

Fast Start Metrics Update

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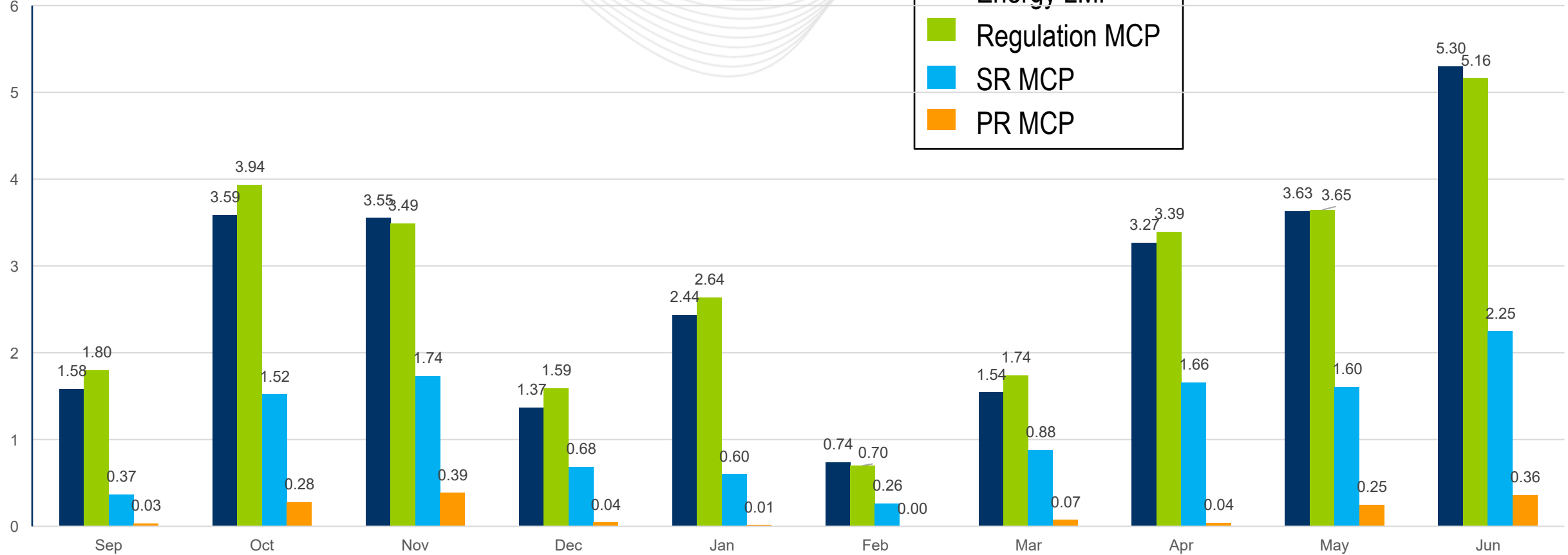
July 13, 2022

- The average energy price increase was \$2.72/MWh, which is 4.9 percent of average system energy LMP from September, 2021 to June, 2022
 - The increase from May to June is due to:
 - Hot weather and higher load
 - Higher system energy prices and more shortages



Fast-Start Pricing: Sep, 2021 – Jun, 2022

Average Increase
(\$/MWh)



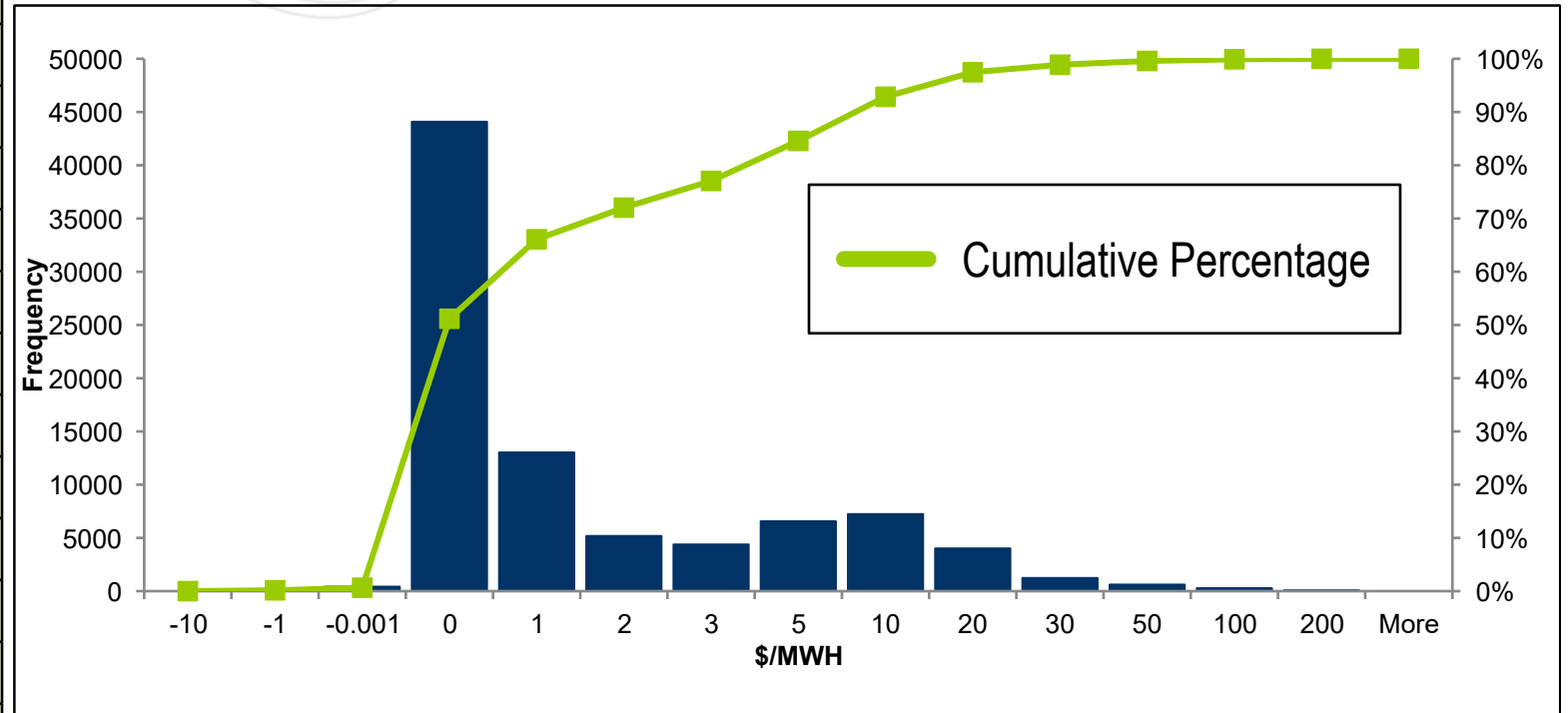
Key Takeaway: Energy and Ancillary Service Market clearing prices all increased due to co-optimization.



Fast-Start Energy LMP Increase (Histogram): Sep, 2021 – Jun, 2022

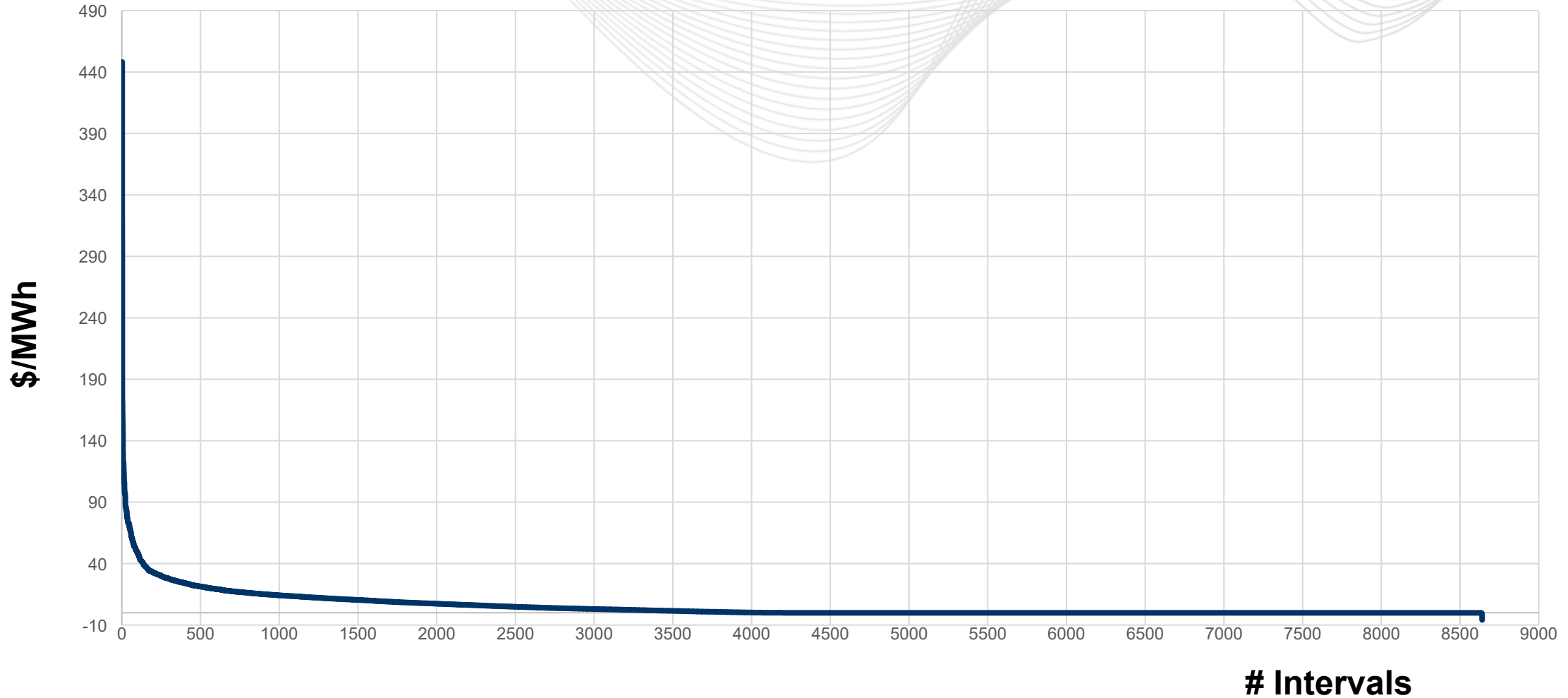
Energy LMP Increase	Frequency	Cumulative
$(-\infty, -10]$	23	0.03%
$(-10, -1]$	115	0.16%
$(-1, 0)$	420	0.64%
0	44090	51.16%
$(0, 1]$	13029	66.09%
$(1, 2]$	5183	72.03%
$(2, 3]$	4384	77.06%
$(3, 5]$	6561	84.58%
$(5, 10]$	7239	92.87%
$(10, 20]$	4014	97.47%
$(20, 30]$	1236	98.89%
$(30, 50]$	616	99.59%
$(50, 100]$	277	99.91%
$(100, 200]$	75	100.00%
$(200, +\infty)$	2	100.00%

Frequency
(Number of Intervals)



Key Takeaway: Over 50% of the time, there was zero impact on Energy LMPs.

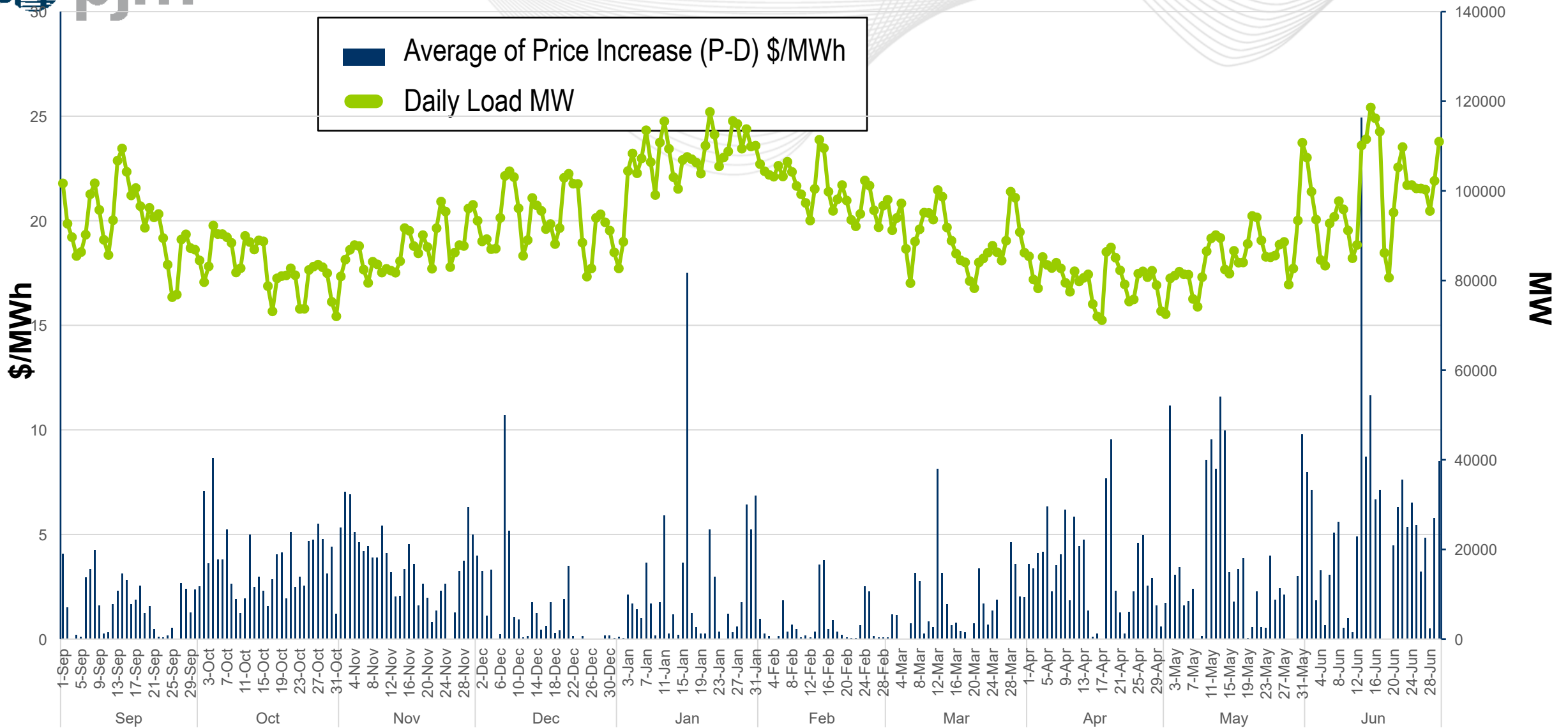
Energy Price Increase Duration Curve – Jun, 2022



Key Takeaway: Energy LMPs increase range is [-5.8, 448] for Jun.



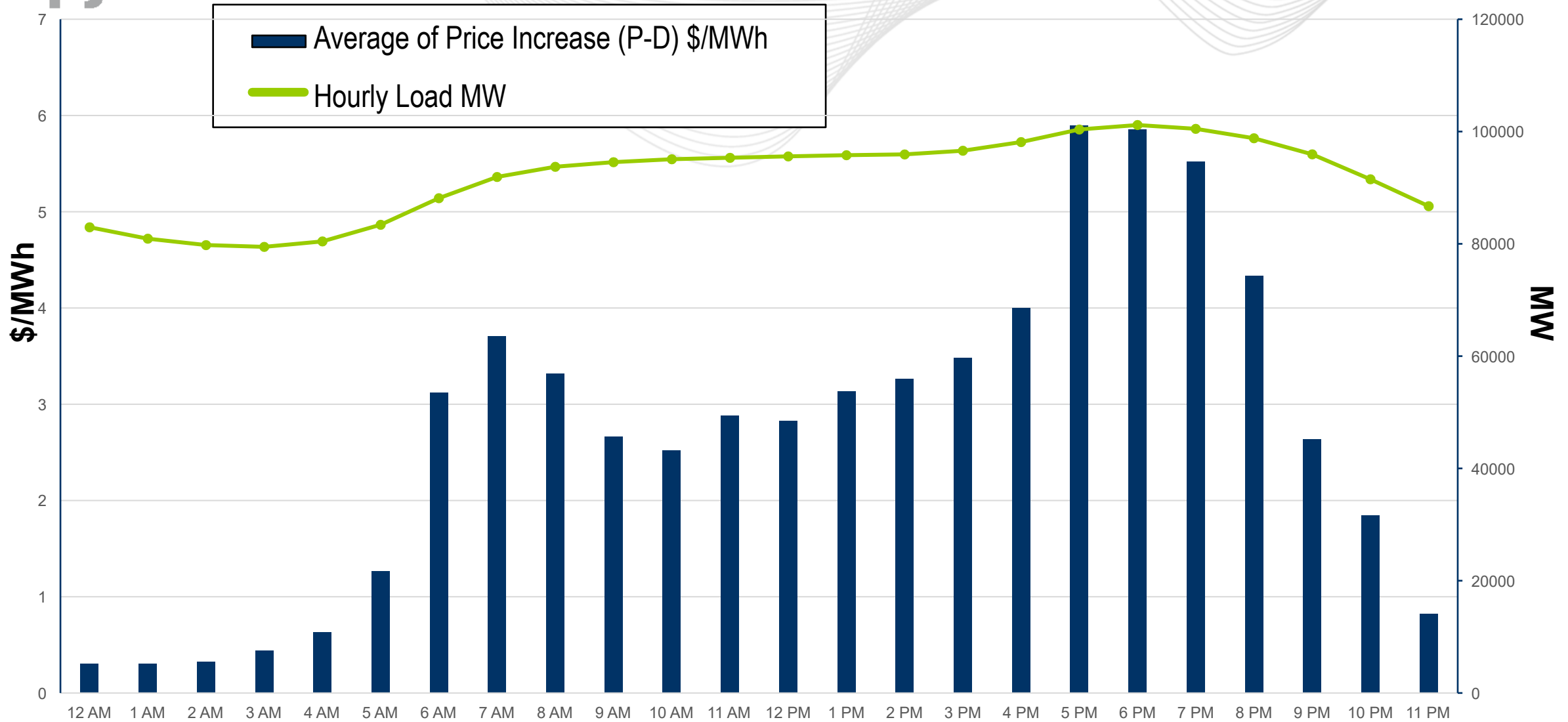
Fast-Start Daily Distribution: Sep, 2021 – Jun, 2022



Key Takeaway: LMP increases are more impacted by the system energy LMP, outages and load from September, 2021 to May, 2022.



Fast-Start Hourly Distribution: Sep, 2021 – Jun, 2022



Key Takeaway: Largest impact on LMPs occur during on-peak hours.

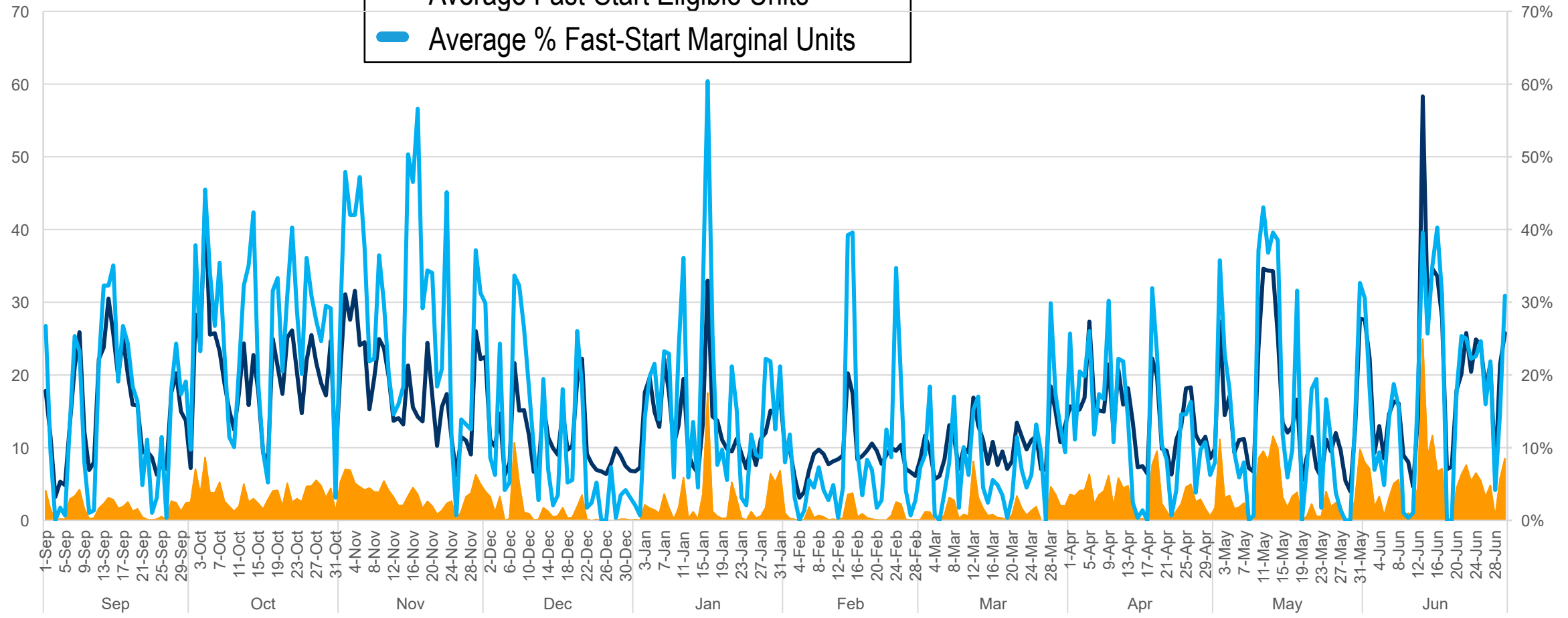


Fast-Start Eligible and Marginal Units: Sep, 2021 – Jun, 2022

FS Eligible Units Count

- Average Energy LMP Increase (P-D)
- Average Fast-Start Eligible Units
- Average % Fast-Start Marginal Units

Average %



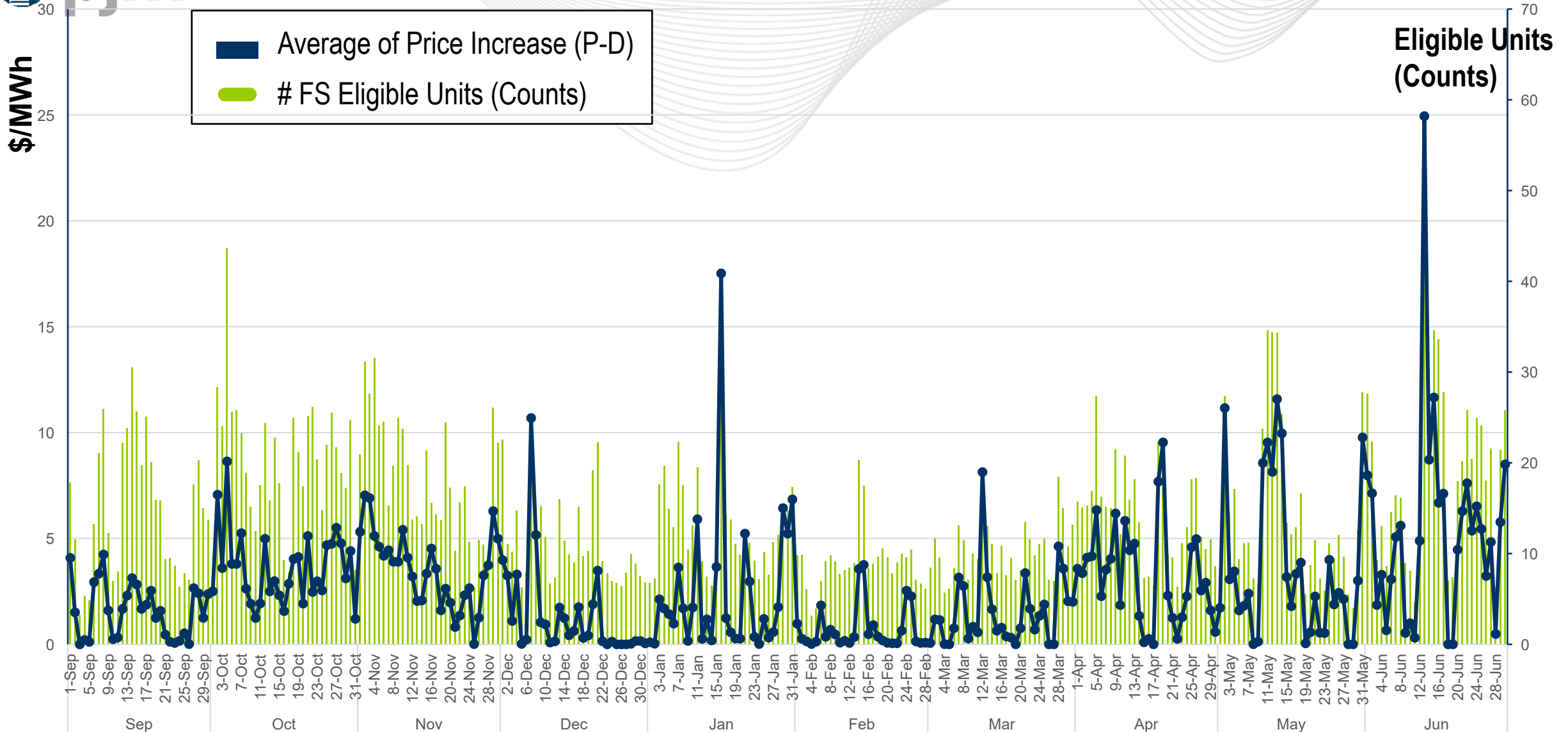
Key Takeaway: Fast-start units and price increase are correlated.



Fast-Start Eligible and Marginal Units: Sep, 2021 – Jun, 2022

	EnergyLMP Increase (\$/MWh)	FS Eligible Units	% FS Marginal
September	1.58	15	15%
October	3.59	20	26%
November	3.55	18	29%
December	1.37	11	11%
January	2.44	13	16%
February	0.74	9	9%
March	1.54	10	8%
April	3.27	14	14%
May	3.63	14	16%
June	5.30	20	18%

Fast Start Eligible Units vs. Energy Price Increase



Key Takeaway: More Fast-start eligible units leads to higher energy price increase.

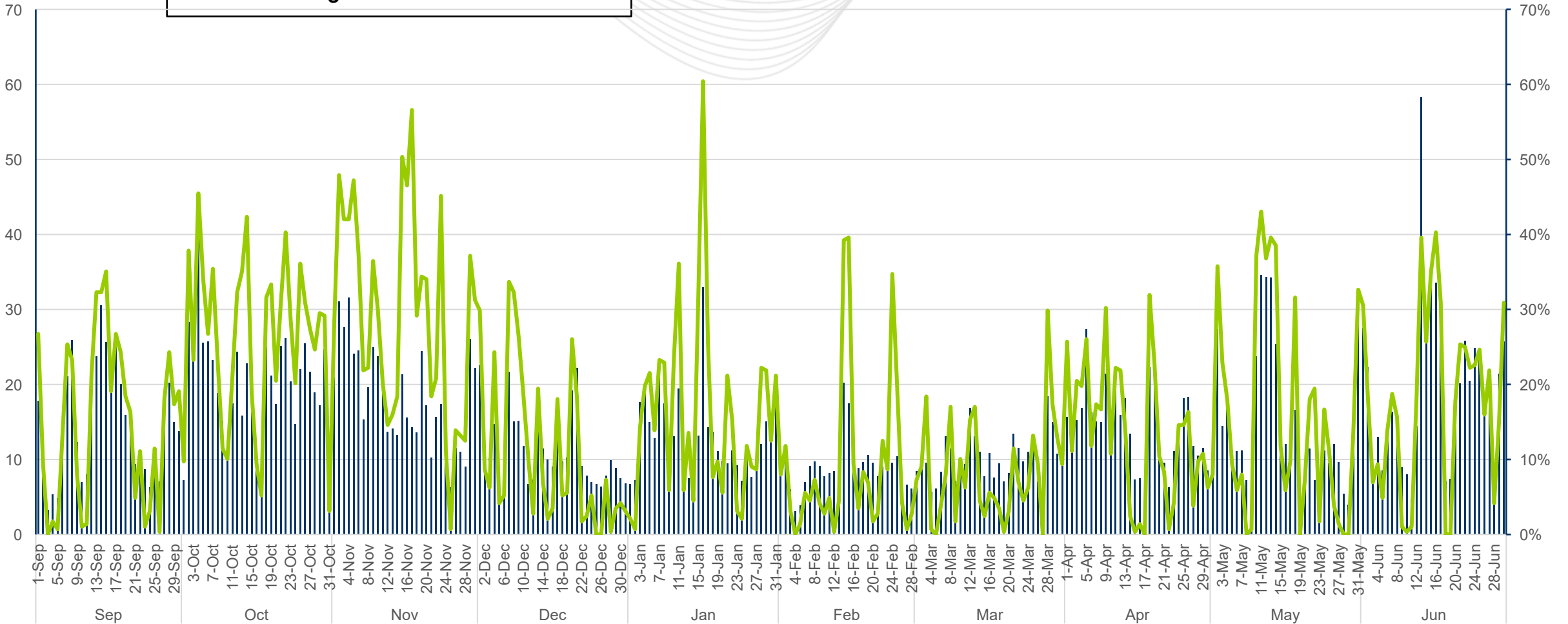


Fast Start Eligible Units vs. % Fast Start on Marginal

Eligible Units (Counts)

- # FS Eligible Units (Counts)
- % Marginal Units

Average %



Key Takeaway: On average Fast-start units are marginal 16% of the time.

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Fast Start Metrics Update



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