

Overview of the Office of Electricity's Energy Storage Science & Technology Activities

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Advanced Power Sources R&D
Sandia National Laboratories
Albuquerque, New Mexico, USA

OE Peer Review
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Sandia National Laboratories is a multiprogram laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.



Overview of OE ESS Program Management Structure

- **Dr. Imre Gyuk**
Program Manager, Department of Energy
Office of Electricity Delivery and Reliability (OE)
- **Sandia National Laboratories**
Ross Guttromson, Program Manager
- **Pacific Northwest National Laboratory**
Dr. Landis Kannberg, Program Manager
Dr. Z. Gary Yang, Laboratory Fellow
- **Oak Ridge National Laboratory**

OE Energy Storage Program Focus Areas

Applied R&D

- Electrochemical Batteries
- Mechanical (CAES, Flywheels)
- Power Electronics

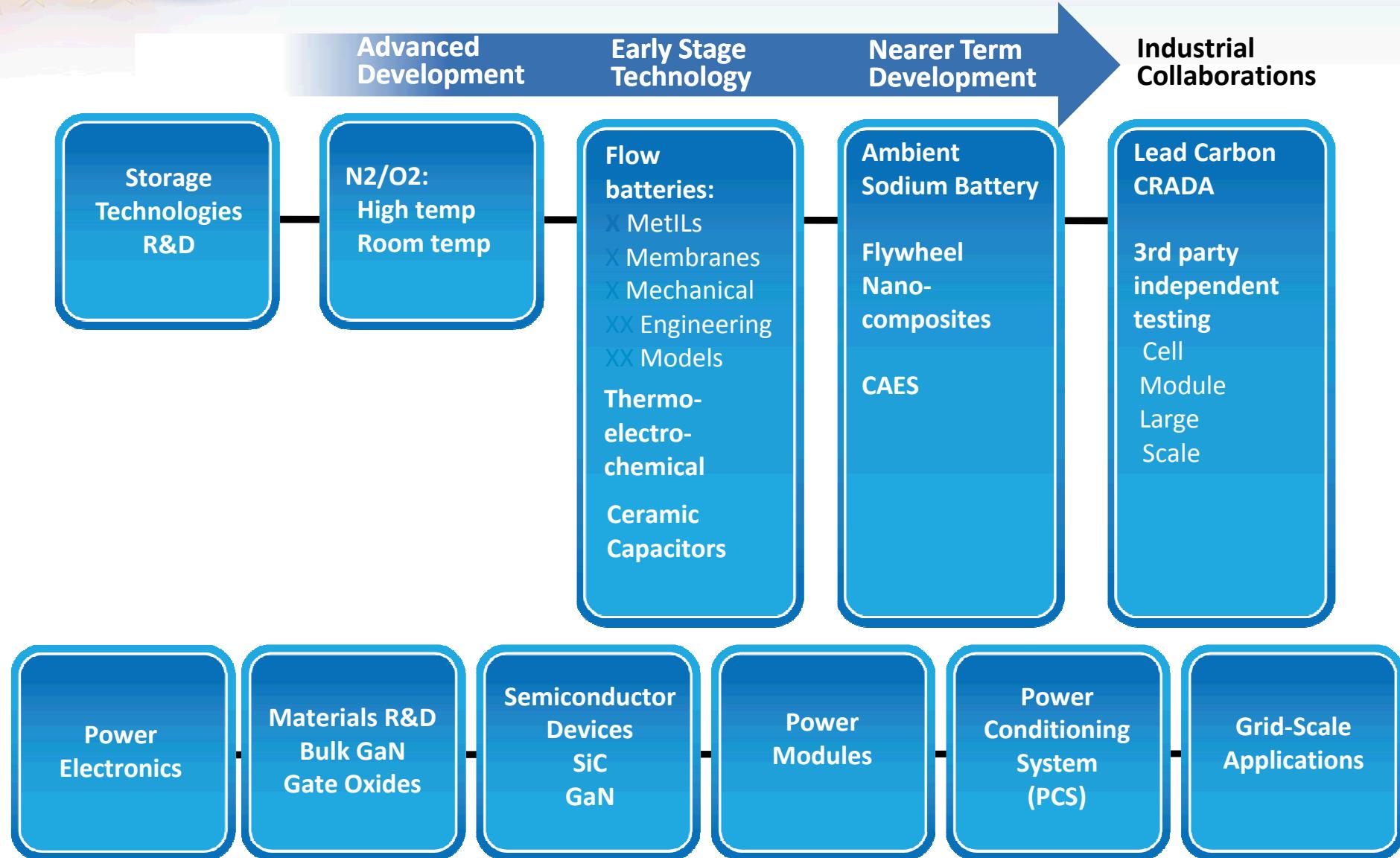
Energy
Storage
Program

Policy, Education,
and Outreach

Analysis
& Demos



Overview of Development Activities at Sandia



Highlights of ESS Program

Coordinated Sub-Programs on Flow and Sodium Batteries

**Flow
Batteries**

**Sodium
Battery**

Early Stage

Electroactive
Electrolytes “MetILs”

Membrane Development

Mechanical Modeling

Room Temperature

NaSICON based efforts

Family of cathodes



Nearer Term

Improving VRB Electrolytes

Component Modification

Testing Facility—Standards
Development

High Temperature

β ”-Al₂O₃ based efforts

Reduced temperature



OE University Solicitation for ESS Technologies

\$2.4M awarded in 2-stage national proposal selection process

Peer Review panel consisted of industry, academic, and government energy storage experts

Requirement to demonstrate a bench-scale prototype of technology

PI	University	Co-PI	Technology Area
Esther S. Takeuchi	University at Buffalo NY	Ken Takeuchi	Multivalent ion cathodes
Austen Angell	Arizona State University	S. W. Martin, Iowa State University	Ambient Temperature Sodium Batteries
Jesse S. Wainright	Case Western Reserve University	U. Landau, CWRU R. Savinell, CWRU	All-Iron Flow Battery
Bruce Dunn	UCLA	Y. Gogotsi, Drexel University	Electrochemical Capacitors