

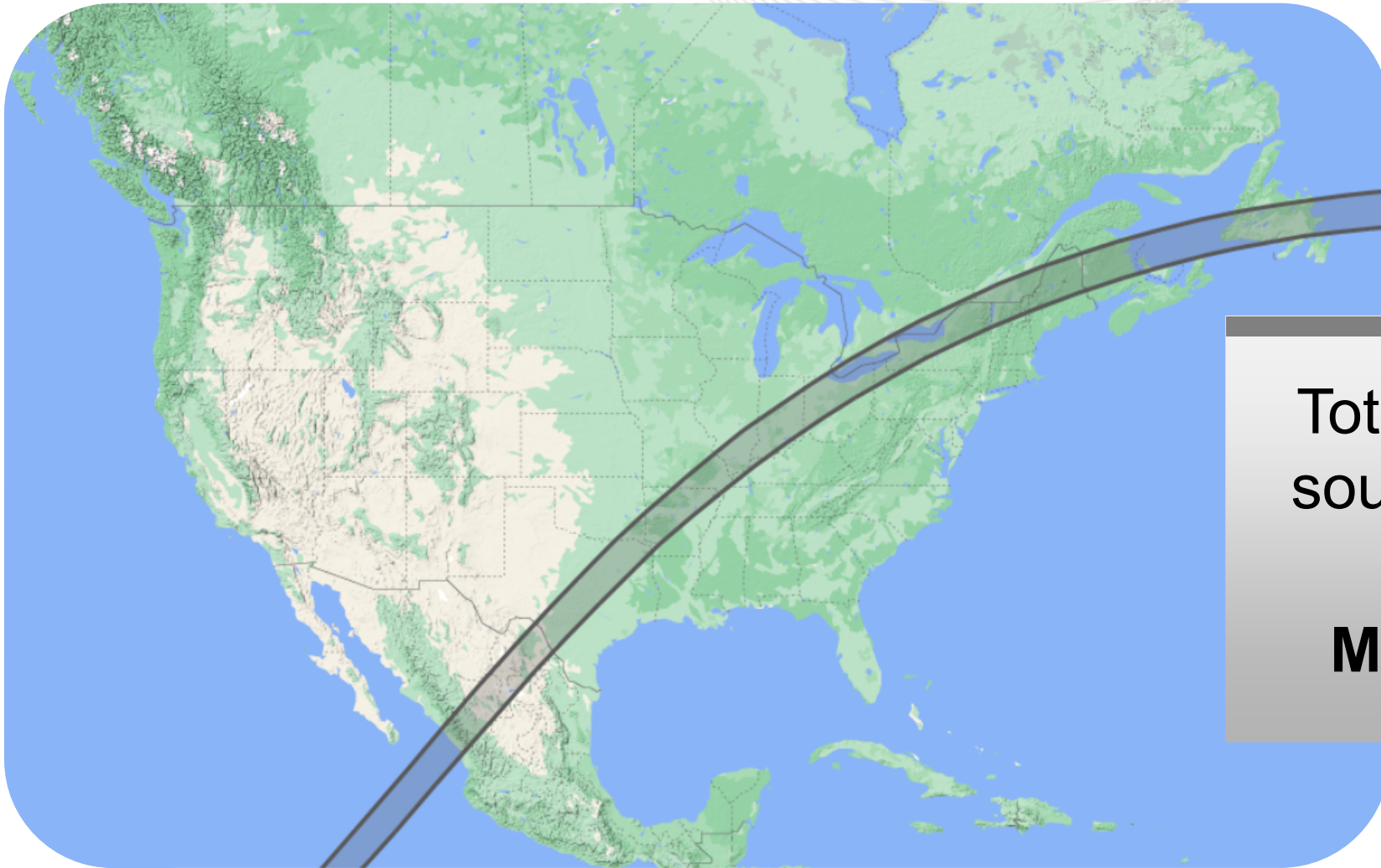


April 8, 2024 Total Solar Eclipse Impacts to PJM Footprint

Michael Stewart

System Operations Subcommittee

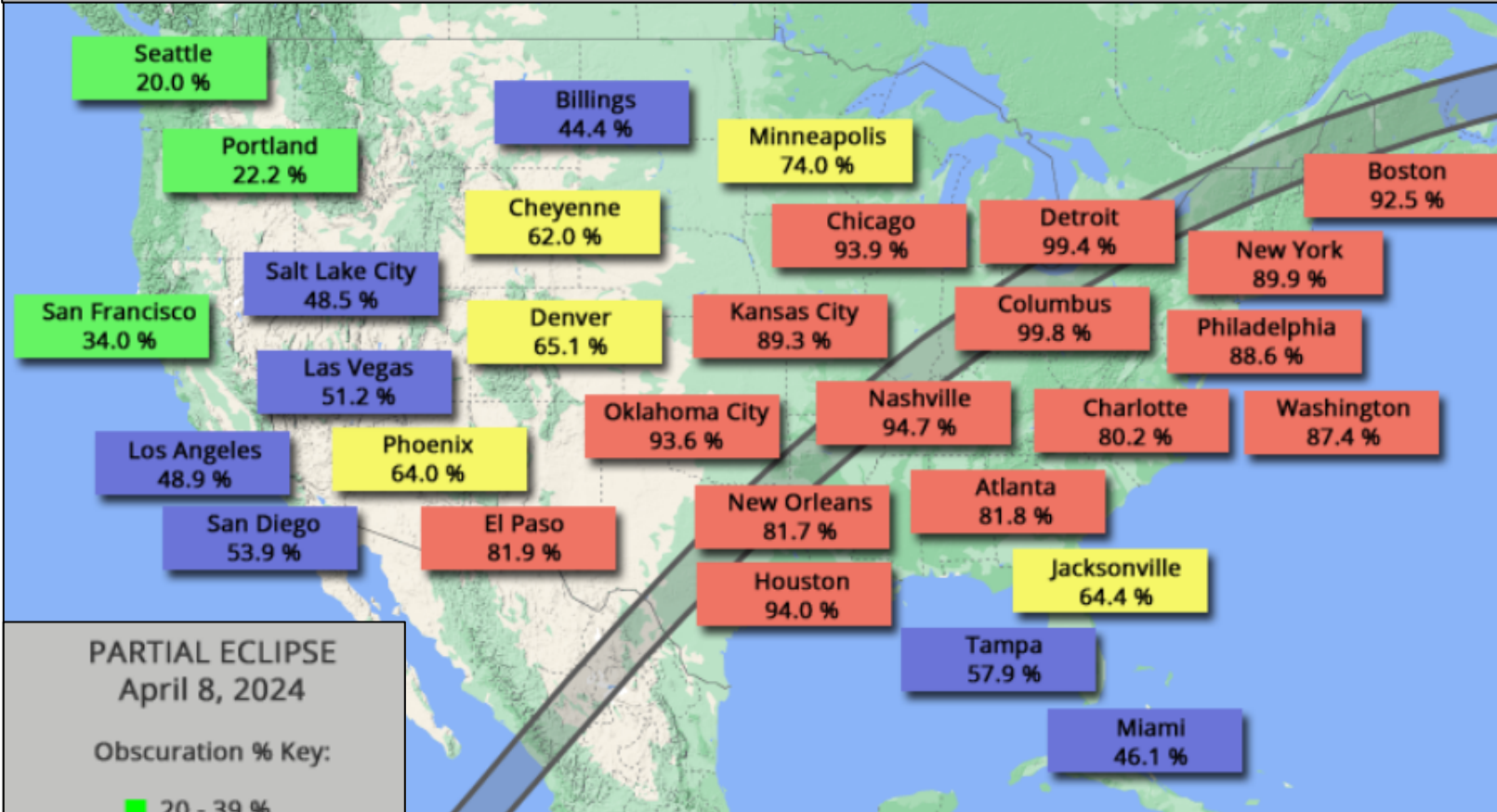
March 27, 2024



Total solar eclipse across
south-central and eastern
United States
Monday, April 8, 2024

Source: Map adapted by NationalEclipse.com from original at eclipse.gsfc.nasa.gov. Map copyright Google, INEGI, ORION-ME. Eclipse predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center.

Total solar eclipse across south-central and eastern United States



PARTIAL ECLIPSE
April 8, 2024

Obscuration % Key:

- 20 - 39 %
- 40 - 59 %
- 60 - 79 %
- 80 - 99 %

(Percentages shown are only representative samples)

Source: Map adapted by NationalEclipse.com from original at eclipse.gsfc.nasa.gov. Map copyright Google, INEGI, ORION-ME. Eclipse predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center.

Monday, April 8, 2024

85-100% Obscuration
Mid-afternoon | During Spring

Different from past:

October 2023

<40% Obscuration
Early morning | During Fall

August 2017

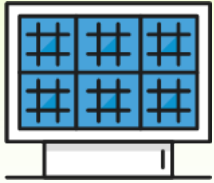
70%-90% Obscuration
Early afternoon | During Summer

Installed capacity solar and grid-connected MW:

13x increase
for grid-connected

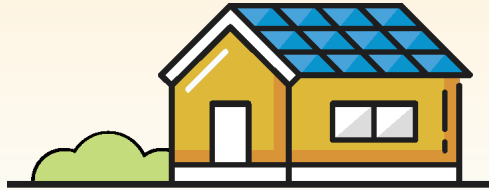
2.7x increase
for behind-the-meter

Generation



Metered solar
(grid-connected)

Load



Non-metered solar
(behind-the-meter)

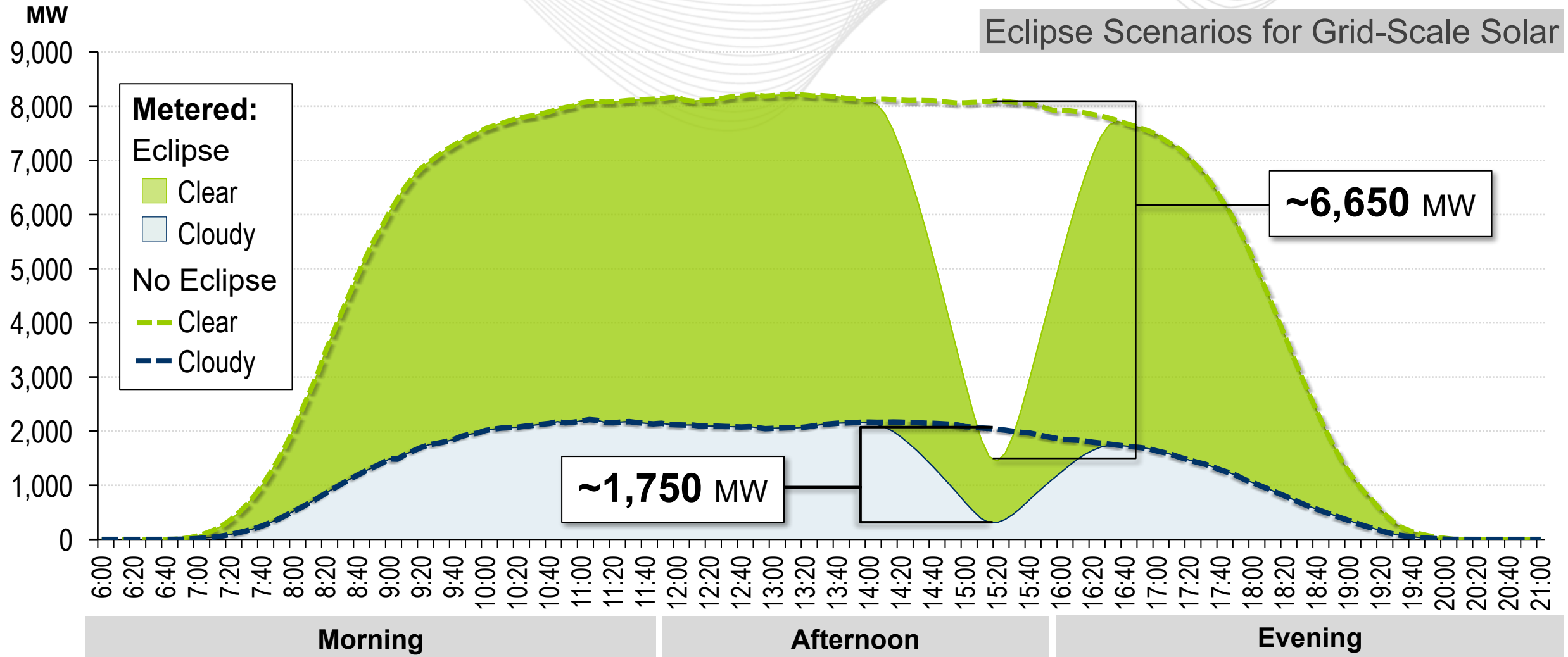


Temperature

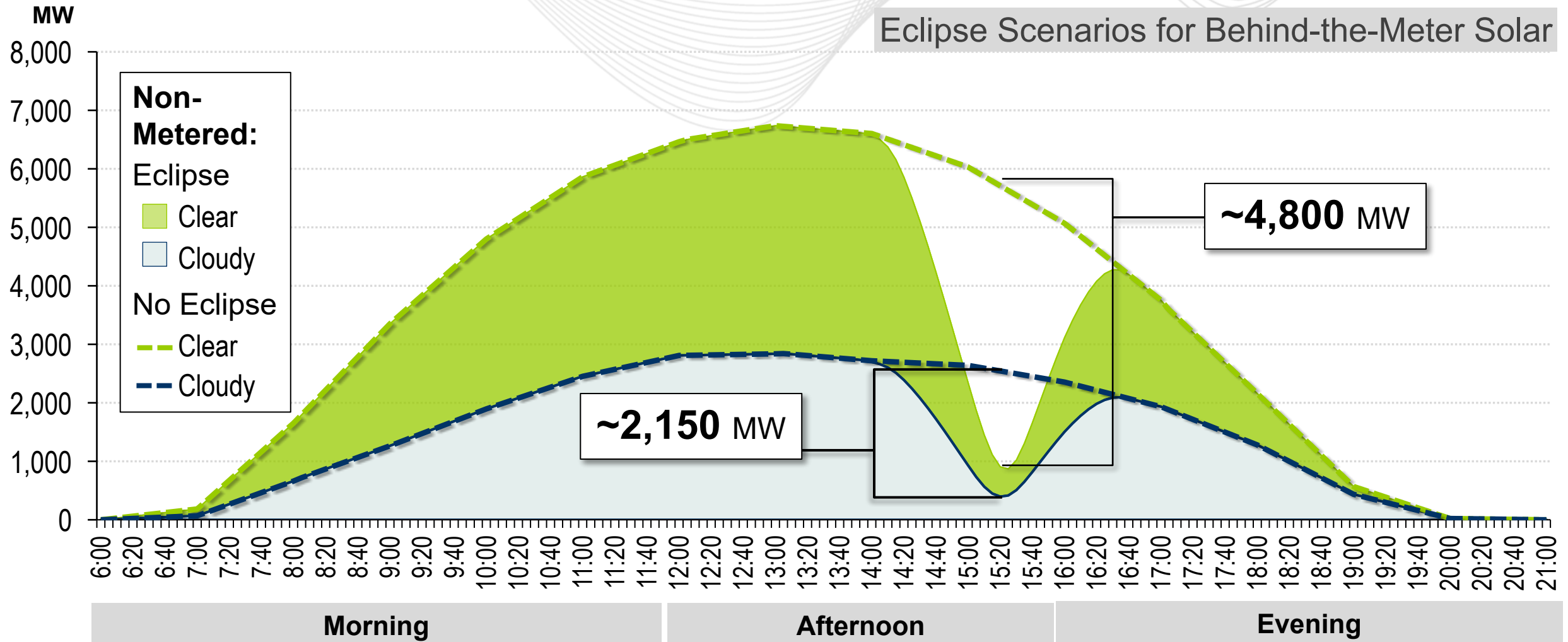


Consumer behavior



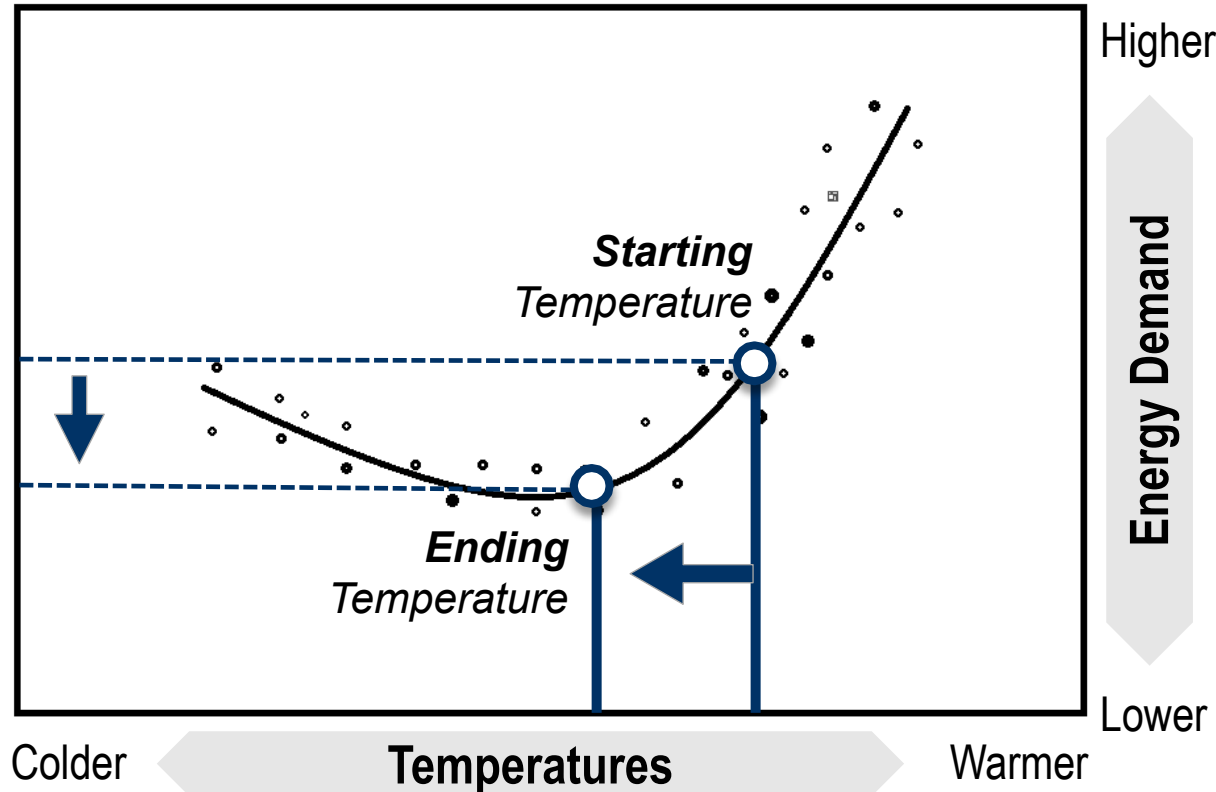
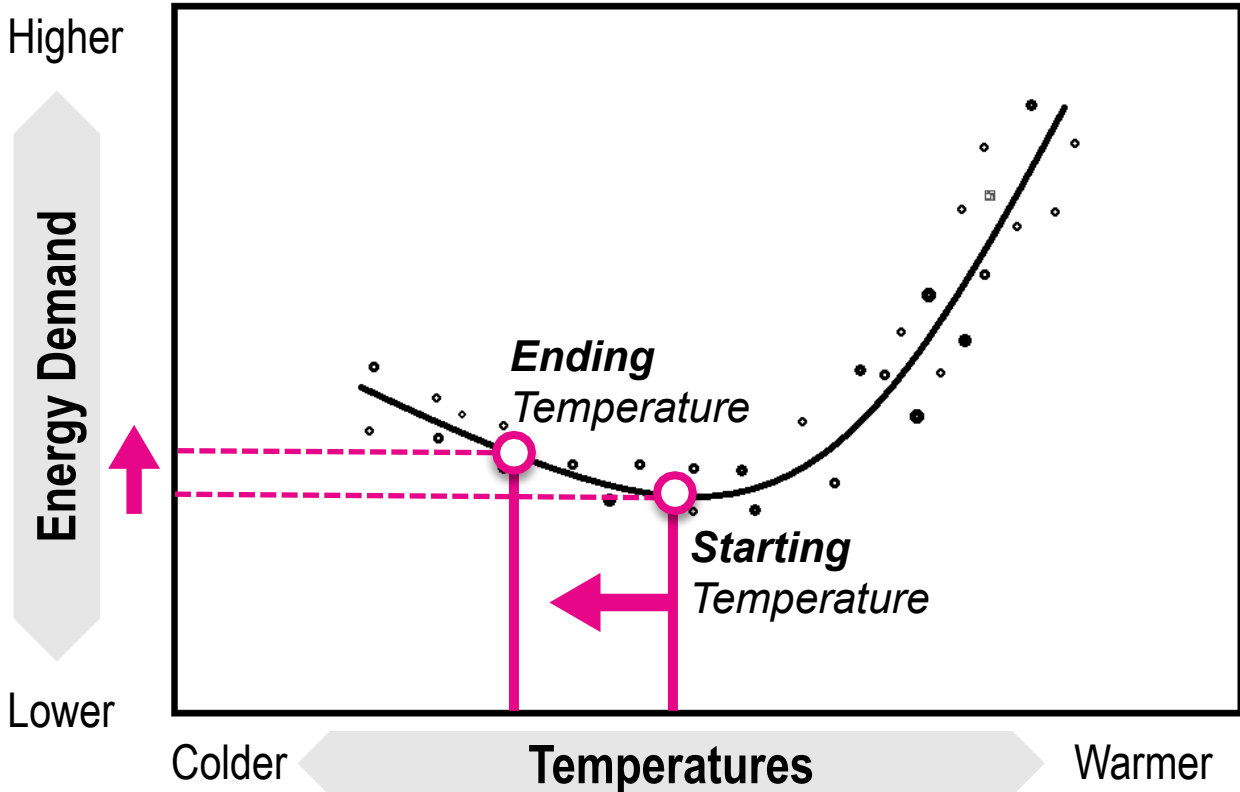


The preceding is an excerpt of a more complete Work Product.
 Source: data and analysis provided by UL Services Group LLC



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Solar eclipses cause decreases in temperature (-4 to -10°F)	TWO SCENARIOS FOR EARLY SPRING:	
	Cold spell with heating load could lead to increased load	Warmer regime with cooling load could turn back off and lead to reduced load





- Anticipating variables that could impact load
 - School closures (decrease)
 - Travel to locations of totality (decrease/increase)
- Not a holiday, but not a normal Monday

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**April 8, 2024, Total Solar Eclipse Impacts
to PJM Footprint**



Member Hotline

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- <https://nationaleclipse.com/maps.html>
- <https://cires.colorado.edu/news/noaas-model-predicts-how-solar-eclipse-will-shift-weather>
- Trees, V.J.H., de Roode, S.R., Wiltink, J.I. *et al.* Clouds dissipate quickly during solar eclipses as the land surface cools. *Commun Earth Environ* **5**, 71 (2024). <https://doi.org/10.1038/s43247-024-01213-0>

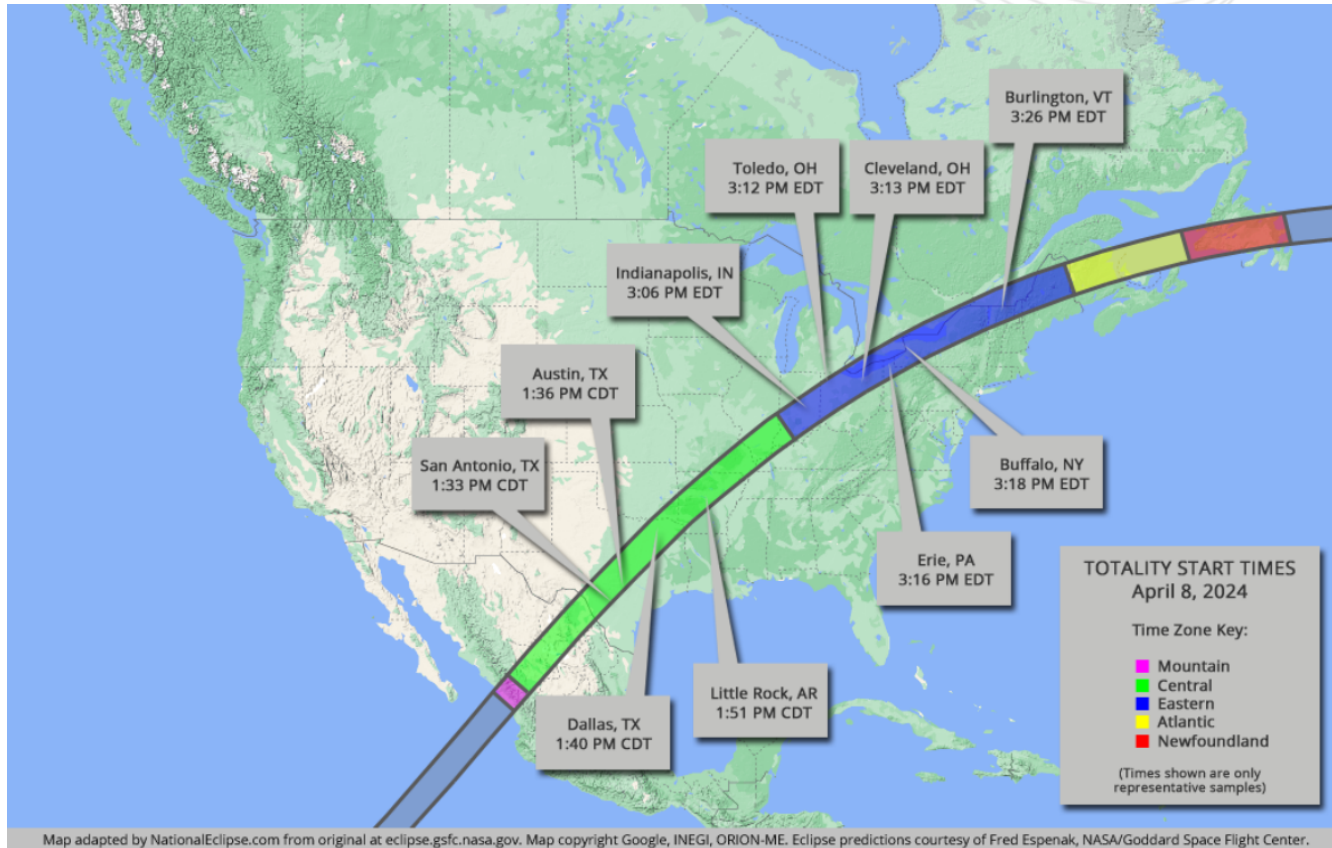
Appendix

- Depending on weather pattern, solar eclipses can diminish low-level cloud cover
 - Variability prior to eclipse will pause until temperature is re-established
 - Due to time of day of eclipse, grid operators may need to revise strategy to accommodate solar variability
 - Variable cloud cover pre-eclipse could change post-eclipse

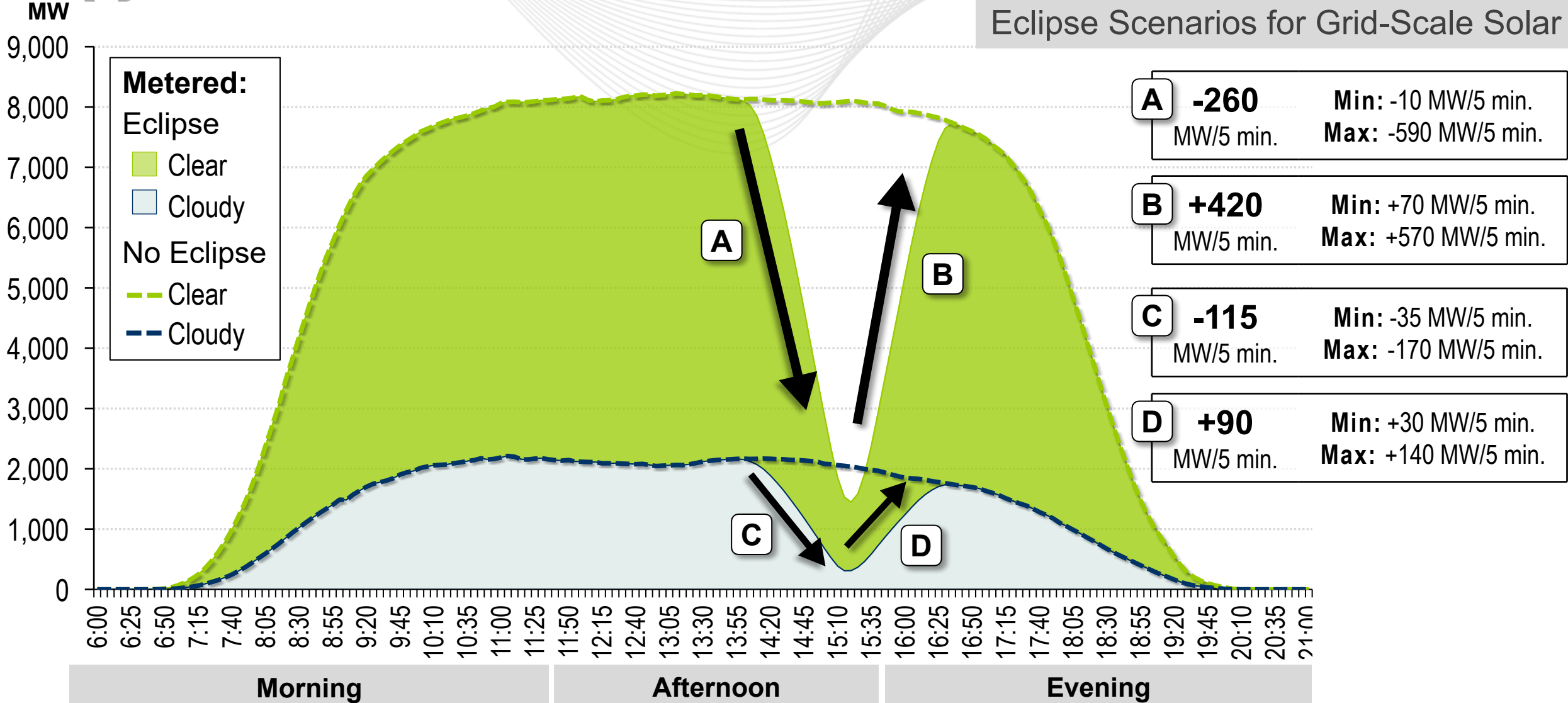
- Totality durations across event



- Start times of totality

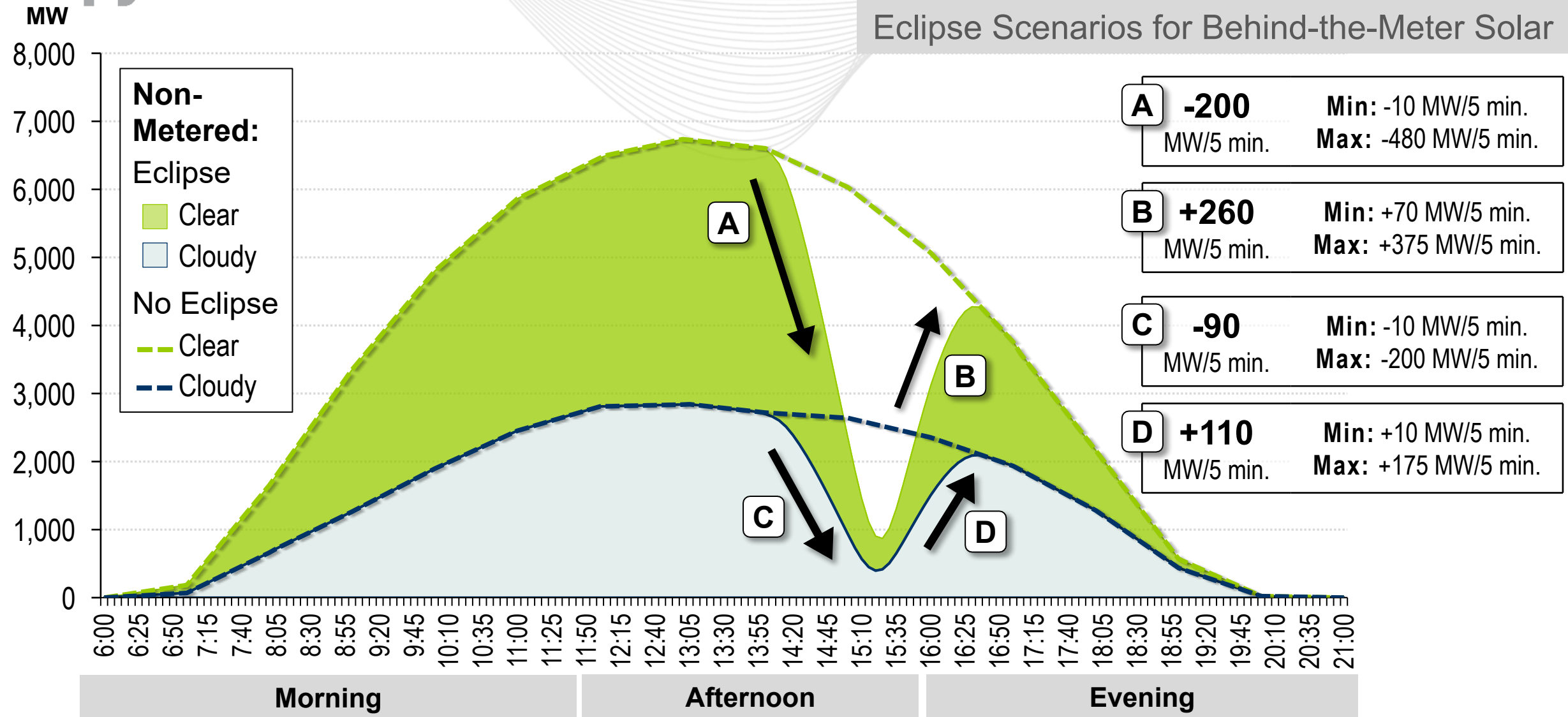


Eclipse Scenarios for Grid-Scale Solar



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Eclipse Scenarios for Behind-the-Meter Solar



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