

# Limited Energy Storage Resource (LESR) Market Integration Update

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**Price Responsive Load Working Group**

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## Limited Energy Storage Resource (LESR) Introduction

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- ◆ LESR:

- A Generator authorized to offer Regulation Service only and characterized by limited energy storage, that is, the inability to sustain continuous operation at maximum energy withdrawal or maximum energy injection for a minimum period of one hour.
- To take full advantage of the capabilities of these technologies the NYISO proposes to modify some business rules and software systems.
- These rules are being proposed so that the NYISO can address the unique characteristics of LESR technologies, allowing for all resources to offer services on a comparable basis while continuing to schedule resources to satisfy all reliability criteria.

# LESR: Market Integration Update

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- ◆ Creation of a Regulation Only Supplier that:
  - *Is a Generator*
  - *Will provide only Regulation Service*
  - *Converts energy but does not offer it, energy output is only incidental to the provision of regulation*
- ◆ Scheduling of regulation service will be comparable to other suppliers of regulation service
- ◆ AGC/RTD functionality will be modified:
  - To recognize the LESR capabilities and limitations
  - Manage LESR energy levels
- ◆ Settlements will generally be consistent with those of other Suppliers with LESR specific modifications to address LESR limitations.

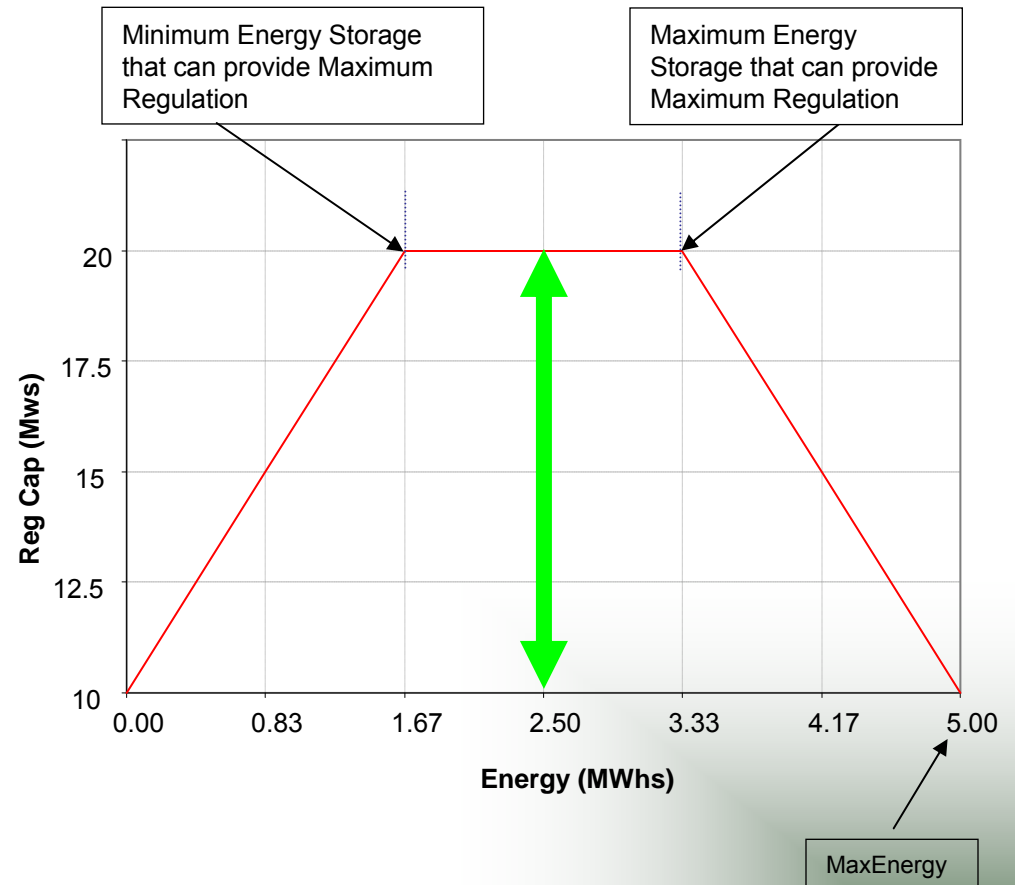
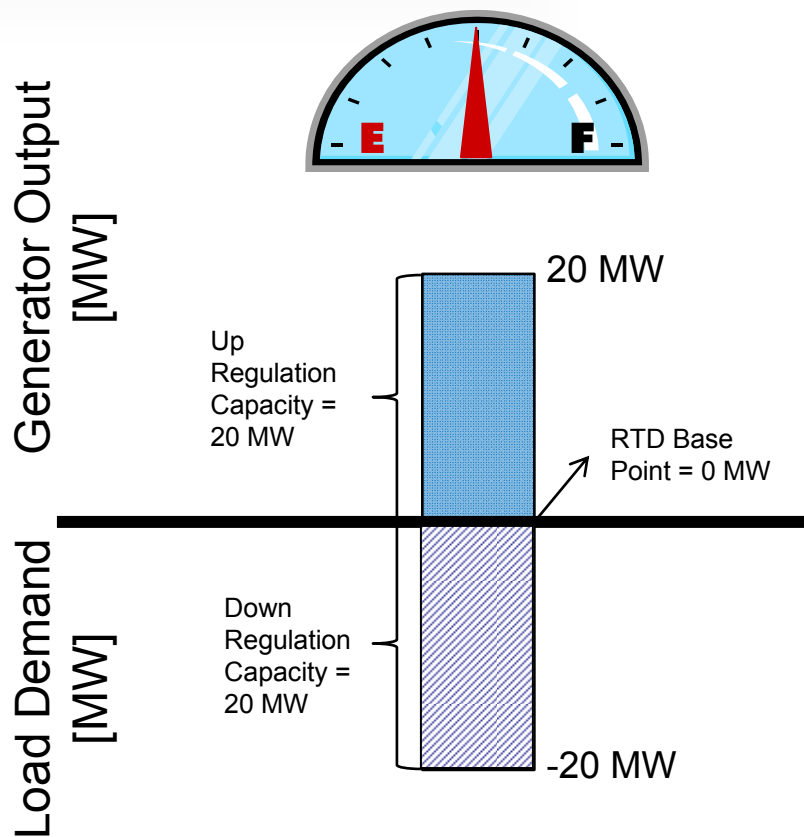
## **LESR: Market Integration Update - RTD Scheduling**

- ◆ LESR energy level will be managed by RTD to maintain regulation capability to the extent possible by charging/discharging the LESR as necessary.
  - For all intervals with a valid real-time regulation bid, RTD will manage the LESR energy level.
  - During these intervals the Regulation Capacity offer will be reduced in proportion to the energy level of the LESR.
- ◆ Energy management will NOT occur when the ISO is experiencing shortage conditions as defined by the regulation demand curve.
  - LESR will receive a zero RTD schedule.
  - LESR may be scheduled for regulation based on the energy level.
- ◆ LESR will be scheduled at zero energy and regulation during any RTD-CAM actions when regulation is also suspended.

# Resource Management

Normal % Energy

Flywheel: Regulation vs. Energy

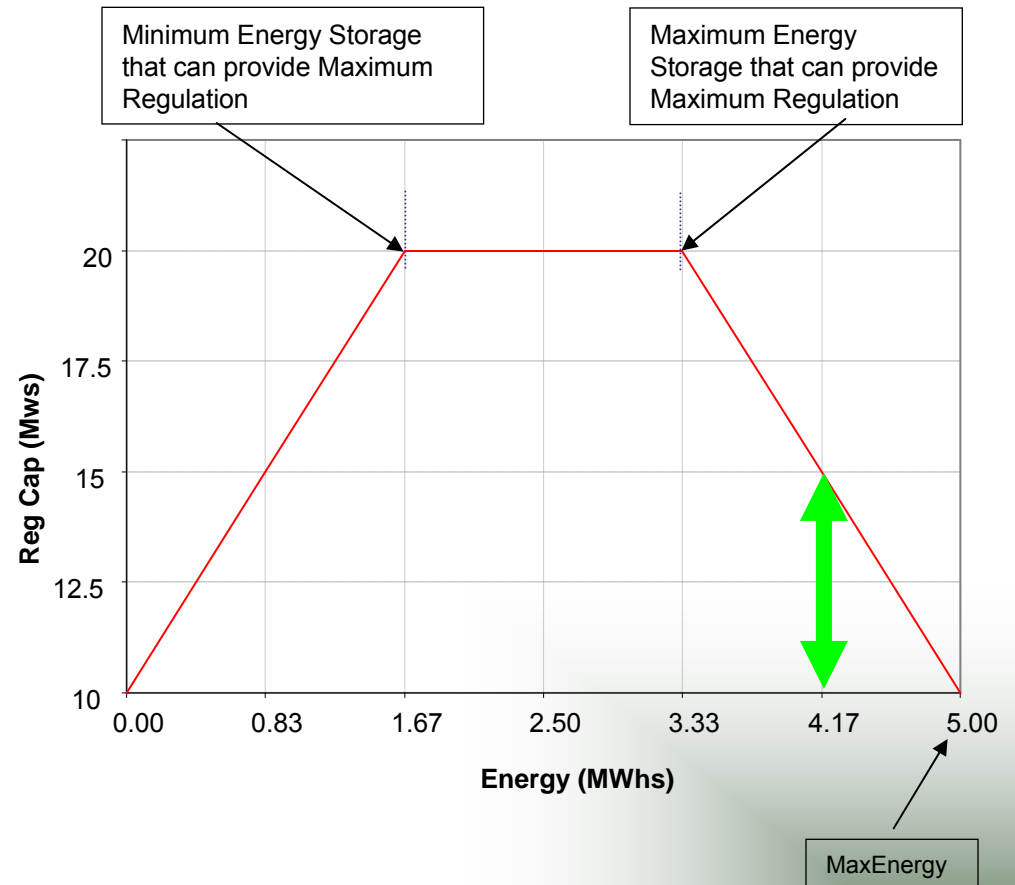
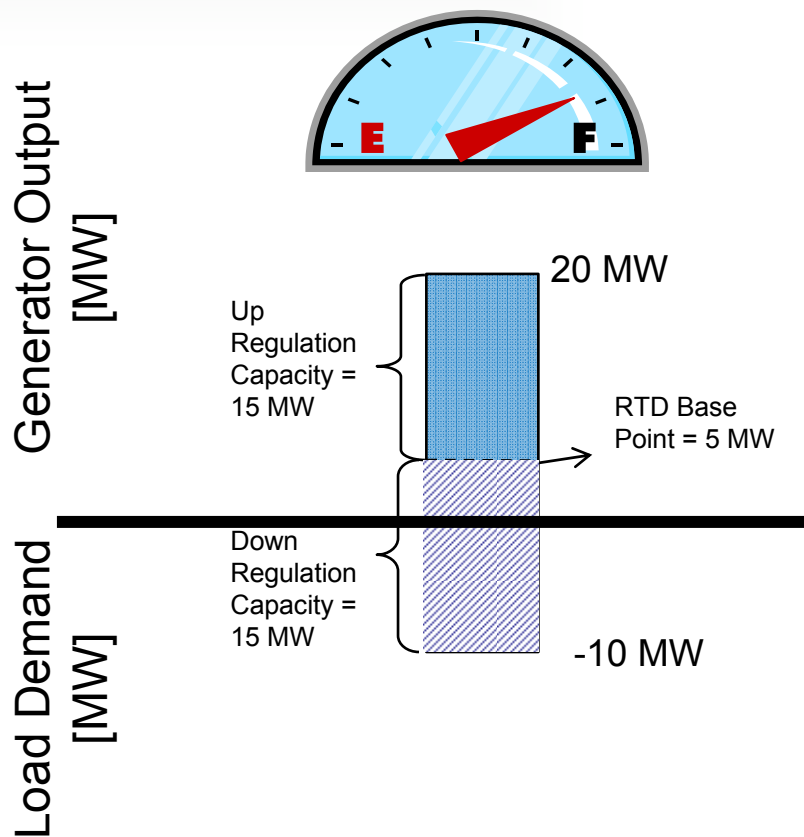


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# Resource Management

Normal % Energy

Flywheel: Regulation vs. Energy



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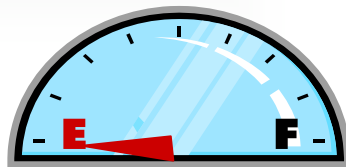
# Resource Management

Normal % Energy

Flywheel: Regulation vs. Energy

Generator Output  
[MW]

Load Demand  
[MW]

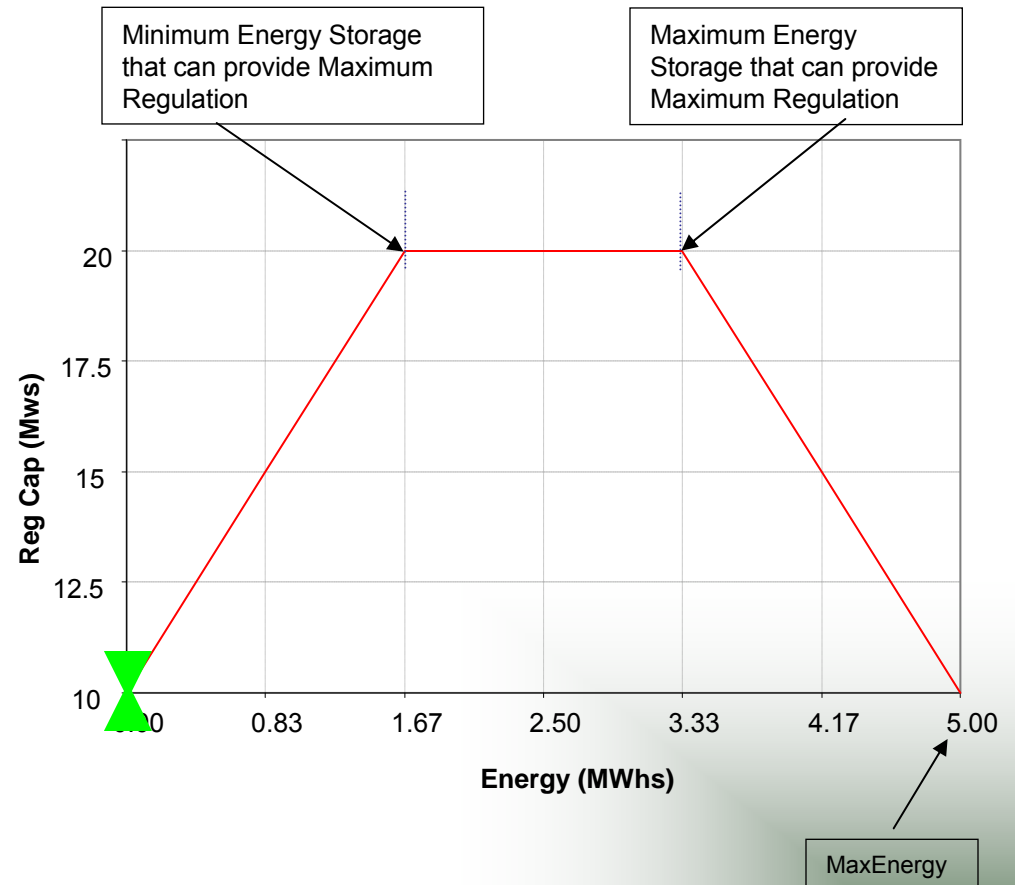


Up Regulation  
Capacity = 10 MW

Down Regulation  
Capacity = 10 MW

RTD Base  
Point = -10 MW

- 20 MW



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## **LESR: Market Integration Update - AGC Scheduling**

- ◆ AGC will be modified to allocate control error to maximize the capabilities of all regulation resources.
- ◆ Unique characteristics of LESRs will be addressed by AGC.
  - AGC will take advantage of the LESRs high response rates and maximize their energy deployment during periods that the ACE allocation improves the energy position of the LESR.
  - In situations where the LESR energy is limited, ACE allocations will be ramped at a normal response.



## LESR: Market Integration Update - Settlement

- ◆ LESRs:
  - ◆ May offer into both DA and RT markets.
  - ◆ Will be paid for Regulation Capacity scheduled by ISO in the DAM and RT.
    - ◆ Performance Index available but initially set to 1 until NYISO verifies metering can handle such rapid response.
  - ◆ Will be responsible for buying out against DA regulation positions when RTD is scheduling them for energy discharge / charge.
    - ◆ DAMAP is **not** provided during these periods.
  - ◆ Will pay the hourly time weighted LBMP for their net energy which includes AGC ACE allocations.
- ◆ Settlements during shortage conditions as defined by the regulation demand curve:
  - Will be responsible for buying out against DA regulation positions.
  - Replacement regulation costs are provided a DAMAP.
- ◆ LESRs will be charged the fixed portion of RS 1 as are Generators.
  - Charge will be based on all injected energy from the LESR.

## **LESR: Market Integration Update - Settlement**

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- ◆ Energy withdrawals (i.e. load) associated with the LESR regulation service is not station power load.
- ◆ LESRs provide no bids for energy either to charge or discharge:
  - ◆ RRA payments and charges will not apply.
  - ◆ Not eligible for Day-ahead and Real-time BPCG supplemental payments.

The New York Independent System Operator (NYISO) is a not-for-profit corporation that began operations in 1999. The NYISO operates New York's bulk electricity grid, administers the state's wholesale electricity markets, and provides comprehensive reliability planning for the state's bulk electricity system.

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