Regulation Redesign Phase 1
Commitment Logic Enhancements and Pricing Outcomes

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Disclaimer: While materials are current at the time of publishing, applicable requirements may change. PJM Governing Documents control.

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Overview

The Regulation Redesign project stems from an approved solution developed with stakeholders during the Regulation Market Design Senior Task Force (RMDSTF).

The projected overall benefits of the FERC-approved Regulation Market updates are to create efficiencies in procurement and price formation for regulation service while meeting the challenges presented by the changing resource mix (increase in renewable resource types) over the next few years.

PJM and the IMM have been closely following the clearing and pricing since go-live, Oct. 1, 2025.

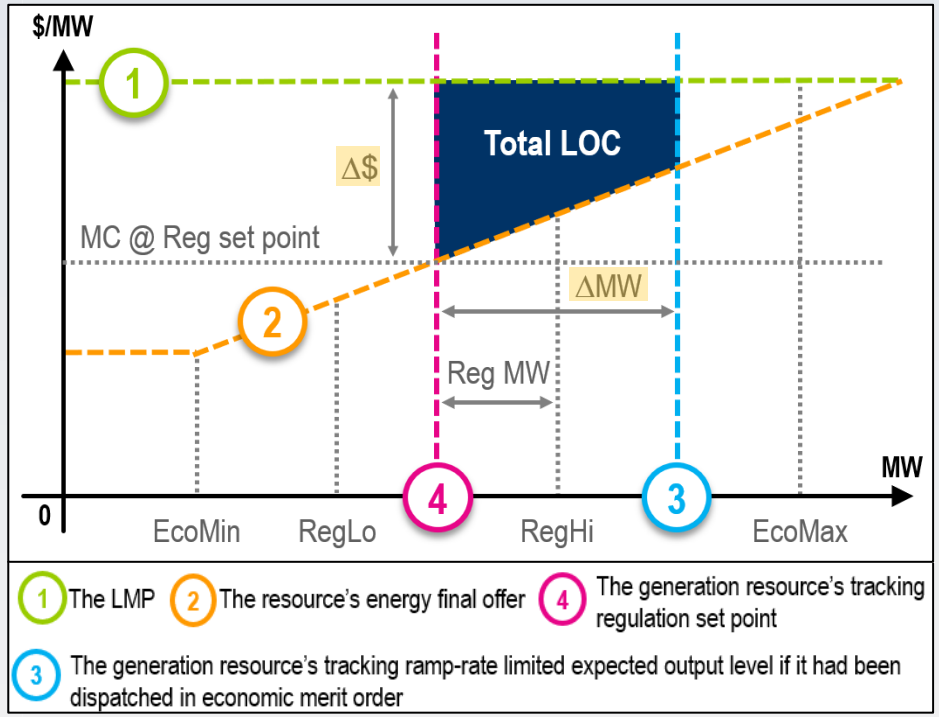
Some areas are performing well, while others have steadily improved over the year.

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Regulation Clearing & Pricing

Commitment: ASO's half-hourly energy, reserve and regulation co-optimization incorporates loc estimates based on forecasted system conditions, forecast LMP, and resource estimated output to support least-cost resource selection to provide regulation.

Pricing: LPC recalculates loc for regulating resources every five minutes using real-time LMP and tracking ramp-limited desired megawatt output. The resource with the highest combined updated loc and adjusted offer sets the regulation clearing price.

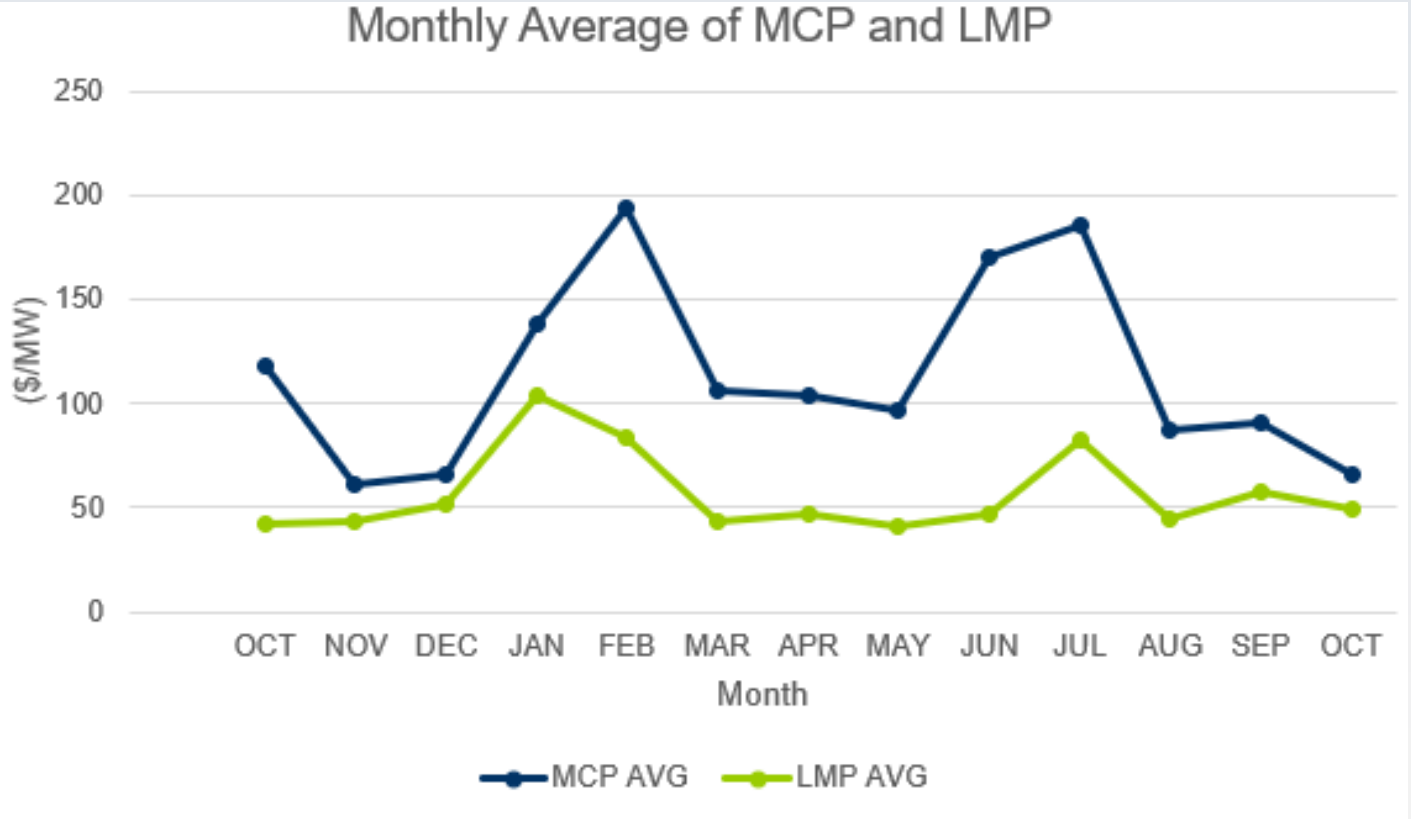


$$\text{LOC (\$/MW)} = \frac{TotalLOC}{PS * RegMW} = \frac{\Delta\$ * \Delta MW}{PS * RegMW}$$

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Average Energy LMP vs. Regulation MCP

MONTH	MCP AVG	LMP AVG
Oct-25	118.23	41.75
Nov-25	61.40	43.80
Dec-25	65.90	51.58
Jan-26	138.69	103.97
Feb-26	193.86	83.64
Mar-26	105.82	43.78
Apr-26	103.82	47.11
May-26	96.46	41.14
Jun-26	170.43	47.16
Jul-26	185.01	81.93
Aug-26	86.82	44.08
Sep-26	90.82	57.45
Oct-26	66.17	49.44



Key Takeaway:

Real-time LMP and Regulation MCP may correlate.

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Objective

Improve resource selection using inputs that better reflect resource attributes, capabilities and anticipated system conditions.

Expected benefits

- Maintain least-cost regulation commitment.
- Better align estimated loc with real-time outcomes.
- Reduce exposure to resources that could elevate Regulation MCP during real-time energy price volatility.

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Two Revisions to Commitment Logic

PJM and the IMM SME Worked Together

Starting MW	Ramp rate for currently regulating resources
Replaced the RTSCED-based PTRLD starting point with TRLD MW from the latest approved LPC solution. *Provided a more representative starting point for look-ahead commitment*	Use residual ramp rate in the optimization in place of full ramp rate.

Key Takeaway:

- Together, these changes expected to improve loc estimation and identification of resources with a high loc impact.
- Changes went into production on Oct. 27, 2026.
- Same logic will be applied to Phase 2.

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Key Takeaways

1	2	3
Regulation Operation • For the first time in years, System Operations requested no additional regulation for summer or extreme conditions. • 30-minute commitment framework supports operational reliability.	• Improved Opportunity Cost calculation that incorporates ramp rate limitations better captures the true cost of holding capacity for regulation vs. energy. • Regulation costs are more transparently embedded in the market clearing prices.	**Reduced Uplift** (from 14% to 1.7%) **Improved Cost Allocation** • Costs are now more transparently embedded in the market clearing prices. • Enhanced market efficiency and fairness

PJM is constantly monitoring the optimization engine results with our software vendor and the IMM for potential improvements.

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Acronyms

Acronym	Term & Definition	PJM Glossary
ASO	**Ancillary Service Optimizer** performs the joint optimization function of energy, reserves and regulation in the dispatch run. The main functions of ASO are the clearing and commitment of all Regulation resources for a half-hour time period and inflexible Reserve resources for a one-hour time period.	
MCP	**Market Clearing Price** – The price that is paid by all load and paid to all suppliers for the service received or provided	
LOC	**Lost Opportunity Cost** – In general, the foregone revenues resulting from following PJM's dispatch instructions to provide some type of ancillary service. Lost opportunity costs are calculated for generating units participating in many PJM markets.	
MW	**Megawatt** – A unit of power equaling one million watts (1 MW = 1,000,000 watts) or one thousand kilowatts (1 MW = 1,000 kW). To put it in perspective, under non-severe weather conditions, one megawatt could power roughly 800 to 1,000 average-sized American homes.	
LMP	**Locational Marginal Price** is defined as the marginal price for energy at the location where the energy is delivered or received. For accounting purposes, LMP is expressed in dollars per megawatt-hour ($/MWh). LMP is a pricing approach that addresses transmission system congestion and loss costs, as well as energy costs.	
TRLD	**Tracking Ramp-Limited Desired Megawatt at LMP** – Reflects consecutive market conditions to form the real-time dispatch profile based on ramp rates, unit schedule and nodal LMP – independent of initial megawatts	

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