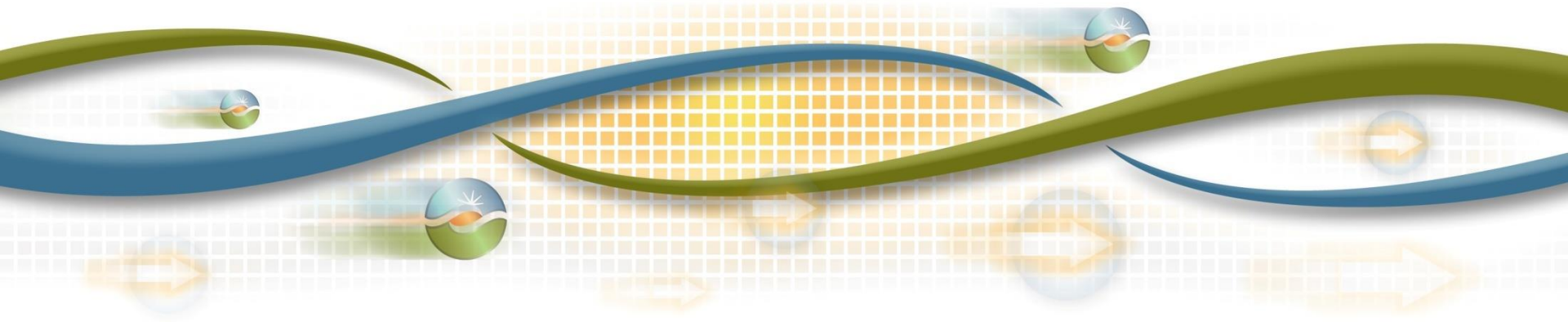
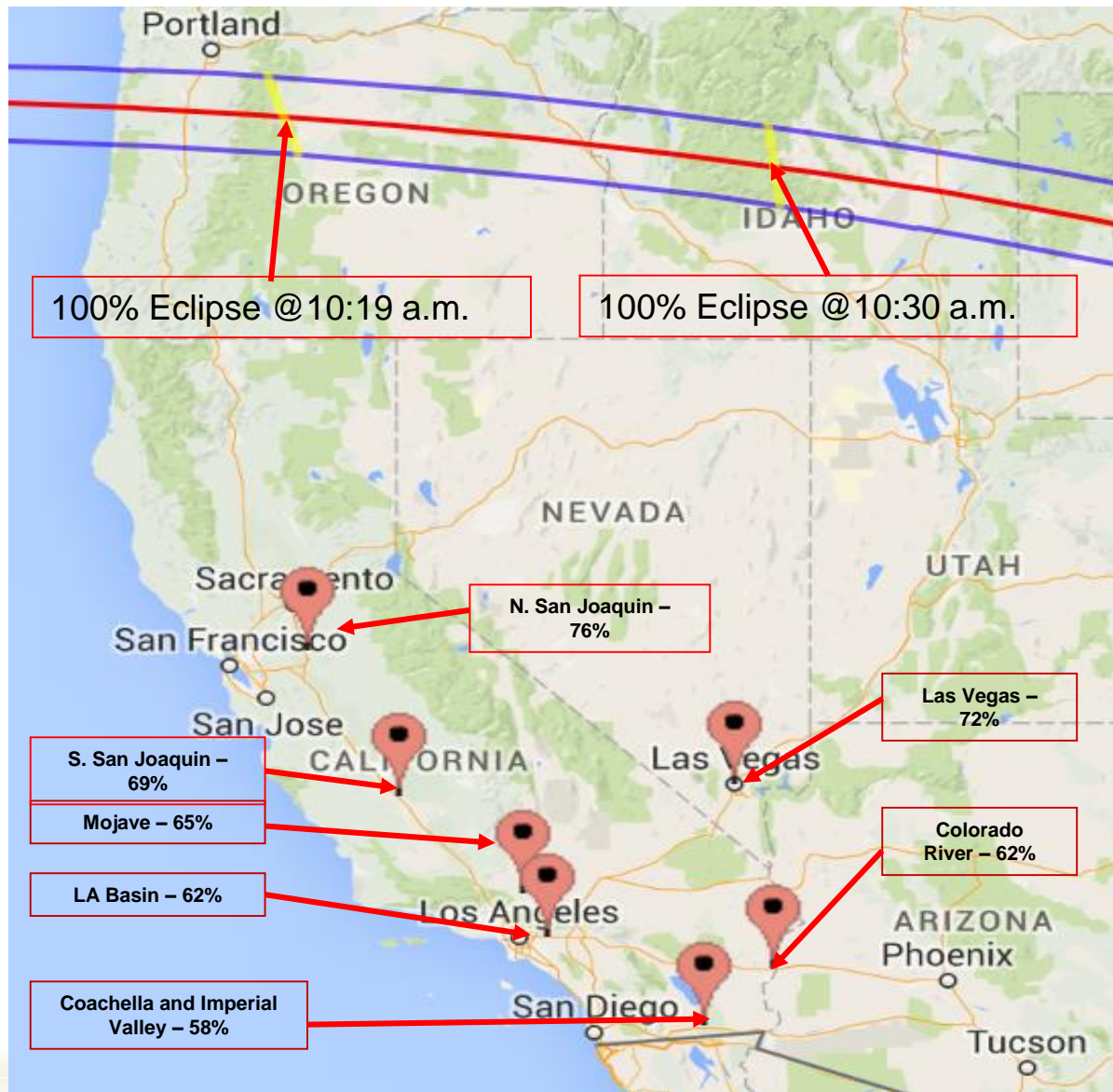


# Solar Eclipse Readiness

Nancy Traweek, Executive Director, System Operations  
July 27, 2017



# August 21, 2017 Solar Eclipse

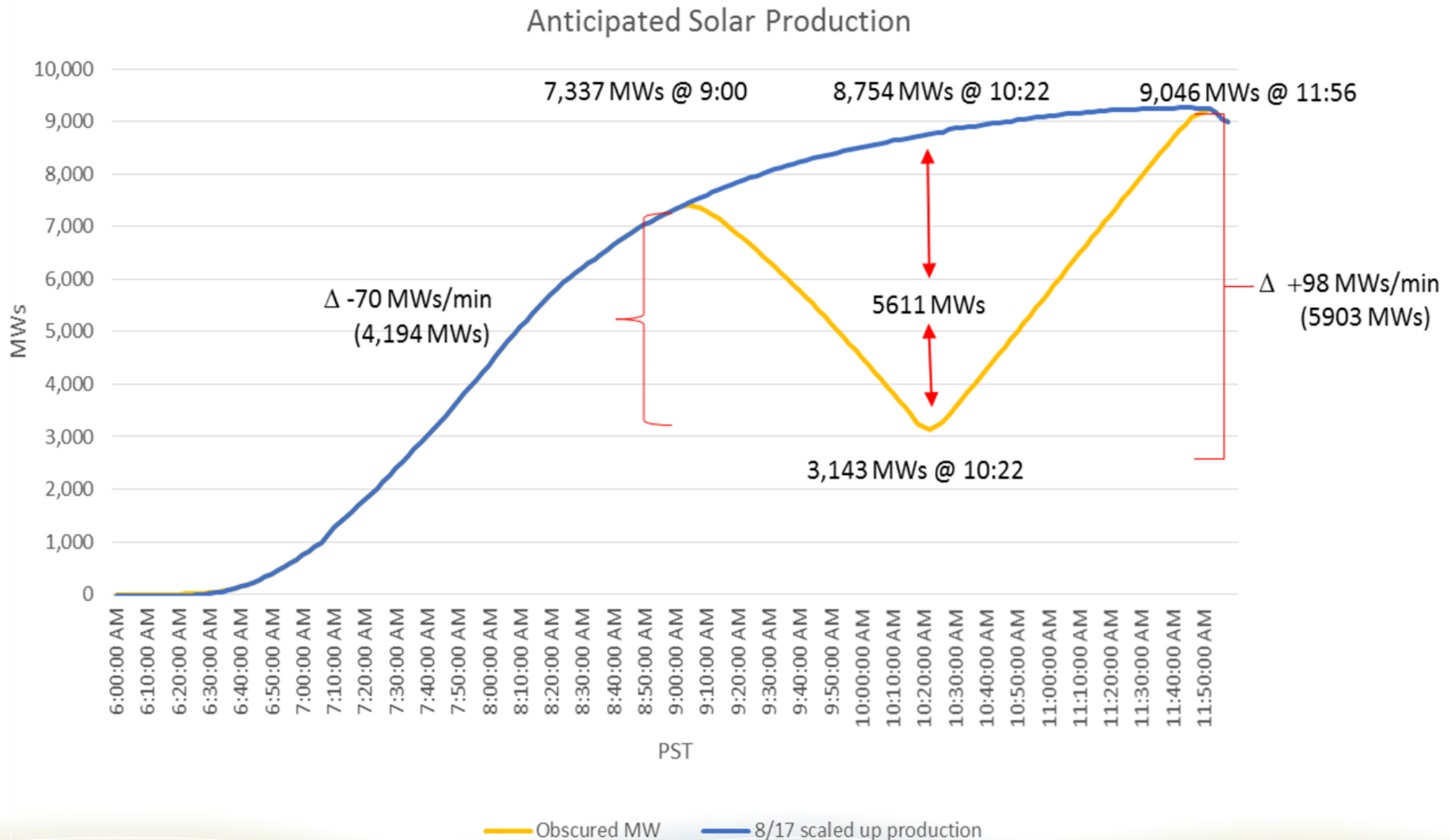


Note:  
% = Expected obscuration

# Solar Eclipse Summary

- Estimated utility scale solar reduction: **4,194 MW**
- Estimated load increase: **1,365 MW**
- Estimated net load increase: **6,000 MW**
- Solar ramp rate
  - Normal:
    - up / down ramps average **30 – 36 MW/min** with highest rates at **60 – 70 MW/min** morning and evening (short duration)
  - During eclipse
    - **Down-ramp of ~70 MW/Min** through max obscuration, **up-ramp of ~90 MW/Min** on return

# Potential MW impact on ISO grid connected solar



# Preparation for Operational Impact

Task	Analysis / Communication / Coordination
Analyze Impact through off-line Market Simulations	<ul style="list-style-type: none"><li>• Analyze regulation requirements</li><li>• Capture intra-hour solar ramp</li><li>• Analyze gas requirements</li></ul>
Regulation procurement	<ul style="list-style-type: none"><li>• Increase Regulation Requirement for impacted hours (in-ramp / out-ramp)</li></ul>
Use of Large Hydro	<ul style="list-style-type: none"><li>• Position large hydro for rapid response during loss and return of solar</li></ul>
VERs – Solar Resources	<ul style="list-style-type: none"><li>• Meetings with Scheduling Coordinators to discuss Operations expectation for duration of Eclipse</li></ul>
EIM Participants	<ul style="list-style-type: none"><li>• Consistent policy for ETSR's during eclipse</li><li>• Accounting for eclipse in VER submittals</li></ul>
Ops Personnel	<ul style="list-style-type: none"><li>• Crew training – use simulator and table top</li><li>• Guide for on-shift crew</li></ul>
Gas Coordination	<ul style="list-style-type: none"><li>• Ongoing coordination with Gas Control</li></ul>

# How you can help...

- Submit Day Ahead solar schedules that accurately reflect hourly solar forecasted output including reductions during the eclipse hours
- Follow Real Time DOTs
- Provide a wide range of decremental bid range on dispatchable solar resources
- Follow Master File Ramp Rates

# Follow-up questions:

- Email your client representative
- Call the Customer Hotline at (916) 608-7320