New York Solar Eclipse August 21, 2017 Projected & Actual Implications

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VICE PRESIDENT OPERATIONS

NYISO Management Committee

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Eclipse – New York

- New York experienced a partial solar eclipse, from 2:30 to 2:45, with peak totality of roughly

  80% (Chautauqua County)

  75% New York City & Long Island

  67% (Clinton County)

Image From Time Magazine Online: http://time.com/4909879/solar-eclipse-new-york-city-photos/

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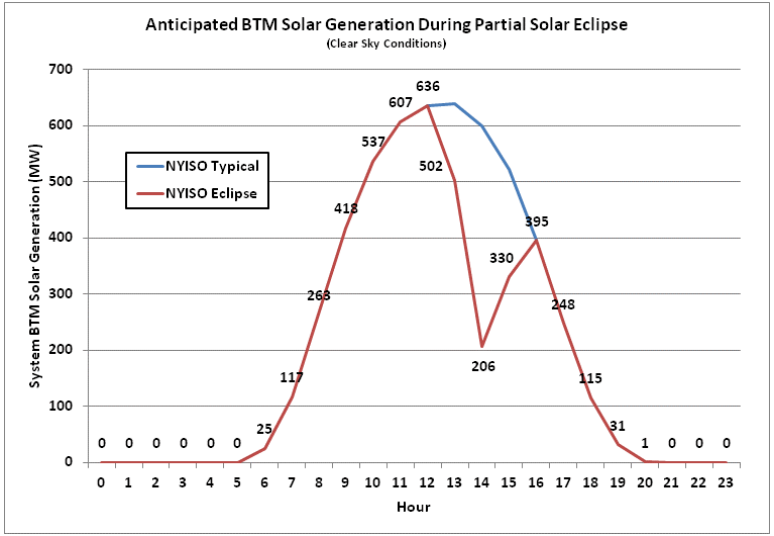
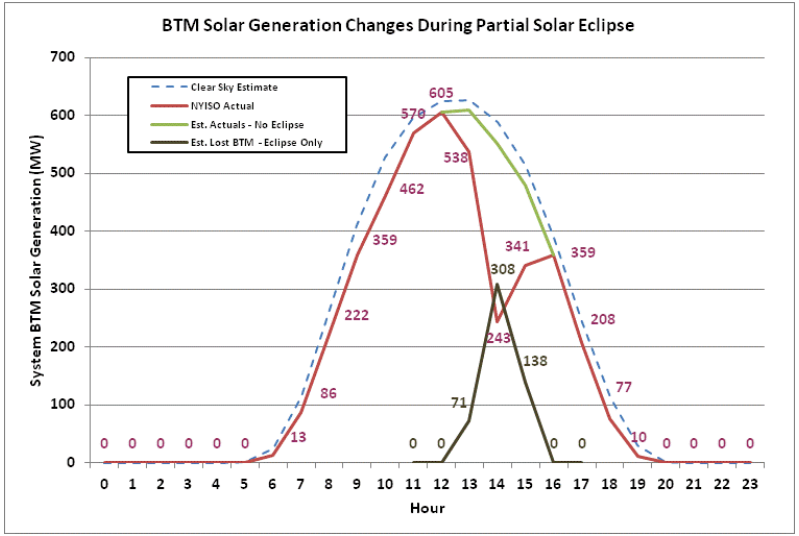
BTM - Projections vs. Actual, August 21 Eclipse





- Prior to the eclipse the actual BTM solar was slightly below maximum “clear sky” estimates
- The projected clear sky reduction of BTM solar was approximately 430 MW
- Experienced a 362 MW reduction of BTM solar
- Projected post eclipse BTM solar increase (clear sky) 189 MW and experienced 116 MW increase

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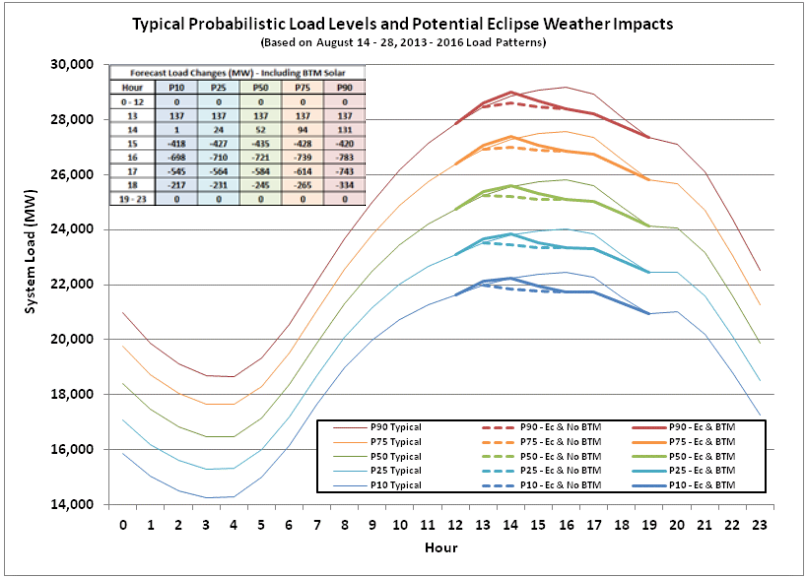
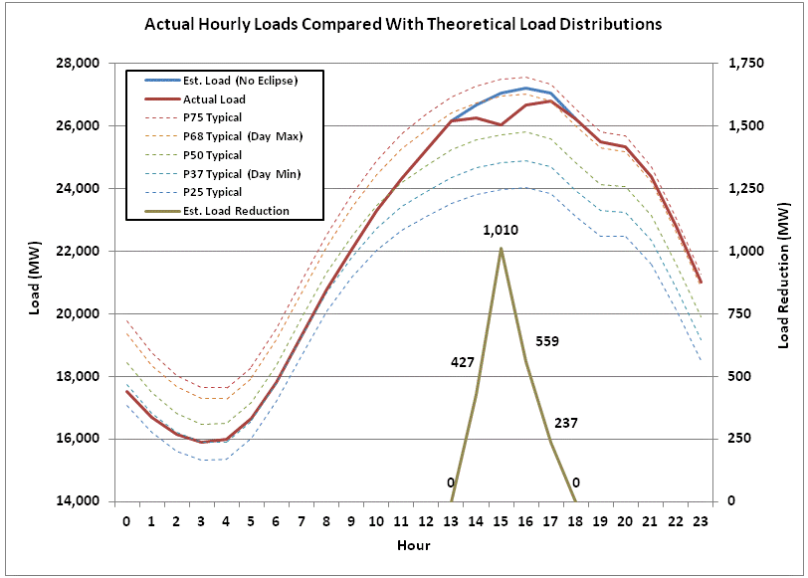
Net Load - Projections vs. Actual, August 21 Eclipse





- **Start of Eclipse**: Did not experience the slight projected load increase early in the eclipse possibly due to less loss of BTM solar than originally anticipated and public reaction impacts to loads
- **During Eclipse**: Projected reduction of net load of 721 MW (P50) yet recognized 1,010 MW of reduction
- **End of Eclipse**: Net load increase was greater than expected. Explained by higher mid-day humidity

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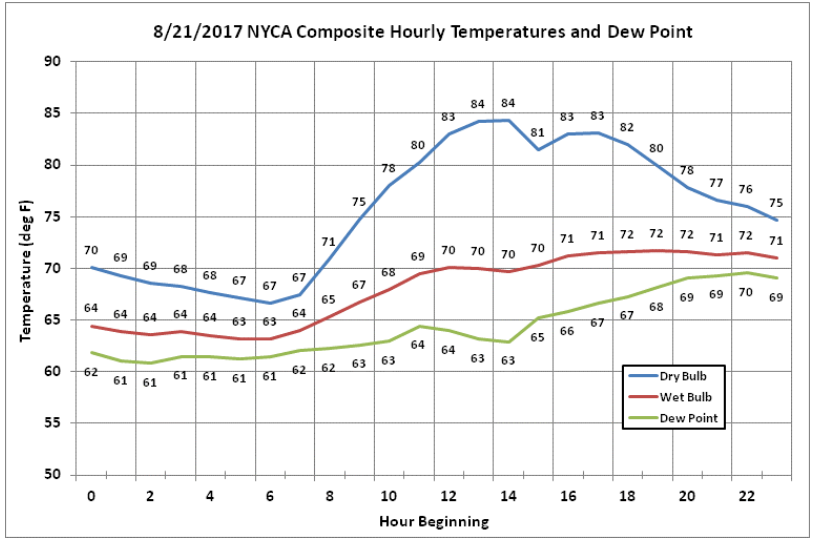
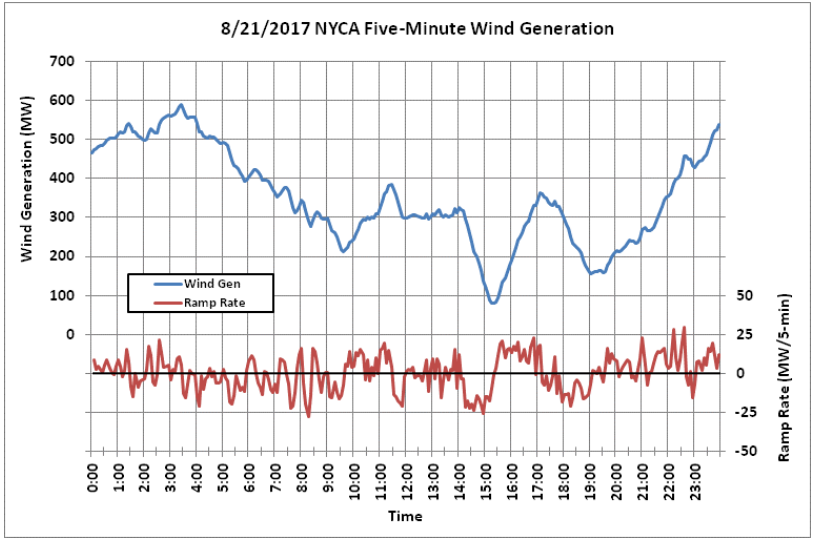
Weather and Wind





- Humidity levels increased throughout the day (Wet Bulb and Dew Point); especially during the afternoon hours
- Wind speeds & generation (-200 MW) declined at start of eclipse and increased as eclipse ended. Wind generation changes lagged the sun obscuration pattern by about 45 minutes

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Summary – NY Eclipse Impacts / Lessons Learned

- The NYISO easily met operational reliability criteria throughout the eclipse
- The predicted effects of the partial solar eclipse on BTM solar generation and net load were generally realized
  - Actual impacts are a function of sky cover, load levels, humidity's, BTM solar impacts, and human reaction
- The wind generation changes followed the sun obscuration timeline with roughly a 45-minute lag

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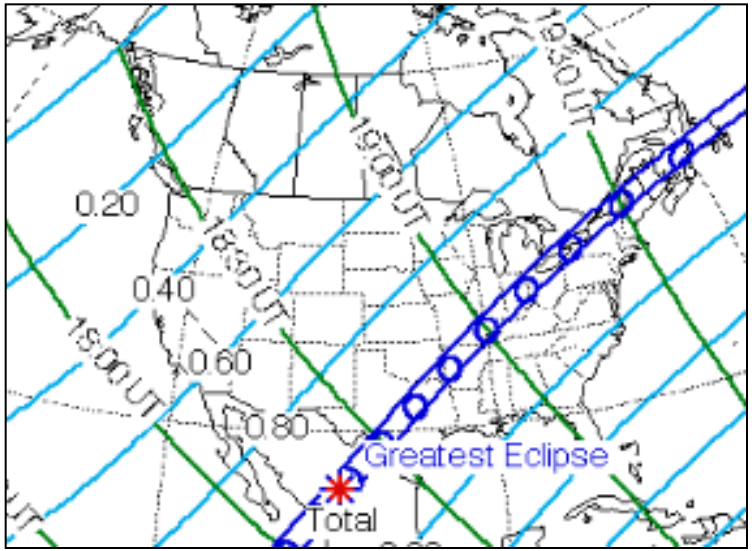
Next Significant Eclipse, April 8, 2024

- Western and northern New York will experience a total solar eclipse; roughly 90% or more sun obscuration will occur across the entire state
- Expecting much higher levels of renewable energy resources (wind and solar) connected at transmission and behind-the-meter in 2024
- Weather and load patterns will be significantly different because of the Spring season. The 2024 eclipse peak will be about half an hour later than the August 21, 2017 eclipse



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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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