Yamoussoukro texas energy storage

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The energy landscape has entered a period of transformation, driven by increased demand, rapid technology development and the global push to achieve net-zero emissions. Texas is one of the most energy resource-rich states in the country and is uniquely positioned to lead the innovation underpinning next-generation energy solutions. With nearly a century of leadership in the field -- from roots in oil and gas to breakthroughs in batteries and new sources of power -- the breadth of expertise in the Cockrell School of Engineering is unmatched in this area. The future of energy starts here.

Cockrell is seeking partners to help identify problems, invest in ideas and implement economically viable solutions. Connect with the Cockrell School Industry & Research Relations Office to learn more about partnership opportunities.

With a foundation that dates back to Nobel Prize-winning battery pioneer John Goodenough"s arrival at UT Austin in the 1980s, Cockrell is addressing every aspect of battery innovation, aiming to enhance life cycle and safety, develop new materials, create storage solutions and reduce cost and charging time. From computational modeling of battery mechanics and chemistry at the atomistic level to manufacturing EV-sized batteries and everything in between, Cockrell has the know-how and capabilities to continue a tradition of pioneering research.

Cockrell has a history of leadership in advancing the hydrogen economy, from deploying Texas" first hydrogen-powered bus on the road, to developing new materials to produce hydrogen from sunlight and water, to constructing hydrogen research facilities that represent the end-to-end value chain for hydrogen. Investigators are researching ways to make, store, transport and use hydrogen as a safe, efficient, cost effective and zero-carbon energy source.

Power grids must continue to evolve to meet increased resiliency, electricity demand, reliability and security challenges, among other key drivers of change. UT Austin is at the forefront of this effort, partnering with national labs and using the campus microgrid and test microgrid at the Center for Electromechanics to prove out new solutions. UT Austin is addressing power source integration, delivery, stability and vulnerability through modeling and demonstration programs. Research groups in the Chandra Family Department of Electrical and Computer Engineering are investigating future grid solutions, including power electronics and grid architecture for improved resilience.

Supported by a National Science Foundation solar power research center, Texas Engineers are developing new energy technologies and alternative resources that improve our energy system worldwide. Faculty are investigating several topics related to wind energy, including thunderstorm impacts on wind turbines and development of offshore windfarms in the Gulf of Mexico. Leveraging our roots and expertise in oil and gas drilling and completions, we are exploring new frontiers in geothermal energy and finding the best ways to

harvest and utilize it.

The Cockrell School is home to leading experts in emissions modeling, measurement and mitigation in various, including methane emissions and abatement of unwanted combustion by-products.

Building energy use accounts for a significant portion of overall energy consumption. Researchers are studying how to best integrate building and infrastructure systems to make them more energy efficient and bidirectional in the ability to demand and supply power to the grid. Next-generation technologies like artificial intelligence have the potential to serve as a backbone for improved energy usage in our built environment.

Cockrell is working on solutions to the technical and economic challenges facing carbon capture, storage and utilization by developing new technologies and methods, while partnering with industry to address important needs. Researchers are helping identify subsurface locations and formations that make the most sense to store carbon-dioxide from the Gulf of Mexico to the Permian basin and beyond, and also performing pioneering research such as the storage of carbon dioxide in hydrate state.

Looking at the entire energy spectrum means addressing the processes and methodology through which we are producing, storing, delivering and recycling energy producing materials, as well as rethinking the materials we are using throughout the energy mix and their lifecycles.

Nuclear reactor designs have changed in recent years to focus on smaller, safer, modular solutions that aim to better address spent fuel disposal. Nuclear energy will continue to play a significant role in meeting the world"s increased demand for climate-friendly energy. UT Austin has a strong history in nuclear engineering and remains at the technological forefront. UT Austin"s Nuclear Engineering Teaching Lab is home to a TRIGA Mark II reactor, one of the newest in the fleet of U.S. university teaching reactors. And it is home to a number of collaborative research endeavors including, the development of a molten salt reactor.

As the future of energy evolves, properly integrating renewables, clean fossil fuel sources and nuclear with the grid while leveraging leading-edge technologies such as AI and machine learning presents challenges and decision points. The Walker Department of Mechanical Engineering"s Operations Research and Industrial Engineering group focuses on advanced methods, technologies, and techniques to help integrate energy system components and analyze the tradeoffs and technology of the future of energy.