The School of Energy Resources (SER) at the University of Wyoming is uniquely positioned to advance the university’s energy-related education, research, and outreach. SER’s independent operation allows for the development of interdisciplinary collegiate collaboration and program development.

Since its founding in 2006, SER has achieved its initial strategic goals and continues to pursue excellence in competitive energy-related education; advancement of science, technology, and economic research; and outreach to energy industries, academic institutions, governmental agencies, and the public.

Today, SER remains steadfast in its promise to fulfill its objectives and to advocate for a secure, sustainable energy future by:

- Establishing and fostering relationships that rapidly assess and respond to the changing requisites of Wyoming’s energy stakeholders
- Preparing undergraduate and graduate students for technical and business careers in diverse energy sectors
- Researching solutions to provide technological advancements and diversification to Wyoming’s energy industry

SER’s mission is to promote and develop the human resources and expertise to solve critical energy challenges faced by society. SER strengthens the University of Wyoming’s talent and resources for interdisciplinary research and outreach, fulfilling Wyoming’s promise to be a global leader in a secure and sustainable energy future.
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. SER’s operating structure and policies are established by the UW Board of Trustees.

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.

In addition to the advisory role of the ERC, the Wyoming Legislature, (W.S. 21-17-121), directed the Advanced Conversion Technologies Task Force, consisting of the voting members of the ERC, to award and oversee funds to proposals for clean coal and advanced conversion technologies after submitting recommendations to the Wyoming Legislature Joint Minerals, Business and Economic Development Interim Committee.

The ERC consists of twelve members. 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 three ex-officio members: the President of the University of Wyoming, the Director of the Haub School of Environment and Natural Resources and a member of the University of Wyoming Board of Trustees.
Aligning with the mission and vision of the School of Energy Resources is the completion of the new Energy Innovation Center (EIC), located on the UW campus in Laramie, Wyoming. Researchers housed in EIC laboratories have access to state-of-the-art technology, including the Shell 3-D Visualization Center, the Advanced Research Computing Center and the NCAR-Wyoming Supercomputer to record, visualize and analyze complex data sets. The EIC is a 27,300-square-foot technical research facility that includes office, classroom and meeting spaces as well as 12,500-square-feet dedicated to six reconfigurable advanced laboratories.

Bachelor of Science in Energy Resource Management and Development
SER’s undergraduate degree program provides a foundation of knowledge required to assess, develop, and manage energy resources. The program focuses on the fundamental competencies required to address the challenges of complex interdisciplinary problems, and to communicate solutions to a wide range of stakeholders. Students have opportunities to work directly with faculty on cutting-edge research projects that make valuable industry connections.

In order to keep current with the constant state of change in the energy industry, SER’s academic program offers a balance of traditional classroom courses with relevant and practical experience in industry, government, and academics. Students complete a capstone project and are encouraged to pursue undergraduate research experiences and internships with SER’s industry partners. When students graduate, they are motivated, self-directed, and workforce-ready. These concepts are critical to the career placement and long-term success of the graduates. Enrollment has increased every year since the program’s establishment in 2009.
The Energy Resource Management and Development (ERMD) BS degree allows students to choose one of the following concentrations:

- Energy Air, Land, and Water Management
- Fossil Fuels
- Professional Land Management (PLM)*
- Renewable Energy

*The PLM program is accredited by the American Association of Professional Landmen (AAPL) and was the seventh accredited program in North America.

Energy Management Masters of Business Administration

In collaboration with the College of Business, this rigorous, 21-month program prepares graduate students for dynamic management roles in traditional hydrocarbon energy, power generation, and alternative energy businesses. Students become versed in macro energy economics, terminology, and contextual understanding of business practices across diverse industry segments, including:

- Energy Supply Chain Management
- Energy Finance (Project Evaluation)
- Energy Accounting
- Energy Law and Regulation
- Energy Marketing & Sustainable Consumption
- Energy Finance (Energy Trading, Hedging, and Securities)

In addition to core management courses, students complete an experiential summer project in the energy field during their first year of the program.

K12 ENERGY EDUCATION

SER is committed to coordinating statewide efforts to enhance the workforce pipeline by promoting general energy literacy in primary and secondary education. Activities are targeted to increase awareness of the diverse career opportunities available in the public and private energy sector; to promote in-service teacher training in energy issues and inquiry-based pedagogy; to provide cutting-edge, energy-based lesson plans with field trips and practical experience for an engaging curriculum and project-based learning; and to connect industry and community efforts with K12 energy initiatives.

SER students graduate prepared for the workforce, equipped with experience in complex simulations of energy challenges

Private-sector partners have increased internship opportunities and recruitment of SER graduates
E N E R G Y R E S E A R C H

Pursuing transformative solutions

Mission: To drive state-of-the-art energy-related science, technology, and economics research.

Centers of Excellence
The Centers of Excellence research groups are an important component of SER’s efforts to bring faculty and graduate students together from multiple disciplines to develop important energy research programs. The centers are established with seed funding from SER to garner support through outside funding from sources such as the U.S. Department of Energy and the National Science Foundation. While some existing centers disband as their programs are complete, new research groups are formed to address emerging energy industry challenges.

Joint U.S.-China Clean Energy Research Center
The School of Energy Resources is an active member of the U.S.-China Clean Energy Research Center Advanced Coal Technology Consortium. This consortium focuses on advancements in the following areas: advanced power generation, clean coal conversion technologies, pre- and post-combustion capture, oxy-combustion capture, CO2 sequestration and utilization, simulation and assessment, communication and integration, combined coal pyrolysis, gasification and combustion multi-generation technology, and microalgae bio-sequestration of CO2 from flue gas. The U.S. membership consists of federal, private, and public sectors.

Advanced Conversion Technologies Research Program
The Advanced Conversion Technologies Research Program was created to facilitate research and development in the area of low-emissions and advanced coal technologies using Wyoming Power River Basin coal. Commercially successful deployment of these technologies is the ultimate goal of the program. The program’s objectives are:

• Enable and accelerate the demonstration, and early commercial deployment, of technologies that have the potential to enhance and improve the use of sub-bituminous coal at high altitudes, specifically in Wyoming.

• Generate and test new ideas for significant improvement of cost reductions in next-generation low-emissions and advanced coal technologies.

• Support collaborative research and development in accomplishing the above objectives.

Since its inception, the state has appropriated over $40 million to advanced conversion research. These funds have supported 49 research projects, some of them resulting in patents and successful small-scale operation.

OVERVIEW
State-of-the-art research is a requirement for preserving and growing the value of Wyoming’s energy resources while protecting the state’s natural resources. The ability of UW faculty to seek and obtain research grant funding is greatly enhanced by SER’s commitment to provide competitively awarded matching funds through the Matching Grant Fund program. These highly leveraged funds, along with the advanced laboratories and equipment available in the Energy Innovation Center, provide UW with excellent opportunities to compete in a broad spectrum of research endeavors across energy sectors that are important to the state: natural gas, petroleum, coal, uranium, wind, and solar.

$4 million
managed and allocated for SER’s research program through the Matching Grant Fund

$40 million
allocated through the Advanced Conversion Technologies Fund

$1.6 million
allocated to the Uranium Research Fund for research and outreach
OVERVIEW

One important benefit SER provides Wyoming is the transfer of technology and knowledge to a broad range of constituents. For research at UW to make a difference, it must address current and future challenges, and stakeholders must have timely access to the information. SER collaborates extensively with partners to offer a dynamic selection of symposia, conferences, workshops, and colloquium speakers each year.

SER’S STRATEGIC AREAS OF CONCENTRATION

The School of Energy Resources has embarked on a five-year plan that focuses on three primary areas in energy academics, research, and outreach at UW.

• Explore unconventional reservoirs that contain fossil energy resources, which do not flow at economic rates or produce economic volumes of oil and natural gas without stimulation or other enhanced recovery processes

• Create value-added products, such as liquid fuels and petrochemicals, through conversion and other manufacturing activities that create new commoditized markets for energy resources

• Develop wind and solar energy technologies that improve efficiency, mitigate the impacts of variable supply, and convert output to higher-value products

SER’S collaborative approach to outreach has resulted in the following events:

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<th>Annual SER Distinguished Speaker Series</th>
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<tr>
<td>Bi-Annual International Advanced Coal Technologies Conference</td>
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<td>Powder River Basin Coal: Domestic Challenges and International Opportunities</td>
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<td>Power Generation and the Environment: Choices &amp; Economics Trade-Offs</td>
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<td>Annual Landscape Discussion on Energy Law in Wyoming Symposium</td>
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<td>International Conference on Future Technologies for Wind Energy</td>
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<td>Secondary Biogenic Coal Bed Natural Gas International Conference</td>
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<td>Sustainable Management: Strategies and Tools for Energy &amp; Extractive Industries</td>
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<td>Hydraulic Fracturing: A Wyoming Forum</td>
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<td>Clean Coal Technology Research Symposiums</td>
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<td>Future of Uranium Production in Wyoming</td>
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<td>Finding the Balance: Energy and Environment</td>
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<td>Wyoming Pipelines: The Territory Ahead</td>
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<td>Transmission Forum</td>
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<td>Global Competition for Energy</td>
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Mission: To create and support opportunities for the exchange of scholarly, scientific and policy information to Wyoming’s energy stakeholders, communities and government agencies.
Wyoming’s investment in energy programs at UW is creating real-world benefits for the state and the university:

- Growing student enrollment in energy degree programs
- Building strong industry partnerships
- Increasing job opportunities for a skilled workforce
- Developing new markets for existing energy resources

$68 MILLION
in private sector contributions from SER’s industry partners have matched state funds in supporting facilities and endowments

$185 MILLION
invested (through direct support and the state’s matching funds) in the School of Energy Resources and energy programs at the university since 2006

SER is fortunate to have broad support across the energy industry including these major donors:

- Anadarko
- Arch Coal
- Baker Hughes
- BP
- Cordillera Energy Partners
- Encana
- Halliburton
- Hess
- Marathon
- Jim Nielson
- Peabody Energy
- Shell
- Ultra Petroleum
- WPX Energy

SER: INVESTING IN THE FUTURE

The School of Energy Resources has enjoyed the generous support of both private and public sectors. Wyoming has invested more than $185 million in the School of Energy Resources and energy programs at the university. These funds have helped build the Energy Innovation Center, supported the implementation of SER’s Strategic Areas of Concentration, and supported critical energy research programs. Public and private sector partnerships support the university’s teaching and research missions and contribute to Wyoming’s economic development. These collaborations are groundbreaking for both UW and the state—they establish and foster mutually beneficial relationships, transform the university’s educational and research environments, and chart a course for diversification of Wyoming’s economy.

BOLD ACTIONS SPARK BRIGHT REACTIONS

At the School of Energy Resources, we’re creating the future of energy, and the potential for results is unlimited. The State of Wyoming, its private partners—and you—expect valuable and measurable results from an investment in energy education, research and technology. We invite you to join us in action and consider attending an outreach event, becoming a financial supporter or sharing your expertise because all of our talents are needed to become a global leader and to deliver a sustainable, secure energy future.