

Capacity Market Rules for the Dispatchable DER Model

Zachary T Smith

Manager, Capacity Market Design

ICAPWG

August 23rd, 2018



DRAFT – FOR DISCUSSION PURPOSES ONLY

©COPYRIGHT NYISO 2017. ALL RIGHTS RESERVED

Agenda

- **Background**
- **Distributed Energy Resource (DER) overview**
- **Capacity Market Rules for the Dispatchable DER Model**
 - Capacity Market Qualification Rules
 - Capacity Market Eligibility and Participation Rules
 - Derating Factors for Distributed Energy Resources
 - Obligations and Other Capacity Market Rules

Background

Previous Presentations

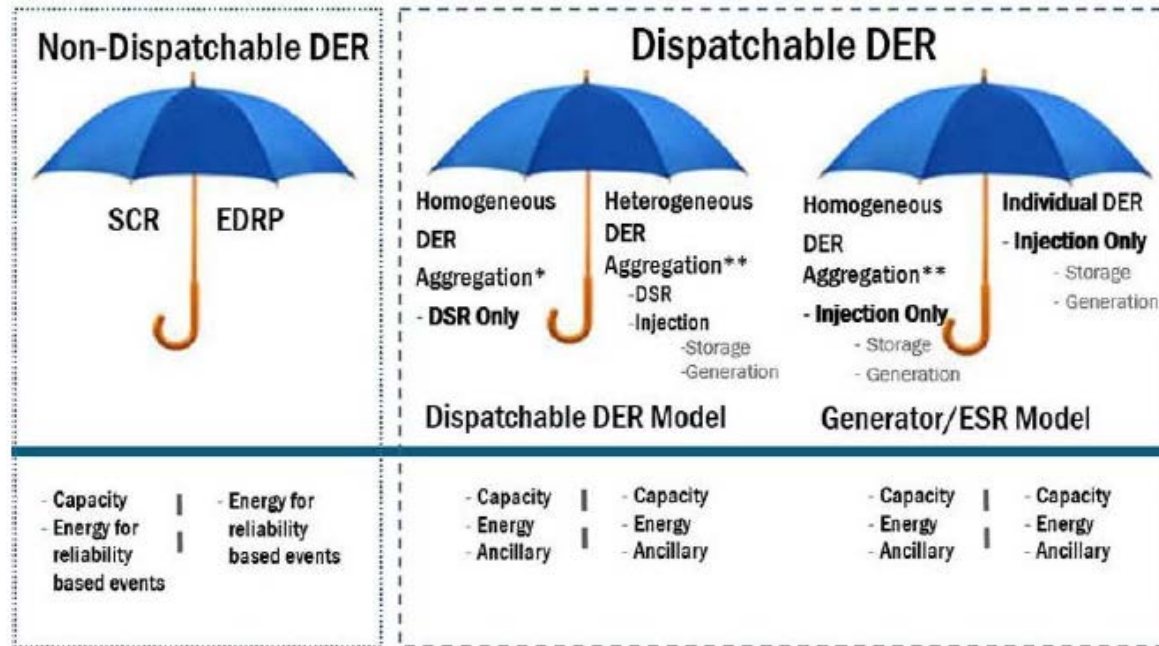
- July 26th ICAPWG – Capacity Market Rules for Distributed Energy Resources
- August 14th ICAPWG – Capacity Market Rules for the Dispatchable DER Model

Purpose of Today's meeting

- **Review NYISO's proposed design of the Dispatchable DER Model for resources that meet the eligibility criteria to be a full capacity supplier**
 - Proposed design of the rules are subject to change
 - Rules on partial capacity, changes in eligibility requirements, and dual participation are not part of today's presentation
- **Solicit feedback on the market design**

Distributed Energy Resource Overview

Participation Models Available to DER



* Aggregations consisting only of Demand Side Resources (DSR) can be comprised of 1 of more Facility.

** All other aggregations must be composed of 1 or more Facilities.

Capacity Market Rules for the Dispatchable DER Model

DRAFT – FOR DISCUSSION PURPOSES ONLY

© COPYRIGHT NYISO 2017. ALL RIGHTS RESERVED.

Capacity Market Qualification Rules

- **What will a resource using the Dispatchable DER Model need to be qualified to participate in the Capacity Market?**
 - Satisfaction of all registration requirements, including an effective Interconnection Agreement with the Connecting Transmission Owner (or with the Connecting Transmission Owner and the NYISO, if the resource is subject to the NYISO's interconnection procedures) that allows wholesale market participation
 - Specific to Injection portion of the resources
 - CRIS obtained through existing NYISO processes
 - More information on CRIS is found on the following slide
 - Two year forward outage schedule beginning from the anticipated date of first offer into the capacity market

Capacity Market Qualification Rules (continued)

- **Consistent with current practice, CRIS will only be for the Injection capability of the Dispatchable DER Model**
 - CRIS does not apply to Withdrawal or Load Reduction portion of the resources
 - Facilities with both Injection and Withdrawal or Load Reduction capability will only be evaluated for CRIS for the Injection portion of the resource

Capacity Market Qualification Rules (continued)

- What will a resource using the Dispatchable DER Model need to be qualified to participate in the Capacity Market?
 - Capability to meet the minimum run-time duration requirement
 - The NYISO is requiring that these resources be able to perform for the full duration requirement
 - The duration requirement is pending the GE Study
 - The NYISO expects that any proposal would be generally applicable to all Capacity Suppliers
 - DMNC test
 - More information on the DMNC test is found on the following slides

Buyer-side Market Power Mitigation (BSM) of the Dispatchable DER Model

- What will a resource using the Dispatchable DER Model need to be qualified to participate in the Capacity Market?
 - Distributed Energy Resources that are Injection resources in Mitigated Capacity Zones (i.e., presently NYC and G-J Locality) must be evaluated under the BSM Rules
 - The NYISO will determine if they are exempt or subject to an Offer Floor (i.e., the price at or above which they can offer, and such offers are restricted to the ICAP Spot Market Auction)
 - For DERs with more than 2 MW of injection capability, exemptions are available if they pass one of two economic tests, or if they request and are determined to be eligible for a special exemption
 - Competitive Entry Exemption. Proposed rules pending before FERC (since April 2016): renewable energy exemption and a self supply exemption

Capacity Market Eligibility and Participation Rules

- What is necessary for a resource using the Dispatchable DER Model to be eligible to participate in the Capacity Market and for what quantity?
 - Resources will only be allowed to change DCEA at the beginning of the Capability Period
 - Must provide a DMNC for the full duration requirement each Capability Period
 - DMNC will be reported for each asset or aggregation as well as what the load reduction and/or injection portion of the asset provided
 - Aggregations will be tested as a whole, not on an individual asset basis
 - Aggregations that obtain an existing asset (but new to aggregation) do not need to provide a new DMNC test
 - Aggregations that obtain an asset new to the market must provide a new DMNC test for the aggregation as whole if the aggregation wants to sell that asset in the Capacity Market

Capacity Market Eligibility and Participation Rules (continued)

- What is necessary for a resource using the Dispatchable DER Model to be eligible to participate in the Capacity Market and for what quantity?
 - ICAP for the Dispatchable DER Model will be based on CRIS and DMNC
 - $ICAP = \min(CRIS, DMNC \text{ of injection}) + DMNC \text{ of load reduction}$
 - UCAP for the Dispatchable DER Model will be the ICAP times the quantity 1 minus the Derating Factor
 - $UCAP = ICAP * (1 - \text{Derating Factor})$
 - Derating factors for the Dispatchable DER Model will be calculated using the new availability calculation
 - Details on following slides
 - The NYISO is still evaluating what, if any, changes are necessary for resources using the DER Participation Model in Mitigated Capacity Zones subject to “Supply Side” Mitigation measures (i.e., the Pivotal Supplier rules)

Derating Factors for resources using the Dispatchable DER Model

- How will derating factors for resources using the Dispatchable DER Model be calculated?
 - Derating factors for assets using the Dispatchable DER Model will be calculated based upon a time-weighted UOL availability evaluated against the ICAP sold of the aggregation the DER asset is part of
 - For each RTD interval that the UOL is adjusted down due to a NYISO or a TO reliability need, the NYISO will replace the UOL with the bid UOL
 - The Normal UOL will be capped against the ICAP Sold, and the number of seconds will be calculated for that interval
 - For the intervals where the unit was on a planned or scheduled outage approved by NYISO operations, the seconds will be set to 0, removing it from the calculation
 - The NYISO is still evaluating the rules for when a resource runs of out energy

Derating Factors for resources using the Dispatchable DER Model (continued)

- How will derating factors for resources using the Dispatchable DER Model be calculated?
 - Derating factors for assets using the Dispatchable DER Model will be calculated based upon a time-weighted UOL availability evaluated against the ICAP sold of the aggregation the DER asset is part of
 - For each month, 4 values will be calculated
 - Total Seconds – Sum of seconds in the month that the unit was not on an approved outage
 - Total Available Capacity – Sum of (Normal UOL for interval * seconds in interval) for the month
 - Total Expected Capacity – ICAP sold * Total Seconds
 - Monthly Availability – Total Available Capacity / Total Expected Capacity

Derating Factors for resources using the Dispatchable DER Model (continued)

- How will derating factors for resources using the Dispatchable DER Model be calculated?
 - Using the availability of the aggregation the DER asset is part of, 12-month blocks will be calculated, summing the Total Available Capacity, the Total Expected Capacity, and the availability calculation for the 12-month block
 - The availability factor for the Dispatchable DER Model will be the average of 6 of the 12-month blocks
 - These will be the same 12-month blocks used in the existing EFORd calculation
 - Derating factor to determine Summer UCAP uses a 12 month period ending in July, August, September, October, November, and December from the prior year
 - Derating factor to determine Winter UCAP uses a 12 month period ending in January, February, March, April, May, and June from the current year
 - Derating Factor = $1 - \text{Availability Factor}$

Derating Factors for resources using the Dispatchable DER Model (continued)

- **What will be the default derating factors for resources using Dispatchable DER Model who are just entering the market?**
 - For the Dispatchable DER Model:
 - Once 3 or more resources have entered the market and have data available to calculate derating factors, the NYISO will use the NYISO class average
 - Pending significant penetration of resources, the NYISO still evaluating the default derating factor
 - Resources that have availability data for some of the required timeframe but not all of the timeframe will use the default values for the timeframes that are missing

Obligations and Other Capacity Market Rules

- **What are the obligations for a resource using Dispatchable DER Model that has sold capacity into the NYISO's Capacity Market?**
 - Continue to provide 2 year forward outage information
 - Bid/Schedule/Notify for all 24 hours for the DAM for the ICAP equivalent of the UCAP sold
 - Max run time constraints will be respected

Obligations and Other Capacity Market Rules (continued)

- What are the obligations for a resource using the Dispatchable DER Model that has sold capacity into the NYISO's Capacity Market?
 - Respond to a NYISO SRE
 - Subject to penalties/shortfall charges, e.g., for over sale of capacity, failure to Bid/Schedule/Notify

Derating Factor Example

Derating Factors for resources using the Dispatchable DER Model

	Aggregation A	Aggregation B
12-Month Average Availability, M.E.:	Availability Factor	Availability Factor
July	83%	92%
August	80%	96%
September	83%	96%
October	83%	96%
November	73%	96%
December	83%	80%
Summer Capability Pd.	81%	93%
January	83%	80%
February	83%	96%
March	80%	98%
April	83%	96%
May	83%	96%
June	83%	96%
Winter Capability Pd.	83%	94%

- Example of availability factor calculation for two different aggregations

Derating Factors for resources using the Dispatchable DER Model

- How will the derating factor be calculated for an DER using the Dispatchable DER Model that swaps between aggregations?
 - The NYISO is proposing that the DER's historic availability be assigned based on the availability of the aggregation(s) in which it previously resided
 - The derating factor for an DER within an aggregation will be calculated based on the aggregation performance factor
 - The performance factor is based on the Total ICAP for the aggregation on a monthly basis

Derating Factor Calculation Example (continued)

- For example, a 10 MW DER swapped from Aggregation A to Aggregation B
 - The availability of both Aggregations is immediately effected by the DER switch
 - Aggregation B does not know the monthly derating factors that make up the DER's derating factor; the Aggregation will only know how much UCAP the swapped DER can sell

Derating Factor Calculation Example (continued)

	Aggregation A	Aggregation B						
		Agg. B prior to New Asset		New Asset		Total Agg. B with New Asset		
12-Month Average Availability, M.E.:	Availability Factor	ICAP	UCAP	ICAP	UCAP	ICAP	UCAP	Availability Factor
July	83%	50	46	10	8.3	60	54.3	91%
August	80%	50	48	10	8.0	60	56.0	93%
September	83%	50	48	10	8.3	60	56.3	94%
October	83%	50	48	10	8.3	60	56.3	94%
November	73%	50	48	10	7.3	60	55.3	92%
December	83%	50	40	10	8.3	60	48.3	81%
Summer Capability Pd.	81%					60	54.4	91%
January	83%	50	40	10	8.3	60	48.3	81%
February	83%	50	48	10	8.3	60	56.3	94%
March	80%	50	48	10	8.0	60	56.0	93%
April	83%	50	48	10	8.3	60	56.3	94%
May	83%	50	48	10	8.3	60	56.3	94%
June	83%	50	48	10	8.3	60	56.3	94%
Winter Capability Pd.	83%					60	54.9	92%

Open Items

- **Duration requirements**
 - DMNC test lengths are subject to change based on the duration requirement
- ~~The ability to move between aggregations~~
 - ~~NYISO is evaluating tracking DMNC and Derating Factors for resources that move between aggregations~~
- **The ability to stack/sequentially align (time stacking) resources to meet the minimum requirements for full capacity payments**

Next Steps

- Future ICAPWG to continue discussion

Feedback/Questions?

- Email additional feedback to: ztsmith@nyiso.com and 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



www.nyiso.com