



# U.S. High-Tech Research to Develop Next-Generation Lead Batteries

**Project Overview** More than a dozen U.S. lead battery companies and suppliers are currently working with the U.S. Department of Energy's Argonne National Laboratory (ANL) to unlock the untapped potential of lead batteries. The goal: To provide scientific insight that will significantly increase lead battery performance, by establishing a foundation for the next generation of advanced lead battery technology.

## Vision

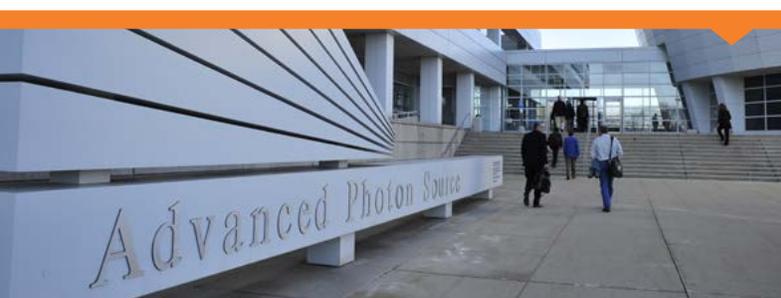
Leverage groundbreaking analytical techniques to develop a deeper understanding of lead battery operation. This will allow the lead battery industry to transform their technology to meet increasingly demanding requirements for existing and future applications: renewable energy storage, eco-friendly transportation, smart cities, electrification, and other sustainable efforts to decarbonize.

## Objectives

1. To use analytical techniques to understand the behavior of active materials during lead battery charge/discharge.
2. To determine the effects of various battery additives and material purity on battery performance.

## Participants

- + Two divisions of ANL – a multidisciplinary science and engineering research center based in Chicago: the Chemical Sciences and Engineering Division and the Materials Science Division
- + A range of U.S. battery companies, lead producers and suppliers (see full list on next page)
- + Advanced Lead Acid Battery Consortium (ALABC)
- + Program Manager is Electric Applications Incorporated of Phoenix



## Official Project Name

### Lead Battery Science Research Program

## Duration

Three years (2018-2021)

## The Need

Lead batteries supply 75 percent of the world's rechargeable battery energy needs and have been in use for more than 150 years. Yet, there remains significant untapped potential in lead battery technology, and thus, great opportunity. This project provides a foundation of scientific insight to advance lead battery energy storage and cycling capabilities, as demand escalates worldwide.

## ANL Techniques

This project will primarily involve ANL's Advanced Photon Source (one of the world's premier high-energy synchrotrons) and its Electrochemical Discovery Lab. Both will allow scientists to watch in real time the chemical transformations at atomic and molecular levels that occur in lead batteries during charge/discharge. This will be the first time these techniques have been used to study lead batteries.

## Companies Involved

All participating companies operate in the U.S. Those guiding the research program are Crown Battery Manufacturing Company, Doe Run Resources Corporation, East Penn Manufacturing Company, EnerSys, Exide Technologies, Johnson Controls, NorthStar Battery Company, RSR Technologies, and Trojan Battery Company. Associate participants are Advanced Battery Concepts, Borregard Lignotech, Cabot Corporation, Microporous LLC, and Superior Graphite.



**This deep scientific insight will help unlock significant untapped potential in lead batteries to meet global demand.**

## Links

### + News Release

Go to [EssentialEnergyEveryday.eu](http://EssentialEnergyEveryday.eu), then visit the News & Insights section

### + Tech Summary

Go to [EssentialEnergyEveryday.eu](http://EssentialEnergyEveryday.eu), then visit the Resources section

## Contacts



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**Essential Energy Everyday** exists to increase awareness of the critical importance of lead batteries to power our daily lives. We encourage continued investment in sustainable lead battery technology to store and provide energy on demand. Our initiative is supported by the two global trade associations that represent the lead battery industry, **Battery Council International** and the **International Lead Association**.

**Learn more at [EssentialEnergyEveryday.eu](http://EssentialEnergyEveryday.eu)**