

DER Eligibility and Performance Obligations

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Purpose of Today's Meeting

- DER Overview
- Eligibility & Day-Ahead and Real-Time Performance Obligations Overview
- Review Additional Registration and Offer Parameters
- Review Commitment and Dispatch Concepts

Background

Date	Working Group	Discussion points and links to materials
02-02-17	Posted	<u>Distributed Energy Resources Roadmap for New York's Wholesale Electricity Market</u>
02-28-17	Market Issues Working Group (MIWG)	<u>DER Roadmap: Aggregation Participation Model</u>
04-28-17	Market Issues Working Group (MIWG)	<u>DER Roadmap: Aggregation Participation Model</u>
05-23-17	Market Issues Working Group (MIWG)	<u>DER Roadmap: Measurement & Verification, Monitoring & Control and Meter Data Study</u>
06-21-17	Market Issues Working Group (MIWG)	<u>DER Roadmap: Eligibility and Performance Obligations</u>

Purpose of the DER Roadmap Effort

- Develop a Dispatchable DER Participation Model for the NYISO-administered wholesale markets
- Create a model that supports the **NYISO Market Design Vision** - *Attract and retain the most efficient resources to meet NY's reliability needs.*

DER Roadmap Concepts

- **NYISO is developing the following concepts through the stakeholder process:**
 - Aggregations (Feb. 28 & Apr. 28, 2017)
 - Measurement and Verification (May 23, 2017)
 - **Real-Time (RT) & Day-Ahead (DA) Eligibility Criteria and Performance Obligations (Jun. 21, 2017 and Jul. 31, 2017)**
 - RT Operational Requirements and Resource Obligations
 - DA Operational Requirements and Resource Obligations
 - Installed Capacity Eligibility Criteria and Performance Obligations
 - Dual participation in wholesale markets and retail programs
- **NYISO will present a full market design to stakeholders after these concepts have been finalized**

DER – New Proposed Definition

- A Supplier that is (1) connected to the distribution system, or located behind an end-use customer's utility meter, and (2) not otherwise eligible to participate as a Supplier, except as a Special Case Resource (SCR) or Emergency Demand Response Program (EDRP) resource

Eligibility & Day-Ahead and Real-Time Performance Obligations Overview

- In addition to meeting minimum aggregation criteria (discussed Feb. 28 & Apr. 28, 2017), a DCEA must meet additional eligibility requirements to provide Energy and Ancillary Services
 - NYISO will review existing criteria applicable to Generators and Demand Side Resources and determine what modifications, if any, should be made for DER
 - Additional eligibility criteria may be developed
- Existing RT & DA Operational Requirements and Resource Obligations
 - Aggregation & Supply Offer Parameters (Bidding Model)
 - Existing Generator and Demand Response supply offer attributes
 - RT Dispatch (RTD), RT Commitment (RTC) & DA Security Constrained Unit Commitment (SCUC)
 - Energy and Ancillary Services Eligibility Criteria
 - Incorporating FERC Order 745 concepts for Offer Floor/Net Benefits Test
- RT & DA Settlements
 - FERC Order 745 directive for cost allocation

Eligibility and Performance Obligations for DER

- **This presentation outlines the NYISO's proposals for DER**
 - Application of existing eligibility requirements, performance obligations as well as DER registration and offer parameters
 - Potential for application of new rules to DER aggregations consisting of various resource types

Proposed DCEA Registration and Offer Parameters

DCEA Registration Parameters

- **Generation Type – DER, Renewable, other**
- **Response Rates**
 - Emergency Response Rate (MWs/Min)
 - Regulation Capacity Response Rate (MWs/Min)
 - Normal Response Rate 1 (MW/Min)
 - Normal Response Rate 1 (MW)
 - Normal Response Rate 2 (MW/Min)
 - Normal Response Rate 2 (MW)
 - Normal Response Rate 3 (MW/Min)
- ~~Physical~~ **Min Gen (MW) & Min Load (MW)**
- **Min Gen Cost (\$)** or **Min Load Cost (\$)**
- **Start-up Cost (\$)** or **Start-up Load Cost (\$)**

- **Blue text indicates new ES parameters**
- **Black text indicates existing parameters**
- ~~Stricken text indicates parameters not to be included~~

DCEA Registration Parameters (cont'd.)

- Estimated Summer Operating Capacity (MW @ x degrees F)
- Estimated Winter Operating Capacity (MW @ x degrees F)
- DAM and RTM Bid options
 - Fixed Energy
 - Dispatch Energy
 - 10 Minute Spinning Reserves
 - 30 Minute Spinning Reserves
 - 10 Minute Non-Synchronized Reserves
 - 30 Minute Non-Synchronized Reserves
 - Regulation Control
 - Voltage Support (NYISO is researching if this is possible)

DCEA Registration Parameters (cont'd.)

- Transition Time (min)
- Upper and Lower Charge Limits (MWh)
- Charge Rate [Max Load] (MW)
- Discharge Rate [UOL] (MW)
- ~~Energy Level [SoC] (yes/no)~~
- Min and Max Charge Time (min)
- Min and Max Run Time (min)
- Min Downtime (min)
- ~~Withdrawing and Injecting Losses (%)~~
- ~~Through Put (MWh)~~

DCEA Offer Parameters

- Market – DAM/RT
- Date/Time (including each hour being offered)
- Upper Operating Limit (MW)
- Emergency Upper Operating Limit (MW)
- Min Gen (MW) & Min Load (MW)
- Min Gen Cost (\$) or Min Load Cost (\$)
- Operating Mode
 - ISO committed (fixed/flexible)
 - Self committed (fixed/flexible)
 - Fixed – fixed operating level that can be specified in 15min increments, no real-time dispatch evaluation, ineligible for reserve or regulation
 - Flexible – flexible operating level, follows 5min basepoints

DCEA Offer Parameters (cont'd.)

- Self Scheduled MW (MW) – 15 minute MW schedule values (HAM only)
- ~~Host Load (MW) – for BTM:NG Resources only~~
- Bid Curve (MW/\$ per MW)– up to 11 point curve representing the incremental cost to supply
- Ancillary Services (based on qualification to provide service)
 - 10 Minute Spinning Reserves (\$/MW) – single \$ cost value (DAM only)
 - 10 Minute Non-Synchronized Reserves (\$/MW) – single \$ cost value (DAM only)
 - 30 Minute Spinning Reserves (\$/MW) – single \$ cost value (DAM only)
 - 30 Minute Non-Synchronized Reserves (\$/MW) – single \$ cost value (DAM only)
 - Regulation Movement (\$/MW) – single \$ cost value (DAM & RTM)
 - Regulation Capacity (MW and \$/MW) – both the MW amount and single \$ cost value (DAM & RTM)

DCEA Commitment Parameters

- **Minimum Run Time** – min hours unit must run once started by NYISO
- **Minimum Down Time** – min hours unit must be down once de-committed by NYISO
- **Maximum Stops/Day** – number of times unit can be de-committed in dispatch day
- **Start-up Cost or Start-up Load Cost**
 - For resources that have the ability to transition between load and injection states these costs will not be used for each transition change, but instead only for the initial startup
- **Start-up Notification Time Curve (hours to start/hours offline)** – up to 6 point curve representing time to start after being offline for a specified number of hours
- ~~Beginning & Ending State of Charge (MWh)~~

DCEA Commitment and Dispatch Concepts

DCEA Commitment

- NYISO is exploring the feasibility of allowing DCEAs 1MW and larger to be committed
 - Super Aggregations will not be eligible for commitment
- NYISO is trying to find a balance between allowing all resources to participate (including allowing for DCEA commitment) without impacting market efficiency and operational reliability



Commitment & Dispatch

- **NYISO will evaluate whether additional smaller resources will cause delays to SCUC and RTC solution times, and to what extent additional smaller resources can be included in SCUC and RTC without unreasonable solution times**
 - Including impacts to the Unit Commitment algorithm solution tolerance
- **If a DCEA is committed**
 - DAM
 - A minimum run time up to 24hrs in a day
 - RTM
 - A minimum run time has a 1hr maximum
 - DCEAs will be committed based on prices set in RTC but will be settled on RTD prices
 - A maximum of a 30 minute notification time for startup in RTM
- **NYISO does not foresee any logic changes to the SCUC, RTC and RTD optimizations (Appendix B) at this time**

Next Steps

- NYISO and the utilities continue to discuss coordination and operational procedures for aggregation mapping to the transmission network
- Begin the Meter Data Study
 - Anticipated results in later this year
- Continue to develop Measurement & Verification/Monitoring & Control concept
- Continue reviewing Performance Obligations concept

Feedback?

- To ensure all feedback is captured please email additional feedback to: DER_Feedback@nyiso.com

Reminder – All comments received will be posted on the NYISO Demand Response Programs [webpage](#)

Appendix A - Acronyms

- DER – Distributed Energy Resource
- DCE – DER Coordinator Entity
- DCEA – DCE Aggregation
- DSP – Distributed System Platform provider
- DR – Demand Response
- RT - Real-Time
- DA – Day-Ahead
- RTC – RT Commitment
- RTD – RT Dispatch
- DAM – DA Market
- RTM – RT Market

Appendix B - Current Commitment and Dispatch Concepts

Day-Ahead Commitment

- The NYISO's SCUC software is a multi-period, security constrained unit commitment process that co-optimizes to solve simultaneously for Load, Operating Reserves, and Regulation Service on a least as-bid production cost basis over a twenty-four hour optimization period.
 - Evaluates day-ahead offers, identifies unit commitments & financially binding schedules for generators and bilateral transactions for twenty-four, one hour intervals
- **SCUC evaluates the following resource parameters:**
 - Day-ahead outages
 - Preliminary zonal load forecasts
 - Generation offers
 - NYISO load forecasts
 - LSE load bids
 - Virtual bids/offers; and
 - External transactions

**See section 3 (NYISO Market Mechanics) of the Market Participants User's Guide for more details*

Real-Time Commitment

- The NYISO's RTC software is a multi-period, security constrained unit commitment and dispatch process that co-optimizes to solve simultaneously for Load, Operating Reserves, and Regulation Service on a least as-bid production cost basis over a two and half hour optimization period.
 - Evaluates real-time offers and makes binding unit commitment and de-commitment decisions for the periods beginning 15 minutes (in the case of resources that can respond in ten minutes) and 30 minutes (in the case of resources that can respond in thirty minutes) after each RTC run
 - Produces binding schedules for external transactions; and
 - Provides advisory commitment information for the remainder of its optimization period
- Each RTC run considers:
 - SCUC's resource commitment for the day;
 - Load and loss forecasts for each quarter hour in its optimization timeframe;
 - Binding transmission constraints;
 - External transactions; and
 - All real-time offers and offer parameters by Generators that are able to start within 30 minutes.

**See section 3 (NYISO Market Mechanics) of the Market Participants User's Guide for more details*



Real-Time Dispatch

- **The NYISO's RTD software is a multi-period, security constrained dispatch model that co-optimizes to solve simultaneously for load, operating reserves, and regulation service, and to minimize the total cost of production over its nominal optimization period of one hour.**
 - Dispatches Generators, BTM:NG Resources and Demand Side Resources on a 5-minute basis;
 - Calculates real-time market clearing prices for energy, operating reserves, and regulation service, and establishes real-time schedules for those products on a five-minute basis
- **RTD does not consider start-up costs in any of its dispatching.**
- **In addition to producing a binding schedule for the next five minutes, each RTD run produces advisory schedules for the remaining four 15-minute periods of its bid-optimization horizon.**

**See section 3 (NYISO Market Mechanics) of the Market Participants User's Guide for more details*

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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