

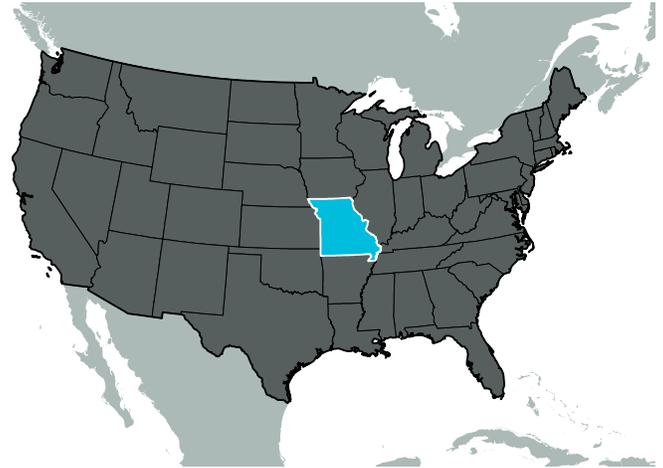
Missouri's Energy Storage Industry Ecosystem

Missouri is Home to the Future of Energy

Missouri is home to leading developers and producers of batteries from the defense, space, automotive, and consumer industries.

Our batteries power NASA's space program, including NASA's InSight lander, which is currently on the surface of Mars.

We have assets hidden below the surface as well. Missouri is the leading producer of lead for batteries in the U.S. and is home to what is likely the largest cobalt reserve in North America. Cobalt is an indispensable raw material for a wide variety of highly sophisticated processed materials, including the mixed metal oxide cathode powders used in all high-energy lithium-ion batteries.



Energy Storage Developers and Manufacturers

Recent Announcements

Clarios, which until 2019 was part of Johnson Controls, recently invested \$25 million and added 114 jobs at one of their St. Joseph facilities to support increased production of absorbent glass mat (AGM) batteries for hybrid and electric vehicles.

EaglePicher Technologies, LLC, recently opened their new Lithium Ion Center of Excellence. The 100,000-plus square-foot, state-of-the-art facility was built adjacent to the company's current Lithium Ion facility in Joplin and will expand the EaglePicher cell and battery portfolio.

ICL Group, a leading global specialty minerals company, recently announced plans to build a \$400-million lithium iron phosphate (LFP) cathode active material (CAM) manufacturing plant in St. Louis. It is expected to be the first large-scale LFP material manufacturing plant in the United States when it begins operations in 2024.





Energy Storage Research in Missouri

Advanced Energy Materials & Systems Lab at Missouri University of Science & Technology (Missouri S&T) focuses on research areas such as degradation in energy storage systems, life prediction for energy storage systems, nanostructured electrodes, multiscale/multiphysics modelings, self-assembly of nanoparticles and nano-/micro-mechanics of materials.

Center for Physical and Power Electronics at the University of Missouri focuses on high-power electronic devices for defense, life sciences, environmental applications and alternative energy sources and storage. The Center is developing new dielectrics for energy storage that utilizes nanotechnology.

Energy Research and Development Center at Missouri S&T researches electric energy conversion for high impact application in power and energy systems, next generation energy systems, vehicle-to-grid integration, hydrogen fuel cell analysis, and grid stabilization and storage.

Future Renewable Electric Energy Delivery and Management Systems Center (FREEDM) is a collaborative effort between Missouri S&T and seven other U.S. and European universities to transform the nation's power grid into a distributed system. A major goal is to introduce distributed energy storage devices and distributed grid intelligence such as plug-in hybrid electric vehicles and other tools.

Missouri Center for Advanced Power Systems (MOCAP) is a partnership between Missouri Southern State University, Missouri State University, University of Missouri, Missouri S&T, EaglePicher Technologies, the Joplin Area Chamber of Commerce, and the Joseph Newman Innovation Center. MOCAP is devoted to research and development of new battery and advanced power technologies and educating a new high-tech workforce for the future.

Solar Energy and Energy Storage at Washington University in St. Louis aims to become a global knowledge centric consortium that promotes and enables vertically integrated solar energy and energy storage science and technology across organizations.