Paper Title: *Forecasting Capacity Price in CA Power Market (CAISO)*

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Abstract: *Electricity market price forecasting has been a significant area of research across various Independent System Operators (ISOs). However, the majority of existing studies have primarily focused on forecasting energy or power prices, with relatively limited attention given to capacity prices. Among the available literature on capacity markets, most research has concentrated on long-term capacity price forecasting, typically adopting a fundamental approach based on supply-demand dynamics, generation adequacy, and market equilibrium conditions.*

In contrast, the California Independent System Operator (CAISO) capacity market exhibits unique characteristics. A substantial portion of capacity transactions occurs in short- to medium-term horizons and is conducted through bilateral agreements. These transactions represent significant financial commitments, with annual trade volumes amounting to several billions of dollars. Despite the economic importance of this market, there remains a lack of transparent and robust mechanisms for short-term capacity price discovery and forecasting.

This paper addresses this gap by examining the statistical behavior and underlying dynamics of short- and medium-term capacity prices within the CAISO market. Using stochastic modeling techniques, it proposes a framework capable of capturing the inherent uncertainty, volatility, and temporal structure of capacity price movements. The proposed model provides probabilistic forecasts that can improve market participants' understanding of future price distributions rather than relying solely on deterministic estimates.

The forecasting methodology presented in this study has practical applications for a wide range of stakeholders, including asset owners, traders, risk managers, structuring teams, and market analysts. By providing more accurate and transparent capacity price forecasts, the model supports enhanced risk assessment, portfolio valuation, hedging strategy development, and investment decision-making. Ultimately, improved forecasting and price discovery can contribute to greater market efficiency, enhanced liquidity, and informed participation in the evolving CAISO capacity market.