

Electrical Energy Storage History at INL



Idaho's national laboratory has been conducting research on energy storage systems nearly as long as the nation has been advancing electric vehicles. This snapshot of INL's battery research history shows some of the highlights.

1970

1976: Congress passes Electric and Hybrid Vehicle Research, Development, and Demonstration Act to "encourage and support accelerated research into, and development of, electric and hybrid vehicle technologies."

1980

1983: Energy Storage Testing Laboratory at Idaho National Engineering Laboratory established for testing full-size electric vehicle batteries in support of the U.S. Department of Energy's Electric and Hybrid Vehicle Program. Initial work occupied about 500 square feet (sf) in building IF-605.

1984: DOE Electric Vehicle Center dedicated at INEL Research Center C wing for electric vehicle dynamometer and road testing. Idaho Sen. James McClure, an early supporter, attends.

1990

1991-1992: The U.S. Advanced Battery Consortium (USABC) is formed (mainly by the Big Three U.S. automakers: Ford, General Motors and Chrysler); decisions about technology pursuits shift from DOE and its labs to the consortium. Idaho's lab receives USABC funding to conduct research on nickel metal hydride and high-temperature batteries.

2000

Late 1990s: INL begins work on coatings for reactive metal batteries including Li metal.

Early 2000s: INL begins work on liquid electrolyte components including phosphazenes.

Early-mid 2000s: INL advances knowledge of electrolyte transport.

2008: Diagnostic testing activities begin at INL.

2010

2011: R&D 100 Award: Impedance Measurement Box technology for measuring the state of battery health.

2012: Battery testing expands into Energy Systems Laboratory, increasing its footprint to over 15,000 sf.

2013: INL begins transition to understanding electrode and electrolyte degradation pathways.

2014: Battery material characterization and electrode characterization efforts move to Energy Innovation Laboratory, expanding the battery research footprint to approximately 17,500 sf.

2014: R&D 100 Award: Advanced Electrolyte Model for optimizing electrolyte selection and material combinations.

2015: R&D 100 Award finalist: Cellsage computational tool for predicting performance and aging aspects of battery cells.

2016: Completion of Nondestructive Battery Evaluation Laboratory (NOBEL) expands battery testing space at INL to approximately 20,000 sf. in four facilities (IF-603, IF-605, ESL and EIL).

2020

● Battery Test Manuals INL has produced for the U.S. Advanced Battery Consortium