

School of Energy Resources Update
November 17, 2022

1. The SER Academics program continues to focus on recruiting, evaluating its offerings and supporting student success. Select updates include:
 - a. SER's proposed undergraduate certificates (carbon capture, utilization and storage and land administration) continue to move through approvals necessary and are on the BOT agenda in November. If approved, these will launch in FA23.
 - b. SER is part of a pilot program with Admissions to send "journey" emails to prospective students. This allows SER to send three specific emails about SER degree offerings to prospective students that meet certain criteria in tandem with Admissions. Thus far, at least two admits for FA23 are due to these emails.
 - c. SER hosted a booth with our secondary accrediting organization, American Association of Professional Landmen, at the Houston Energy Day Festival on October 15, 2022. This is the largest annual free festival with a focus on STEM and yielded thousands of participants.

2. SER Outreach has led many events in the past two months, including:
 - a. Facilitated major tribal outreach between the University of Wyoming leadership and the Wind River Reservation by hosting Wes Martel to give a presentation on tribal governance. This initial meeting also provided the opportunity to meet with other tribal members on campus to discuss possible opportunities for collaborating on energy-focused projects.
 - b. Additionally, SER Outreach has continued to provide major events to connect Wyoming stakeholders, members of the community and UW faculty, staff, and students through:
 - i. Annual CORE-CM (Carbon Ore, Rare Earths and Critical Minerals) meeting for the Greater Green River and Wind River Basins (Oct. 19-20), which was hosted at Western Wyoming Community College
 - ii. 2022 Annual Landscape Discussion on Energy Law & Policy in the Rockies (Oct. 14) in Laramie
 - iii. Fall Distinguished Speaker Series: Six presentations bringing different energy experts to campus through the fall semester

3. The SER research program continues to grow and diversify. With the following key initiatives and changes:
 - a. Staffing: SER's research program continues to grow, including the five staff led Centers of Excellence.
 - i. SER's research team had two staff departures, including the retirement of Dr. Yuri Ganshin. Ganshin, a Wyoming Alumnus and a founding member of the Center for Economic Geology Research (CEGR) served as the Center's Senior Geophysicist for 11 years. We are grateful to Yuri for his many years of service.
 - ii. The Hydrogen Energy Research Center has three open searches. CEGR has added three new research scientists two for subsurface modeling and one with expertise in economic geology. One of the hires was a recent graduate of the UW Chemical Engineering Department.
 - b. New Projects:

- i. The Mowry Project: The goal of the project is to bring together a multidisciplinary UW team to focus on unlocking Wyoming's largest untapped unconventional oil and gas resource – with massive economic upside for Wyoming.
 - 1. SER issued a competitive RFP and six projects were selected. A kickoff meeting was held in September that was attended by each project Principal Investigator (five different departments are represented). The meeting highlighted that there is significant synergy between the projects and as a result many of the PI are now collaborating on samples, experiments and results.
 - 2. Outside collaborators have shown interest in participating in the effort. For example, the project Principal Investigator are collaborating with Colorado School of Mines and Texas Christine University on Mowry projects that are ongoing at those universities.
 - c. Each BOT update, SER highlights at least one faculty-led center of excellence. Thus, we are pleased to provide an update on the Wind Energy research Center (WERC), which is under the leadership of Dr. Jonathan Naughton and Michael Stoellinger in the Department of Mechanical Engineering. Through theoretical, computational, and experimental approaches, WERC focuses research efforts on modeling wind, improving wind energy technology and its integration with existing electricity production, impacts on the transmission grid and economic impacts associated with wind energy. Over the last quarter:
 - i. There were numerous national presentations by both faculty and students.
 - ii. Based on a wind database developed in conjunction with the National Renewable Energy Laboratory (NREL), PhD student Sarah Buckhold proposed a study for using stranded wind energy for hydrogen production to the SER Hydrogen Center, and the proposal was selected for an award.
 - iii. A proposal led by Michael Stoellinger to compete in the DOE Collegiate Wind Competition 2023 was accepted. Student teams have been formed and are working towards the first deliverables for the competition.
<https://www.uwyo.edu/uw/news/2022/10/uw-selected-for-department-of-energys-collegiate-wind-competition.html>
4. SER's Center for Economic Geology Research (CEGR) continues its research on CO₂ storage, hydrogen and critical minerals research. Select highlights include:
 - a. Under the SER's flagship CO₂ storage project, Wyoming CarbonSAFE, a commercial-scale storage hub is being developed that could provide carbon management solutions for the northern Powder River Basin. Currently, the project team has finalized the schedule for in-situ well tests and completed injection draft permits. In addition, the project team has evaluated literature that provides guidance on the final Phase of CarbonSAFE to prepare for the next proposal.
 - b. The CORE-CM projects, which are focused on building new industries in carbon ore, rare earths and critical minerals in the Powder River Basin and the Greater Green River Basin, completed Wyoming-focused annual forums as well as attending and presenting at the annual DOE update meeting. Current project assessments include expanding regional resource assessments and identifying best technologies for commercial project advancement.

- c. CEGR, continues to expand its research focus to support Wyoming industries, and recently worked with colleagues within the Geology and Geophysics Department to complete a characterization assessment of the geology at TerraPower's proposed nuclear Natrium plant site that will be used to evaluate construction risks.
5. SER's Center of Excellence for Carbon Capture and Conversion (CCCC) continues to progress research and technology development associated with the future of Wyoming coal.
- c. Wood engineering is proceeding with the site prep and movement of the coal drying equipment from Manti, UT for the field demonstration plant being constructed in Gillette, Wyoming. Finalization of the detailed engineering proposal for the pyrolysis unit is almost complete and will commence when the contract signed.
 - d. The students working on the UW solvent extraction pilot plant are making great progress on the implementation of the vacuum tower needed to purify the coal extract for the asphalt team.
 - e. The students working on the UW pyrolysis pilot plant have added a system that can easily change from co-current flow to counter-current flow which allows for a more flexible design for the field demonstration plant.
 - f. Movement on the commercialization effort and what the entity would look like for the Coal Refinery is being investigated with input from several different sources around Wyoming. There is growing interest in the technology that is coming from the Carbon Engineering effort.
6. The Center for Energy Regulation and Policy Analysis (CERPA) is focused on supporting other SER centers, state elected and appointed officials and leading its own research programs. Select updates include:
- g. A new CERPA director has been selected and will start in December 14. This individual is a Wyoming native and has extensive legal and regulatory expertise.
7. SER's Hydrogen Energy Research Center (H₂ERC) is leading several projects and initiatives, including:
- a. For the hydrogen hubs funded through the Infrastructure Investment and Jobs Act (IIJA), the Western Interstate Hydrogen Hub (WISHH) concept paper has been submitted with substantial input from H₂ERC. H₂ERC will continue building the WISHH full hydrogen hub proposal until April 2023.
 - b. H₂ERC is facilitating two proposals on hydrogen production from desalinated produced water and hydrogen storage are being prepared.
 - c. H₂ERC is creating an ecosystem for research and development in hydrogen energy at the University of Wyoming. An internal RFP was released and seven proposals from faculty were funded to research the production, storage, movement, and use of hydrogen.
 - d. Research projects are underway with Tallgrass MLP and Williams to focus on hydrogen produced from natural gas (blue) and water electrolysis (green).
 - e. The DOE-funded study titled 'A Mid-Century Net-Zero Scenario for the State of Wyoming and its Economic Impacts' is helping H₂ERC to a baseline for the future of a hydrogen economy in the state of Wyoming.