

DOCKETED

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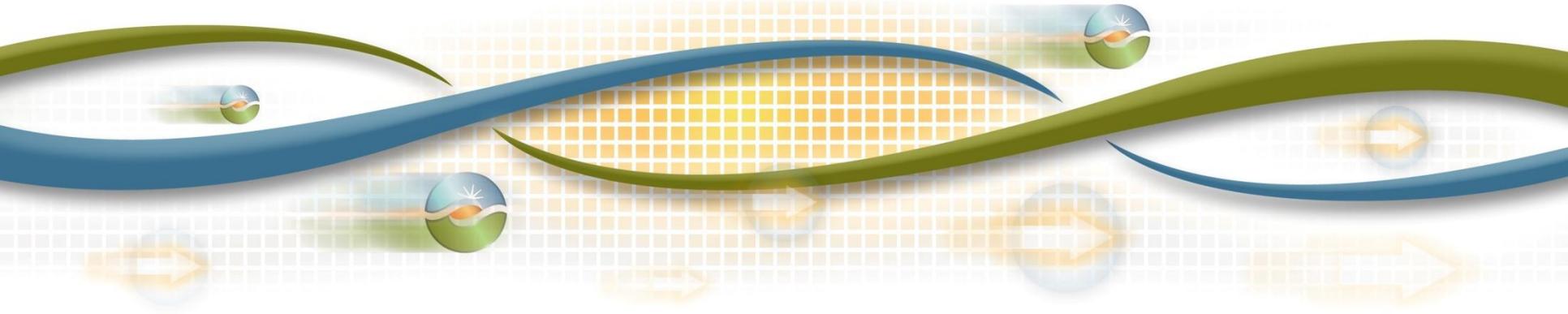
CEC IEPR Commissioner Workshop

Renewable Progress, Challenges & Opportunities

Renewables and Reliability

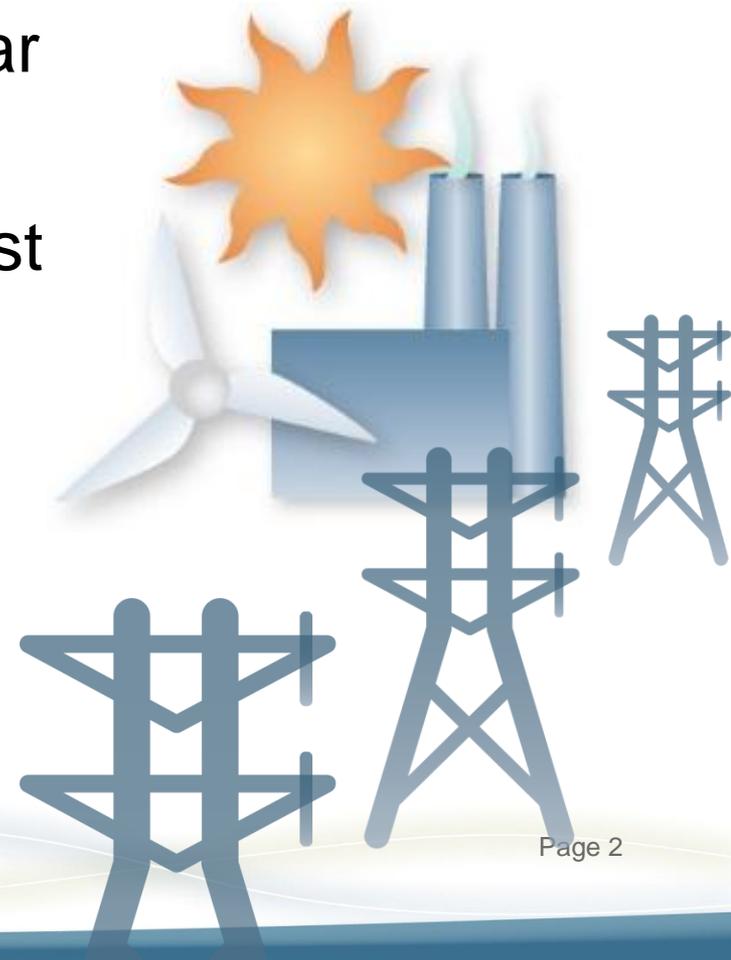
Dennis Peters

May 11, 2015



Game Changers: Components of New Grid Model

1. Rapid growth in utility-scale renewables
2. The rise of consumer-owned solar
3. Governor's 50% Goal
4. Opportunities for CA and the West



Utility-Scale and Consumer-Owned Renewables

Utility-scale renewables online

- 6,400mw wind; 7,100mw solar
- On track for 33% by 2020

2,500 MW of Consumer Solar

- Growing fast; “invisible” to ISO

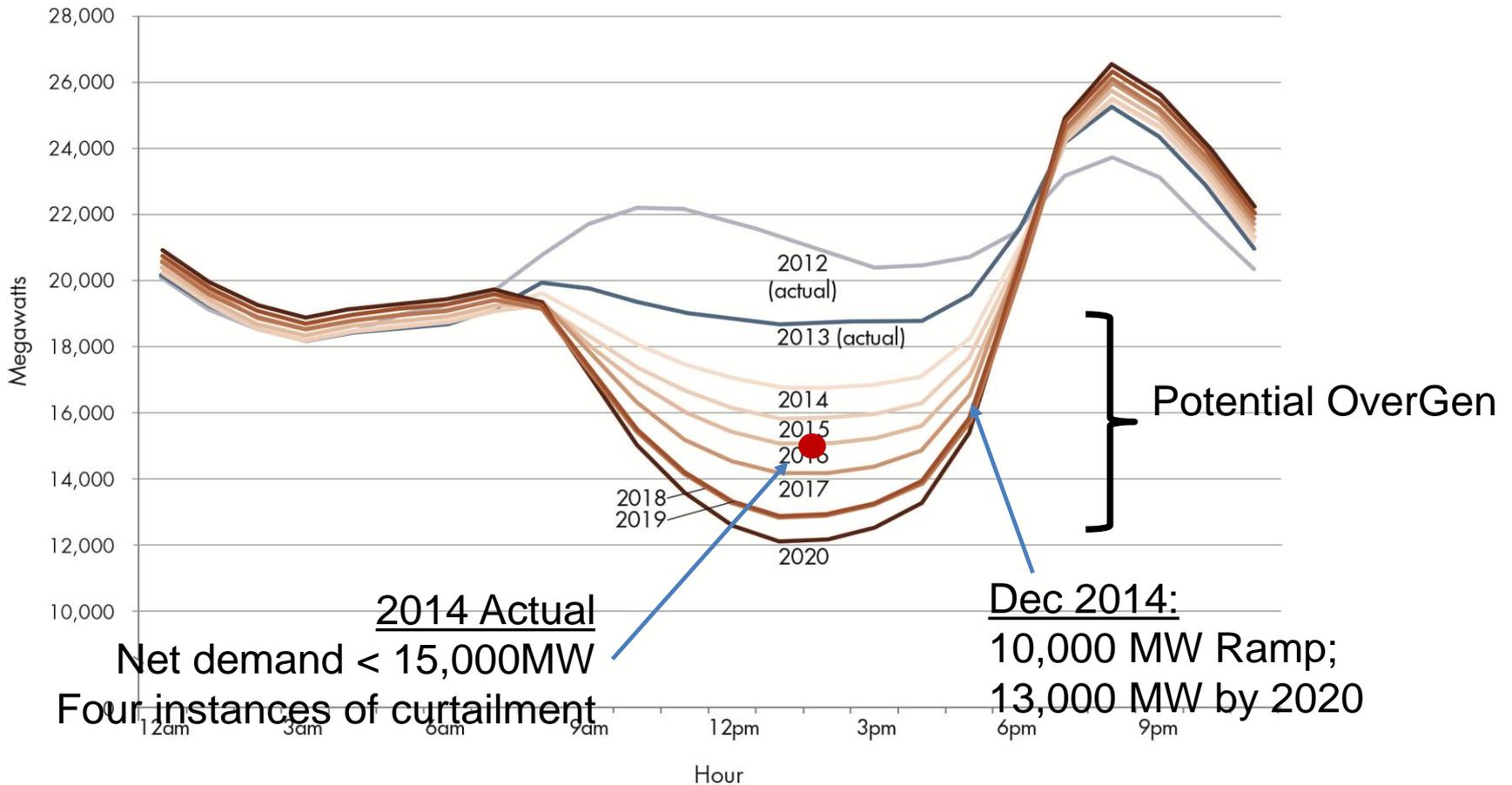
Governor’s Goal

- Does 50% = 50% RPS??
- ISO working with others; conducting studies; new models and scenarios



Overgeneration and Ramping The Challenge for Grid Operators

Net load - March 31



Four instances of manual renewable curtailments in 2014

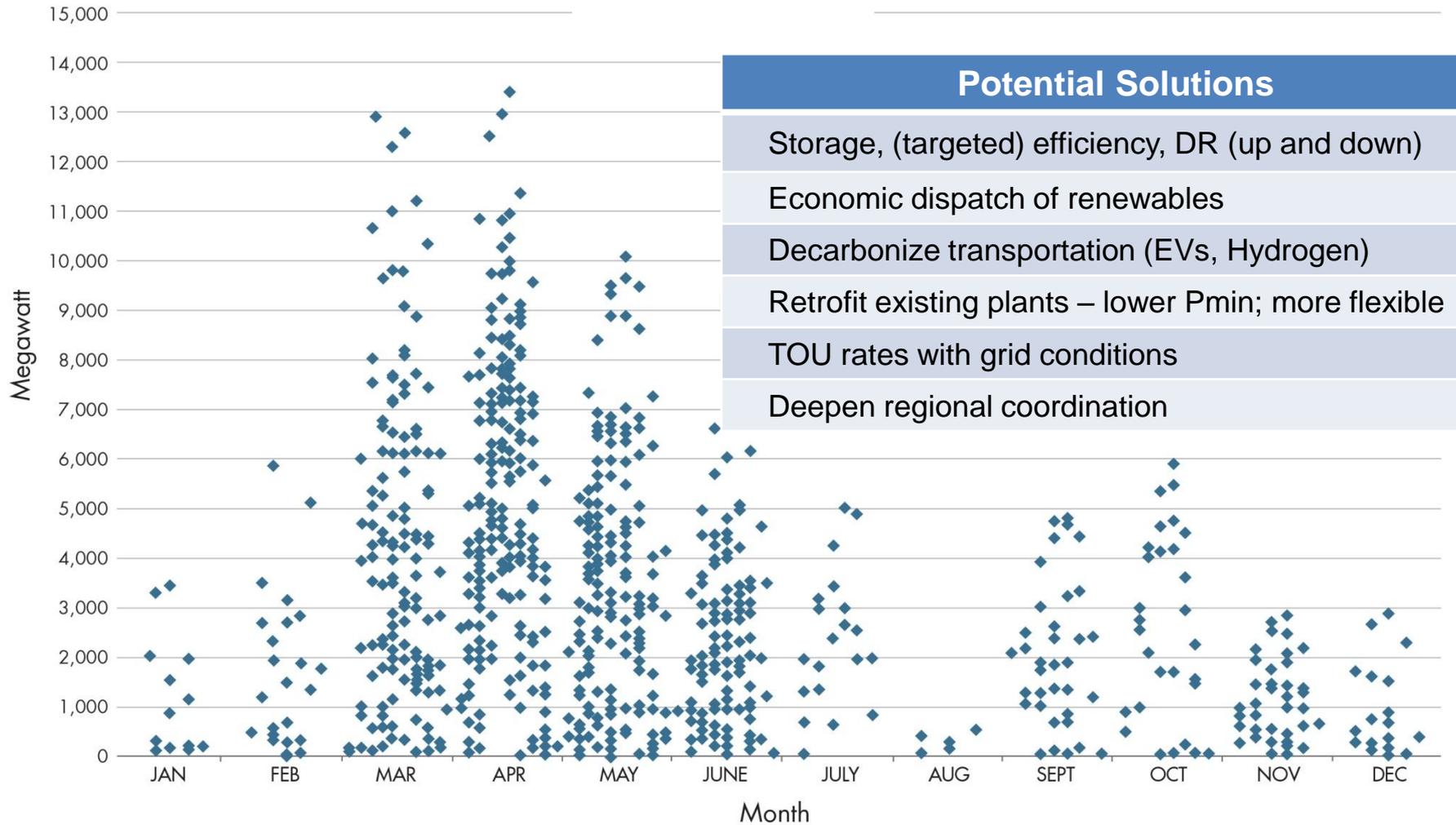
Date	Curtailed MWs	Duration (minutes)
February 19	116	170
March 7	123	60
April 12	427	30
April 27	740	90

Expected increasing challenges through 2020

- Loads expected to decrease by 3,000 MW due to solar DG
- Net demand expected to drop by 4,000-5,000 MW due to utility-scale solar installation to meet 33% RPS
- 4,000 to 5,000 MW additional resources would have to be committed to get about 3,000 to 4,000 MW of downward dispatchability
- Evening 3-hour ramp expected to be 13,000 MW

Overgeneration risk is significant over next decade

800 + curtailments in 2024, under 40% RPS Scenario



Regionalism: high value and timely solutions

Energy Imbalance Market

- Unlocks value of diverse assets
- Leverages ISO's market/systems

NEW: PacifiCorp full participation

- Day ahead = significant benefits
- Study underway
- Stakeholder processes for RA, Governance, TAC, etc.

