



The Commoditization Electricity

The electricity market has undergone a revolution and is still evolving. Large end users' power purchasing practices must adapt to the way the power market is changing in order to remain competitive in their own markets. An understanding of how this market developed provides insights into the future features of the retail power market and how customers can best respond to the next phases of market development.

Traditionally, a utility developed rates that reflected its own fixed and variable costs. The utility's fixed costs (mainly, rate of return, principal and interest payments on capital) were recovered in demand charges. The volumetric energy charge collected variable costs, such as fuel and maintenance. In the 1980's, as a consequence of the financially disastrous nuclear plant construction programs, utilities began to expand the use of interruptible rates with much lower demand charges. This was premised on the idea that customers' interruptible power was a substitute for building new power plants, hence, relieving the need for capital recovery through demand charges.

In the 1990's there was a revolution in the wholesale power market which had numerous ramifications for the power industry, including how rates were designed. With the rise of non-utility power producers and independent energy traders, market conditions broke out in the power industry. The terms and conditions of contracts and the business relations resembled those of a commodity exchange. The underlying energy volumes were sold on a short-term basis with on-peak and off-peak pricing. Variable energy charges with no demand charges became the standard way of pricing power in the wholesale market. Electricity became commoditized, and utilities began to develop retail rates to mimic the conditions of the wholesale market.

Old-style demand and energy rates were developed in a monopoly atmosphere where rational cost recovery by producers was the primary objective. Variable marginal-cost based energy pricing, on the other hand, was developed under market conditions and resembled many other commodity markets, like natural gas. Hence, the evolution of variable energy pricing is a market outcome and should continue to replace old fixed demand and energy rate designs. The power industry is in transition away from regulatory mechanisms toward market mechanisms for setting retail rates.

The wholesale power market has become commoditized, and many of the terms and conditions developed in that market have already influenced retail utility rates. Future

retail rates will continue to follow the conditions of the wholesale market. In the commoditized wholesale market, prices are set for the energy component only. That means there are no demand charges or fuel adjustments. There is only a kWh charge that varies with time. This price is known to market participants, and within a region the price has very little markup due to intense competition between suppliers. Marginal costs set what the price of a commodity will be in a competitive market. Since this cost must be determined by potential sellers, it is known and available for use in retail sales as well. Utilities base their time-sensitive rates on the marginal costs to generate the next increment of power whether purchased or produced.

Power customers can expect future power rates to move even closer to a true commodity market with unbundled pricing of other service components. The commoditized and competitive power market only allows a small markup on the power commodity itself. Therefore, utilities are seeking more profit from the delivery service. The appropriate action for large customers is to deal with these other costs separately by reducing the need for reactive power and by owning service equipment. As the market becomes more aligned with the underlying commodity price and shorn of markups, it will be easier to develop hedging strategies using market-based financial instruments. The experience large customers have with hedging gas will serve them well in this new power market.

As the wholesale market, driven by competition, increasingly sets prices based on marginal costs, price volatility will reflect market conditions. This is something retail power customers must learn to deal with. At times in the past the Southeast has been flooded with nuclear power during certain off-peak periods that resulted in exchanges at .5 ¢/kWh. There have even been cases where nuclear producers, which cannot cut back production, had to pay other parties to take excess power. But in 1999 and again in 2014 prices in some regions reached over \$10 per kWh. This volatility is enormous by any standard. The situation provides both opportunities and problems for customers. The opportunities are access to low-priced power during off-peak times. The problems are developing strategies for dealing with the price spikes.

The strategies to deal with these price spikes are the physical response and the financial hedge. Some industrial process can easily reduce power consumption for short periods. For other facilities, however, the use of financial instruments will be far more cost effective than a physical curtailment or adding on-site generation.

Another aspect of marginal cost pricing and commodity trading is the elimination of the distinction between firm and interruptible service. If the customer can afford the power, there will be no interruptible requirements. The clear trend in the power market is to sell power at time-sensitive market rates with interruptible agreements being made separately by means of call option-type arrangements. During periods of excess generation there is little likelihood of the calls being exercised. However, as the system load grows and utility reserves are decreased, this will become a risky strategy and should not be used. Other hedging tools are available to suit different situations.

The wholesale power market uses real-time costs instead of average costs for its fuel inputs. Under traditional retail rates, the fuel cost component of recovery is a moving average of the utility's past and projected fuel cost. If costs change dramatically and unforeseen one way or the other, the utility has an under-collection or over-collection problem. Market-based marginal cost rates recover fuel costs on an on-going basis and have no over/under collection problem. This is more consistent with the way industries experience prices for other manufacturing inputs. That part of a customer's power supply that is sold under traditional rates recovers fuel costs in a delayed fashion. Having prices out of sync with the true costs can cause large users of power to make faulty decisions. Also it is difficult to develop a hedging program for prices that lack a correlation to the market. The real-time fuel costs collection as embedded in real-time style rates is preferred.

The wholesale power market has become more homogenized. Power prices flow across political boundaries much faster than was the case years ago. If power prices are high in New England due to generation outages or high demand, that situation will affect the prices in the Mid-Atlantic and Southeast. In like manner if a local generator goes down in the Southeast, power coming in from other utilities and independent generators will suppress price spikes. Marginal priced exchanges between utilities makes this happen. As a result of this trend for homogeneous prices in the power industry, end users will be faced with fewer hours when power prices are in the basement. When there is a market connection to retail rates, local generating costs do not always determine local prices.

Over the longer term, the commoditization of electricity leads to rational investments by both utilities and their customers. Consumers by their willingness to pay or respond to high prices will provide market feedback to the utility industry that now takes its direction from regulators rather than customers. Market conditions will improve utility operating as well as investment practices.

Many customers go into the new electricity market with distinct advantages. Some customers have developed proficiencies in various commodity markets. The manufacturing industry, in general, is not afraid to own its service transformers. Management of loads is made easier with readily available computerized monitoring and control systems.

Management of electricity price risk will become an important part of an industry's energy procurement program in the future. It will take a few more years for the nation's glut of generating capacity to be consumed and power prices become more volatile. In the meantime, the sophistication that end users develop in managing gas price risk provides important training for the new electricity market.

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