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Independent System Operator

2020 RNA: Behind-the-Meter Solar PV

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Agenda

- Data Inputs to GE MARS
- Load Shape Adjustment Procedure
- Incorporating BtM Solar Photovoltaic (PV)

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Inputs to GE MARS

- **Three Required Input Files**
  - Load Shape File, containing load shapes for each area
  - Hourly Modifier File, containing generation shapes for select units
  - The “MIF” (Master Input File), containing all other information
- **This presentation discusses:**
  - how data is prepared for the Load Shape File
  - how solar data is included in the Hourly Modifier File

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Applying Probabilistic Methods

- **Two methods for shapes representing units:**
  1. Specifying multiple 8,760 hourly profiles that are randomly selected
     - This method is utilized for wind and other units, where 5 years of production data is equally weighted
  2. Specifying a random day selection mechanism, where either:
     - A random day within a sliding window is selected (*e.g.* ±3 days)
     - A random day within the month is selected
- **These methods can be combined in the latest MARS releases**

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Load Shape Data Sources

- **The following reference years are used:**
  - 2006 for load level 1 (highest Load Forecast Uncertainty - LFU)
  - 2002 for load level 2
  - 2007 for load levels 3 – 7 (lowest LFU)
- **The same historic reference years are used for the external areas**
- **Updates to LFU will be discussed at a future meeting**

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BtM Solar PV Data Sources

- **Profiles based on installed inverter data**
  - Actual data for 2017-19
  - Data derived for 2015 and 2016 from hourly irradiance values
- **The MARS random shape mechanism will be used**
  - Aligns with the method used for wind, utility solar, landfill gas, and run-of-river facilities

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Load Shape Adjustment Procedure

Applicable Gold Book Forecasts

- **Load Forecasts:**
  - Table I-2: Baseline Annual Energy
  - Table I-3A/I-3B: Baseline Coincident Peak Demand
  - Table I-4A/I-4B: Baseline Non-Coincident Peak Demand
  - Table I-5: Baseline Peak Demand in G-J Locality

NOTE: Table references from the 2019 Gold Book

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General Adjustment Procedure

For each reference shape:

1. Adjust reference shape to energy forecast
2. Adjust shape to seasonal zonal peak load forecast (non-coincident peak - NCP)
3. Adjust shape to additional seasonal peak load forecasts
   - NYCA (coincident peak)
   - G-J Locality
4. Repeat for each year of study

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Incorporating BtM Solar PV

Applicable Gold Book Forecasts

- **Load Forecasts:**
  - Table I-2: Baseline Annual Energy
  - Table I-3A/I-3B: Baseline Coincident Peak Demand
  - Table I-4A/I-4B: Baseline Non-Coincident Peak Demand
  - Table I-5: Baseline Peak Demand in G-J Locality
- **Behind-the-Meter Forecasts (New):**
  - Table I-9B: Solar PV Impacts, Behind-the-Meter (Energy)

NOTE: Table references from the 2019 Gold Book

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Adjusting the Solar Input Shapes

- **Shapes are adjusted to the energy forecast for each year**
  - NOTE: The PV available at peak may not match the forecast for PV at peak
  - If multiple resource shapes are used, then the expected average shape is adjusted to the energy forecast

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Changes to the Load Forecast

- **Update forecasts for Solar BtM PV Impact:**
  - The Energy Forecast is increased by the BtM Energy Forecast
  - The Peak Load Forecasts are increased by the expected Solar PV in the reference shapes
- **The adjustment methodology is otherwise unchanged**

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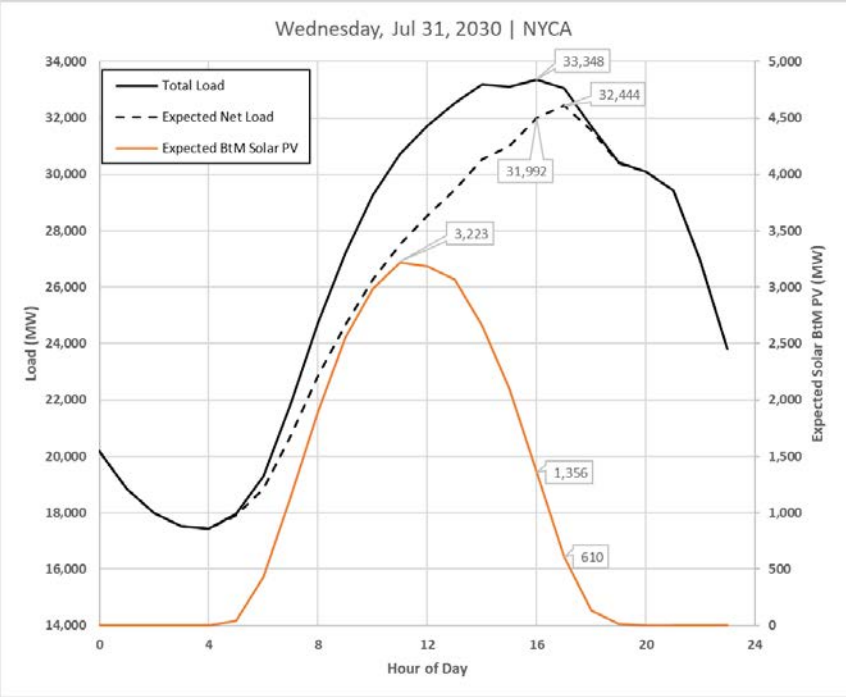
Example:



NOTE:
Numbers based on preliminary 2020 Gold Book load forecasts from March 16 ESPWG

Notes:

- **At HB16 (Total Load Peak):**
  - Total Load: 33,348 MW
  - Expected Net Load: 31,992 MW (Baseline Forecast)
  - Expected BtM Solar PV: 1,356 MW
- **At HB17 (Expected Net Load Peak):**
  - Total Load: 30,054 MW
  - Expected Net Load: 32,444 MW
  - Expected BtM Solar PV: 610 MW

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Questions?

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

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