



The Equitable Regulatory Environment Thrust Area

Overview and PNNL's Contributions

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Agenda

- ▶ **Equitable Regulatory Environment: Thrust Area Overview**
- ▶ **2020 Program Efforts**
 - ▶ Southeastern Energy Storage Symposium and Workshop
 - ▶ Overview of State Engagements
 - ▶ Report: Planning Considerations for Energy Storage in Resilience Applications
 - ▶ Report: The Nexus Between Energy Storage Ownership Models and Policy Goals
 - ▶ Energy Storage Grand Challenge
 - ▶ Engagements With Other Groups
- ▶ **Looking Ahead**

Equitable Regulatory Environment Mission

Mission Statement

“Value propositions for grid storage depend on reducing institutional and regulatory hurdles to levels comparable with those of other grid resources.”

Program Tasks:

- ▶ **Document** federal, state and local policies affecting storage deployment
- ▶ **Review** integrated resource plans (IRPs) and similar analytic processes affecting storage development and deployment
- ▶ **Explore** alternative policies that may affect technology attributes and deployment
- ▶ **Maintain** publicly available information on storage technology and attributes affecting its deployment
- ▶ **Disseminate** comprehensive information on storage technology status, experience, and realizable contributions to grid resilience, emergency response, renewable deployment, and asset utilization
- ▶ **Provide** best practices for installation and use of energy storage to regulators, policy makers and industry

Program Model

- ▶ Policy options and impacts
- ▶ Planning obstacles and best practices
- ▶ Emerging use cases (i.e. resilience, transmission)
- ▶ Discrete issues (ownership models, PURPA, hybrid resources, etc.)

**Basic
Research**

Provides a foundation for

**Direct
Engagement**

Informs

- ▶ Technical Workshops
- ▶ Conference Presentations
- ▶ Regulatory filing review
- ▶ Valuation
- ▶ Interconnection standards
- ▶ Codes and safety tutorials

Strategic Objectives

- ▶ **Strategic Objective:** Support regulatory and policymaking processes as an independent, credible, and objective entity
 - ▶ **Actions:** convene workshops, provide technical assistance
 - ▶ **Task Link:** disseminate comprehensive information, provide best practices
- ▶ **Strategic Objective:** Produce responsive and useful research and reference materials
 - ▶ **Actions:** produce reports on discrete regulatory topics, maintain policy databases
 - ▶ **Task Link:** document policies, explore alternative policies, review IRPs, maintain publicly available information
- ▶ **Strategic Objective:** Increase the visibility of program efforts with new audiences
 - ▶ **Actions:** participate in Energy Storage Grand Challenge, reach out to new stakeholder groups
 - ▶ **Task Link:** disseminate comprehensive information, provide best practices



Support Regulatory and Policymaking Processes: Southeastern Energy Storage Symposium and Workshop

In July 2019, DOE and the labs convened a seminar for staff from nine state regulatory commissions in the Southeastern and Mid-Atlantic states, held in Birmingham, AL.

Our objectives:

- ▶ Discuss challenges that staff face in current storage proceedings
- ▶ Increase understanding of storage technologies and economics
- ▶ Identify research and training needs

Lessons learned:

- ▶ Regulatory needs are becoming more detailed and challenging
- ▶ Strong support for format (in-person, regional event)
- ▶ Significant interest for research and technical assistance on hybrids

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Southeastern Energy Storage Symposium and Workshop

Report on Proceedings and Lessons Learned

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<http://energystorage.pnnl.gov/pdf/PNNL-29591.pdf>

Support Regulatory and Policymaking Processes: Overview of State Engagements

North Carolina

- ▶ Presented at a series of workshops for the North Carolina Utilities Commission (NCUC); covered technologies, policy options, interconnection, codes & safety, transmission and distribution impacts
- ▶ Collaborating with Public Staff of the NCUC on a paper exploring the technical, economic, and regulatory implications of retrofitting existing solar projects with energy storage

Maine

- ▶ Presented on energy storage technologies and policy options to the Maine Energy Storage Commission, a study group formed by the Maine Legislature to make policy recommendations on energy storage

Rhode Island

- ▶ Presented to the RI League of Cities and Towns on energy storage fundamentals
- ▶ Presented to the RI Office of Energy Resources and Rhode Island PUC on energy storage technologies, economics, policy options, storage as transmission, and resilience
- ▶ Assisting state in developing a storage demonstration project at a state facility (Sandia led)

Support Regulatory and Policymaking Processes: Overview of State Engagements

Maryland (in collaboration with Sandia)

- ▶ Participated in a series of workshops for the Maryland PSC in March-April on various storage topics

Oregon

- ▶ Provided a workshop Oregon PUC Staff covering energy storage economics, interconnection, safety codes, and emerging regulatory topics
- ▶ Assisted staff in reviewing utility filings regarding state's storage procurement requirement

Idaho

- ▶ Presented a workshop for Idaho PUC staff on energy storage economics and the potential role for energy storage in the Public Utilities Regulatory Policy Act (PURPA) framework
- ▶ Conducted an analysis for Idaho PUC staff identifying the barriers to storage within current PURPA rates

Washington

- ▶ Participated in a stakeholder group for the Washington Department of Commerce to identify electric infrastructure investment needs to enable the state's clean energy target

Support Regulatory and Policymaking Processes: Overview of State Engagements

Utah (in collaboration with Sandia)

- ▶ Participated in a series of workshops for Utah stakeholders on various energy storage topics

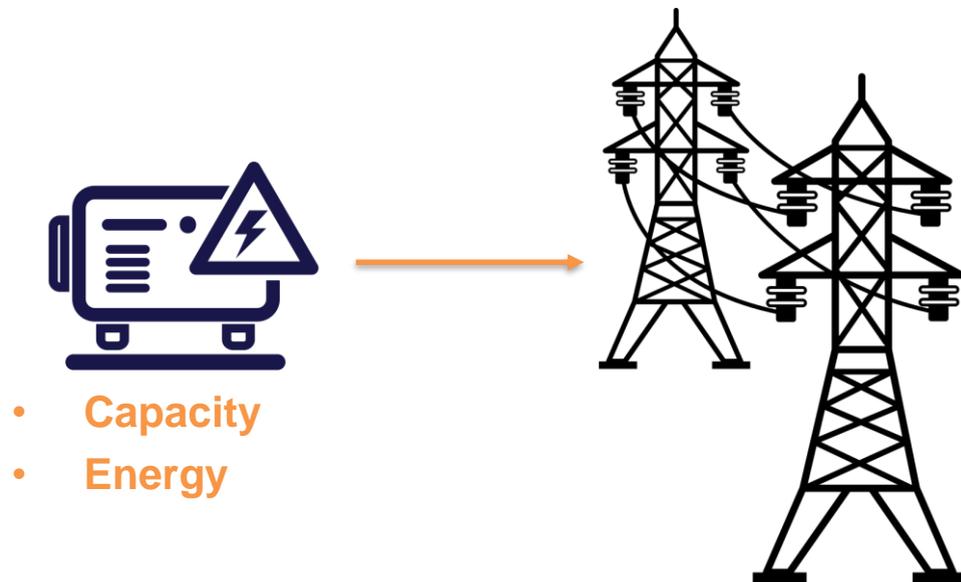
Organization of MISO States (in collaboration with Sandia and Iowa State University)

- ▶ Participated in a series of workshops for state regulators, project developers, and utilities within the footprint of the Midcontinent Independent System Operator (MISO)

Produce responsive and useful research: Energy storage and resilience

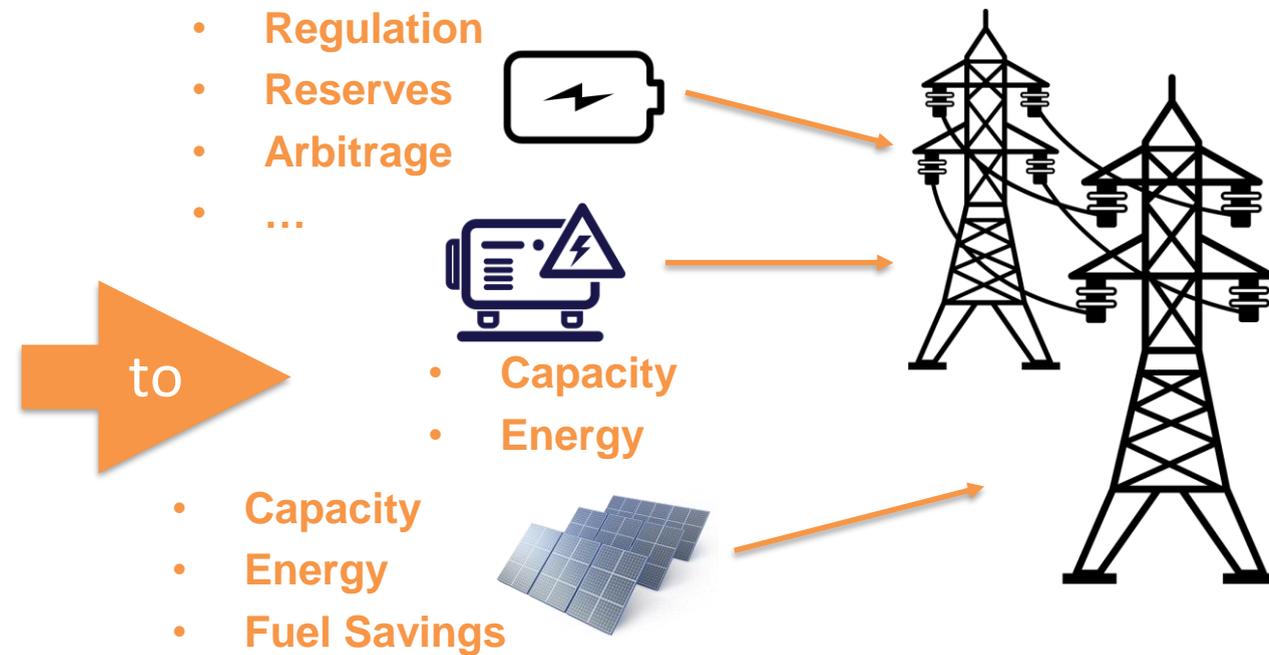
The advent of cost-competitive energy storage options has enabled us to go from:

Mission-critical resilience



- Limited opportunities for grid participation
- High cost
- Limited to facilities in which resilience is mission critical

Economic Resilience



- Increased opportunities for grid participation
- Offsetting revenues reduce system costs
- Viable resilience for broader range of facilities

[Report: Planning Considerations for Energy Storage in Resilience Applications](#)

Produce responsive and useful research: Energy storage and resilience

By approaching resilience from a local level, resilience goals can be broken down into more manageable subtasks, and needs can be more specifically defined:

1. Define critical loads.

- Identifying specific loads that must be maintained in a grid outage breaks resilience into achievable objectives.

2. Identify major events of concern.

- Understanding the shape of the resilience need is necessary to establish tangible planning objectives.

3. Establish planning objectives.

- Defining success first – what the resilience assets will be expected to do – will translate into clear objectives.

4. Engage in iterative site and local grid planning.

- Local grid needs will define values for the project to pursue, and projects may drive needs for communication and control upgrades on the local grid to enable their value.

5. Throughout the process, consider questions of ownership, cost allocation, and rate design.

- These policy decisions have significant ramifications on the value of resilience assets and how they will be used.

Produce responsive and useful research: Ownership Models

Energy storage technologies offer an unprecedented degree of flexibility to the electric grid in both operational and locational terms.

- ▶ Operationally, energy storage's ability to act as either a generator or a load and its ability to rapidly respond to changing grid needs enable it to provide a wide range of services
- ▶ In locational terms, the scalability of energy storage enables it to be deployed at multiple points on the electric grid by different owners for different purposes

In collaboration with Sandia, we are developing a paper that studies the relationships between various energy storage ownership models and energy policy goals. The paper explores:

- ▶ Policy considerations underlying ownership decisions
- ▶ Different ownership models associated with energy storage and how storage is generally used under each of them
- ▶ The use cases for energy storage identified by state policies
- ▶ How ownership models align with those policies, including any additional infrastructure or regulations necessary to enable a particular use under a given model

Produce responsive and useful research: Ownership Models

Front of Meter

Behind the Meter



Readily provided



Conditionally provided



Cannot be provided

Owner	Resource Adequacy	Peak Reduction	Ancillary services	Renewables Integration	Customer Rate Management	T&D Services	T&D Deferral	Resilience	Decarbon-ization
Utility	●	●	●	●	○	●	●	●	●
Third Party	●	●	◐	●	○	○	●	●	◐
Utility/Third Party Hybrid	●	●	●	●	○	●	●	●	●
Utility	●	●	○	●	●	●	●	●	●
Customer	◐	◐	○	●	●	◐	◐	●	◐
Utility/ Customer Hybrid	●	●	○	●	●	●	●	●	●
Third Party/ Customer Hybrid	●	●	○	●	●	◐	◐	●	◐

Increasing Program Visibility: Energy Storage Grand Challenge

In January, the U.S. Department of Energy launched the [Energy Storage Grand Challenge](#)

- ▶ DOE-wide effort to coordinate R&D efforts on energy storage through 2030
- ▶ Vision: “To create and sustain global leadership on energy storage utilization and exports, with a secure domestic manufacturing supply chain that does not depend on foreign sources of critical materials.”

Organized into five tracks:

- ▶ Technology Development
- ▶ Technology Transfer
- ▶ Policy and Valuation
- ▶ Manufacturing and Supply Chain
- ▶ Workforce Development

Increasing Program Visibility: Energy Storage Grand Challenge

Throughout FY2020, we provided support to DOE on the Policy & Valuation Track of the Energy Storage Grand Challenge by:

- ▶ Briefing track managers on the research and technical assistance work done within the Equitable Regulatory Environment thrust area
- ▶ Assisting DOE in preparing template for national labs to report their energy storage work and capabilities to the department
- ▶ Providing feedback and assistance to track managers in preparing the draft road map for the P&V track and the request for information that went out to the public
- ▶ Participating in two workshops for national lab staff to provide feedback to DOE on the Grand Challenge
- ▶ Assisted in gathering information about lab capabilities and research needs for the Hybrid Resources Initiative that grew out of the Grand Challenge

Increasing Program Visibility: Broader Knowledge Dissemination

Traditionally, work in the Equitable Regulatory Environment thrust area has focused on state regulators. In FY 2020, we worked to build relationships with other stakeholder groups to ensure that their perspectives and information needs are represented in our work:

▶ **State Legislatures**

- Presented to the National Conference of State Legislators (NCSL) Power Supply Task Force
- Working with NCSL on an energy storage primer for their membership

▶ **State Energy Offices**

- Established a dialogue with the National Association of State Energy Offices (NASEO)

▶ **Governors' Offices**

- Established a dialogue with the National Governors' Association (NGA)
- Assisting NGA in planning a clean energy conference (postponed by Covid)

Increasing Program Visibility: Broader Knowledge Dissemination

Industry Conferences

- ▶ Energy Storage Association/Electric Power Research Institute Storage Exchange
 - November 2019: Storage in IRPs; August 2020: Ownership Models
- ▶ IEEE Innovative Smart Grid Technologies (Storage in IRPs)
- ▶ Energy Information Administration – Energy Storage Workshop (Data and information needs)
- ▶ EUCI IRP Summit (Storage in IRPs)

International Engagement

- ▶ Costa Rica: Provided an overview of energy storage technologies and regulatory structures at a conference for Central American regulators and at a meeting with Costa Rica's quasi-state electric utility
- ▶ Colombia: Recorded a pair of training modules on the use of storage for renewables integration and for resilience for Colombian regulators
- ▶ Canada: Provided a workshop on the role of storage and other emerging technologies in IRPs for regulators from British Columbia
- ▶ World Bank: Briefed World Bank staff on the Equitable Regulatory Program's technical assistance efforts to help them design an international technical assistance program

Looking Ahead: Planned FY21 Activities

Reports

- ▶ Retrofitting PV with Energy Storage
- ▶ Energy Storage and PURPA
- ▶ Quantitative Analysis of Energy Storage Policy Impacts
- ▶ Basic Primers for Regulators and Policymakers
 - Storage Overview
 - Interconnection
 - Codes and Standards
- ▶ Vehicle to Grid Applications

Stakeholder Engagement

- ▶ Resume development of the Regulatory Roadmap to guide thrust area efforts and engagement strategy
- ▶ Continue engaging with stakeholders to understand needs



Thank you

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