

Energy Storage Safety & Reliability Overview and Research Priorities

DOE - ESS Safety & Reliability Forum

Dirk Long, PE, PMP

Principal Technical Leader

Energy Storage and Distributed Generation

Electric Power Research Institute

Email: dlong@epri.com

Mobile: +1 (720) 925-1439



Electric Power Research Institute

 **ELECTRIC POWER
RESEARCH INSTITUTE**

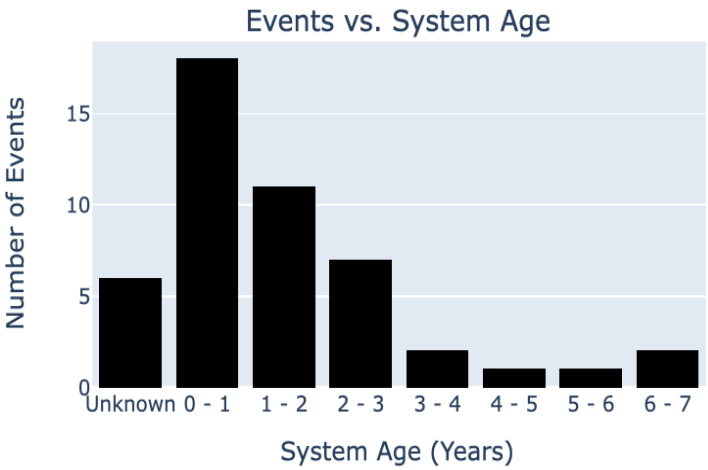
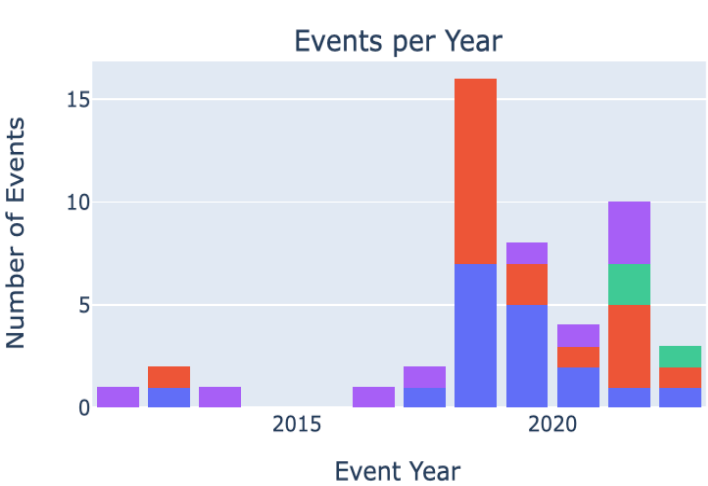
Advancing safe, reliable, affordable, and environmentally responsible electricity for society through global collaboration, thought leadership, and science and technology innovation.



Together...Shaping the Future of

KEY ASPECTS				
Nonprofit Chartered to serve the public benefit, with guidance from an independent advisory council.	Thought Leadership Systematically and imaginatively looking ahead to identify issues, technology gaps, and broader needs that can be addressed by the electricity sector.	Independent Objective, scientific research leading to progress in reliability, efficiency, affordability, health, safety, and the environment.	Scientific and Industry Expertise Provide expertise in technical disciplines that bring answers and solutions to electricity generation, transmission, distribution, and end	Collaborative Value Bring together our members and diverse scientific and technical sectors to shape and drive research and development in the electricity sector.

Battery Storage Failure Incidents Continue



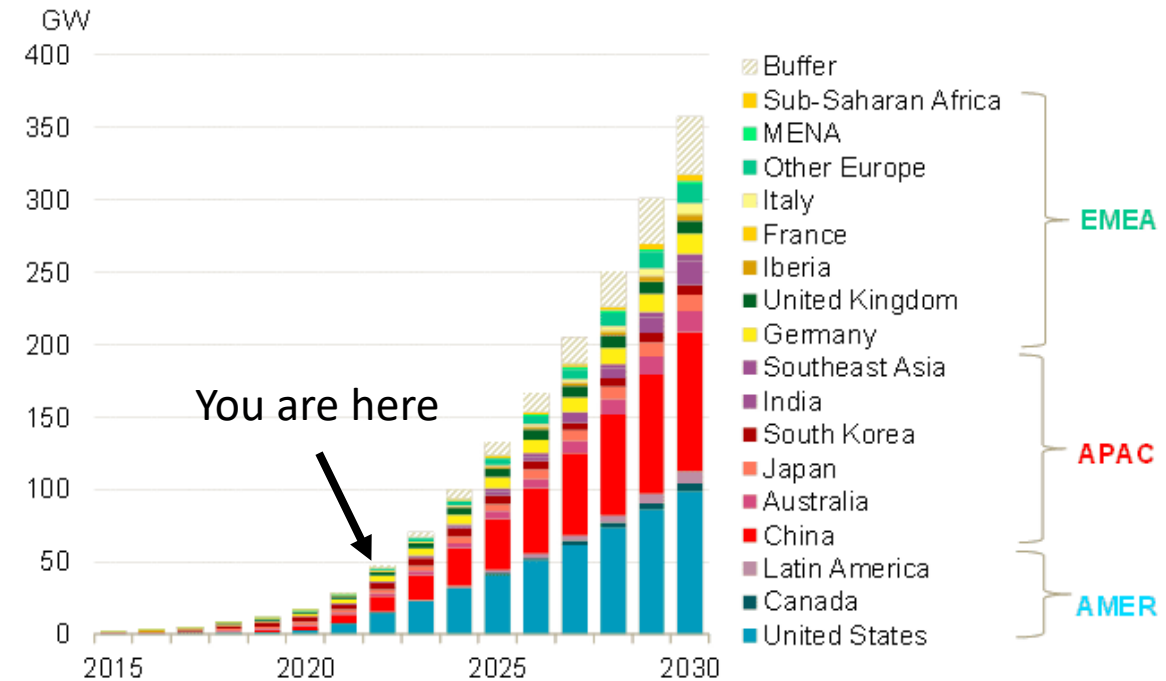
- 50+ documented incidents
- 5 incidents in 2022

https://storagewiki.epri.com/index.php/BESS_Failure_Event_Database

It is a critical time for ensuring safe, reliable, cost-effective systems

~1 TWh of new storage expected to be deployed this decade

Global cumulative energy storage installations, 2015-30



Source: BNEF 2021 Global Energy Storage Outlook (excludes pumped hydro)

EPRI Energy Storage Research

Techno-Economic Analysis

Design, locate, and operate projects

Technology Evaluation

Data analysis, testing, and demonstrations

Implementation

Project lifecycle best practices

Asset Management Support

Explore risk mitigation and reliability

Industry Engagement

Common approaches across stakeholders

Workforce Skill Development

Identify gaps and training materials

Leading Practices

Gain insights from utilities across the globe

Advance integration and use of safe, reliable, economic and environmentally responsible energy storage.

				
SAFETY	ELECTRICITY RELIABILITY	ECONOMICS	ENVIRONMENTAL RESPONSIBILITY	INNOVATION
Safety practices established	Energy storage asset reliability characterized and enhanced	Planning and operational modeling validated and applied	Reduced emissions with energy storage applications	Cross-industry disruption awareness and integration
Asset hazards characterized and minimized	Energy storage controls integrated and interoperable	Multi-use applications enabled	Sustainable life cycle implemented	Future workforce available and trained
Community resilience and public safety applications viable	Energy storage integrated into grid planning and portfolio management	Total cost of ownership reduced	End-of-life impacts minimized	Technology advancements accelerated

Source: EPRI Energy Storage Roadmap, Vision for 2025, [3002019722](#)

A blue-tinted photograph of four people standing in a row. From left to right: a woman with curly hair and glasses, a man with glasses and a tie, a woman wearing a hard hat and a dark shirt, and a man with glasses and a beard. They are all smiling and looking towards the camera.

Together...Shaping the Future of Energy™

Dirk Long, PE, PMP

Principal Technical Leader, Storage Safety Lead

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