Energy Storage Opportunities in New York State

NEW YORK BATTERY AND ENERGY STORAGE TECHNOLOGY CONSORTIUM

William Acker

Thermal-Mechanical-Chemical Energy Storage Workshop

August 4th, 2022

NY-BEST Mission

To catalyze and grow the energy storage industry and establish New York State as a global leader.

We do this by:

1. *Communicating information and facilitating connections*
2. *Accelerating commercialization*
3. *Educating policymakers and stakeholders*
4. *Promoting New York's intellectual and manufacturing capabilities and providing access to markets*

New York State Overview

2019 Climate Leadership and Community Protection Act (CLCPA)

70% Renewable Energy by 2030

Carbon-free grid by 2040

85% GHG reduction by 2050

CLCPA and other trends driving:

Electrification and the great convergence of energy

Significant need for energy storage

2022 NY doubles 2030 Energy Storage Goal to 6 GW

Challenges for the Future Grid

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Why we need energy storage

- Intermittency of Renewable Generation
- Limitation on incorporating renewables into existing grid
- Large new loads

New York Load Projection

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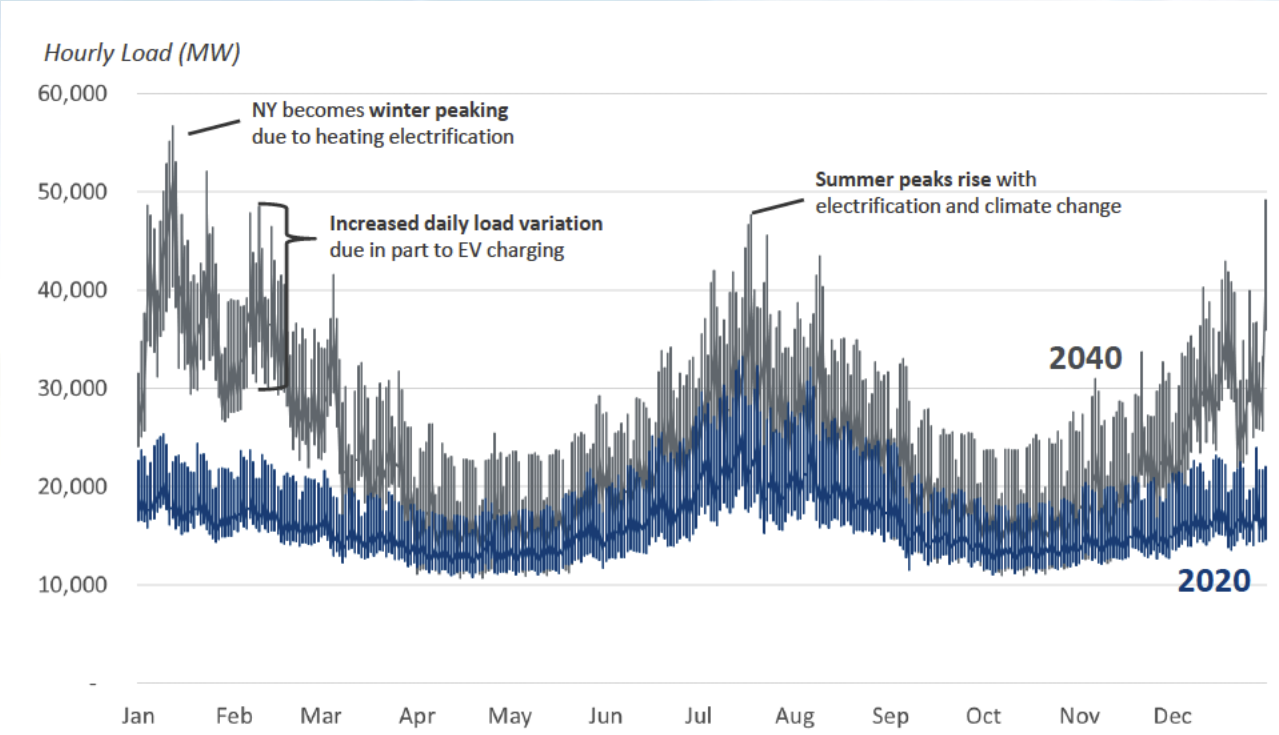
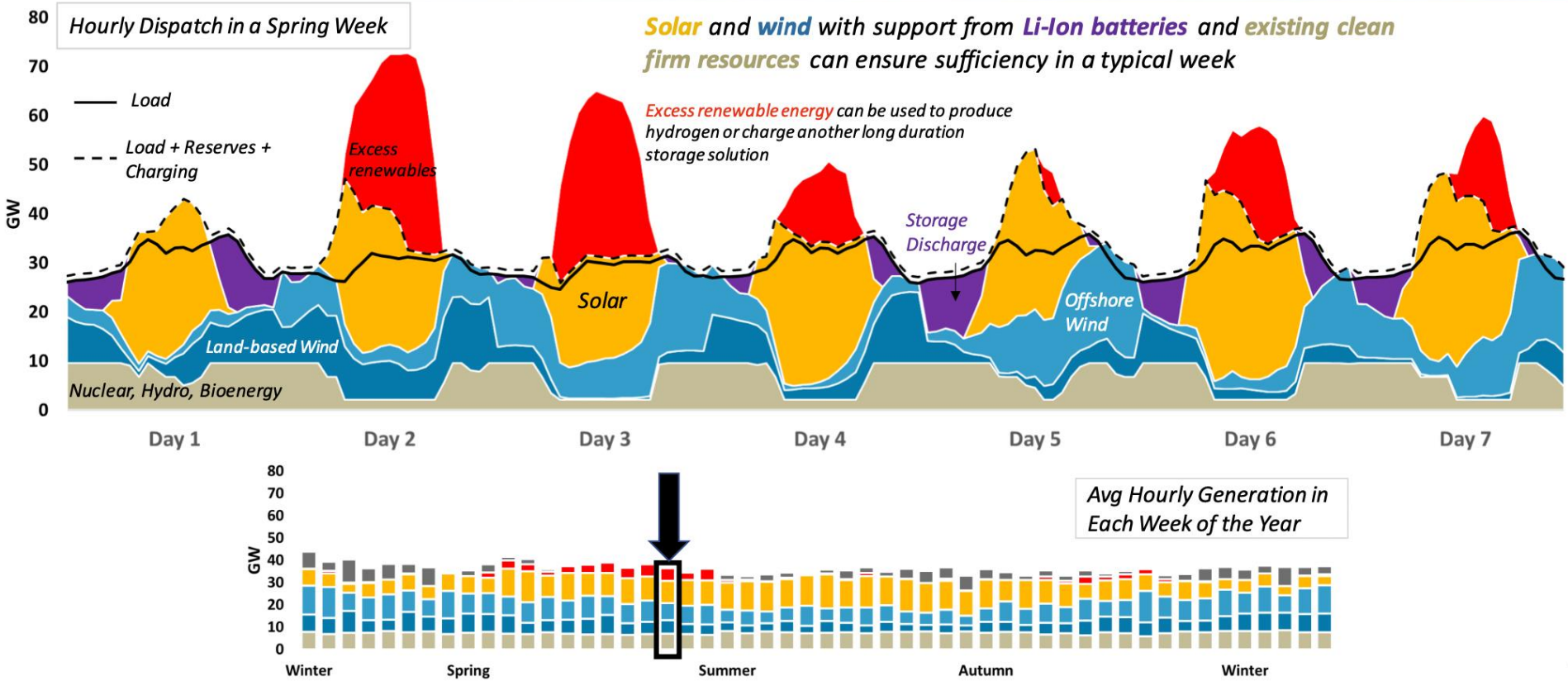


Source: “New York’s Evolution to a Zero Emission Power System”, The Brattle Group, prepared for NYISO June 22, 2020

Typical Spring Week in 2050

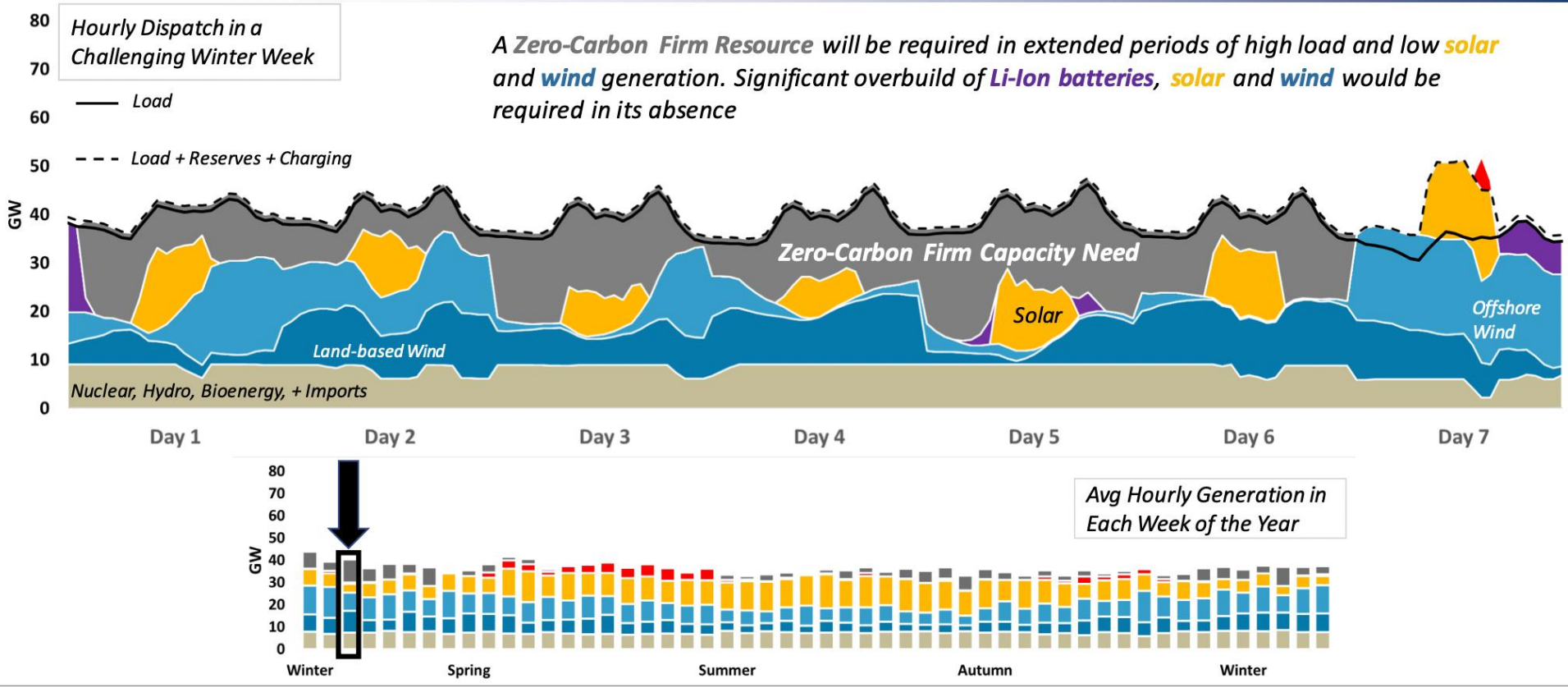
Scenario 3



Source: NYS Climate Action Council Meeting October 14th, 2021, E3 Integration Analysis

Multi-Day Reliability Needs in 2050

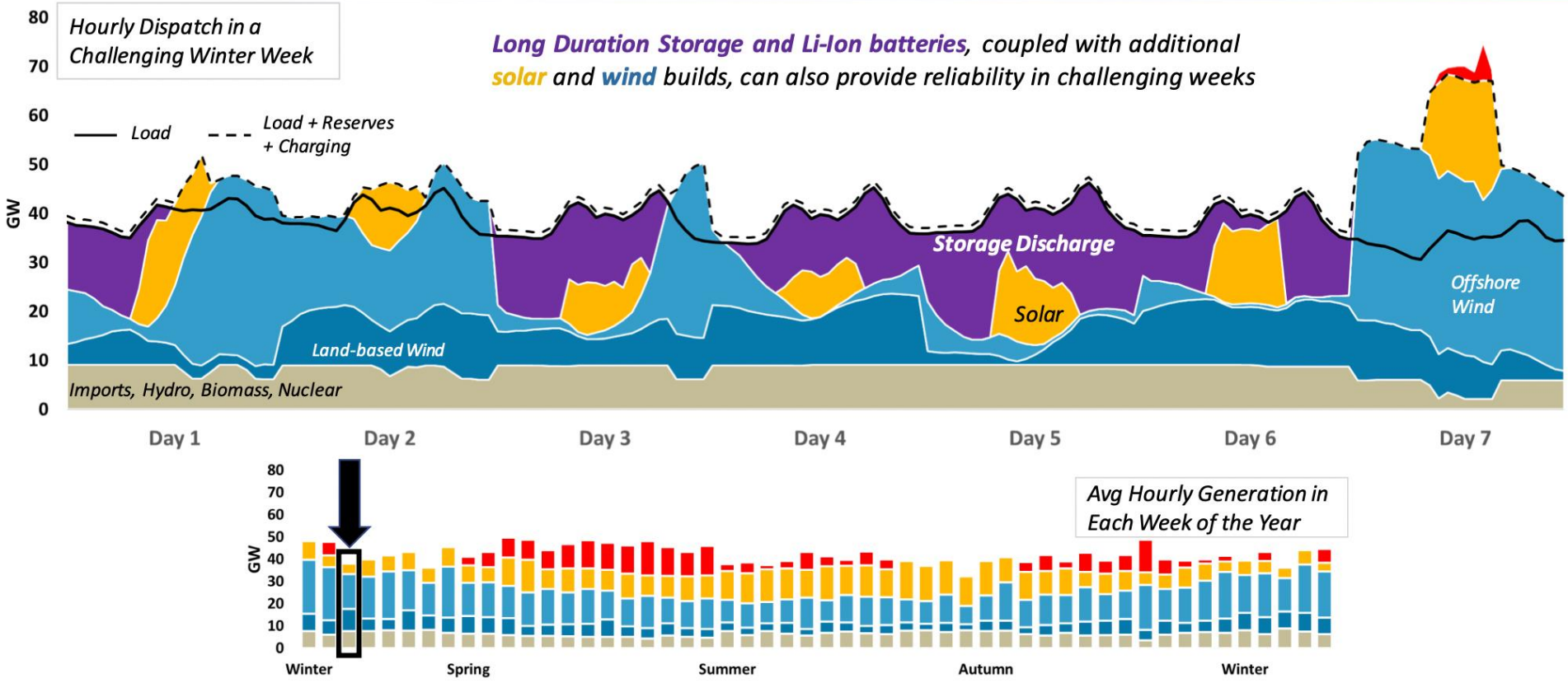
Scenario 3



Source: NYS Climate Action Council Meeting October 14th, 2021, E3 Integration Analysis

Meeting Multi-Day Reliability Needs in 2050 with LDS

Scenario 3



Source: NYS Climate Action Council Meeting October 14th, 2021, E3 Integration Analysis

New York Generation Growth

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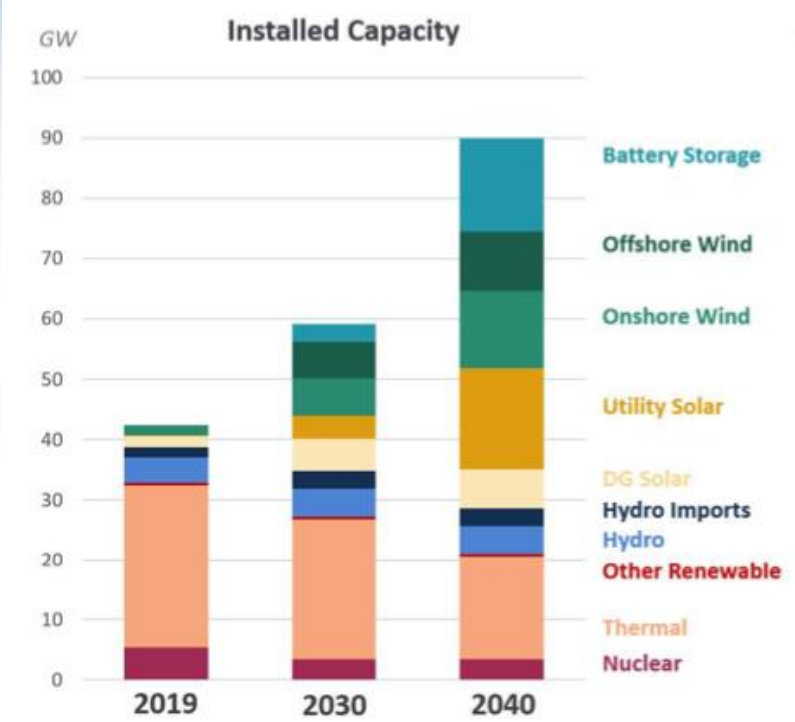

Hourly storage

Long duration storage and clean dispatchable technologies

Source: “Initial Report on the New York Power Grid Study”, The Brattle Group and Pterra Consulting, prepared for NY PSC January 19, 2021

Long Duration Resource Deployment

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Challenges and Considerations

- Market compensation mechanisms
- Validation and confidence in new technologies
- Scale and cost of demonstration projects
- Overcoming mindset that the need is in the future

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Peaker Plant Replacement

NYC Peaker Plant Age

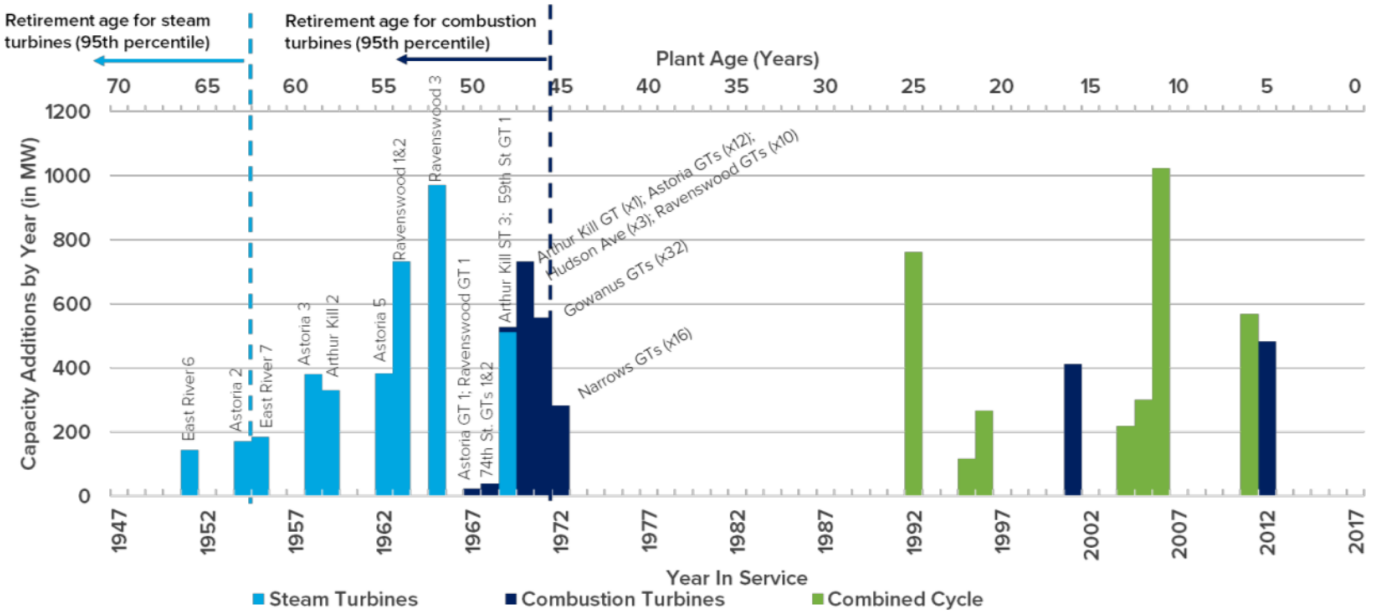

Figure 3. Installed Generation Capacity in Zone J - N.Y.C.
(Source: NYISO 2017 Load and Capacity Data aka "Gold Book")

Source: Strategen New York City Peaker Study commissioned by NY-BEST

Peaker Run Time

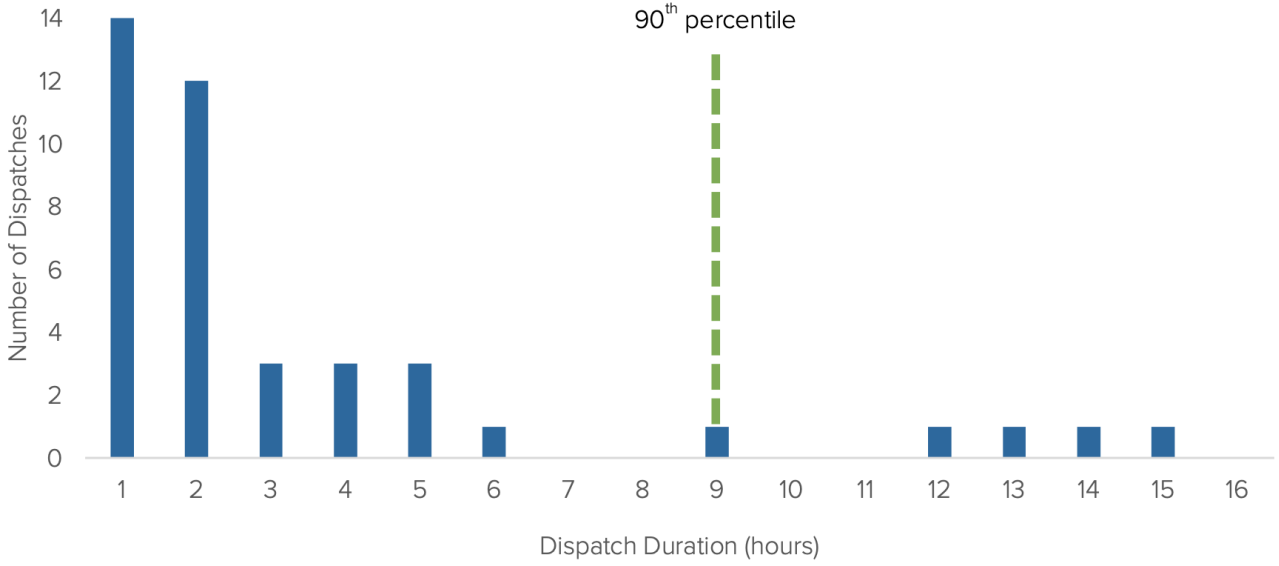

Figure 9. Shoreham Peaking GT3 Dispatch Duration, 2018

Source: Strategen Long Island Peaker Study commissioned by NY-BEST

Peaker Run Time

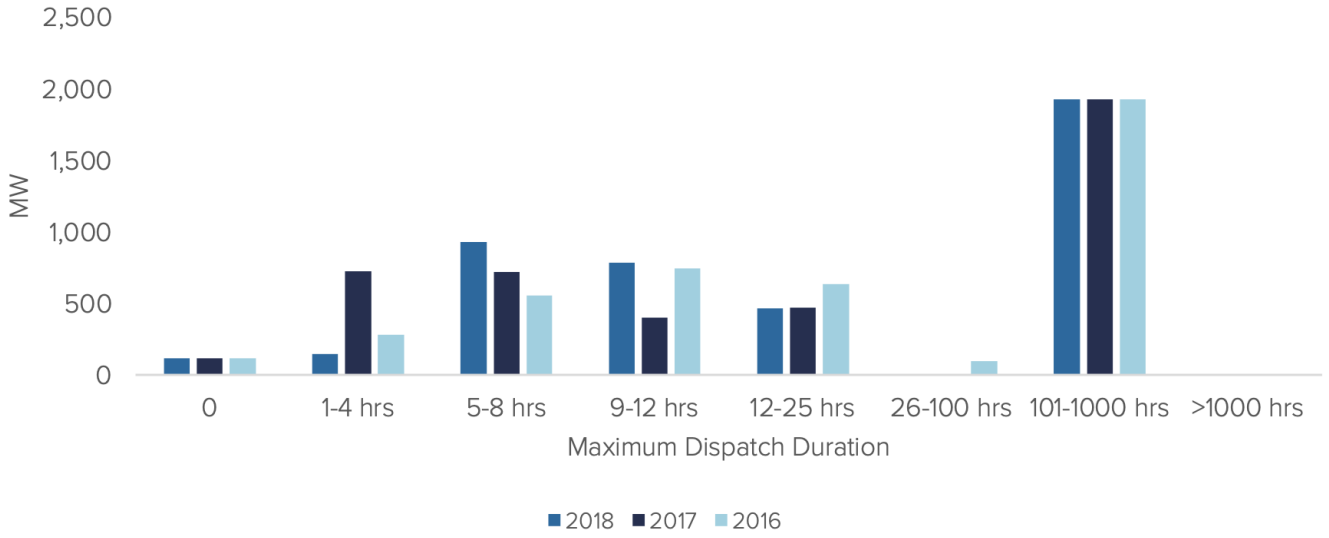

Figure 15. Consistency of 90th Percentile Peaker Dispatch Duration, 2016-2018

Source: Strategen Long Island Peaker Study commissioned by NY-BEST

Energy Delivery

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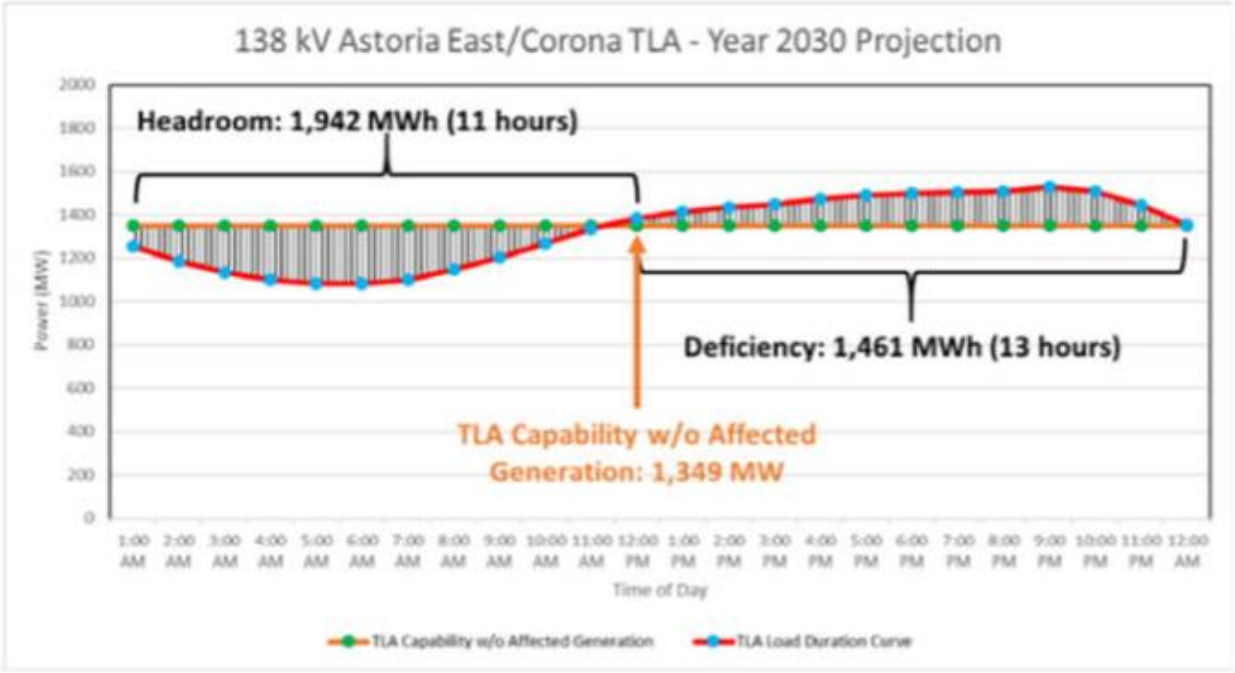
Zero Carbon Grid will require significant investments in T&D and Energy Storage

- Higher peak power from intermittent resources
- Load pockets
- Generation pockets
- Curtailment and spillage

Virtual Transmission



Source: Utility Transmission and Distribution Investment Working Group Report filed with PSC Nov 2, 2020

Virtual Transmission

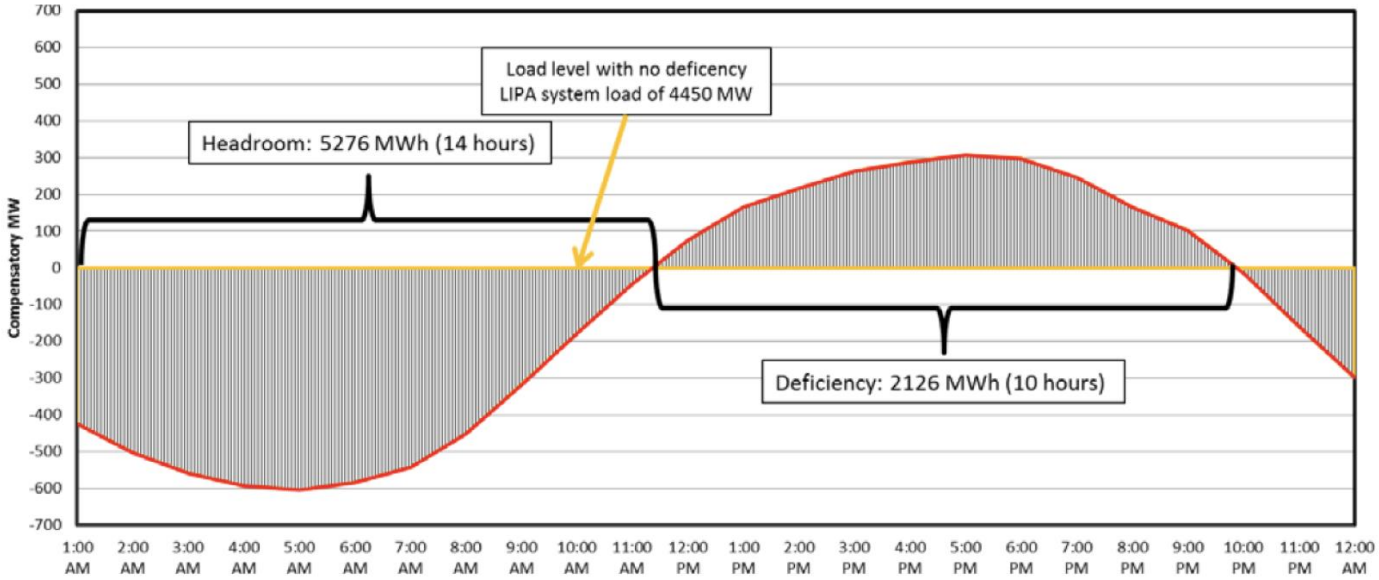
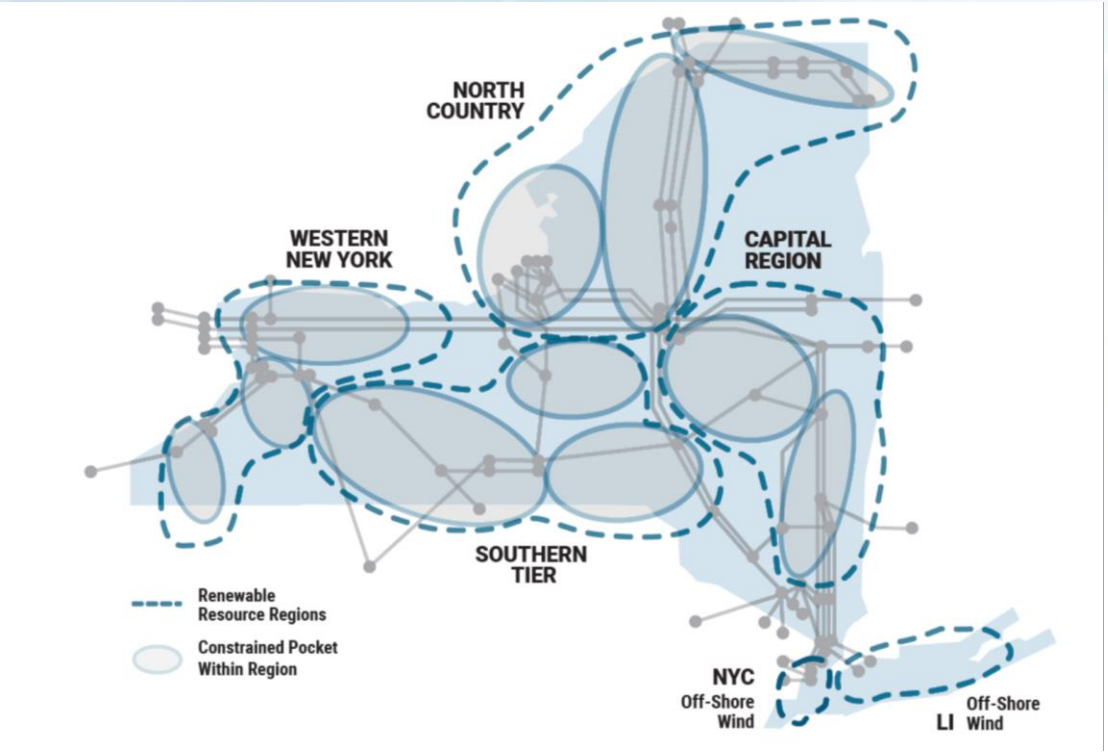


Figure 18. South Western Suffolk Load Duration Curve[44]

Source: Strategen Long Island Peaker Study commissioned by NY-BEST

Renewable Generation Pockets



Source: NYISO 2021-2030 Comprehensive Reliability Plan

Virtual Transmission

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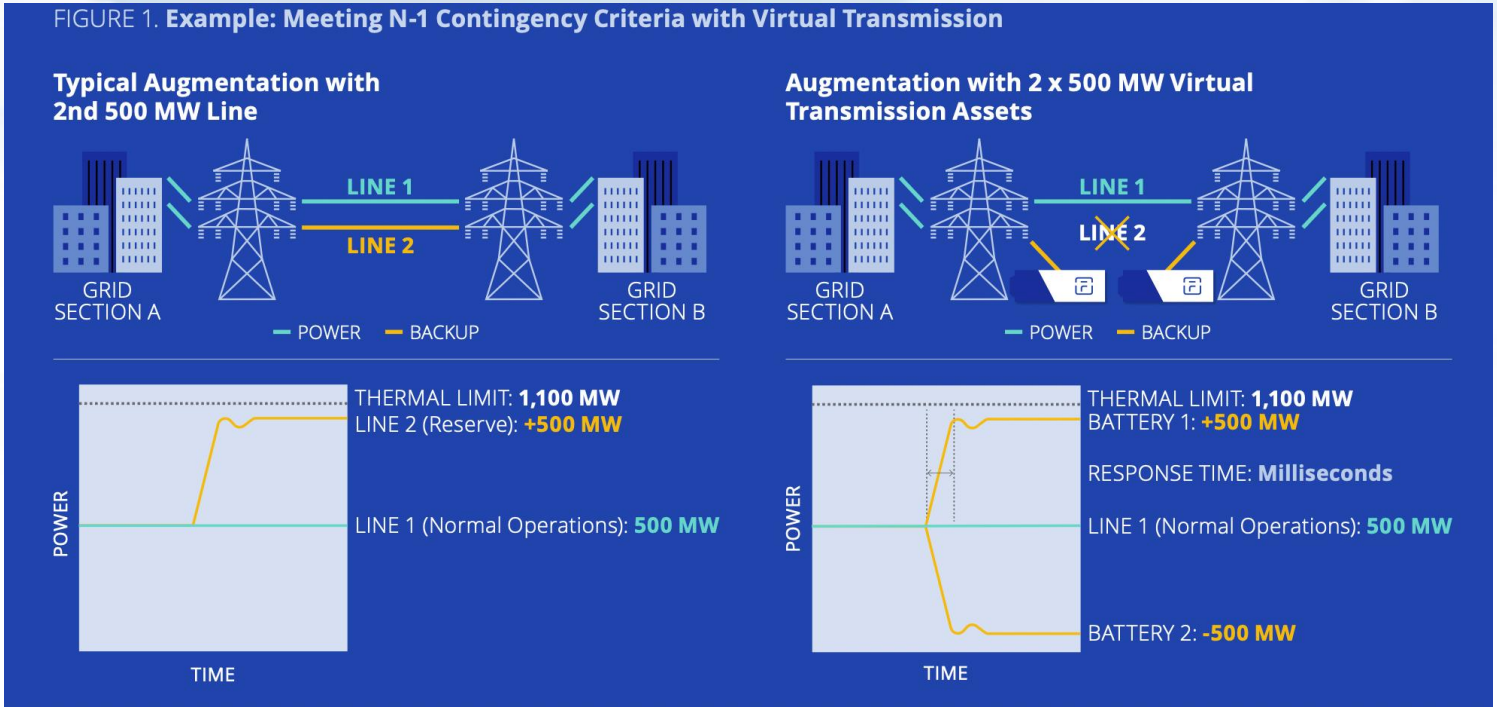
FIGURE 1. **Example: Meeting N-1 Contingency Criteria with Virtual Transmission**



Source: Fluence White Paper: "Building Virtual Transmission: Critical Elements of Energy Storage for Network Services" WP-009-01-EN 2020

Resource Adequacy

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Generally based on Monte Carlo simulations of generator performance. Further considerations:

- Correlated events
- Interaction with load
- Extreme weather
- Capacity value of new resources

Going Forward

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New York Energy Storage Roadmap expected release early fall

New programs for Energy Storage

Thank You

NY-BEST Technology and Innovation Conference
Rochester, NY
October 26th,2022

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www.ny-best.org