

4.3 Regulation Charges

Each PJM load serving entity, or other Regulation buyer, is charged an hourly obligation ratio share of the total hourly Regulation Market Capability Clearing Price (RMCCP) credits and the Regulation Market Performance Clearing Price (RMPCP) credits. Hourly Regulation obligations equal their real-time load ratio share of the total amount of Regulation supplied ~~excluding the mileage ratio component by PJM that hour~~, adjusted for any bilateral Regulation transactions. In addition, net purchasers of Regulation in an hour are also charged a proportionate share of any lost opportunity credits paid to regulating generators for unrecovered costs over and above their Regulation Clearing Price credits.

PJM Actions

- From the Regulation log, PJM sums the total amount of Regulation supplied (both pool-scheduled and self-scheduled) for all five minute intervals during an hour.
- Total Regulation Supplied ~~(excluding mileage)~~ = Sum of ~~-all~~ five minute intervals Regulation MW * Actual five minute Performance Score for all eligible resources * Regulation Marginal Rate of Technical Substitution integrated for an hour
- PJM determines each load serving entity's (LSE's) applicable regulation zone load ratio share based on their real-time load (excluding transmission losses).

$$\text{Load Ratio Share} = \frac{\left[\begin{array}{l} \text{Real Time Load} + \text{Retail or Wholesale Load Responsibility} \\ \text{InSchedule MW, if buyer} \\ \text{Retail or Wholesale Load Responsibility} \\ \text{InSchedule MW, if seller} \end{array} \right]}{\text{Total PJM Real Time Load}}$$

- PJM calculates each LSE's hourly Regulation obligation by multiplying their applicable regulation zone load ratio share for that hour by the total amount of Regulation supplied in that hour for the applicable regulation zone's market.

$$\text{Regulation Obligation} = \text{Load Ratio Share} * \text{Total Regulation Supplied} \text{ ~~excluding mileage~~}$$

- PJM adjusts obligations to reflect bilateral Regulation transactions among Regulation market participants.

$$\text{Adjusted Obligation} = \text{Regulation Obligation} - \text{Regulation MW Purchased} + \text{Regulation MW Sold}$$

- PJM calculates each Market Participant's hourly Regulation obligation share by dividing their Adjusted Obligation by the Total PJM Adjusted Obligation.

Regulation Obligation Share = Adjusted Obligation / Total PJM Adjusted Obligation

- PJM calculates the hourly capability clearing price charge for each Market Participant by multiplying their regulation zone obligation share for the hour by the total Regulation Market Capability Clearing Price (RMCCP) credits for that hour.

*Regulation Capability Clearing Price Charge = Regulation Obligation Share * Total RMCCP Credits*

- PJM calculates the hourly performance clearing price charge for each Market Participant by multiplying their regulation zone obligation share for the hour by the total Regulation Market Performance Clearing Price (RMPCP) credits for that hour.

*Regulation Performance Clearing Price Charge = Regulation Obligation Share * Total RMPCP Credits*

- PJM calculates amount of Regulation each market buyer purchased from the applicable market by subtracting the amount of self-scheduled regulation MW provided by that market buyer from their adjusted obligation for the hour.

Net Regulation Purchase = Adjusted Obligation – Self Scheduled Regulation MW

- If any lost opportunity or other unrecovered costs due to regulating were credited to Regulation providers, each Regulation market buyer is allocated a share of the hourly costs based on the amount of Regulation they purchased from the market that hour.

*Lost Opportunity Cost = $\frac{\text{Total Lost Opportunity Costs} * \text{Net Regulation Purchase}}{\text{Total PJM Regulation Purchases}}$*

- PJM sums the Regulation charges (both Regulation Clearing Price charges and Lost Opportunity charges) to determine the total hourly charge for each Regulation market participant.