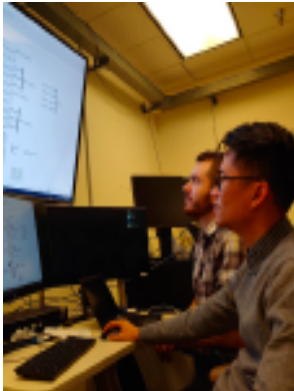


Sandia National Laboratories



Energy Storage R&D Program Update



PRESENTED BY

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Energy Storage R&D at Sandia



BATTERY MATERIALS

Large portfolio of R&D projects related to advanced materials, new battery chemistries, electrolyte materials, and membranes.



CELL & MODULE LEVEL SAFETY

Evaluate safety and performance of electrical energy storage systems down to the module and cell level.



POWER CONVERSION SYSTEMS

Research and development regarding reliability and performance of power electronics and power conversion systems.



DEMONSTRATION PROJECTS

Work with industry to develop, install, commission, and operate electrical energy storage systems.



SYSTEMS ANALYSIS

Test laboratories evaluate and optimize performance of megawatt-hour class energy storage systems in grid-tied applications.



STRATEGIC OUTREACH

Maintain the ESS website and DOE Global Energy Storage Database, organize the annual Peer Review meeting, and host webinars and conferences.



GRID ANALYTICS

Analytical tools model electric grids and microgrids, perform system optimization, plan efficient utilization and optimization of DER on the grid, and understand ROI of energy storage.

For more information, visit www.sandia.gov/ess-ssl

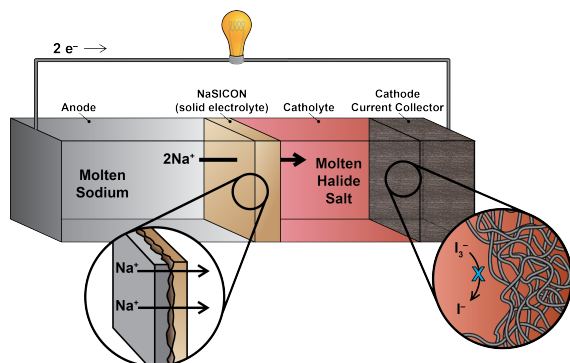
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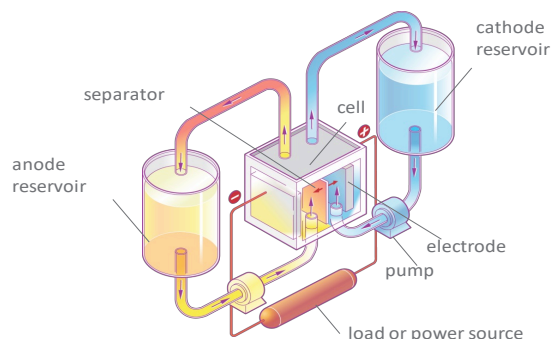
Researching Materials Innovations to Enable Safe, Low-Cost, Long Cycle Life Grid-Scale Batteries

Low Temperature Molten Sodium Batteries



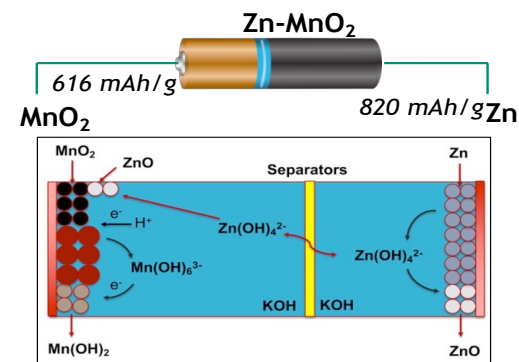
- Exploring safe new cathode chemistries to reduce temperature. from $\sim 300^\circ\text{C}$ to $\sim 100^\circ\text{C}$
- Developing robust, selective, zero-crossover solid state separators.
- Optimize cell design for low temperature operation.

Aqueous and Non-aqueous Redox Flow Batteries



- Innovating separators for reduced crossover and high conductivity.
- Investigating low cost, high energy density, stable active materials.
- Uncovering integrated material interactions governing battery performance.

Rechargeable Alkaline Zn-MnO₂ Batteries

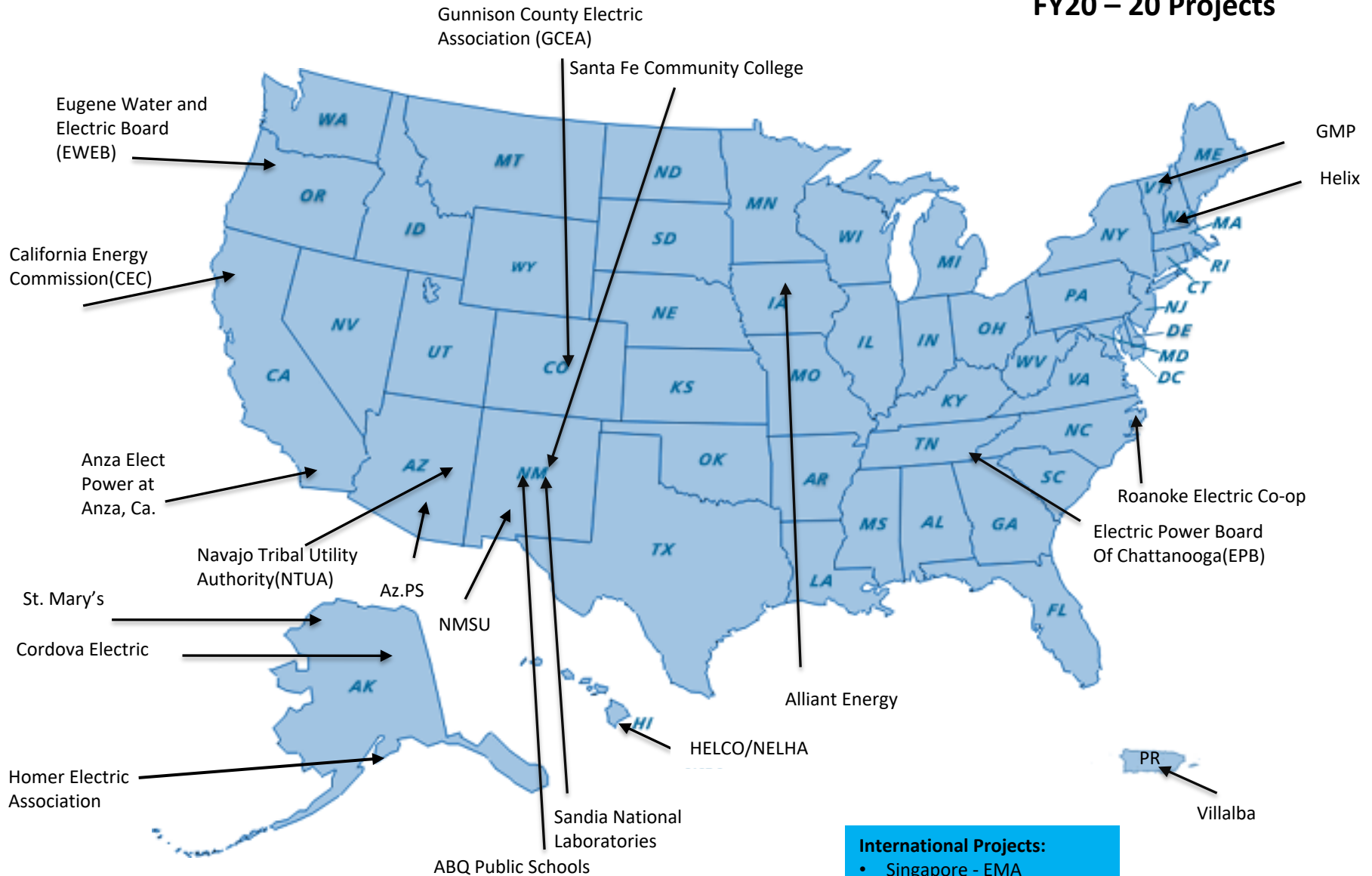


- Improving stable utilization of MnO₂ cathodes and Zn anodes for high capacity, long-lifetime.
- Extending battery life with reduced crossover separators.
- Advancing manufacturing science for large-scale production.



Demonstration Projects

FY20 – 20 Projects



International Projects:

- Singapore - EMA

Contact Information

- **See us at our Booth for more information**

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This work is supported by Dr. Imre Gyuk through the Department of Energy - Office of Electricity.