

# Modeling Improvements for Capacity Accreditation: SCR Modeling

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# Agenda

- **Background**
  - Modeling Improvements for Capacity Accreditation
  - SCR Modeling
- **Review of 2022 SCR CAF Results**
- **2023 Work Plan**
- **Next Steps**

# Background

# Background: Modeling Improvements for Capacity Accreditation

- **As part of the 2022 Improving Capacity Accreditation project, the NYISO identified that the functionality utilized in the current resource adequacy analysis -- used to establish New York State installed reserve margins and used as the basis of determining Capacity Accreditation Factors -- related to the modeling of and accounting for attributes, such as correlated fuel unavailability for non-renewable resources, long start up notification requirements, non-fuel-related correlated outages, etc., may limit the basis for identifying certain Capacity Accreditation Resource Classes (CARCs) and calculating Capacity Accreditation Factors(CAFs) for some resource types**
  - Enhancing the model's functionality will enable more accurate calculations of the Resource Adequacy requirements needed to maintain reliability and the Capacity Accreditation Factors, which will reflect the marginal reliability contributions of each Capacity Accreditation Resource Class
- **The Modeling Improvements for Capacity Accreditation project deliverable is the development of Functional Requirements due in Q4 2023**

# Background: SCR Modeling

- **Special Case Resources (SCRs) are modeled in the IRM/LCR model. However, the current modeling of SCRs in the IRM/LCR model is not sufficiently aligned with the expected performance and obligations of SCRs in the NYISO's market. Therefore, SCRs cannot currently be treated as a separate CARC, for which to separately calculate CAFs, using the current modeling of SCRs**
  - The following slide highlights differences in the modeling of SCRs in the IRM/LCR model compared to the expected performance and obligations of SCRs in the NYISO's market
  - Until the IRM/LCR model reflects the expected performance and obligations of SCRs in the NYISO's market, SCRs will be assigned to the 4-hour Energy Duration Limitation Capacity Accreditation Resource Class
- **As part of this project, the NYISO will examine and recommend how to better reflect the expected performance and obligations of SCRs in the IRM/LCR study**
  - Changes to the design of the SCR program are not within the scope of this project. Discussions on the needs of demand side resources and DERs, and gaps of the current NYISO DR/DER programs will take place as part of the Engaging the Demand Side initiative.

# Background: SCR Modeling

- **IRM/LCR modeling**
  - SCRs are modeled as a step in the Emergency Operating Procedure (EOP)
    - GE MARS activates EOP steps if there is not enough capacity to supply load in the simulation
  - GE MARS does not consider certain market requirements such as advanced notice for SCRs
  - The SCR EOP is limited to a maximum of 5 activations per month
  - SCRs are modeled without output hour limitations and therefore can be available for the whole day
  - All SCRs in the NYISO are activated as part of the EOP
  - SCRs are modeled at a derated capacity based on zonal performance factors and zonal Average Coincident Load (ACL) to Customer Base Load (CBL) derates
- **Expected performance and obligations in the NYISO market**
  - Similar to an EOP, the NYISO activates SCRs only when the Day-Ahead Market indicates potential serious shortages of supply for the next day. (ICAP Manual Section 4.12.5)
  - The NYISO is required to provide SCRs with advanced notice at least 21-hours prior to activation
  - There is no maximum number of SCR activations per month in the NYISO market
  - When activated, SCRs have a minimum 4-hour performance obligation. SCRs are not expected to reduce load for the entire day
  - SCRs can be activated separately by LBMP zone
  - SCRs receive capacity payments based on the Aggregation’s seasonal performance factor, which “recognizes over-performance by one SCR to compensate for underperformance by another SCR in the same SCR Aggregation in the same hour” (ICAP Manual Section 4.12.2)

# Review of 2022 SCR CAF Results

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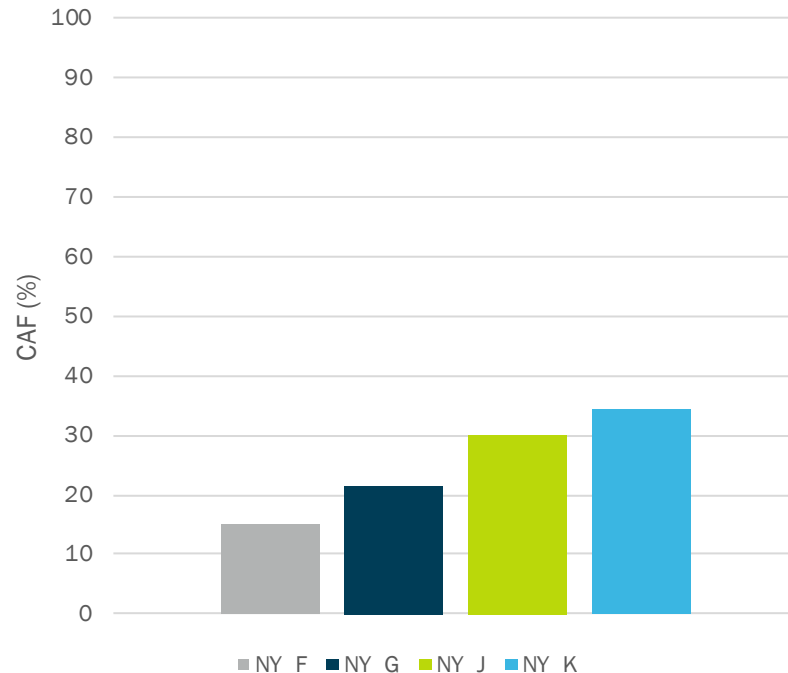
- **As part of the NYISO's 2022 Improving Capacity Accreditation project, the NYISO and GE calculated Capacity Accreditation Factors (CAFs) for SCRs under various modeling approaches for the representative SCR unit and existing SCRs in GE MARS<sup>1</sup>**
  - All testing utilized the 2022 NYISO LCR database
- **The purpose of this presentation is to review the 2022 SCR CAF results and discuss next steps**

<sup>1</sup> See the NYISO presentation to the [07/28/2022 ICAPWG meeting](#)



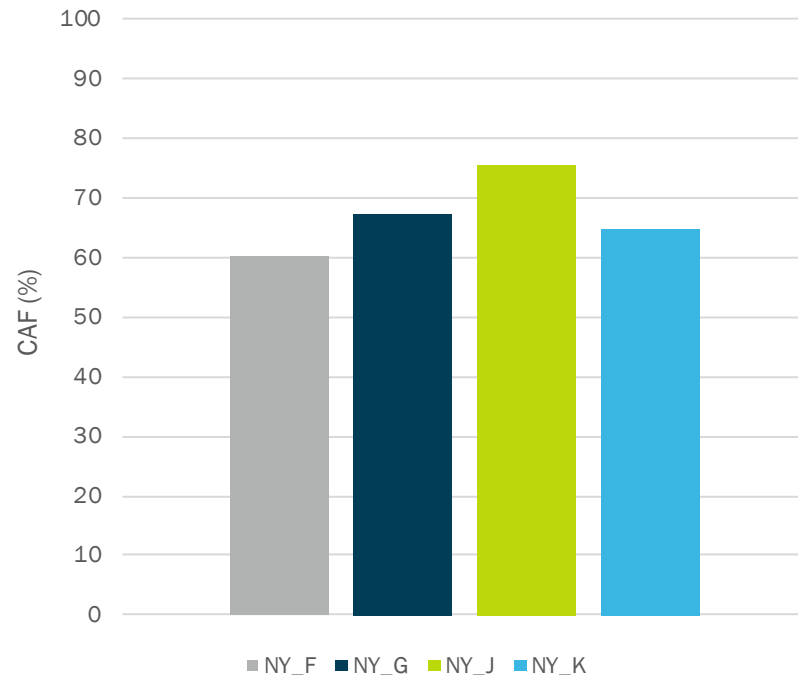
# Review of 2022 SCR CAF Results

- When the representative SCR unit was modeled consistently with the current modeling of SCRs in the IRM/LCR model, the average SCR CAF was approximately 25%
  - Modeled as a step in the Emergency Operating Procedure (EOP)
  - Limited to a maximum of 5 activations per month
  - Modeled with no output hour limitation (i.e., available for the whole day)
  - All SCRs activated as one unit



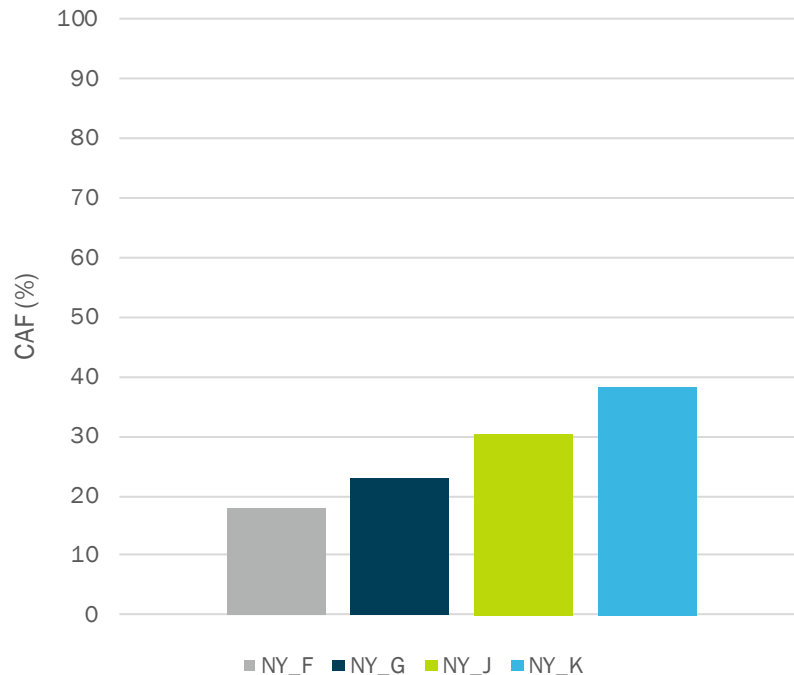
# Review of 2022 SCR CAF Results

- **When the representative SCR unit was modeled closer to the expected performance and obligations of SCRs in the NYISO's market, the average SCR CAF increased to approximately 70%**
  - The representative SCR unit was modeled using the 4-hour energy-limited unit type in GE MARS, subject to a 1 call per day limit and no maximum monthly activation limit
    - This unit type was subject to a starting output window of 1 pm
  - The modeling of the existing SCRs in the base IRM/LCR model was not changed (*i.e.*, continued to be modeled as a step in the EOP, subject to a maximum of 5 activations per month and no output hour time limitation)



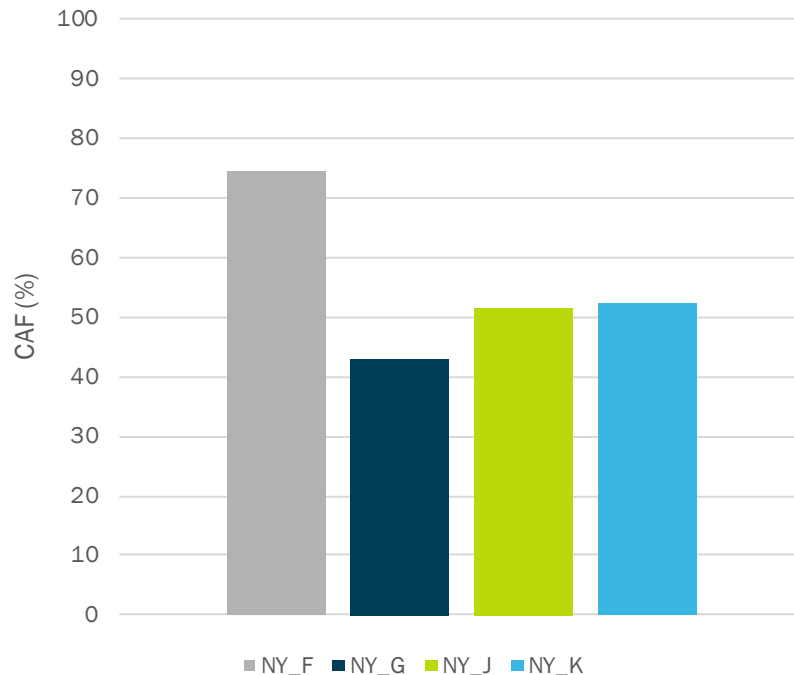
# Review of 2022 SCR CAF Results

- When both the existing SCRs and representative SCR unit were modeled using the 4-hour energy-limited unit type (subject to a 1 call per day limit and no maximum monthly activation limit), the average SCR CAF decreased to approximately 27%
  - Changing the modeling of the existing SCRs lowered the starting LOLE to 0.092 compared to the 0.10 LOLE of the 2022 LCR model
    - The timing and magnitude of loss of load events also changed, impacting the CAF values
      - Since the 4-hour energy-limited unit type was subject to a starting output window of 1 pm, all SCRs were called at 1 pm on days of need
      - The addition of the representative SCR unit, which also started at 1 pm, provides less additional reliability value when all SCRs start at 1 pm



# Review of 2022 SCR CAF Results

- **In the market, the NYISO can call SCRs of different zones at different times**
  - The NYISO tested the CAF impact of staggered zonal start times of SCRs by allowing Zone F SCRs to be called starting at 12 pm and Zone J SCRs to be called starting at 2 pm
    - Lowered the starting LOLE to 0.088
- **Staggered start times changed the timing and magnitude of loss of load events**
  - The new timing and magnitude of loss of load events resulted in the average SCR CAF increasing from 27% to 55%
- **Staggering SCR start times in different ways would produce different CAF values for SCRs and other resource types**
  - Challenge: What is the correct staggering of SCR start times?



# 2023 Work Plan

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## ■ Q1-Q2

- Analyze SCR performance in comparison to current IRM/LCR modeling
- Test alternative ways to stagger zonal SCR activations in the IRM/LCR model

## ■ Q2-Q3

- Coordinate with the New York State Reliability Council (NYSRC)'s EOP whitepaper effort to test SCR modeling changes within broader possible EOP modeling changes
- Identify the preferred modeling approach to better reflect the expected performance and obligations of SCRs in the IRM/LCR model

## ■ Q3-Q4

- Prototype the preferred SCR modeling approach on the 2024 Preliminary Base Case database
- Recommend the preferred SCR modeling approach to the NYSRC

# Next Steps

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- **The NYISO currently plans to return in April to discuss analysis of SCR performance in comparison to current IRM/LCR modeling**



# Questions?

# Our Mission & Vision



## Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



## Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation