

Hybrid Storage Model

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Agenda

- Background
- Project Scope
- Project Goals
- Related Participation Models Under Development
- Hybrid Storage vs DER and ESR
- Planned Timeline
- Next Steps

Background: A Grid in Transition

- **The NYISO's wholesale markets can serve as an effective platform for achieving New York State environmental objectives**
 - Through active engagement with stakeholders and policymakers, the NYISO is developing design improvements to meet the future challenges expected to arise with high levels of intermittent renewable and distributed energy resources
- **The plan includes a set of market design enhancements that work together coherently and efficiently to satisfy New York's changing grid reliability needs**
 - The Hybrid Storage Model project will help enable climate policies while also supporting grid reliability



Background

- **Incentives along with improvements in flexibility and availability are motivating developers to couple generation resources with storage resources**
 - Future resource deployment is likely to be increasingly in the form of such resources
- **NYISO's market rules do not presently include a participation model for large paired/co-located front-of-the-meter generators and energy storage resources (i.e. Hybrid Storage Resources)**
 - Today, co-located resources are required to be separately metered and have their own point identifier (PTID)

Project Scope

- **This project seeks to explore a market participation model for use cases such as:**
 - Renewable resources co-located with small energy storage resources.
 - Renewable resources co-located with large energy storage resources.
 - Thermal resources co-located with energy storage resources.
 - Renewable and thermal resources paired with energy storage resources via financial contracts
- **A market participation model will be developed for a potential vote at the BIC by the end of 2020**
 - It is reasonable to expect that the design could be multifaceted, where some elements of the design are advanced faster than others

Project Scope (continued)

- **This project will explore different aspects related to participation of hybrid resources, such as:**
 - Participation in NYISO's Energy and Ancillary Services markets
 - Participation in NYISO's Installed Capacity markets
 - Settlement process
 - Modeling for interconnection, planning and operations
 - Metering requirements

Project Goals

- The Hybrid Storage project will evaluate the possibility of enabling hybrid storage resources to receive a single dispatch schedule
- The Hybrid Storage project will consider an option to enable an ESR to be the sink in a bilateral transaction
 - Currently, NYISO software does not allow a generator to be a sink

Related Participation Models Under Development

■ Distributed Energy Resources (DER) Participation model

- This project seeks to develop market rules for DERs to participate in NYISO's Energy, Ancillary Services, and Installed Capacity markets
- Status: Market Design completed; Software design efforts in 2020

■ Energy Storage Resources (ESR) Participation model

- This project seeks to develop market rules for ESRs to participate in NYISO's Energy, Ancillary Services, and Installed Capacity markets
- Status: FERC Order on NYISO's compliance filing issued 12/20/19; Deployment planned in 2020

Hybrid Storage vs DER and ESR

■ Distinctions between Hybrid Storage and DER

- The DER model permits aggregation of resources across multiple locations
 - The NYISO anticipates that Hybrid Storage resources will exist at the same physical location
 - Aggregation swapping is also permitted in the DER model, which may not be applicable for Hybrid Storage resources
- The DER model is for smaller resources
 - The Hybrid Storage model would seek to accommodate resources with larger injection capability

■ Distinction between Hybrid Storage and ESR

- The ESR model is for standalone storage resources
 - Coupling storage with another generating resource creates additional complexity that is not addressed within the ESR model

Planned Timeline

■ Q1 2020

- Initiate discussions on market concepts for hybrid storage resources

■ Q2 2020

- Continue discussions on market participation concepts for hybrid storage resources
- Present Market Design Concept Proposal to stakeholders

■ Q3 2020

- Present consumer impact analysis to stakeholders
- Present Market Design Complete to stakeholders

Next Steps

- NYISO will continue discussions with stakeholders on different use cases that we are seeking to explore in this project
- Any stakeholder input is welcome
- The next working group will be targeted for February

Feedback/Questions?

- Email additional feedback to:
Debbie Eckels, deckels@nyiso.com

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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