

ESAI POWER - DETAILS MATTER

Our platform provides fundamental-based outlooks for power market investors, generation owners and energy traders to make better investment & trading decisions.



ESAI  **POWER**

Forecast Methodology

ESAI Power - Details Matter

Four Key Strengths to ESAI's Market Forecast Methodology

ESAI Power's forecast methodology is based on fundamentals. We keep a close eye on forward curves and granular, detailed transactional activity. We are always prepared to explain why our fundamental view may be different from forward curve quotes or specific transactional activity in the capacity markets for example. ESAI Power's long-term market forecasts are differentiated versus other forecast services on the power markets as a result of our four key strengths.



When forecasting the supply curve, particularly the granular details on generation projects in the queue, upcoming retirements, and projects at-risk of retirement really matter. Our deep understanding of PJM, NYISO, & ISO-NE and our clear and transparent presentation of our forecasts, underlying assumptions, and market dynamics helps companies clearly understand the range of likely scenarios to inform their investment or trading decisions. ESAI Power provides annual and monthly granularity (on- and off-peak, 7x24) in our reports and published outlooks. We can provide hourly granularity if needed but there could be limitations to the usefulness of hourly data from our models depending on the application which we would be happy to discuss.

ESAI Power Forecast Methodology

Detailed Fundamental Inputs



ESAI Power projections are based on a high level of detail in our fundamental inputs. Our energy models compute annual prices on an 8760-hour basis under full security-constrained dispatch, like the ISO models.

Heat Rate, Output Specs & Transmission Grid Constraints

Our models include all details that impact prices on the grid. For example, every generator has heat rate and output specs (and others) that have been vetted for accuracy against past reported performance. The transmission grid representation and constraints are all accurately modeled (can provide both zonal & nodal detail).

Gas Basis Pricing & Emissions Costs

Additional inputs that impact generation costs are developed in-house. For example, we project gas basis pricing at approximately 15 locations in the Northeast. We also model emissions costs (e.g., CO₂, SO_x, and NO_x) that affect generator bid profiles.

Detailed Generation Project Outlooks

One aspect of our research that is unique is our Project Evaluation Program (PEP). We provide outlooks in an excel database for the probability of completion for all generation projects in development and under construction in PJM, NYISO, and ISO-NE, including all renewable projects. Retirement outlooks are also included. The bottom line is that our fundamental outlooks are based on a very high level of detail with attention to accuracy.

Transparency of Forecast Assumptions



We are not a black box in terms of our thought process. We ensure the assumptions behind our outlooks are always clear, available, and well-presented in our research reports. This allows clients

to agree/disagree with the assumptions and weigh the impacts on the pricing. We help clients with sensitivities if needed. For example, we may assume that a lot of offshore wind will get built in NYISO, whereas the client's internal outlook may deem that very little will get built. We can help bridge the gap on pricing outcomes between these two outlooks for offshore wind. In contrast, many national forecast providers have forward curves that are just market quotations based on the bids and offers of market participants and therefore, the assumptions behind the forward curves are opaque.

PJM, NYISO, ISO-NE Expertise



Our team has a deep knowledge of the New England, New York, and PJM power markets, having focused on these ISOs for many years. We understand the nuances of market rules and regulations and how changes will affect price outcomes.

ESAI Power's senior analysts have been involved in the Eastern U.S. power markets since the start of deregulation 20 years ago.

Our quarterly reports provide detailed overviews of current market dynamics and upcoming changes that could change pricing outlooks. This is backed up by direct 'analyst access' where clients receive additional color on market outlooks similar to what was presented in ESAI Power's recent Goldman Sachs Capacity Markets Webinar.

Assessment of Risks



We publish base case outlooks based on assumptions that, based upon our experience, are the most probable outcomes.

However, there are many risks on the horizon that can alter price outcomes. ESAI Power can assist with assessing these risk outcomes via our analyst access service to entertain questions and impacts of changing assumptions or building out sensitivities cases as part of an advisory or consulting project.

ESAI Power's Quarterly Power Service

Our Quarterly Research Reports

These six research publications, make up our Quarterly Power Service.



Capacity Watch™ - Quarterly analysis of capacity markets & policy issues. This report includes ESAI's outlook for 10-year capacity prices and in-depth analysis of current market issues. In PJM, we produce RTO & LDA level outlooks for each BRA. In NYISO we provide outlooks for the Summer & Winter Strip Auctions, and 10-year outlook for Capacity Prices. ISO-NE coverage includes pre and post FCA coverage & 10-year outlook of Capacity Prices.



Energy Watch Quarterly™ - Quarterly analysis of market & policy issues affecting energy pricing dynamics over a 10-year period for both power & natural gas. Includes forecasts of pool-wide & zonal energy prices in ISO-NE, NYISO & PJM, including forecasts of fuel inputs. The dynamics of market and policy changes are analyzed and the impacts on energy prices assessed. These impacts are placed in the context of high-level benchmark economics for theoretical plants in specific locations. ESAI's long term natural gas outlook is included, with fundamental analysis, regional basis spreads, and LNG projects under consideration.



Renewables Watch™ - Provides quarterly update on significant policies (state and federal) facing the PJM, NYISO & ISO-NE renewable energy markets. In addition, inputs to ESAI's Class I REC supply and demand models are updated quarterly to provide timely updates to Class I REC forecasts. ESAI also covers federal issues that impact renewable policy and development in the Northeast.



Emissions Watch™ - This quarterly report contains our outlooks and views on the emissions markets. ESAI provides regular updates and analysis on developments in the SO₂, NO_x and CO₂ emissions markets as well as price forecasts for state and regional markets. In addition, regular updates are provided on the RGGI program as well as other state-specific emissions programs.



Transmission Watch™ - An in-depth look at the essential elements driving transmission investment and development. Regional reliability issues, economic congestion relief and policy drivers are considered in the context of RTO planning processes. ESAI discusses regulatory and policy initiatives as well as providing updates on significant projects.



Energy Asset Database - Provides an outlook for construction of generation projects and plant retirements in ISO-NE, NYISO & PJM. Each project is assigned a "probability of completion factor in % terms" that is then applied to develop a forward assessment of likely capacity additions and retirements in each pool. The database is published quarterly and includes project by project level details such as project status, queue numbers, project name, developer permit status, financing status, PPA status, etc.

ESAI Power Forecast Methodology

Our Research Methodology

Energy Asset investment and power trading decisions should always be based upon fundamentally sound inputs and detailed project outlooks. While the demand side of the equation for energy asset valuations and energy pricing is relatively straightforward, getting the supply side data correct relies upon a detailed and accurate understanding of construction of generation projects, the likelihood of project completion, and energy asset retirements and those at-risk of retirement. Supply forecasts also require a broad understanding of how transmission, congestion, emissions, and renewable energy mandates impact capacity and energy price outcomes.

What Our Customers Receive

Our platform provides fundamental-based outlooks for power market investors, generation owners and energy traders to make wise investment and trading decisions.

Each quarter, subscribers to ESAI Power's Quarterly service receive market updates on important market events such as Capacity Auctions and important new renewables legislations, plus complete PJM, NYISO, and ISO-New England long term price forecasts for Capacity, Power, and RECs.

ESAI Power quarterly service includes access to 5 Quarterly Reports, listed on the previous page.

Contact Us

For more information about how we can make a difference for your business, please call Tom Bausemer at (781) 460-1227 or email esaipower@esai.com



About ESAI Power

ESAI Power is a market research and consulting firm that delivers focused analysis of the wholesale power markets in the Northeast region of the U.S.: PJM, NYISO, and ISO-NE. Since 2001, ESAI has provided market-focused research product content and custom consulting services for Northeast power market participants, including investors (banks, private-equity, & hedge funds) & developers, generation owners & operators, utilities, regulatory bodies, traders, and end-users & buyers. ESAI Power LLC, 401 Edgewater Place, Suite 640, Wakefield, MA 01880.

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