We'll Leave The Light On For You

A Chicago alderman named Paddy Bauler grunted famously in 1955, "Chicago ain't ready for reform." Thus did this modern-day Machiavelli state more in five simple words than most tedious political science courses do in a semester.

We can update this dictum and apply it to the North American electricity market. It has not proven itself ready for reform in more than a decade of stop-and-go attempts at ending the longstanding systems of regulated monopolies. There is no need to engage in an orgy of blame and lamentations over last week's system failure in the Northeast and Ontario. Complex systems fail, and the larger the system the more spectacular the failures. On balance, we have been able to take the engineering aspects of electricity for granted and will soon do so again.

Finance + Engineering ≠ Financial Engineering

The problems of the electric utility system derive not from engineering, but from a unique combination of financial risks, political decisions and, most important and most overlooked, from the nature of electricity itself. Many free market economists looked to the deregulatory process as bringing to electricity many of the same efficiencies and innovations that a combination of deregulation and financial risk management brought to industries as diverse as mortgage lending, telecommunications, airlines and trucking.

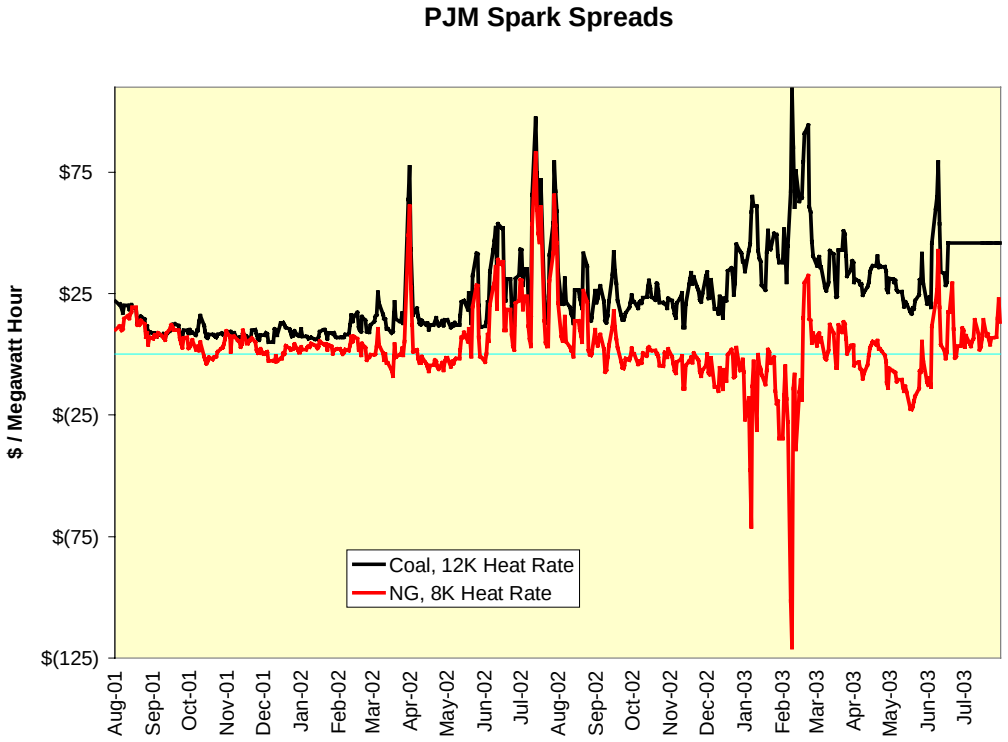
Note to potential e-mailers who just blew their stack at the last sentence: Tell me who your wireless and Internet service providers were in 1983, and how much it cost to make a long distance call then. Tell me what the relative power of the Teamsters union was then as compared to today, etc.

I will concede, however, that all of these industries are messier today than they were then, and therein lies another eyebrow-raiser: I never thought deregulation of electricity was a good idea. Other energy sources are centered on a physical commodity that can be stored and consumed at a time than it was delivered. Gasoline, for example, has an intricate supply network from the refinery to your car, but it can be stored at each step along the way. Refineries keep primary inventories, service stations keep secondary inventories and you keep what are referred to as tertiary inventories right there in the family chariot.

By comparison, when you walk into a room and flip the light switch, you are exercising a call option on your local utility for a service, not for a storable good. You can call electricity from them in any quantity you are capable of consuming and you can do so at a fixed price. Option traders know the nervous feeling of being short any option in an adverse market. Can you imagine being short a call option on a stock at a strike price of $30, where the price can suddenly and without warning jump to $1,200 or more, and you have to deliver a variable quantity of that stock immediately? And, for good measure, let's stipulate that when you are trying to meet that call that all of your potential suppliers - your fellow generators - are faced with the identical situation.

If you want some more action, let's talk about how you or other suppliers are going to meet that call. Electrical generation assets are arrayed in a stack based on their cost of production. If you have a nuclear or coal-fired plant, you turn them on and leave them on for as long as you can; these are the lowest variable cost sources of electricity. Then you move up the stack to oil-fired plants. Some natural gas-fired plants are of the low-cost baseload variety; many others are higher-cost swing sources of supply sitting on top of the stack. So, the greater your demand, the higher your cost of production: An increasing marginal cost of supply curve opposite of those seen in most industries.

The profitability of the plants at the top of the stack often is determined by the fuel cost; the processing spread between the fuel and the price of electricity is referred to as the spark spread. It is not at all unusual for these spreads to turn negative, as illustrated below in a chart of coal and gas-fired spark spreads at the Pennsylvania-New Jersey-Maryland interconnection.



Given the array of short-term price bursts, supply stack cost jumps, embedded exotic options throughout the industry and increasing reliance on highly volatile natural gas as a fuel source, can anyone be surprised at the trading debacles of Enron and those of its ilk? If any sort of political constraints are added into the mix, as they were in the California case in 2000-2001, electricity trading can become a killing field. As one trader told me in 1998, well before any of these mishaps, "The first generation of electricity traders got fired. The second generation got fired, too. No one understands 200% volatility."

The Volatility Always Existed

The old-fashioned way of handling volatility was for the vertically integrated electric utility to overbuild capacity, persuade the state utility commission to grant a utility rate of return on that capacity, and then to absorb the natural fluctuations in price by adjusting output. The consumer overpaid in the form of excess capacity, but part of that overpayment went to subsidize the concomitant overbuilding of the transmission and distribution networks of recent infamy.

This overpayment, decried by free market economists, actually was an insurance payment. The most expensive kilowatt is the one you needed and could not get, or the one that trips off a regional blackout. Maintaining inventories constitutes insurance in other markets, but this cannot be done easily or cheaply in electricity. On a small scale, I have four battery backups and an array of surge protectors at home, close to $700 worth of insurance necessary because of Commonwealth Edison's poor track record of reliability during the 1990s.

Is the cumulative cost of such physical insurance protection greater than the various inefficiencies associated with the old regulatory regime? Quite possibly: Electricity is a service, and sooner or later you have to pay for its reliable delivery.

No Future(s)

The futures industry created a series of failed contracts on electricity in the 1990s; only the PJM contract at the NYMEX still trades. The reasons for these failures are numerous, but center on the misalignment of the contracts with utility industry practices. They delivered what is called a "rectangular load shape" or a fixed

quantity at a fixed price over a fixed period of time. Utilities trade in ten-minute blocks, and in the California case were prohibited from hedging their costs more than one day ahead. Prices are wholly asymmetric in their risk, and only utilities realistically could participate on the short side. Large commercial electricity users, including municipalities, found cash market service contracts with the likes of Enron to be far more useful until the minute they weren't.

With the failures of electricity futures and electricity traders and the loss of internal subsidization of transmission and distribution assets, we are left with a market with no outlet for normal risk management and with poor financial incentives for investments in system integrity.

Many of the promised benefits of electricity deregulation never materialized and look a little gee-whiz in retrospect. I don't know about you, but I never got all that excited about the idea of Commonwealth Edison or anyone else giving my refrigerator its own IP address so that it could make ice at 2 AM. At this point, I'll be happy to pay a little more for a regulated monopoly if that means a return to overbuilt networks and reliable service.