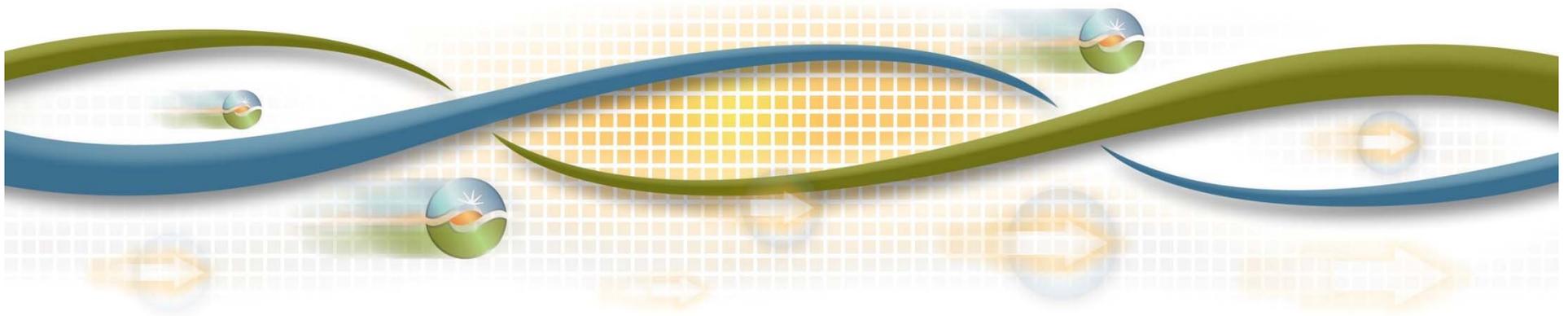




# Briefing on preliminary 2015 Summer Loads & Resources Assessment

Robert Emmert  
Manager, Interconnection Resources

Board of Governors Meeting  
General Session  
March 26-27, 2015



## 2015 Summer Loads & Resources Assessment includes:

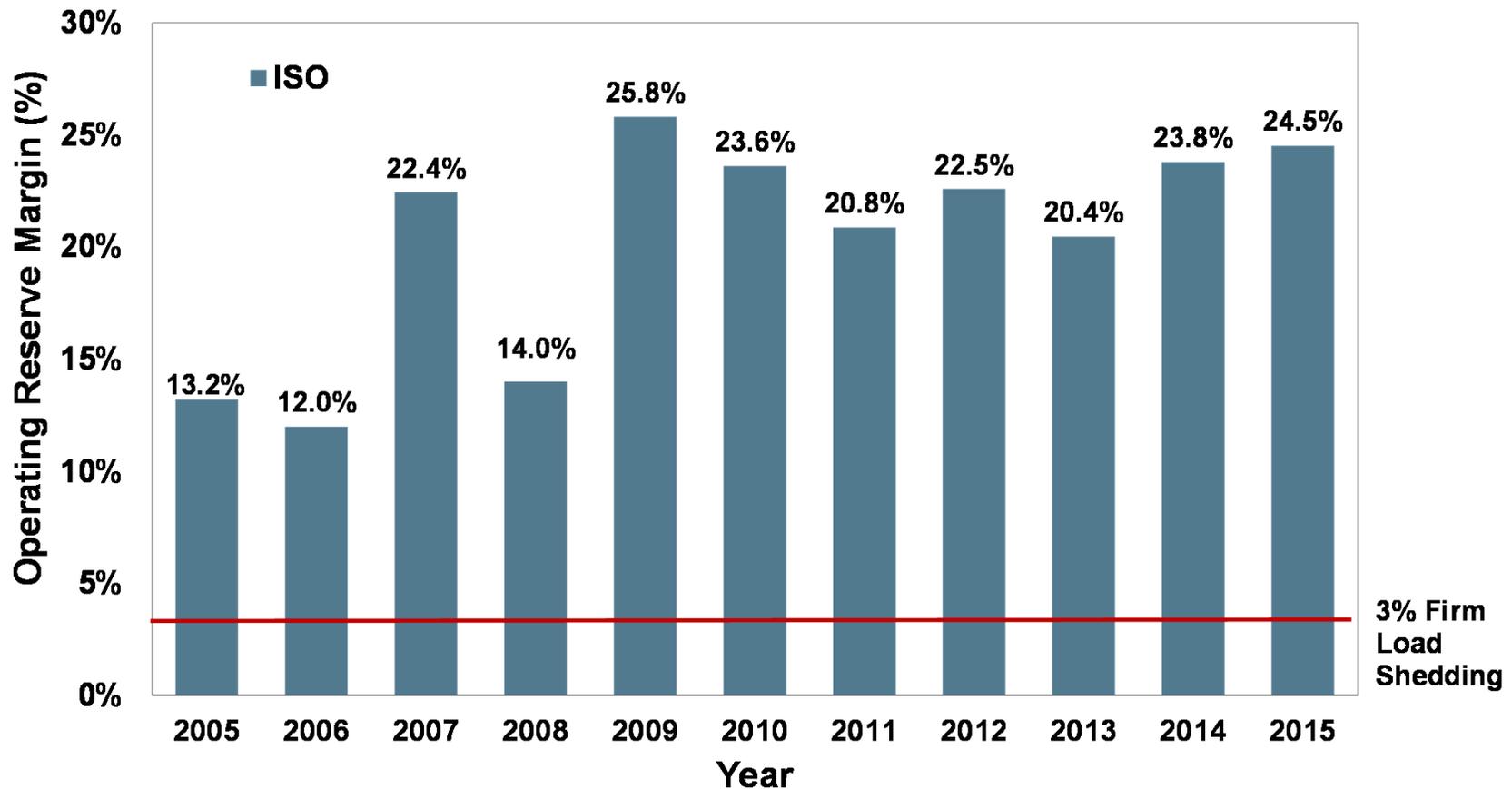
- Forecasts of ISO System and Northern & Southern CA zones:
  - Peak demand
  - Generation resources/imports/demand response
- Reliability concerns related to the ongoing drought
- System and Northern & Southern CA zone capacity adequacy
  - Normal and extreme operating reserve margin scenarios

# Key findings

- Project adequate reserve margins to meet peak summer conditions
  - ISO system, and
  - Northern & southern California
- Drought impacts offset by:
  - Moderate load growth
  - Additional 2,135 MW of new generation
    - 2,066 MW Solar
- Transmission upgrades in San Diego and Orange County are beginning to come online, providing an overall improvement in these local resource adequacy areas.

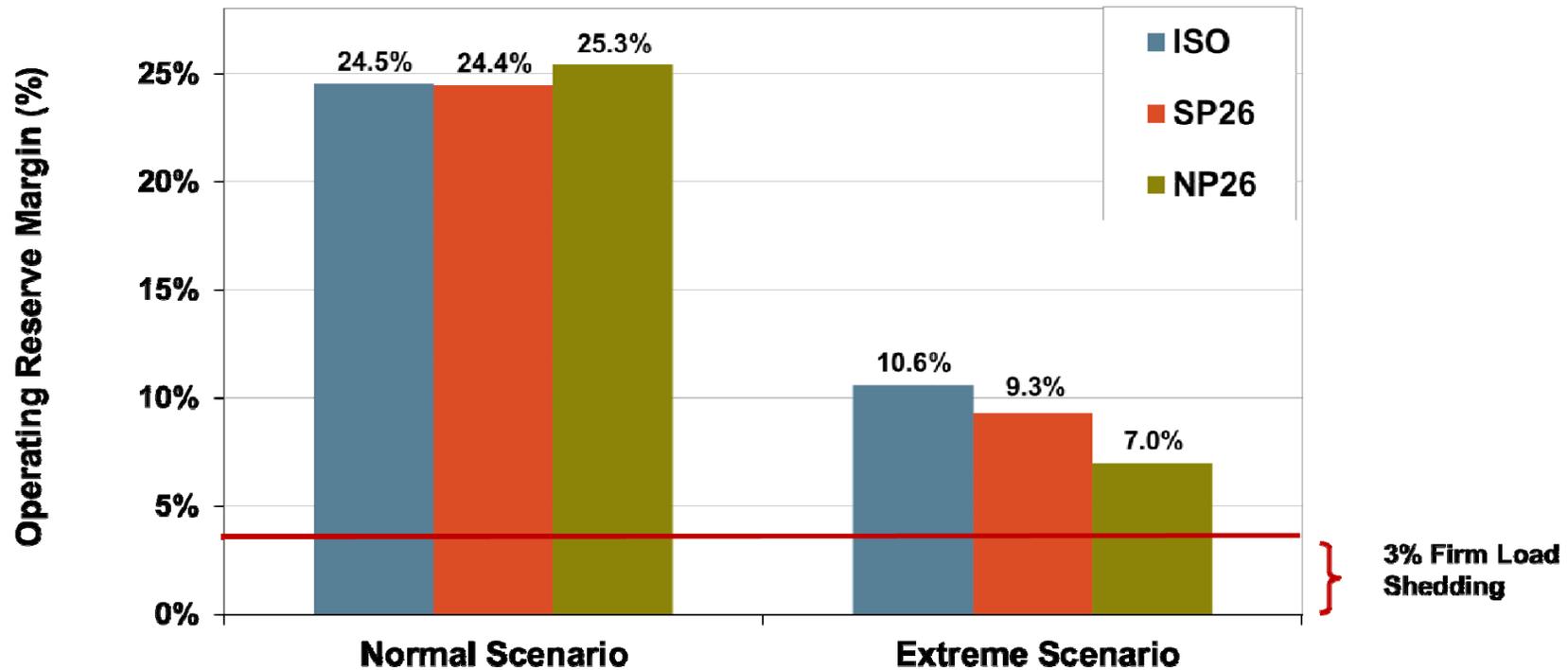
ISO projected operating reserve margin is trending up as California progresses to 33% RPS

### ISO Operating Reserve Margin base on Normal Scenario



# Normal and extreme scenario operating reserve margins are adequate

## ISO, SP26 and NP26 Operating Reserve Margins at 2015 Summer Peak

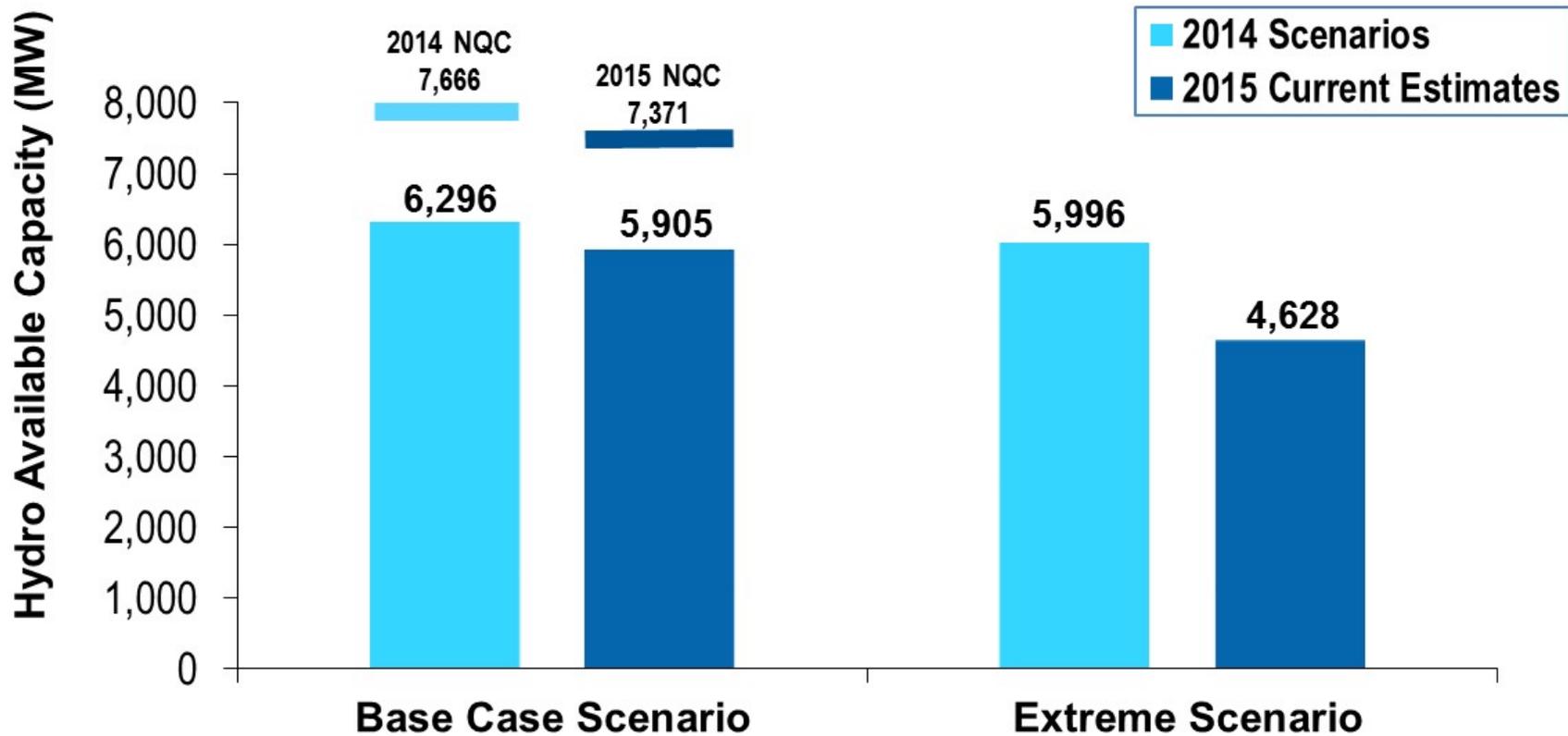


**Notes:**

- ⇒ Demand based on 1-in-2, or 1-in-10 Weather.
- ⇒ Outages based on 1-in-2, or 1-in-10 Generation curtailments.
- ⇒ All Demand Response and Interruptible Load has been utilized.

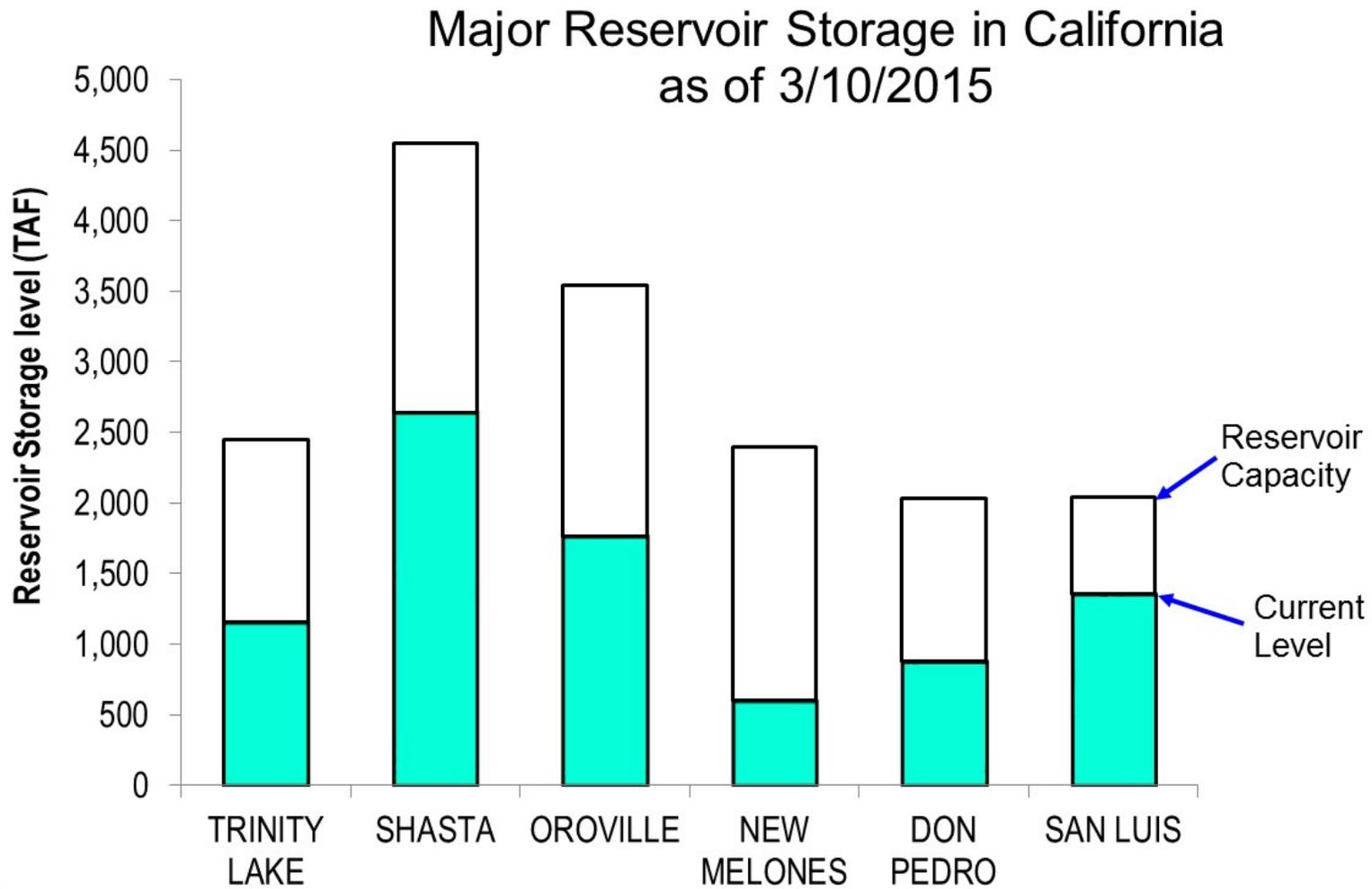
Continuation of drought conditions will further limit the availability of hydroelectric generation over the summer.

### ISO Hydro Available Capacity for 2015 vs 2014

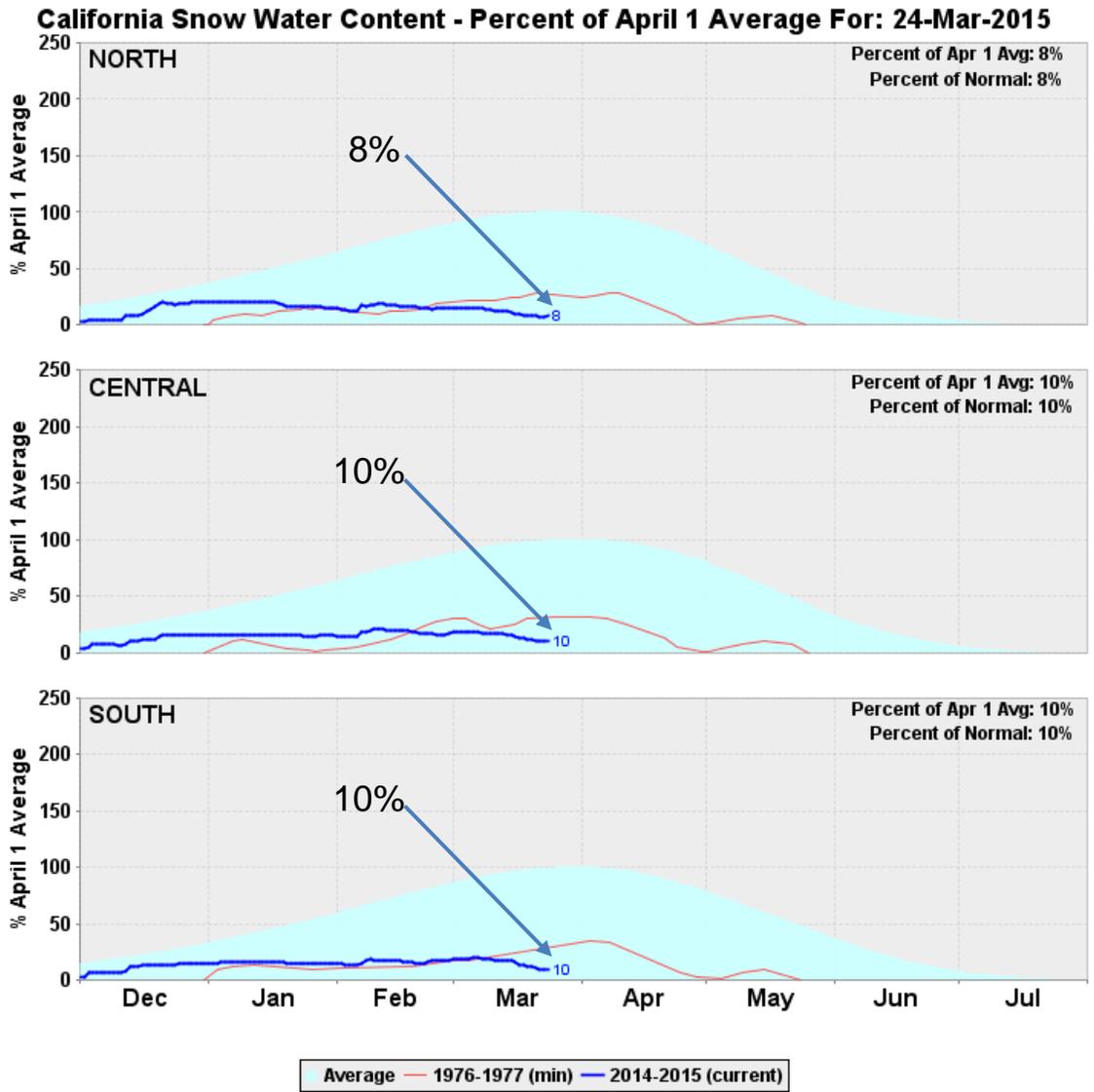


Note: Available Capacity means the capacity which can run for 6 hours/per day and 3 consecutive days

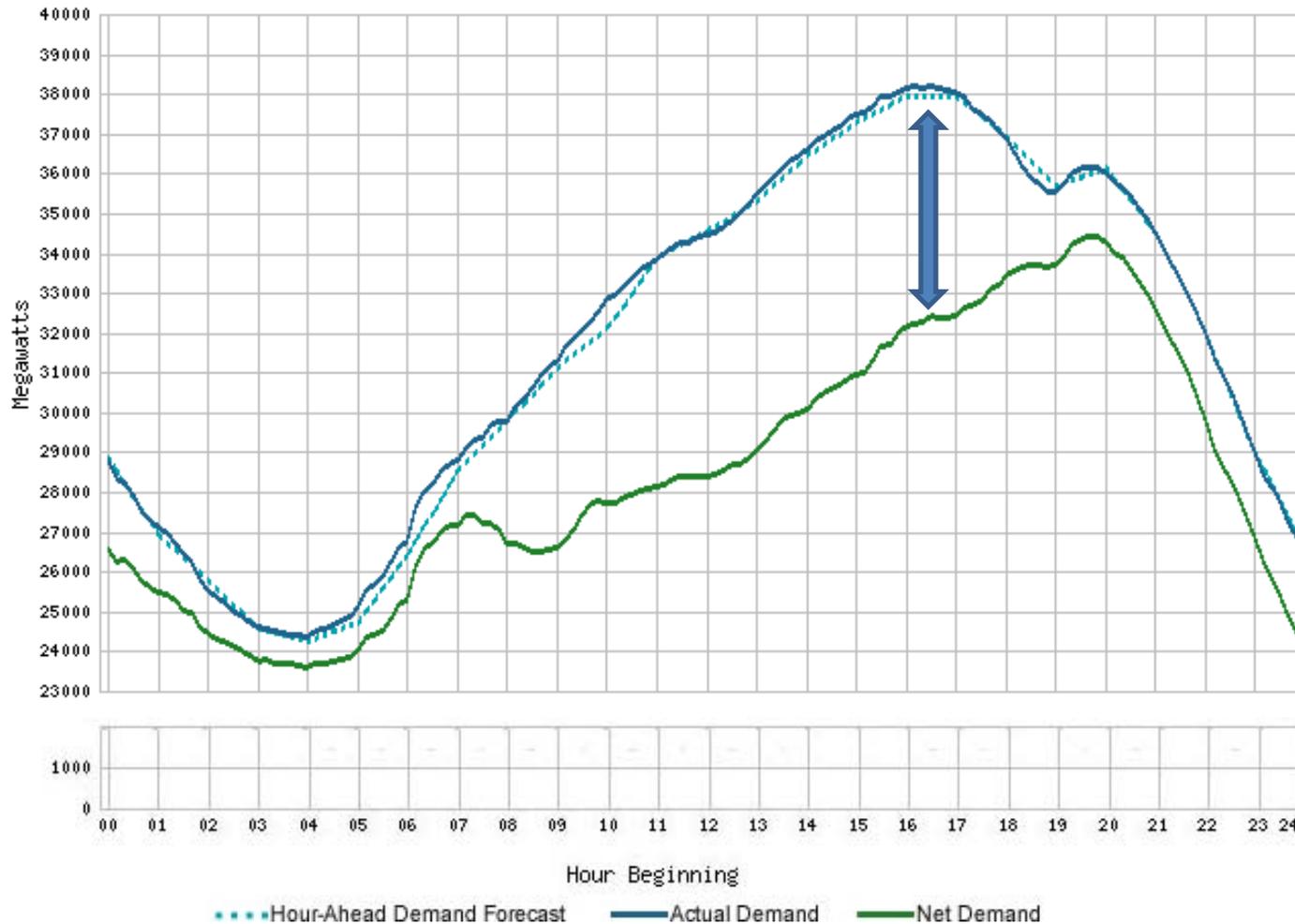
# Major reservoir storage in California is 110% of 2014 (65% of Historical Average)



# California snowpack tracking historical worst year for 2<sup>nd</sup> year in a row – statewide average is 9% of April 1 historical average



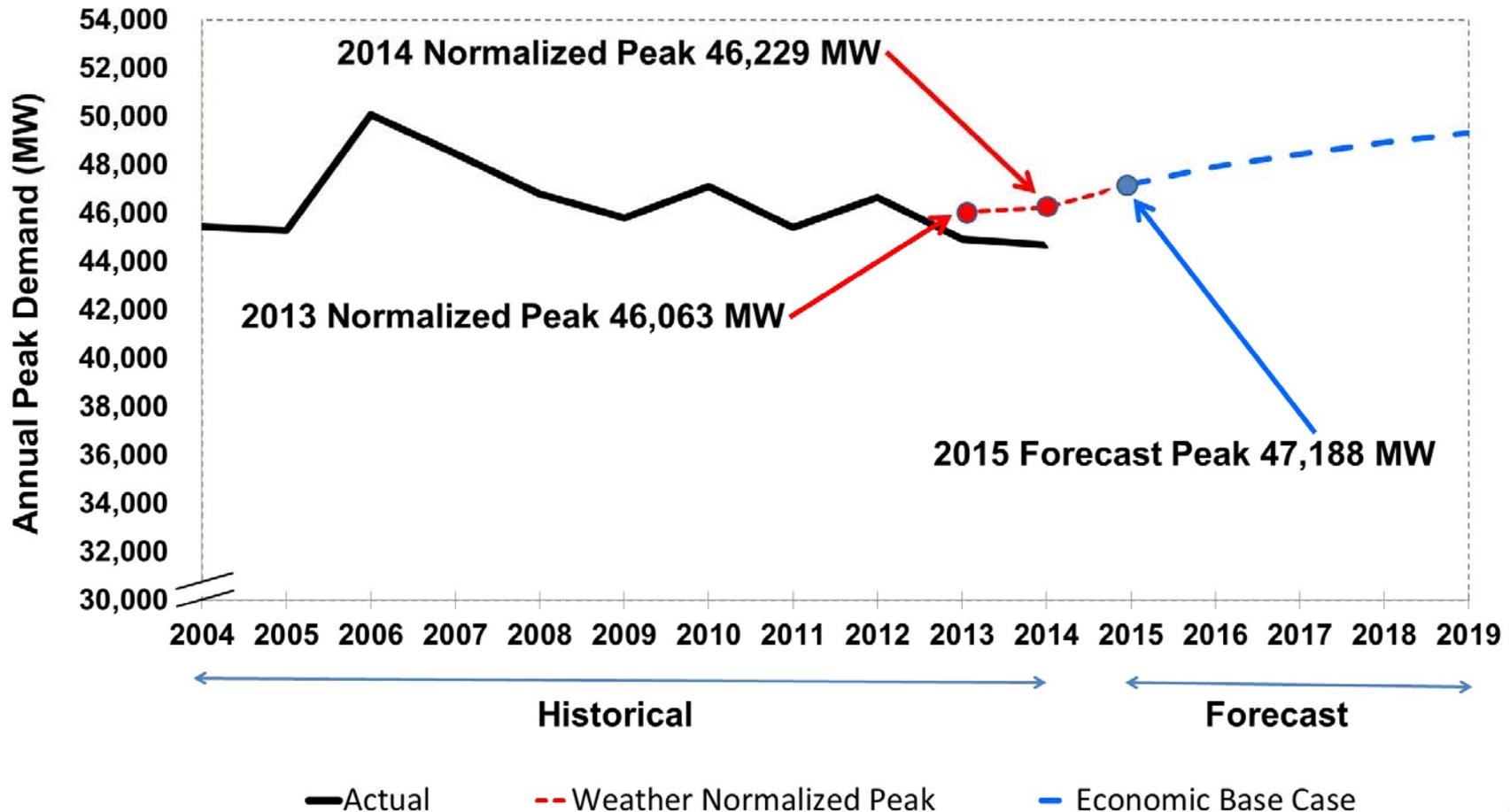
# Solar production significantly reduces the need for conventional resources on peak demand days.



**Net Demand** is calculated by taking the actual demand and subtracting the electricity produced by wind and solar resources that are directly connected to the ISO grid.

2015 ISO peak demand forecast is 47,188 MW  
(Compared to 47,351 MW in 2014)

### ISO Weather Normalized Peak and 1-in-2 Forecast peak



## System and zonal normal-scenarios for operating reserve margins show adequate margins for 2015

<b>On-Peak Resources (MW)</b>	<b>ISO</b>	<b>SP26</b>	<b>NP26</b>
On-Peak Generation <sup>1</sup>	53,908	26,605	27,303
Hydro Derate (1-in-2)	(1,466)	(613)	(852)
Generation Outages (1-in-2 )	(5,028)	(2,163)	(2,882)
Moderate Net Interchange	9,500	8,700	2,000
DR & Interruptible Programs	1,839	1,297	543
<b>Total Resources</b>	<b>58,754</b>	<b>33,826</b>	<b>26,111</b>
<b>Peak Demand (1-in-2)</b>	<b>47,188</b>	<b>27,183</b>	<b>20,832</b>
<b>Operating Reserve Margin</b>	<b>24.5%</b>	<b>24.4%</b>	<b>25.3%</b>

<sup>1</sup>On-Peak Generation = Existing Generation + Additions - Retirements

## Extreme scenario: ISO system operating reserve margin is greater than 10%

<b>On-Peak Resources (MW)</b>	<b>ISO</b>	<b>SP26</b>	<b>NP26</b>
On-Peak Generation <sup>1</sup>	53,908	26,605	27,303
Hydro Derate (1-in-10)	(2,743)	(1,216)	(1,527)
High Generation Outages (1-in-10 )	(6,704)	(3,478)	(4,165)
Net Interchange	8,300	8,500	1,100
DR & Interruptible Programs	1,839	1,297	543
<b>Total Resources</b>	<b>54,599</b>	<b>31,708</b>	<b>23,253</b>
<b>Peak Demand (1-in-10 )</b>	<b>49,370</b>	<b>29,006</b>	<b>21,735</b>
<b>Operating Reserve Margin</b>	<b>10.6%</b>	<b>9.3%</b>	<b>7.0%</b>

<sup>1</sup>On-Peak Generation = Existing Generation + Additions - Retirements