



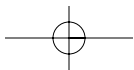
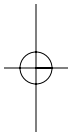
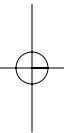
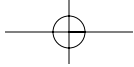
PART
one

The Industry

We are on the edge of a whole new world in electricity supply and market orientation. Because electricity is the very lifeblood of modern society, there is much at stake in this transitional phase. Imagine going to buy a stereo, a lawn mower, a piano, or even a car with little or no knowledge about products and suppliers. Sure, I know people do this all the time. But they usually end up wasting time or money. This book is designed to address the core issues that affect the consumer and investor alike so you'll be ready to make the wise choices necessary for you to *save* time and money—not waste them.

As you face this new electricity economy, it is essential that you be ready for both the risks and opportunities inherent in such radical change. When you finish this book, you'll not only be prepared to make wise choices regarding your electricity services, but you'll also be better prepared to evaluate new investment opportunities that may arise. As an investor, our premise is that you first must understand how the new electricity economy affects you as a consumer; only then will your investments be both intelligent and sound.

So let's get you up to speed quickly and press on . . .



CHAPTER 1

Industry Structure

Before you can understand exactly how dramatically the industry is changing, you need to understand a little about the history of the industry and how it is structured today.

The electricity industry was essentially the brainchild of Thomas Edison. After perfecting the incandescent lightbulb, he discovered that he couldn't sell them because there was no reliable electricity supply system. So he decided to create one. Edison envisioned and developed a stable electricity supply infrastructure while at the same time continuing to invent and sell new electrical products. The much-celebrated Pearl Street station which supplied electricity to lower Manhattan in New York City, was built in 1888 by Edison and is considered the first "central" electricity generating station.

Edison's successful ventures stimulated a lot of competition, especially between two very different electricity supply systems—Edison's system based on direct current and Nikola Tesla's system based on alternating current. To keep Edison at bay, some competitors attempted to develop and sell onsite electric generators. Between the 1890s and 1910 or so, the industry was wild and woolly. Competition was fierce, and the development and application of new technologies happened at a rapid-fire pace. A can-do spirit of entrepreneurship characterized the industry, much like the birth of the oil industry, the computer revolution in the 1980s, or the Internet and e-commerce boom of today.

Finally, with Westinghouse's backing, Tesla's alternating current system became the industry standard. It paved the way for the country's entire electric system to grow, organized around basic delivery or transmission functions. These organizations became huge, corrupt, and anticompetitive, wreaking havoc among users. Finally, legislators had to step in. But Edison may have the last laugh, even from the grave. As you'll read in later sections, the new electricity economy could look more like Edison's vision than the alternative system built up over the last 100 years.

REGULATIONS 101

Following World War I, the regulated structure we know today gradually began to take shape. In a manner similar to railroads and other basic infrastructure industries, regulation began to lay claim to controlling the beast of rampant growth and anticompetitive business practices. In 1935, Congress passed the Public Utility Holding Company Act (PUHCA) which essentially regulated the financial pursuits of electric utilities. Laws were also passed to create separate utility entities that would serve rural areas that were unprofitable to serve through private investment.

Between the mid-1930s and 1980, the industry's structure essentially remained unchanged. Electric utility companies were given *service territories*, areas where they would be given the monopoly right to supply electricity to customers. Supplying electricity in this sense meant generating it, transmitting it from power plants over long wires, and then distributing it, customer to customer, through an elaborate distribution network (see Figure 1.1).

Because they had responsibility for the entire electricity production and delivery sequence, they were said to be "vertically integrated." Similarly, if farmers planted, sowed, treated, and converted their grain into food products, and then sold these products through stores they owned, they would be vertically integrated, too.

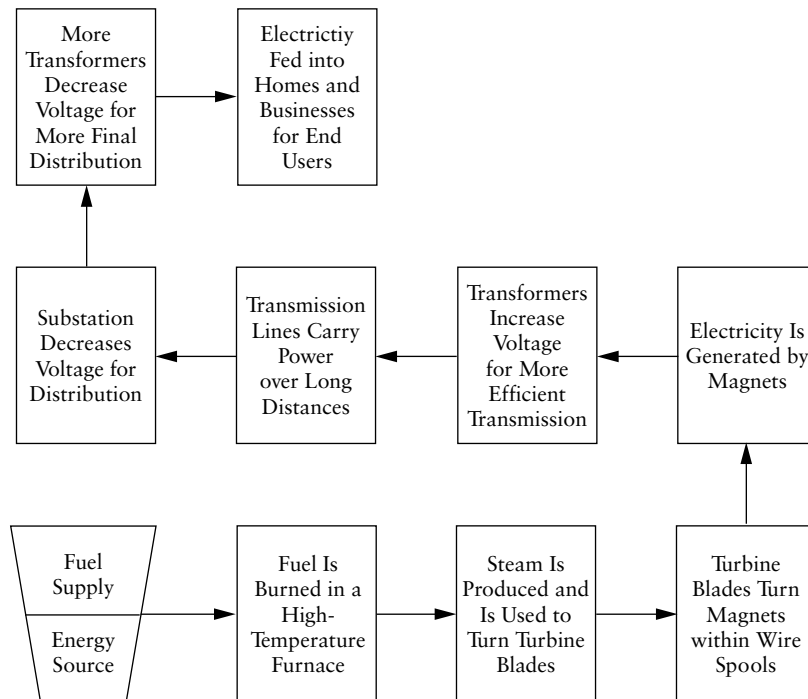


Figure 1.1 Electricity production and delivery (for fuel-based system).

Utilities operated with an “obligation to serve.” They could not refuse to supply electricity to anyone. And they had to do everything within their power to ensure that the juice kept flowing. In exchange, they received regulated rates of return. In other words, they were allowed to spend the money needed to buy fuel; build, operate, and maintain power plants, transmission lines, and distribution systems; carry emergency equipment and staff for emergencies, and so on. Then, regulators would add on to the total expenditures a rate of return. In reality, the rate of return is the utilities’ profit, but it’s not called *profit* in a regulated business. Utilities typically hold rate cases, where they detail their expenditures, have them examined and

approved, and request a certain sum of money above expenses to reward investors.

During this period, utility stocks were considered some of the safest investments ever. And it's certainly no wonder. The return was guaranteed! Working for a utility was considered a job for life. Growth in electricity consumption was greater than growth in the gross domestic product (GDP), perhaps our most fundamental measure of economic health. And the more we consumed, the more real electricity prices steadily declined.

This structure reflected several things going on in American society. First, the Great Depression and World War II caused many industries in this country to take on a socialistic character. Even though we considered ourselves a capitalistic economy, especially compared to communist countries like China and Russia, our government programs leaned toward socialism, just not as far. Regulated electric utilities were perhaps one of the clearest reflections of this ideology. Just as importantly, electricity was considered an extremely important product and service. Unlike soap, automobiles, or cigarettes, electricity was treated as an essential, something that is too precious to be left up to the vagaries of a "free market." In fact, electricity became something of a guaranteed consumer right, like the right to work, the right to an education, or the right to bear arms.

One reason this utility structure remained in place was that, remarkably, in retrospect, electricity prices declined steadily over this period. There was no need to change. Consumers, and indeed the U.S. economy as a whole, were blessed by favorable electric rates.

In the late 1970s, all this changed. But the seeds of that change were planted in the 1960s. Environmentalism became more than a fringe movement and power generating stations, especially those fueled by coal, became targets for costly emissions controls. Once the Clean Air Act was passed in 1970, costs borne by coal-fired plants went up significantly. Nuclear plants were being built and planned at a furious pace at the same time that construction costs were getting

completely out of hand. The United States was subjected to two oil embargoes in the 1970s, which drove the cost of fuel, and therefore the cost of electricity, up dramatically. And finally, the Three Mile Island accident occurred. Nuclear power, an extremely cheap source of clean and efficient energy, suddenly didn't look so appealing and reasonable after all. Although utilities continued to forecast a 6 percent to 7 percent per year increase in demand (which had been typical for many years), load growth suddenly slowed appreciably as a crisis mentality entered the nation's psychology.

Almost overnight, utilities were building plants they didn't need, and rate payers were paying for electricity capacity they weren't using. Since 1973, electricity growth has tracked GDP growth. The real price of electricity began to rise and continued to do so until 1982 to 1983. In that period, it rose by about 50 percent, from 5.7 cents per kilowatt hour to 8.8 cents per kilowatt hour. Since then, it has declined, and today it is close to the price it was in 1970. This is a rather remarkable fact that most people do not recognize. The aim of competition and deregulation is supposed to be lower electricity prices to consumers. In fact, under the regulated system, they've declined over the last two decades.

In 1979, President Carter signed the Public Utility Regulatory Policies Act (PURPA) a law that essentially cracked the generation sector of the industry open for competition. Also in response to the energy crisis, Washington passed the Fuel Use Act (FUA), which essentially said that natural gas was too valuable to be used as a power plant fuel, and therefore barred its use. Although the intent of PURPA was to encourage more efficient means of generating electricity, it essentially, and for the first time, stripped away an integral part of the vertically integrated utility monopoly. It allowed electricity generating plants that were theoretically more efficient (or cleaner, such as small renewable energy facilities) than the utility plants to sell their power back to the utility. In fact, it forced utilities to buy power from others. And although utilities had always had the option of purchasing power from alternative generating units before, and occasionally it

was in their interest to do so, they had never been forced to before. PURPA also encouraged the building of small power plants based on alternative fuels such as waste materials (tires, woodwaste, petroleum coke, coal wastes) and renewable energy.

Like many regulations, PURPA had unintended consequences. By providing only the minimum efficiency benefit required by the law, PURPA initiated the industry's move to natural gas as a power plant fuel. The law was supposed to encourage efficient cogeneration and that it did. But it also allowed large gas-fired power systems to come online, even while FUA, prohibiting the use of natural gas in power plants, was in effect.

Then, in 1992, the National Energy Policy Act (NEPA) forced utilities to open up their transmission lines. What this meant was that if you wanted to generate electricity and sell it to me, we had the right to demand that the utility carry that electricity on its system—for a fee, of course. In practice, this created a vibrant wholesale market for electricity transactions, but the wording of NEPA did not, as yet, encourage retail competition.

In 1996, the Federal Energy Regulatory Commission (FERC) passed Order 888, forcing what is known as *open access*. Owners of transmission and distribution assets, for the most part electric utilities, had to offer nondiscriminatory tariffs to third parties. This order encouraged utilities to spin off their transmission systems into independent agents that could provide these tariffs.

Finally, the order also allowed utilities to collect money for the investments they had made in the past that might not prove economical in a free market. A companion order, No. 889, required that an Open Access Same Time Information System (OASIS) be established to provide the marketplace with necessary information about these tariffs and about the ability of the transmission lines to carry power for third parties.

In practice, OASIS is an elaborate computerized information system that provides everyone who wants to use the “grid”—the nationwide transmission and distribution network—the same opportunity to get information about what it will cost. Theoretically, users

get the information in real time; that is, the information they need to use the grid at that precise moment. When everyone has access to the same information to make transactions, economists call that a transparent system. The information is open to all who need it.

There are still kinks in the system and kinks mean lawsuits and challenges. But Orders 888 and 889 did finally open the electricity industry up from a federal regulatory point of view. And, importantly, they also set the precedents for the states to begin to act.

Now, as this first electric century ends, many state governments have taken up the free-market banner. Most states are implementing, considering, or already have active programs that allow customers to choose from among several suppliers of electricity. This deregulates the third major piece of the puzzle, which is distribution. So as we enter the twenty-first century, the stage is set for the total transformation of the electricity industry, and, ironically, the industry will likely look very much like it did at the beginning, in the years after Edison's Pearl Street station went online (see Figure 1.2).

What's happening now? Some observers have compared today's industry to the wild, wild West. And that's not far from the mark. In California, Massachusetts, Rhode Island, Illinois, Texas, and Pennsylvania, customers can already select from several electricity suppliers. In addition, they are able to select from several different grades of electricity, similar to gasoline for your car. Whereas there was only one supplier servicing the customer, now there are several promoting several different product lines. At least 16 states have passed legislation to deregulate their electricity industries. Eight states have regulatory orders pending. As I write this book, close to half of the states are well on their way to a competitive electricity business.

In response to these regulatory changes, utility companies are breaking apart or disaggregating, to use the professional lexicon. In some states, they've been forced by law, or strongly encouraged, to sell their power plants. Finally, the generation, transmission, distribution vertical tie that was created by regulation is being severed. Utilities are also merging to get bigger and, it is hoped, stronger. Fifteen years ago, there were over 200 investor-owned utilities (utilities

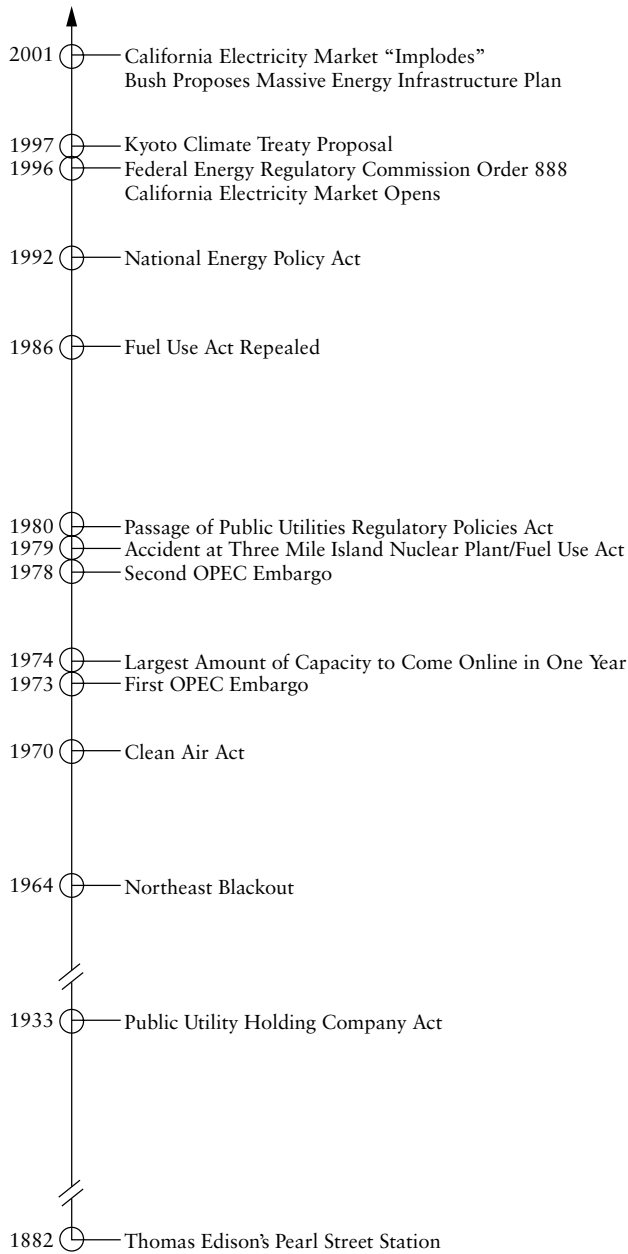


Figure 1.2 Milestones of the electricity industry.

owned through private sector stock). Today, there are less than one hundred and the number will undoubtedly continue to shrink.

But just because the industry is consolidating, does not mean it is getting any less complex. As traditional utilities are shrinking in number, and in some circles are considered an endangered species, new firms are busily invading every sector of the business.

Realistically, the number of companies that actually generate electricity will shrink much more. Already, the power-generating assets are being concentrated in fewer and fewer hands. In five to ten years, there could be a dozen or so companies that actually produce most of the electricity we rely on. As we've seen in other industries, this is a natural progression in a competitive market. Initially, there are many new companies pushing new ideas. Then, to gain control over pricing and costs, consolidation occurs. Let's face it, although we have thousands of automobile dealers, there have only been three major American car companies for decades (with foreign car companies adding to the mixture and, more recently, merging with domestic companies). Will market forces require more than a handful of companies producing electrons for our everyday use?

Traditional utilities are being forced to decide which parts of the business they want to stay in and which ones to exit. Similarly, they also have to determine which regions they can profitably serve in the business sectors within which they choose to operate. Some U.S. electric utilities have been scouring the globe in search of new opportunities.

The transmission system is another story. Right now, it is still the most regulated facet of the new electricity economy. It may ultimately function like the nation's interstate system—funded through monies raised nationally but parceled out at the state and local level. In many states, utilities are required to join a larger, regional transmission entity and in several states they have been forced to divest their generation assets. The reason for these requirements is that without an unbundling of generation and transmission capabilities, utilities will always be accused of “favoring” the electricity

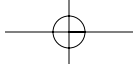
they generated over the electricity someone else generated. In other words, the incumbent supplier may protect its own interests.

The Federal Energy Regulatory Commission (FERC), in response to the California crisis and in support of President Bush's Energy Plan, ordered the nation's utilities to create four "super regional transmission organizations" around the country. FERC was apparently unhappy with the pace of formation of independent system operators (ISOs) being created in response to FERC Orders 888 and 889.

Even though California and other states have competition, it is primarily concentrated in the commercial and industrial markets. A competitive market at the consumer retail level is still emerging. Many states have instituted pilot programs to learn what happens when customers actually have a choice among companies generating a variety of "grades" of electricity. In fact, states with deregulation programs are struggling with how to create competition but still protect the rate payers (read: voters) from dramatic shifts in their electricity bills.

If someone boasts to you that the United States is pioneering electricity deregulation because we're a country that believes in the free market, don't believe it. The United Kingdom (England, Wales, and Scotland), Australia, Chile, Argentina, and countries in Scandinavia beat us to it. And in the case of the United Kingdom, the transition was far more dramatic. The country went from a single state-owned utility to a disaggregated group of electric generating plants, distribution grids, and transmission entities. We perhaps were the first to crack open the door, with the passage of the PURPA legislation. But we're behind now. It's all even more ironic because U.S. energy companies and federal energy agency personnel had been marching around the globe during the 1990s encouraging other countries to "open up their electricity markets" to competition.

Five decades of institutional structure isn't going to reverse overnight. Seventy-five percent of all electricity used today is still supplied by traditional investor-owned utilities. Most of the rest is



supplied by public utilities, such as the federal power authorities and the rural electric cooperatives. A small percentage is generated at energy-intensive industrial sites and used either internally or sold to utilities. It becomes obvious that it takes more than an act of Congress to create an open marketplace. Real competition requires action on the part of real buyers and sellers, who must, each in their own turn, be prepared to act.

