Oak Ridge National Laboratory – OE Energy Storage Program

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Supported by the DOE Office of Electricity:

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Energy Storage Program Manager
Objective
Support cost reduction of energy storage

• R&D focus for energy storage program is to support cost reduction, increased reliability and industry acceptance through:
  – New materials and components
    • Alkali alloy anode and redox flow battery technology
    • Zinc-Air battery
    • Non-aqueous redox flow batteries and membrane development
  – Early stage prototyping and design
    • Secondary use research and prototyping

• ORNL is also supporting deployments and evaluation case studies in partnership with PNNL and Sandia.
Research to application

LOW TRL

HIGH TRL
New materials and components

• Low TRL focus on materials and chemistries:
  – Improving electrode architecture to increase power density for advanced V Redox Flow Batteries.
  – Zinc Air Battery – improving transport optimizing the electrode porosity.

See Tom Zawodzinski presentation
High energy density organic radical mediated flow batteries

• Low TRL focus on materials and chemistries:
  – Demonstrated a mediated high capacity anode using organic radical anions.
  – Developed low cost membranes for nonaqueous flow batteries.

See Jagjit Nanda presentation
Secondary use Identification

• Higher TRL focus on identification:
  – Constructed test-setup for vehicle battery data capture.
  – Data collected on Chrysler Fiat, BMW, Nissan, modules, etc.
  – Identification algorithms for chemistry and health.

See Michael Starke
GMLC
Secondary use prototype

- Higher TRL - Development of controls and power conditioning system:
  - Working with secondary-use energy storage providers.
  - Developed power conditioning system for on and off-grid secondary use system.

See Michael Starke presentation
GMLC
Supporting deployment and analysis

• Working with Sandia and PNNL and Electric Power Board for energy storage deployment and evaluation:
  – System integration support
  – Economic use cases
  – Testing procedures

• Use cases include: Energy Arbitrage, Peak Management, Reliability, and Solar Integration.

See Michael Starke Poster
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