



# **NY Solar Eclipse August 21, 2017 Operating Projections**

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# Eclipse – United States

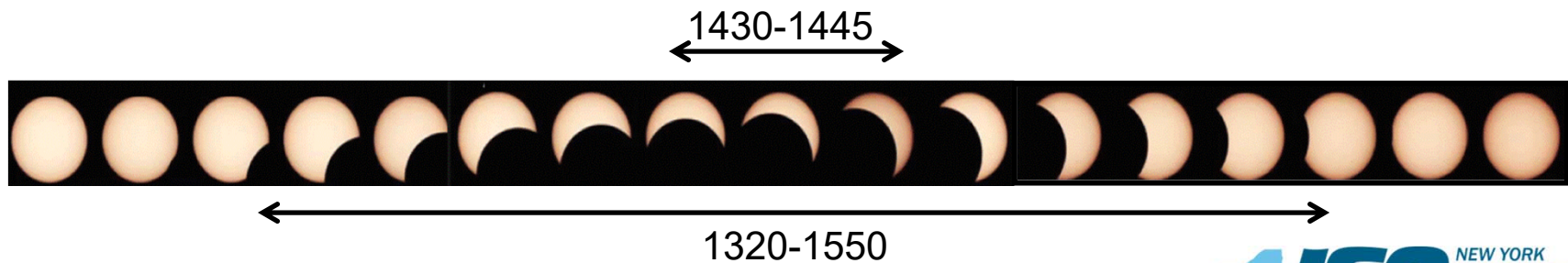
- **Vocabulary**
  - **Total Solar Eclipse:** Moon completely blocks the sun (moon relatively close to earth)
  - **Partial Solar Eclipse:** Moon blocks some of the sun
  - **Annular Solar Eclipse:** Moon blocks sun when moon is furthest point from earth hence diameter of moon slightly smaller than diameter of the sun so not a full eclipse
- A **total** solar eclipse is forecast to cross the United States on Monday August 21, 2017
- Area of greatest eclipse to bisect the U.S. from Oregon to South Carolina from roughly 13:15 to 14:45 EDT



Image From NASA:  
<https://eclipse.gsfc.nasa.gov/SEmono/TSE2017/TSE2017fig/TSE2017-1.gif>

# Eclipse – New York

- New York will see a **partial** solar eclipse with peak totality of roughly 80% (Chautauqua County) to 67% (Clinton County) from about 14:30 to 14:45 EDT
- NYC and Long Island load centers will see roughly 75% to 77% totality
- Eclipse is expected to occur in New York for roughly 2.5 hours total
- Below is an illustration from the 3-20-2015 partial eclipse in Czech Republic rotated to depict the approximate forecast for 8-21-2017 partial eclipse in New York



# Eclipse – Across New York



Image From NASA:  
[http://eclipse-maps.com/Eclipse-Maps/Gallery/Pages/Total\\_solar\\_eclipse\\_of\\_2017\\_August\\_21\\_files/Media/TSE2017\\_poster\\_Eclipse\\_over\\_North\\_America/TSE2017\\_poster\\_Eclipse\\_over\\_North\\_America.jpg](http://eclipse-maps.com/Eclipse-Maps/Gallery/Pages/Total_solar_eclipse_of_2017_August_21_files/Media/TSE2017_poster_Eclipse_over_North_America/TSE2017_poster_Eclipse_over_North_America.jpg)



# What Happened During the Last Eclipse?

- An annular solar eclipse occurred on Tuesday, May 10, 1994
- Area of greatest sun obscuration passed through much of upstate New York. Peak eclipse time was approximately 13:30 EDT. Peak load was 18,317 MW (HB11)
- Temperatures declined a total of 4.4 °F during the eclipse and by the end the load decreased about 500 MW
- **Conclusion:** Data provide some guidance but temperature, load levels, month, and solar obscuration are not consistent with what is expected during August 21, 2017 eclipse

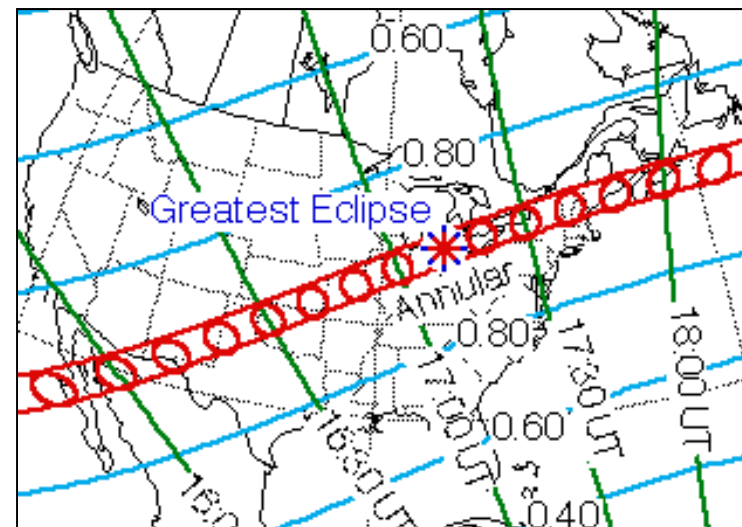


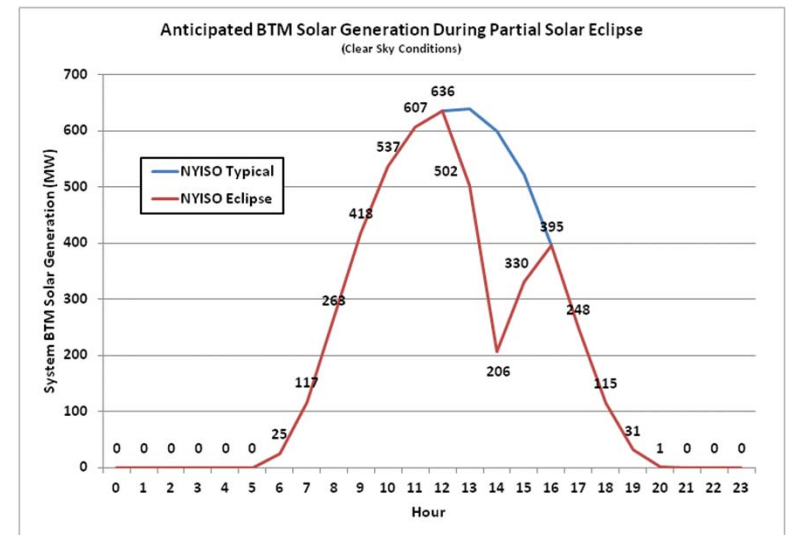
Image From NASA:  
<https://eclipse.gsfc.nasa.gov/SEplot/SEplot1951/SE1994May10A.GIF>

# Projections for August 21, 2017 Eclipse

- **Statewide Behind The Meter (BTM) solar installations are 850 MW to 900 MW**
  - Peak (sunny day) generation are estimated at 625 MW to 650 MW
- **August is typically the least cloudy month of the year**
- **Typical August Monday load and solar patterns are expected up to HB13**
  - Temperature, load, and BTM solar generation should track normally based on statewide ambient weather conditions
- **At the start of the solar eclipse BTM solar output will begin to decrease resulting in increased loads. This will be combined with decreasing temperatures during the middle-to-end of the eclipse which will result in decreased loads. The net effect of the reduced BTM solar and lower temperatures is important to transmission operations.**
- **Typical afternoon temperature and load [patterns](#) will resume after the end of the eclipse with lower actual temperatures later in the afternoon.**

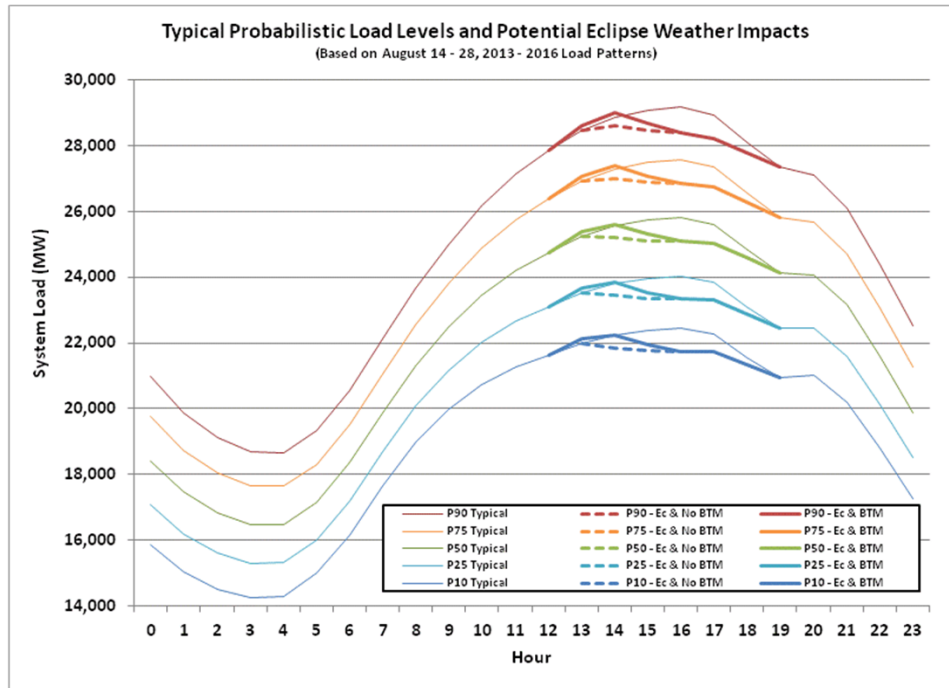
# Projections for August 21, 2017

- BTM solar generation will track normally according to ambient weather conditions until about 13:20 when the moon begins its transit across the sun
- Maximum BTM solar generation reduction will occur between 14:30 and 14:45 during NY peak sun obscuration (80% of total)
- BTM solar generation will ramp up following peak eclipse conditions until about 16:00 when lunar transit is complete
- Ramp up will be much more gradual than the eclipse-driven decline because of late afternoon solar conditions



If cloudy estimated decrease 200 MW to 50 MW

# Projections for August 21, 2017



- Incremental and decremental net load impacts of eclipse relative to net load for no-eclipse

Forecast Load Changes (MW) - Including BTM Solar					
Hour	P10	P25	P50	P75	P90
0 - 12	0	0	0	0	0
13	137	137	137	137	137
14	1	24	52	94	131
15	-418	-427	-435	-428	-420
16	-698	-710	-721	-739	-783
17	-545	-564	-584	-614	-743
18	-217	-231	-245	-265	-334
19 - 23	0	0	0	0	0



# Summary – NY Eclipse Impacts

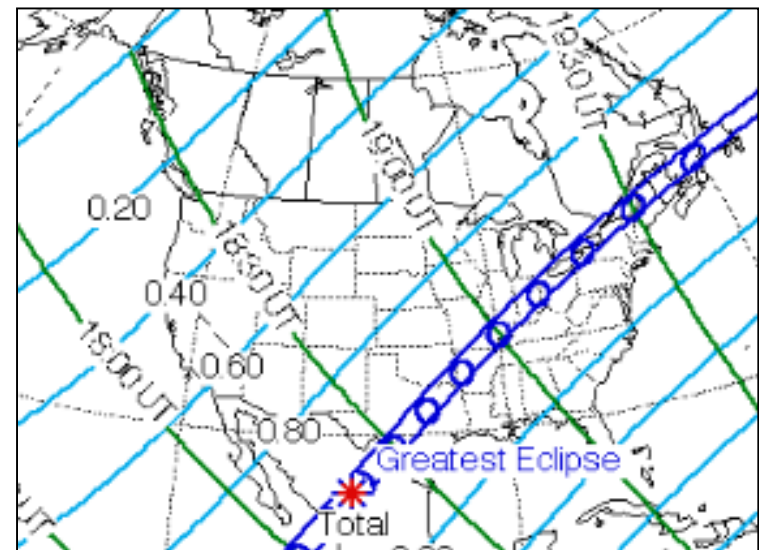
- Beginning around 1:30 PM the projected (incremental) load as the result in loss of BTM solar will be approximately 140 MW for all temperature conditions
- Midway through the eclipse the projected cooling impacts will begin to “dominate” the loss solar impacts and the net load will be lower than no-eclipse load pattern.
- Actual load impacts will be a function of actual ambient weather conditions
  - Clear sky versus cloudy, low humidity versus humid conditions

# Summary – Operational Measures

- Based on the projected, minimal impacts to “net” transmission load, additional operating measures are not needed for the August 21 eclipse
- Current operating criteria and market constructs will provide sufficient dispatch capability, operating reserves, and regulation service to meet reliability.

# Next Significant Eclipse

- On April 8, 2024 New York will experience a total solar eclipse in western and northern New York with major load centers experiencing a partial 90% sun obscuration eclipse



## 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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