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LOOKING FORWARD

WHAT DOES THE FUTURE OF ENERGY TRADING AND TRADING TECHNOLOGIES HOLD?

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A LOOK AT ENERGY TRADING AND RISK MANAGEMENT

The practice of energy trading has not evolved much since FERC 636 first liberalized the natural gas markets in 1992, and FERC Order 888 did the same in the power markets in 1996, separating generation from transmission.

Though exchange-based trading has increased significantly over the years, with as much as 70% or more of physical gas trading having moved onto centralized exchanges such as ICE, bilateral deals done via phone or IM persist and comprise a fair amount of the trading activity in the market. On the power side, day-ahead trading has been more limited than expected when the market first liberalized, but that is likely due to the continuing influx of non-dispatchable wind and solar generation.

The supporting technologies have also evolved, moving from mainframe computers to client-server environments and more recently being developed for and delivered by the web. ETRM solutions have largely followed the same path, with many newer systems being architected as web-native products. Still, many of the more extensive "legacy" systems that launched in the aftermath of FERC 636 have remained essentially client-server applications running in a web-hosted environment. Although not optimized for the cloud, the mature monolithic solutions continue to sell well, particularly to the upper tiers of the market where buyers' functionality needs are complex and are unlikely to be addressable by less mature web-native solutions.

All that said, if you had asked someone 10 years ago how energy trading and the technologies that support the wholesale energy markets would be different now than it was then, their expectations probably would have overshot the reality in which the industry today operates. Ten years ago, a knowledgeable technologist or trader would likely have predicted that virtually all deals would be negotiated and executed electronically and gas scheduling would be highly automated. There would be widespread adoption of automated or algorithmic trading in physical energies, as would collaborative solutions used by trading partners for processes, such as electronic confirmations and automated settlements. While some of these erstwhile predictions have come to fruition, at least in part, many continue to be unrealized.

Web-based commerce and advanced technologies have fundamentally changed many consumer markets over the last decade. In a capital-intensive market with fewer trading partners like wholesale energy trading, the return on investment in new information technologies can be more challenging to realize, slowing adoption.

If one looks ahead 10 years, current trends indicate that emerging technology innovations (from blockchain to artificial intelligence (AI)) will increasingly gain traction in the energy markets and possibly catalyze changes in the underlying energy trading processes.

ETRM CAPABILITIES WILL BE TRANSFORMED BY NEW TECHNOLOGIES AND PLATFORM ARCHITECTURES

Due to their use across a wide breadth of markets, the legacy ETRM solutions that arose out of the 1990s client-server environments have evolved to include highly-developed capabilities for capturing, managing, and valuing transactional data. However, their underlying data models are not optimized for rapid data retrieval and analysis, limiting their ability to provide real-time actionable information in today's faster-moving and globally connected markets. Perhaps more importantly, as these systems have grown in functional depth and complexity, they have become more expensive to acquire and increasingly complex and costly to implement, support, and maintain.

With the increased adoption of cloud computing and new integration technologies, web-native solutions built on modular architectures are beginning to supplant these legacy applications. Other recently launched platform-oriented solutions, such as Beacon, Eka, and others, provide a high level of scalability and agility at a much lower initial cost.

Although newer solutions may be limited in their functional breadth and depth compared to the longest serving commercial ETRM solutions, as they gain wider adoption, their capabilities will grow to match those of the legacy systems. Particularly compelling for buyers is the modular architectures of the newer solutions which allow users to "right-size" the functional footprint of the system to fit their needs – reducing initial license, support and implementation costs. Perhaps even more important is the ability to add functionality as necessary, increasing business agility and helping facilitate company growth into new markets or new assets.

The most recent example of this platform approach to ETRM comes from Previse Systems (Previse), a recently launched technology solutions provider for the global energy markets. Their ETRM platform is purpose-built to be extended via customer or third-party developed apps available via an app store-like platform called Coral Ecosystem. In addition, their suite of capabilities includes a high-performance position application (called Coral) that provides the ability to quickly and easily visualize and process large volumes of data, a clear pain point for users of legacy monolithic solutions.

We believe newer entrants into the market, and the maturation of other cloud based multi-tenant ETRM systems will provide buyers across all tiers of the energy markets with several viable alternative solutions to consider for their critical ETRM needs. Given the costs and risks associated with implementing and supporting large-scale monolithic solutions, we see the vendors of these agile, cloud-based, and platform systems increasingly displacing legacy products and perhaps becoming the dominant players in the ETRM market over the next 10 years.

COLLABORATIVE PLATFORMS WILL IMPROVE TRADING EFFICIENCY

Blockchain and similar technologies have recently found their way into the energy markets via systems designed to centralize, streamline, and automate many manual processes that have dominated energy trading since its inception.

For example, Vakt has emerged in the European oil markets and employs blockchain as its enabling technology for automating many of the manual paper-based processes that have been in use in the Western European oil markets for almost a century. Though Vakt is still in a somewhat early phase of adoption and expansion, their system is in production and has proven successful in expediting settlements and reducing costs for their founding customers.

Previse has also launched a new collaborative platform to improve trading efficiencies via ChorusLink. This Previse owned common trade repository allows users/owners to record, store, and manage energy trade data and related information. Architected so every trade is only captured once as a single data object, the platform ensures both parties involved read the same object, presenting an authoritative view and record of the transaction. Additionally, ChorusLink will also automate settlements of those transactions among its members, reducing back-office costs and accelerating cash flow. ChorusLink is currently targeted at the European energy markets, but it or a similar platform could gain adoption in the North American markets in the coming years.

As the Vakt platform and others have demonstrated, blockchain has proven valuable for at least a portion of the energy trading value chain. And though it may not be suitable in its current form for high volume, low latency environments, we believe the technology will continue to find traction in any number of solutions in and around energy. However, reaching consensus among the earlier adopters of these systems regarding formats, rules and processes has proven difficult and has limited the scale of many consortium-based efforts. Nonetheless, the primary value proposition engendered in blockchain (its ability to capture an immutable record of transactions) has tremendous appeal, and we would expect additional applications in the energy markets to emerge in the coming years.

Other collaborative solutions have been developed and deployed that do not rely on blockchain as an enabling technology. Aquilon, for example, built an AI-enabled solution for invoice reconciliation among trading partners, automating much of the settlement process for oil and gas trades via their Aquilon Network. Unfortunately, the platform had difficulty finding wide adoption, and the company folded in early in 2021.

We believe industry participants will increasingly embrace common standards and processes for some market segments, particularly those with a somewhat slower trading tenor, such as oil trading (either through voluntary collaboration or potentially via regulatory mandates). The common standards and processes will enable blockchain and similar technologies to play a much more significant role in the next decade, helping reduce or eliminate many paper-based or manual tasks, and reducing the administrative costs of energy trading and marketing.

MORE TRADING VENUES, PLATFORMS, AND EXCHANGES LEADING TO INCREASED PRICE VISIBILITY AND LOWER MARGINS

Western regulators have enacted market rules to push energy trading onto exchanges whenever possible, limiting bilateral trading, and increasing energy commodity and derivatives trading visibility. These moves, combined with an increase in the number of exchanges, particularly in the Asia Pacific region, have illuminated once dark markets and have arguably dampened price volatility in many via increased price visibility. As a result, price movements appear to be less influenced by speculative trading and are more reflective of changes or upsets in demand and supply.

This trend is expected to continue with bilateral trading limited mainly to areas with few trading partners and low market liquidity. As electronic exchange trading becomes even more common, AI-powered automated trading software will likely gain broad adoption in fast moving markets within the next 10 years. Given these solutions' ability to quickly identify market imbalances, arbitrage opportunities will be almost immediately washed from the market –a trend already occurring in the European power markets. As a result, running a profitable business in energy and commodities in the future will be less reliant on trading margins and more so on owning the assets and having advanced tools that can consume and instantaneously analyze market and operational data to optimize the commercial operations of those assets.

ADVANCED TECHNOLOGIES WILL ENABLE BETTER ANALYTICS AND PROCESS AUTOMATION

As the energy commodity markets continue moving to digital processes and platforms, the flood of data from existing and new systems, exchanges, and feeds can only increase. Simply capturing and storing this data is a challenge unto itself and will be impossible without vast amounts of cloud storage and advanced analytics, including tools based on Big Data applications.

Given the speed of the markets in which energy commodity companies operate, including potentially sub-five-minute power markets, new architectures based on edge computing may be required as asset optimization algorithms running against these vast data sets may require tens or hundreds of millions of simulations. Using edge computing strategies, where the cloud data is initially parsed for relevance and then passed to local computing resources for processing, may provide a more economical and responsive solution compared to a "pure" cloud environment.

AI is just now beginning to affect energy trading, particularly in power trading, where it is used to predict load and generation profiles as historical data provides limited utility in a market flooded by renewable resources. AI tools are also finding use in the European energy trading markets, and machine learning (ML) capabilities are often embedded in algorithmic trading tools currently in use in those markets.

Robotic Process Automation or RPA is a branch of AI that is also finding good use in the energy markets. However, its applications are likely to continue in the back-office and administrative groups where repetitive tasks (such as payment processing) require little or no analysis or subjective judgment.

AI is perhaps one of the most intriguing and promising technologies for addressing many challenges energy market participants face now and will over the next decade. Though the recent energy price collapse will undoubtedly slow some investments in the near term, energy companies have and will continue to invest in exploring its utility across a wide variety of potential use cases.

THE CONTINUING PUSH TO DECARBONIZATION WILL FUNDAMENTALLY CHANGE ENERGY TRADING

Given the many and varied forces behind the push for decarbonization, it's tough to predict with any certainty what the future of energy and energy trading will look like in 10 years. Suppose one assumes that current market trends (influx of renewable generation, retirement of coal, limited or no new nuclear, legislation to limit natural gas-fired generation, electrification of transportation, etc.) continue. In that case, hydrocarbon commodity trading will likely decline in volume, and real-time power trading (and potentially natural gas to provide reactive capacity for addressing renewables highly variable output) will increase.

Additionally, as renewable energy sources become a more significant part of the generation mix, utility-scale and distributed battery installations will increase in number and capacity. Reliably operating this vast generation, storage, transmission, and distribution infrastructure while ensuring the commercial viability of the various asset owners in the supply chain will be increasingly challenging and no doubt require the use of advanced technologies, such as AI, to enable real-time or near real-time trading.

Of course, that's not to say that oil, natural gas, or NGL trading will cease to exist in 10 years (no reputable observer believes that such a scenario is possible). Still, the number of players in these markets is almost certain to be smaller as trading margins shrink. Those who own production, transportation, and processing assets will need to be more focused than ever on improving operational efficiencies via advanced analytics to ensure profitable operations.

ADAPT OR DIE: THE FUTURE OF A CHANGING MARKET

Given the events of 2020, it is difficult to imagine this or any market continuing along a straight-line trajectory into the future. The ability of a virus to send the global energy and commodity markets into chaos has been startling and serves as a reminder that none of us know what might occur tomorrow, much less 10 years from now.

Though the coronavirus pandemic will hopefully pass sometime next year, there will likely be additional market upsets between now and 2030 that surely change the pace of change or even redirect many of these trends into new directions. Whatever direction and pace the future takes, those who hope to survive and grow will need to become more agile in business strategy and technology to better adapt to a rapidly changing market this coming decade and beyond.

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ABOUT CAPCO

Capco, a Wipro company, is a global technology and management consultancy specializing in driving transformation in the financial services and energy industries. With a growing client portfolio comprising of over 100 global organizations, Capco operates at the intersection of business and technology by combining innovative thinking with unrivalled industry knowledge to deliver end-to-end data-driven solutions and fast-track digital initiatives for banking and payments, capital markets, wealth and asset management, insurance, and the energy sector. Capco's cutting-edge ingenuity is brought to life through its Innovation Labs and award-winning Be Yourself At Work culture and diverse talent.

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