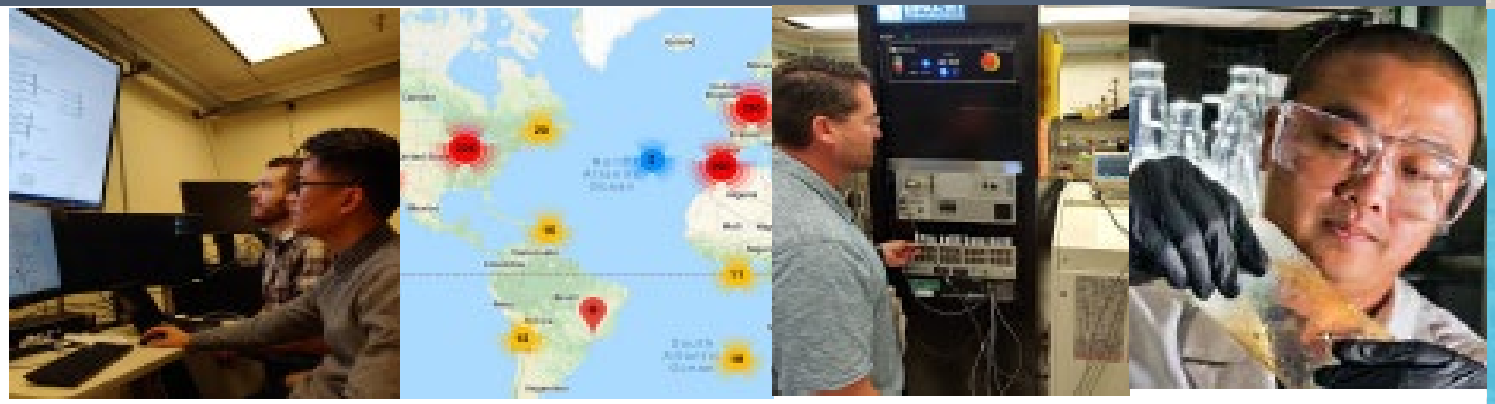
Energy Storage Demonstration Projects

DOE Energy Storage Program Peer Review
October 10, 2022
Albuquerque, NM



PRESENTED BY

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Peer Review

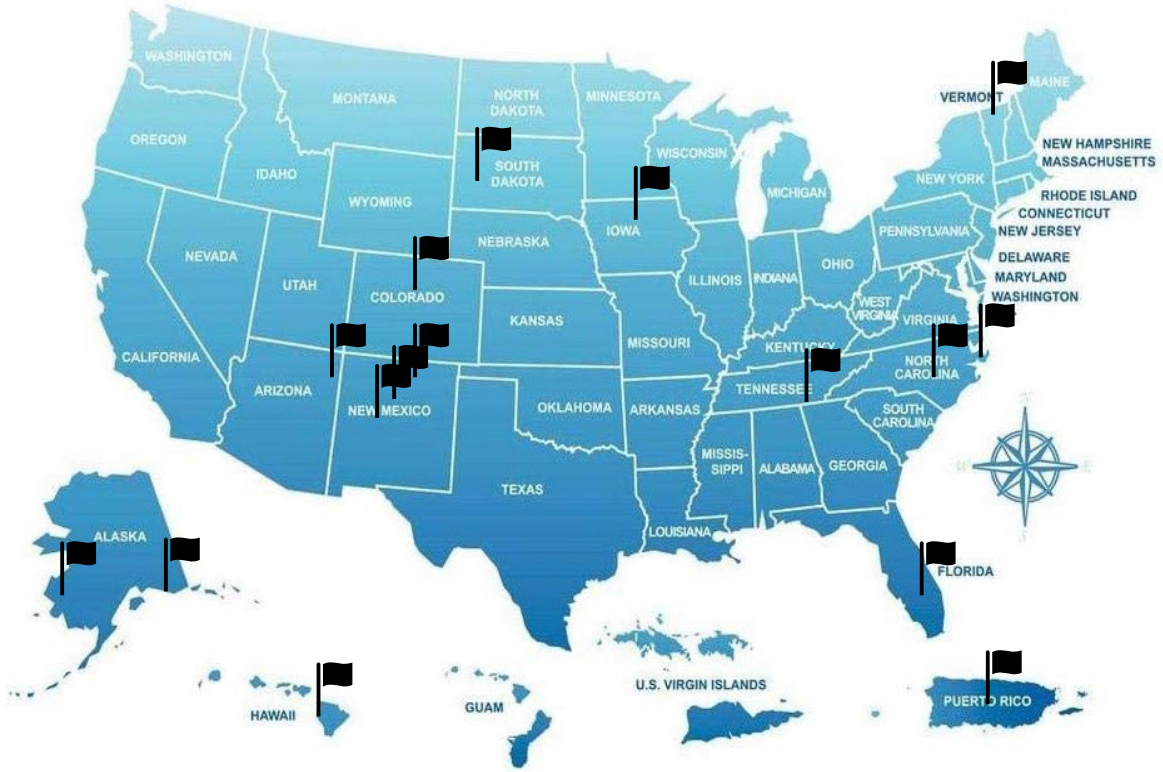
Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

Overview

- Projects – old (utilities) and new (communities)
- Innovation
  - Past and present
  - Where were we? where are we going?
- A view from the bottom rung
- Acknowledging the team

Sandia team and 2021-22 DOE-OE Sponsored Projects (Currently Predominately Utilities)

State or Territory	Partner
Alaska	Cordova Electrical Cooperative (CEC)
Alaska	Alaska Village Electrical Cooperative (AVEC)
Arizona (x3)	Navajo Tribal Utility Authority (NTUA)
Colorado	Poudre Valley Rural Electrical Association (PVREA)
Florida	Seminole Tribe
Hawaii	Natural Energy Laboratory of HI Authority (NELHA)
Iowa	Alliant Energy
New Mexico	Santa Fe Community College
New Mexico	Albuquerque Public Schools



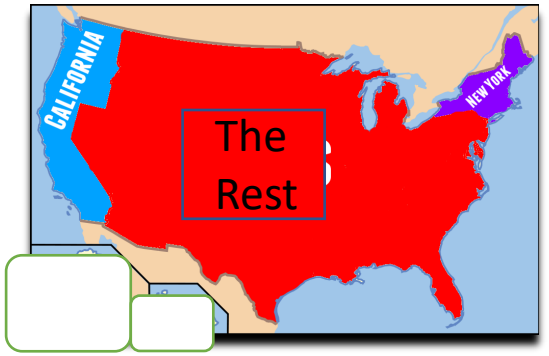
State or Territory	Partner
New Mexico	Picuris Tribe
North Carolina	NC Electric Membership Corporation (NCEMC)
North Carolina	Ft. Bragg Sandhills Utility Services (SUS)
Puerto Rico	Villalba Municipality
South Dakota	Ellsworth AFB West River Electric Association (WREA)
Tennessee	Electric Power Board of Chattanooga (EPB)
Vermont	Green Mountain Power (GMP)

New Direction:

Projects with Communities and Innovative Technologies

- Social Equity
  - Between 5-14 project will be built as part of Energy Storage for Social Equity (ES4SE) program
- Rural
  - Picuris Pueblo
  - Vermont
  - Villalba, Puerto Rico

- Innovative Technologies, Applications, & LDES
  - Re-energized Collaborations (Back to the good old days)
    - CEC
    - NYSERDA



Innovation through the years

One of the first gasoline powered cars ~1891 by Henry Nadig of Allentown, Pa.

Courtesy of American Automobile Museum, Allentown, Pa.

1930's car

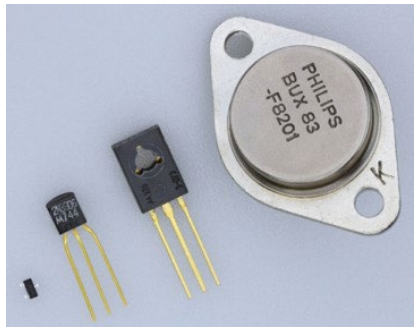
Power point photo

2022 BMW

Christian Wardlaw | Dec 21, 2021

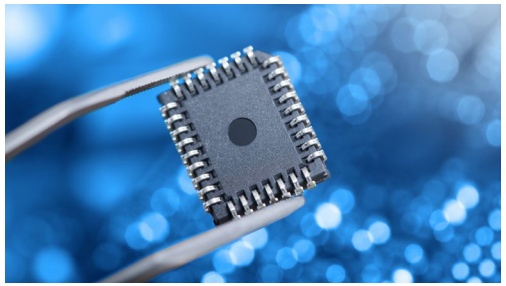
Vacuum tube transistors

Wikipedia



Semiconductor Transistor

Wikipedia



Semi-conductor chip

Power point photo

What's next for Energy Storage

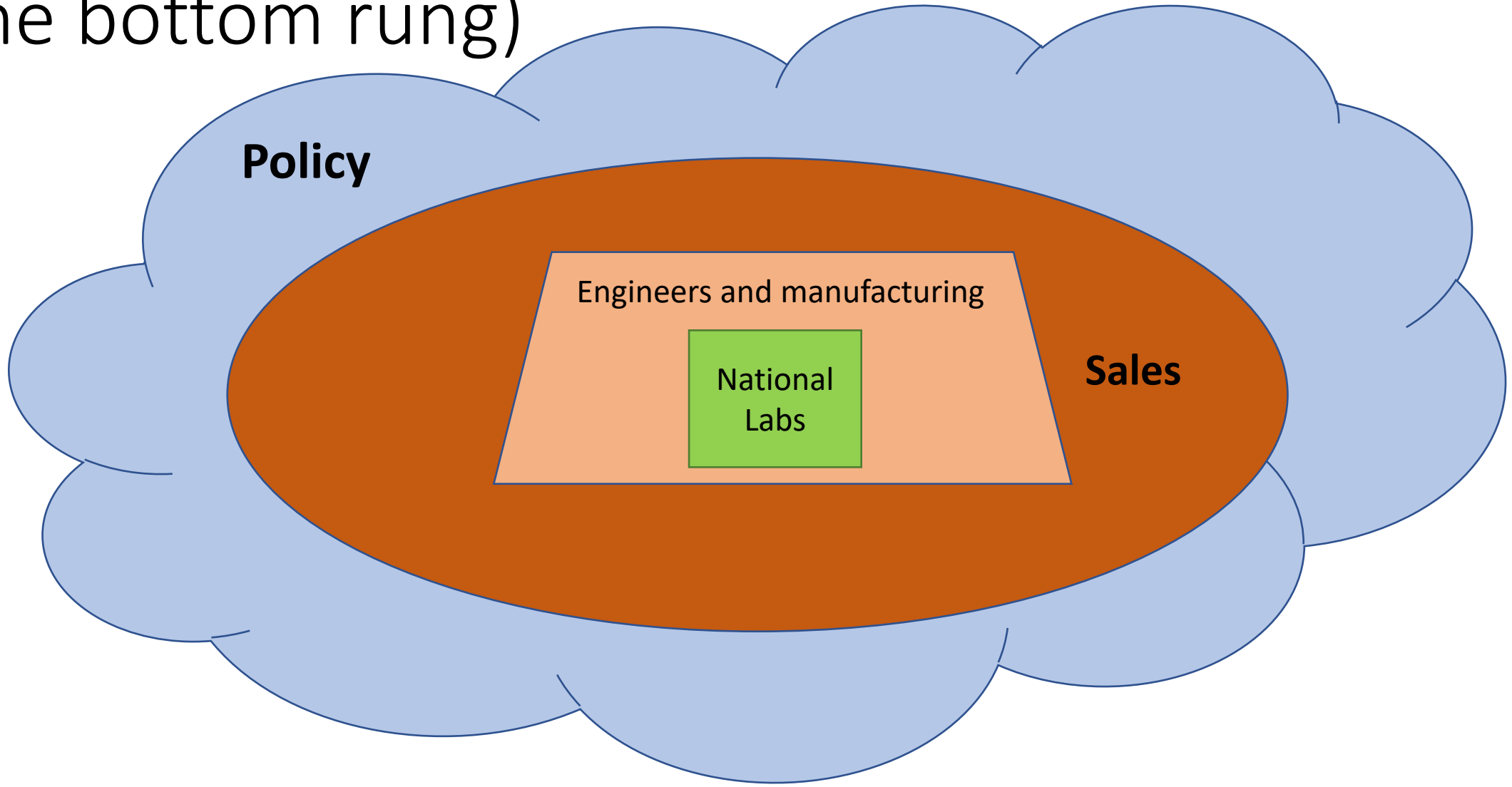
Lead Acid Battery
Power point photo

Li-Ion Battery Energy Storage System
Rj-lithium.com

New & Long Duration Technologies
?????

- Iron
- Flow
- Zinc
- Sodium
- Molten Salt
- Kinetic (Mechanical)
- CAES
- Hydrogen
- Pumped Hydro

Who is running the show? (observations from the bottom rung)



Questions that Bother Me So

- How does the National Lab complex better align with Industry?
  - Maybe a effort for Labs to work with battery vendors? i.e., “SEMITECH” of non li-ion batteries
- Can the Government buy systems to foster and protect manufacturing?
- Given existing installed systems
  - how long will they last ?
  - How do we get more reliable, longer duration and life?
- Until something better comes do we have enough raw materials and secure sources to continue on current trajectory?
- What is the National ES Roadmap?
- What will the ES of tomorrow be?
- How do we temper expectations without taking our foot off the gas?

Projects Team

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Thank you

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