>> Electricity Trading in the US: The Heat is Up!

Negar Nadimi, Managing Consultant

The electricity sector constitutes about 2 to 3 percent of the US's gross domestic product or approximately $450 billion. More than half of the electricity generated in the United States is derived from coal. The low cost and abundance of coal is one of the primary reasons why consumers in the United States benefit from some of the lowest rates of any free-market economy. Between now and 2030, electricity demand in America is expected to grow by nearly 40%. The US's leading production status, (still ahead of China and European nations) coupled with the expected exponential consumption rates for the years to come, has created a significant halo effect and quest for trading this commodity; consequently, this has become a real hot topic for top financial institutions across the country.

>> The trading landscape

Unlike most other commodities, electricity by its nature is almost impossible to store given that storing involves converting the electrical energy to some other form of energy first and then reconverting the stored energy back into electricity. There are inevitably losses due to the inefficiency of these processes, but some solutions are practical if large quantities of electricity are available for storage. There are challenges in being able to ration quantifiable sizes of electricity at a time, specifically considering the storage interims last 5,10, 30 and 60 minutes at a time. As for all commodities, electricity trading can be executed with or without physical delivery.

How does it work?

The economics of supply and demand

Supply and demand vary continuously due to seasonal and weather conditions. Despite the abundance of production in the US today, peak season is carried throughout the summer months, while the country produces just enough electricity for its own usage under normal weather conditions. Therefore, if one of the generators fails or weather turns severe, electricity prices in that region can sky rocket in a matter of seconds. The physical trading is done in Kwh (kilowatt-hour) and dispatched on an hourly basis. Each trade is specified in either hourly or peak hours (6am and 10pm) or non-peak hours (10pm to 6am). Each category has a set price standard, but weather conditions can certainly impact the price.

While the generation of electricity (i.e. the production of electric energy) and marketing (the sale of electricity to final users) have become amenable to competition since the 1970's, long-distance transmission systems and local distribution grids used to move electricity from generators to users today remain mostly regulated monopolies.

Physical delivery

The supply chain in the physical delivery of electricity is comprised of: the conversion of fuel sources to electricity generation plants, the diffusion to transmission utilities (or power grids), followed by diffusion to distribution utilities (i.e. local/regional distributors) and finally delivery to the ultimate consumer. With over 3000 electrical companies in the US today, the pricing matrix is strongly dependent on the storage of electricity.

Power marketers buy and sell electricity, but they do not own or operate transmission or distribution facilities. Actual sales by these power marketers are concentrated in approximately 50 companies or less.

Electricity trading

Wholesale power trading occurs in a variety of contexts, with varying levels of risk. Power may be traded as a commodity using standardized instruments through a Futures exchange, or it may be transacted bilaterally through the exchange of over-the-counter (OTC) contracts. Exchanges, such as the New York Mercantile Exchange (NYMEX) and the California Power Exchange, are regulated and offer an institutional framework for trading.
Bilateral trading constitutes 75 percent bilateral transactions between wholesale buyers and sellers. The remaining 25 percent is bilateral trading of shorter term power, often conducted on a day-ahead or hour-ahead basis.

With principally 4 main commodity exchanges in the US, the margins in this market can be considerable, and hence can lead the trading of electricity to be highly speculative. Historical events, such as the heat wave in the northeastern part of the country, caused electricity prices to jump from $25 per Kwh to a high of $16,000 per Kwh in less than 30 minutes. Traders with shortages of supply of 100 Kwh in a day will incur a substantial loss within minutes, as some firms are unable to absorb the loss. These unpredictable circumstances point to electricity trading as one of the most volatile high risk markets.

The combination of derivatives and leveraging, which is fairly new to the commodities market, has led to spectacular profits for financial trading platforms, but can conversely cause crippling losses. Leveraging has made the ride more volatile, as it exaggerates small movements in the price action when transmitted to the value of futures contracts.

One area of contention is that the spot market carries the most risk for participants as unforeseen events, such as a sudden transmission line failure or unexpected weather, can cause prices to rise or fall dramatically. Nevertheless, the real-time market is essential to fill the gaps in supply where other trades and transactions may not be sufficient to cover the demand.

Two dominant players among banks, Morgan Stanley and Goldman Sachs, are currently highly invested in the procurement and supply chain of the commodity. With large investments in the electricity power generation plants and distribution channels, the creation of financial trading platforms has enabled them to better curtail trading risks. A number of other banks have also recently opened energy trading desks. These institutions also partake in the investment of the energy sector infrastructure and have a closer imprint on the energy sector as a whole, and hence can create valorized trades with greater margins.

Since the movement towards wholesale competition started, the number of companies that generate and sell power in competitive markets as well as the volume of wholesale power trading have increased significantly. Economically, competitive markets will lead to more efficient power generation, more technological innovation, and eventually to lower retail electricity prices.

>> Keeping a close eye on risks

The Federal Energy Regulatory Commission (FERC) has yet to adhere to a strong unified position on the electricity wholesale market. Additionally, local regulatory agencies are still often under-staffed and lack adequate opportunities to collect information and monitor the supply/demand stance of the electricity market. One of the greatest discords with the FERC is their modeling approaches that simulate markets as if they were perfectly competitive, and then apply generic measures to the market which often do not reflect the reality of supply and demand.

Market power

The lack of strong guidance in the electricity directive specifically on market surveillance, and the assumption that ordinary competition laws may be sufficient at dealing with these potentially volatile markets, further raises the risk for abusive market behavior such as the adherence of electric generators' production to fall below the standard market dominance threshold of 40%. Market power is the ability to make larger profits by withholding output in order to raise prices.

Although the magnitude of the problem remains controversial, it is widely agreed that at peak demand times, and when electricity capacity is stretched to the limit, individual generation companies would find it profitable to cut energy supplies even without colluding. The profitability of withholding would be even greater in some circumstances, as it was in California during its electricity crisis, when retail prices were largely fixed; this therefore ensured that the public would continue to demand electricity regardless of its price, but forced wholesale distributors to pay the higher margins.

Hedging market risks

Businesses operating in electricity industries are particularly susceptible to market risk—or more specifically, price risk—as a consequence of the extreme volatility of electricity prices. To a large extent, energy company managers and investors can make more accurate estimates of the likelihood of successful exploration ventures, the likelihood of refinery failures, or the poor performance of electricity generators.

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In view of the high inheritant risks involved in trading in the electricity and the growing need for a stronger risk management structure, OTC Conseil has assisted many top global energy corporations by providing comprehensive framework solutions and addressing the multiple risk factors. Examples of the latest engagements conducted with electricity companies include : EDF (Electricité de France), CRE (Commission de la Régulation de L'Energie), RTE (Gestionnaire du Réseau de Transport d'Electricité) and Total, among others.

Our collaboration leads to the creation and development of:

- Establishing pricing models and comprehensive counterparty risk analysis
- Preparing the Basel II homologation file for trading subsidiary
- Defining risk management and governance procedures
- Evaluating full production accounting cost and auditing the electricity production costs
- Methodological benchmark and impact study on rate of profit by tariff option
- Study of economic principles of accounting depreciation methods for the commodity

We are dedicated to enhancing value, accelerating implementation and managing your exposure to risk. We have diligently supported and advised on a wide range of operational aspects, from carve-out readiness to operational due diligence, synergy assessment and delivery, as well as supporting new integration processes. We are able to assemble the right team to work in partnership with you, through our integrated approach focused on your risk management needs.

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In addition, the electricity wholesale market is subject to volumetric risks, also used to denote the phenomenon whereby electricity market participants have uncertain volumes or quantities of consumption or production. For example, a retailer is unable to accurately predict consumer demand for any particular hour more than a few days into the future, and a producer is unable to predict the precise time that they will have plant outage or shortages.

Diversification, long-term contracts, inventory maintenance, and insurance are effective tools for managing those risks. Such traditional approaches do not work well, however, for managing price risk for electricity, and require specific risk management tools to curtail the downside. Despite these widespread risks, wholesale purchases of electricity have generally remained stable over the last decade, but in a shrinking market, their market share has risen from 29.9 percent in 2002 to 46.2 percent in 2010, hence creating larger single volume trading. Perhaps the greatest opportunity in trading this commodity still lies ahead ●