professor of Geology and Geophysics

Tara Righetti, Occidental Chair of Energy and Environmental Policies and SER Professor of Law

Bryan Leonard, SER Associate Professor of Environment and Natural Resources

Jennifer Bell, Assistant Professor of Soil Science and Reclamation

Madeleine Lewis, Associate Research Scientist and Temporary Lecturer

Scarlett Forrest, Assistant Research Scientist

ADJUNCT FACULTY MEMBERS

Saman Aryana, Occidental Chair of Energy and Environmental Technologies and Professor of Chemical and Biomedical Engineering; Associate Dean, CEPS

Erica Belmont, Associate Professor of Mechanical Engineering

Boone Beausoleil, Adjunct Professor, Nuclear Fuels Engineering, Idaho National Laboratory

Jonathan Brant, Professor of Civil and Architectural Engineering

Ben Cook, Senior Assistant Dean and Professor of Economics

Caleb Hill, J.E. Warren Chair, Nielson Faculty Fellow, Associate Professor of Chemistry

Shane Murphy, Professor of Atmospheric Science

Jonathan Naughton, Professor of Mechanical Engineering

Soheil Saraji, Associate Professor of Energy and Petroleum Engineering

Michael Stoellinger, Associate Professor of Mechanical Engineering

Temple Stoellinger, Associate Dean of Environment and Natural Resources and Wyoming Excellence Chair

Haibo Zhai, Roy & Caryl Cline Distinguished Chair in Engineering and Professor of Civil and Architectural Engineering

Kam Ng, Associate Professor of Civil and Architectural Engineering

Michael Urynowicz, Professor of Civil and Architectural Engineering

Mary Lou Dunzik-Gougar, Associate Dean and Associate Professor of Nuclear Engineering, College of Science and Engineering, Idaho State University

SELECT FACULTY PUBLICATIONS

Nathan Wise, Jenna VonHofe, **Tara Righetti**, Kris Koski, "Reconsidering Renewable Bias in Energy Portfolio Standards," *Tulane Environmental Law Journal 38* (2025).

Parker, Dominic, Sarah Johnston, **Bryan Leonard**, Daniel Stewart, and Justin Winikoff, "Economic Potential of Wind and Solar Resources in American Indian Communities," *Nature Energy* (2024).

Qiang Guo, Yaping Huang, **Dario Grana**, Jianhua Yue, Zhihai Jiang, Yaneng Luo, and Cong Luo, "Coupled inversion of elastic-seismic data for petrophysical and pore-geometry properties," Geophysics 90 (2025).

JX Lian, WY Liao, EJ Lee, DY Chen, **P Chen**, "Integration of Machine learning and equal differential time method for enhanced hypocenter localization in earthquake early warning systems: application to dense seismic arrays in Taiwan," *Earth Planets Space* 76 (2024).

Jennifer K. Bell, Wesley D. Swingley, Meghan G. Midgley, "Bison and burn timing shape arbuscular mycorrhizal diversity and community composition in tallgrass prairie restorations," *Applied Soil Ecology 206* (2025).

Edward Manderson, **Timothy Considine**, "The Effect of Temperature on Energy Demand and the Role of Adaptation," *Journal of the Association of Environmental and Resource Economists 12, No. 3* (2025).

Zhanqing Yu, Shizhong Ma, **Subhashis Mallick**, Cheng Wang, **Haibo Zhao**, Gang Li, "Prediction of shale oil "sweet spot" parameters centered on seismic prestack waveform inversion," *Geoenergy Science and Engineering 241* (2024).

Xiao Liu, Qinglan Hao, **Maohong Fan**, Botao Teng, "Carbonaceous adsorbents in wastewater treatment: From mechanism to emerging application," *Science of The Total Environment 955* (2024).

JP Kaszuba, JC Dewey, JC Bratcher, RT Herz-Thyhsen, "Lithium Mobility in Interbedded Sandstone and Mudstone, Powder River Basin, Wyoming," *Energy and Mineral Resources* (2024).

Stoellinger, Temple, Sam Johnson, **Bryan Leonard**, and Eric C. Atkinson. "Public Playgrounds or Private Trusts? The Future of Recreation on State Trust Lands," Env't L. Rep. 55 (2025).

Luiz Eduardo Queiroz, **Dario Grana**, Celso Peres Fernandes, Tapan Mukerji, Leandro Passos de Figueiredo, Iara Frangiotti Mantovani, "Estimation of Equivalent Pore Aspect Ratio in Rock Physics Models and Validation Using Digital Rocks," *Geosciences 15* (2025).

Andrew Emerich, Elisabeth Takuchi, & **Tara Righetti**, "CCUS in the Checkerboard West: Lessons on How to Move with the Federal Government on the Board," *Wyoming Law Review 24* (2024).

X Guo, C Pan, B Wang, **M Fan**, R Zhang, "C2H2 selective hydrogenation over s-doped graphene supported single-atom catalyst: Unraveling the roles of metal type and coordination environment in tuning catalytic performance," *Molecular Catalysis 573* (2025).

85* Total Faculty Publications in FY25

**Number includes output by graduate students in faculty research groups that list SER faculty members as contributing authors. Number does not include publications from SER adjunct faculty or research staff.*

RESEARCH SUMMARY

SER's research programs focus on maximizing energy production, minimizing environmental footprint, and leading technology innovation, always to benefit the state. Through its Centers of Excellence (COE), SER bridges the gap between academia and industry – and ensures deployment of technology and policy solutions.

RESEARCH ACCOLADES

Celebration of Research and Innovation Excellence

SER was honored by UW's Research and Economic Development Division with the UW Exemplary Research Culture Award for its robust research program dedicated to advancing energy-driven economic development for the state of Wyoming.

Tiffany Bishop

Senior Project Specialist Tiffany Bishop was selected as the UW Employee of the Second Quarter. Nominated by her peers in SER, Bishop was recognized for her exceptional dedication and expertise, and the profound impact she has on the school's success and the broader university community.

Pat McLean

Senior Office Associate Pat McLean was one of four UW recipients of the Unsung Hero Award at Staff Recognition Day. Working diligently to support the administrative functions of SER's research Centers of Excellence, McLean was honored for consistently making significant contributions beyond her defined roles without seeking public acknowledgment.

Selena Gerace

Senior Research Professional Selena Gerace was recognized by UW's Research and Economic Development Division for her contributions to UW's research and innovation landscape, particularly for her work in understanding Wyoming energy communities' views and needs regarding energy development in the state.

ENERGY SCIENCE GRADUATE ASSISTANTSHIPS

SER continued to oversee the distribution of Energy Science Graduate Assistantships supported through the Abandoned Mine Lands funds administered through the Wyoming Department of Environmental Quality. Funded graduate students must work on a Wyoming energy-related project, and at least half must have demonstrated Wyoming residency or be a graduate of UW.

WHO WE ARE

Scott Quillinan, Senior Director of Research

Erin Phillips, Director, Cross-Cutting Programs

Tiffany Bishop, Senior Project Specialist

David Lucke, Associate Project Specialist

Martha Reisch, Associate Project Specialist

Kaleb Peterson, Assistant Project Specialist

CENTERS OF EXCELLENCE

Center for Economic Geology Research, Directed by J. Fred McLaughlin

Center for Energy Regulation & Policy Analysis, Directed by Matt Fry

Center for Carbon Capture and Conversion, Directed by Trina Igelsrud Pfeiffer

3D Visualization Center, Managed by Kyle Summerfield

Hydrogen Energy Research Center, Directed by Eugene Holubnyak

FACULTY-LED CENTERS OF EXCELLENCE

Nuclear Energy Research Center, Directed by Tara Righetti and Caleb Hill

Center for Produced Water Management, Directed by Jonathan Brant

Center for Air Quality, Directed by Shane Murphy

Wind Energy Research Center, Directed by Jonathan Naughton and Michael Stoellinger

Center for Biogenic Natural Gas Research, Directed by Michael Urynowicz

Subsurface Energy and Digital Innovation Center, Directed by Soheil Saraji

RESEARCH PROGRAMS

Jurisprudence of Underground Law and Energy, Directed by Tara Righetti

Energy Engagement, Leadership and Careers Program, Directed by Erin Phillips and Selena Gerace

WYOMING INTEGRATED TEST CENTER

Wyoming Integrated Test Center Selected for Federal Funding for Continuing Operations and Upgrades

The Wyoming Integrated Test Center (ITC), managed by SER, was provisionally selected to negotiate a substantial funding award from the U.S. Department of Energy to continue and expand testing operations for carbon dioxide (CO_2) capture, removal and conversion.

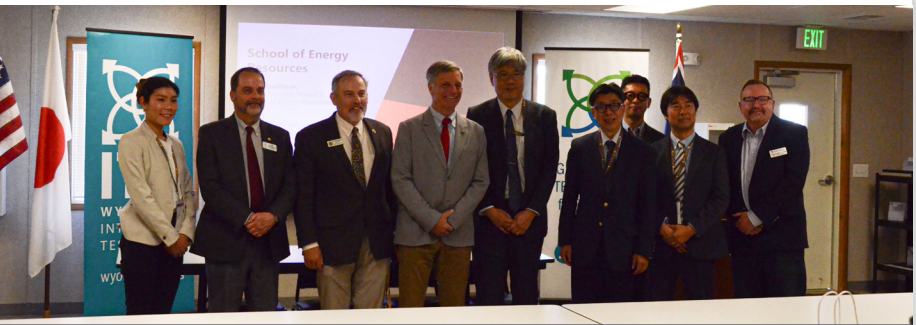
The ITC aims to expand its capabilities by accommodating a wider range of carbon management technologies, including simulating emissions from various sources that include natural gas and industrial facilities.

Japan-Wyoming Energy Summit

The ITC was featured as part of the Japan-Wyoming Energy Summit hosted by **Governor Mark Gordon**. The event included **Hiroyuki Okajima**, the Japanese Consul General in Denver, alongside industry leaders from New Energy and Industrial Technology Development Organization (NEDO) and the Japan External Trade Organization (JETRO).

The three-part event included a tour of the ITC, a business meeting, and dinner with Japanese officials, local elected leaders, and Wyoming energy sector professionals.

The ITC tour portion of the summit was of particular importance. As a result of an agreement entered into five years ago between the state, Japan Carbon Frontier Organization (JCOAL), and Kawasaki Heavy Industries, Ltd. (KHI), a successful demonstration of Kawasaki's carbon capture technology at Dry Fork Station led to further deployment of the technology in Japan.



Representatives from JETRO, NEDO, the Wyoming Energy Authority and UW School of Energy Resources pose with Gov. Mark Gordon and Consul General Okajima at the ITC.

PARTNER RESEARCH ORGANIZATIONS

Enhanced Oil Recovery Institute,
Directed by Lon Whitman

Wyoming Integrated Test Center,
Managed by the UW School of Energy Resources

ITC WYOMING INTEGRATED TEST CENTER

ITC TENANT UPDATES

Membrane Technology and Research

Membrane Technology and Research (MTR) announced the completion of the construction of a large pilot carbon dioxide capture system using its proprietary Polaris™ membrane technology at the ITC. The facility is the largest membrane-based post-combustion carbon capture facility in the world and is a cooperative agreement between MTR and the National Energy Technology Laboratory (NETL) under DOE's Fossil Fuel Large-Scale Pilots program.

Gas Technology Institute

Gas Technology Institute (GTI), in partnership with Ohio State University, began construction on a facilitated transport membrane system for carbon dioxide capture project.

TDA Research Inc.

TDA Research Inc. completed the installation of a small pilot, novel carbon capture system project, which incorporates proprietary solid sorbent technologies to remove CO_2 from flue gas.

Kawasaki Heavy Industries, Ltd. & JCOAL

The KHI and Japan Carbon Frontier Organization (JCOAL) project completed all testing on a solid sorbent carbon capture technology system. The site was fully decommissioned and is available for a new tenant.

ENERGY ENGAGEMENT, LEADERSHIP, AND CAREERS (ELC) PROGRAM

The Energy ELC Program leads in the development of a skilled energy workforce, engages industry stakeholders, empowers communities by incorporating local knowledge into program development and research, advances social science capacity building, and inspires the next generation of leaders through innovative education.

School of Energy Resources Selected to Host Critical Mineral Leadership Academy

Led by the Energy ELC Program, SER was selected as the host site of the inaugural Critical Minerals Leadership Academy (CMLA) in partnership with the National Energy Technology Laboratory; KeyLogic; Entech Strategies LLC; and additional Wyoming industry partners.

Sponsored by the U.S. Department of Energy, the CMLA will assemble future leaders with diverse backgrounds to build a strong domestic critical minerals network and contribute to the buildout of critical minerals industries. Applications were opened in FY25, with the program set to run in FY26.

JURISPRUDENCE OF UNDERGROUND LAW & ENERGY (JOULE) RESEARCH GROUP

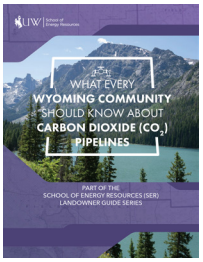
JOULE is a research group designed to conduct innovative legal research that advances the understanding of the rules and relationships governing the use of the subsurface and development of energy and natural resources.

Sloan Foundation Award

Led by Associate Research Scientist **Madeleine Lewis** in JOULE, SER was selected for an award from the Alfred P. Sloan Foundation to conduct interdisciplinary research exploring the legal, social and environmental considerations associated with the buildout of a domestic U.S. supply chain for critical minerals and rare earth elements.

Community Guide Series

JOULE released a new resource guide for Wyoming landowners that addresses frequently asked questions regarding CO_2 pipelines.



Part of a community guide series, the publication, "What Every Wyoming Community Should Know About Carbon Dioxide (CO_2) Pipelines," provides a general overview of the where, why, and how of CO_2 transport, and includes sections addressing safety concerns, siting and permitting, and landowner guidance.

WHO WE ARE: ENERGY ELC

Erin Phillips, Director, Cross-Cutting Programs

Selena Gerace, Senior Research Professional, Community Engagement Specialist

Madison Mankin, Assistant Research Professional, Workforce Development

Pallavi Pokharel, Assistant Research Professional, Community Engagement

CRITICAL MINERALS LEADERSHIP ACADEMY

WHO WE ARE: JOULE

Tara Righetti, Director, JOULE

Madeleine Lewis, Associate Research Scientist, Law & Policy

Scarlett Forrest, Assistant Research Scientist, Law & Policy

Select Publications

Madeleine Lewis & **Tara Righetti**, Contracting the Void: Land, Capital, & Sequestration 50 COLUMBIA J. OF ENVT'L LAW 359 (2025).

Tara Righetti & **Madeleine Lewis**, The Valorization of Federal Pore Space, 105 BOSTON UNIVERSITY LAW REVIEW 549 (2025).

Tara Righetti & **Madeleine Lewis**, Modularity, Licensing, and the NRC, 77 OKLAHOMA LAW REVIEW 357 (2025).

Tara Righetti, **Scarlett Forrest**, & Colton Edwards, Alternative Uses of Associated Gas and the Place of Law, Regulation, and Policy, in Natural Gas Flaring & Energy Transition, (Eduardo G. Pereira, et. al., eds., Wolters Kluwer (2025).

Scarlett Forrest, Should the U.S. Wait to Consolidate? Recent Legal Developments Regarding the Interim Storage of Nuclear Waste, 49 Oil, Gas & Energy Resources Law Section of the State Bar of Texas (2025).

FACULTY-LED CENTERS OF EXCELLENCE & RESEARCH GROUPS

NUCLEAR ENERGY RESEARCH CENTER (NERC)

NERC is focused on interdisciplinary nuclear-energy capacity building across the UW community, and cultivating new resources in nuclear research.

Faculty-led Proposals Selected for Funding

SER selected projects for funding after considering UW faculty-led proposals on nuclear-related research aimed at advancing Wyoming's full fuel cycle and building continued capacity in the nuclear energy sector.

Following a competitive review process, six innovative projects were selected to receive funding, with each project aligning with SER's strategic goals and addressing critical areas within the nuclear energy landscape.

Nuclear Innovation Bootcamp

Led by NERC, the School of Energy Resources served as the host site for the 2024 Nuclear Innovation Bootcamp, an immersive program run by the Nuclear Innovation Alliance.

The two-week intensive course brought together a select group of students and early-career professionals from all over the world to equip them with the tools and understanding needed to approach clean energy challenges.

Highlighting the emerging nuclear energy sector in Wyoming, participants visited an in-situ uranium mining operation, toured a trona processing facility, and visited the planned location of the Natrium™ advanced nuclear reactor.

2024 Nuclear Innovation Bootcamp Cohort and Faculty

SUBSURFACE ENERGY AND DIGITAL INNOVATION CENTER (SEDI)

SEDI is dedicated to becoming a pioneering hub for advancing energy solutions by integrating cutting-edge digital technologies.

New Faculty-led Center of Excellence Launched

SER – in partnership with CEPS – is establishing the Center of Excellence in Subsurface Energy and Digital Innovation.

SEDI will be a groundbreaking hub for advancing energy solutions by integrating cutting-edge digital technologies. SER will provide seed funding to SEDI over five years while it works to establish itself as a leading research center at the intersection of energy solutions and digital technology.

Richard and Marilyn Lynch Non-Endowed Chair

To help kick-start the center and position it for success, a generous gift from **Richard** and **Marilyn Lynch** will establish the Richard and Marilyn Lynch Non-Endowed Chair. **Soheil Saraji**, an associate professor of energy and petroleum engineering, will direct the new center as the inaugural chair. The $150,000 gift over five years was matched by SER.

CENTER OF EXCELLENCE FOR AIR QUALITY (CAQ):

The CAQ is involved in research concerning emissions from oil and gas exploration and production activities, and methane monitoring and mapping technology.

New NSF UW King Air Atmospheric Research Aircraft

The new National Science Foundation (NSF) UW King Air Atmospheric Research Aircraft was unveiled in FY25. Housed in the UW Department of Atmospheric Sciences, researchers in the Center for Air Quality can utilize the plane to mount measurement instruments and conduct atmospheric research.

Mechanistic Air Emissions Simulator

Members of the CAQ were awarded a large allocation on the NCAR-Wyoming Supercomputer (NWSC) to install and run the Mechanistic Air Emissions Simulator (MAES). This allows the CAQ to more accurately model emissions for Wyoming oil and gas basins and better understand potential opportunities to collaborate with industry partners as they reduce emissions.

Mobile Lab Research

Postdoctoral Research Assistant **Jeff Nivitanont** led a CAQ deployment of the mobile lab and drone platforms for several weeks during FY25 in the Greater Green River Basin to quantify methane emissions in collaboration with industry partners. The mobile lab work supports grant-funded projects in the CAQ, including the Department of Energy-funded project, Site-Air-Basin Emissions Reconciliation (SABER).

WIND ENERGY RESEARCH CENTER (WERC):

WERC is a collaboration with the College of Engineering and Physical Science dedicated to improving wind energy technology and its applications in Wyoming.

Wind Tunnel Testing

WERC performed substantial wind tunnel testing on the unsteady behavior of wind turbine airfoils. Data taken on airfoils will be used to both better understand the flow physics and to build data-driven models to predict them.

Select Publications

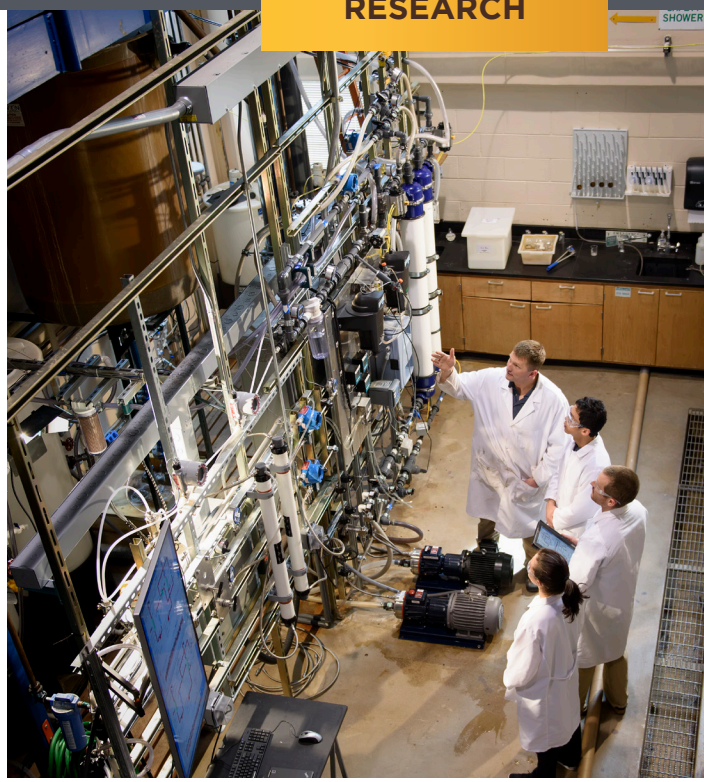
Mostafa Ojaghloo and **Jonathan W. Naughton**, "Impact of Swirl on the Round Wake," 2025 J. Phys.: Conf. Ser. 3016 012010

Sarah Buckhold, **Jonathan Naughton**, and **Eugene Holubnyak**, "Optimizing off-grid hydrogen production using stranded Wyoming wind in hybrid power generation," ET Conference Proceedings, Volume 2024, Issue 32.

ACCOLADES

Castagne Endowed Professorship

Jonathan Naughton, co-director of WERC and a professor in the UW Department of Mechanical Engineering, was awarded the Castagne Endowed Professorship for continued research excellence over his long career. Naughton plans to use a portion of the funds to upgrade instrumentation in the wind tunnel laboratory.



CENTER OF EXCELLENCE FOR PRODUCED WATER MANAGEMENT (CEPWM):

CEPWM provides innovative science and engineering research for application in energy industries that are economical and sustainable.

Nanobubbles

Researchers in the CEPWM are utilizing a new technique combining cavitation and magnetic fields to generate nanobubbles, achieving higher concentrations than current methods allow. Nanobubbles have various applications in produced water treatment, including controlling membrane fouling, removing stubborn organics, and cleaning infrastructure fouled by mineral scale, oils, and greases.

Critical Mineral Recovery

During FY25, CEPWM worked to develop new membranes—some coal-derived—and materials to selectively recover lithium and other critical minerals from mixed brines, resulting in several collaborative proposals with national labs.

CENTER FOR BIOGENIC NATURAL GAS RESEARCH (CBNGR):

CBNGR work to understand and enhance the unique geological and microbiological conditions in the Powder River Basin of Wyoming and Montana, which resulted in a vast biogenic coalbed methane resource. Additionally, utilizing the residue products from sugar beet refining as a key feedstock for its renewable natural gas (RNG) technology, the Center is working to create new market opportunities for growers.

Cowboy Clean Fuels

Cowboy Clean Fuels (CCF), an early-stage energy and tech company established for the sole purpose of commercializing UW technologies developed by the CBNGR, completed its Series B equity financing round in FY25, raising $13 million, as reported by ESG today[1]. The secured financing will support the development of CCF's first commercial project in Wyoming, the Triangle Unit Renewable Energy and Carbon Capture and Storage (TRECCS) Project.

During FY25, CCF announced separate strategic partnerships with Mangrove Systems and Mercuria, making major steps toward scaling high-integrity, verifiable carbon credits.

UW Stable Isotope Facility Support

Coming full circle, CBNGR received a substantial gift of nearly $250,000 from CCF through the UW Foundation. In addition to the gift, $73,000 in matching funds from SER will be allocated to purchase equipment in the UW Stable Isotope Facility, and support new hires – including staff, academic professionals, and graduate assistants.

[1] "Cowboy Clean Fuels Raises $13 Million to Simultaneously Produce Biofuel, Remove CO2," *ESG Today*, July 23, 2024, https://www.esgtoday.com/cowboy-clean-fuels-raises-13-million-to-simultaneously-produce-biofuel-remove-co2/.

CENTERS OF EXCELLENCE

CENTER FOR ECONOMIC GEOLOGY RESEARCH (CEGR)

The mission of CEGR is to investigate solutions for the challenges in Wyoming's fossil fuel and mineral industries. CEGR research projects explore opportunities to use Wyoming's distinctive geology and resources in order to develop those opportunities, diversify Wyoming's economy, and to maintain competitiveness.

NEW PROJECTS

Wyoming Technical Assistance Collaboration for Carbon Management

The U.S. Department of Energy (DOE) selected the UW SER to lead a regional initiative for technical assistance partnerships to advance the deployment of basin-scale carbon transportation and storage.

With an anticipated $4.7 million from DOE, the planned $5.9 million Wyoming Technical Assistance Collaboration for Carbon Management (WYTAC-CM) project intends to build a comprehensive and intuitive central data repository of technical and nontechnical information to accelerate development of carbon storage projects in the Greater Green River Basin and Wind River Basin.

The three-year project aims to conduct a data aggregation campaign that will include technical inventories of CO_2 storage reservoirs and confining units; current and potential CO_2 sources; and current and pending CO_2 capture, transport and storage projects.

Carbon Ore, Rare Earths and Critical Minerals (CORE-CM)

SER was selected to receive $7.5 million from the U.S. Department of Energy's Office of Fossil Energy to lead a regional coalition expanding a domestic critical mineral and materials supply.

The project, "Great Plains and Interior Highlands CORE-CM: Developing a Nexus of Carbon Ore & Critical Mineral Resources, Technology Innovation, and Communities of the Future," totals more than $10.1 million and will assess the carbon ore, rare earth and critical mineral potential of the Great Plains and Interior Highlands, which is composed of 10 states and four basins first studied under Phase I of DOE's initiative.

In additional projects under the same funding selection, SER also will support a similar University of Utah-led effort in the Rocky Mountain Region covering western areas of Wyoming, Colorado and Montana, as well as Utah, New Mexico and Idaho; and the Gulf Coast-Permian Basin project led by the University of Texas at Austin.

WHO WE ARE

J. Fred McLaughlin, Director

Zunsheng 'John' Jiao, Program Manager, Subsurface Storage and Modeling

Tyler Brown, Interim Program Manager, Critical Materials

Tim Fischer, Program Manager, Oil & Gas

Davin Bagdonas, Senior Research Professional, Coal and Rare Earth Elements

Charles Nye, Senior Research Professional and Project Manager

Bob Gregory, Associate Research Professional, Geochemistry

Matthew Johnson, Associate Research Professional, Geomodeling

Ying Yu, Assistant Research Professional, Reservoir Engineering

Lily Jackson, Assistant Research Professional, Regional Geology

Tao Bai, Assistant Research Professional, Geostatistical Modeling and Machine Learning

Dan Eakin, Senior Research Professional, Geophysics

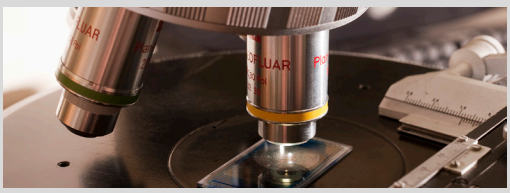
Maryam Lakjaa, Assistant Research Professional, Petroleum Engineering and Finance

Cole Messa, Assistant Research Professional, Geochemistry

Selena Gerace, Senior Research Professional, Community Engagement Specialist

Madison Mankin, Assistant Research Professional, Workforce Development

Pallavi Pokharel, Assistant Research Professional, Community Engagement



CARBON CAPTURE, UTILIZATION AND STORAGE

Spearheaded by the U.S. Department of Energy's Office of Fossil Energy, the Carbon Storage Assurance Facility Enterprise (CarbonSAFE) initiative aims to explore the capacities of subsurface formations to securely store 50 million or more metric tons of CO_2. SER leads four CarbonSAFE projects.

Wyoming CarbonSAFE Project: Phase III

CEGR completed a front-end engineering design (FEED) study for the Wyoming CarbonSAFE Project, which is developing a carbon storage hub around Basin Electric Power Cooperative's Dry Fork Station (DFS) near Gillette.

In collaboration with Resolute Engineering, the FEED study evaluated, analyzed, and presented various considerations in transporting carbon dioxide from DFS to proposed Class VI injection wells that are being assessed under Phase III of the Wyoming CarbonSAFE Project.

Phase III of the project will conclude in FY26.

HERO Basalt CarbonSAFE

In FY25, the research team submitted a stratigraphic test well permit in the state of Oregon for the Hermiston, Oregon (HERO) CarbonSAFE project. The team will plan to drill the test well in FY26.

Williams Echo Springs CarbonSAFE

In FY25, the research team completed a stratigraphic test well permit, as well as in-field sampling and a drilling strategy. A stratigraphic test well will commence in FY26.

Sweetwater Carbon Storage Hub

A significant carbon management project led by Frontier Carbon Solutions LLC (Frontier) – in partnership with the School of Energy Resources – completed the drilling of a deep characterization well.

At a depth of more than 16,000 feet, it is among the deepest wells recently drilled in the state and will help characterize deep saline formations in the Green River Basin that are deeper than known oil and gas targets.

A second well will be equally noteworthy in a long list of "firsts" for the project. After procuring the first Class VI permits to construct ever issued by Wyoming's Department of Environmental Quality following a rigorous review process, Frontier will aim to complete the second well under that Class VI umbrella for carbon management in early FY26.

CEGR HIGHLIGHT

A group of SER researchers representing interdisciplinary fields at SER attended a week-long field course in Moab, Utah.

*Led by CEGR geologists **Autumn Eakin** and **Lily Jackson**, the team looked at geologic outcrops to explore concepts of saline storage and reservoir modeling to better inform assumptions made in modeling, managing uncertainty, and communicating effectively with stakeholders with varying levels of technical expertise.*

Pictured: the Wyoming-based Cyclone Rig 35 used to drill the first test well to a depth of more than 16,000 ft.

RARE EARTH ELEMENTS AND CRITICAL MINERALS

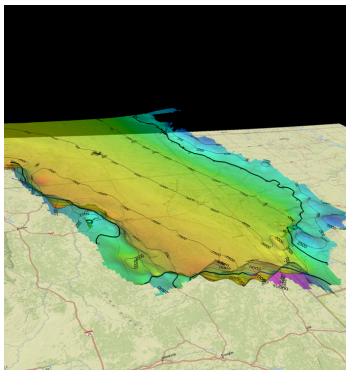
Rare Earth Extraction Pilot Project

A National Energy Technology Laboratory (NETL) collaboration with SER to develop technologies and methods for extracting rare earth elements from coal fly ash began testing on a pilot-scale production facility at the Wyoming Innovation Center (WyIC) near Gillette.

Funded by the U.S. Department of Energy's Technology Commercialization Fund, the pilot plant will scale up the extraction technologies previously developed in the laboratory by NETL, and will work to demonstrate the economically viable production of rare earth elements from coal-related feedstocks.

OIL AND GAS

Mowry Shale Project



During FY25, major accomplishments were achieved through the UW faculty-led research projects funded under the Mowry Shale Project, especially in areas of reservoir characterization, drilling and completions, production and fluid flow, and in economic forecasting. Additionally, multiple peer-reviewed publications were released.

The project will now aim to better understand the complex geology, characterize the play, identify economic and policy drivers, and find the ideal locations for extraction.

SELECT CEGR PUBLICATIONS

- Ifeanyi Valerian Nwankwo, Morteza Dejam, **Tim Fischer**, **Scott Austin Quillinan**, "A comprehensive review on analysis of permeability measurements and surfactant enhanced oil recovery in shale," Physics of Fluids 37, 071305 (2025).
- Ifeanyi Valerian Nwankwo, Morteza Dejam, **Scott Austin Quillinan**, "A critical review of experimental and theoretical studies on shale geomechanical and deformation properties, fluid flow behavior, and coupled flow and geomechanics effects during production," International Journal of Coal Geology, Volume 306 (2025).
- Reedy, R.C., Scanlon, B.R., **Bagdonas, D.A.** et al. Coal ash resources and potential for rare earth element production in the United States. Int J Coal Sci Technol 11, 74 (2024).
- Abdeldjalil Latrach, **Lily J. Jackson**, Christian Martinez, "Class VI Database project: Drill-stem test data from Sweetwater County, Wyoming, USA," Data in Brief, Volume 61, (2025).
- **CM Messa**, KWW Sims, ME Stelten, BL Lawler, MA Kuntz, "New 40Ar/39Ar eruption ages reveal an important temporal relationship between mafic and silicic volcanism in the Yellowstone Plateau volcanic field," Geology 53 (4), 317-322 (2025).

CENTERS OF EXCELLENCE

CENTER FOR ENERGY REGULATION AND POLICY ANALYSIS (CERPA)

The primary function of CERPA is to produce meaningful, high-quality, impartial analysis to inform policymakers, stakeholders, and the public about issues critical to the economic development of Wyoming's energy resources.

POLICY SUPPORT

During FY25, CERPA provided policy support both internally and externally to SER. During the legislative session, CERPA closely monitored and tracked energy-related bills by providing daily updates of activity and committee meeting schedules. Outside SER, CERPA regularly engages with the Wyoming Governor's Office, the Wyoming Energy Authority, the Wyoming Mining Association, and the Petroleum Association of Wyoming.

Federal CCUS Task Force

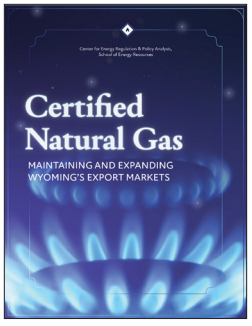
CERPA Director **Matt Fry** serves as the chair of the Federal Lands and Outer Continental Shelf (OSC) Subcommittee. The Task Force worked to develop a report with recommendations on opportunities to improve authorization process of federal lands, the OCS, and non-federal lands.

SELECT PUBLICATIONS AND RESOURCES

CERPA published white papers and research briefs to inform lawmakers, the public, and industry in Wyoming on policy issues, regulatory challenges, or relevant topics of interest related to energy production and mineral development.

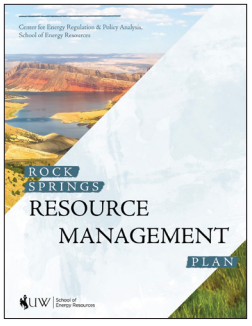
Certified Natural Gas: Maintaining and Expanding Wyoming's Export Markets

This paper explores the purposes and components of certified natural gas, describes major certification programs and voluntary frameworks, addresses recent trends and how they are playing out in the energy markets, including the slow growth of certified natural gas to date. The paper also provides recommendations for ways that certified natural gas can help Wyoming remain competitive in markets with greenhouse gas reduction policies and goals.



Rock Springs Resource Management Plan

This paper analyzes potential impacts from the Bureau of Land Management's (BLM) Rock Springs Resource Management Plan (RMP) to Wyoming state revenues generated from energy development. The paper provides the history of the Rock Springs RMP, describes the overarching energy-related issues in the draft Rock Springs RMP, and compares the energy-related issues in the draft RMP to those contained in the approved RMP.



WHO WE ARE

Matt Fry, Director

Esther Wagner,
Senior Research Professional, Energy Policy

Dawson Kluesner,
Assistant Research Professional, Economics & Policy

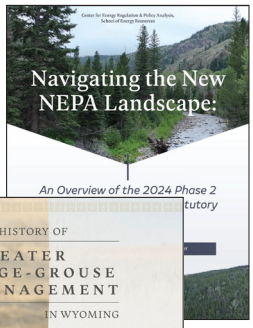
RESEARCH AFFILIATES

Alex Gebben,
Energy Economist, UW Center for Business and Economic Analysis

Daniel Cooley,
Energy Economist, UW Center for Business and Economic Analysis

Navigating the New NEPA Landscape

The National Environmental Policy Act (NEPA) has been a cornerstone of environmental decision-making in the United States since its enactment in 1970. Over the past few years, the NEPA regulations and statute have undergone a series of substantial changes. These rapid changes have left many struggling to keep up and understand the current state of NEPA law and practice. This paper provide a comprehensive analysis of the current state of NEPA, focusing on the most recent changes to the law and regulations.

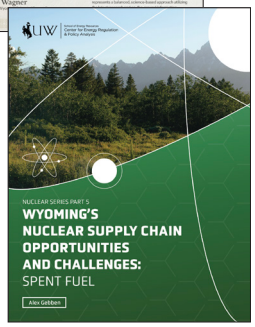


History of Greater Sage-Grouse Management in Wyoming

For more than twenty-five years, conservation advocacy groups have filed petitions with the U.S. Fish and Wildlife Service (USFWS) to list the Greater Sage-Grouse (GRSG) as endangered or threatened pursuant to the Endangered Species Act (ESA). As the state with the highest number of GRSG and the most sage-grouse habitat across its 11-state range, Wyoming would be significantly impacted by such a listing. The state's early recognition of this led to an unprecedented collaborative effort to protect the bird and its habitat. This paper explores the history of Wyoming's Sage-Grouse Executive Order.

Nuclear White Paper Series

CERPA released the remaining installments of the nuclear white paper series exploring and evaluating the components of a domestic integrated nuclear industry. Papers in the series explore the feasibility of uranium enrichment, uranium recovery, nuclear component manufacturing, heat applications, spent fuel storage and recycling, and nuclear electricity generation.



Issue Snapshots

CERPA launched a new paper series called "Issue Snapshots." These mini-papers provide an overview of various topics in a manageable size. The first paper released during FY25 outlines leasing, permitting, rules and regulations for naturally occurring hydrogen exploration and production. The second, focuses on the decline in coal-derived electricity generation as a primary catalyst for the decline in Wyoming coal production through an analysis of the electricity generation portfolios in the top ten states, export demands for Wyoming coal, and changing markets.

CREW REPORTS

Consolidated Review of Energy in Wyoming (CREW) Report

Launched in FY25, the CREW report from the Center for Energy Regulation and Policy Analysis provides data and information about Wyoming's energy sector. The monthly 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.

CENTERS OF EXCELLENCE

CENTER FOR CARBON CAPTURE AND CONVERSION

The mission of the Center for Carbon Capture and Conversion (CCCC) is to develop new high-volume uses for coal and to explore new opportunities in an evolving carbon market. CCCC delves into the potential marketable properties of higher-value products from Wyoming coal. The technologies and products developed in CCCC are focused on large-scale, commercial application.

COAL REFINERY TECHNOLOGY

The CCCC has continued to advance its integrated coal processing technology, combining a fast pyrolysis process and a solvent extraction process, to efficiently decompose Powder River Basin (PRB) coal which yields high-value liquids and solids that are then used to create environmentally friendly, non-energy products.

Both processes are at a critical juncture in which scale-up is necessary in order to produce enough feedstock material for downstream manufacturing research.

Fast Pyrolysis Processing

Construction of the pyrolysis field demonstration continued at the Wyoming Innovation Center (WyIC) in Gillette, Wyoming. Utilizing PRB coal, the main product from the pyrolysis plant is coal char which is used to manufacture high volume products such as building materials and a soil amendment.

Research Professional Eli Ellis holds jar of coal char derived from PRB coal

At the existing lab facility in Laramie, the team is working to streamline any changes necessary to run coal from the Greater Green River Basin (GGRB) through the pyrolysis unit.

GGRB coal will produce a slightly different coal char, creating new opportunities for other downstream products.

Solvent Extraction of Coal

Construction of the solvent extraction pilot plant continued in Laramie with preliminary testing. The pilot plant will be fully operational in FY26.

The byproduct of the solvent extraction process yields a liquid feedstock, which is used to manufacture useful products such as coal-based asphalt binder with a lower carbon footprint, and samples for roofing and paving industries.

WHO WE ARE

Trina Igelsrud-Pfeiffer, Director

Mark Behrens, Program Manager, Technology Scale-Up

Marie Dudgeon, Senior Research Professional, Chemical Engineering

Stefan Holberg, Associate Research Professional, Chemistry

Eli Ellis, Assistant Research Professional, Mechanical Engineering

Resham Thapa, Assistant Research Professional, Soil Science

Louis Muller Assistant Research Professional, Chemical Engineering

Yi Yao, Assistant Research Professional, Chemical Engineering

UW FACULTY PRINCIPAL INVESTIGATORS

Kam Ng, Associate Professor of Civil and Architectural Engineering

Jing Zhou, Professor of Chemistry

Michael Stoellinger, Associate Professor of Mechanical Engineering

John Oakey, Professor of Chemical Engineering

Jonathan Brant, Professor of Civil and Architectural Engineering

RESEARCH AFFILIATES

Jeramie Adams, Western Research Institute

Paul Behrens, Senior Research Consultant

SELECT COAL-TO-PRODUCTS FIELD DEMONSTRATION SHOWCASES

Agricultural & Soil Fertility Products

Researchers in the CCCC began a fifth year of testing the coal char soil amendment at the Powell Research Center and the Sustainable Agriculture Research and Extension Center (SAREC).

The coal char soil amendment is also being used for three reclamation projects. Results from previous applications to Peabody's North Antelope Rochelle Mine, and Navajo Energy Transitional Company's Cordero Rojo Mine are being analyzed.

A new endeavor integrating algae and the coal char soil amendment was launched in FY25 at the Wyoming extension research centers. This will help the team understand the relationship between the soil amendment and algae, for enhanced soil health and fertility.

Coal-Derived Building Materials

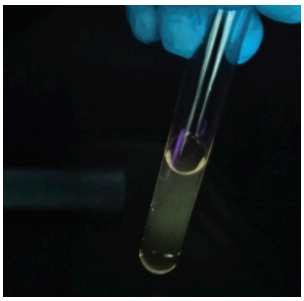
The independent consulting company procured to monitor the performance of coal-derived bricks on the demonstration house in Laramie concluded its evaluation of the second-generation bricks. Data are being compiled and compared to results from the first-generation bricks.

NEW COLLABORATIONS

Synthetic Graphite and Carbon Dots

Led by **Dr. Jonathan Brant** in the Department of Civil and Architectural Engineering, and director of the Center of Excellence for Produced Water Management, new downstream products are being investigated from the coal char resulting from the flash pyrolysis system.

Graphitic material in the coal char from GGRB coal is being investigated to develop a synthetic graphite. The coal char can also be made into both carbon quantum dots and graphene carbon dots. The types and relative amounts of these produced materials are controlled through manipulation of the char processing conditions.



Critical Minerals Rare Earth Elements

Extraction of critical minerals, including some rare earth elements, is being tested on intermediate streams from the coal refinery process, coal beds, and coal fly ash. Separation of rare earth elements is also being explored.

In FY25, CCCC Director **Trina Igelsrud Pfeiffer** traveled to Bergen, Norway to present at the Norwegian Research Centre (NORCE) on carbon capture, carbon engineering and rare earth extraction.

SELECT CCCC PUBLICATIONS

- **Thapa, Resham B.**, Roger H. Coupal, Mohan B. Dangi, and Peter D. Stahl. "Coal Char and Biochar as Soil Amendments: Effect on Soil Properties and Grass Biomass in Degraded Rangeland." Agricultural Sciences: Techniques and Innovations Vol. 22 (2025).
- **Thapa, Resham B.**, Samir Budhathoki, Chandan Shilpakar, Dinesh Panday, Bouzeriba Alsunuse, Sean X. Tang, and Peter D. Stahl. "Enhancing Corn Yield and Soil Quality in Irrigated Semiarid Region with Coal Char and Biochar Amendments." Soil Systems 8, no. 3 (2024).
- Dipta, Iftekhar Alam, **Kam Ng**, Chooi Kim Lau, and Hua Yu. "Coal-derived char for improving mechanical performance and microstructural characteristics of concrete." Journal of Sustainable Cement-Based Materials 14, no. 4 (2025).

CENTERS OF EXCELLENCE

HYDROGEN ENERGY RESEARCH CENTER (H_2ERC)

The mission of H_2ERC is to identify and quantify the relative competitive advantages of Wyoming in an emerging low-carbon hydrogen economy. H_2ERC focuses on all forms of hydrogen with: low-cost coal via gasification, massive natural gas resources via methane reforming, naturally occurring geologic hydrogen, and relatively high-capacity wind energy via electrolysis, as well as potential for solar, nuclear, and more.

PROJECT UPDATES

Supercritical Water Desalination and Oxidation with Autothermal or Steam Methane Reforming

The two-part project combines a water desalination process paired with steam methane reforming to turn the disposable burden of produced water from oil and gas development into a clean energy asset to be sold to Pacific Northwest markets.

During FY25, construction of the equipment was conducted on both parts of the project, and a seventeen month project extension was granted so that testing can commence in FY26.

Success of the project would allow Wyoming to lead an emerging hydrogen industry.

Geologic Hydrogen

Working with the University of Texas at Austin on a geologic hydrogen project, the H_2ERC team collected samples from the South Pass Mine in Wyoming and plans to sample other iron-rich areas in Wyoming that are currently not mined to look for traces of naturally occurring geologic hydrogen produced from iron-rich rocks.

WHO WE ARE

Eugene Holubnyak, Director

Charles Nye, Senior Research Professional and Project Manager

Dayana Jones, Assistant Research Professional, Energy Economics

Sarah Buckhold, Assistant Research Professional, Mechanical Engineering

Robert Cincotta, Assistant Research Professional, Chemical Engineering

Haoming Ma, Assistant Research Professional, Techno-Economic Analysis

MAJOR ACCOLADES

Eugene Holubnyak was recognized by the Society of Petroleum Engineers (SPE) as a 2024 recipient of a regional award for his technical expertise and exceptional contributions to programs focused on hydrogen transportation and storage.

Nominated by peers among the SPE organization, Holubnyak was named the recipient of an SPE Projects, Facilities and Construction Award for the Rocky Mountain North America Region.

Example of South Pass Banded Iron Formation samples

Wyoming Geohydrogen Exploration

Identified by the U.S. Geological Survey as a geologic hydrogen prospect, Wyoming has meaningful potential for naturally occurring, or geologic, hydrogen. This creates an opportunity to develop a new, abundant, low-cost energy resource by leveraging the state's existing strengths in the fossil fuel and mining industries.

Funded through private investment and matched through a state of Wyoming artificial intelligence (AI) state matching appropriation, the Wyoming Geohydrogen Exploration Project seeks to assess the occurrence of geologic hydrogen in Wyoming, using advanced AI and machine learning technology for precision modeling and mapping resources.

CAPACITY BUILDING AT THE UNIVERSITY OF WYOMING

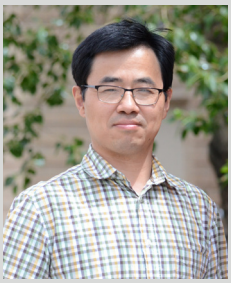
Make, Move, Use or Store Initiative

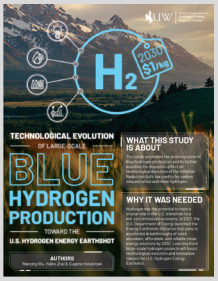
SER investment in UW faculty-led research across the hydrogen supply chain has resulted in several notable peer-reviewed publications and a growing ecosystem of hydrogen projects on campus.

SELECT H_2ERC PUBLICATIONS

- Wu, W., **Zhai, H.** & **Holubnyak, E.** "Technological evolution of large-scale blue hydrogen production toward the U.S. Hydrogen Energy Earthshot." *Nature Communications* 15, 5684 (2024).
- Zitao Wu, **Haibo Zhai**, **Eugene Holubnyak**, **Selena Gerace**, Amy Murphy, and Curtis Biggs, "Unlocking Potential for Low-Carbon Hydrogen Production from U.S. Natural Gas Resources," *Environmental Science & Technology* (2024).
- Zhichao Zhao, Danish Kumar, Chengyi Zhang, Huimin Li, Saksham Timalsina, "Techno-economic analysis of green hydrogen integration into existing pipeline infrastructure: A case study of Wyoming," *International Journal of Hydrogen Energy,* Volume 93, (2024).
- **Buckhold, Sarah** & **Naughton, Jonathan** & **Holubnyak, Eugene**, "Optimizing off-grid hydrogen production using stranded Wyoming wind in hybrid power generation," IET Conference Proceedings (2024).
- **Sheikheh S**, Rabiei M, Rasouli V., "A Review of Evaporite Beds Potential for Storage Caverns: Uncovering New Opportunities," *Applied Sciences* (2025).

A new analysis by UW researchers examines the impacts of current federal economic incentives on large-scale blue hydrogen production technologies and estimates the expected outcomes in long-term expenses as those hydrogen production pathways evolve.





The research, titled "Technological Evolution of Large-Scale Blue Hydrogen Production Toward the U.S. Hydrogen Energy Earthshot," was led by ***Haibo Zhai****, the Roy and Caryl Cline Distinguished Chair in Engineering and a professor in the UW College of Engineering and Physical Sciences. The study appears in the prestigious and highly cited journal Nature Communications. Zhai's UW Ph.D. student, Wanying Wu, was lead author.*

Funding for the study was made possible by the "Hydrogen: Make, Move, Use or Store" initiative.

CENTERS OF EXCELLENCE

3D VISUALIZATION CENTER

The mission of the 3D Visualization (3D Viz) Center is to foster new knowledge and insight, support interdisciplinary research, and drive integration between research computing, data science, visualization, human interaction, and data-capture technologies by leveraging state and national opportunities.

TECHNOLOGY UPGRADES

Replacing the Cave Automatic Virtual Environment (CAVE)

For many years, the CAVE was a centerpiece of the 3D Visualization Center. When it was first installed, it was a powerful, cutting-edge visualization platform, showcasing the technological innovation at SER for nearly fifteen years. However, the technology became heavily dated and the 3D Viz Center was in dire need of a replacement to continue supporting the state-of-the art energy visualization needs of the university.

In FY25, co-funded by the UW School of Computing, the CAVE was removed and replaced with a large, direct-view LED display. The fully functional display is equipped with powerful visualization, collaboration and development capabilities.

The new digital LED display

WHO WE ARE

Kyle Summerfield,
Program Manager and Lead Developer

James Amato,
Assistant Research Professional, GIS and Remote Sensing

Rachel Toner,
Assistant Research Professional, GIS and Remote Sensing

Cole James,
Assistant Research Professional, Asset Developer

Ayla Carncross,
Assistant Research Professional, Software Developer

Phil Black,
Assistant Research Professional, VR Development

CONTRACTORS

Jerry Evans, Mechdyne

MAJOR ACCOLADES

Kyle Summerfield, program manager in the 3D Visualization Center, was honored at UW Staff Recognition Day with the Deans and Directors Award, an accolade reserved for UW employees who demonstrate exceptional leadership and serve as strong advocates for their staff. The award recognized Summerfield's ability to positively mentor his team and guide the 3D Visualization Center into a new era of innovation and collaboration. His empathetic approach and genuine care for his colleagues, both professionally and personally, were key factors in his nomination.

Remote Sensing Program

The 3D Viz Center made a major investment in its remote sensing program with the addition of a drone-based Visible Near-Infrared, Short Wave Infrared (VNIR-SWIR) hyperspectral imaging (HSI) system offering centimeter-scale resolution. The overarching goal is to build in-house capacity for both academic research and applied geospatial data collection.

This ability will be crucial for the exploration and identification of critical minerals in the state – including in coal and waste streams – a major priority of SER's research.

The team spent much of FY25 acquiring the new equipment, and conducting field operations to master the nuances of data capture and post-processing raw data into corrected, usable hyperspectral datasets.

The planned deployment of the new aerial and field-based services is scheduled to commence in 2026.

The heavy-lift drone with mounted hyperspectral scanner

SER RESEARCH UNIT SUPPORT

Wyoming Class VI Site Characterization Database

In collaboration with SER's Center for Economic Geology Research, the 3D Viz Center is co-leading the Wyoming Class VI Site Characterization project. The collaborative project will create a data-verified Class VI geologic database providing a unique service to carbon storage developers and regulatory agencies for the state of Wyoming.

The team is tasked with the management of the logistical storage of the data-sets and metadata documentation. A relational database schema was drafted in FY25, and will be used to test

SER Publication Database

The 3D Viz Center is leading the implementation of a standardized publication database across SER. The public-facing database will feature an HTML-based front-end interface, enabling users to search for and download internal SER publications, reports, resources, and accompanying formats. It will also include externally published papers and SER-affiliated graduate research. The deployment of the database will take place in FY26.

Technology Associate Program

The Technology Associate Program (TAP) in the 3D Viz Center is an internship program designed to train interns in virtual reality, animation, and augmentation software and techniques.

During FY25, the program was restructured to streamline and standardize the internship experience. Students are selected through a competitive application process and gain practical experiences through weekly lectures and modules in 3D modeling or programming.

Student Interns Trained in the TAP Program in FY25

5

OUTREACH AND ENGAGEMENT

Outreach supports research and stand-alone efforts to engage with local, regional, national, and international stakeholders and community members on efforts within the School of Energy Resources to advance energy-driven economic development for the state of Wyoming.

LIVE EVENTS AND CONFERENCES

Rocky Mountain Professional Landman Conference

SER hosted the fourth annual Rocky Mountain Professional Landman Conference. Spearheaded by the Student Chapter for Energy Resources Club, the in-person forum seeks to bring together industry professionals and professional landman alumni in the Rocky Mountain region to showcase the profession, discuss current topics and issues facing the industry and explore career paths and opportunities for future graduates.

Tribal Energy Summit

SER hosted a Tribal Energy Summit. The first-of-its-kind conference for UW brought together leaders from energy-producing tribal nations and tribal energy companies to hear from them directly about challenges and opportunities for continued energy development in the rural American West.

Wyoming's Energy Future Symposium

SER and the Wold Foundation again hosted a joint symposium that focuses on the state's energy future. Examining different topics from an industry perspective as well as an academic perspective, the free event brought together leading experts across the spectrum of energy development and various state stakeholders to collaborate and learn about what comes next for energy in Wyoming.

Given its importance to Wyoming and relevant expertise at SER and across the state, the 2024 symposium had an emphasis on Wyoming economic geology opportunities. As part of the symposium, students competed in a poster competition to showcase energy-related research projects across campus. Winners were selected from among 18 submissions.

Distinguished Speaker Series

SER Outreach brings energy leaders to campus to share cutting edge research, the latest industry trends, and expertise on new energy technologies. FY25 featured 9 different speakers on varying energy topics.

WHO WE ARE

Christine Reed,
Director of Outreach and Energy Resources Council Secretary

Sabrina Kaufman,
Marketing Outreach Coordinator and Graphic Designer

Peighton Hayes,
Special Events Coordinator

Pictured above: James Trosper, the Eastern Shoshone Sun Dance Chief, provides a blessing to open the Tribal Energy Summit.

Wold Foundation Executive Director Glenda Thomas, Charles Nuncio, Sophia Stuart, Alirza Orujon, John and Jane Chair in Energy Excellence and SER Professor of Geology & Geophysics John Kaszuba.

Wyoming's Energy Symposium Student Poster Competition Winners

First Place: Charles Nuncio, Geology & Geophysics

Second Place: Alirza Orujov, Chemical Engineering

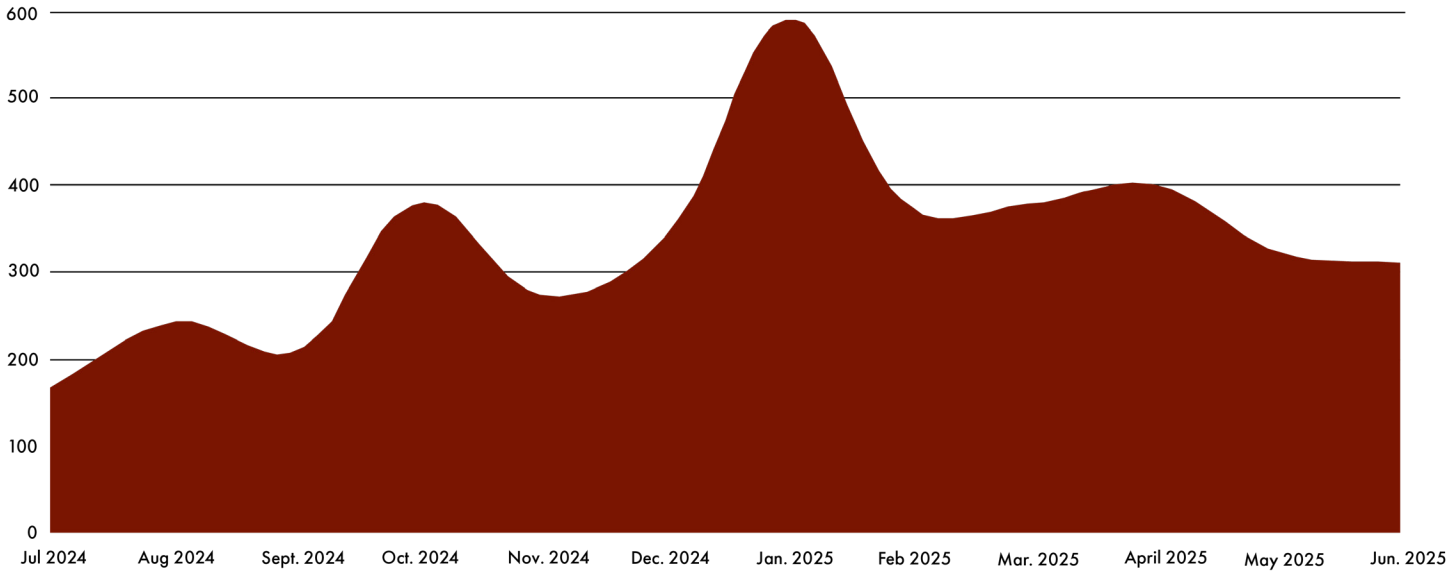
Third Place: Sophia Stuart, Geology & Geophysics

COMMUNITY ENGAGEMENT

Energy Frontier: The Wyoming Landscape Podcast

The SER podcast series, "Energy Frontier: The Wyoming Landscape," brings together academic researchers, industry professionals, students, policymakers and more to explore energy topics, including SER's research efforts and developing Wyoming projects.

In FY25, the podcast released 47 episodes on a weekly schedule. Moving into FY26, episodes will be release bi-weekly.



3,990 DOWNLOADS FROM JULY 1, 2024 - JUNE 30, 2025

STEM Roadshow

SER joined the STEM Roadshow organized by the UW Science Initiative. The Science Initiative Roadshow aims to build curiosity and empower discovery of the natural world through STEM outreach. SER participated by teaching students in K-12 classrooms about the formation of coal, and different types of energy producing natural resources—all found in Wyoming!

Wyoming Communities Visited in FY25

Big Piney	Hanna/
Lyman	Elk Mountain
Cody	Laramie
Farson/Eden	Rock Springs
Pavillion	Gillette
Green River	Cody

CONTINUING ENGAGEMENT ACTIVITIES

- Internal Newsletter and External Quarterly Newsletter
- Electronic News Blog and Collaborative Press Releases
- Social Media and Events

News Stories and Press Releases highlighting SER faculty, staff, projects and events in FY25

80

FINANCIAL SUPPORT

The financial team at SER manages the standard appropriation from the Wyoming legislature, and administers the multi-million dollar research program funded by the state, the private sector and federal cooperative agreements (aka grants).

PERSONNEL SUPPORTED BY SER FUNDING

Brilliant minds of faculty, staff, and students drive value-added research, and ultimately contribute to the energy industry and economy in Wyoming.

Operating as a hub to ensure that resources are allocated across UW in support of energy excellence and innovation, SER supported 320 people in departments across campus in FY25.

Education and Retention

Of the 61 full-time staff members at SER during FY25, 48 hold at least one degree from UW, retaining some of Wyoming's top talent to continue working to drive energy innovation in the state.

320 People

Faculty and Staff 117
Student Support 203
Graduate Assistants (86)
Hourly, Non-Benefitted (117)

WHO WE ARE

Rachel Ferrell,
Director of Business Operations

Carrie Ver Burg,
Assistant Director, Business Operations

Cindy Ishkanian,
Grants Manager

Frankie Vogt,
Business Manager

Kimmie Takaki,
Business Manager

James Christensen,
Business Manager

Cole Swisher,
Grants Accountant

MAJOR ACCOLADES

Frankie Vogt, one of SER's business managers responsible for managing state-funded projects and special appropriations, received the Pete Simpson Golden Gloves Award from his colleagues in the Staff Senate. This award celebrates outstanding participation in staff senatorial committees, consistent attendance at meetings, dedicated service to staff senatorial causes, including community projects, and strong representation of constituents. Vogt has served as SER's staff senatorial representative for the past two years, demonstrating an exceptional commitment to his fellow staff members.

Additionally, Vogt was among the inaugural cohort to complete the University of Wyoming's Presidential Leadership Institute (PLI) to develop skills and enhance UW supportive campus community.

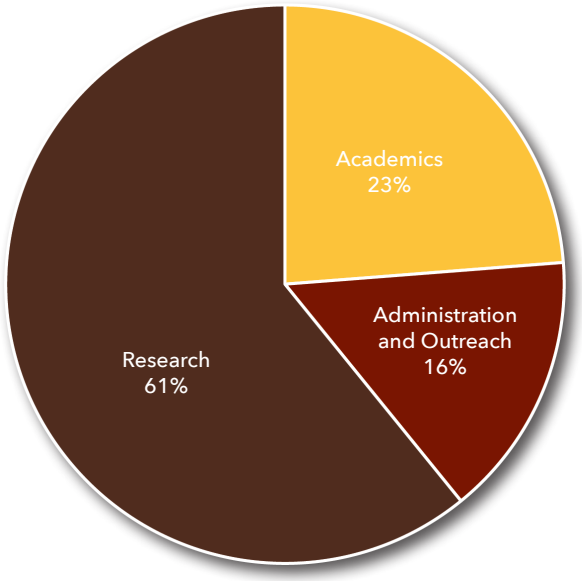
FINANCIAL STATEMENT

STANDARD BUDGET ALLOCATION & EXPENDITURES

Fiscal Year July 1, 2024 - June 30, 2025

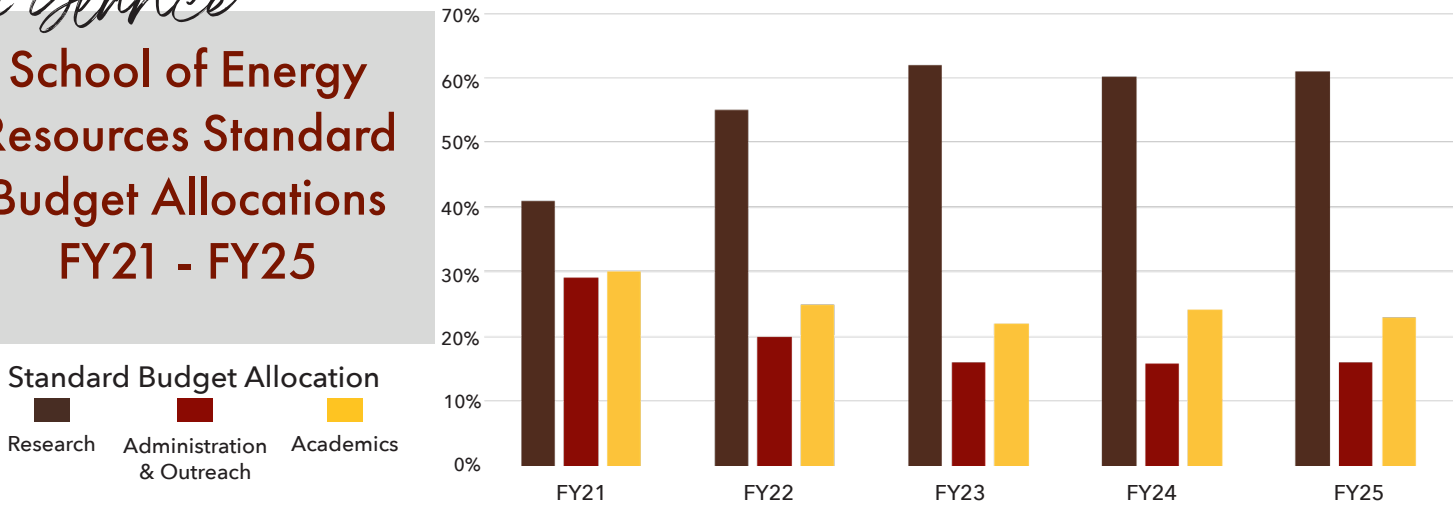
- Academics $2,451,869
- Research $6,467,929
- Administration and Outreach $1,634,106

TOTAL:
$10,553,904



At a Glance

School of Energy Resources Standard Budget Allocations FY21 - FY25



SPENDING BY COLLEGE

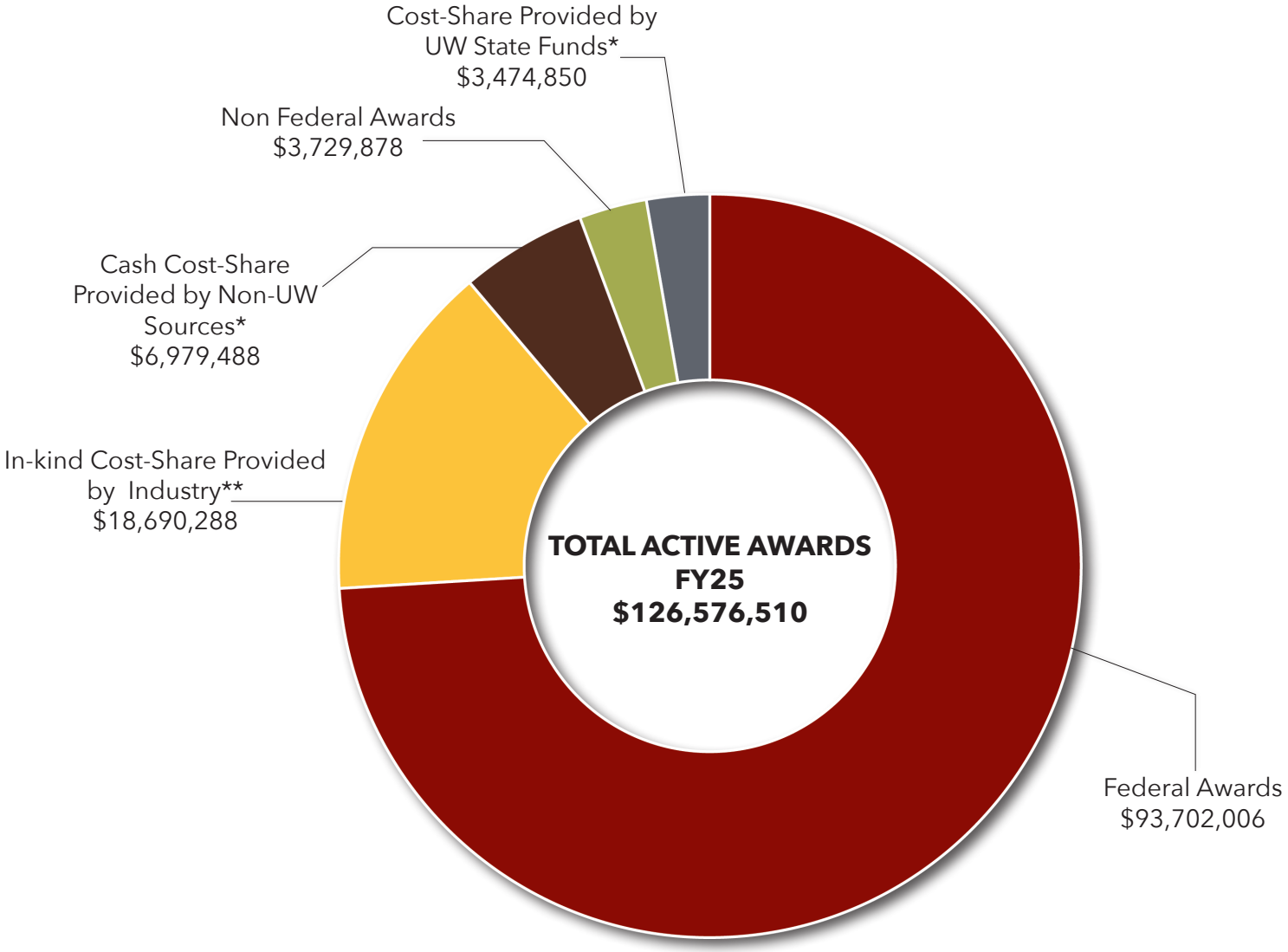
SER supports faculty, staff and students across UW to tackle Wyoming's most pressing energy issues.

Total spending by college $2,826,491

- College of Engineering and Physical Sciences $1,876,831
- College of Business $339,756
- College of Law $265,710
- Center of Innovation for Flow Through Porous Media $161,474
- Haub School of Environment and Natural Resources $101,816
- College of Agriculture, Life Sciences and Natural Resources $51,400
- Ellbogen Center for Teaching & Learning $25,165
- Science Institute $2,774
- School of Computing $1,565

FINANCIAL STATEMENT

GRANT FUNDING



$126,576,510

Awards Funded	**55**
UW Departments Funded	**9**
Principal Investigators Supported	**24**
Internal SER P.I.s	14
External UW Dept. P.I.s	10

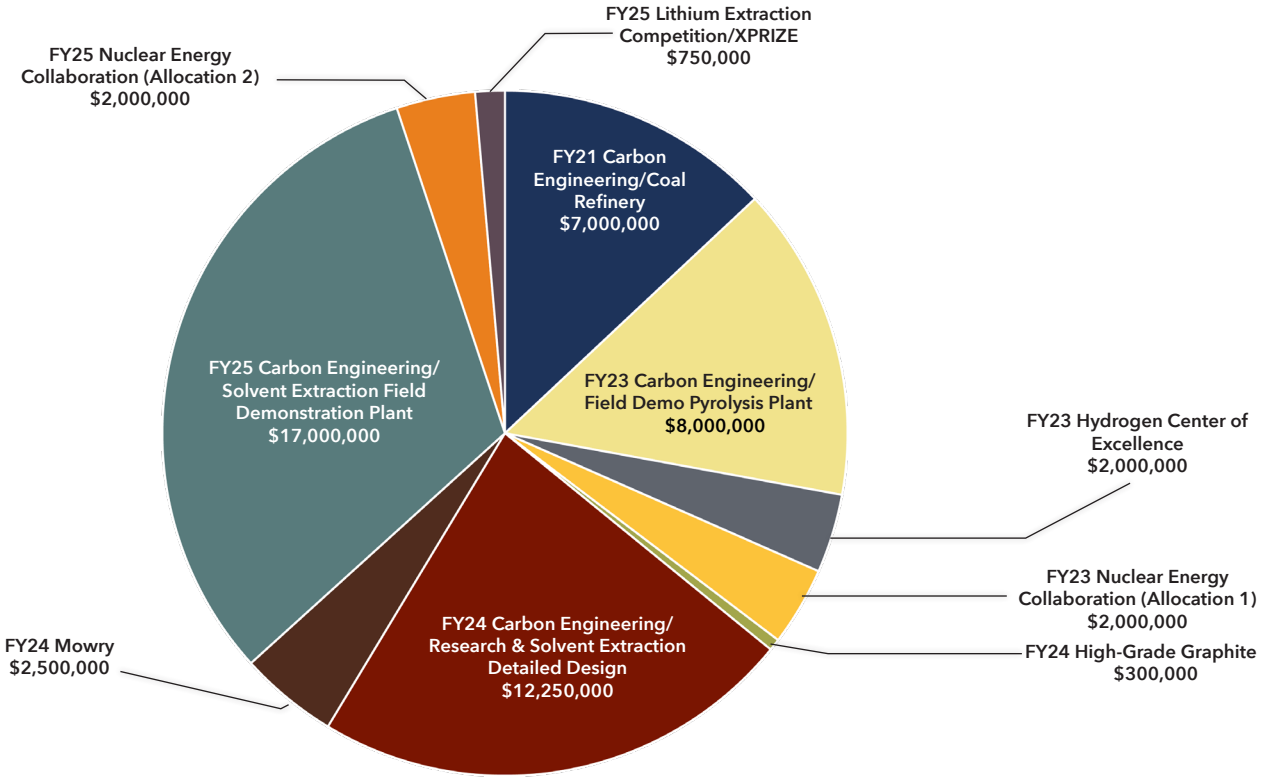
**Cost-Share - the resource contributions to a sponsored project beyond the amount funded by the sponsor. Could be from SER, industry partner, legislative support or from a state agency.*

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

****These awards were active at various points throughout FY25, with some closing during the fiscal year.*

EXCEPTION FUNDING

EXCEPTION FUNDING TOTALS



FUNDING ALLOCATION AND TOTAL SPENDING THROUGH FY25

	SPENDING THROUGH JUNE 2025	EXCEPTION FUNDING TOTALS
FY21 Carbon Engineering/Coal Refinery	$ 7,000,000	$ 7,000,000
FY23 Carbon Engineering/Field Demo Pyrolysis Plant	$ 7,743,324	$ 8,000,000
FY23 Hydrogen Center of Excellence	$ 1,625,850	$ 2,000,000
FY23 Nuclear Energy Collaboration	$ 1,475,393	$ 2,000,000
FY24 High-Grade Graphite	$ 300,000	$ 300,000
FY24 Carbon Engr/Research & Solvent Extraction Detailed Design	$ 6,246,292	$ 12,250,000
FY24 Mowry Shale Project $2.5M	$ 1,541,658	$ 2,500,000
FY25 Carbon Engineering/Solvent Extraction Field Demonstration Plant	$ --	$ 17,000,000
FY25 Nuclear Energy Collaboration (Allocation 2)	$ 3,209	$ 2,000,000
FY25 Lithium Extraction Competition/XPRIZE	$ 137,741	$ 750,000
Total	$ 26,073,468	$ 53,800,000

EXCEPTION FUNDING SPENDING BY COLLEGE

College of Engineering and Physical Sciences $9,147,785

College of Business $379,610

College of Law $100,067

Western Research Institute $3,964,358

College of Agriculture, Life Sciences and Natural Resources $251,416

Haub School of Environment & Natural Resources $11,384

FOUNDATION ACCOUNTS

Fiscal Year July 1, 2024 - June 30, 2025

Arch Resources Technology and Sustainability Fund

Charles Koch Foundation UW Energy Policy Fund

Christine A. Barry Nuclear Energy Student Enrichment Fund

ConocoPhillips CO_2 Storage Excellence Fund

Directors Discretionary Funds for the School of Energy Resources

EOG Resources Reclamation Fund

ExxonMobil K-12 Energy Education & Workforce Development Initiative

Hassler Family Energy and Emerging Opportunities Fund

John P. Ellbogen Foundation Nuclear Energy Research Center Fund

Hydrogen Energy Research Center, supported by Williams

Integrated Testing Center Investment Fund

Kenneth G. Burnes Endowment in the Center for Carbon Capture and Conversion

Kenneth G. Burnes CO_2 Storage Excellence Fund

Marathon Interdisciplinary Fossil Fuel Research Lab

Martin Knauss Energy Student Enrichment Fund

Navajo Energy Transitional Energy Company School of Energy Resources Excellence Fund

NextEra Energy Resources Excellence Fund in Professional Land Management

James E. Nielson Excellence Fund for the School of Energy Resources

Non-Endowed Chair in Subsurface Energy and Digital Innovation

Occidental Chair in Energy and Environmental Technologies

Occidental Chair of Energy and Environmental Policies

Peabody Education, Innovation and Technology Fund

PureWest Energy Natural Gas Research Fund

Rita Meyer Nuclear Energy Excellence Fund

School of Energy Resources Building Fund

School of Energy Resources Professional Land Management Program

School of Energy Resources Reservoir Characterization Collaboratory

Tallgrass CO_2 Storage Excellence Fund

J.E. Warren Chair for Energy & Environment

Williams CO_2 Storage Excellence Fund

Wold Foundation Oil and Gas Student Success Excellence Fund

John & Jane Wold Chair Energy

Wyoming NOW (nuclear, onshore wind and more) Fund

York Future of Energy Exception Scholarship

$23,572,974 – Total Market Value
(as of June 30, 2025)

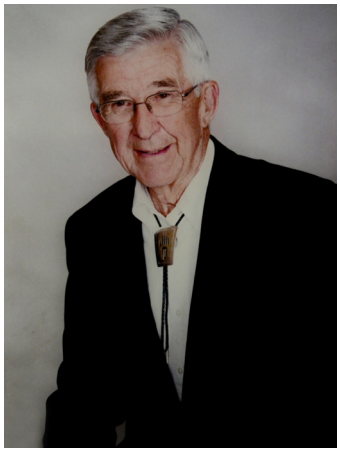
$940,187 – Estimated Payout for FY26
(as of June 30, 2025)

$798,252 – Total Spending for FY25

$3,487,632 – Total Dollars Raised in FY25

SELECT MAJOR GIFTS

James E. Nielson Excellence Fund for the School of Energy Resources



A gift from the estate of the late **James "Jim" Nielson** was matched dollar for dollar by the state of Wyoming and made to the James E. Nielson Excellence Fund for the School of Energy Resources.

In addition to supporting students within SER committed to making a difference in the energy sector, the Nielson Excellence Fund has provided a mechanism to support students in related fields on collaborative research projects.

Over the years, hundreds of UW students with an interest in energy have benefited from the fund. It has also has been used to develop the Nielson Faculty Fellows program, which recognizes exceptional faculty members for their superior performance in advancing energy research, education, and stewardship.

Wold Foundation Oil and Gas Student Success Fund

A $225,000 contribution from the Wold Foundation, doubled by the state of Wyoming's matching program, created the Wold Foundation Oil and Gas Student Success Fund.

The gift will provide graduate fellowships to students working with the SER Centers of Excellence and affiliated faculty on oil and gas projects. It will support scholarships, experiential learning opportunities and events, engagement activities with Wyoming high schools and community colleges, and student organizations.

EOG Resources Reclamation Fund

UW's Sheridan Research and Extension Center has received a key gift from EOG Resources Inc. to advance research on reclamation and to combat invasive plant and grass species in northeast Wyoming.

The gift – part of SER's mission to support the energy industry – was doubled by state matching funds through SER.

DONOR SPOTLIGHT

Hassler Family Energy and Emerging Opportunities Excellence Fund

A major gift from Wyoming engineer and energy strategist **Bryan Hassler**, established the Hassler Family Energy and Emerging Opportunities Excellence Fund, which will fuel critical initiatives within UW's energy programs and support emerging opportunities that drive economic diversification across the state.

The Wyoming NOW Fund

The $1 million gift from **Paul** and **Judy Lerwick** established Wyoming NOW (nuclear, onshore wind and more) Fund. Matched by the state of Wyoming, the fund will be used to foster excellence and allow SER to execute activities that grow the robust research and academic programs, and to leverage many opportunities specific to Wyoming.

Navajo Transitional Energy Company School of Energy Resources Excellence Fund

The Navajo Transitional Energy Company (NTEC) School of Energy Resources Excellence Fund was established to facilitate SER's efforts to bolster Wyoming's energy industry. The gift was doubled by the state's matching program. The gift will create opportunities to develop new technologies and educational programs at the SER.

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