

Lignite Research Program- Grant Round 80- Application Summaries

Application Number	Application Title	Applicant	Project Duration	Summary of Project	Funding Requested	Total Project Cost
LRC-80-A	Investigation of Rare Earth Elements Extraction from ND Coal-Related Feedstocks	University of North Dakota- Institute for Energy Studies	18 Months	To develop technologies for recovering rare earth elements (REEs) from coal and coal byproducts. Phase 1 focuses on sampling, characterization, concentration methods, and evaluating the technical and economic feasibility of REE extraction, while laying the groundwork for Phase 2 development of separation and extraction technologies. The research supports domestic production of critical minerals and creates new value-added uses for coal resources.	\$94,000	\$936,874
LRC-80-B	Managing Aerosol Emissions from CO2 Capture Systems	Energy & Environmental Research Center (EERC)	10 Months	To investigate how aerosols formed during low-rank coal combustion affect solvent loss and emissions in post-combustion carbon capture (PCC) systems. Through measurements, modeling, and testing, the research aims to identify methods to reduce aerosol formation, improve carbon capture efficiency, and lower operating costs for coal-fired power plants.	\$300,000	\$600,000
LRC-80-C	Pathway to Low Carbon Lignite Utilization	Energy & Environmental Research Center (EERC)	19 Months	To advance development of a lignite-duced Allam Cycle power system that uses supercritical CO2 technology to generate electricity efficiently while capturing carbon for enhanced oil recovery. The research will	\$3,500,000	\$10,300,000

				further validate key technologies, conduct pre-engineering design activities, and support commercialization of low-carbon lignite power generation to strengthen North Dakota's energy and oil industries.		
LRC-80-D	Management Practices to Improve Soil and Vegetation Perimeters of Reclaimed ND Coal Mine Lands	North Dakota State University- School of Natural Resource Sciences	5 Years	To improve reclamation of surface coal mine lands in North Dakota by addressing persistent soil compaction and invasive plant species that limit long-term ecosystem recovery. Through field trials at four coal mines, researchers will evaluate soil and vegetation management practices to enhance water movement, reduce compaction, promote native vegetation, and improve land productivity. The project will produce best management practices, scientific publications, and guidance for future reclamation efforts across the state.	\$578,187	\$1,156,390
LRC-80-E	Carbon Capture & Utilization Using 'VCCSTM Cycle' Technology Phase I	Expansion Energy LLC	16 Weeks	To design and engineer a pilot-scale carbon capture system using XE's parented VCCS technology, which converts power plant CO2 emissions and lignite coal ash into marketable mineral products, including rare earth elements	\$45,000	\$145,000

				and metals. Phase I will develop process designs, simulations, and cost estimates for a pilot plant, while laying the groundwork for a future demonstration at Great River Energy's Coal Creek Station to reduce emissions and create new value-added products from lignite.		
LRC-80-F	Capture and Capture Sequestration of Carbon Dioxide	Carbontec Energy Corporation (CEC) Michigan Technological University (MTU)	12 Months	To evaluate a carbon capture technology that removes CO2 from coal-fired power plant emissions using a carbonate-based scrubber system. The project will test CO2 capture efficiency, contaminant impacts, and a two-stage scrubber design to support future pilot-scale deployment and production of commercial-grade CO2.	\$48,000	\$96,000