

Conquering Complexity

The Challenge of North American Power

By Wolfgang Ferse & Mike Prickett

Thanks to a labyrinthine market structure with varying conventions and information protocols, successfully navigating the North American power market is an arduous task. What are the challenges created by this complexity and how might the new joint venture between OpenLink and MCG Energy Solutions empower market participants through its integrated approach to trading, risk management and logistics?

Even the most experienced North American power trader or scheduler would concede that it's a daily challenge to successfully operate in the North American power market, thanks to its fragmentation and opacity. Each regional market varies greatly in terms of its own particular market rules, products, contract specifications, settlement and fee structures. What's more, these rules and products are constantly evolving, which creates tremendous operational challenges and risks for all categories of market participants.

To the less experienced participant seeking to make an optimal decision around execution of a trade, manage confirmation and settlement or source additional power to meet load requirements at short notice, market structure and conventions can quite understandably seem convoluted. And, that's before you even take into account the price volatility and dramatically shifting balance of supply and demand that are part and parcel of the current market.

The Texas electricity market's turbulent 2008 serves as a case in point for the volatility and operational challenges that must be managed. As has historically been the case in a number of regions, the Texas grid is prone to congestion during peak periods – especially along transmission lines running north-south. Bottlenecks in the supply of additional power to cover local shortages have been commonplace in recent years – exacerbating price volatility in high-usage areas such as Houston. Last year proved no different.

For example, a rolling 30-day average (all-hours) for Electric Reliability Council of Texas (ERCOT) real-time prices hit multi-year highs in several zones. Indeed, concerns about price spikes in the balancing market – which ERCOT uses to manage under- and over-scheduling resulting from changes in load demand – led to the imposition of emergency congestion rules that needed to be quickly assimilated by all market participants.

Whether your organisation is a generator, a load serving entity (LSE), or a marketer, and whether you are a trader, a scheduler, or are working in some related function, keeping

abreast of such external issues can be trying. But there's another big problem too which is the fact that, for most organisations, traders and schedulers occupy parallel worlds.

Parallel Worlds: Trading & Scheduling

Traditionally, traders and schedulers have performed quite distinct roles in the power market. Whereas a scheduler's goal is to balance and schedule physical delivery as smoothly as possible, a trader is making financial profits and managing P&L volatility.

So, in the past, a division between trading and scheduling may have made sense in some organisations. Historically, a

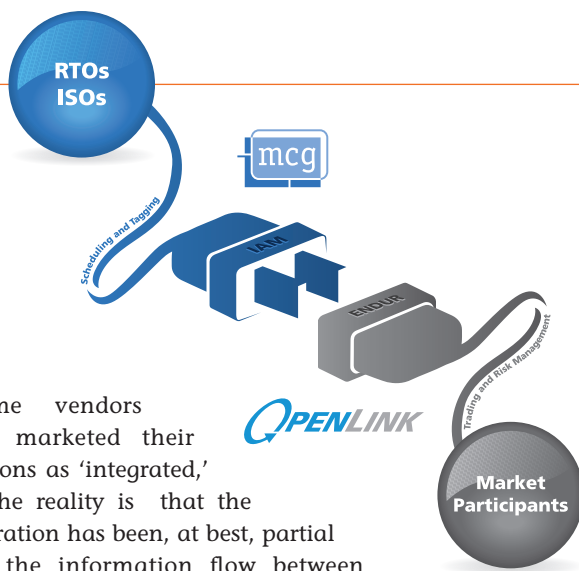
... for most firms, the separation of trading and scheduling continues

more active approach to risk management was simply not given top priority by firms that viewed their generation assets as a natural hedge for P&L volatility. But, in recent years, the effectiveness of this kind of hedge has

been weakened to some degree. After all, a decade ago, there was no such thing as a coal shortage, there was limited coal price volatility and there was limited volatility in natural gas prices. Amid such dependable price stability, in essence, the only risk being taken was that the asset would go out of service. Nowadays, volatility and shifting price environments mean that the effectiveness of this kind of natural hedge is dubious – making the idea of moving towards a more thoughtful and rigorous integration of trading and scheduling all the more compelling.

Nevertheless, for most firms, the separation of trading and scheduling continues. This division is reflected in (and has been perpetuated by) the distinct technologies that most firms deploy for their traders and schedulers. To put it simply, the energy trading risk management (ETRM) and scheduling systems aren't able to 'talk' to one another. This disconnect creates operational inefficiencies and risks. For example, this unsatisfactory state of affairs often leads to schedulers making sub-optimal decisions due to incomplete information about trading activity. Similarly, traders may not execute in the most optimal way for the overall power portfolio without ready access to near real-time information about transmission constraints.

In other words, without a truly integrated solution that brings together trading and scheduling systems, it's extremely difficult for an organisation to give an accurate answer to the very basic question of what its power commitments are, versus its current capacity at any given time – especially when it involves significant activity in the real-time market.



Some vendors have marketed their solutions as 'integrated,' but the reality is that the integration has been, at best, partial with the information flow between ETRM and scheduling systems being largely one way. But over recent months, OpenLink and MCG Energy Solutions have been working hard to meet the challenge of creating a truly integrated solution for the North American power market. The result is a solution that seamlessly integrates OpenLink's cutting-edge ETRM technology with MCG Energy Solutions' state of the art scheduling system.

Layers of Complexity

Before going on to consider how this new solution will fulfill the pressing need in the North American power market for a truly integrated approach to trading, risk management and logistics, it is instructive to survey the intricacies and challenges that market participants have to grapple with every day. In some ways, there are more differences between the electricity markets within each state in the US than there are between each individual national market within Europe. The US power grid is highly regionalised in terms of its architecture, as exemplified by the division between the 'western' and 'eastern' power markets, and the more localised markets that exist within each of these two separate major interconnections on either side of the Rocky Mountains. This level of fragmentation can be especially problematic for entities whose activity spans several markets since the rules for moving power physically in or out of each market also varies.

There are two broad categories of markets: Regions with traditional, utility-based Balancing Authorities where a utility, in effect, performs all of the various market participant roles in terms of generation, transmission and distribution; and regional power markets that are managed by Independent System Operators and Regional Transmission Organizations (ISO/RTOs).

There are 10 ISO/RTOs that serve around two thirds of electricity consumers in the US and more than half of Canada's population. While the mission of these entities is a shared one – to facilitate and ensure power supplies are distributed efficiently, reliably and fairly – the processes, requirements and rules that must be put in place to achieve this vary greatly, and are often in a state of flux.

For the power generating companies (gencos), power distributors (often referred to as LSEs) and the marketers,

dealing with the nuances of intra and inter-ISO/RTO activity is very time and resource consuming. Some of the specific areas in which challenges are greatest include:

- **e-Tags.** What started out as a standardised high-level communication protocol framework for the inter-region movement of physical power on the North American grid has metamorphosed into something quite different: An electronic tag within which each ISO has embedded its own specific market rules. What's more, regional requirements evolve over time. This can represent something of an operational nightmare for market participants, who have to operate under tight time constraints. Failure to embed the right market communication data into the e-Tag and gain approval for the e-Tag from all the other participants involved in the transaction before a strict deadline (say, 20 minutes prior to the when the power is due to flow) will cause the ISO to not approve the e-Tag and associated transaction. Once the power is flowing, participants involved in the transaction have to monitor the e-Tag in case there is some kind of disruption such as a transmission line or generator going down, or a change in volume required by the buyer. Reacting effectively and quickly in such a dynamic environment is a challenge without ready access to real-time data and a system that is able to manage real-time schedule changes.
- **ISO Connectivity.** The applications and technologies for communicating bids, offers and settlement is unique for each ISO, and each ISO does not provide test systems and software for vendors to work with directly. This has certainly hampered the development of effective solutions. While ISOs don't change application interfaces around bids, offers and generation dispatch signals without giving proper notice, the same cannot necessarily be said of the data feeds used in pricing and settlement. And while a shutdown or reformatting of a data feed won't put a stop to trading activity, it can have a deleterious effect on risk and performance analysis.
- **Capacity/transport.** Within the e-Tag that allows a participant to flow power on the grid, a key component of the included data is associated with a transmission reservation request. Essentially, this component (known as an Open Access Same-Time Information System, or OASIS reservation) creates a request for a transmission contract that conveys the right to move power at a certain level of interruptibility, for a certain time period, and at a certain capacity – on or off-peak.

Unfortunately, similar to the compatibility issues surrounding e-Tagging, ensuring that one OASIS system can communicate with another system is complicated by the fact that there are a variety of platforms in operation. This translates into yet another operational headache – both in terms of initially pushing transmission contract requests to other OASIS sites, and for keeping an accurate transmission inventory by pulling real-time statuses.

Integrating Trading & Scheduling Empowers

Clearly, operational complexities, inefficiencies and risks are rife in North American power markets. It's also evident that the functional and technological separation of traders and schedulers is leading to sub-optimal decision making, lost profit opportunity and poor risk management.

The fact that traders and schedulers often work different shifts and use systems that can't automatically be reconciled is a widespread problem. Consequently, traders regularly make hedging decisions based on stale information that doesn't include, for example, recent revisions to schedules, or recognition of additional real-time contracts that a scheduler may have booked to balance in the near-term.

Beyond painting an inaccurate picture of portfolio risk at any given time, a more subtle corollary of this situation is that trader performance is difficult to assess. Without taking into account the real-world constraints of scheduling, a trader can create what looks like a compelling book of trades, but if it's only possible to flow the power for half of those contracts, it begins to resemble an academic exercise that's not grounded in reality. Assessment of a trader's profitability is further complicated by the fact that fee application rules vary between ISOs.

Many of the existing systems that seek to bridge the gap between trading and scheduling also have an Achilles heel. Creating an interface that can transfer scheduling information is a step forward, but one is still exposed to significant operational risk if the scheduling and ETRM systems do not share common reference data. For firms that are active in real-time trading, this lack of integration can lead to particularly compromised position and price risk management, alongside an inability to enforce governance controls around issues such as credit limits, counterparty validations and trading limits.

OpenLink is known in the marketplace as being one of the only vendors to offer a cross-commodity ETRM system that can handle the entire lifecycle of a trade and provide an integrated view of physical and financial trading. Meanwhile, MCG has a deep knowledge of and experience with the North American power market that has allowed it to develop a system with cutting edge connectivity and scheduling functionality. Real-

time scheduling, e-Tagging and ISO connectivity are all handled effortlessly.

Leveraging our market proven expertise in complex system integration, OpenLink is working with MCG to create an interface that enables users to view their power obligations, commitments and requirements side by side with what is happening in the real-time world. It enables them to make more informed trading decisions based on real-time capacity and transmission constraints and to monitor power flow more effectively.

Many of the existing systems that seek to bridge the gap between trading and scheduling also have an Achilles heel

With its bi-directional interface, the new integrated solution from OpenLink and MCG will ensure that schedule, deal and referential data are shared between traders and schedulers, and that it's consistent. In this way, connectivity between traders, schedulers, ISOs and other market participants is instant; operational risk is minimised; and, position keeping, credit checks, risk reports, settlement and accounting are consolidated, accurate and firm-wide in scope.

From the OpenLink-MCG perspective, a truly integrated solution should be empowering for traders – allowing them to make more refined trading decisions and helping them to optimise their firm's portfolio. Indeed, with this kind of integrated solution at their disposal, it's likely that utilities and other market participants may have a strategic rethink. After all, if you can manage trading and scheduling holistically in real-time, then the operational risks and opacity that were previously a concern may become much less daunting. ●

Dr. Wolfgang Ferse is Executive Vice President, Commodities & Energy Solutions with OpenLink. Dr. Ferse holds a Masters degree and a PhD of Power Engineering from Technical University of Dresden.
www.olf.com

Mr. Micheal Prickett is co-founder and Chief Executive Officer of MCG Energy Solutions, a position he has held since founding MCG in 1995. Mr. Prickett holds a BS in Business Computer Information Systems from St. Cloud State University in Minnesota.
www.mcgenenergy.com