School of Energy Resources Update

July 14, 2021

1. With the announcement of a novel, fast-reacting, nuclear power plant with energy storage, SER is evaluating options to expand research in the field of nuclear energy. A list has been compiled with potential collaborators from across campus, many of whom are already working in this field, and INL has been visited. There may be near-term opportunities to increase collaboration through external funding.
2. SER Academics program update:
   1. SER’s energy management minor will be officially available starting this fall semester
   2. SER continues collaborating with units across campus to expand its academic offerings and support of other units
   3. After obtaining permission from Academic Affairs, SER renamed its Energy, Land and Water concentration to Energy and Environmental Systems, more accurately reflecting the focus of the concentration
3. SER’s Center for Economic Geology Research (CEGR) continues its research on carbon storage and critical minerals research. Select highlights include:
   1. Phase III of the Department of Energy-funded Wyoming CarbonSAFE project is underway and focused on implementing field operations. The project is building a fully-permitted, commercial-scale carbon storage site around two sequestration wells at Dry Fork power station near Gillette and lay the foundation to develop a regional carbon storage hub.
   2. CEGR is assessing carbon storage resources of potential injection reservoirs across Wyoming basins as part of the Department of Energy-funded Plains CO2 Regional Partnership initiative. This project is funded through 2024.
   3. CEGR was successful in obtaining nearly $3 million from the U.S. Department of Energy for research focused on expanding and transforming the use of coal and coal-based resources to produce coal-based products, using carbon ore, rare earth elements (REE) and critical minerals (CM). These multi-phase projects are expected to start in the fall of 2021 and will last for 2 years.
4. SER’s Center of Excellence for Carbon Capture & Conversion (CCCC) is progressing activity associated with the future of Wyoming coal, and is supporting and collaborating with an interdisciplinary faculty and staff team from across campus. While invented at the lab-scale, the UW team is now focused on pilot testing, scale up, demonstrate and commercialize technology in support of the Wyoming economy.
   1. Working with UW faculty in Chemical Engineering, Physics, Civil Engineering and Architecture and Ecosystem Science and Management, research and pilot testing is being advanced on the following processes and coal-derived products
      1. Two pilot plants (pyrolysis and solvent extraction) to create the starting materials for coal-derived products
      2. Dry methane reforming (DMR) pilot plant as a novel approach to using CO2 emissions
      3. A mini house made from coal-derived building products that will (subject to approval of BOT), be constructed on campus
      4. Energy storage applications
      5. Field test of coal-derived soil fertility products at the UW Powel and Lingle extension test centers. The team is also working with Peabody and Jonah Energy to establish new demonstration field sites focused on land restoration.
   2. The core technology is being scaled up and thus SER has contracted Wood Plc, an engineering contractor, to undertake a feasibility study for a field demonstration in collaboration with Atlas Carbon, LLC in Gillette, WY.
5. The 3D Visualization Center
   1. Significant strategic effort and progress has been made to broaden the funding portfolio of the 3D Viz Center, with the ultimate goal of being largely self-sufficient. External comment has been garnered from internally renowned visualization academic experts such as Maxine Brown (of the Electronic Visualization Laboratory (EVL) at the University of Illinois at Chicago (UIC)). Inclusion with SER’s successful research grants, including CORE-CM, CarbonSAFE Phase III, Intermountain West Energy Initiative, and existing grant funding will generate over $165k during the year (nearly to 1/3 of the 3D Viz Center operating costs).
   2. The 3D Viz Center continues to support the Digital Pillar, and the School of Computing planning process
   3. New opportunities for work include
      1. Exploring the use of Digital Twins to allow for remote monitoring of research orientated physical infrastructure
      2. Development of a proposal outlining the potential statewide benefit of an interactive visualization tool supporting the teaching, research, and economic use of the North Platte River, by mapping the riverbed morphology
6. SER thanks UW administration and the Board of Trustees for supporting the change in the distribution of indirects from sponsored research projects. This change provides much-needed resources to the offices that researchers at SER and across UW rely on to submit and manage competitive research grants. SER believes supporting these offices is critical to grow UW research, increase external funding and meet our land grant mission. Thank you!