Supplemental Project Notice

EMERGING ENERGY STORAGE TECHNOLOGIES de-RISKED

(Readiness Informed by Shared Knowhow, Evaluation, and Data)



PROJECT HIGHLIGHTS

- Access to independent evaluation of energy storage preformance, safety, functionality, and reliability for technologies that others are testing
- Collection and independent analysis of data from pre-commercial energy storage systems in both laboratory and field environments
- Collaborative sharing of demonstration experiences and testing insights
- Comprehensive documentation and categorization of technology data, deployment and integration experiences, and commercialization insights to enable consistent technology assessments and detailed comparisons

Background, Objectives, and New Learnings

Energy storage is integral for realizing a clean energy future in which a decarbonized electric system is both reliable and resilient. Lithium ion battery advancements have enabled the significant growth in installed energy storage capacity over the past decade. Lithium ion's demonstrated success in meeting grid operator and customer needs has paved the path for emerging energy storage technologies to enter the market. These pre-commercial technologies have the potential to fill various market needs not met by lithium ion batteries due to associated availability, cost, safety, or longevity concerns. Therefore, advancing the development and commercialization of these technologies is critical for accelerating safe, reliable, affordable, and clean energy storage deployments.

Successful technology commercialization requires balanced supply and demand. Reluctance to enter the market due to unknown risks associated with technology evaluation can delay product commercialization, affect procurement targets, and potentially lead to business failures. Evaluating emerging energy storage technologies is vital for product development, as is the case with Urban Electric Power which incorporated system controls into its product design following insights gained from testing with EPRI.

This project is a collaborative opportunity to de-risk pre-commercial energy storage technologies through detailed technical due diligence. Recognizing that testing and hardware demonstrations can be cost- and time-intensive, taking a shared cost approach improves participant accessibility to performance and safety testing and data analysis of multiple emerging energy storage technologies.

The project aims to understand how various emerging energy storage technologies work and provides EPRI's data-informed perspective on the advantages and challenges of the various technologies, which may include validation of claims, safety insights, discussion of system design and integration, sharing deployment and operation experiences, and overall readiness assessment. The project will apply and expand upon EPRI tools, as needed, to ensure independent and objective technology assessments and to enable detailed product and commercial comparisons that participants can use in planning models, demonstration and deployment decisions, and corporate strategy.

Benefits

Participants will gain a deeper understanding of multiple pre-commercial energy storage technologies that are unlikely to be cost-effective to test and analyze independently. Participants are expected to gain an improved comprehension of a technology's capabilities, such as:

- Realistic time horizons for product readiness; gaps to commercialization.
- Potential avenues for modifying product design to improve system characteristics.
- Technology specific safety risks and hazards.

This project also informs product development of emerging energy storage technologies.

Project Approach and Summary

Hardware demonstrations typically require significant time and financial investment. EPRI's collaborative approach alleviates participant cost constraints. Further, prioritizing data gathering is intended to mitigate schedule challenges. EPRI's plans to remain flexible in how it acquires data enables participant input on which energy storage technologies the project should target. EPRI intends to expand its reach of technologies to investigate through the following tasks:

1. Independent analysis of data provided directly from technology solution providers.
2. Analysis of data provided by participant technology demonstration projects.
3. Report on interim findings from government demonstration projects.
4. Host technology testing at EPRI's Solar TAC and Knoxville sites. Document insights from installation and commissioning, develop and execute test plans, and perform data analysis.

EPRI can provide an additional customized scope for funders interested in developing test plans, commissioning, monitoring and verification, or other tasks for demonstration projects hosted at their facilities.

Deliverables

- Documentation of technology performance and reliability data analyses, deployment and integration experiences, and commercialization insights through:
  - Quarterly webcasts providing interim results.
  - Access to a dedicated StorageWiki.epri.com page with project information and updates.
  - Technical report at the conclusion of the project documenting final results.
- Webcast on field deployment lessons learned from government, funder, and EPRI hosted projects.
- Generalized test plans for government and EPRI hosted projects.

Additional deliverables may be offered to support customized tasks.

The non-proprietary results of this work will be incorporated into EPRI's R&D programs and to the public for purchase, or otherwise.

Price of Project

Participant cost - $90,000

Contact EPRI for customized scope and cost.

This project qualifies for self-directed funding (SDF) and costs may be spread across the three-year duration of the project.

Project Status and Schedule

The estimated time to complete the project tasks is 36 months and will begin upon the first funder joining.

Who Should Join

Utility R&D engineers, planners, and strategic managers interested in emerging energy storage technologies for future utility needs.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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