New York ISO
Independent System Operator

Update on NYISO Preparation for Upcoming Solar Eclipses

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Agenda

- Annular Solar Eclipse October 14, 2023
- Annular Solar Eclipse path and impacts to New York
- Total Solar Eclipse April 8, 2024
- Total Solar Eclipse path and impacts to New York
- Preparations for Solar Eclipse
- Eclipse Impact Mitigation

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Annular Solar Eclipse Saturday October 14, 2023

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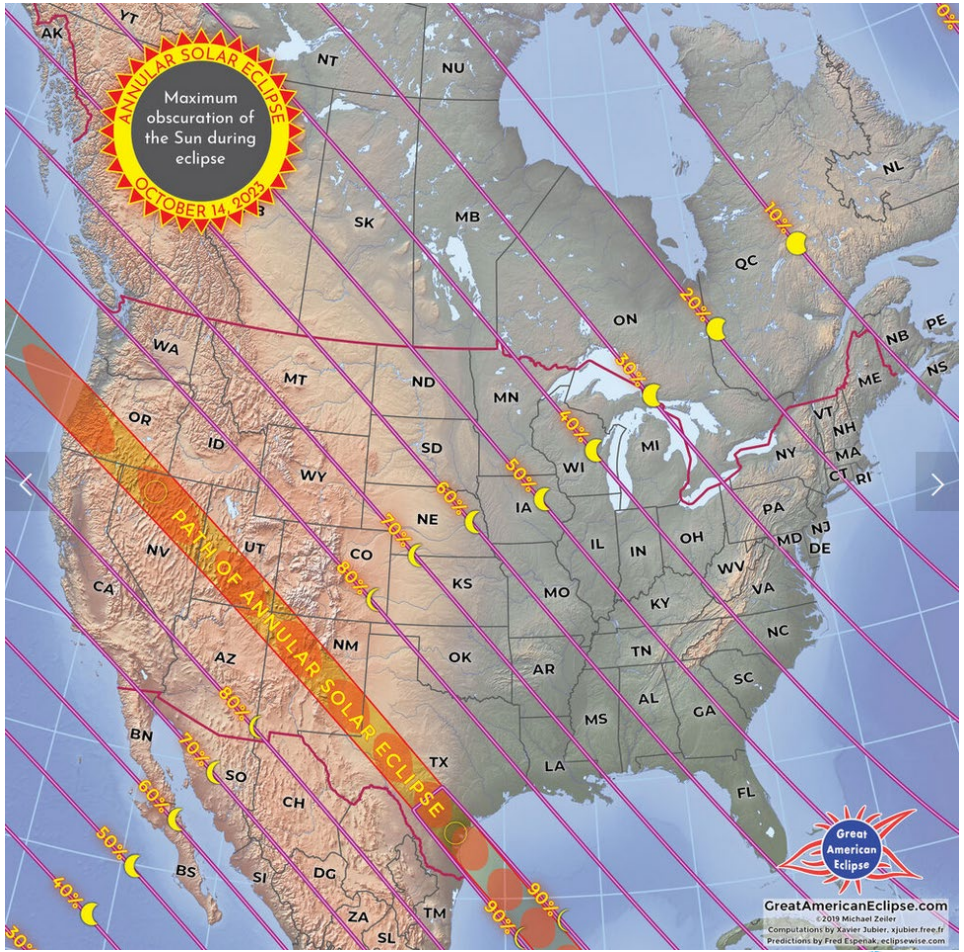
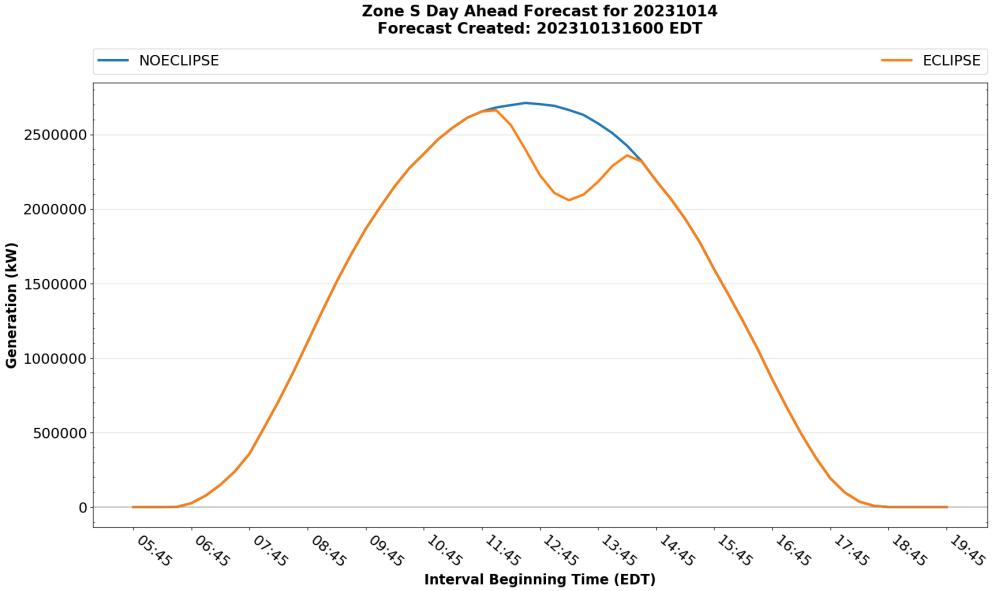
Annular Solar Eclipse Path

- In the U.S., the annular solar eclipse begins in Oregon at 12:13pm EDT and ends in Texas at 2:03pm EDT.
- Time period of expected solar reductions in New York will be 11:00am EDT to 3:00pm EDT.
- 15-30% of the annular eclipse coverage will be experienced by NYS (greatest south and west, least north and east).



Annular Solar Eclipse Impacts – New York

- Forecast results shown are for a clear-sky day. Cloud conditions will modulate the impacts, but the timing of the impacts are accurate.
- Reduction in BTM solar generation may be up to 700 MW at the peak of the eclipse.
- Reduction in FTM solar generation may be up to 30 MW at the peak of the eclipse.
- Wind generation impacts are expected. In day wind speeds and cloud conditions will influence the impacts to wind generation.
  - During the partial eclipse on August 21, 2017, wind speeds and generation declined at start of eclipse and increased as eclipse ended



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Total Solar Eclipse Monday April 8, 2024

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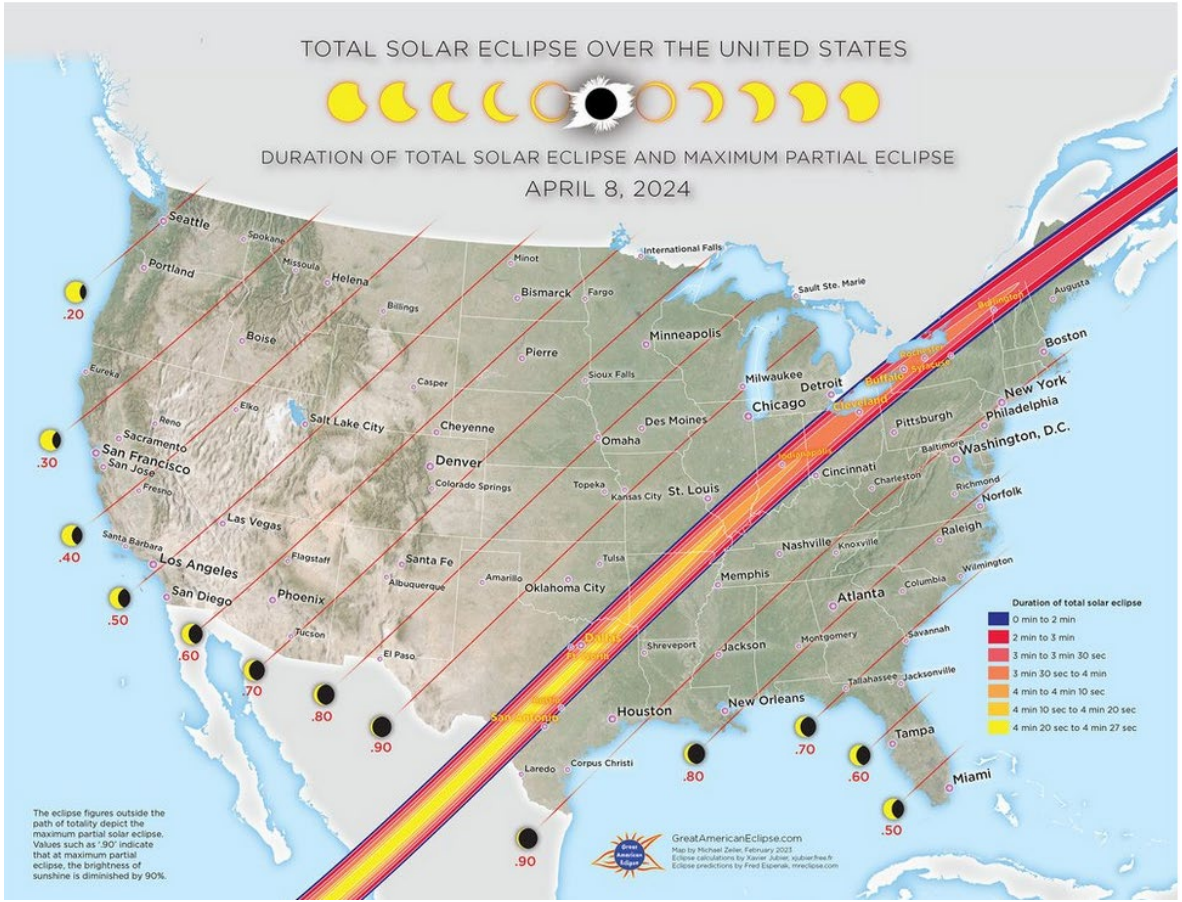
Total Solar Eclipse Path

- Total solar eclipse will begin over the South Pacific Ocean and will cross North America, passing over Mexico, United States, and Canada.
- The first location in continental North America that will experience totality is Mexico's Pacific coast at around 2:07pm EDT.



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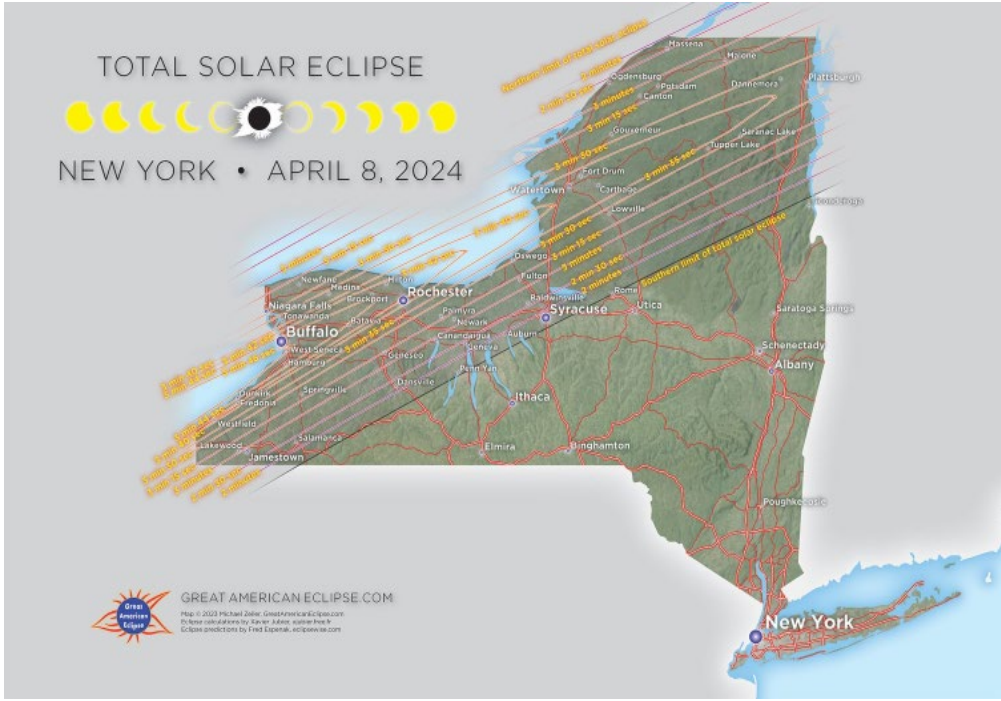
Total Solar Eclipse Timeline – New York

- Total solar eclipse begins at 3:16pm EDT and ends at 3:29pm EDT.
- Across the state the partial solar eclipse begins in HB14 and ends in HB16 lasting roughly 2 hours, 30 minutes.
- NYC & Long Island → 60-90% obscuration
- Albany → 96% obscuration
- Buffalo → 100% for 3m45s
- Rochester → 100% for 3m38s
- Historical cloud cover in April along the eclipse central line is between 60 and 65 percent for Buffalo, NY, and Rochester, NY.



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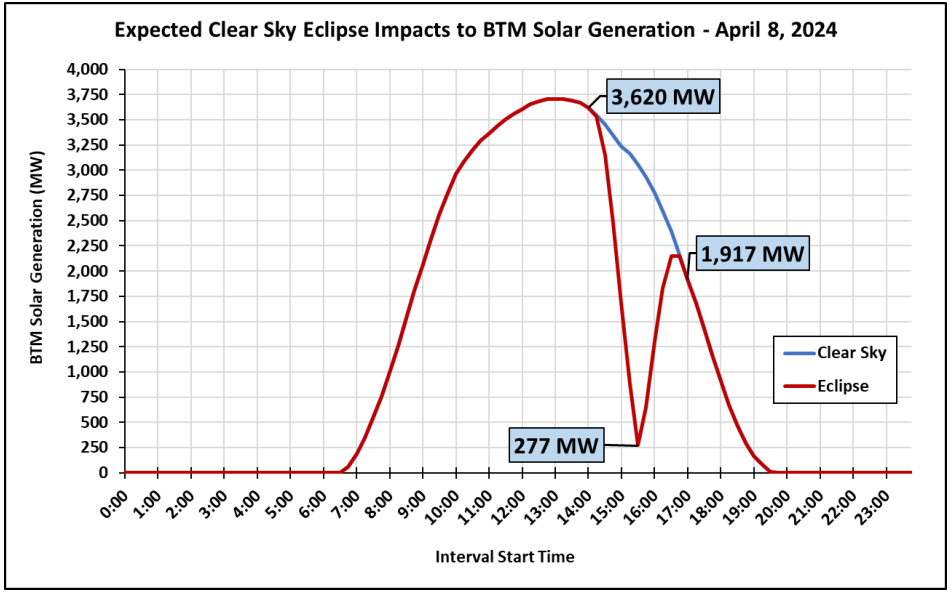
BTM Solar Generation Impacts – Clear Sky

- Forecast results shown are for a clear-sky day. Cloud conditions will modulate the impacts, but the timing of the impacts is accurate.
- Reduction in BTM solar generation may exceed 3000 MW at the peak of the eclipse.
- Reduction in FTM solar generation could be up to 110 MW at the peak of the eclipse.
- Wind generation impacts are expected. In day wind speeds and cloud conditions will influence the impacts to wind generation.
  - During the partial eclipse on August 21, 2017, wind speeds and generation declined at start of eclipse and increased as eclipse ended



Source: NYISO BTM Solar forecasting vendor generation profiles (clear sky with and without eclipse) adjusted to the expected BTM installed capacity schedule for 2024

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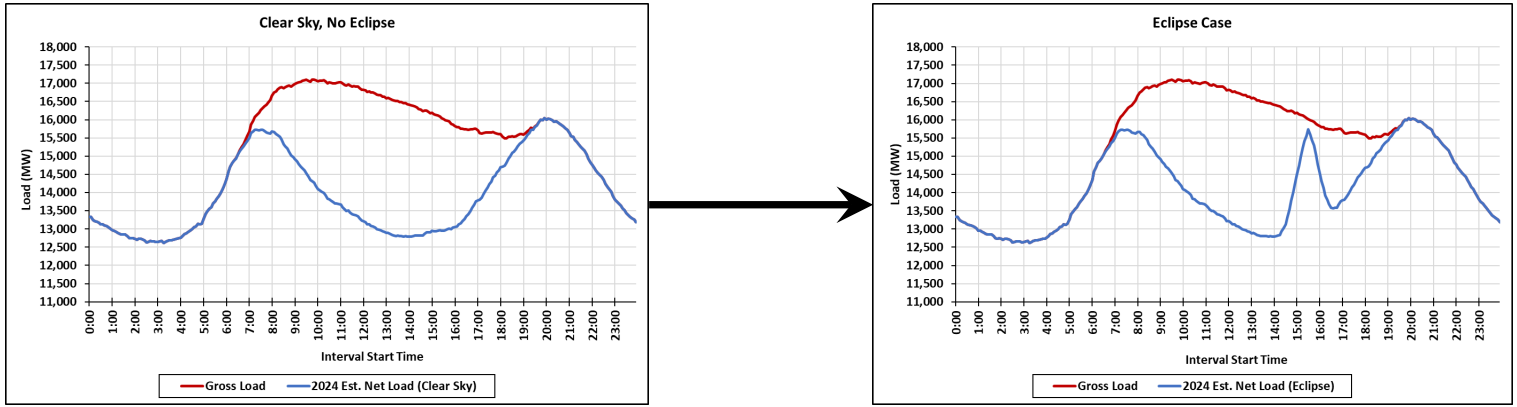
Load Profile Impacts of BTM Solar - Clear Sky

- **Case study for estimating the eclipse Impact (4/10/2023)**
  - Clear sky weekday with temperatures near April norms (lower- to mid-60s) and near maximum levels of BTM solar generation
  - Gross load profile (observed Net load + estimated BTM solar) is constant under both scenarios shown below
  - 2024 BTM solar generation profiles were provided by the NYISO BTM solar forecasting vendor and subtracted from the gross load profile to illustrate the highest potential impact



- **Cloud cover and other obscuring factors (e.g., haze and smoke) will reduce the load ramp impacts caused by the eclipse because the net load trough will not be as deep**
- **This case study does not account for the following smaller load impacts:**
  - Eclipse-induced weather changes (temperature, wind speed, etc.) that impact load
  - Potential increases to lighting load resulting from the period of darkness
  - Spectator tendencies (going outside, traveling, etc.)

Preparation for the Solar Eclipse

- **Develop a readiness plan**
  - Day Ahead Market simulations
  - Fine tuning BTM and FTM solar forecasts with vendor
  - Coordination with neighboring BAs
- **Training for system operators on forecasted impacts**
- **Evaluate and defer impactful planned outages**

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Possible Actions to mitigate Solar Eclipse impacts

- Manual Operator Intervention
- Supplemental commitment of fast responding resources
- Gas supply coordination
- Pre-emptive RT Load Forecast Actions

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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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Questions?

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Appendix

- https://solarsystem.nasa.gov/eclipses/2023/oct-14-annular/overview/
- https://www.greatamericaneclipse.com/october-14-2023
- https://solarsystem.nasa.gov/eclipses/2024/apr-8-total/overview/
- https://www.greatamericaneclipse.com/april-8-2024

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