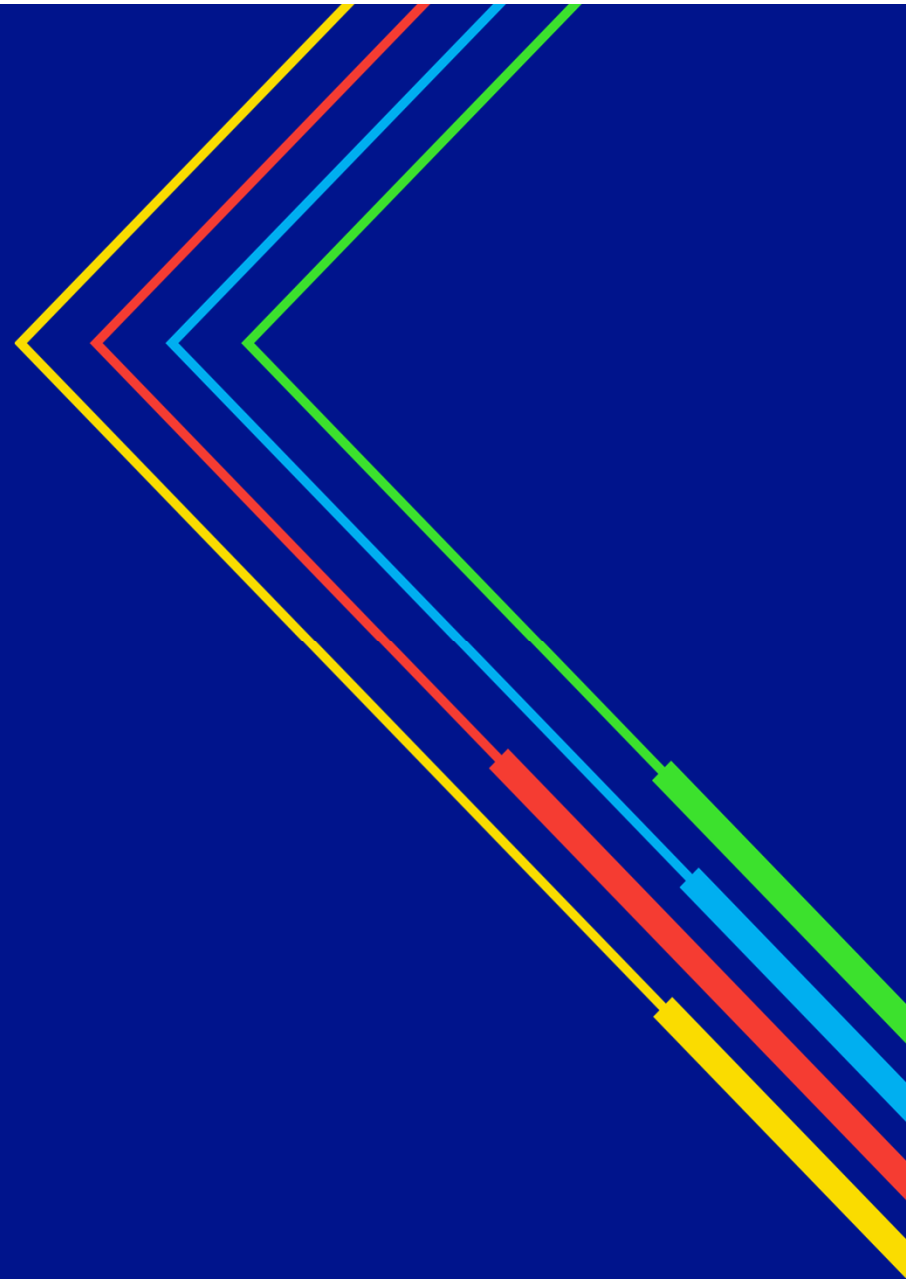


Facilitating a Transforming Grid – Storage Panel

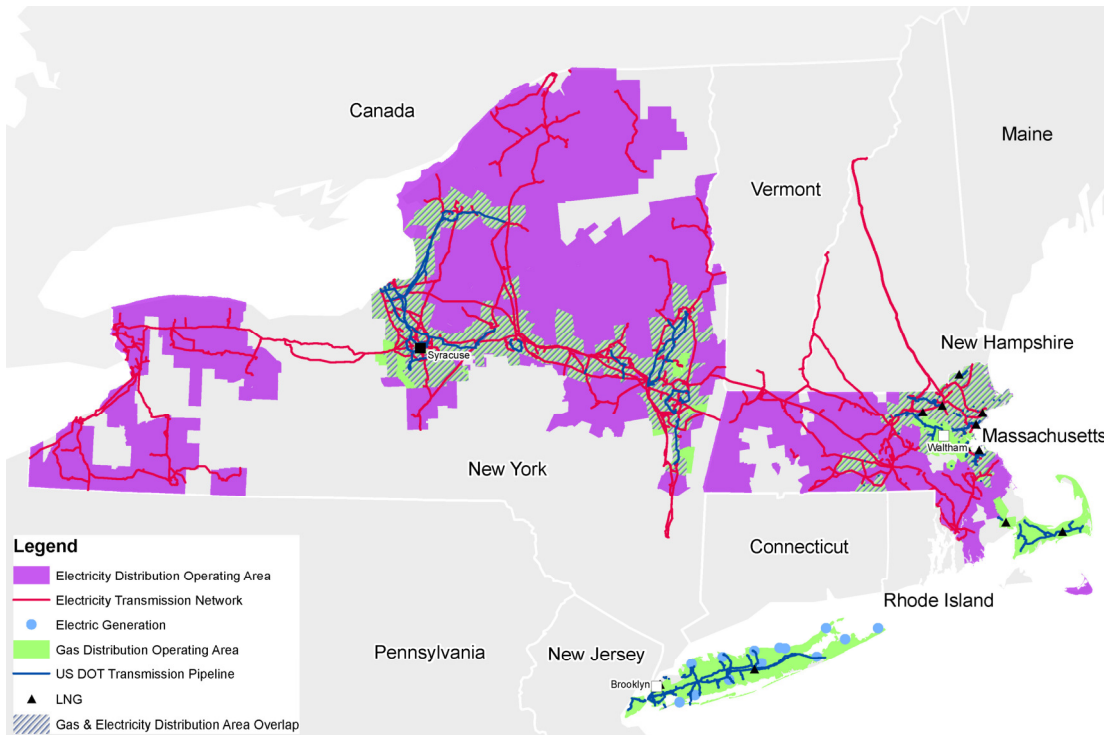
DOE Electricity Advisory Committee
June 7, 2023

nationalgrid



National Grid Overview

National Grid's regulated business serves more than 20 million electric and gas customers throughout New York and Massachusetts.



Energy Storage Assets:

- Demonstration systems:
 - MA - 5 systems ranging in size from 500kW/1MWh to 1MW/2MWh
 - NY - 2 systems each 2MW/3MWh
- Full-scale systems –
 - Nantucket, MA 6MW/48MWh

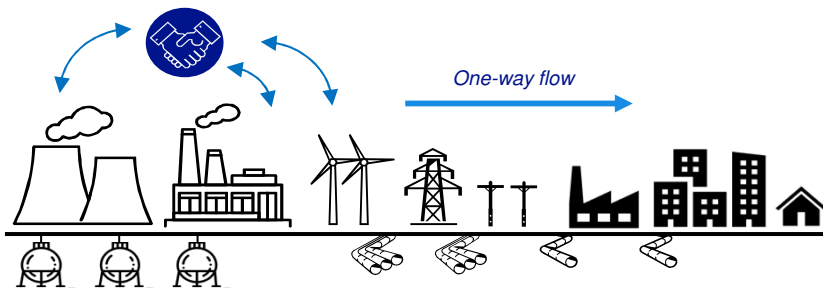
National Grid Ventures, our unregulated business, has 3 operating energy storage systems including two in NY (40MWh each) and one in TX (125MWh).

Opportunities for Energy Storage

Energy Storage can facilitate this transformation in many ways.

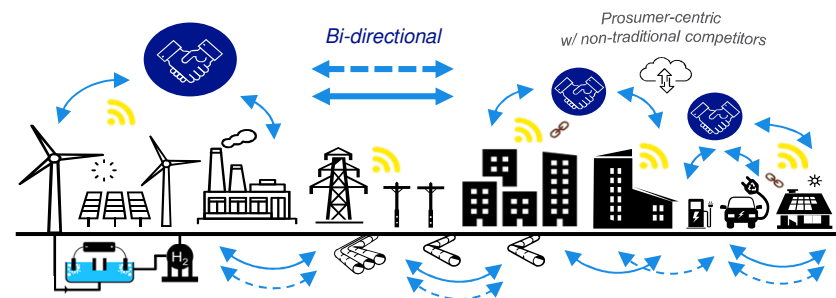
From Fossil-based, Centralized, Analog...

...To Decarbonized, Digitized, Decentralized, Electrified



Traditional Utility Performance Criteria for Success

- Safety
- Reliability
- Cost



New and Expanded Utility Performance Criteria for Success

- Safety
- Reliability → Resiliency
- Cost → + Affordability
- Satisfaction
- Flexibility
- Sustainability

Challenges Across the Electric Network		Energy Storage Mitigation
Generation	<ul style="list-style-type: none"> Supply variability due to intermittency of solar and wind 	<ul style="list-style-type: none"> Smoothing and Shifting, Frequency Regulation, operating reserves, voltage support, black start
Transmission & Distribution	<ul style="list-style-type: none"> Increased need for reliability & resiliency Increased loading on grid infrastructure Grid stability 	<ul style="list-style-type: none"> Backup power T&D asset capacity Reactive power
Customer	<ul style="list-style-type: none"> Increased need for reliability & resiliency Affordability 	<ul style="list-style-type: none"> Power quality, backup power Demand charge management, Time of use management

Energy Storage in Support of Transmission

National Grid is investigating storage for a variety of Transmission use cases.

Reliability & Resilience

Challenge: With climate change and increased dependence on electricity for transportation, heating, and industrial applications, reliability and resilience become even more important.

Approach: Energy storage can provide power in the case of an outage.

Example: Nantucket Energy Storage System

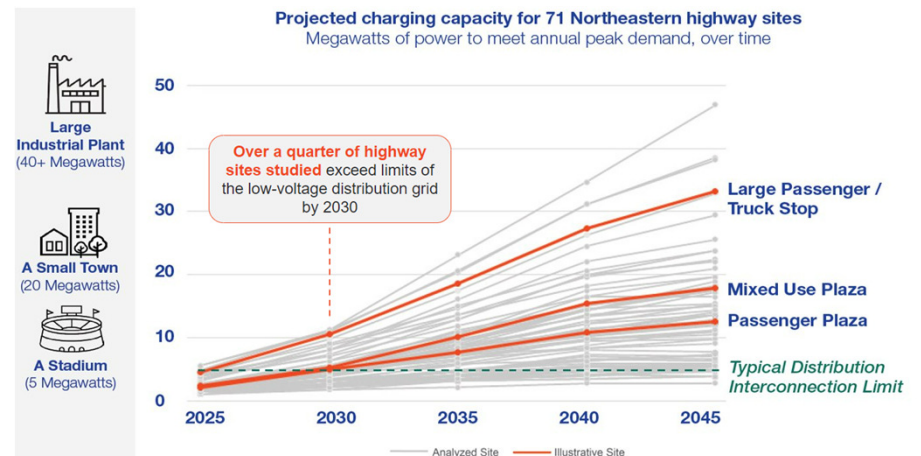


Asset Capacity

Challenge: As transportation, heating, and industrial sectors electrify, the existing transmission network will be required to convey significantly more power.

Approach: Energy Storage can provide power to supplement transmission infrastructure during peak to defer or avoid upgrades.

Example: Public Highway EV Fast Charging



As a secondary use, energy storage can provide grid stability (e.g., reactive power).

Focus of Today's Discussion

While energy storage can theoretically facilitate grid transformation, there are still many issues to be discussed and addressed.

- 1) **Transmission**
- 2) **Data**
- 3) **Safety**

Moderators

- **Lola Infante** EAC Member
- **Colette Lamontagne** Director, Energy Storage & Transportation, National Grid

Panelists

- **Ray Kubis**, Chairman, Gridtential Energy, LLC
- **Peter Olmsted**, Director of Public Policy, FreeWire Technologies
- **Jason P. Handley**, General Manager, Customer Delivery Distributed Energy Group, Duke Energy

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