

Fast Start Metrics Update

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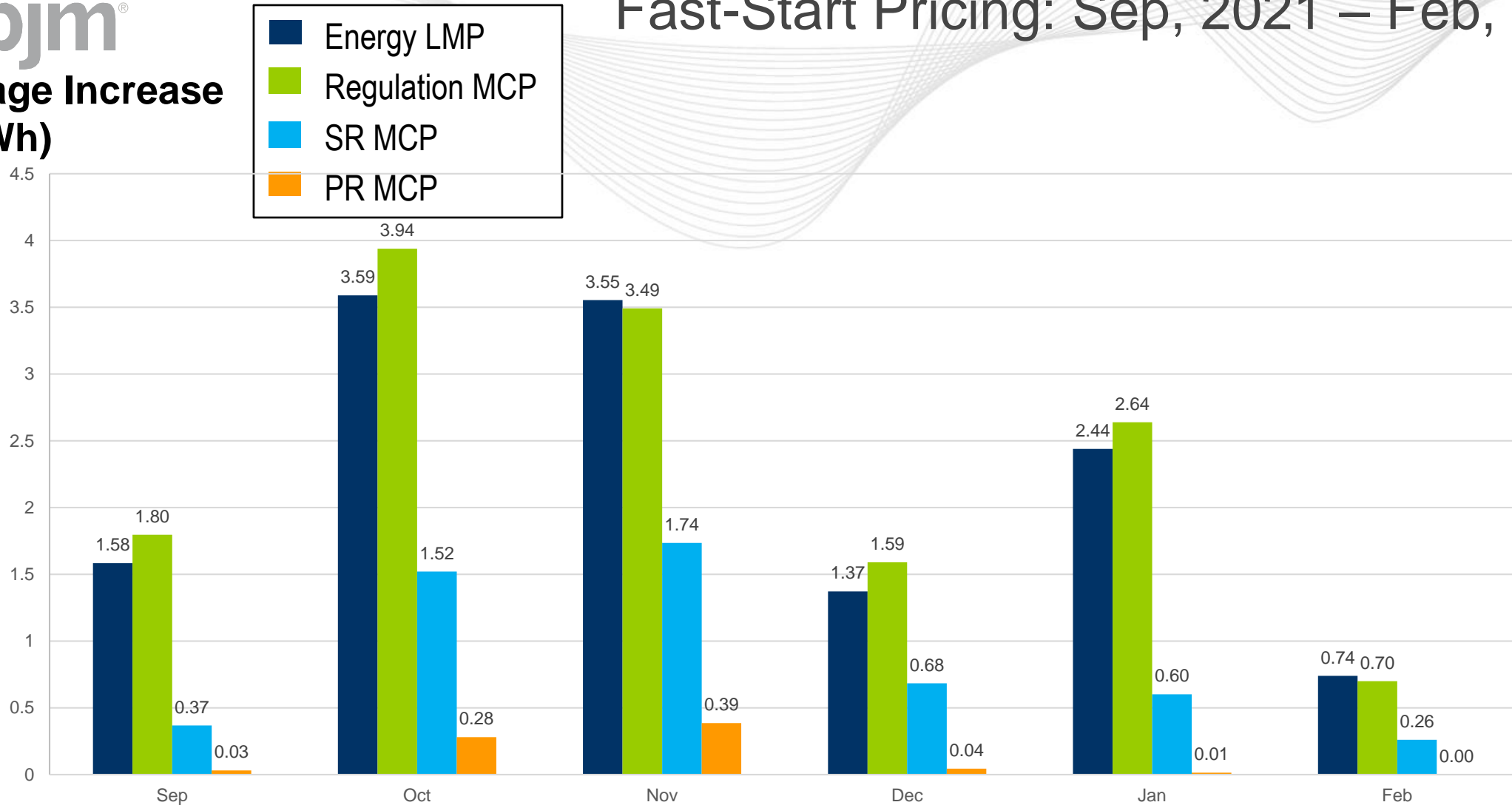
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- The average energy price increase was \$2.21/MWh, which is 5 percent of average system energy LMP from September, 2021 to February, 2022
 - The decrease from January to February is due to:
 - Lower system energy LMP
 - Lower system load
 - Less transmission outages



Average Increase (\$/MWh)

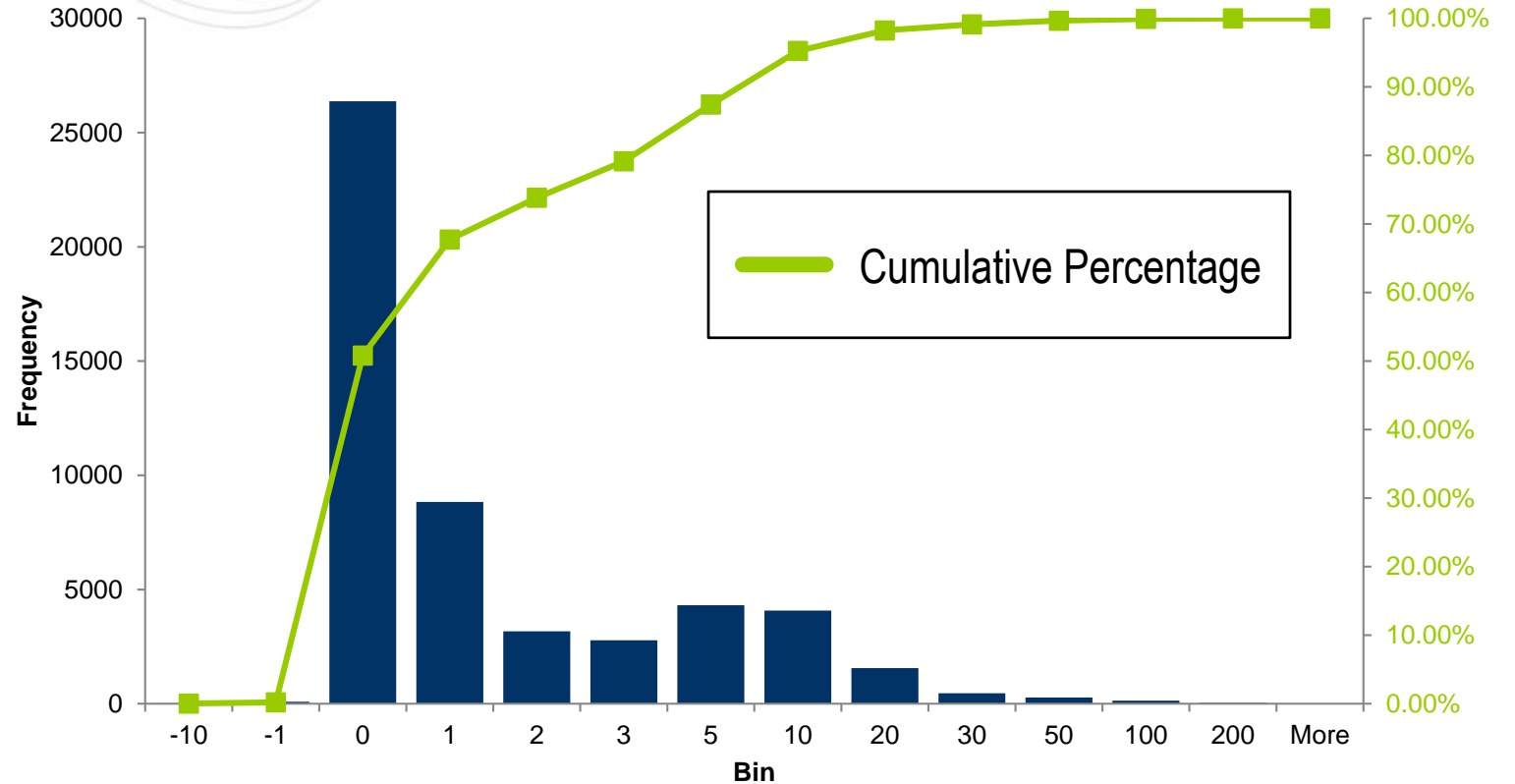
Fast-Start Pricing: Sep, 2021 – Feb, 2022



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

Energy LMP Increase	Frequency	Cumulative
-10	20	0.04%
-1	90	0.21%
0	26372	50.80%
1	8831	67.74%
2	3170	73.82%
3	2776	79.15%
5	4313	87.42%
10	4077	95.24%
20	1563	98.24%
30	461	99.13%
50	278	99.66%
100	137	99.92%
200	40	100.00%

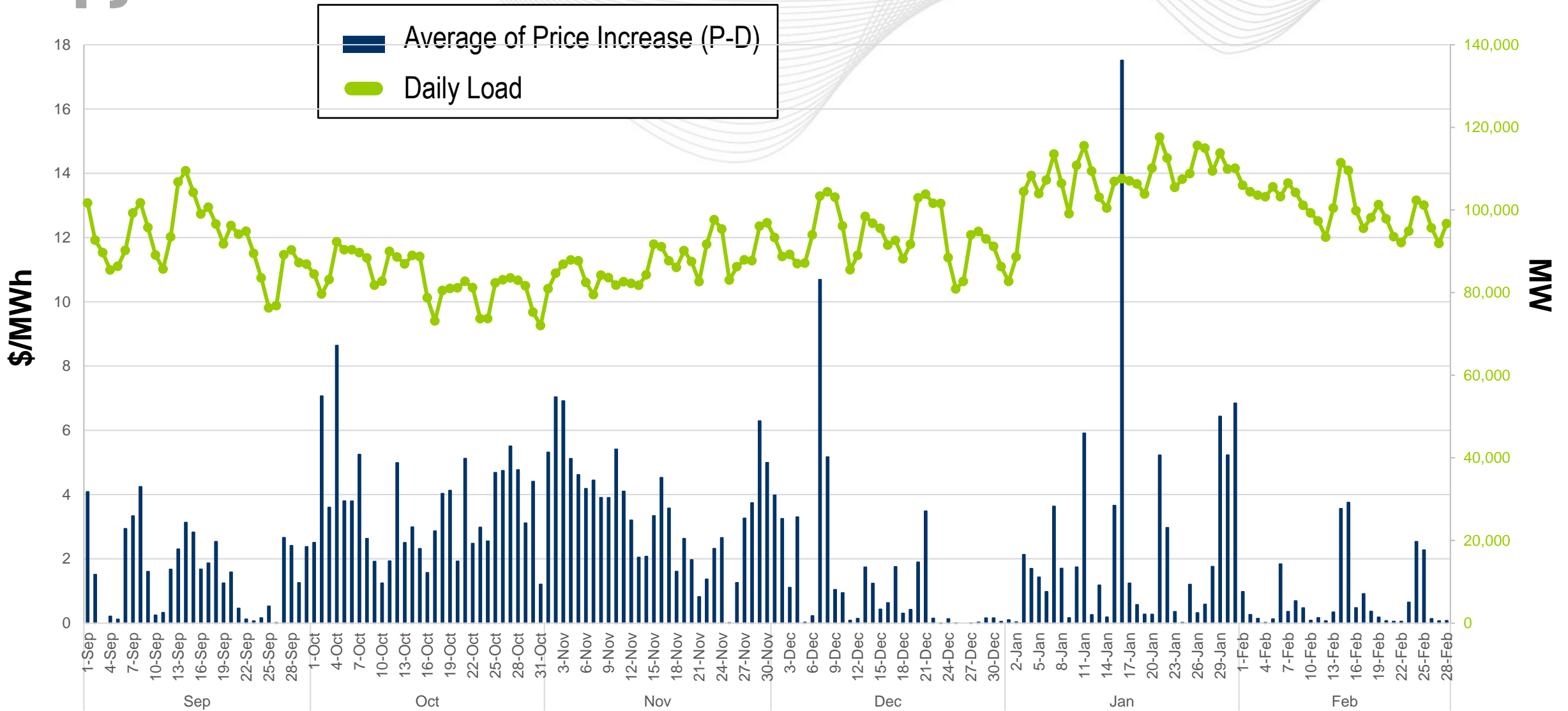
**Frequency
(Number of Intervals)**



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

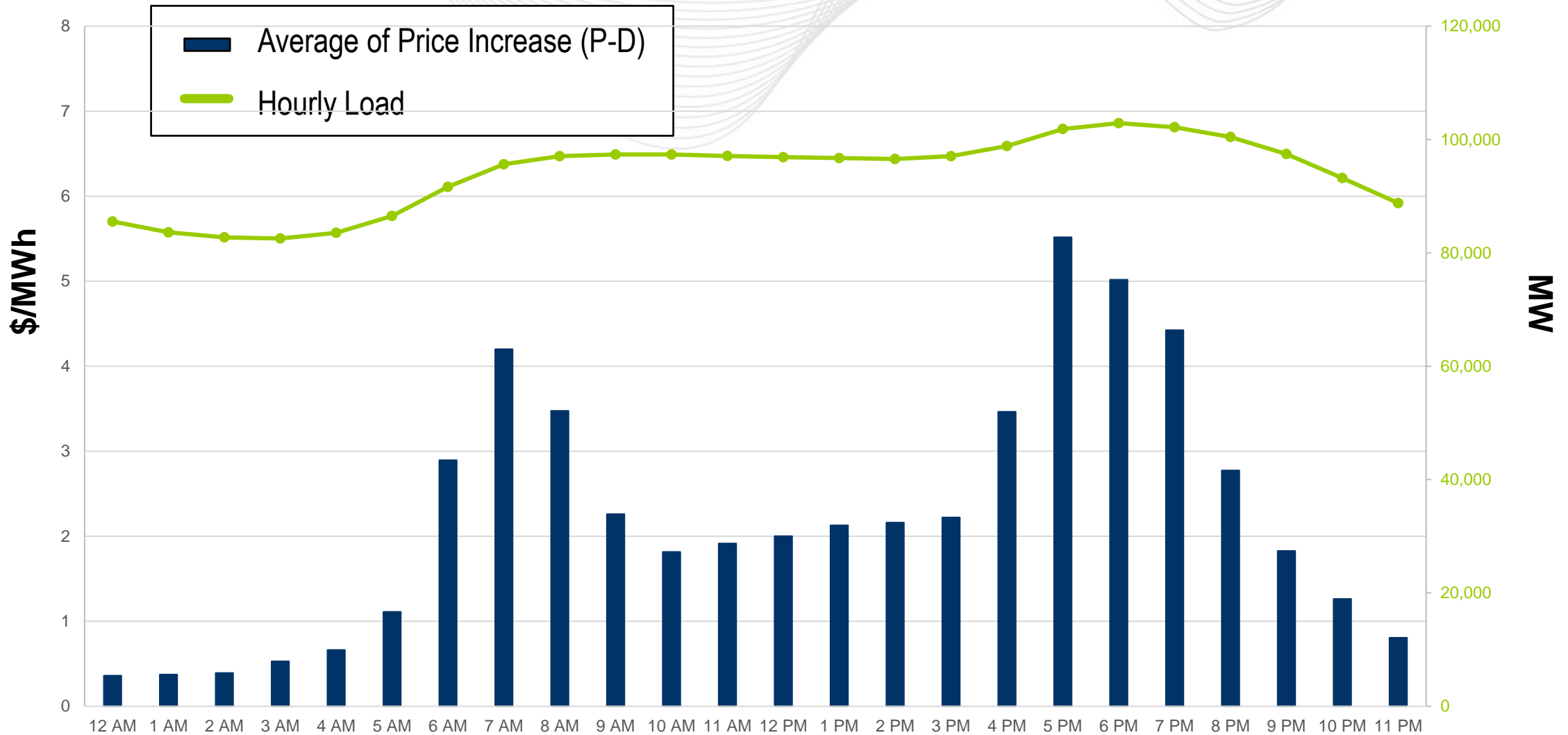


Fast-Start Daily Distribution: Sep, 2021 – Feb, 2022



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

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

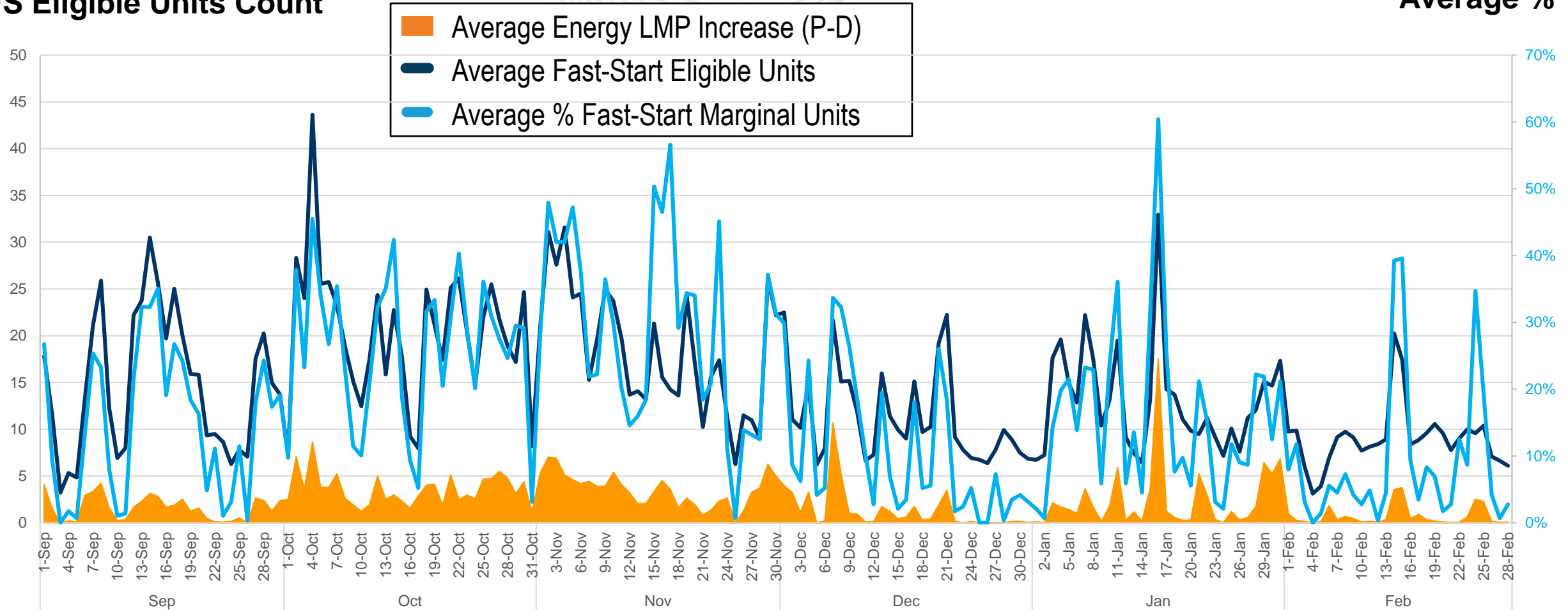


Key Takeaway: Largest impact on LMPs occur during on-peak hours.



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

FS Eligible Units Count



Average %

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

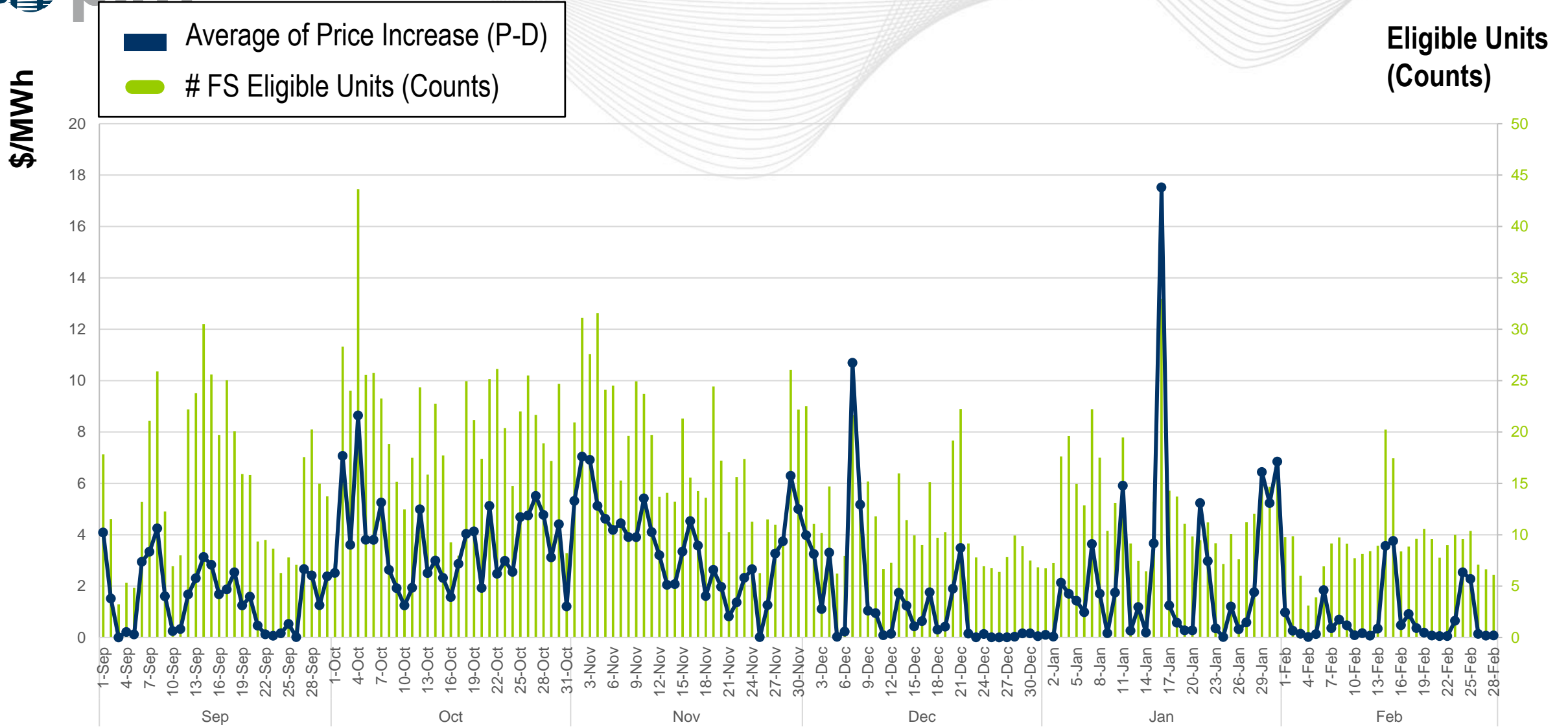


Fast-Start Eligible and Marginal Units: Sep, 2021 – Feb, 2022

	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%



Fast Start Eligible Units vs. Energy Price Increase



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

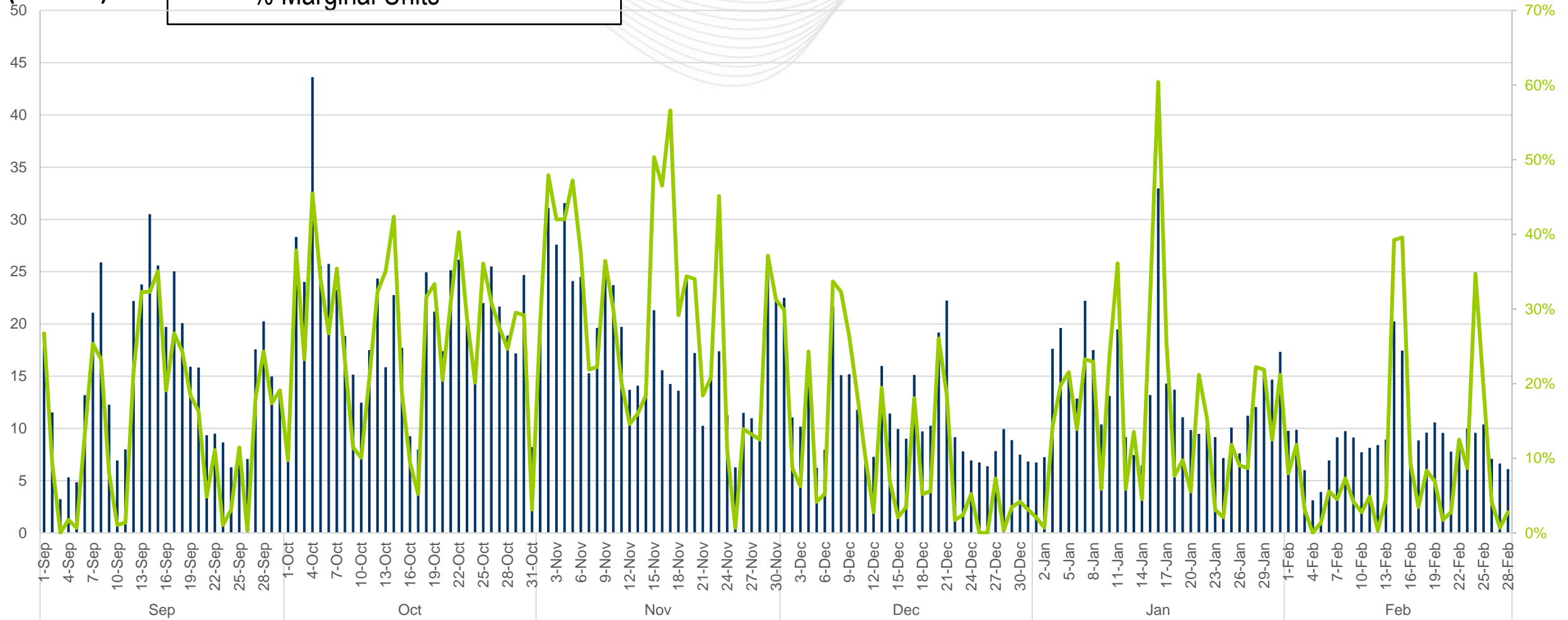


Fast Start Eligible Units vs. % Fast Start on Marginal

Eligible Units (Counts)

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

Average %



Key Takeaway: On average Fast-start units are marginal 18% of the time.

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Fast Start Metrics Update



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