

June 25, 2025

Optimizing Bid and Offer Strategies for Storage in Evolving Energy Markets

Optimizing wholesale market bid and offer strategies for battery energy storage systems (BESS) is a complicated endeavor. As markets grow more complex to facilitate increasing renewable penetrations, so too does storage bid optimization: maximizing revenue and minimizing risk involves hundreds of intricate decisions all day, every day. BESS owners and operators benefit greatly from sophisticated energy analytics software, such as Ascend's [SmartBidder](#) platform, to create and use custom, risk-adjusted bidding strategies for energy and ancillary revenue maximization.

As part of the 2025 Ascend Analytics Power Markets Workshop, Mike Huisenga, Managing Director of Business Development, joined Tapas Peshin, Manager of Bidding and Trading Analytics, and Martin Chown, Senior Energy Analyst, to discuss day-ahead (DA) and real-time (RT) energy market bidding and offering strategies, specific examples of risk-adjusted strategies that maximize BESS revenue, and key elements of risk management for BESS assets in wholesale markets.

Key Takeways

- Managing energy storage bidding and offering in DA and RT markets requires extensive decision making to optimize bids and offers within asset constraints and owner risk thresholds.
- A customizable energy bid and offer optimization software analytics platform, such as Ascend's [SmartBidder](#), can help BESS owners and operators maximize revenue and minimize risk in complicated power markets via continuously updated forecast models that leverage machine learning.
- Maximizing revenue in day-ahead and real-time energy markets necessitates a robust integration of market forecasts, physical constraints, and market rules, all within the context of understanding how to mitigate risk at an asset and portfolio level.
- When customizing battery bid and offer strategies, it is important to not solely pursue revenue maximization, but also ensure that optimization strategies are not increasing downside risk. A multi-model approach, such as the one employed by Ascend's SmartBidder, can mitigate risk through the use of absolute forecasts, probabilistic forecasts, nodal price dynamics, physical constraints, and BESS owner/operator risk appetites.

Reduce Risk, Maximize Revenue, Manage Uncertainty: The Power of Bid Strategy Optimization Software

For owners and operators who manage energy storage assets on a merchant basis, operating in modern energy markets can be complicated. On a sub-hourly basis, BESS asset managers must evaluate short-term forecasts, account for asset constraints, understand market rules, make participation decisions (DA, RT, ancillary services, or a combination), address risks, and ultimately try to understand the multitude of factors that drive price differences in order to optimally clear into the right products at the right time.

Many BESS managers turn to [energy analytics software that can optimize bidding strategies](#). Not all bid optimization solutions are created equal, however. Many BESS operations employ human traders, or others use standard modeling approaches designed to produce moderate risk/return outcomes.

Other asset owners deploy more sophisticated solutions, such as [Ascend's SmartBidder](#) platform. By continuously harvesting new data and by using a suite of probabilistic and AI-assisted models, SmartBidder provides high-resolution views of the price formation drivers and probable price outcomes, as well as the ability to tailor custom risk-adjusted strategies that provide significant returns relative to other options, as shown in **Figure 1**.

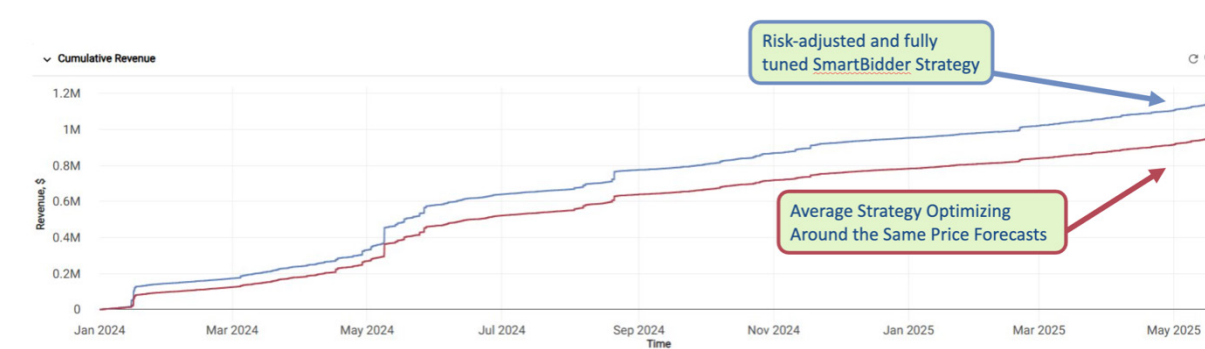


Figure 1. Using a sophisticated risk-adjusted strategy generates 20% more revenue, which makes the difference between beating a project's IRR vs underperforming it.

Maximizing Revenue for Battery Energy Storage Systems

When considering how to offer battery capacity and allocate precious MWhs, BESS owners and operators rely on short-term forecasts for DA and RT markets. Assessing the confidence intervals for these forecasts often presents a daily dilemma for traders: on average, the DA price will be more lucrative, but failing to capture a massive RT price spike presents a significant missed revenue opportunity.

Another key consideration involves ancillary services, and how best to bid (or not) into those markets. Significant complexity exists in this context as well. In ERCOT, for example, there exist five different AS products with five different sets of market rules. For asset managers, it is imperative that the rules around each service are directly accounted for in any optimization strategy.

In such a multi-factored, complex environment, choosing the right bid optimization software becomes critical. Ascend's [SmartBidder](#) uses an [opportunity cost framework](#), grounded in market fundamentals, so that BESS operators bid and offer into the right products during the most important hours in any given day.

For instance, SmartBidder can assemble a package of offers that bids into DA, RT, and ancillary services within a single day. Submitting this package to an independent system operator such as ERCOT allows for co-optimization into the most valuable products in the most valuable hours subject to economically derived bid and offer prices. As shown in **Figure 2**, co-optimization across a broader set of products has a 2x potential to improve revenue over a TBx strategy. Simply, [SmartBidder](#) allows BESS owners and operators to clear into the best products while minimizing overall costs to the grid, thus producing a win-win situation.

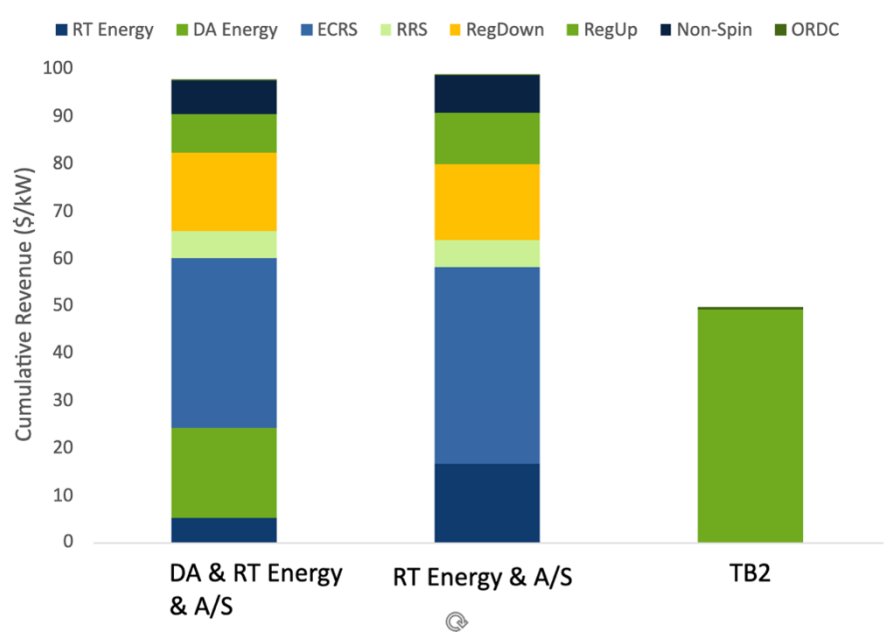


Figure 2. Co-optimization has the ability to significantly improve revenue on a TBx strategy;
Note: Data is 2024 simulated revenue for a 9.9 MW/2-hour battery in ERCOT Houston Hub.

Battery Energy Storage Systems: Strategy Design and Risk Management

In designing bid and offer strategies that maximize value for batteries, key considerations include nodal price dynamics, physical constraints, asset performance, and risk appetite. Location is of essential importance, of course: in markets such as ERCOT, price dynamics vary extensively depending on the node. BESS operators must also factor in physical and warranty considerations such as state-of-charge (SoC) minimums and maximums, cycling constraints, or ramp rate constraints that prevent assets from participating in specific products. When it comes to participation, each asset owner has different levels of risk tolerance: while some are open to higher-return, and potentially riskier, RT exposure, others have a lower appetite for risk.

Taking into account all of these factors, a high-quality bid and offer optimization software platform, such as [SmartBidder](#), will create a menu of different strategies that work around different physical conditions, changing market conditions, and individual risk appetites. This ability to customize allows BESS owners and operators to take diverse approaches to bid optimization that allow strategies to change as market conditions change. SmartBidder, for example, has more than 150 parameters that can be tweaked to account for market participation, risk appetite, and much more.

When customizing battery bid strategies, it is also important to not just think in terms of revenue maximization but also whether a certain strategy might increase downside risk. Ascend strategies secure more revenue without increasing downside risk by managing bids and offers to create additional exposure to the RT market while managing SoC for optimal future revenue and battery health. Ascend also helps mitigate downside risk by using a multi-model approach that drives

enhanced market forecasts, including absolute DA and RT price forecasts, probabilistic forecasts, DART forecasts, RT price spikes, ancillary throughput forecasts, market states, and more.

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Interested in Learning More About SmartBidder?

[SmartBidder™](#) uniquely provides a unified platform for custom bid and offer optimization combined with scheduling services to manage asset performance and operations for storage, renewable, and hybrid assets. SmartBidder maximizes revenue and reduces risk, offering asset owners and operators a 100% increase relative to traditional arbitrage strategies, and a 10–25% improvement over similar competing platforms. The solution enables users to develop their own customized bid strategies based on nodal specific forecasts, asset specific constraints, and risk-based optimization for day-ahead and real-time bids. [Contact us](#) to learn more.

About Ascend Analytics

Ascend Analytics is the leading provider of market intelligence and analytics solutions for the power industry. The company's offerings enable decision makers in power development and supply procurement to maximize the value of planning, operating, and managing risk for renewable, storage, and other assets. From real-time to 30-year horizons, their forecasts and insights are at the foundation of over \$50 billion in project financing assessments. Ascend provides energy market stakeholders with the clarity and confidence to successfully navigate the rapidly shifting energy landscape. Visit us at ascendanalytics.com