



Task Force on Data Analytics for Energy Storage

Progress and Accomplishment

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Mission and Scope

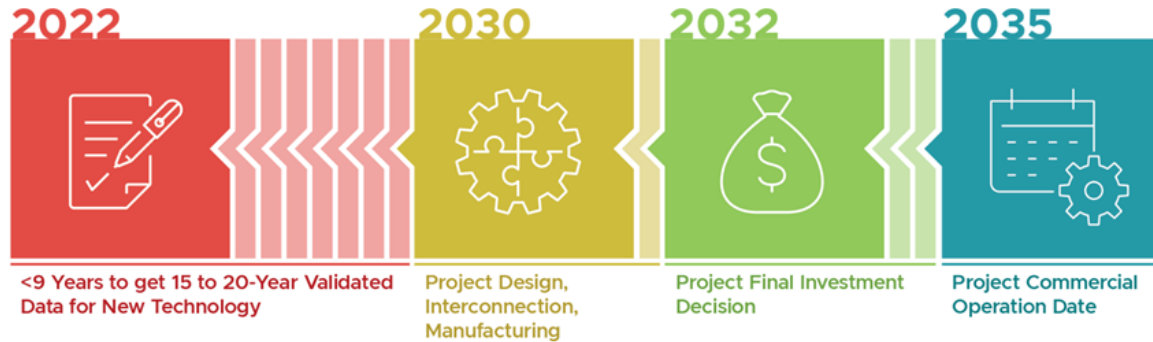
- **Mission:** use advanced data analytics to assist energy storage planning and operation, and thereby advance the development and deployment of energy storage to improve the resiliency, reliability, and efficiency of the electric grid.
- **Duration:** 24 months (2023 and 2024)
- **Proposed tasks**
 - Identify data needs and availability for energy storage modeling and analytics, considering different energy storage technologies, deployment options, use cases, and applications
 - Explore and compare existing data analytics methods and tools for energy storage planning and operation
 - Identify practical challenges and opportunities in advanced data analytics for energy storage.

Planned Activities and Outcomes

- [A1] Regular TF online meetings to facilitate coordination and report progress
 - [A2] TF in-person meetings at IEEE PES GM
 - [A3] A survey regarding the need for data and analytics for energy storage**
 - [A4] Panel sessions on energy storage analytics at major IEEE PES conferences
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- [O1] Energy storage dataset that contributes to the Data Access service**
 - [O2] A report that summarizes findings from the survey and highlights gaps and opportunities**
 - [O3] A library of tools for energy storage analytics leveraging the Model Selection Platform developed at PNNL

ROVI

To impact 2035 Clean Energy Goals, newly developed storage technologies will need to be validated at accelerated pace



Congressional Requirements:

BIL Validation and Piloting projects require “a report describing the performance of those programs”

BIL Joint Program must “help new, innovative long-duration energy storage technologies become commercially viable”

Energy Act of 2020 Sec. 3201: “In coordination with 1 or more National Laboratories, the Secretary shall support the development, standardized testing, and validation of energy storage systems”

Rapid Operational Validation Initiative (ROVI) Concept

- Driven by DOE National Labs
- Establish data collection framework and protocols for field deployments
- Performance prediction tools; engagement with larger storage community



End Goal:

Bankable storage technologies
15- to 20-year financial grade performance projections with 1 year of combined testing and validation

Energy Storage Data Analytics

ESS design and characteristics

- Energy storage technology, physical capability, and characteristics

Deployment scenarios

- Vertically integrated utilities, electricity markets, distribution utilities, and large C&I customers

Applications and use cases

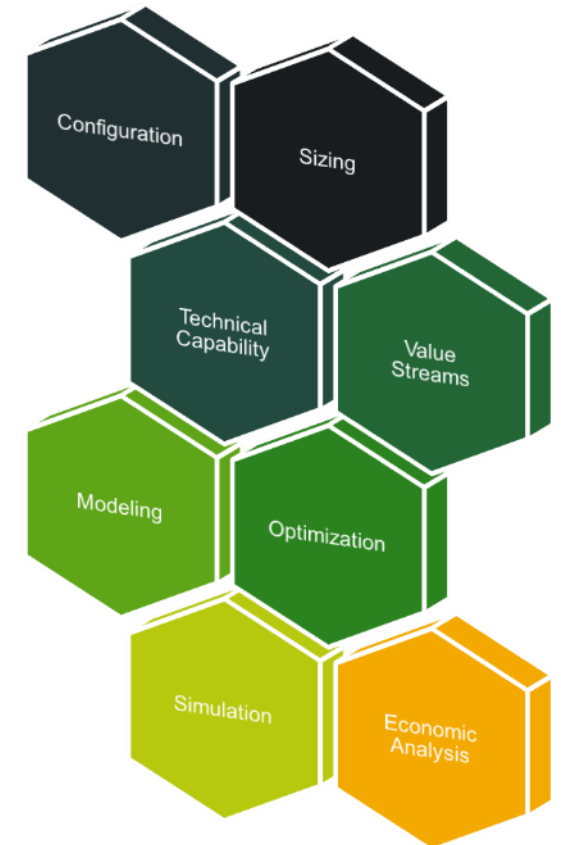
- Bulk energy, ancillary service, transmission-level, distribution-level, and end-user services

Dispatch and control strategies

- Co-optimization, rule-based control, mathematical programming, stochastic/risk-aware control, learning-based method, hybrid-control

Regions and systems

- Different generation mix, grid infrastructure, market structures/rules, distribution system capacity, and load growth rate



Energy Storage Data Analytics

Data Needs

- **Performance and Degradation** – Data on efficiency, capacity, response time, and degradation rates over time, as well as factors influencing these aspects.
- **Cost** – Information on capital expenditures, operational and maintenance costs, financing options, and projected cost reductions.
- **Regional characteristics** – Grid infrastructure, load profiles, and market prices that influence energy storage deployment and operation.
- **Grid Integration** – Information on interconnection requirements, grid support services, and system reliability and stability.
- **Policy** – Insights into regulatory frameworks, incentives, and market mechanisms that influence energy storage development, deployment, and integration.

Examples of Existing Datasets

- [DOE Global Energy Storage Database](#)
 - Projects and policies
- [Energy Storage Cost and Performance Database at PNNL](#)
 - Component-level cost and system-level performance
- [BatteryArchive.org](#)
 - Cycling and disruptive tests
- [Energy Storage Policy Database](#)
 - Demonstration programs, regulatory requirements, financial incentives, interconnect policies, etc.

Progress and Accomplishment

Past Events

- Kickoff Meeting of key TF members (March, 2023)
 - Mission and scope, activities and outcomes, roles and responsibilities
- Established IEEE Collabratec[®] Workspace (April, 2023)
 - Announcements, collaborative authoring, and resource sharing

Ongoing Tasks

- Initial draft of the survey questions

Upcoming Efforts

- Develop a spreadsheet outlining planned efforts and tasks, and invite team members to indicate the areas of interest for involvement and contribution
- Initiate a collaborative document for collecting inputs on the survey
- Compile a list of datasets to contribute to the Data Access service



Thank You

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