2016 Second Quarter Report on Market Issues and Performance

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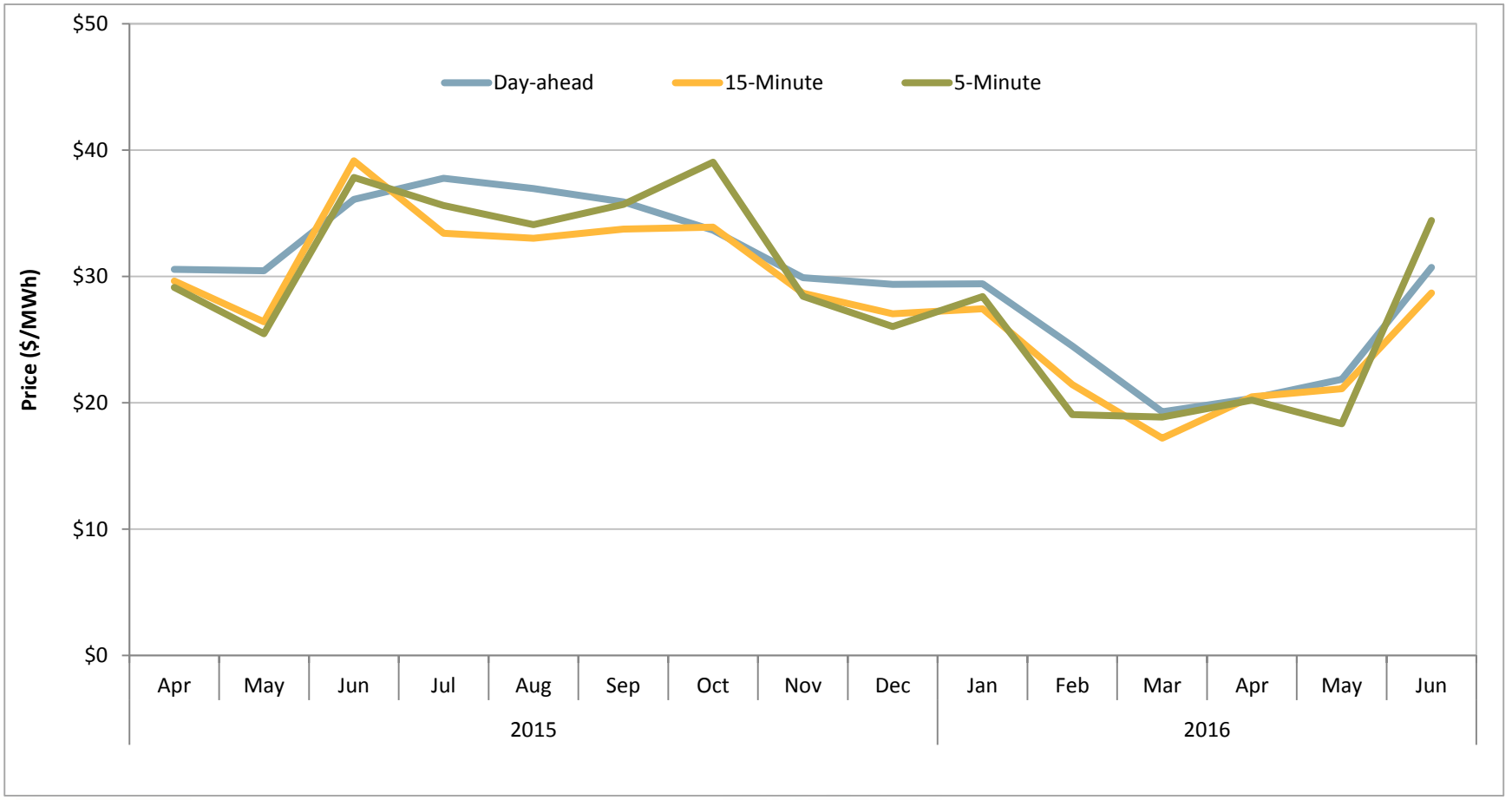
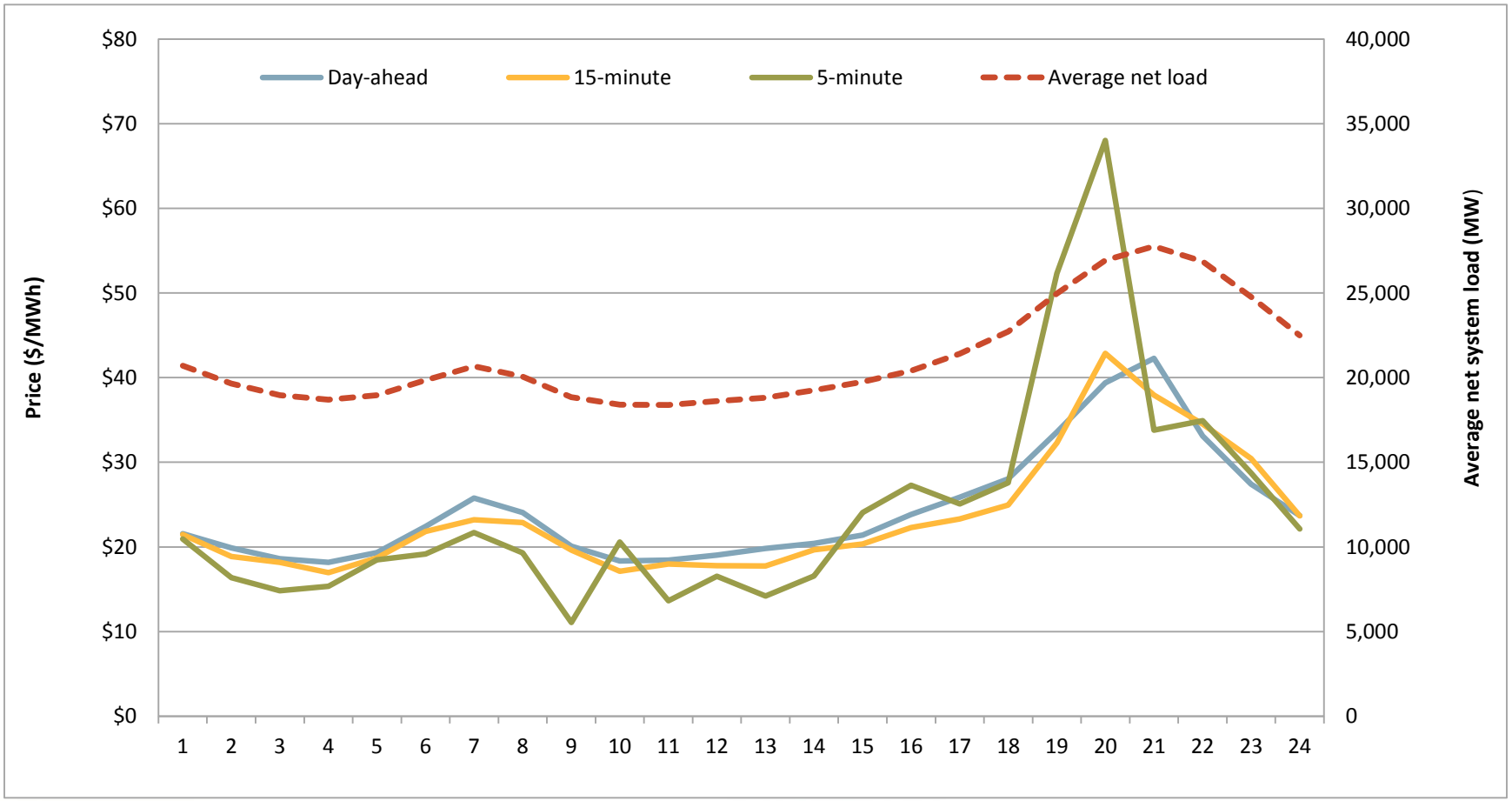
Presentation outline

- Quarterly report highlights
  - Wholesale market performance
  - Energy imbalance market performance
  - Operator load forecast adjustments
  - Recommendations

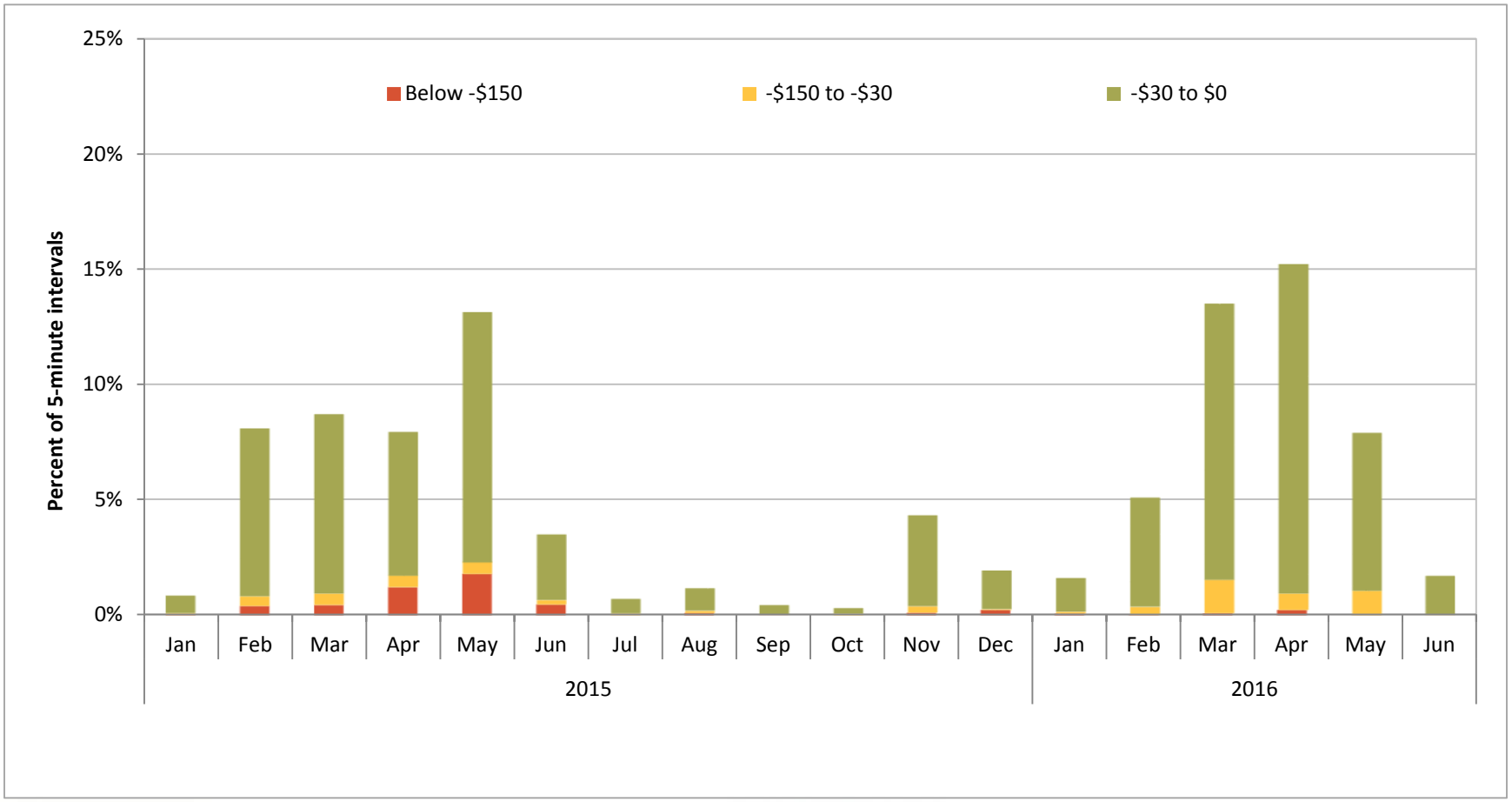
Prices remained low in April and May and increased in June because of higher natural gas prices and seasonally higher loads.



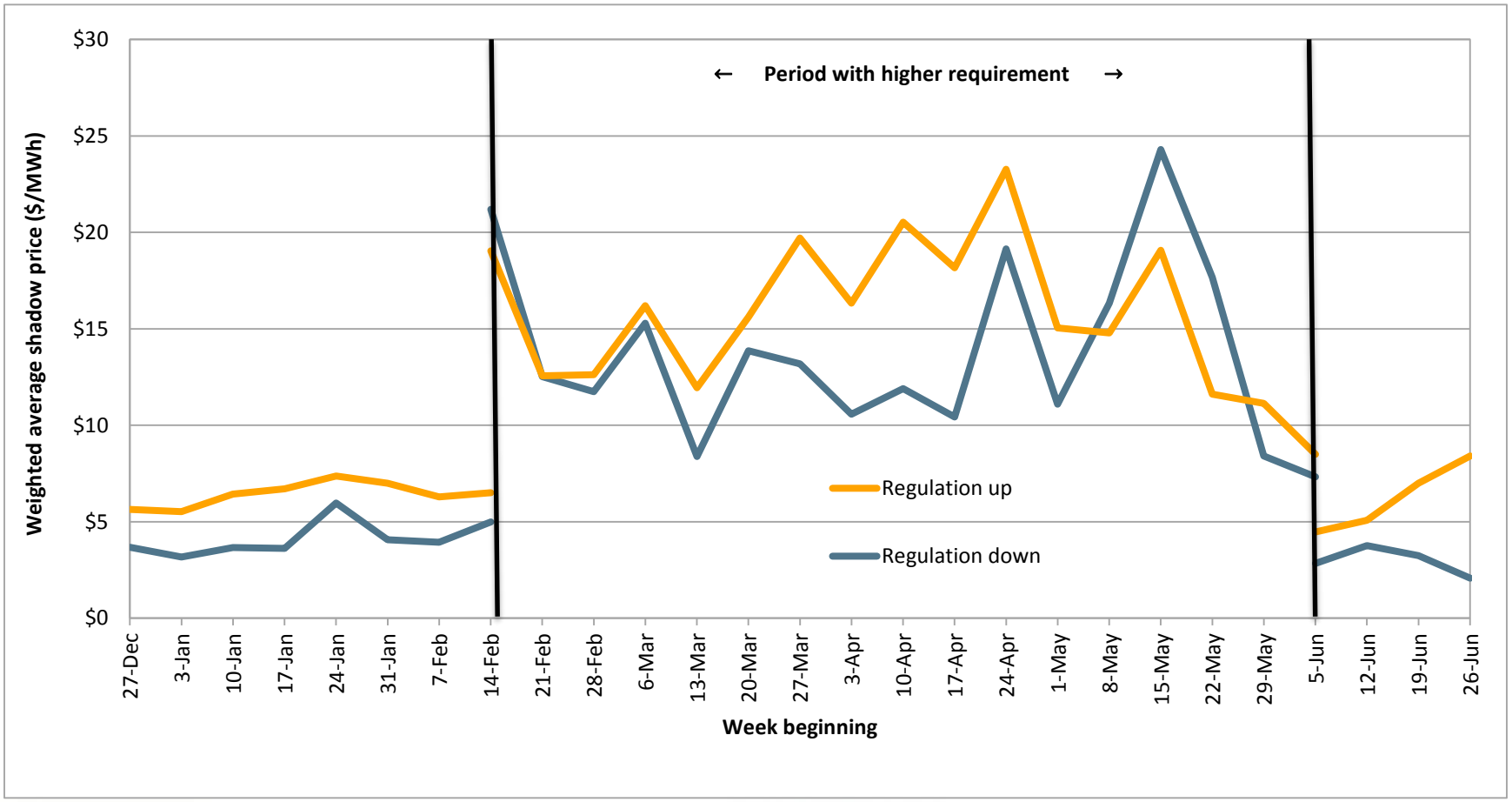
Prices follow a net load pattern with low prices during mid-day hours and higher prices during the late morning and evening peak hours.



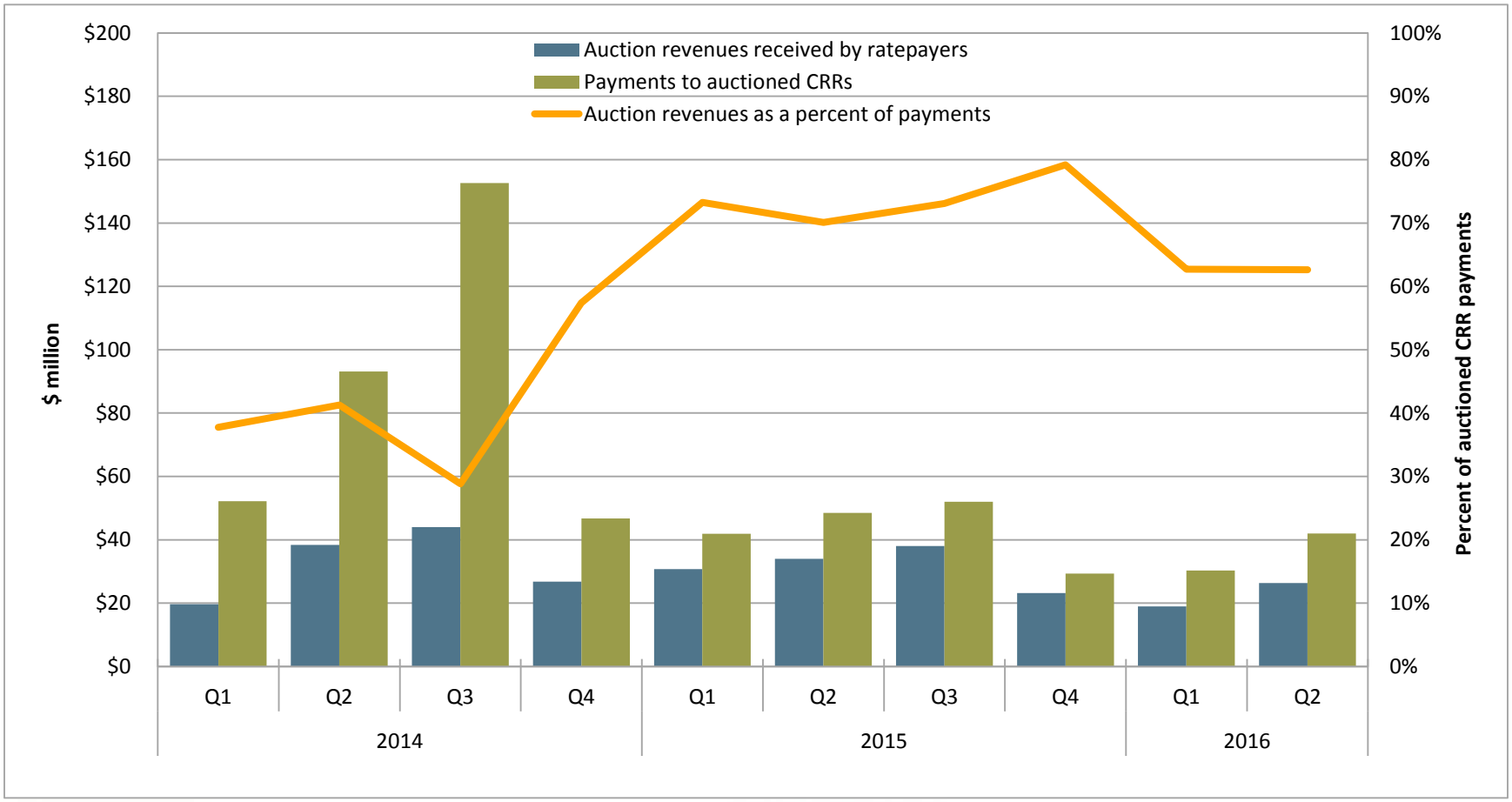
Prices at or below the -$150/MWh bid floor were lower than in 2015, representing availability of economic dispatch down and fewer curtailments.



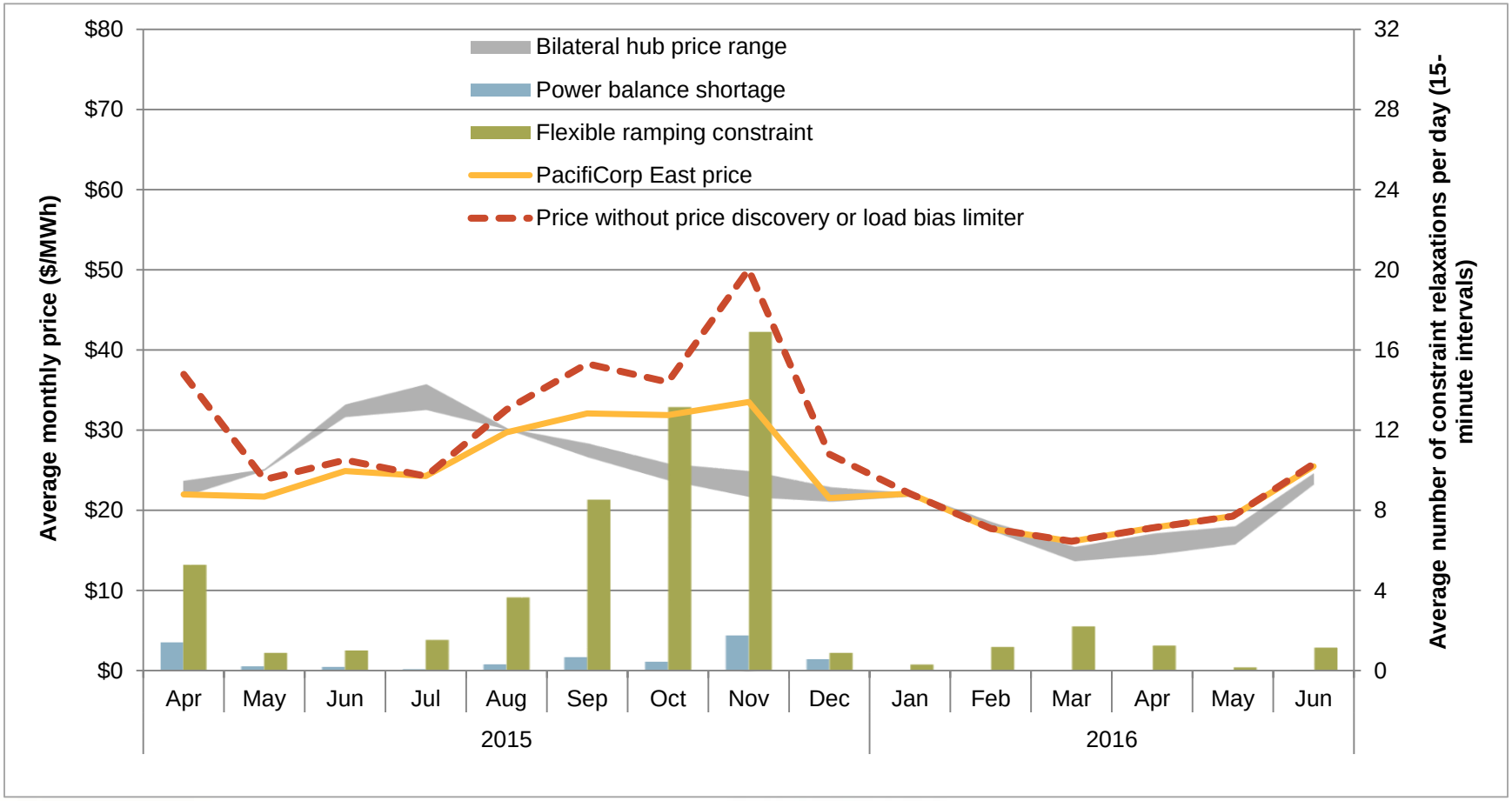
The ISO decreased regulation requirements on June 10, after the increase on February 20. Prices and procurement costs fell as a result.



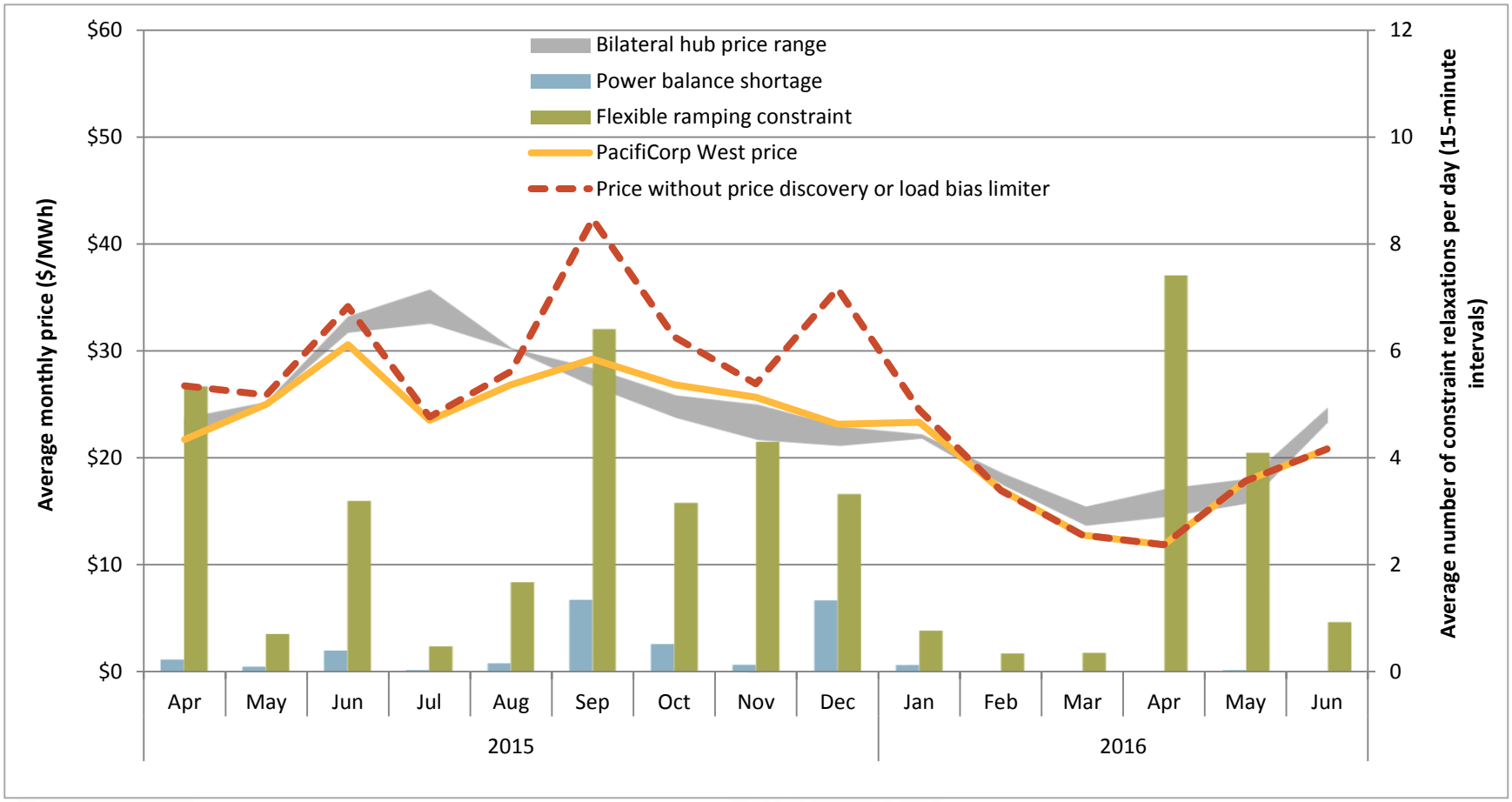
In the first half of 2016, congestion auction revenues were $27 million less than payments to non-load serving entities purchasing CRR's.



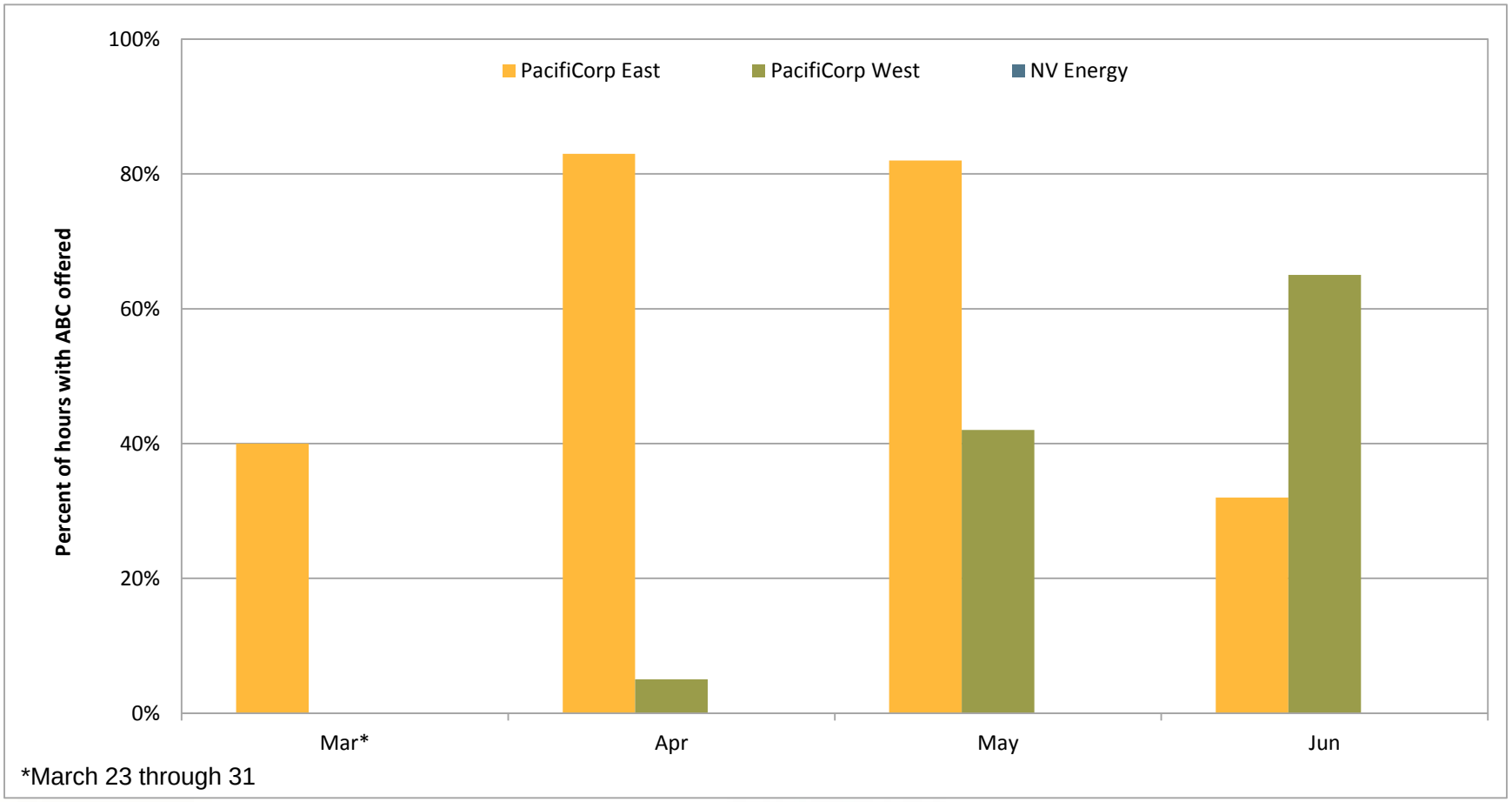
The power balance constraint and the flexible ramping constraint bound infrequently in the second quarter in PacifiCorp East.



Flexible ramping constraint relaxations increased in PacifiCorp West during the second quarter, but prices remained below the bilateral hub range.

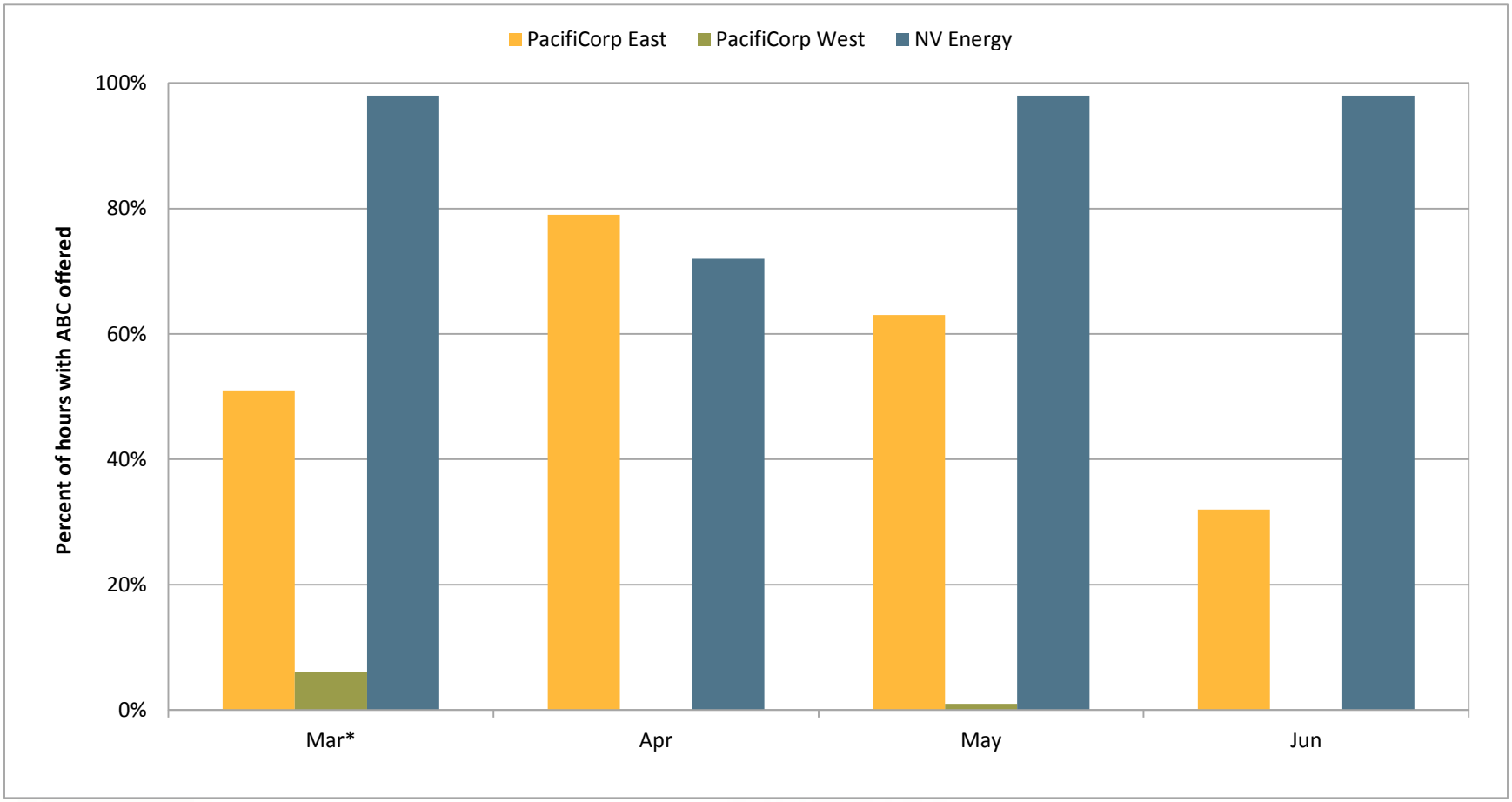


No upward available balancing capacity was offered in NV Energy through the end of second quarter.

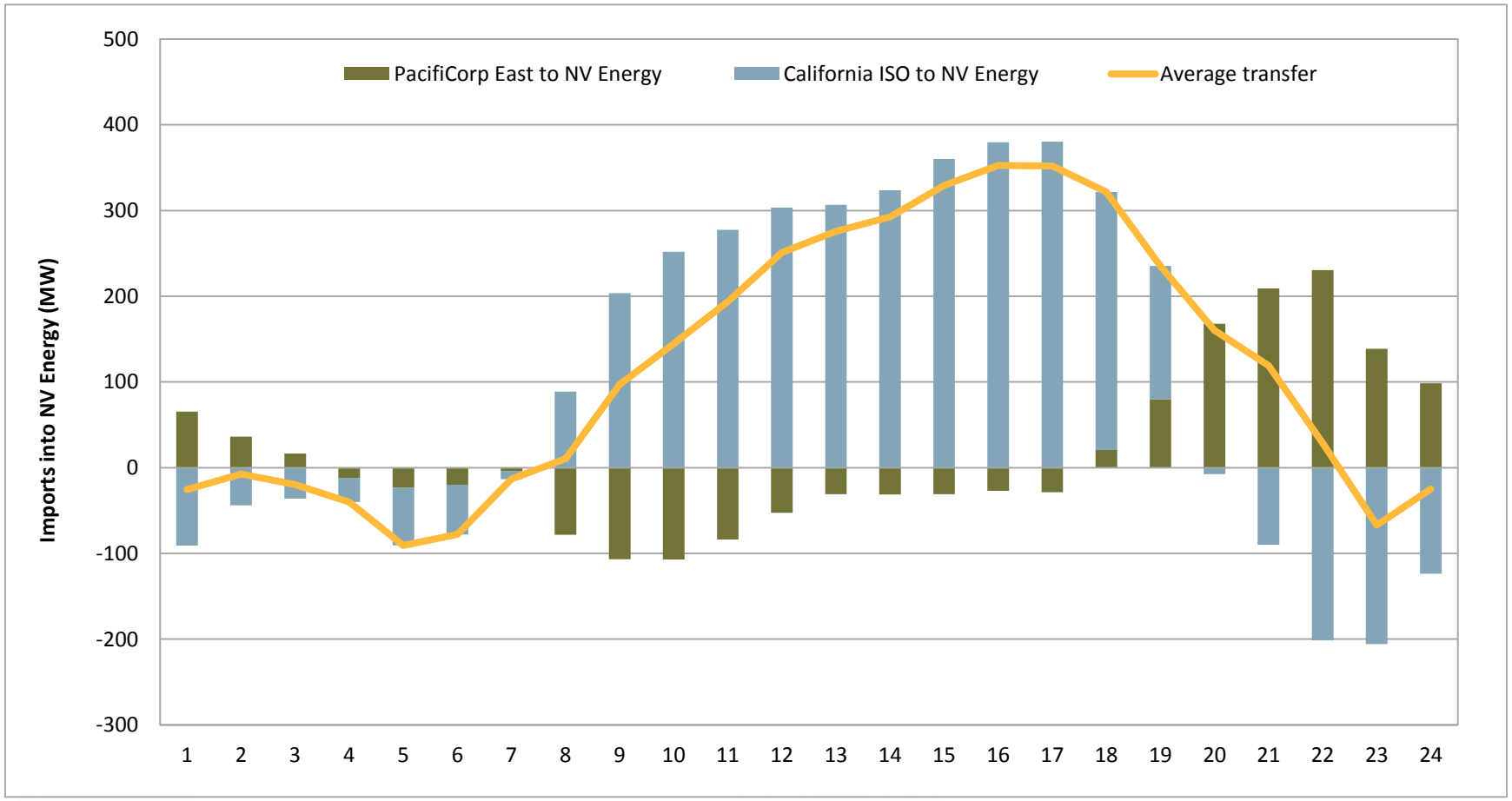


*March 23 through 31

Downward available balancing capacity offered by PacifiCorp West was very limited.



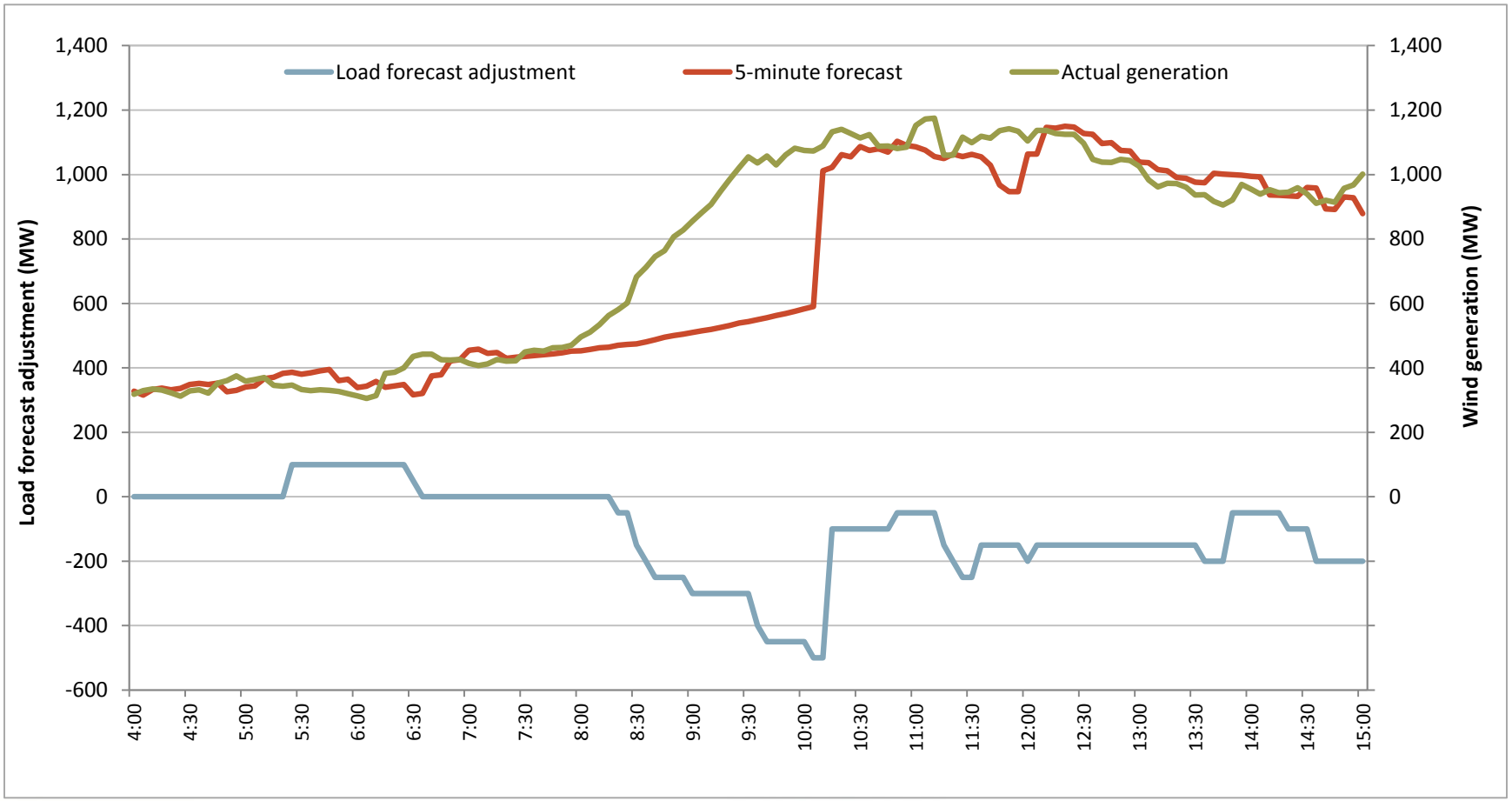
Excess solar generation was exported from ISO to NV Energy during midday hours, which then was exported to PacifiCorp East.



Positive load adjustments were most frequent in NV Energy and the ISO, while negative load adjustments were most frequent in the PacifiCorp areas.

	Positive load adjustments			Negative load adjustments			Average hourly bias MW
	Percent of intervals	Average MW	Percent of total load	Percent of intervals	Average MW	Percent of total load	
California ISO							
15-minute market	37%	450	1.6%	19%	-292	1.3%	112
5-minute market	49%	455	1.7%	29%	-301	1.3%	137
PacifiCorp East							
15-minute market	3%	83	1.7%	42%	-110	2.1%	-44
5-minute market	7%	85	1.7%	64%	-130	2.7%	-77
PacifiCorp West							
15-minute market	9%	59	2.7%	29%	-55	2.6%	-11
5-minute market	12%	63	2.9%	39%	-57	2.8%	-15
NV Energy							
15-minute market	48%	127	2.8%	2%	-171	5.1%	57
5-minute market	47%	90	2.0%	10%	-70	1.9%	36

Example: Load adjustments used to account for actual wind generation deviation from forecasts.



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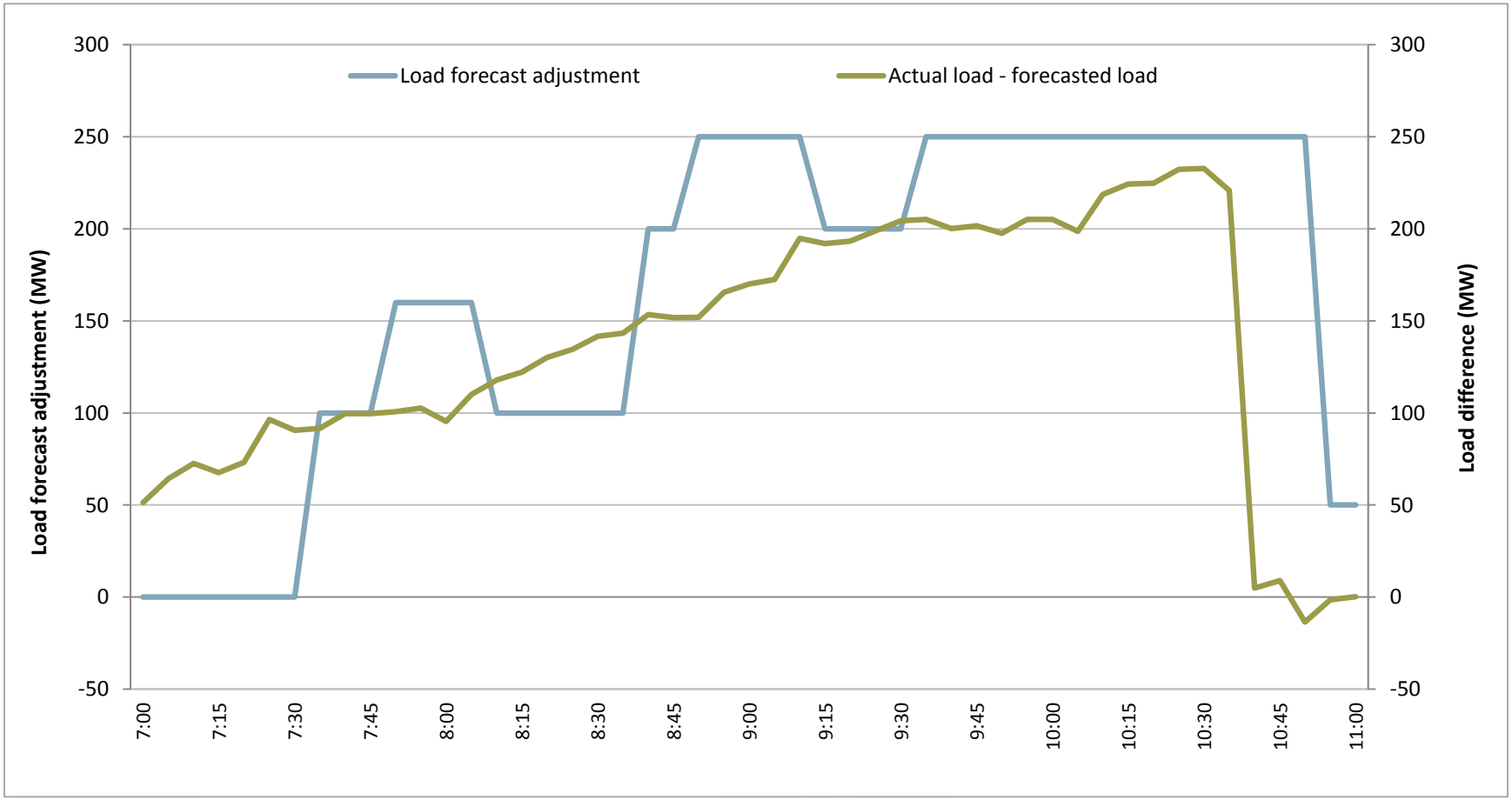
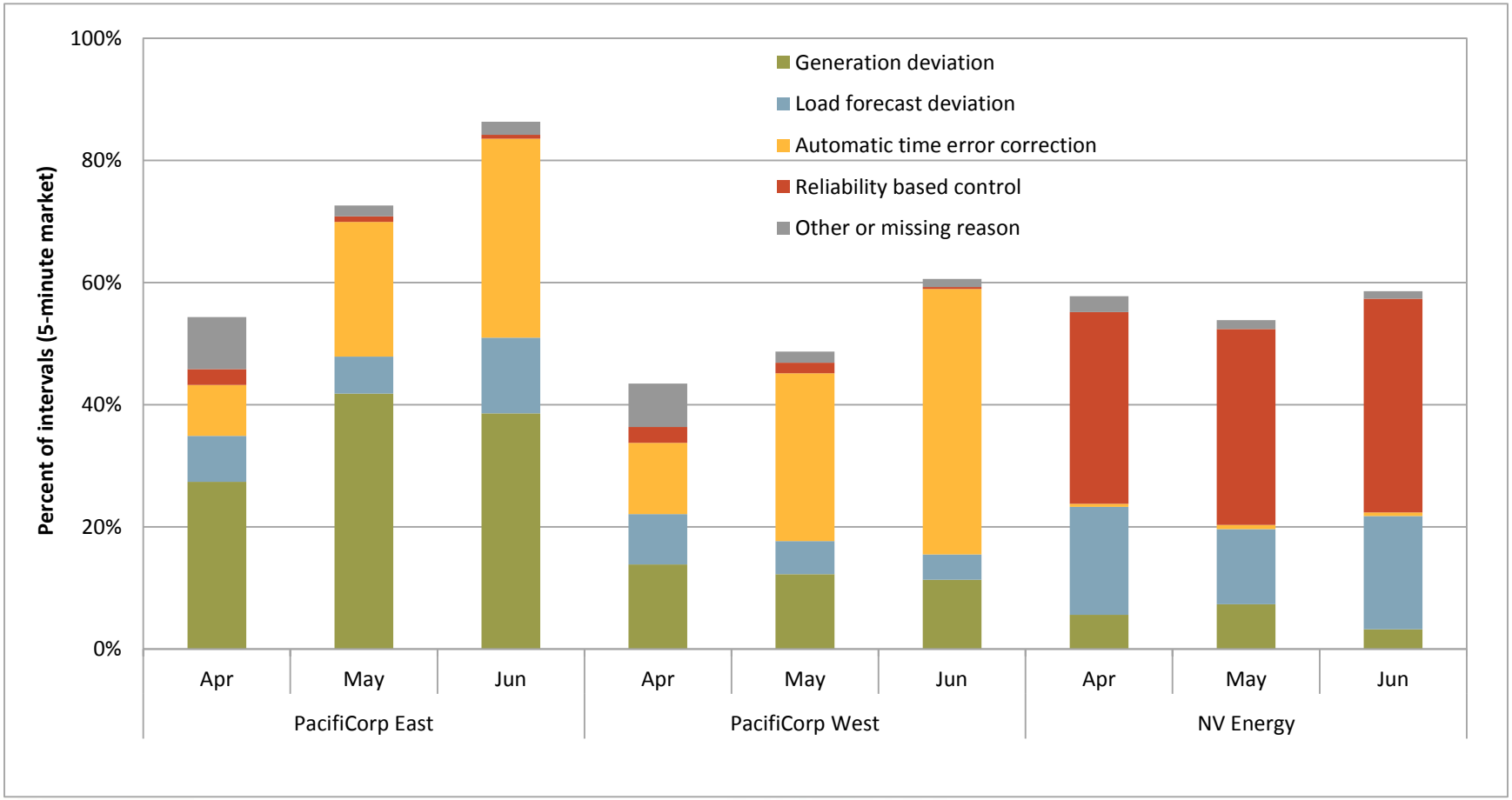


Generation deviation and reliability based control were the primary reasons for load forecast adjustments in PacifiCorp and NV Energy areas, respectively.



Key recommendations

- Congestion revenue rights
- Operator load adjustments
- Enhanced market power mitigation procedures
- Enforcement of internal constraints in EIM
- Enhanced outage reporting