

CASE STUDY

Fluence Mosaic™ Outperforms CAISO Market Benchmarks

AI-Powered Optimization That Delivers Proven Financial Results



Overview

Independent benchmark data from Modo Energy confirms 2025 brought revenue headwinds for CAISO battery storage assets. Despite compressed fleet-wide merchant revenues from tighter energy price spreads and increased deployed storage assets, the data reveals top performers can still achieve significant profitability, highlighting clear strategies for market winners.

Against this market context, Fluence Fluence Mosaic™ bid optimization software delivered consistent outperformance vs CAISO fleet averages, demonstrating the ability to generate material and repeatable financial gains for battery energy storage assets even as overall market revenue opportunities become more elusive.

By combining advanced AI-driven forecasting, large-scale stochastic optimization, and expert human oversight, Mosaic enables storage assets to identify and capture incremental revenue opportunities across day-ahead, 15-minute, and real-time markets, outperforming fleet averages in a challenging market environment. This capability is further strengthened by Mosaic's DART (Day-Ahead/Real-Time) Co-Optimization Framework, which can improve how assets coordinate participation across CAISO markets and products under increasingly complex operating conditions.

DART co-optimization enhances Mosaic's ability to align day-ahead and real-time decisions, which can help assets respond more effectively to evolving CAISO market dynamics.

The Challenge: Why Yesterday's Strategies Fail in Today's Market

The California Independent System Operator (CAISO) market has become one of the most complex energy markets in the world for maximizing market revenue for battery energy storage. The challenge is no longer just high volatility; it's that value has become harder to extract. As price spreads compress and uncertainty shifts from *where* volatility occurs to *when* it appears, profitability increasingly depends on precision, timing, and disciplined risk management for maximizing market revenues for battery energy storage.

For asset owners and operators, the challenge is structural. Modern storage assets must simultaneously participate in:

- Day-Ahead (DA), 15-Minute, and Real-Time (RT) markets
- Up to five distinct revenue products – with market evolution expanding to nine in the near future
- A wide range of operating states of charge
- Tight operational, warranty, and degradation constraints

Even at a coarse hourly resolution, this creates hundreds of coupled decisions every day in a solution space that quickly becomes exceptionally large. The problem is further complicated by uncertainty. Operators are not optimizing against a single price forecast but against probability distributions for energy, ancillary services, deployment likelihoods, and system conditions.

This is a large-scale stochastic optimization problem involving tens to hundreds of thousands of interdependent decision variables across multiple time horizons. While human traders and operators apply heuristics and experience, they cannot reliably solve this problem optimally every day across an entire fleet without leaving significant value on the table or

increasing operational risk. This is where the role of expert human oversight becomes essential. Experts define and orchestrate strategies by setting risk tolerance, operational constraints, and long-term goals, which are then executed by Mosaic's AI-driven forecasting and stochastic optimization to maximize revenue.

To objectively quantify the impact of Mosaic, Fluence benchmarked its CAISO portfolio performance by gathering the real revenue results from Mosaic's portfolio of nearly 20 BESS assets representing in excess of 6.3 GWh of capacity that utilized Mosaic in 2025 to generate and submit bids into CAISO and compared that against the Modo Energy's CAISO BESS Index, a trusted, independent standard for fleet-level market performance.



The Solution: A New Approach to Market Participation

Fluence deployed Mosaic's AI-powered bidding optimization and the DART Co-Optimization Framework across multiple CAISO assets to enhance:

- Price forecasting accuracy
- Multi-product decision making
- Revenue optimization across day-ahead and real-time markets

The DART framework represents a meaningful improvement in how storage assets participate in CAISO. For any given day, rather than treating the DA and RT markets independently, it models the full market dynamics by

integrating price forecasts with revenue performance feedback loops. This enhances Mosaic's ability to capture arbitrage while providing robust decisions under uncertainty. By ingesting more forward-looking information and explicitly modeling the interactions between the two markets, Mosaic, powered by DART, enables more informed, adaptive, and profitable bidding strategies.

Performance data from June through September 2025 was analyzed and compared to the CAISO fleet average using independent Modo Energy benchmarks.

The Results: Tangible Financial Gains

Mosaic-optimized assets demonstrated a consistent ability to outperform the broader fleet and uncover incremental revenues through superior forecasting, optimization, and cross-market participation. In a year when many assets struggled to meet financial expectations, Mosaic delivered significant revenue uplift relative to the market average. The results demonstrate Mosaic's ability to capture higher revenue potential, especially during the critical summer months:

50% Mosaic Fleet-Wide Performance Uplift

Mosaic-optimized assets outperformed the CAISO average by 56%, generating an **additional \$3 million in revenue** across the four-month evaluation period.

204% Uplift with DART Co-Optimization

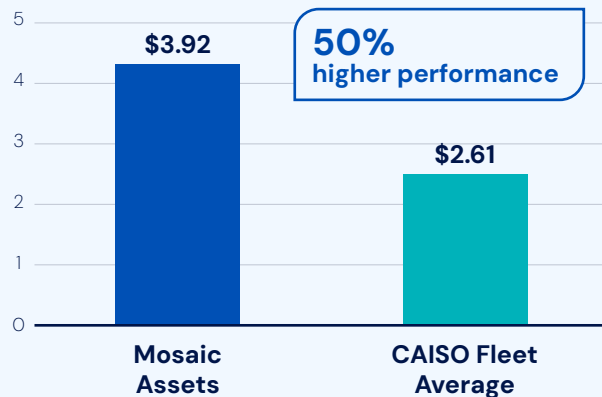
One of our best performing assets utilizing the DART framework achieved an astounding 204% improvement compared to the CAISO average, a clear indicator of the framework's outsized impact on revenue capture.

These results confirm that Mosaic's AI-driven optimization delivers superior financial performance, turning intelligent software and analytics into tangible revenue gains. They highlight a fundamental market shift: as complexity grows, asset profitability is now driven by the quality of system-wide decisions, not just chasing price swings. This reality demands a more integrated approach, where market optimization is part of a broader approach to how storage assets are designed, operated, and monetized over time. By pairing Mosaic's proven optimization with Fluence's industry-leading storage technology and operational expertise, asset owners can build a fully coherent strategy; one that not only maximizes revenue in complex markets but also strengthens the bankability and long-term financial foundation of their investment.

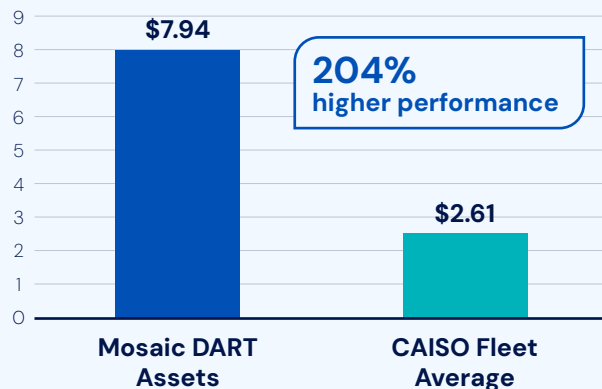
Summer 2025 Mosaic Performance (\$/kW-Month)

\$3M
incremental revenue

CAISO Mosaic Fleet vs. CAISO Average (June–September 2025)



DART Co-Optimization Assets vs. CAISO Average Assets



Source: Modo Energy - CAISO Fleet Average



Fluence Energy, Inc. (Nasdaq: FLNC) is a global market leader delivering intelligent energy storage and optimization software for renewables and storage. Our solutions and operational services are helping to create a more resilient grid and unlock the full potential of renewable portfolios. With gigawatts of projects successfully contracted, deployed, and under management across nearly 50 markets, we are transforming the way we power our world for a more sustainable future.

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