DOE

Energy Storage Grand Challenge

Introduction and Overview

April 23, 2020

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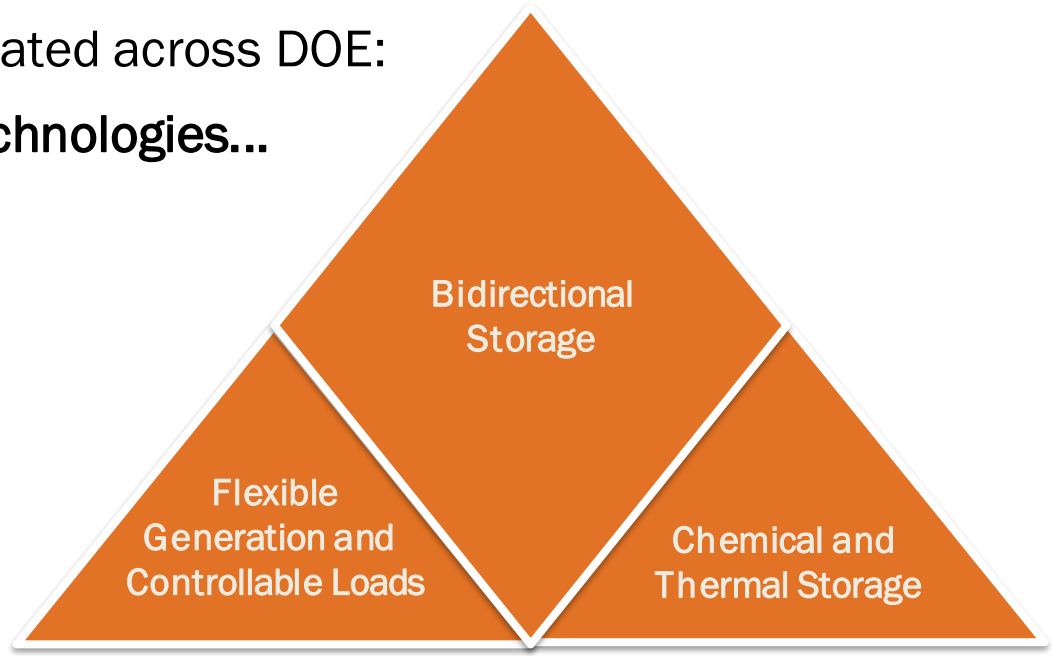
The Energy Storage Grand Challenge

DOE-wide strategy to accelerate US leadership in energy storage technologies

Coordinated across DOE:

technologies…



…offices…

- Office of Electricity
- Energy Efficiency and Renewable Energy
- Office of Science
- Office of Technology Transitions
- Nuclear Energy
- Fossil Energy
- ARPA-E
- Loan Programs Office

…and functions

Basic Science Research & Discovery → Application Driven Materials Development → Applied Device and System R&D → Cost & Performance Metrics, Targets → Demonstration and Performance Validation → Systems Analysis and Valuation → Commercialization Strategy

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Energy Storage Grand Challenge Focus Areas

Vision: By 2030, the U.S. will be the world leader in energy storage utilization and exports, with a secure domestic manufacturing supply chain independent of foreign sources of critical materials

The Storage Grand Challenge focuses on five complimentary pillars:

Technology Development

- Establish ambitious, achievable performance goals, and a comprehensive R&D portfolio to achieve them.

Technology Transition

- Accelerate the technology pipeline from research to system design to private sector adoption through rigorous system evaluation, performance validation, siting tools, and targeted collaborations

Policy and Valuation

- Develop best-in-class models, data, and analysis to inform the most effective value proposition and use cases for storage technologies.

Domestic Manufacturing and Supply Chain

- Design new technologies to strengthen U.S. manufacturing, recyclability, and reduce dependence on foreign sources of critical minerals

Workforce Development

- Train the next generation of American workers to meet the needs of the 21st century grid and energy storage value chain

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Technology Development: A Use Case-Informed R&D Strategy

Vision

- What are your energy or infrastructure goals?
  - Home, business, community, regional
  - Potentially accelerated with next-generation storage

Use Cases

- Who are the beneficiaries?
- What are the performance requirements?
- What are other technical or deployment constraints?

Technologies

- What technologies could meet the use case need?
- Can substantial progress (cost, performance) be made by 2030?

Pathways

- What is the R&D pathway to achieving commercial viability?
- What DOE resources (consortia, partnerships, test facilities, programs) would be utilized to accelerate each technology?

Policy and Valuation: Purpose and Rationale

Proposed revised mission statement:

Provide data, tools and analysis that maximize the value of energy storage to the electric and transportation systems and drive U.S. leadership

Data | Tools/Models | Analysis

- What can different kinds of storage do?
- What is the most effective way to plan for and operate storage?
- How can storage be fairly valued and compensated?

PUCs | ISO/RTOs | States | Utilities

Developers | Consumers | Manufacturers | DOE

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Energy Storage Grand Challenge: Technology Transition Track

Develop Collaborative Relationships and Knowledge-sharing Tools

- Market Analysis

Pursue Demonstration Projects

- Interagency/External Engagement

Ensure Bankable Projects via Predictable Revenue Streams

- Request for Information (RFI)

Manufacturing's Role in the ESGC

U.S. global leadership in energy storage utilization and exports with a **secure domestic manufacturing supply chain independent of foreign sources of critical materials**

Accelerate scale-up of **emerging manufacturing processes**

Improve **critical materials supply chain** resilience

Address **technical barriers** in production and manufacturing

DOE Education & Workforce Development Efforts

GOAL

Develop training and education programs to ensure a sufficient pipeline of workers who can **research, design, develop, manufacture, and operate energy storage systems**

FOCUS

- Broaden awareness of existing programs
- Perform a needs assessment to determine gaps
- Develop new programs modeled on existing, successful DOE activities

How Can You Engage?

Upcoming events:

- ESGC Overview: May 1
- ESCG Use Case Deep Dive + 3 Regional Webinars: May TBD
- ESGC Live workshop (conditions permitting): June 26, Arlington, VA
- Request for Information: planned May - June

Please send questions, comments, or suggestions to RTICstorage@hq.doe.gov