



Energy imbalance market update

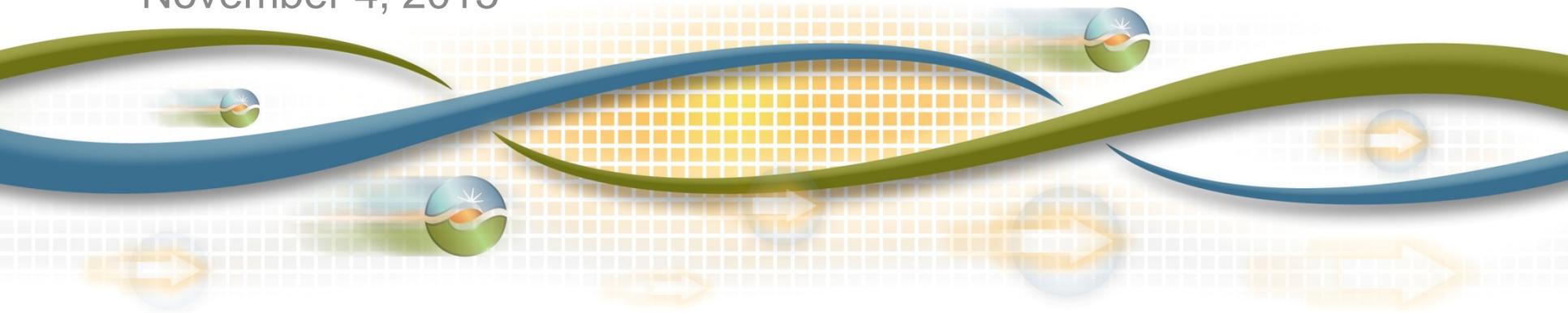
Mark Rothleder

Vice President, Market Quality and Renewable Integration

Board of Governors Meeting

General Session

November 4, 2015



EIM operational update

- Benefits assessment for 2015-Q3 issued
 - First year benefits exceed \$33 million
- Pricing performance continued to perform well
 - Frequency of infeasibilities overall below 1%
 - PACW Infeasibility events increased in September due to transfer constraints
- Transfers:
 - PACE to PACE transfers unavailable in September and October due to maintenance work
 - COI dynamic transfer capability increase
- EIM supporting transfer data added to monthly performance report

Total first year of EIM benefits exceed \$33M

BAA	Nov – Dec 2014	Jan – Mar 2015	Apr – Jun 2015 ¹	Jul – Sep 2015 ¹	Total
ISO	\$1.24 M	\$1.45 M	\$2.46 M	\$3.48 M	\$8.63 M
PACE	\$2.31 M	\$2.62 M	\$3.26 M	\$4.51 M	\$12.70 M
PACW	\$2.42 M	\$1.19 M	\$4.46 M	\$4.01 M	\$12.08 M
Total	\$5.97 M	\$5.26 M	\$10.18 M	\$12.00 M	\$33.41 M

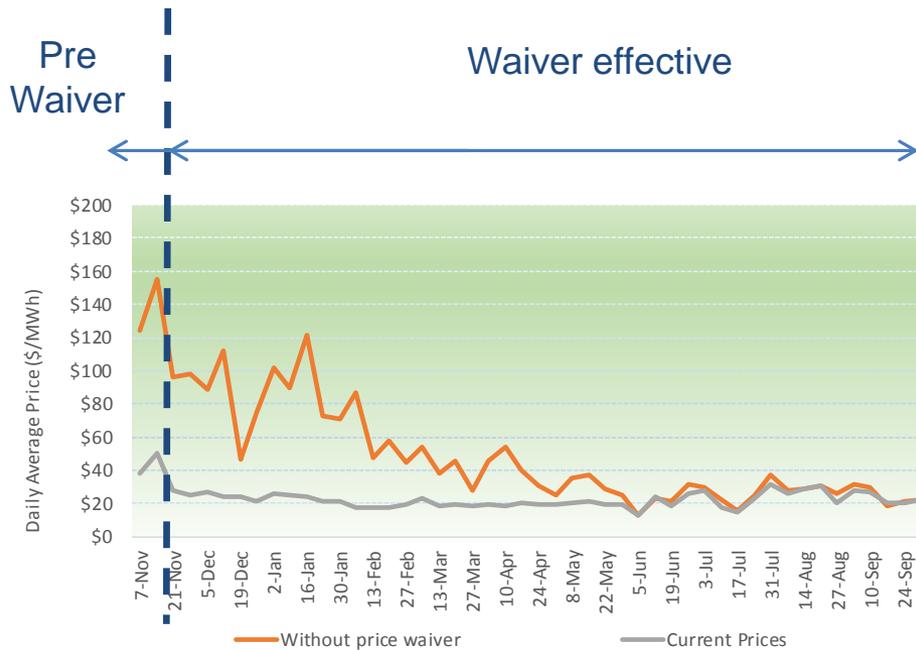
¹ Q2-2015 analysis based on 5-minute granularity. Prior analysis was 15-minute granularity. Benefits are in millions of dollars.

Report contains following enhancements:

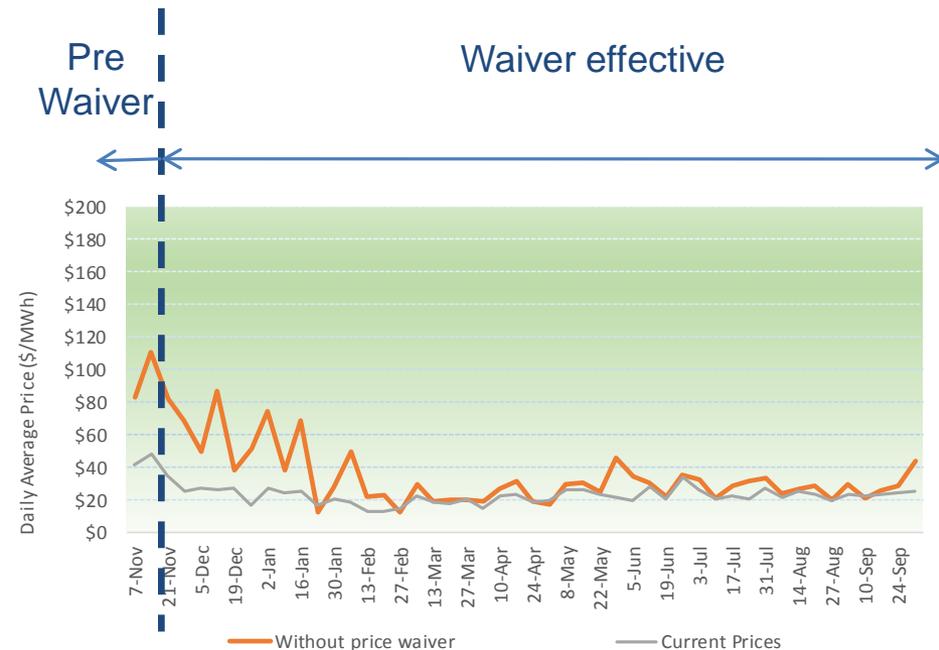
- Estimated 5,699 metric-tons CO2 avoided by reduced renewable curtailment in 2015.
- Estimated 132 MW of average flexible reserve reduction as a result of diversity

15-minute pricing continues to perform well

15-minute PACE Aggregate Price

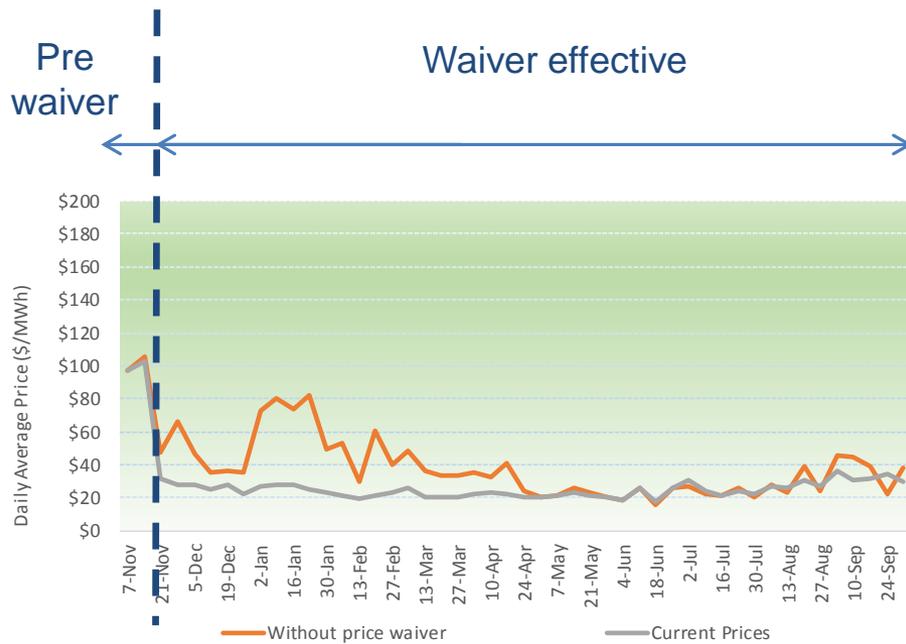


15-minute PACW Aggregate Price

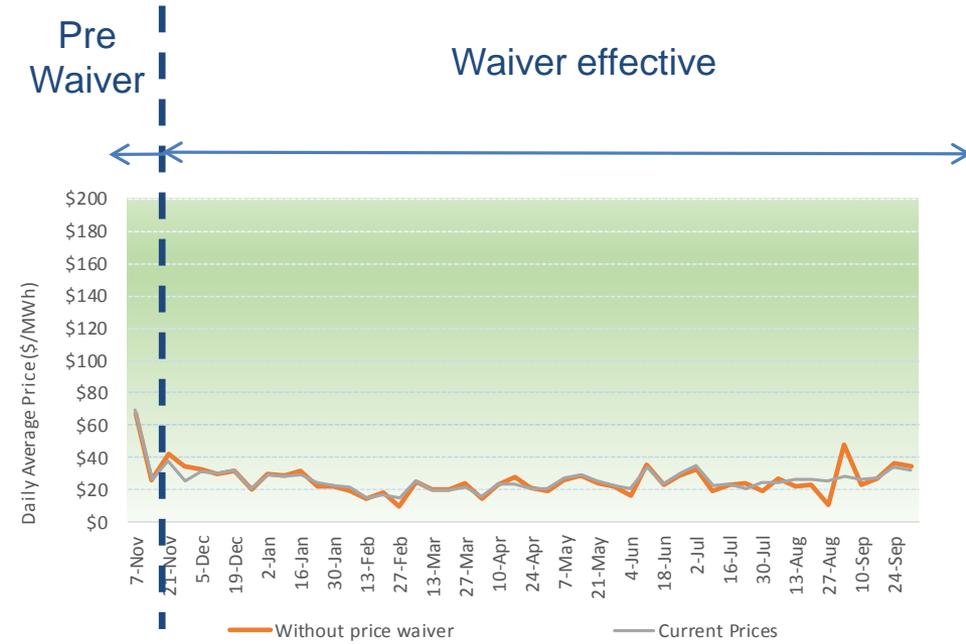


5-minute pricing continues to perform well.

5-minute PACE Aggregate Price

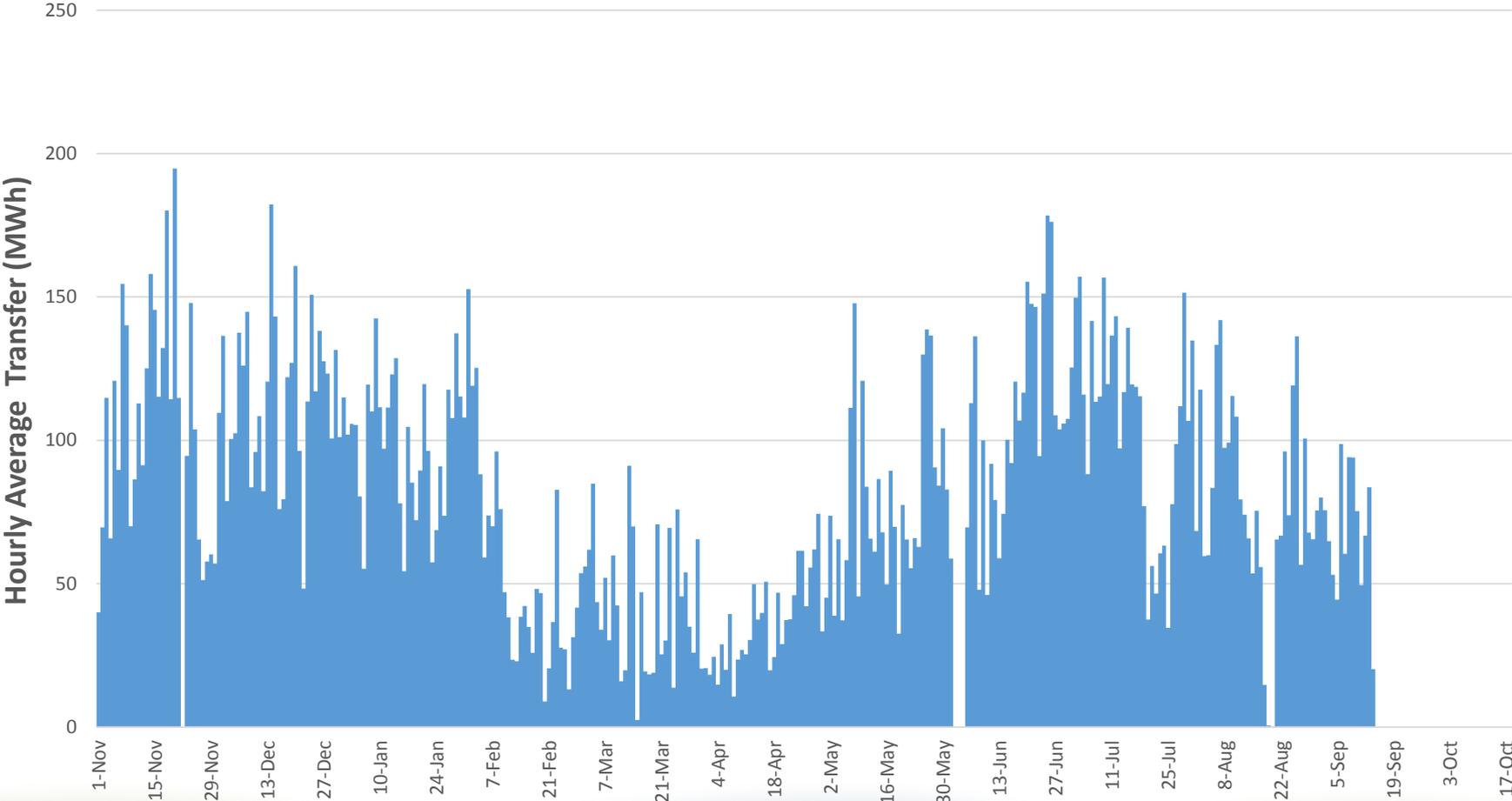


5-minute PACW Aggregate Price



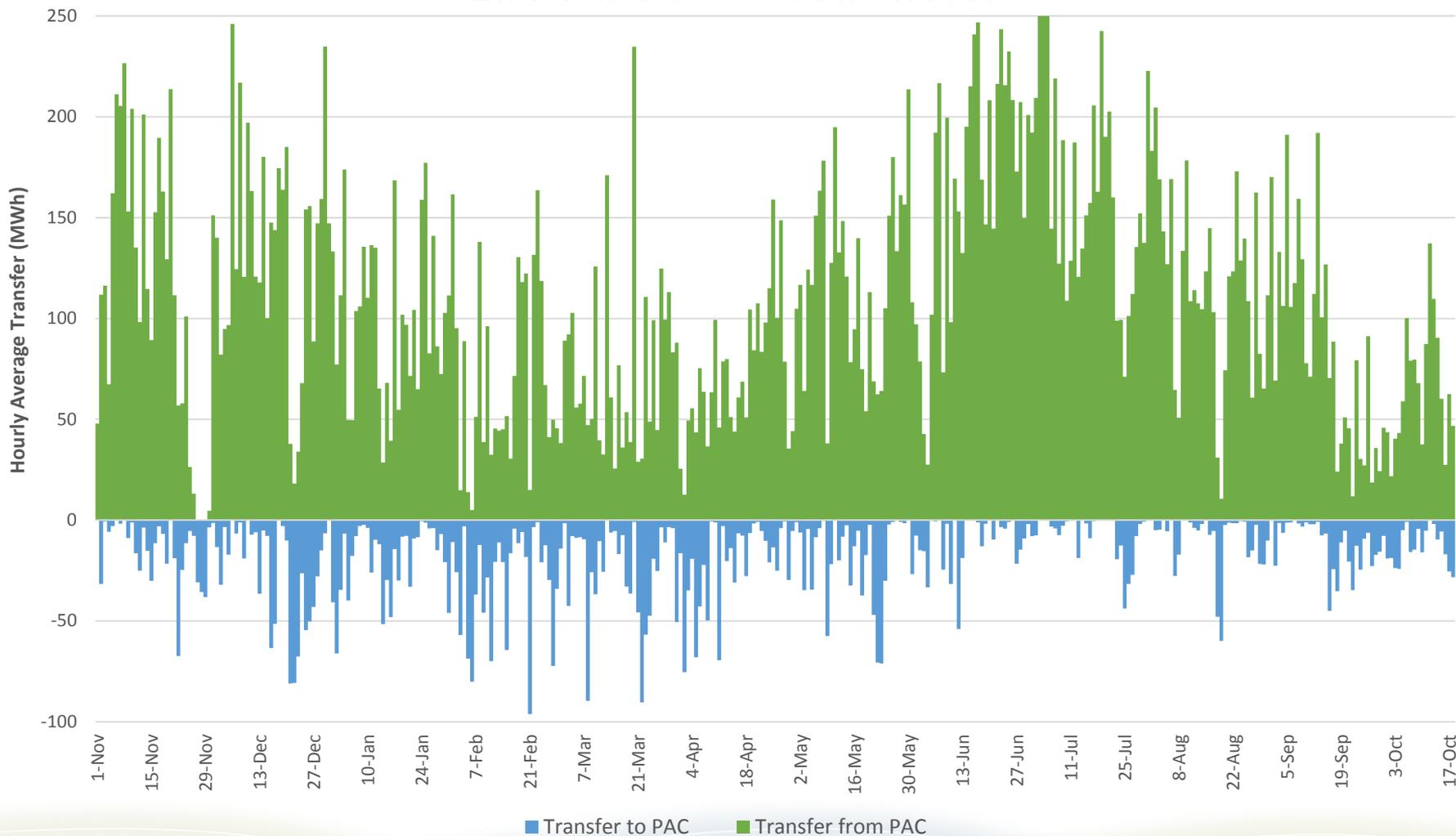
PACE to PACW transfer unavailable part of September and October due to maintenance work

EIM transfers PACE to PACW



EIM operations update

EIM transfers to and from PAC



Transfer into ISO by supporting resource type

Month	Coal (%)	Gas (%)	Non-Emitting (%)	Total
14-Nov	3.66%	11.11%	85.23%	100%
14-Dec	24.18%	10.78%	65.04%	100%
15-Jan	0.06%	6.04%	93.90%	100%
15-Feb	0.32%	88.89%	10.79%	100%
15-Mar	0.46%	99.54%	0.00%	100%
15-Apr	0.13%	65.48%	34.39%	100%
15-May	0.00%	84.37%	15.63%	100%
15-Jun	0.00%	72.95%	27.05%	100%
15-Jul	0.00%	65.16%	34.84%	100%
15-Aug	0.02%	86.48%	13.50%	100%

http://www.caiso.com/Documents/MarketPerformanceReport_August_2015.pdf.

Note: In the first two months of EIM operations (November and December 2014), EIM startup issues related to processing GHG bid adder resulted in the dispatch of coal generation to support transfers into California. Once GHG bid adders were properly accounted for, beginning in January 2015, almost all of the EIM dispatches to support transfers into the ISO were from resources other than coal, as documented in the above table.

EIM implementation update

- Year 1 Enhancement approved by FERC scheduled for implementation November 4
- FERC approved 6-month transition period for new EIM entities
- Nevada Energy implementation delayed from November 1 awaiting necessary FERC orders
- Puget Sound Energy and Arizona Public Service implementations are in progress and on schedule for October 1, 2016.