



HYDROSTOR

ESIG Forecasting and Markets Workshop – Market Participation Models

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Gabe Murtaugh

Director of Market Development

Gabe.Murtaugh@hydrostor.ca

Market Participation Models in Power System Applications

Traditionally, resources participate in forward ‘planning’ markets and ‘real-time’ markets

- Traditional markets include **resource adequacy**, **energy** and **ancillary service** markets
- Ancillary service markets traditionally make up very small portions of overall revenues for participating resources
- Energy and RA capacity markets generally are designed to solve a “two-part pricing” problem that participating resources face
 - Resources must recover fixed costs, incurred during development
 - Resources must recover fuel and other variable operating costs while operating

Traditional day-ahead **energy markets** are designed to incentivize resources to bid in true marginal costs, but schedules may change in real-time (always rent increasing)

- Storage resources profit maximize by forgoing schedules in the day-ahead markets, leading to fundamental changes in market incentives



How do we change energy markets to accommodate changing resource mixes with new profit maximizing incentives? The answer may be to not use traditional market structures.



Day-ahead markets are ‘smart’ and schedule a storage resources if there is an ‘attractive’ price spread

Figure 1.6 California - Average hourly generation by fuel type in the (Q4 2024)

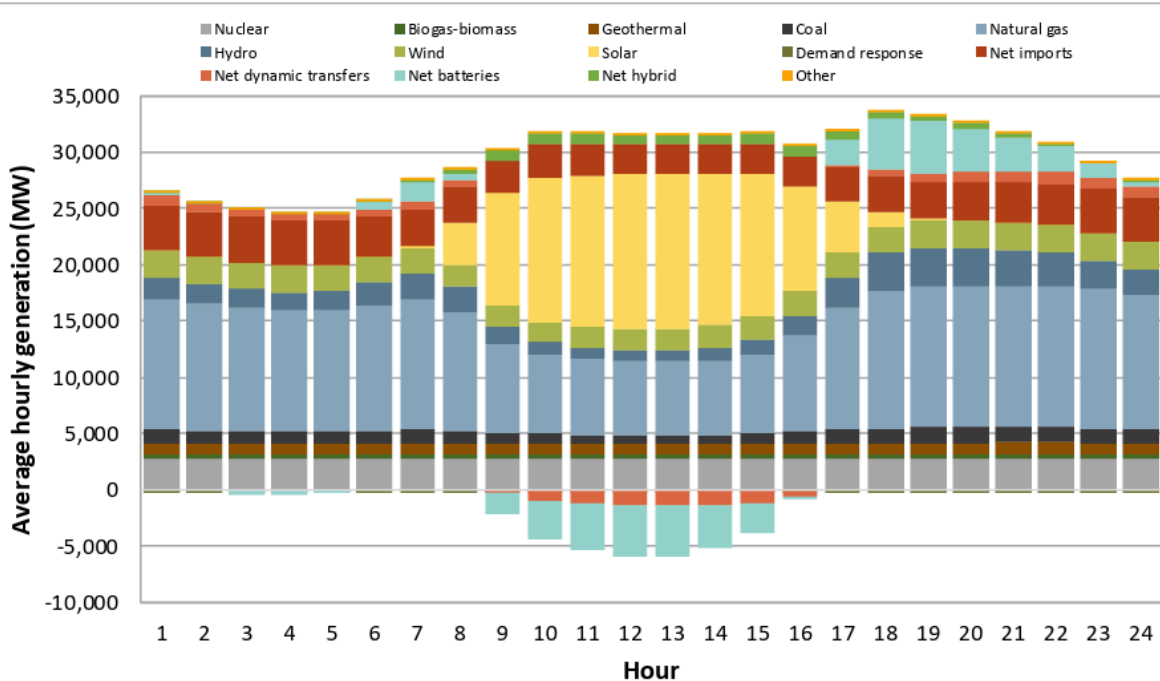
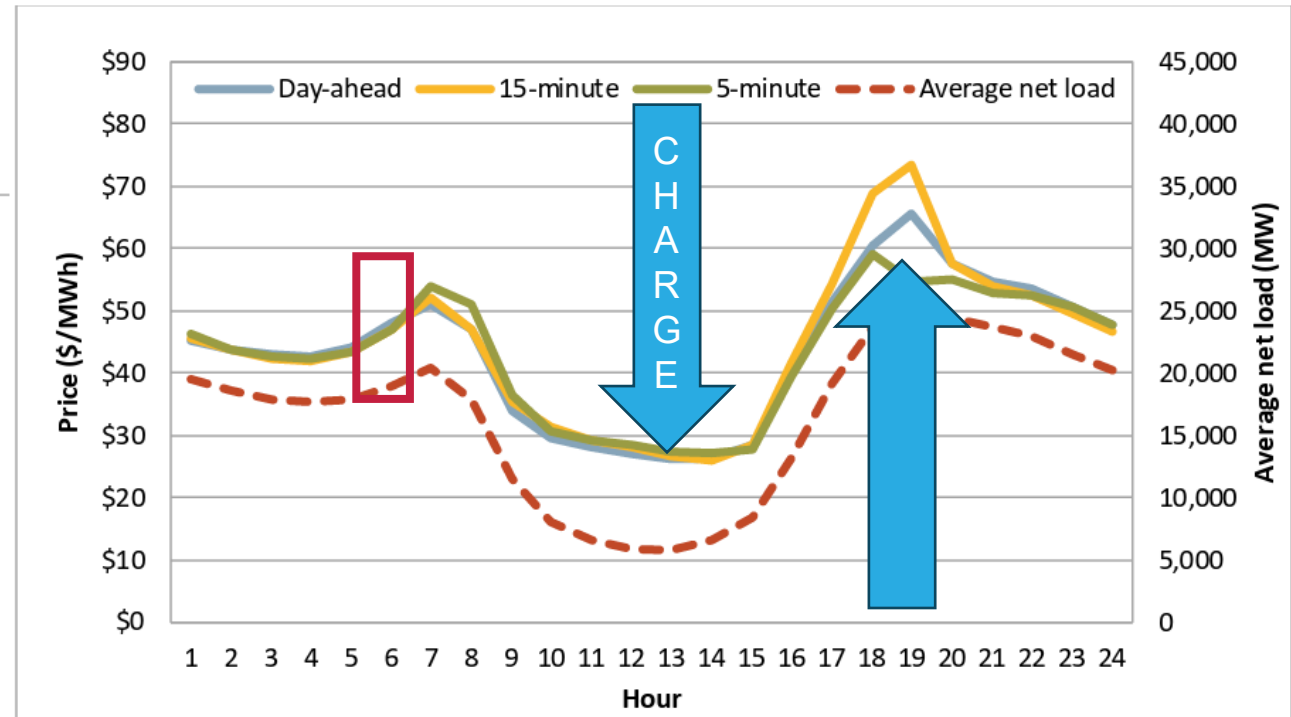


Figure 3.8 Hourly load-weighted average energy prices for balancing areas in day-ahead market (CAISO October–December)



Real-time markets only look out about an hour – and essentially **only** dispatch resources based on prices and bids