

MANAGING UNCERTAINTY¹

Adam Borison and Gregory Hamm

Two years ago, deregulation was expected to sweep unimpeded across the country, the international community was moving rapidly to implement carbon dioxide and other environmental restrictions, and the Internet was going to rapidly and fundamentally change the way utilities sold power and the way facility executives bought it.

Now deregulation continues, but the California crisis has made regulators much more cautious. At least three states have delayed their deregulation schedules. States without specific schedules are expected to move much more slowly.

The Kyoto Treaty, too, has been firmly rejected by the Bush administration. The future of fossil fuels seems bright, and new coal generation is in the works. Even nuclear power seems to be coming back from the dead.

Adoption of the Internet business platform, which will eventually have a dramatic effect on the economy, has slowed. To say the least, involvement in the Internet and high-tech is no longer seen as the easy way to high stock market valuations.

Do the events of the past couple years tell us that we listened to the wrong experts? Do they tell us that the experts now will be more accurate? The answer is an emphatic no on both points. What the occurrences of the past two years say is that the future of the electric power industry was — and is — uncertain.

RATHER THAN FOCUSING entirely on better predictions, facility executives and others in the electric power industry should accept the high level of uncertainty and make decisions consistent with it. Decisions made today must have sufficient flexibility to cope with an uncertain environment.

Consider California. Years ago, California power planners were apparently confident of their estimates of power demand and made inadequate provisions for unexpected increases in demand. Somewhat later, they were apparently confident of their estimates of fuel and power prices, and made inadequate provisions for unexpected increases in these prices. Still later, when the crisis finally hit, they were apparently confident that prices would remain high and entered into long-term contracts at these prices, making inadequate provisions for a decrease in prices. The failure here was not always underestimating or overestimating some factor, such as price or demand. The failure was overconfidence, and the result was making decisions that did not build in flexibility.

EVEN THOUGH uncertainty comprises the backdrop of today's energy markets, it's still worth looking at some important trends regarding deregulation, market structure and

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market offerings so that better — and more flexible — decisions can be made in today's changing energy landscape.

Deregulation

Deregulation is proceeding on three fronts: 1) the growth of independent power producers; 2) the Federal Energy Regulatory Commission (FERC) push for very large Regional Transmission Organizations (RTOs), and 3) retail-level choice in contracting for electric supply.

Popular opinion is that virtually all new generation will be gas powered and built by independent power producers (IPPs). Virtually everything under construction or in licensing now is IPP based, though often by the unregulated sisters of major regulated power companies. But the combination of the California experience and a more positive environment for large coal and even nuclear power could encourage more construction by regulated power companies.

Meanwhile, FERC is pushing for very large RTOs. The hope is that these would open up the wholesale market and encourage more efficient use and expansion of the transmission system. For wholesale buyers and sellers, FERC promises a wider and more competitive market. For retail customers in the short run, success would mean lower prices in high-cost regions and higher prices in low-cost regions.

California has at least temporarily slowed the pace of state-level deregulation, but don't assume that it is dead. Federal-level action could change the picture quickly, and success in Pennsylvania, Texas and elsewhere could overshadow the California experience. It is very likely that higher price volatility will accompany deregulation, but whether the risk will fall on retail customers or intermediaries is unclear. What will happen with the average price of power? The majority opinion is still that deregulation will lower price, but the California experience has created many more doubters.

Market Structure

Horizontal consolidation continues, and a number of observers still feel that 10 to 15 large power companies will dominate the market. But the trend seems to be slowing down as the pace of deregulation and competitive threat slows. Another unpredictable factor is the change in public power, particularly municipals. Rolling up municipal power companies into larger, more efficient organizations has shown some success. On the other hand, the California experience has a number of cities considering municipalization of local distribution assets.

The trend to vertical disintegration — separation of distribution, transmission and generation — has been driven by deregulation and to some extent by concern that the stock market finds it hard to value a combined fuels, generation, marketing and transmission firm. On the other hand, many generators are increasing their integration into fuels. Marketers may want generation to trade around. The California crisis has created support for distribution companies having more control over generation.

Market Offerings

A third important trend is the diversification of products offered by power companies. Power companies were burned in a spate of diversification in the 1980s. As a result, they refocused on their core mission —supplying power — and then began to look toward diversification again in the late 1990's. Diversification efforts have included everything from owning coal mines and developing fuel cells to operating collection agencies, auto auctions and shipping companies.

Clearly, however, the focus of investment has been in optical fiber, telecom, energy management, building services and Web and software products. While there is less interest in non-energy and non-network businesses, diversification away from regulated businesses has been deeper than many realize; in 1999 seven of the 10 largest (by revenue) investor-owned holding companies in power had more than 50 percent of their revenues come from unregulated businesses. Fiber and telecom have been particularly popular channels for large power companies. Seven out of the 10 largest power company holding companies had fiber and/or telecom as part of their diversified businesses.

Although not one of the largest power companies, Montana Power is an interesting example of the vagaries of the push into telecom. Montana Power diversified early into telecom. By 1999, it was so successful that it spun off its electric power assets and maintained a market multiple that was the envy of most power company executives. Then, the high-tech and especially telecom sell-off hit in 2000 and 2001, and almost 90 percent of its value was gone. Its market value is now approximately 50 percent of what it was as a power company years ago. While some observers have suggested that the fall in high-tech prices have made telecom and fiber optic network bargains that may be attractive to power companies, it is more likely that the recent high-tech downturn will slow power companies' entry into telecom and fiber.

Distributed generation has been much discussed but little implemented for a number of years. Distributed generation is the generation of electricity close to users so that the costs of transmission and/or distribution are lowered. Only smaller generators, 10 megawatts or less, are generally considered distributed generation assets.

WHAT'S DIFFERENT NOW is that there are a number of economically feasible distributed generation technologies, and costs continue to fall. But the returns on distributed generation depend a great deal on regulation. Regulation that promotes rates that reflect temporal and locational differences in service costs promote distributed generation for peaking. Regulation that transfers costs from residential to industrial customers and lowers the cost of backup service encourage distributed generation for baseload. Because of the dependence on price regulation rather than underlying economics, the growth of distributed generation is difficult to predict.

The discussion above points out the difficulty in predicting the pace and even the direction in major trends in the power industry. This uncertainty makes flexibility on the

part of market participants, particularly facility executives, very valuable. Decisions can be divided into four groups:

- Electricity purchases
- Electricity production and use
- Purchases of non-electric services
- Investment in knowledge

Electricity Purchases

In many cases, facility executives have only one choice when it comes to electricity: rate structure. When options can be negotiated in power contracts, many facility executives do not adequately value flexibility in rates, because the degree of uncertainty in electric prices tends to be underestimated.

Deregulation and some flexible regulation regimes allow power companies and facilities to negotiate contracts that include tailored provisions and lengths of commitment. Facility executives should very carefully examine the value of the flexibility where available and remember that they can also hedge their purchases in the developing financial markets for electricity. Facility executives should value contracts and contract clauses that allow flexibility in the both kilowatts and kilowatt-hour consumption and in the extension or reduction in contract length. Modern finance theory provides a wide range of tools for estimating the value of such flexibility.

In addition to contract flexibility, facility executives should examine other more strategic forms of flexibility, such as simply monitoring alternative sources of electric supply and alternative contract conditions.

Electricity Production and Use

Organizations of almost any size have the opportunity to invest in energy efficiency and in energy management. Larger facilities have the option of self-generation and co-generation. Uncertainty in electric prices, uncertainty about rate structures that may be available in the future, and uncertainty about daily and hourly price variation all tend to create value for systems that provide organizations with greater control over the pattern of their energy use and greater knowledge concerning their energy use. Particularly with generation investments, flexibility in the hours of operation should be valued.

Purchases of Non-Electric Services

Power companies are likely to come knocking with a wide variety of products: energy management services, telecom, security services and others. Don't presume that the providers will offer superior or inferior services. Do, however, expect these businesses to be in flux. Some power companies will become long-term suppliers. Others will sell, spin-off, or shut down these businesses when performance does not match expectations. Facility executives should look for maximum flexibility in contracts and not assume that a power company will be as stable a provider of telecom services as it has been of electric services.

Investment in Knowledge

Lastly, although prediction is difficult, learning is extremely valuable in an uncertain world. Facility executives should consider actively increasing their investment in information gathering. This does not simply mean hiring consultants or making studies. Instead, it may mean getting real market data through experimentation. Rather than predicting the price of power in the future or the cost of a technology, an alternative is to actually purchase power futures or implement the technology — simply in order to improve understanding.

When considering energy management investments, proper consideration should be given to the value of knowledge. When evaluating investments in electric efficiency or generation, facility executives need to consider the value of what they may learn about energy regulation, prices and other factors if they delay investments. The value of this learning needs to be weighed against any losses due to delay in such investments.

ELECTRIC POWER EXPERTS have consistently overestimated their ability to predict the future. Market participants need to learn from this experience, and realize the difficulty in prediction and the importance of flexibility. Charles Darwin’s conclusion about species is equally applicable to firms. “It is not the strongest species that survive, nor the most intelligent, but the ones most responsive to change.”