Task Force on Data Analytics for Energy Storage

IEEE PES BDA subcommittee

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Outline

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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.
- **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.

TF Core Members

Name	Organization	Name	Organization
Di Wu (Chair)	Pacific Northwest National Laboratory	Paul F. Mutolo	Standard Hydrogen Corporation
Vinod Siberry (Vice Chair)	U.S. Department of Energy	Yazhou Jiang	Clarkson University
Dexin Wang (Secretary)	Pacific Northwest National Laboratory	Robert Gaugl	Graz University of Technology
Ning Lu	North Carolina State University	Karlo Šepetanc	University of Zagreb
Jeremy Berke	WA Department of Commerce	Blake Scherer	Benton PUD
Bolun Xu	Columbia University	Nishad Mendis	Bureau Veritas Group
Huazhen Fang	University of Kansas	Fengyu Wang	New Mexico State University
Thomas Edward Wilson	Duke Energy	Brian Kan	Amazon Web Services
Nathan Kassees	Xcel Energy	Lei Fan	University of Houston
PJ Rehm	ElectriCities	Roshan Sharma	ComEd
Kaitlyn He	Pacific Northwest National Laboratory		

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

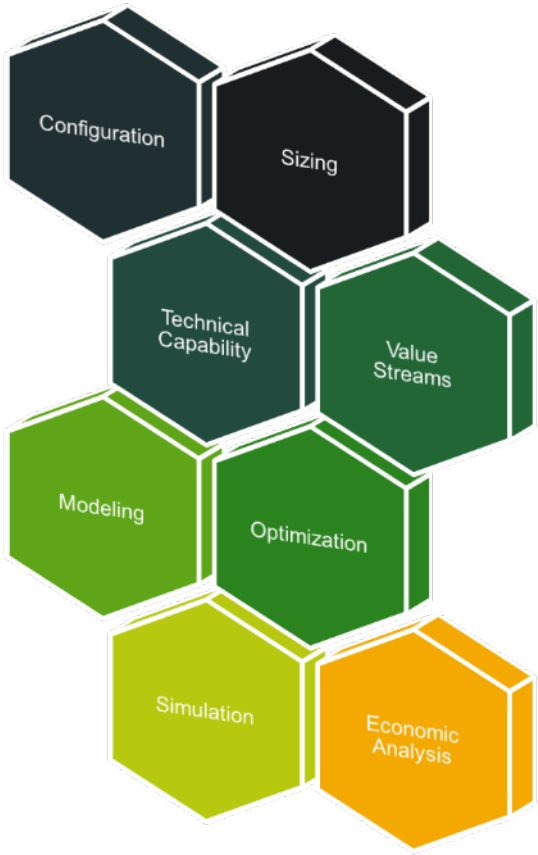
- Bulk energy, ancillary service, transmission-level, distribution-level, and end-user services

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



MSP

ESET ENERGY STORAGE EVALUATION TOOL

REopt

Quest

DER-VET

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.

Planned Activities

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

Q&A and Discussion

Thank You

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