# 4<sup>TH</sup> ANNUAL ENERGY STORAGE GRAND CHALLENGE SUMMIT

Long Duration Energy Storage (LDES) Grid Integration – Valuation Framework and Incentive gaps

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## **ESGC BIG-DIG**

# Long Duration Energy Storage (LDES) Grid Integration – Valuation Framework and Incentive gaps

PRIMARY ESGC TRACK: Markets and valuation

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# IDEA SIGNIFICANCE

### Status Quo:

 Incentive gaps in valuing LDES resource adequacy and operational benefits

### **Proposal:**

- Develop LDES-centric evaluation framework
- LDES resource adequacy, reliability and resiliency values

### Target Outcome:

- Identify market design and policy gaps in compensation
- Guide future reforms





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Policy analysis

Reliability & resiliency



# **KEY ELEMENTS**

Roadmap

development

## ESGC BIG-DIG August 2024

TIME IN YEARS Benefit of LDES. Outputs Modeling Framework gaps and priorities System Benefit During Winter Storm Uri, wind output was low for a 12-day period across multiple regions Sienna∖Ops Sienna **Market Efficiency** 7 ISI **EMIS-AS Resource Adequacy** PSH V.T. A-LEAF **Incentive** gap Source: Wood Mackenzie, ERCOT, MISO, SPP, PJN Year 1 Year 2: Develop Year 3: Initial report Year 5: Final Year 4: Sensitivities evaluation framework deliverables Stakeholder analysis on **Evaluation metrics** engagement, Market design Comprehensive Market design Effectiveness of • Gap identification report **Resource adequacy** options market design and

policy incentive

options

Policy reform

proposals

- Visual dashboards
- Stakeholder outreach



# PROGESS TO DATE

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The team has performed initial gap analysis policy, standard and market design related to the valuation of LDES benefits to the grid operations and planning

NERC: Two Standard Authorization Requests: Energy assessments

- long-term planning horizon (1 to 5 years)
- operational planning (1 year or less)

#### FERC:

- Order 2023: accommodate storage in GIQ
- Order 1920: LDES versus transmission

ISONE:Development of Energy Shortfall ThresholdPJM IMM:Capacity market deficienciesSPP:Multi-day market evaluation

#### **Integrated Resource Planning:**

Models unable to reflect LDES values

#### Power purchase agreement

LDES is a key enabler for 24/7 clean PPAs

How can we do better to properly valuing LDES and not repeating lessons learned from other emerging resource?

- Example: building solar and not anticipating fast diminishing value of ELCC
- Policy and tools need to reflect the changing resource values under an evolving portfolio



https://www.ethree.com/wp-content/uploads/2020/08/E3-Practical-Applicationof-ELCC.pdf

## **Next steps**

## Continue gap analysis

- Industry reports, research papers
- Industry outreach and stakeholder interviews
- Relevant experience and findings from national labs, vendors and academia

## Rules

- Policy
- Standard
- Market rules
- Industry practice and methodologies

## Software tools

- Modeling & Computation
- Resource adequacy, production cost simulation, market clearing optimization, ...
- Policy representation, extreme events,

### Final report on program design and priorities: July 2025

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