New York ISO
Independent System Operator

BTM Solar Modeling and Impact Assessment

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Agenda

- Background
- Methodology
- Impact Assessment
- Next Steps

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Background

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Background

- **During the ICS meeting on 1/30/2024, the NYISO presented a potential methodology and the initial impact assessment of modeling Behind-the-Meter (BTM) solar as a supply resource**
  - However, because the underlying solar data is based on the baseline energy forecast, the potential impact on the Installed Reserve Margin (IRM) and the locational capacity requirements identified concerns as to whether such a stand-alone change would be appropriate
- **During the ICS meeting on 2/27/2024, ICS indicated that a comprehensive improvement of the load modeling should be developed before proceeding with efforts to explicitly model the BTM solar**
- **During subsequent ICS meetings, the NYISO presented the details and the impact assessment of a potential alternative load shape adjustment method**
  - The potential alternative load shape adjustment method would adjust the seasonal peaks and the annual energy requirement to be aligned with the forecasts
  - The potential alternative load shape adjustment method aligns with the methodology currently used in the NYISO's Reliability Needs Assessment (RNA)
- **During the ICS meeting on 6/5/2024, ICS expressed interest in exploring the combined impact of the potential alternative load shape adjustment method and explicitly modeling BTM solar resource**

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Methodology

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Overview of BTM Solar Modeling

- **To model BTM solar explicitly, both the resource side and the load side modeling need adjustments**
- **The NYISO's BTM solar data would be utilized to develop the hourly profiles for BTM solar load for each zone. Inputs include:**
  - NYISO's forecasted annual energy reduction by BTM solar PV (NYISO Load & Capacity Data report or "Gold Book" Baseline Forecast Table I-9b)
  - Energy normalized representative hourly values of BTM solar
    - To be multiplied by the Gold Book Table I-9b data to produce hourly MW values for the applicable year
- **If BTM solar is modeled explicitly as a supply resource in the MARS model, the calculation for the IRM should remain unchanged**
  - Net demand forecast should continue to be used as the denominator of the IRM calculation
  - The MW of BTM solar would not be counted in the total ICAP in the numerator of the IRM calculation
  - The derating factor of BTM solar would not be included in the IRM zonal derating factors as a part of the shifting methodology

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BTM Solar Modeling

Load side modeling

- Modeled as negative Demand Side Management (DSM) units
- The 2013, 2017, and 2018 BTM solar zonal hourly load profiles
- The BTM solar shapes are aligned with the underlying load shapes

  LFU bins 1 – 2: 2013
  LFU bins 3 – 4: 2018
  LFU bins 5 – 7: 2017

- Not subject to the Load Forecast Uncertainty (LFU) multipliers

Supply side modeling

- Modeled as positive DSM units
- Modeled using the recent 5 years of hourly profiles
  - 2018-2022 shapes used for the impact assessment presented herein
  - For 2025-2026 IRM study, 2019-2023 shapes would be used
- One of the historical shapes is chosen randomly for each replication during the MARS simulations
  - The selection will be consistent with the selection of the other DSM resources

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Impact Assessment

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Impact on 2024-2025 IRM FBC (Tan45)

	IRM	J LCR	K LCR	G-J Locality
C00: 2024-2025 IRM FBC	23.10%	72.73%	103.21%	84.58%
C01: Alternative Load Method	21.70%	72.25%	103.01%	84.22%
C02: BTM Solar Modeling + C01	22.50%	72.92%	104.31%	84.72%
Delta (from C00) – Combined Impact	*-0.60%*	*0.19%*	*1.10%*	*0.14%*
Delta (from C01) – BTM Solar Impact	*0.80%*	*0.67%*	*1.30%*	*0.50%*

- **The combination of the BTM solar modeling and the potential alternative load shape adjustment method decreases the IRM by 0.6%**
- **With the explicit modeling of BTM solar, locational capacity requirements increase**
  - The Load Zone K locational requirement increases by a greater margin because the quantity of BTM solar in Load Zone K is double that of Load Zone J
- **The explicit modeling of BTM solar when assessed as a stand-alone impact increases the IRM by 0.8% compared to the stand-alone impact of using the potential alternative load shape adjustment method**
  - Modeling BTM solar as a supply side resource with the most recent 5 years of production profiles increases uncertainty in the model, and consequently increases the IRM

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Hourly Risk Analysis

- The NYISO conducted an hourly risk analysis for the 2024-2025 IRM Final Base Case (FBC) to better understand the combined impact of the BTM solar modeling with the potential alternative load shape adjustment method

	HB00	HB01	HB02	HB03	HB04	HB05	HB06	HB07	HB08	HB09	HB10	HB11	HB12	HB13	HB14	HB15	HB16	HB17	HB18	HB19	HB20	HB21	HB22	HB23
C00: 2024-2025 IRM FBC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	6%	7%	13%	20%	21%	12%	6%	7%	4%	0%	0%
C02: BTM Solar +Alt. Load	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	8%	7%	14%	21%	22%	11%	5%	5%	2%	0%	0%

- The combination of explicitly modeling BTM solar and the potential alternative load shape adjustment method would result in slightly more concentrated hourly risk compared to the 2024-2025 IRM FBC
- The hours that trigger loss of load events, however, remain unchanged
  - The high-risk hour window (HB15-HB18) would also remain unchanged from the 2024-2025 IRM FBC

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Next Steps

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Next Steps

- **Consider the BTM solar modeling (combined with the potential alternative load shape adjustment method) for a potential sensitivity to the 2025-2026 IRM Preliminary Base Case (PBC) using the 2024 Gold Book forecast data:**
  - Summer and winter peak forecasts
    - coincident peak, non-coincident peak, and G-J Locality peak
  - Baseline annual energy forecast
  - Forecasted annual energy reduction by BTM solar
- **The NYISO will provide ongoing updates to the ICS to share progress and solicit feedback**
- **Future work:**
  - Consider the BTM solar modeling in combination with the potential alternative load shape adjustment method for a sensitivity to the 2025-2026 IRM FBC using the updated fall forecast data

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Questions?

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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

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