

# Is the California ISO Becoming an Uplift Market? Pricing, Uplift and Commitment

Scott Harvey

Member: California Market Surveillance Committee

Folsom, California

May 19, 2014



Critical thinking at the critical time™

# TOPICS

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- Context
- Incentive Problems in Uplift Markets
- Has the California ISO Become an Uplift Market
- What can be done?

## CONTEXT

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California ISO market participants articulated a variety of concerns relating to price formation, price signals and uplift at the April 22 pricing forum.

- In order for the California ISO to best respond to those concerns we will need to understand what is driving the outcomes that cause these concerns.
  - Are these outcomes the inevitable consequence of the resource mix the California ISO uses to meet load?
  - Are these outcomes the result of choices California ISO operators make in meeting load?
  - Are these outcomes the result of incentives created by California ISO market rules?

## CONTEXT

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- Are these outcomes the result of features of California ISO unit commitment and dispatch software (including the penalty factors used for various requirements, the degree to which it is forward looking, differences between RTPD and RTD, flaws in the software implementation, etc)?

We are not going to answer these questions today but we can start the process required to work through them.

# INCENTIVE PROBLEMS

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Should we care about the relative level of uplift payments and energy market revenues in the California ISO electricity market?

- Providing resources assurance that they will recover the cost of following ISO dispatch and unit commitment instructions is essential to maintaining reliability.
- However, it is also important that uplift payments serve only as a backup mechanism, not replace the market, because uplift payments adversely impact other incentives.

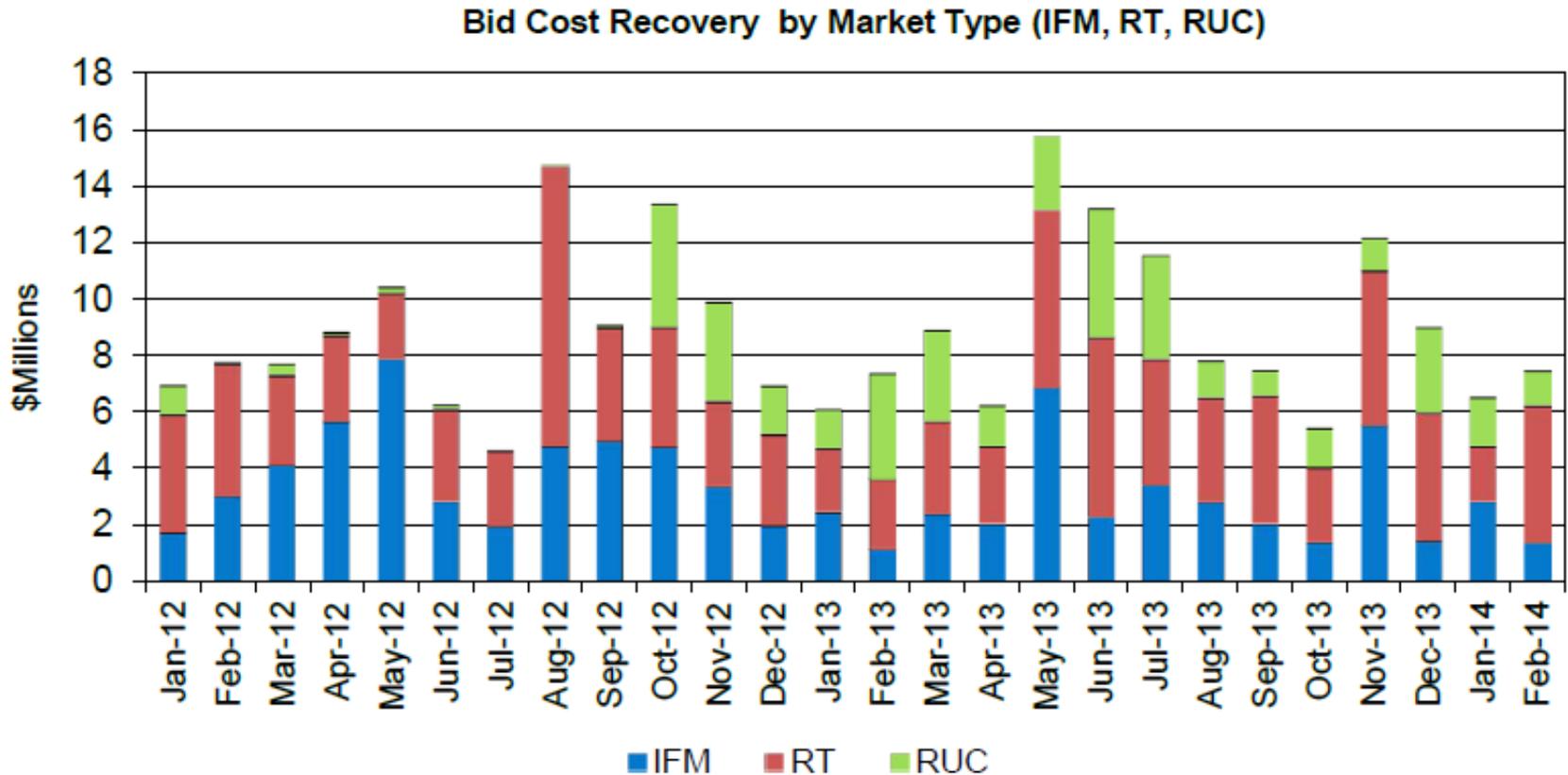
# INCENTIVE PROBLEMS

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Resources receiving uplift payments in many hours over the year:

- Have reduced incentives to make investments to reduce their incremental operating costs, as the cost reductions will also result in lower uplift revenues;
- Have reduced incentives to make investments to improve their performance (such as raising their ramp rate) as increases in energy revenues will be offset by lower uplift revenues;
- Have reduced incentives to bid their actual costs. Higher offer prices will raise uplift revenues if the unit remains economic and offer prices in excess of costs will generate a profit while cost based bidding will not.

# IS THE CAISO AN UPLIFT MARKET?



Source: California ISO, Market Performance and Planning Forum, March 13, 2014, p.26.

# IS THE CAISO AN UPLIFT MARKET?

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While the level of uplift payments in the California ISO electric market is material, it is not exceptional in proportion to the overall cost of meeting load if compared to levels in other ISOs and RTOs.

- The level of uplift payments relative to total uplift, energy and ancillary service costs in the California ISO was 1.03% in 2013 and 1.31% in 2012. <sup>1</sup>
- In ISO New England in 2012, NCPC (uplift in New England) was 1.89% of total uplift, energy and ancillary service payments. <sup>2</sup>
- PJM's uplift charges were around 2.8% of the cost of load in 2013. These uplift charges include some costs that would be covered by ancillary service revenues in other RTOs. <sup>3</sup>

1. California ISO, Department of Market Monitoring, 2013 Annual Report on Market Issues and Performance, Table 2.1 p. 64.

2. ISO New England Internal Market Monitor, 2012 Annual Markets Report, p. 95.

3. Monitoring Analytics , 2013 State of the Market Report for PJM, March 13, 2014 pp. 102, 106, 121,136

## IS THE CAISO AN UPLIFT MARKET?

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On the other hand, uplift payments in California are largely going to oil and gas fired on dispatch generation, which is a smaller proportion of total generation in California than in New England.

- A statistic that would inform us as to the extent to which the level of uplift payments in California ISO markets is undermining market incentives would be to calculate the percentage of the on dispatch gas fired units that are typically receiving uplift payments.
- If the proportion is relatively small and the identity of the units receiving uplift varies from day to day, this would suggest that uplift payments should not be having a material adverse impact on generator performance incentives.

## WHAT CAN BE DONE?

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It would be troubling to find that on dispatch gas fired units in the California ISO market are typically receiving uplift payments.

- This would suggest that the energy market may not be effective in providing performance incentives for flexible generation in the manner needed to reliably meet net load with high levels of intermittent resource output.
- If this is the situation, we need to understand why it is happening and try to correct it.

# WHAT CAN BE DONE?

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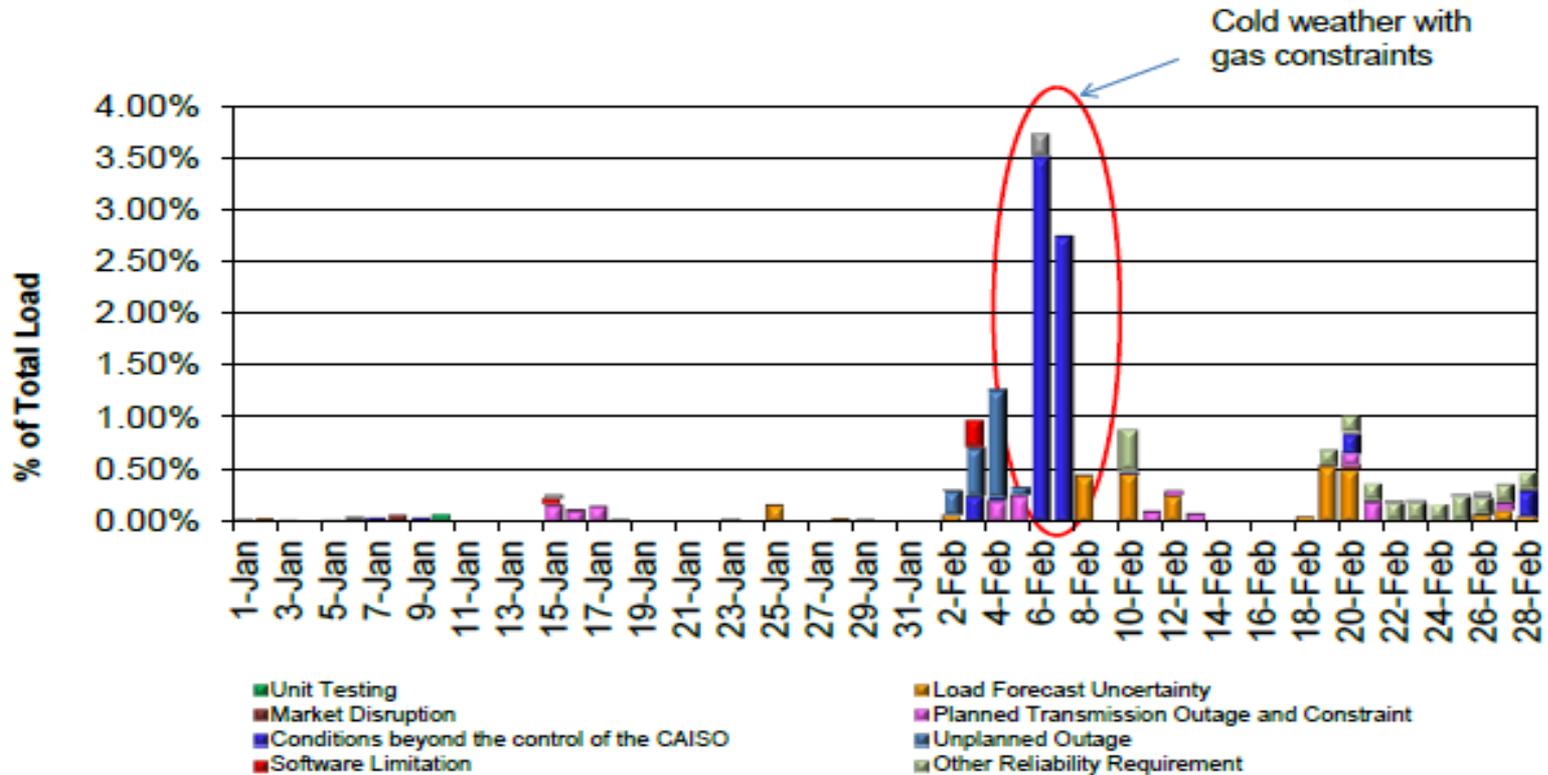
An initial question is the degree to which the level of uplift payments is a result of resources that are dispatched out of merit.

- Out of merit dispatch does not appear to be a major contributor to uplift payments.
- Department of Market Monitoring calculations indicate that it accounted for only \$8 million of uplift payments in 2012 and \$1.4 million in 2013. <sup>1</sup>

1. California ISO, Department of Market Monitoring, 2013 Annual Report on Market Issues and Performance 2013 p. 216.

# WHAT CAN BE DONE?

## Daily Exceptional Dispatches by Reason



Source: California ISO, Market Performance and Planning Forum, March 13, 2014, p.25.

## WHAT CAN BE DONE?

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The high level of exceptional dispatch on February 6 and 7 was noted at the April 22, 2014 pricing forum.

- It is my understanding that the exceptional dispatch reflected gas fired resources dispatched down out of merit because of the limited gas supply, not resources dispatched up out of merit.
- This appears to have been the economically efficient way for the California ISO to reflect the gas system limitations.
- Reducing the electricity price in the region in which gas fired generation was dispatched down would not have sent the correct price signal. Electric power output was needed in that region, it was the gas consumption of the gas fired generation that needed to be limited.

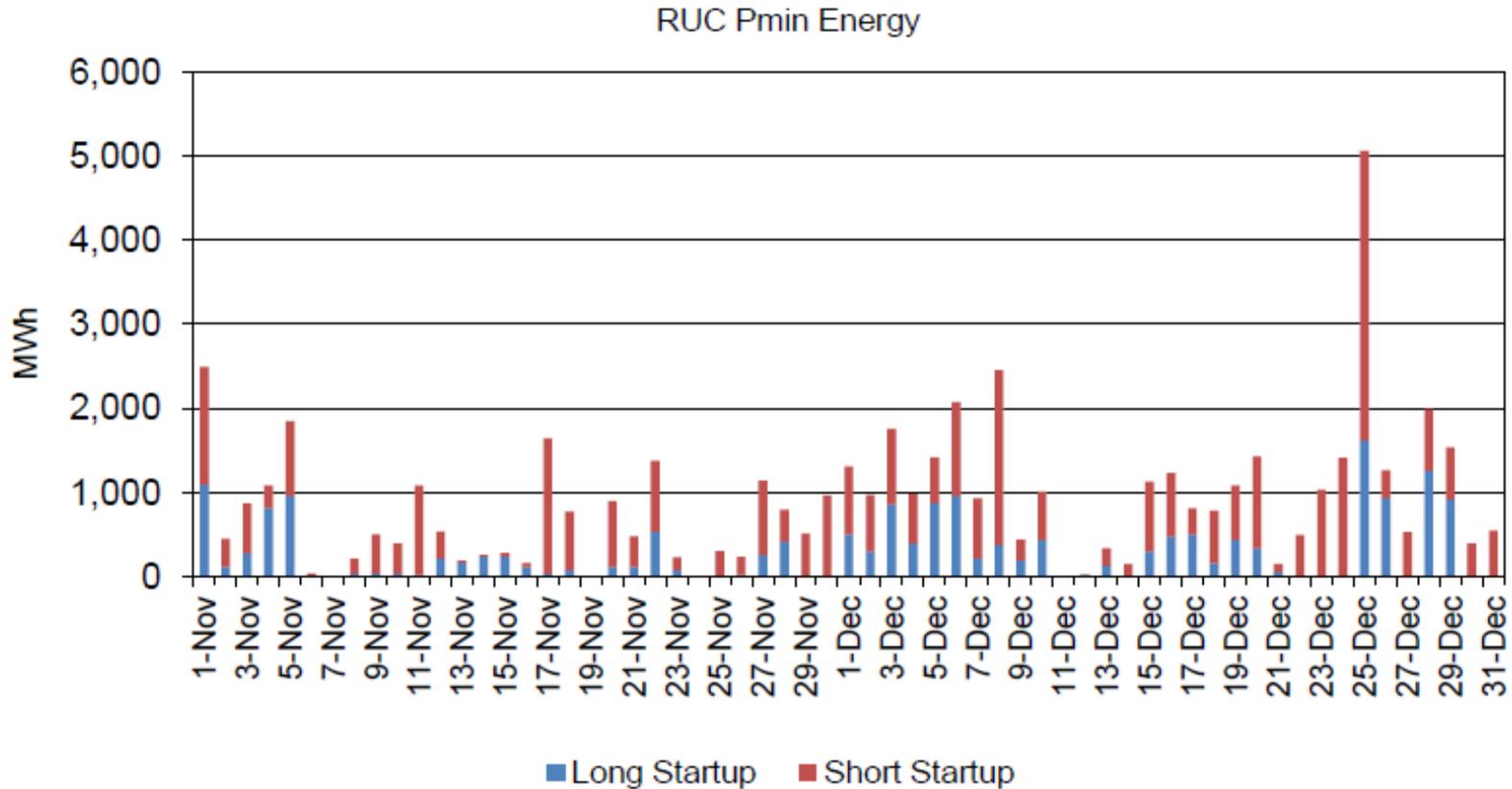
## WHAT CAN BE DONE?

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Since out of merit dispatch does not appear to be a material source of real-time uplift, real-time uplift is largely due to resources committed in real-time that do not recover their start-up and minimum load costs in energy market revenues.

- A starting point in understanding the causes of real-time uplift costs would be to understand why the resources receiving uplift payments in real-time are on-line.
- Were they committed by RUC, STUC, RTPD or real-time operators?

# WHAT CAN BE DONE?



Source: California ISO, Market Performance and Planning Forum, January, 2014, p.20.

## WHAT CAN BE DONE?

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In assessing the impact of RUC on real-time prices and uplift, it is important to keep in mind that only RUC commitments, not RUC procurement, impact real-time prices and contribute to real-time uplift costs.

- It is my understanding that only the procurement of RUC capacity on long-start units committed in RUC result in the commitment of capacity based on the RUC procurement.
- The commitment decisions for short-start capacity procured in RUC are not made in RUC but in STUC or RTPD.
- The Department of Market Monitoring estimates that of the \$23 million of uplift on units off-line in the IFM with capacity procured in the RUC pass in 2013, only around \$8 million was for long-start units actually committed by RUC. <sup>1</sup>

1. California ISO, Department of Market Monitoring 2013 Annual Report on Market Issues and Performance p. 79.

## WHAT CAN BE DONE?

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Hence, commitment of long-start units in RUC accounts for a small proportion of overall uplift in California ISO electricity markets.

- It would be useful to confirm that the RUC commitment process is operating as intended and understand the reason for RUC commitments that give rise to uplift.
- But the Department of Marketing Monitoring's calculations of the magnitude of RUC uplift suggest that it is probably a better use of CAISO and Department of Market Monitoring resources to understand the causes of uplift on other units committed in real-time. The level of uplift on long-start units committed in RUC may be in large part a result of commitments by STUC, RTPD and real-time operations.

# WHAT CAN BE DONE?

## Uplift in \$ Millions

	2012	2013
ED Dispatch	8 <sup>1)</sup>	1.4 <sup>1)</sup>
Real-Time Commitment	41 to 49	65.6
Long Start RUC		8 <sup>2)</sup>
IFM Total	47 <sup>2)</sup>	33 <sup>2)</sup>
IFM MOC	22 <sup>4)</sup>	8 <sup>3)</sup>
Total	104 <sup>2)</sup>	108 <sup>2)</sup>

1. California ISO, Department of Market Monitoring, 2013 Annual Report on Market issues and Performance, p. 216.
2. California ISO, Department of Market Monitoring, 2013 Annual Report on Market issues and Performance, p. 79
3. California ISO, Department of Market Monitoring, 2013 Annual Report on Market issues and Performance, p. 80
4. California ISO, Department of Market Monitoring, 2012 Annual Report on Market issues and Performance, p. 75.

## WHAT CAN BE DONE?

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Are STUC and RTPD unit commitment decisions efficient or are they contributing to the duck belly and excessive real-time uplift costs?

- Is the California ISO committing the wrong units in RTPD during the morning ramp, committing units able to meet the morning ramp but units with too little downward ramp for the duck belly hours.
- Is the unit commitment for the duck belly period in RTPD not optimal because the RTPD runs that commit generation for the morning ramp do not look out far enough into the duck's belly to take into account the need for downward ramp?

## WHAT CAN BE DONE?

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- Is the level of uplift the inevitable result of the current design with a flexiramp constraint in RTPD with a high target and penalty price, and no flexiramp constraint in RTD?
- Is part of the problem that the RTPD runs in the duck belly period that schedule net interchange have an upward flexible ramp constraint but no downward flexible ramp constraint, with the result that RTPD fails to schedule exports that would provide more downward ramp at low cost, contributing to downward price spikes and higher uplift costs?
- Or several of the above, all of the above, something else?

It is possible to gain insight into these questions by examining historical data on units receiving uplift payments.

## WHAT CAN BE DONE?

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How much of the capacity on line in real-time that was not scheduled in the IFM, was:

- Committed as a result of a market participant self-schedule?
- Committed in STUC to meet load at least cost?
- Committed in RTPD, either to meet load at least cost or to meet the flexi-ramp constraint?
- Committed by real-time operations to manage constraints not modeled in the IFM, RTPD or RTD?

## WHAT CAN BE DONE?

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Of the capacity committed by STUC, RTPD or real-time operators:

- How much uplift was due to each category of commitment?
- What proportion of the capacity operated profitably over its commitment period?
- What was the aggregate profitability of the capacity over its commitment period?

Identifying the process used to commit the bulk of the capacity receiving uplift payments would allow us to focus on what is most important.

Examining the overall profitability of these commitments would highlight asymmetries that may be contributing to the overall level of uplift costs.

# WHAT CAN BE DONE?

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What are we going to do about it?

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- Scott Harvey [scott.harvey@fticonsulting.com](mailto:scott.harvey@fticonsulting.com)
  - 617-747-1864