

Fast Start Metrics Update

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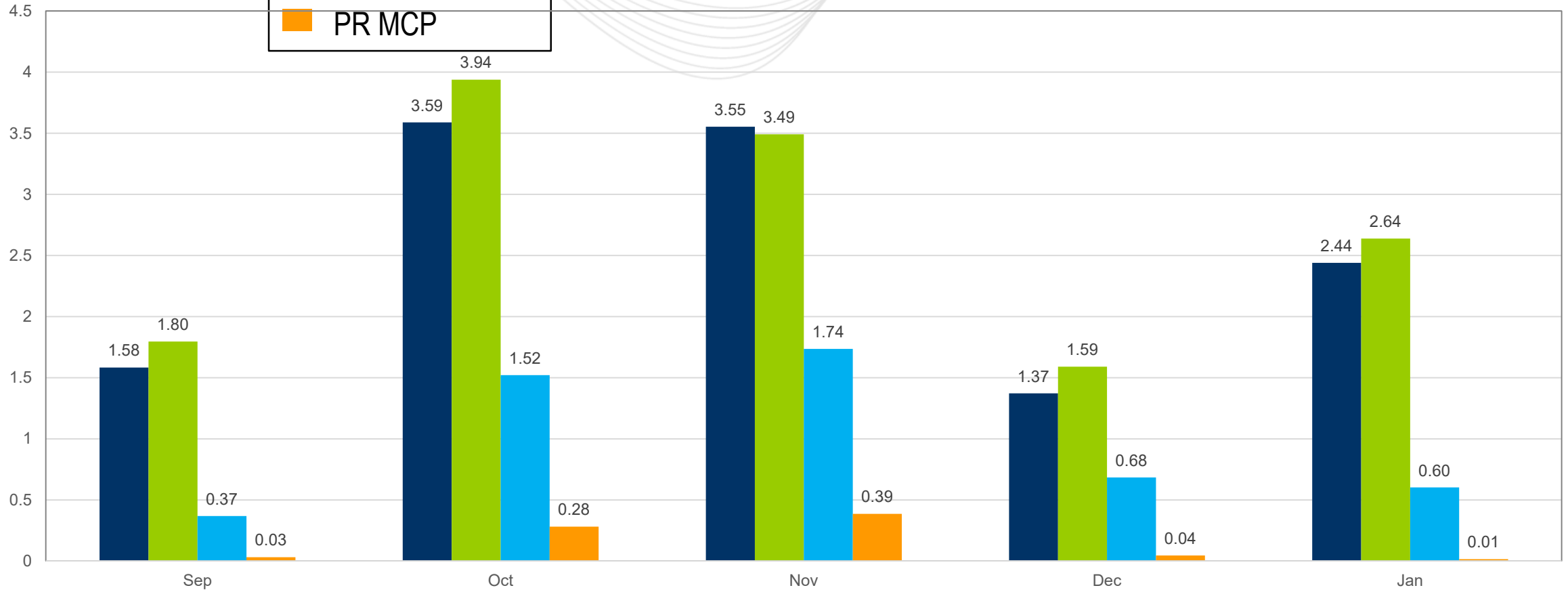
- The average energy price increase was \$2.50/MWh, which is 5 percent of average system energy LMP from September, 2021 to January, 2022
 - The increase from December to January is due to:
 - Higher system energy LMP
 - Higher system load



Average Increase (\$/MWh)

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

- Energy LMP
- Regulation MCP
- SR MCP
- PR MCP



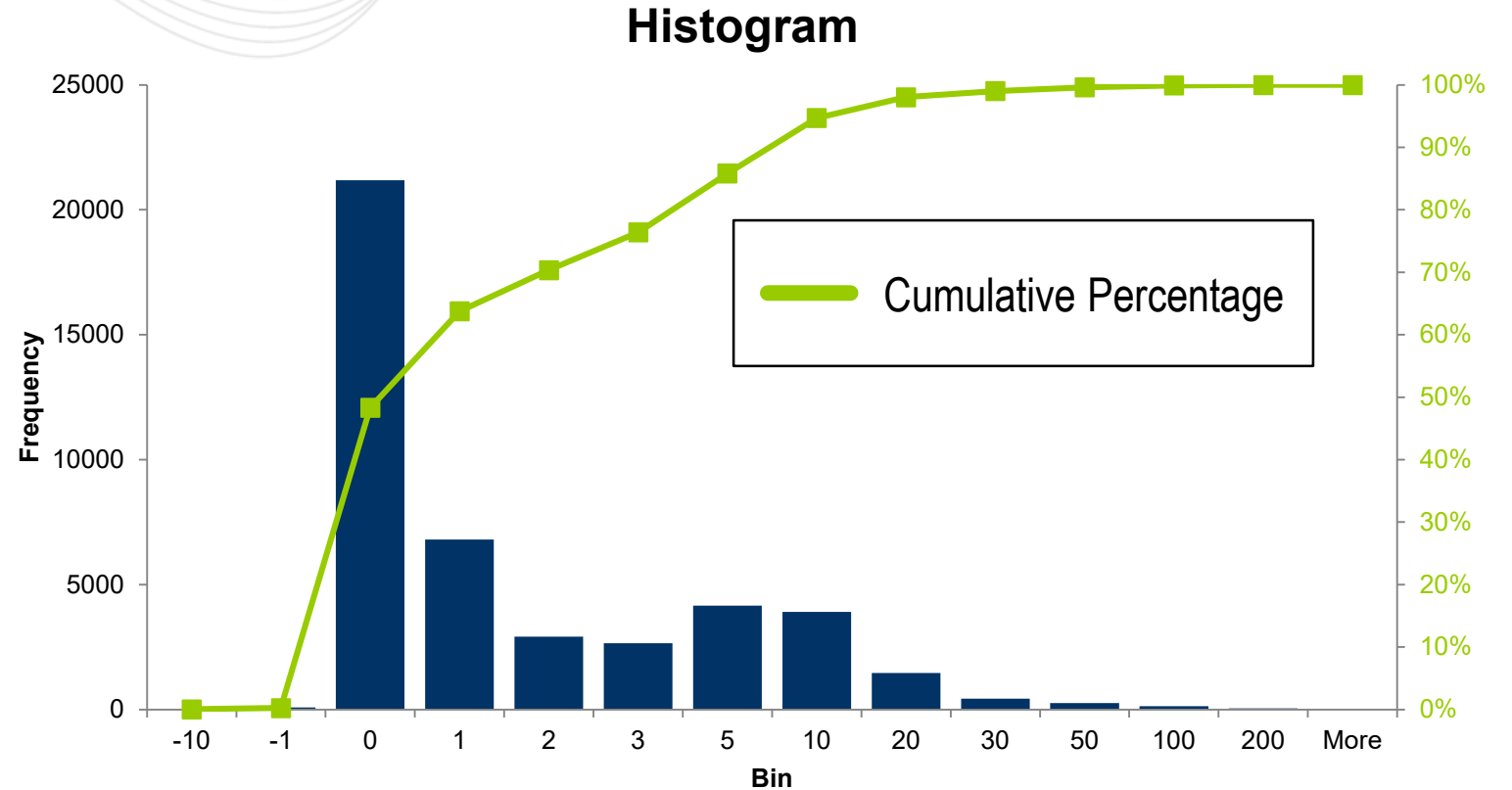
Key Takeaway: Energy and Ancillary Service Market clearing prices all increased due to co-optimization.



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

Energy LMP Increase	Frequency	Cumulative
-10	20	0.05%
-1	84	0.24%
0	21183	48.31%
1	6808	63.76%
2	2911	70.37%
3	2655	76.39%
5	4159	85.83%
10	3909	94.70%
20	1468	98.03%
30	437	99.02%
50	258	99.61%
100	132	99.91%
200	40	100.00%

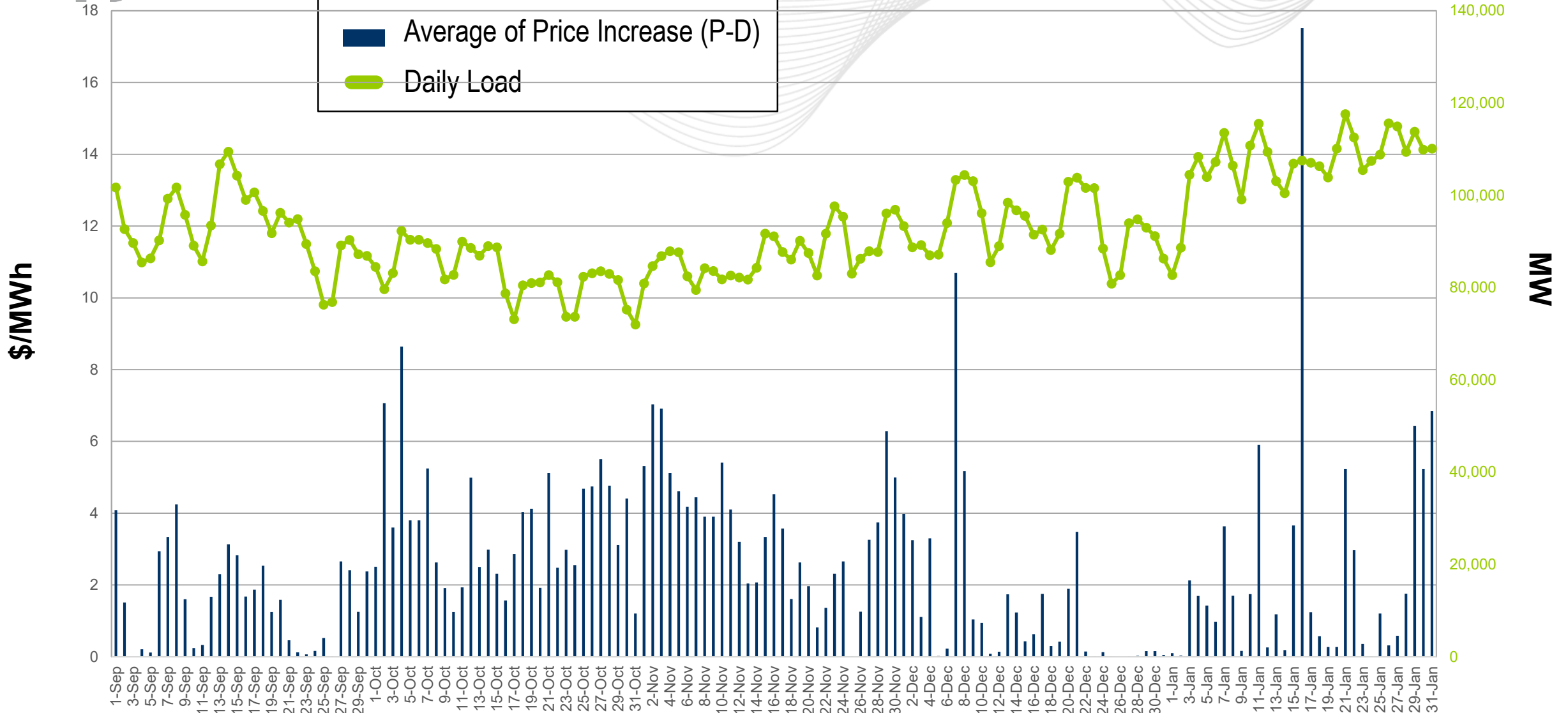
Frequency
(Number of Intervals)



Key Takeaway: Over 40% of the time, there was zero impact on Energy LMPs.



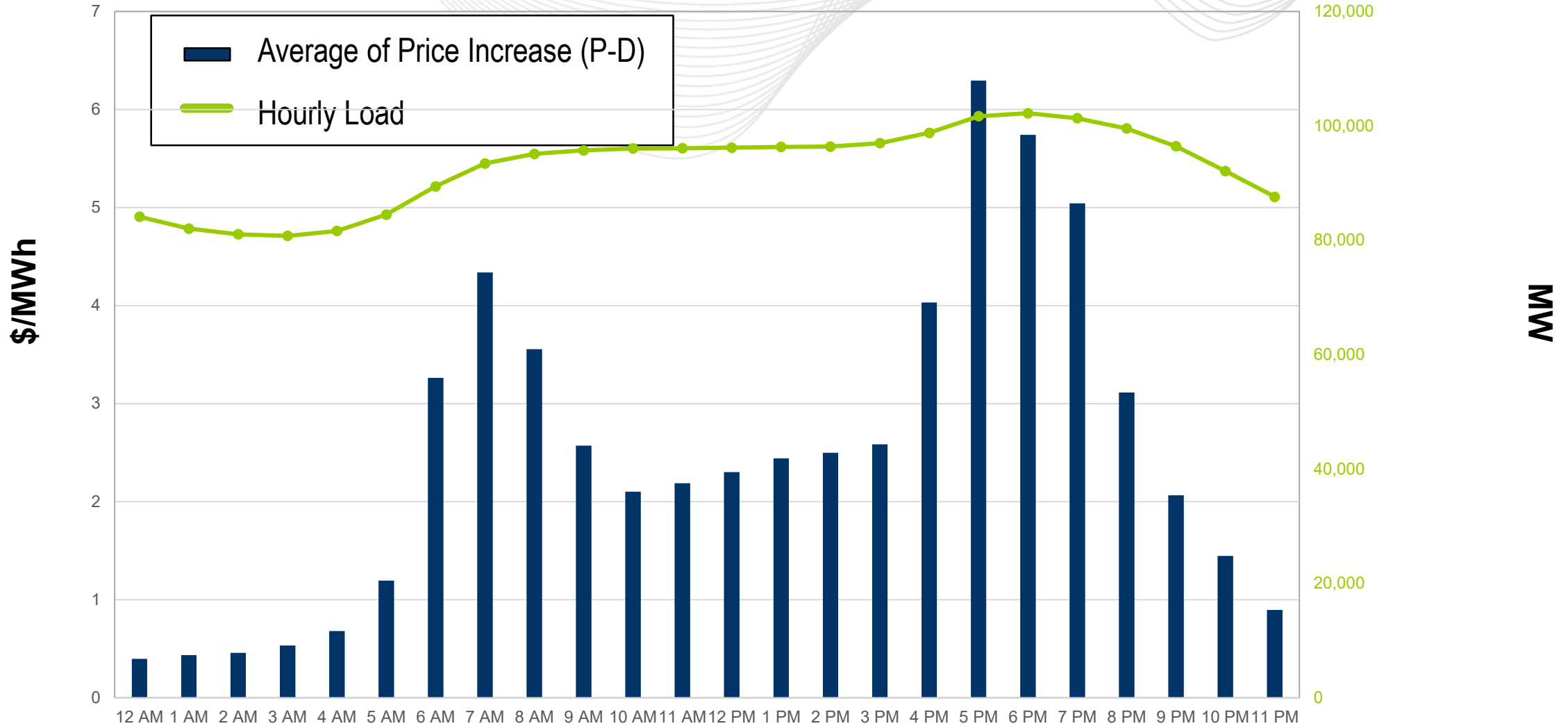
Fast-Start Daily Distribution: Sep, 2021 – Jan, 2022



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



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



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

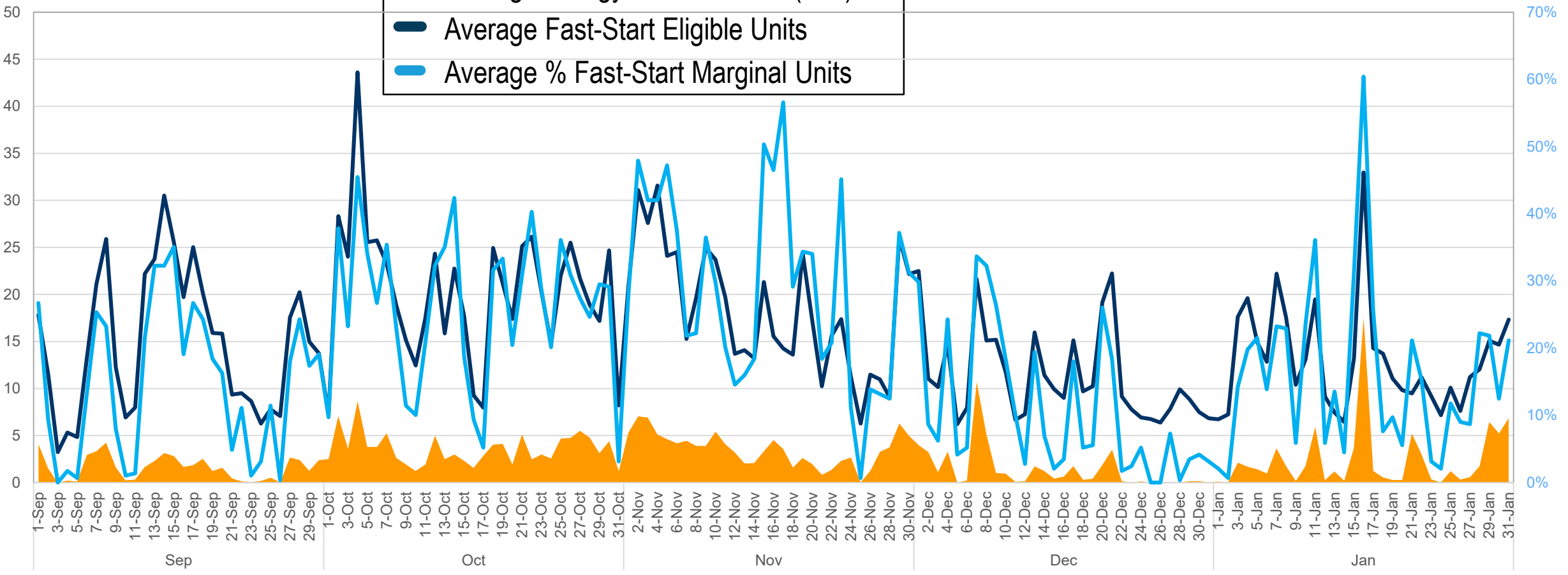


Fast-Start Eligible and Marginal Units: Sep, 2021 – Jan, 2022

FS Eligible Units Count

Average %

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



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

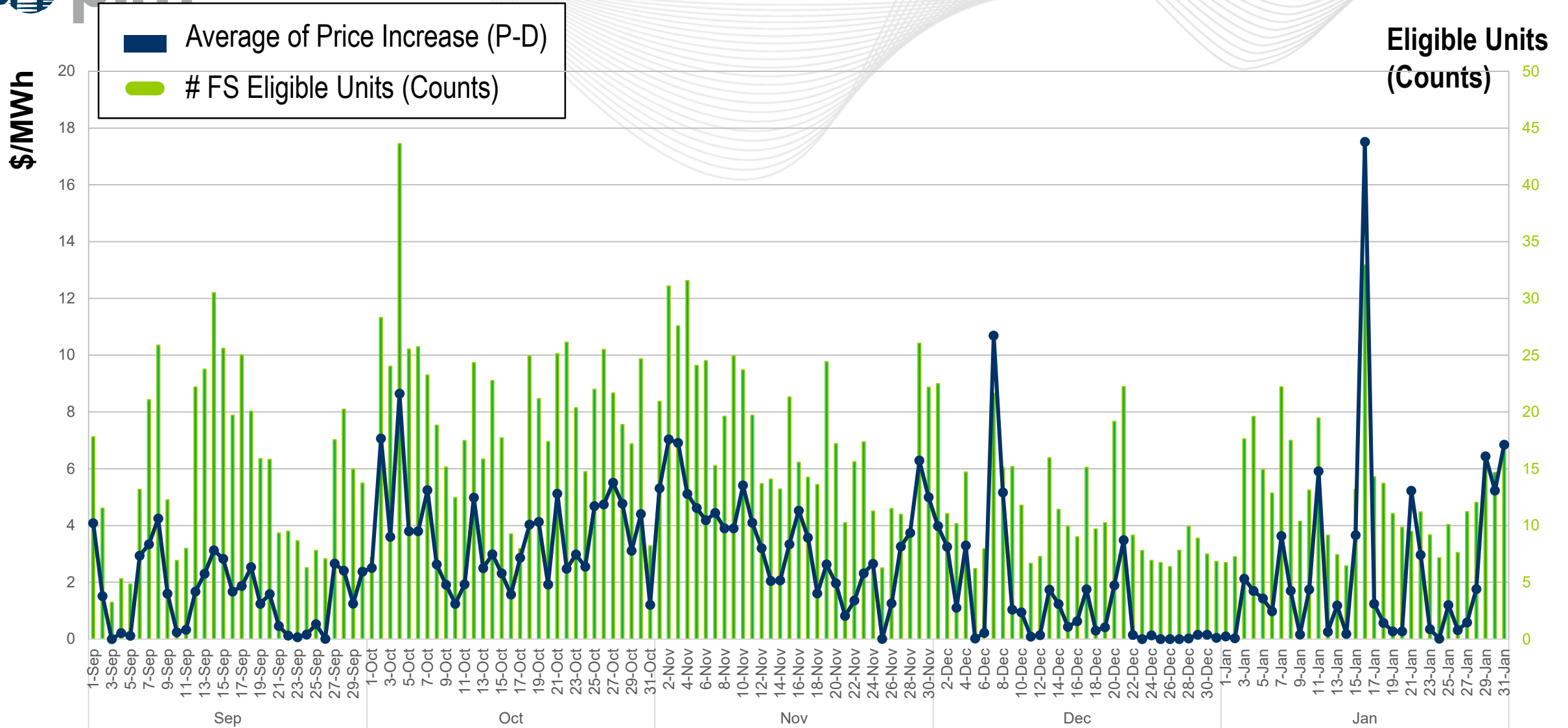


Fast-Start Eligible and Marginal Units: Sep, 2021 – Jan, 2022

	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%



Fast Start Eligible Units vs. Energy Price Increase



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

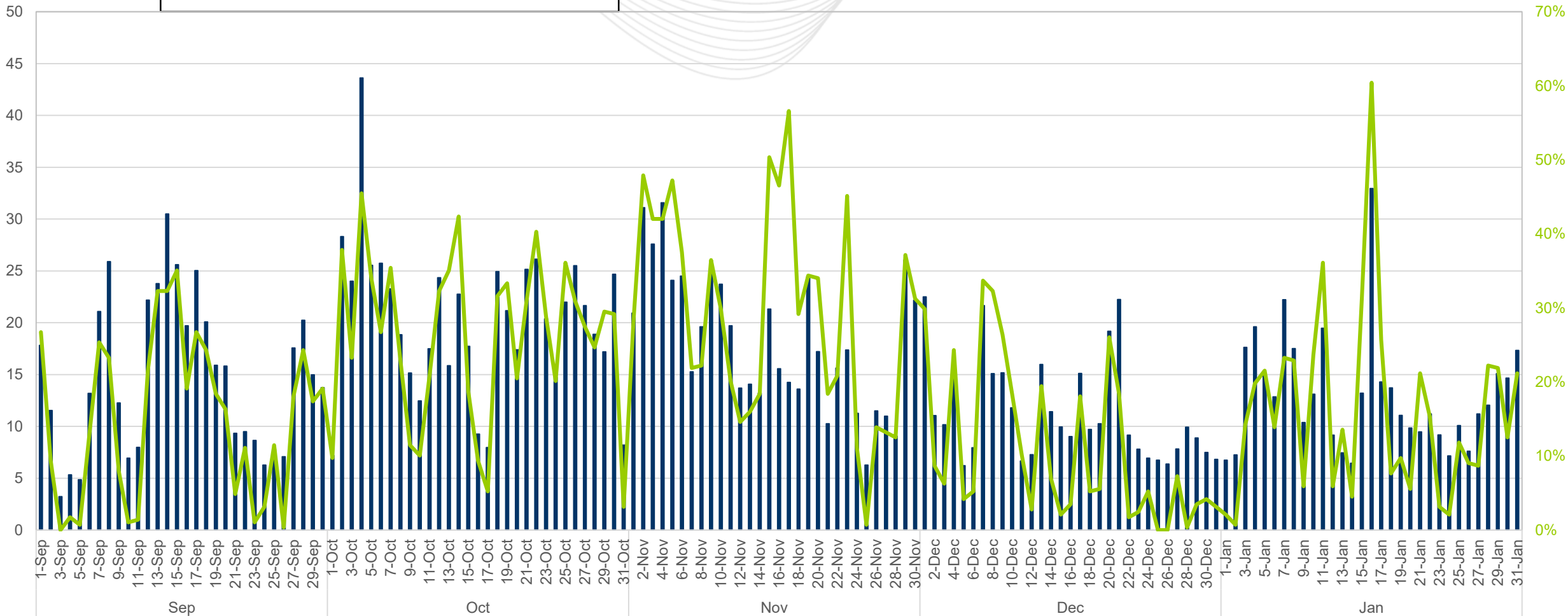


Fast Start Eligible Units vs. % Fast Start on Marginal

Eligible Units (Counts)

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

Average %



Key Takeaway: On average Fast-start units are marginal 19% of the time.

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Fast Start Metrics Update



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