

# Fast Start Metrics Update

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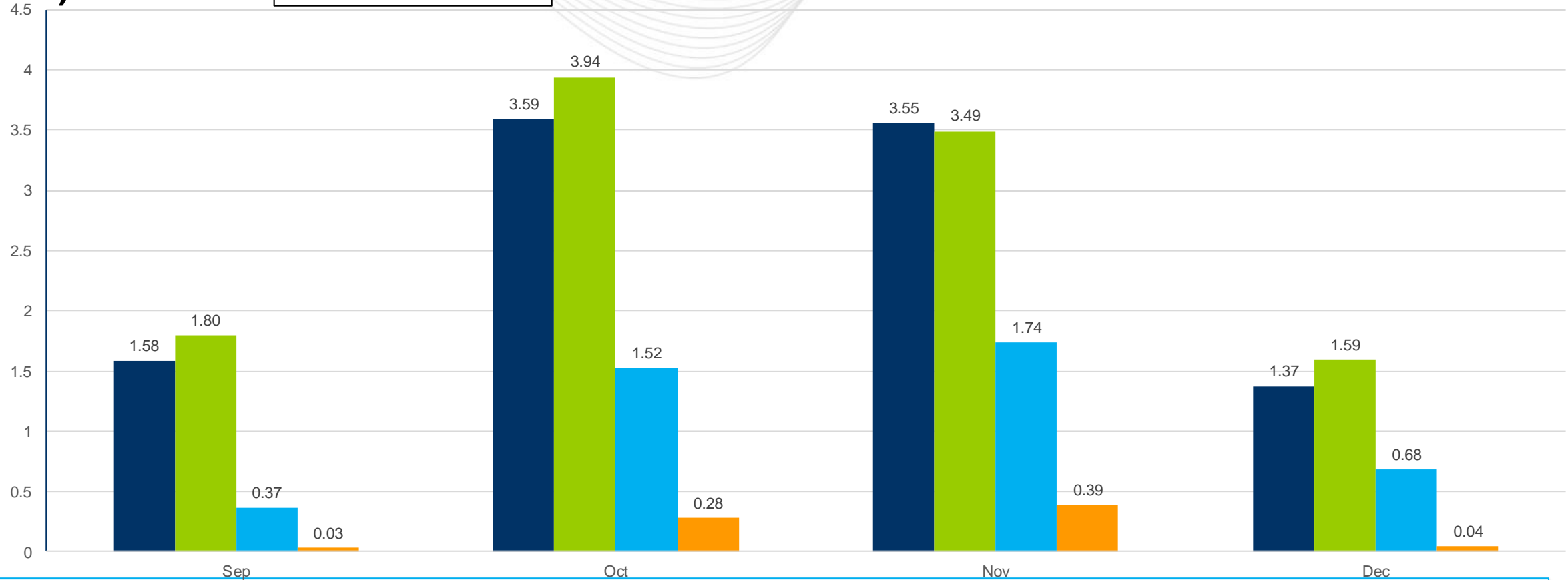
- The average energy price increase was \$2.52/MWh, which is 5 percent of average system energy LMP from September to December
  - The smaller increase in December is due to:
    - Much lower system energy LMP
    - Less outages transitioning into the Winter season
- Uplift summary will be postponed. PJM will post it as soon as the enough data and process is ready.



## Average Increase (\$/MWh)

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

# Fast-Start Pricing: Sep - Dec 2021

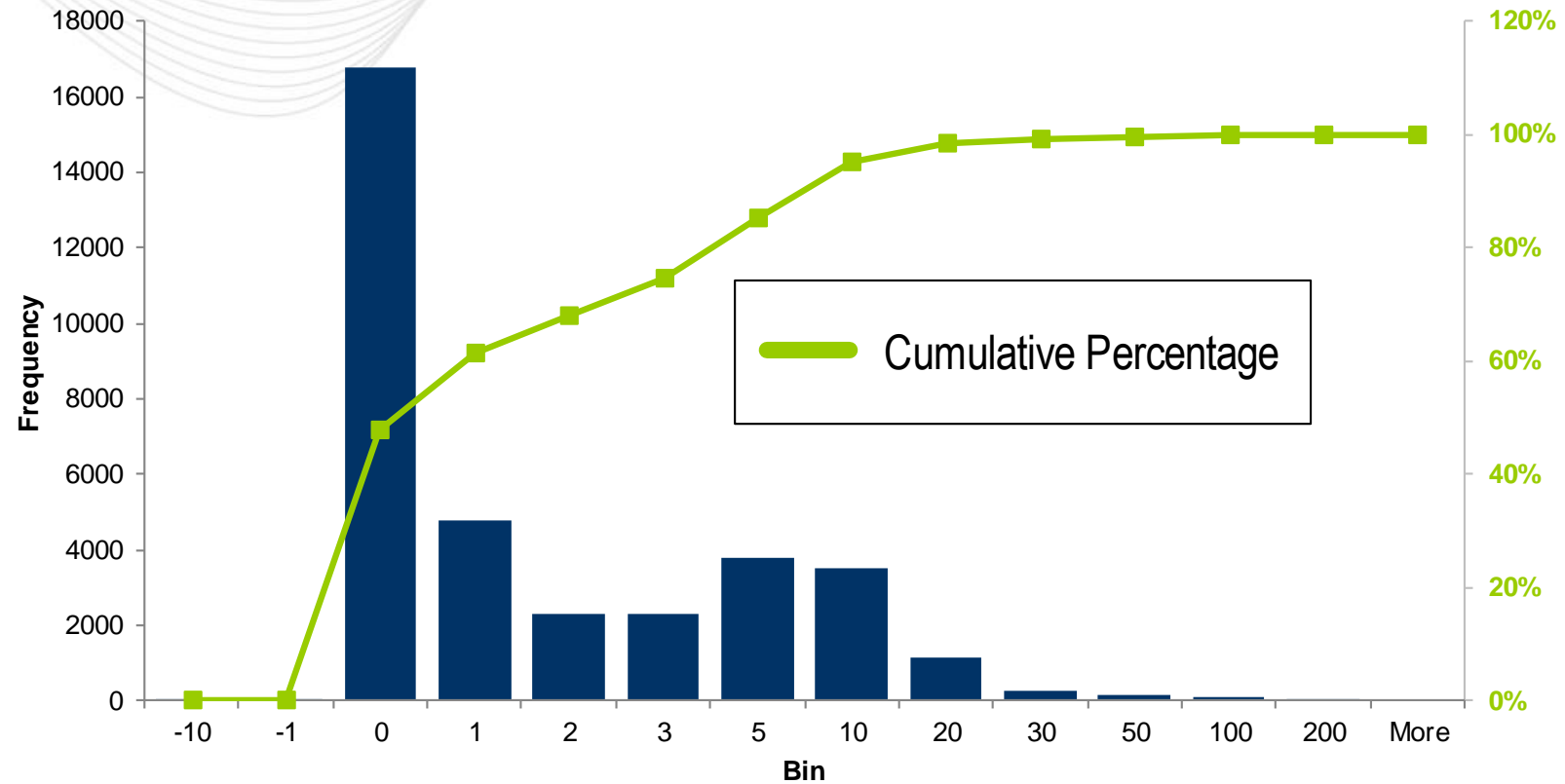


**Key Takeaway:** Energy and Ancillary Service Market clearing prices all increased due to co-optimization.

# Fast-Start Energy LMP Increase (Histogram): Sep - Dec 2021

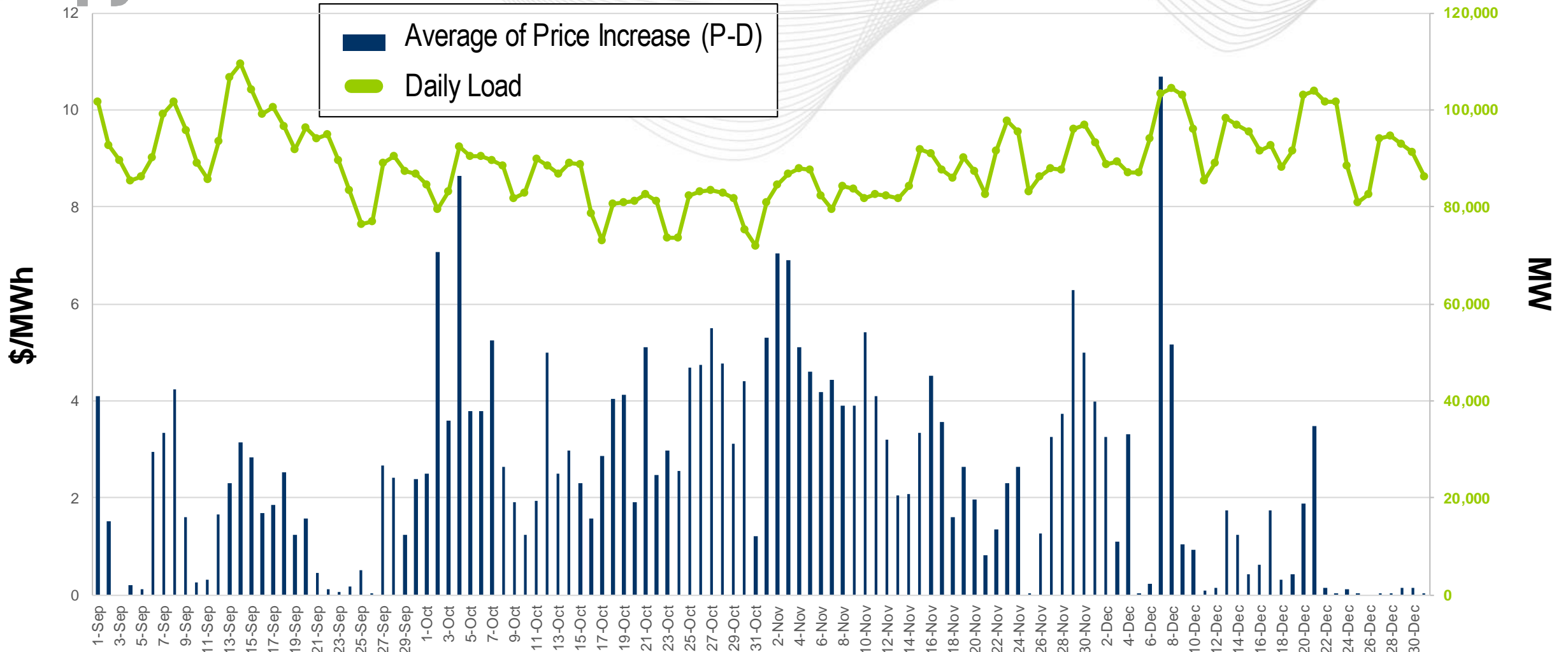
Energy LMP Increase	Frequency	Cumulative
-10	9	0.03%
-1	46	0.16%
0	16783	47.92%
1	4769	61.50%
2	2291	68.02%
3	2286	74.52%
5	3766	85.24%
10	3498	95.20%
20	1141	98.44%
30	270	99.21%
50	131	99.58%
100	109	99.89%
200	37	100.00%

Frequency (Number of Intervals)



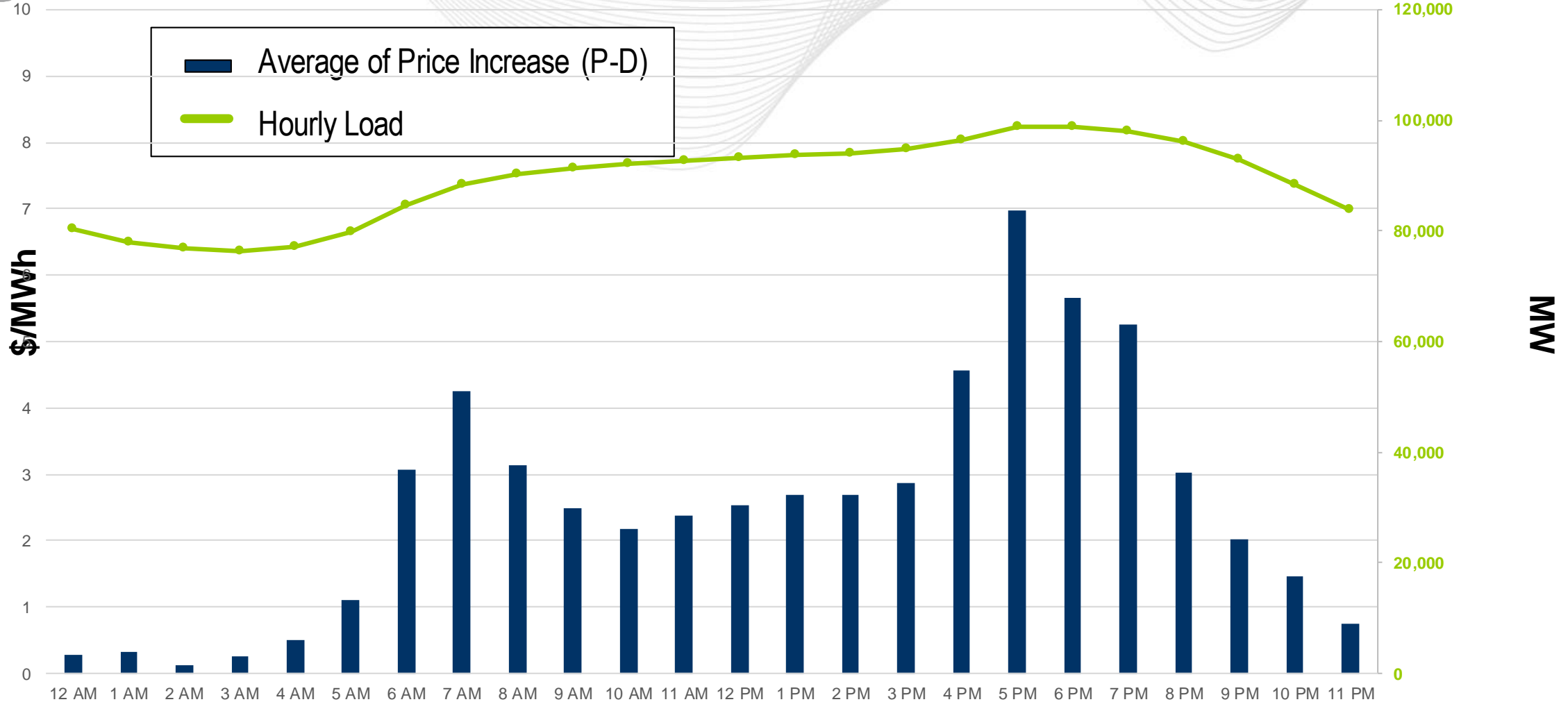
**Key Takeaway:** Over 40% of the time, there was zero impact on Energy LMPs.

# Fast-Start Daily Distribution: Sep - Dec 2021



**Key Takeaway:** LMP increases are more impacted by the system energy LMP and outages from September to December.

# Fast-Start Hourly Distribution: Sep-Dec 2021



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

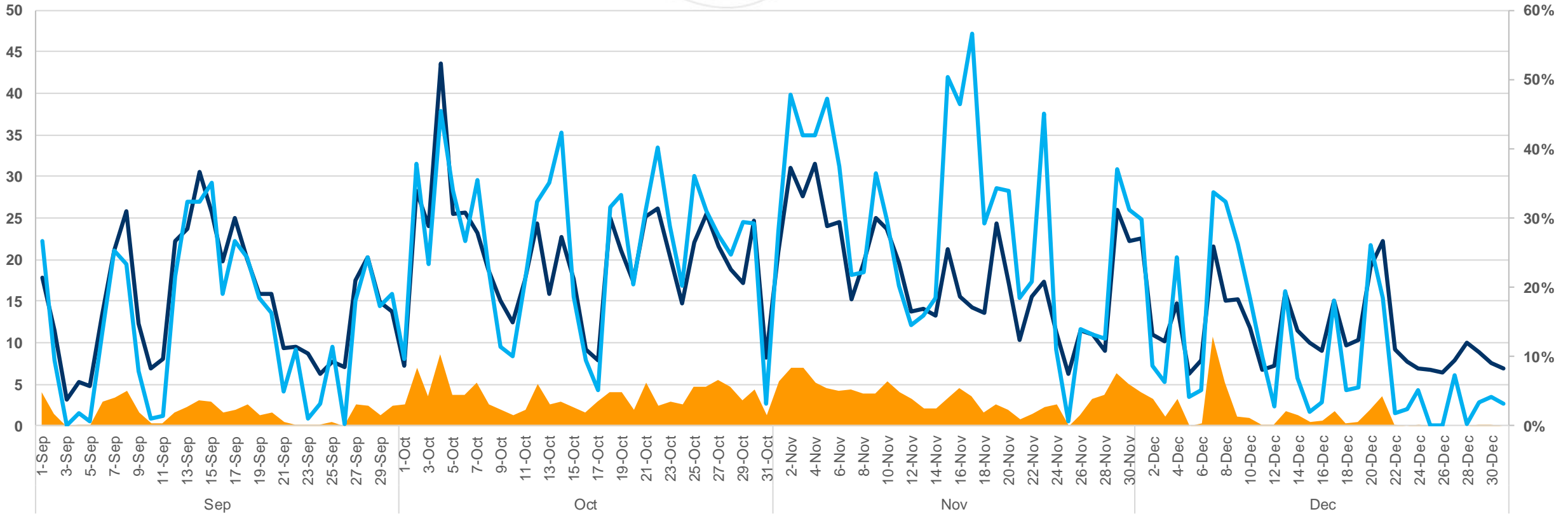


# Fast-Start Eligible and Marginal Units: Sep - Dec 2021

## 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.**

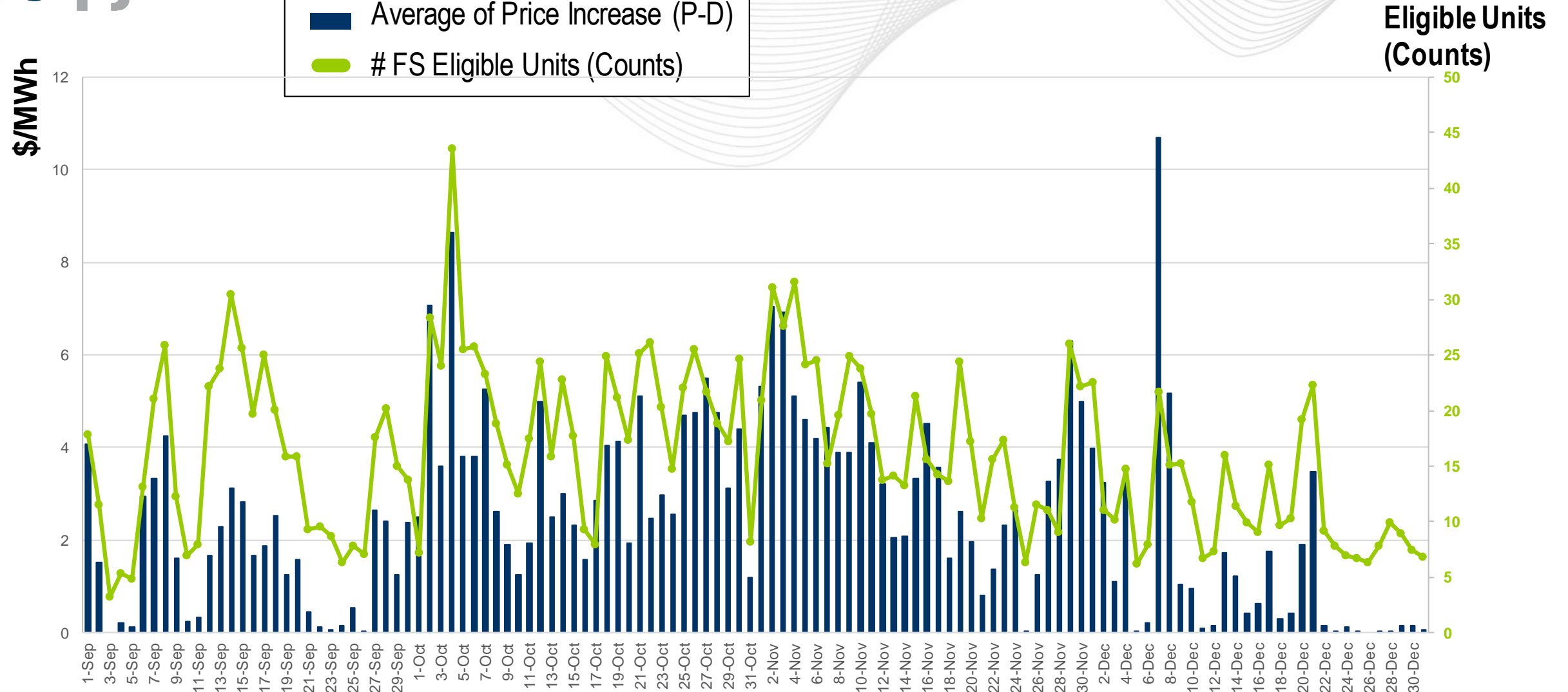


# Fast-Start Eligible and Marginal Units: Sep - Dec 2021

	<b>Energy LMP Increase (\$/MWh)</b>	<b>FS Eligible Units</b>	<b>% FS_Marginal</b>
September	1.58	15	15%
October	3.59	20	26%
November	3.55	18	29%
December	1.37	11	11%



# Fast Start Eligible Units vs. Energy Price Increase



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

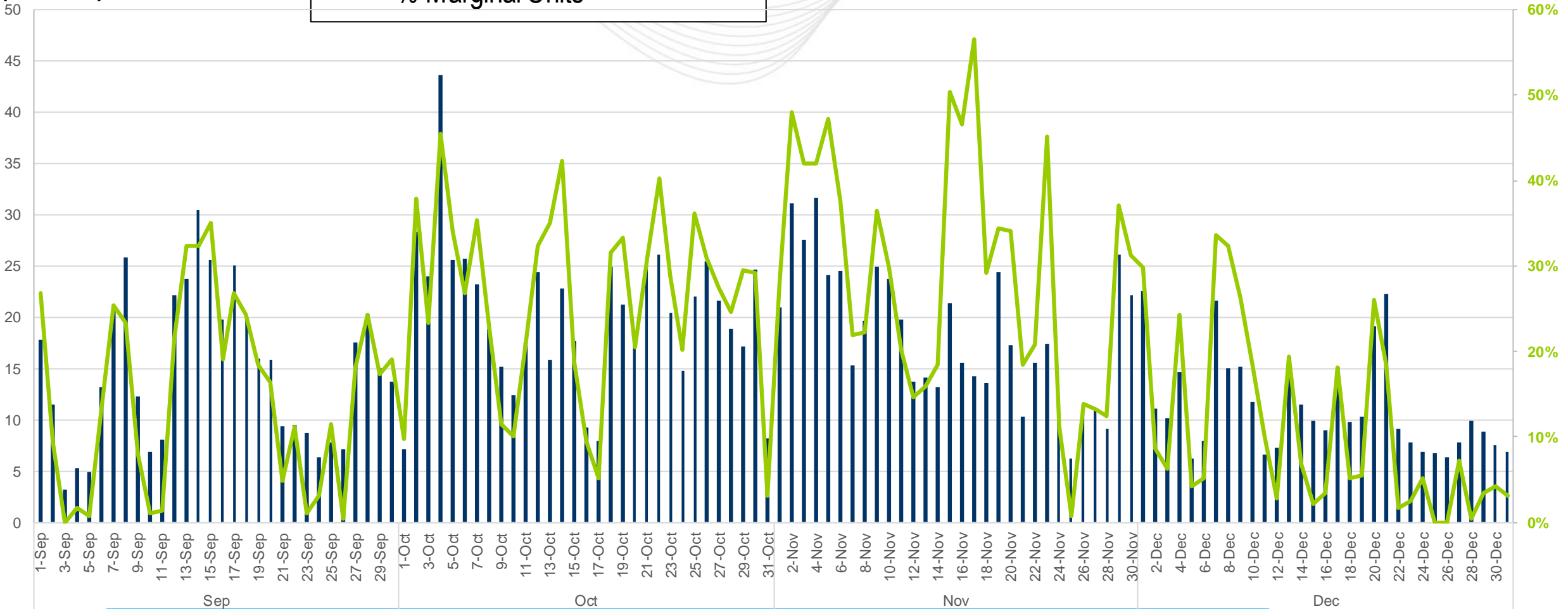


# Fast Start Eligible Units vs. % Fast Start on Marginal

Eligible Units  
(Counts)

- # Eligible Units (Counts)
- % Marginal Units

Average %



**Key Takeaway:** On average Fast-start units are marginal 20% of the time.

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## Fast Start Metrics Update



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