

Fast Start Metrics Update

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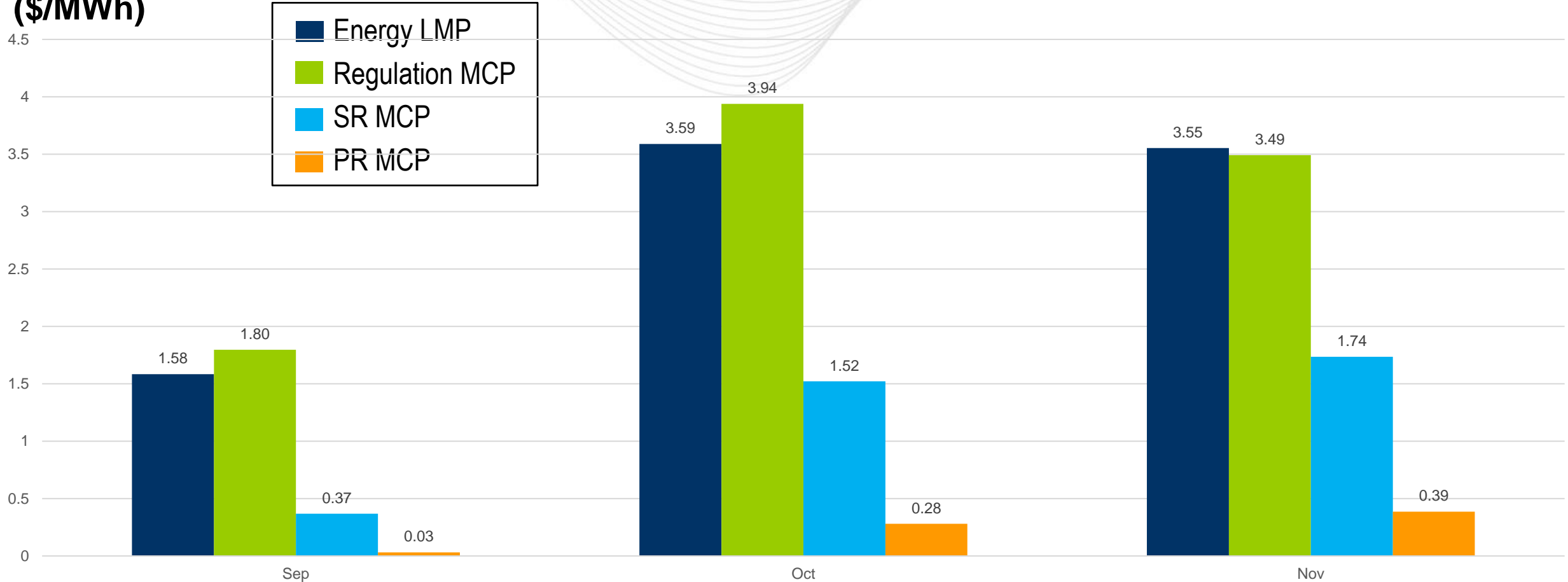
Manager, Real-Time Market Operations

Market Implementation Committee

December 6, 2021

- The average energy price increase was \$2.92/MWh, which is 5.3 percent of average system energy LMP from September to November
 - The increase for November is consistent with October which is higher than September due to:
 - higher system energy LMP
 - higher congestions (outage related)
- Uplift summary will be postponed. PJM will post it as soon as the enough data and process is ready.

Average Increase (\$/MWh)

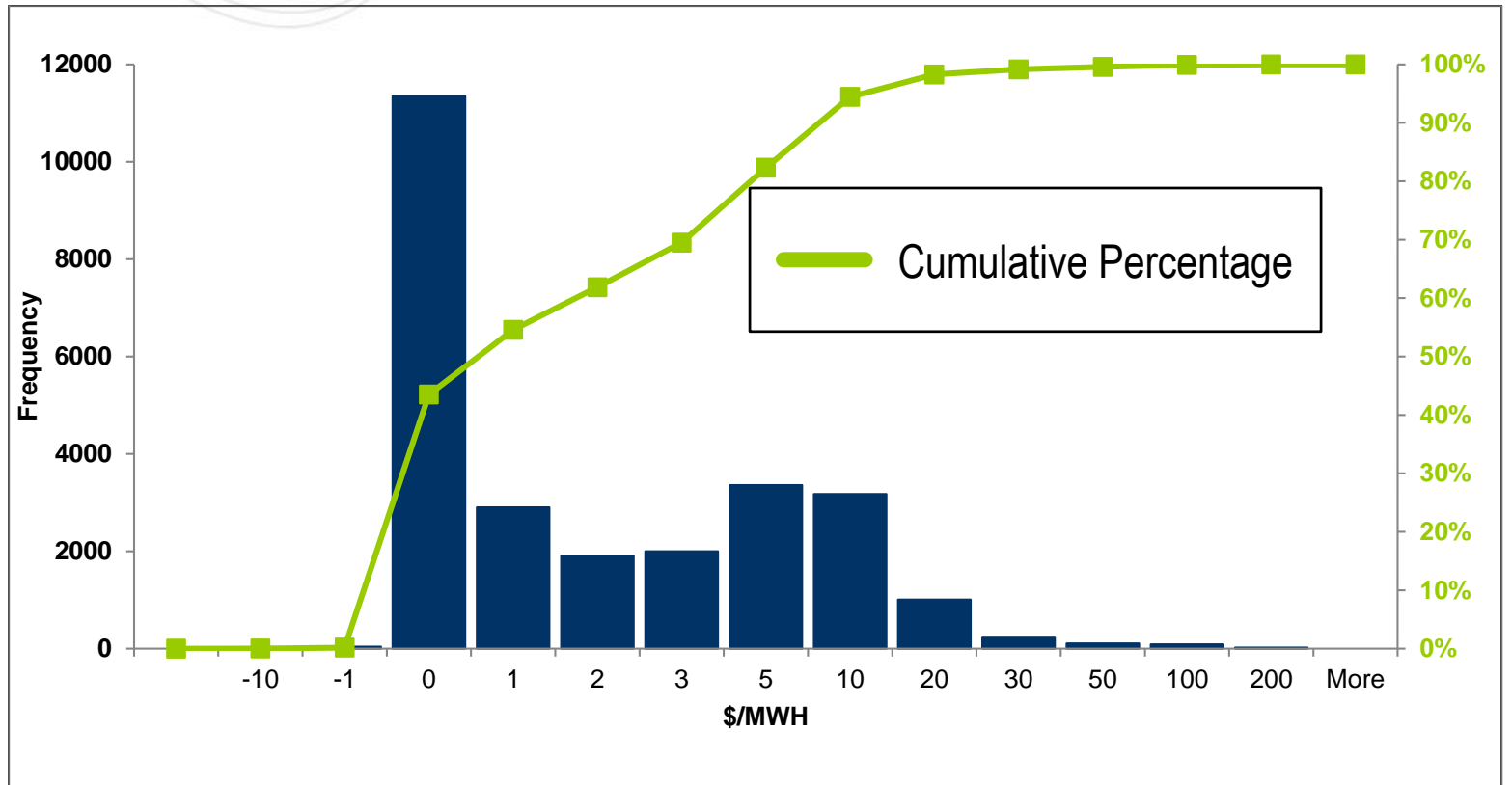


Key Takeaway: Energy and Ancillary Service Market clearing prices all increased due to co-optimization.

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

Energy LMP Increase	Frequency	Cumulative
-10	9	0.03%
-1	42	0.19%
0	11349	43.50%
1	2903	54.57%
2	1910	61.86%
3	2000	69.49%
5	3361	82.32%
10	3175	94.43%
20	1008	98.28%
30	227	99.15%
50	110	99.57%
100	91	99.91%
200	23	100.00%

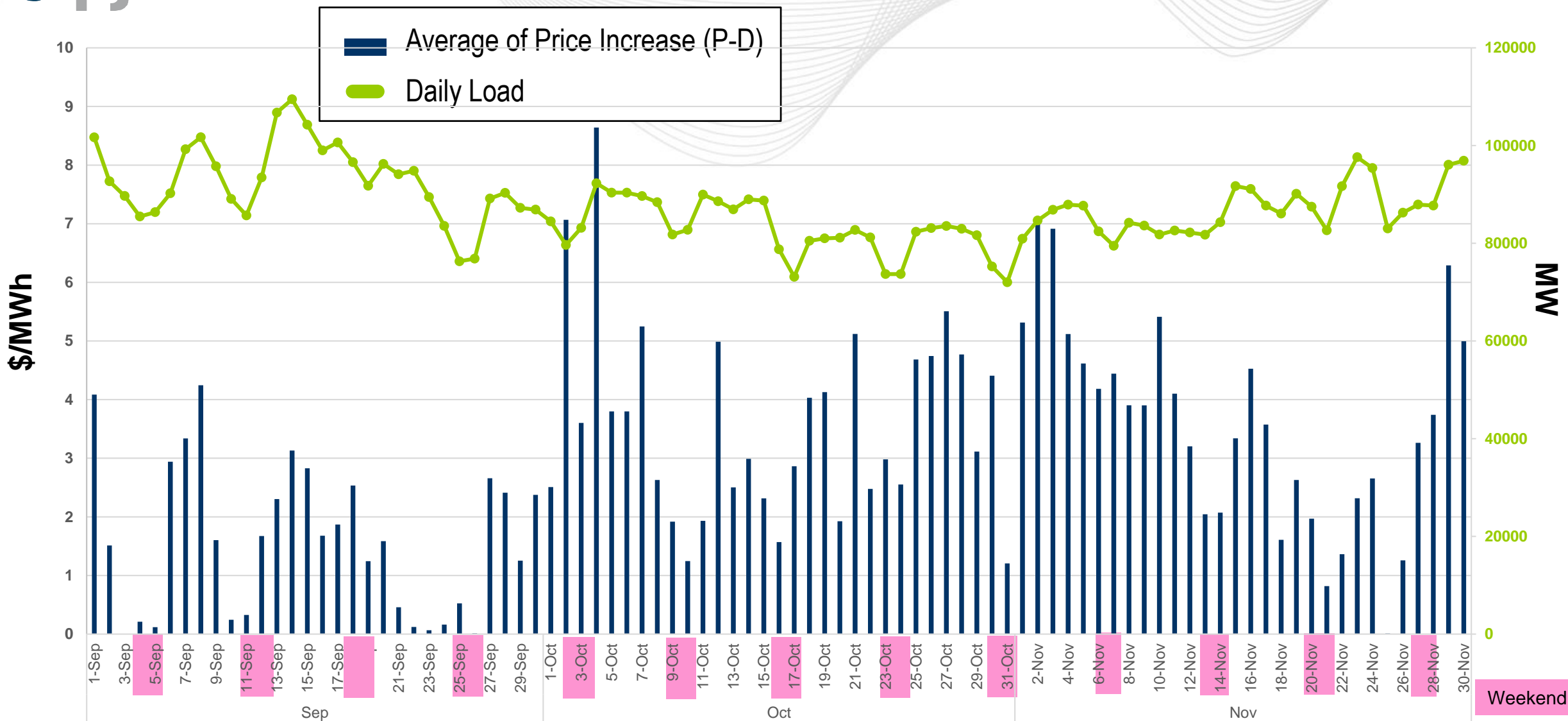
Frequency
(Number of Intervals)



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

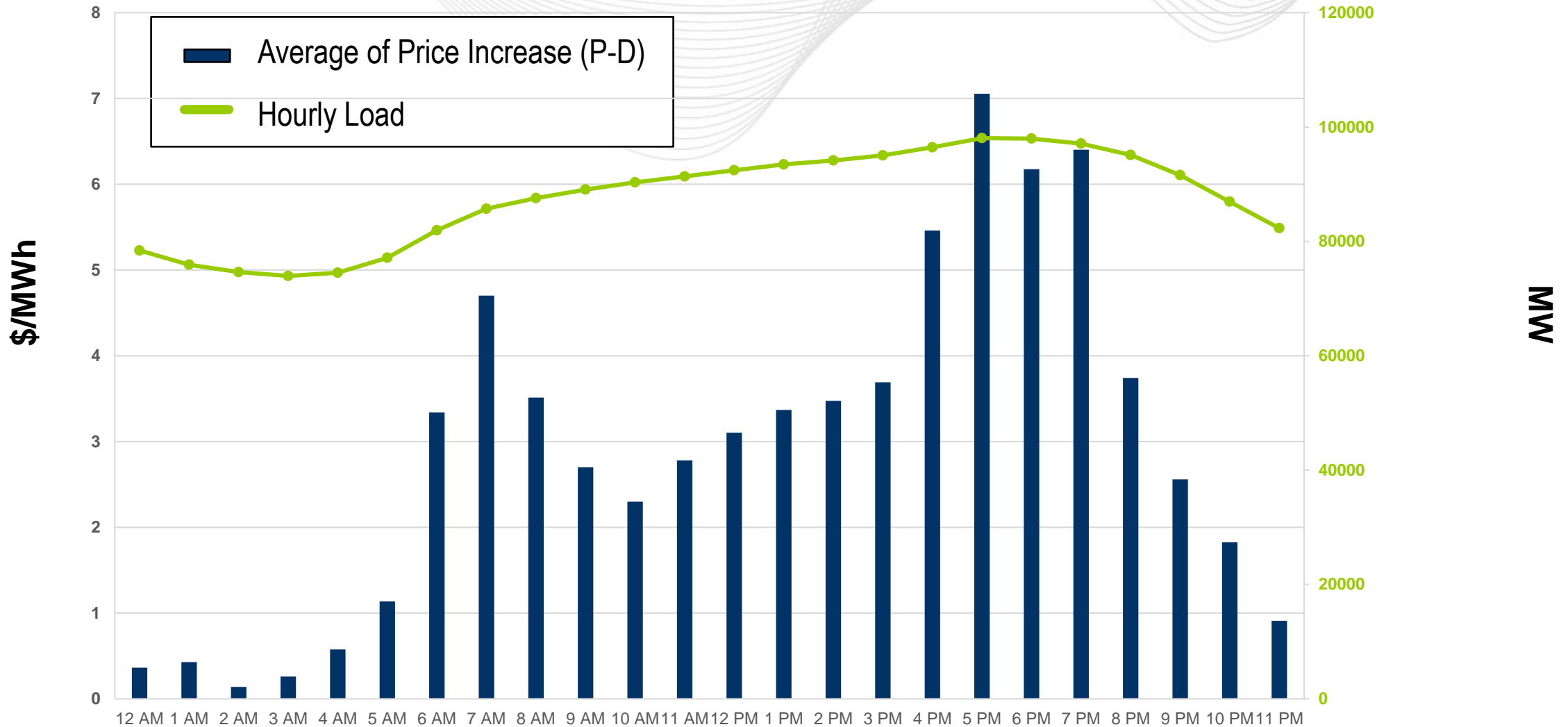


Fast-Start Daily Distribution: Sep - Nov 2021



Key Takeaway: LMP increases are more apparent on higher load days; The increases are more impacted by the system energy LMP and outages from October to Nov.

Fast-Start Hourly Distribution: Sep-Nov 2021



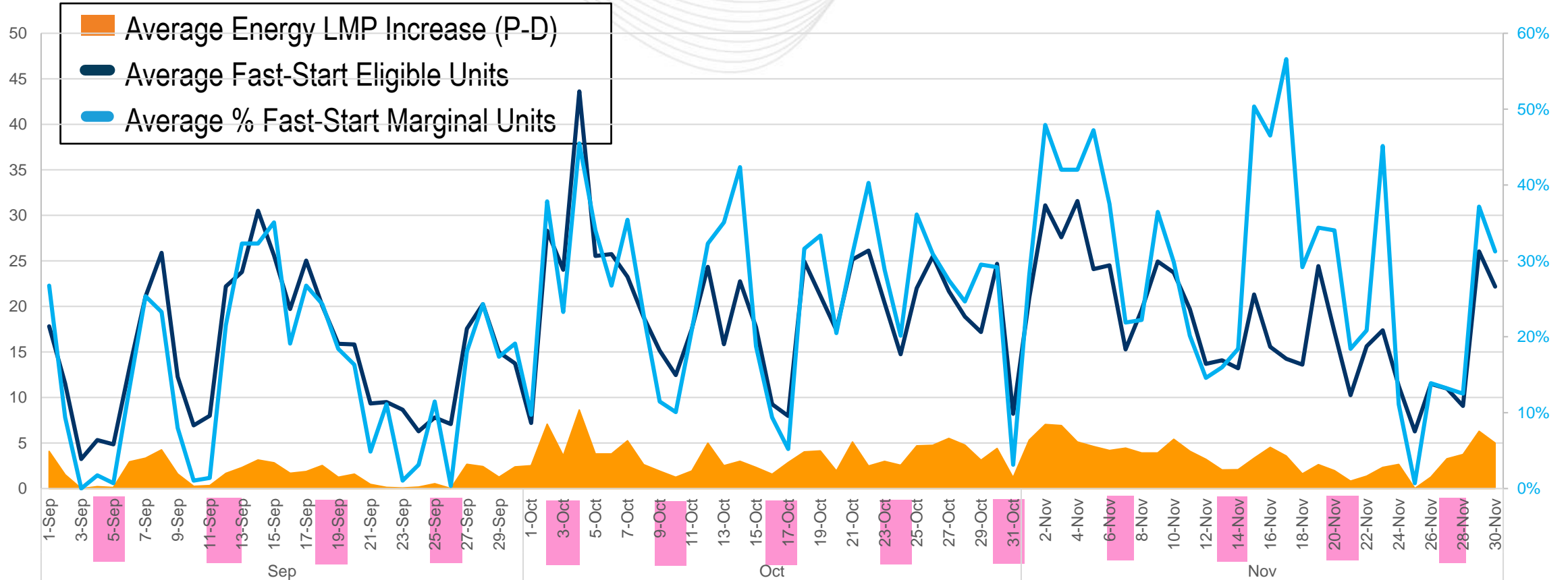
Key Takeaway: Largest impact on LMPs occur during on-peak hours.



Fast-Start Eligible and Marginal Units: Sep - Nov 2021

FS Eligible Units Count

Average %



Weekend

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

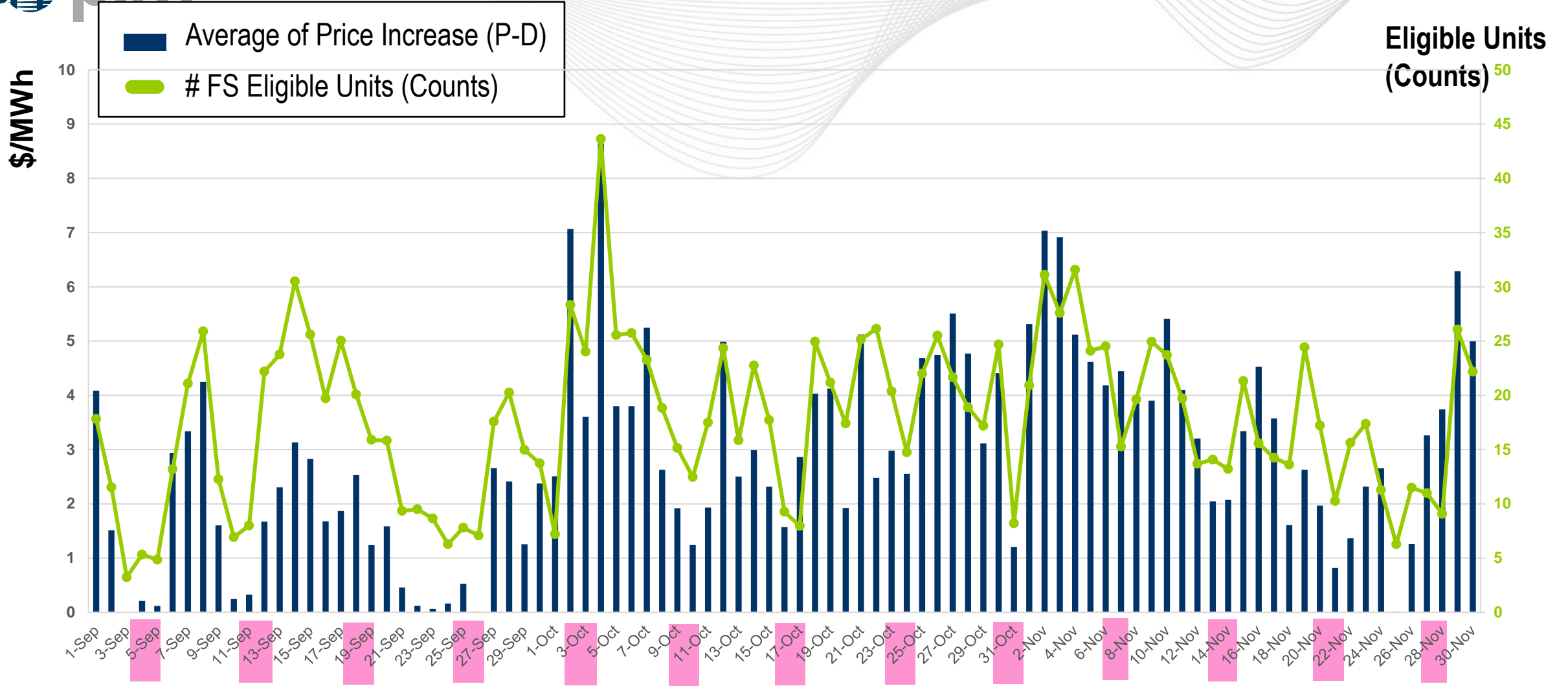


Fast-Start Eligible and Marginal Units: Sep - Nov 2021

	EnergyLMP Increase (\$/MWh)	FS Eligible Units	% FS_Marginal
September	1.58	15	15%
October	3.59	20	26%
November	3.55	18	29%



Fast Start Eligible Units vs. Energy Price Increase



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

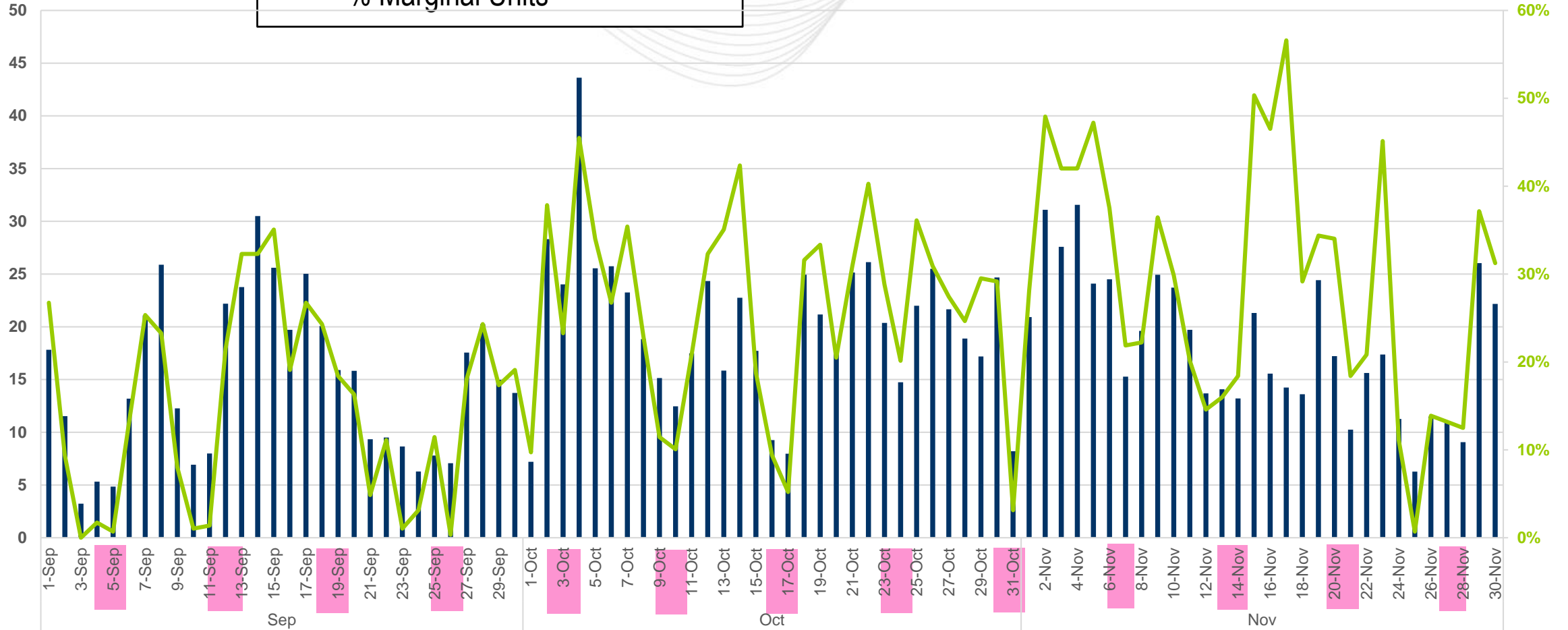


Fast Start Eligible Units vs. % Fast Start on Marginal

Eligible Units (Counts)

- # Eligible Units (Counts)
- % Marginal Units

Average %



Key Takeaway: On average Fast-start units are marginal 23% of the time.

Weekend

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Fast Start Metrics Update



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