Predicting the Impact of the August 21st, 2017 Eclipse on Behind-the-Meter PV in California

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June 20, 2017

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v083116

Agenda

- August 21st Eclipse Path
- Eclipse Model – Applied to PV
- Single versus Fleet of PV
- Reduction in BTM Power

Directed Research in Solar Forecasting

- CEC EPIC (CPR teamed with Itron)
  Address cost-effective strategies for integrating large amounts of PV into distribution systems by integrating PV modeling into utility planning and operation tools.
- U.S. Department of Energy SUNRISE (CPR lead) – Integration of BTM forecasts into the CAISO ALFS

Itron

California ISO
Shaping a Renewed Future

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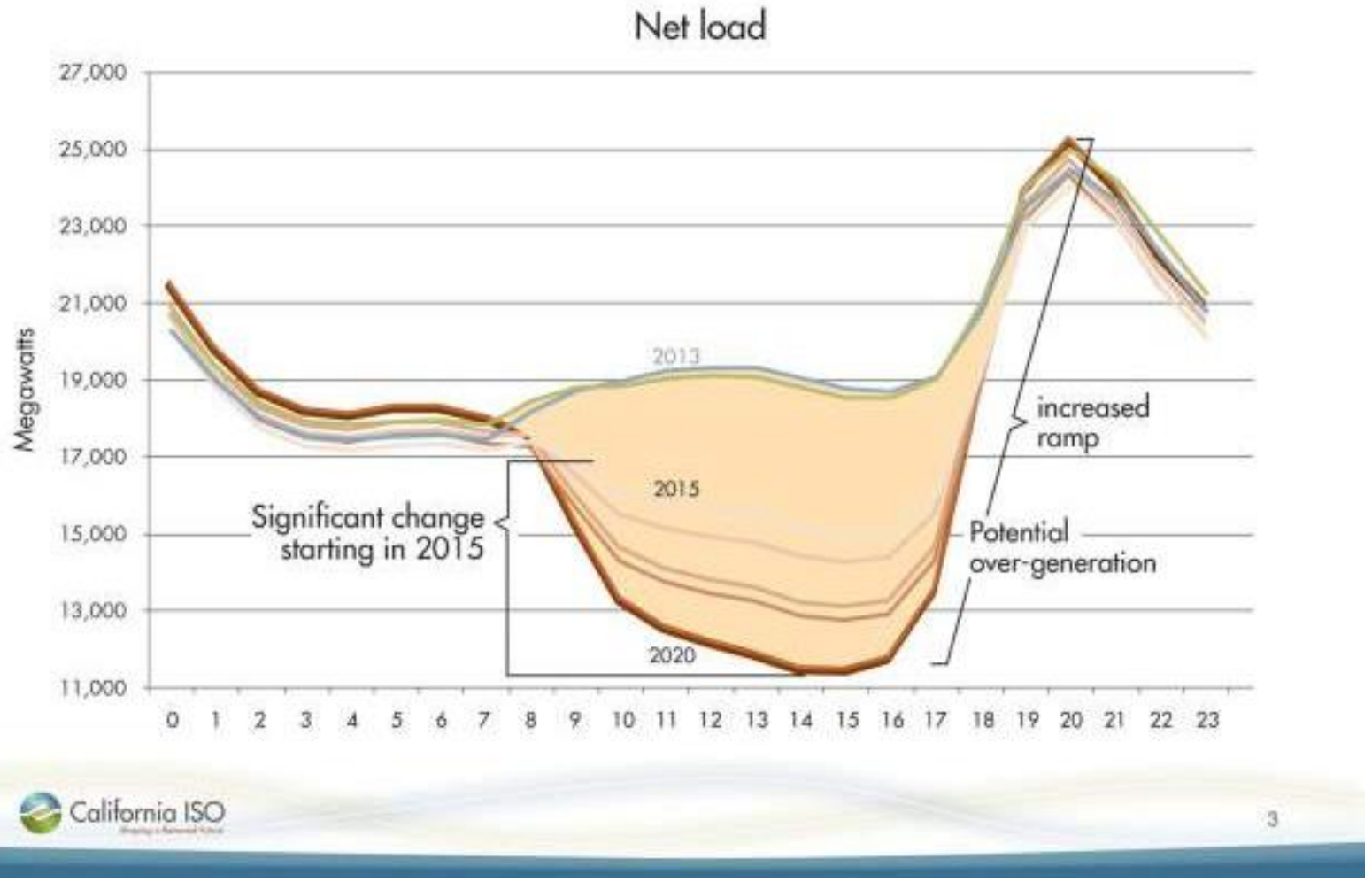
STATE OF CALIFORNIA
ENERGY COMMISSION
SINCE 1975

Powered by
SunShot
U.S. Department of Energy

PV Forecast Challenge: **The Duck**



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Courtesy of California ISO

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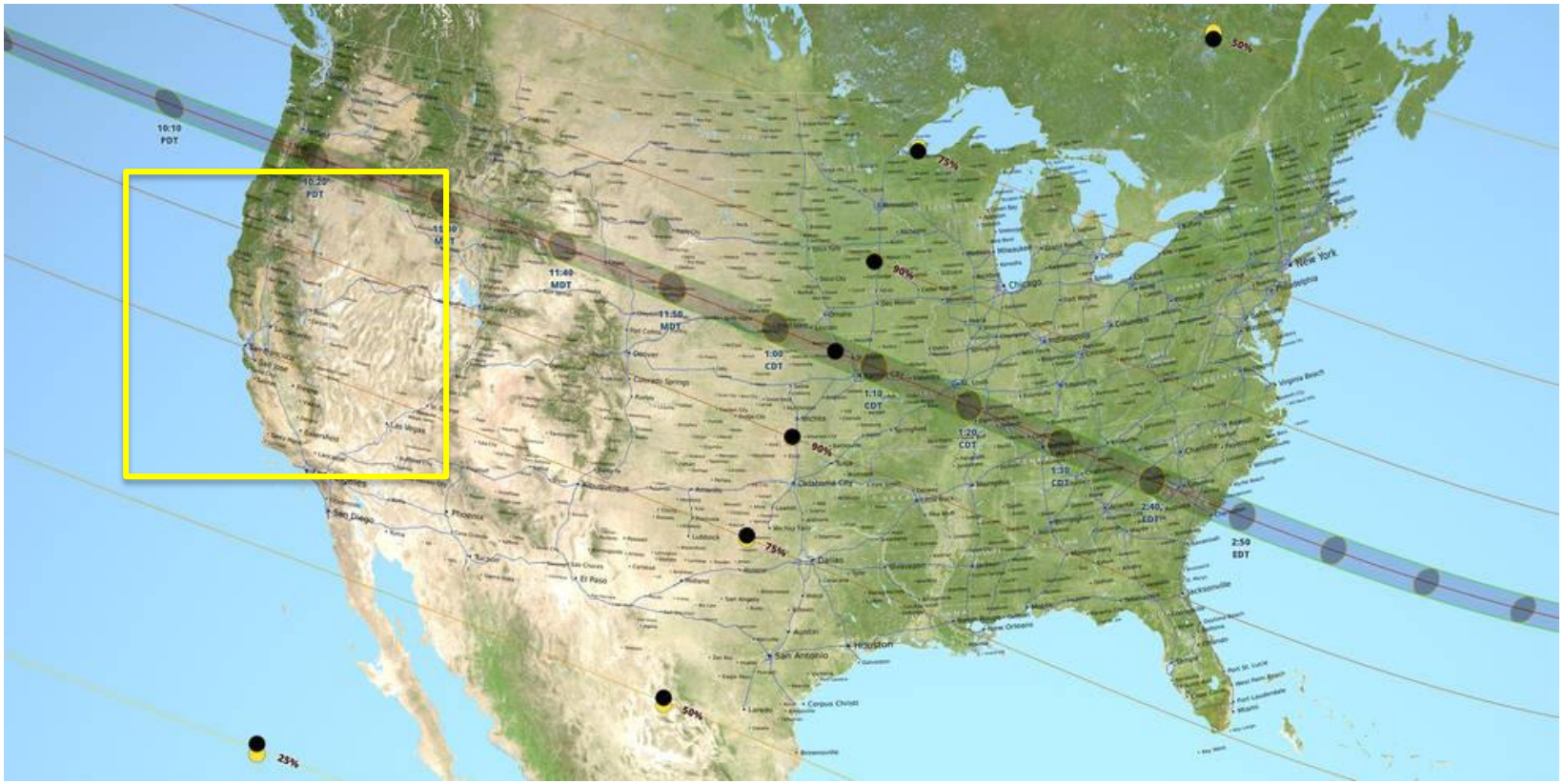
August 21st Eclipse Path



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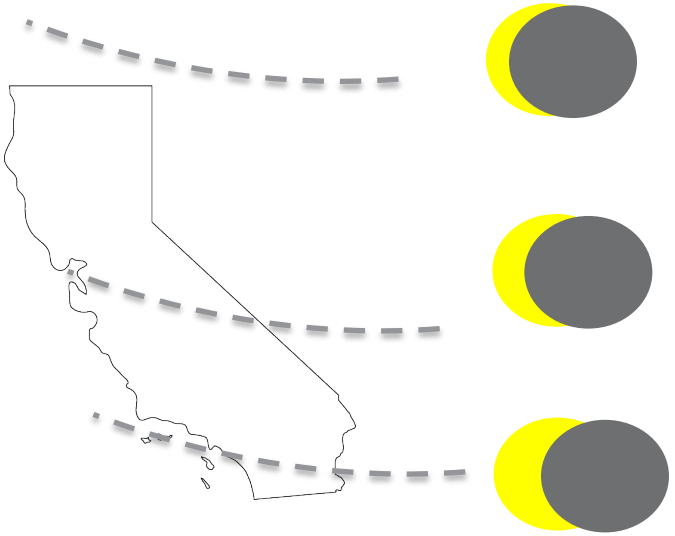
Courtesy of NASA

August 21st Eclipse Obscuration Factor (OF)



90% OF_MAX

75% OF_MAX

60% OF_MAX

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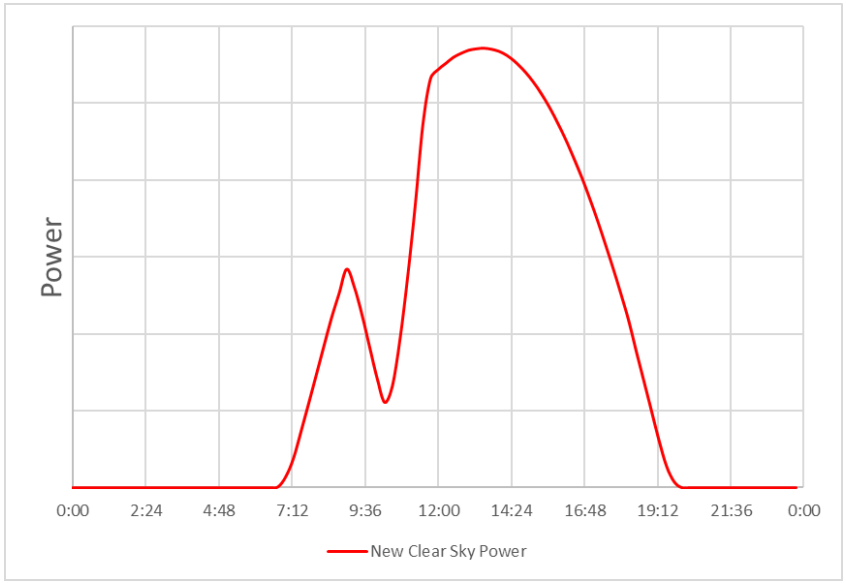
Eclipse Model Methodology

1. Calculate clear sky GHI, based on location.
2. Calculate OF = f(t), based on location
3. Combine
4. Simulate PV power using site spec



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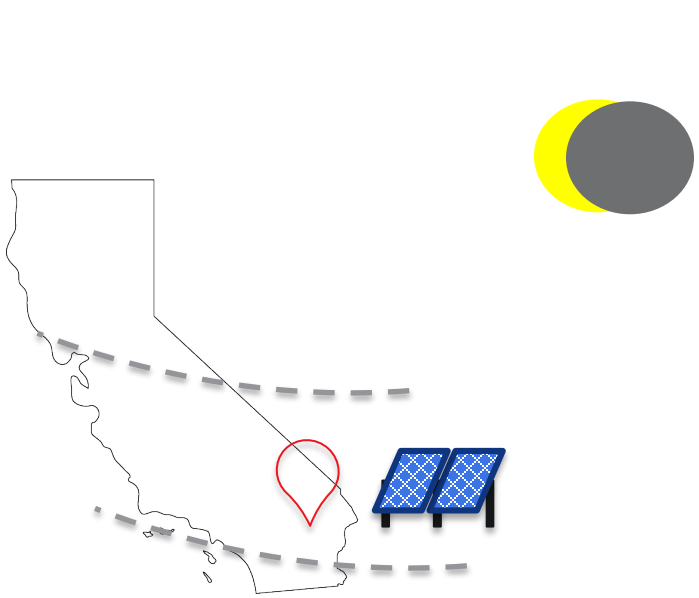
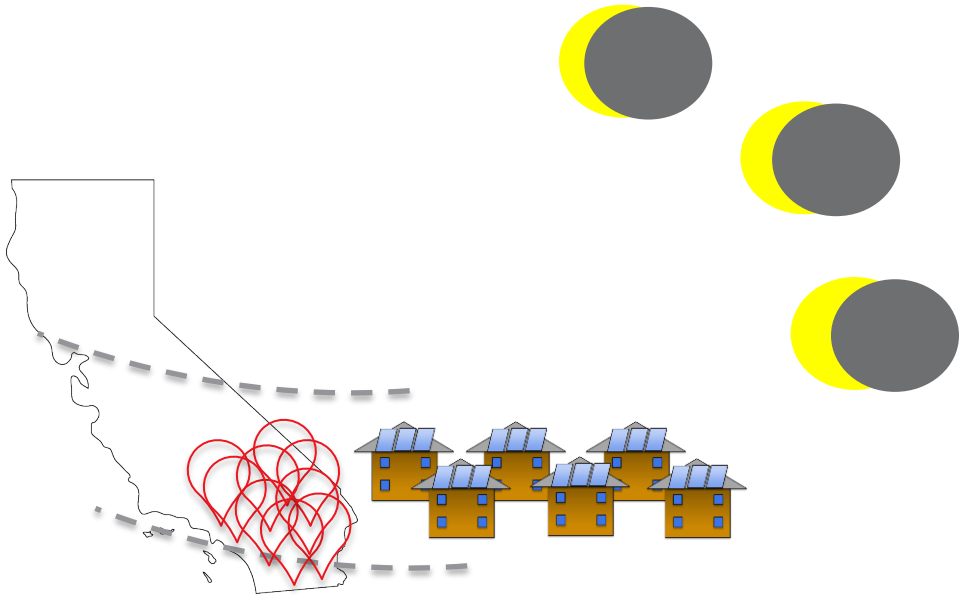
Single PV versus Fleet





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BTM Eclipse Model – Key Considerations

1. PV Location
2. PV Fleet Composition
3. Predicted Fleet Growth

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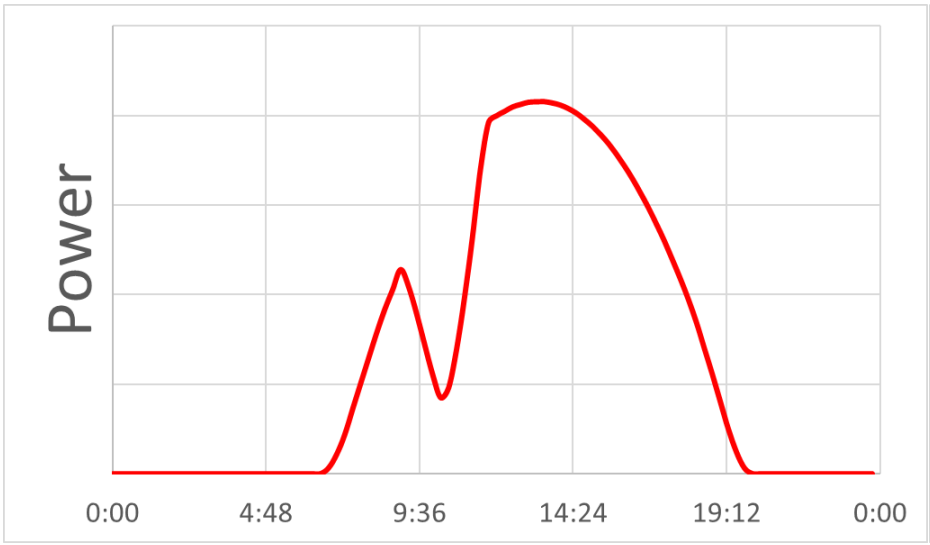
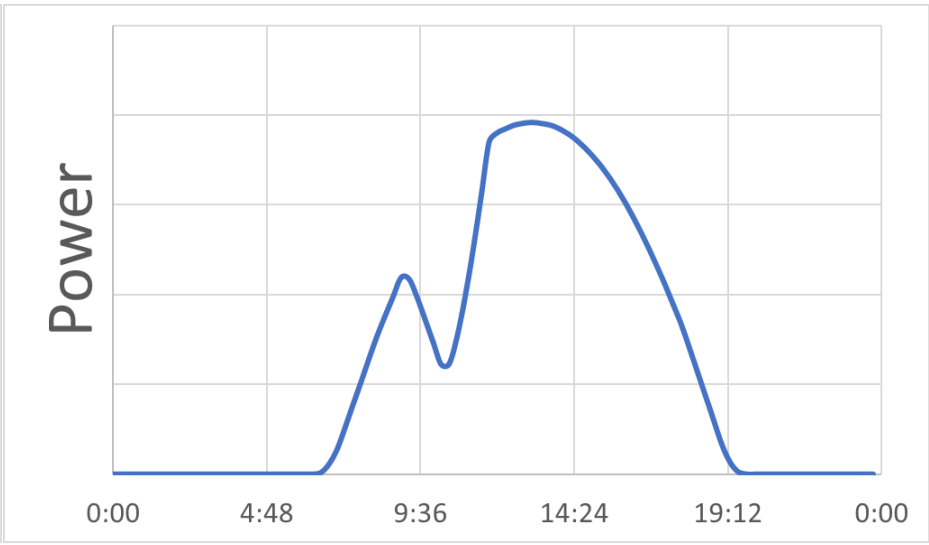
Fleet Power Reduction by Region



Northern California



Southern California

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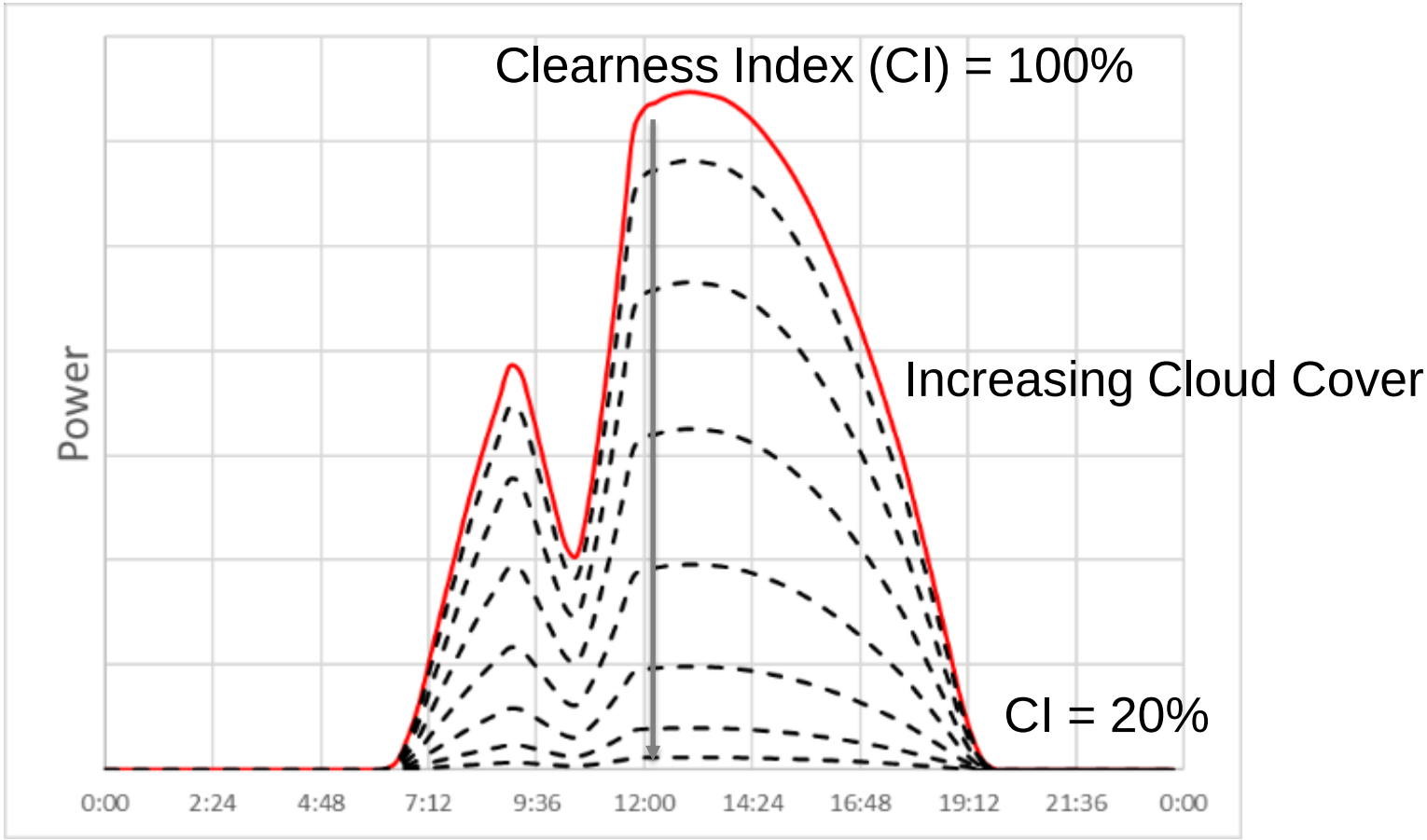
Potential Variability in Cloud Cover



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Thank you

Please feel free to contact us for any details or clarification related to presentation

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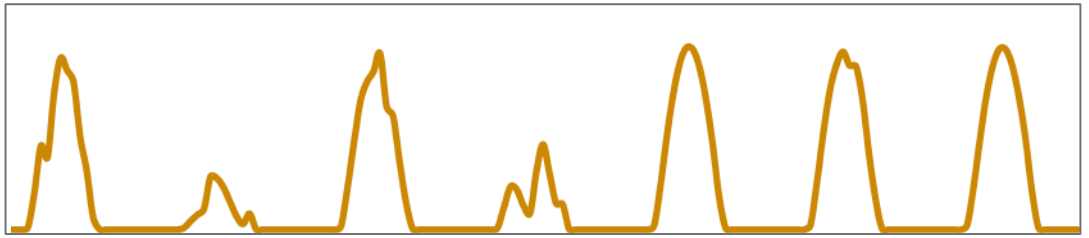
PV Fleet Forecast

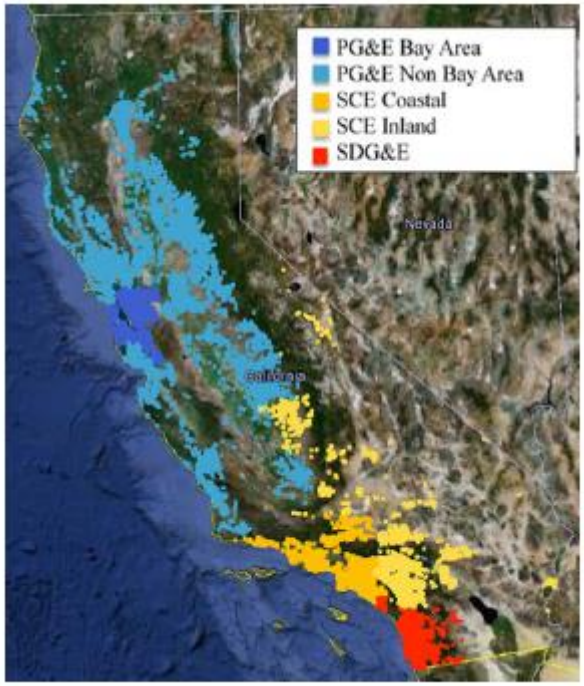
PV FLEET DATA:

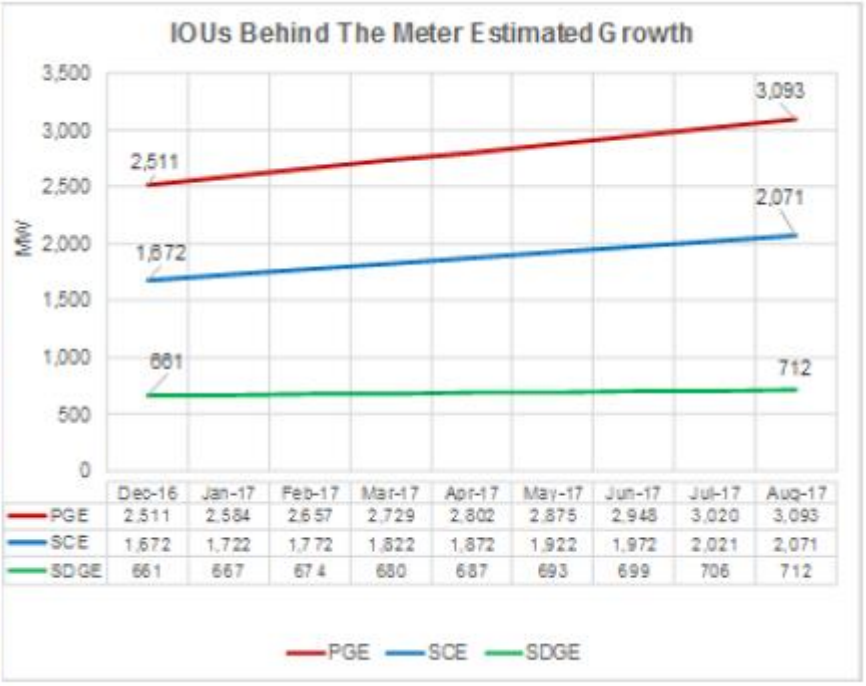
Individual system size, orientation, location, specs, shading



PV POWER FORECAST

Eclipse Model Applied – Key Considerations





	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17
PGE	2,511	2,584	2,657	2,729	2,802	2,875	2,948	3,020	3,093
SCE	1,672	1,722	1,772	1,822	1,872	1,922	1,972	2,021	2,071
SDGE	661	667	674	680	687	693	699	706	712

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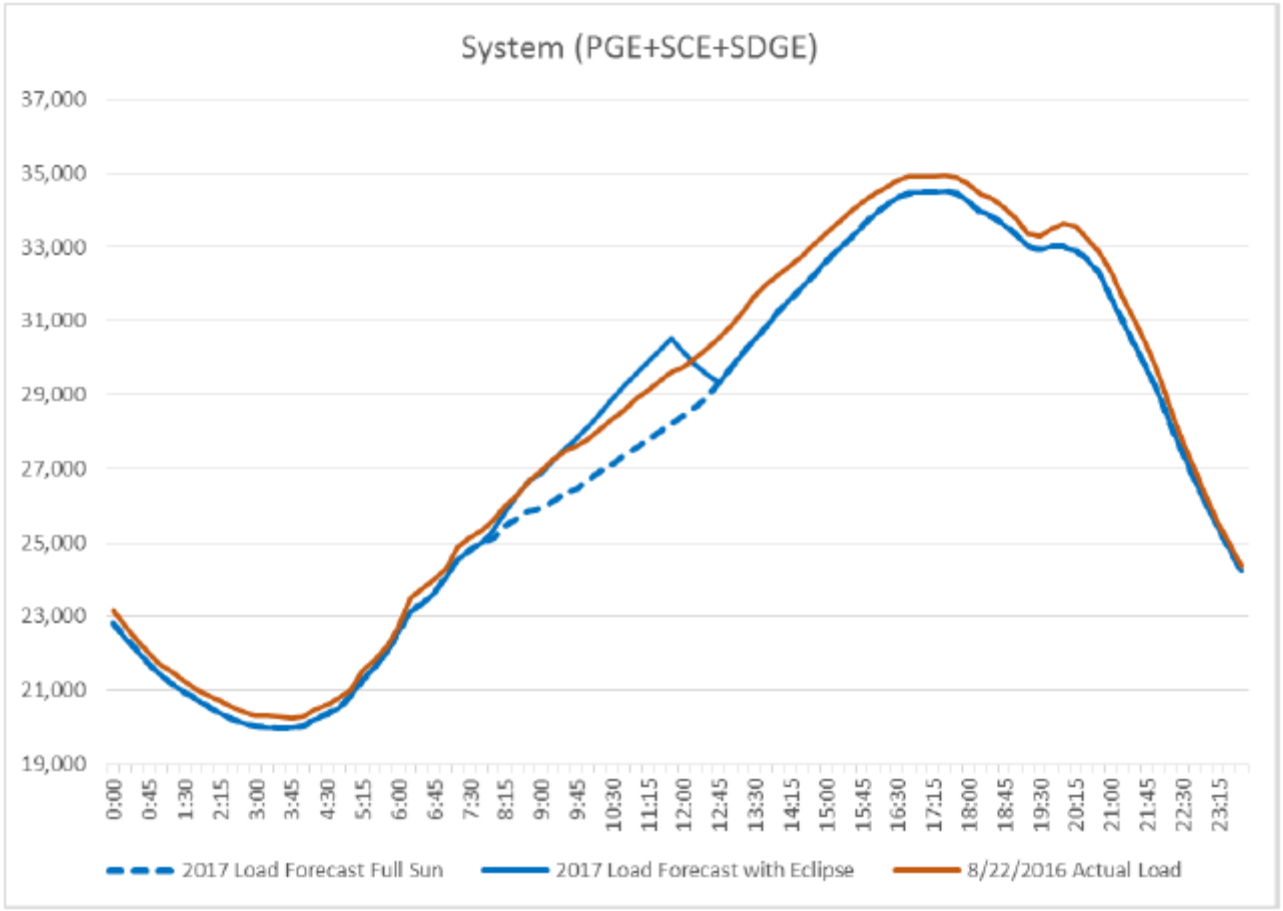
Impact on CAISO Load Model (ALFS)



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Eclipse Model Applied – Key Considerations

1. PV Location
2. PV Fleet Composition
3. Predicted Fleet Growth

BTM Fleet Name	Average Latitude	Average Longitude	Maximum Obscuration Factor (OF_MAX)
SDG&E	32.98	-117.13	58%
SCE Coastal	34.07	-118.27	66%
SCE Inland	34.25	-117.42	63%
PG&E Non-Bay Area	37.67	-121.18	75%
PG&E Bay Area	37.60	-122.06	75%

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