

## **Electricity Policy in the 1970s: The Bizarre and Unanticipated Driver of Utility System Restructuring in the 1990s and Beyond**

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Electricity policy made in the 1970s had huge impacts in later decades. With passage of the Public Utility Regulatory Policies Act (PURPA) of 1978, American electric utilities began a two-decade process that introduced competition in a formerly staid and monopolistic system. By the beginning of the new millennium, more than two-thirds of the states had taken steps to implement (or seriously consider) the restructuring of their utility systems, with the promise that free markets would benefit society by providing innovative new services and lower costs.

Historians and policy analysts often describe major shifts in policy as the result of actors who belong to one (or more) of several specific communities. In some cases, elite policy makers, such as presidents, governors, or congressional leaders, win support for legislation that dramatically alters the status quo. Much of the New Deal legislation that altered the federal government's role in everyday life, for example, stemmed from efforts directly initiated by President Roosevelt and his top aides. Elites do not make all history, however, as is recognized by those who describe the effects of social movements. Though many of these group actions have leaders, such as Senator Gaylord Nelson, an Earth Day originator who helped guide the environmental movement of the 1970s, social change ultimately stems from the actions of millions of people who visibly affect the work of policy makers. A third community consists of engineers and business people who build and employ new technologies. The increasing popularity and use of novel hardware (from radios to nuclear power plants) sometimes forces policy makers to consider the impact and regulation of the devices. Finally, members of the policy community themselves help create new initiatives, as they analyze, debate, and advocate policies that become adopted by elite and non-elite individuals who have the power to implement them.<sup>1</sup>

The fun part of the history of recent electricity policy derives from the fact that none of these communities had much to do with the initial impulse leading to the radical reshaping of the electric power system. Though the impetus to restructure came from a provision of a public law—PURPA—neither the writers of the legislation nor those who voted for it had much idea of its potential impact. In other words, the restructuring of the power system constituted an unforeseen consequence of PURPA, as is evidenced by the

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<sup>1</sup> Frank N. Laird, "Constructing the Future: Advocating Energy Technologies in the Cold War," *Technology and Culture* 44 (2003): 27-49.

scant attention paid to the law at the time of its passage by utility industry insiders and professional lobbyists.

To be sure, scholars recognize that unexpected outcomes occur frequently in history. Academics often reflect on “contingency” and good (or bad) luck that alters the course of events. (Civil War historians point to the loss of Confederate battle plans—and their fortuitous retrieval by Union forces—before the 1862 battle of Antietam as such an example.) In the case of electric power system restructuring, an apparently insignificant policy provision probably had such large and unforeseen results because of the existence of nurturing political, economic, and technological conditions.

In this paper, I will highlight those conditions and explore the impact of the 1978 law that radically altered the electric utility system. Though one can point to occasional efforts in earlier decades to introduce competitive forces to the largely monopolistic and regulated system, the notion of restructuring and deregulation only occurred after passage of a largely unnoticed law that made up part of President Carter’s national energy plan. Beyond discussing the impact of the law in the 1990s, I will also describe the backlash against restructuring that has begun in the last seven years. Events occurring since 2000, in other words, have caused policy makers to rethink the virtue of restructuring the electric power system, a process that their legislator-ancestors unintentionally initiated almost thirty years earlier.

## **Creation of the Electric Utility System<sup>2</sup>**

The electric utility system began, like other technology-based businesses, within a free-wheeling competitive environment that characterized the “gilded” age of the 1880s. Soon after Thomas Edison demonstrated, starting in 1882, that electricity could be generated and sold to nearby businesses, other companies entered the fray. By the 1890s, Edison’s direct-current technological approach had been supplanted by the alternating-current method proffered by the Westinghouse and Thomson-Houston companies, which also demonstrated that power could be generated at great distances from the users and transported efficiently at high voltages, something impossible to do with Edison’s direct-current system. (Westinghouse generated power using the water falling at Niagara Falls and transmitted the electricity about 20 miles to Buffalo in 1896.)

Some entrepreneurs realized they could exploit AC technology to consolidate smaller firms into larger ones and realize economies of management. Samuel Insull, once Thomas Edison’s secretary, took over the small Chicago Edison firm in 1892, but he quickly wrested control of other firms by building large plants that could produce power at lower unit costs than could several smaller plants. By buying out competitors and using AC technology to transmit power over greater, he dramatically increased the amount of electricity sold to customers. By early in the twentieth century, he held a virtual monopoly of electric power in the region.

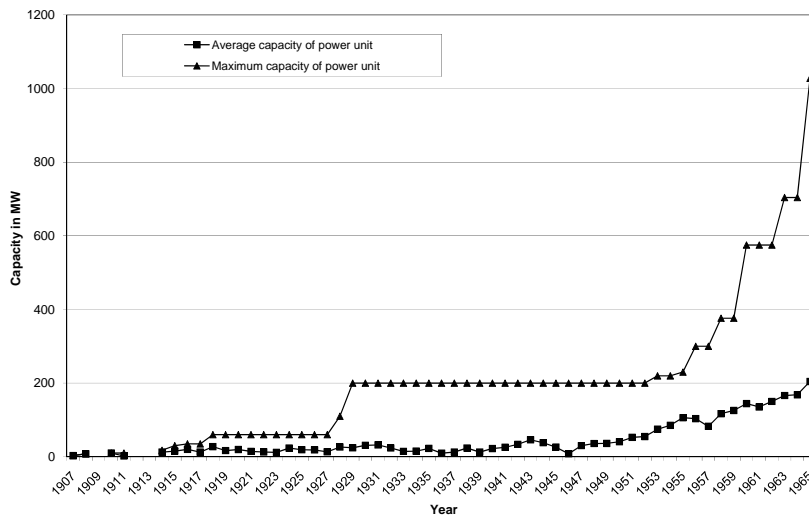
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<sup>2</sup> Much of the next two sections draw on Richard F. Hirsh, *Technology and Transformation in the American Electric Utility Industry* (Cambridge: Cambridge University Press, 1989).

## Technological and Managerial Principles

Insull became successful in the new electric utility business largely because he exploited two technological trends and because he saw the value of the idea of regulation. In the technological realm, he realized that a new form of prime mover—the steam turbine—could yield huge economies of scale. Designed and first used in England for maritime use, the steam turbine produced rotary motion directly (unlike traditional steam engines that yielded reciprocating—up and down—motion) for powering a dynamo, also known as a generator. Taking up less space than its predecessor, it also could be enlarged upon with few limits, producing more power while using disproportionately less material in a way that ultimately yielded lower unit costs. In 1903, Insull convinced a skeptical General Electric Company to manufacture a turbine that generated 5 megawatts (MW) of electrical power. In 1912, he installed a unit that produced 12 MW. Taking advantage of economies of scale afforded by this new technology, Insull bought turbines that cranked out 208 MW by 1929 from the largest steam turbine yet built. In similar ways, utility managers in other cities established electric utilities that employed ever-larger turbines, some that reached capacities of greater than 1,000 MW by the 1960s.

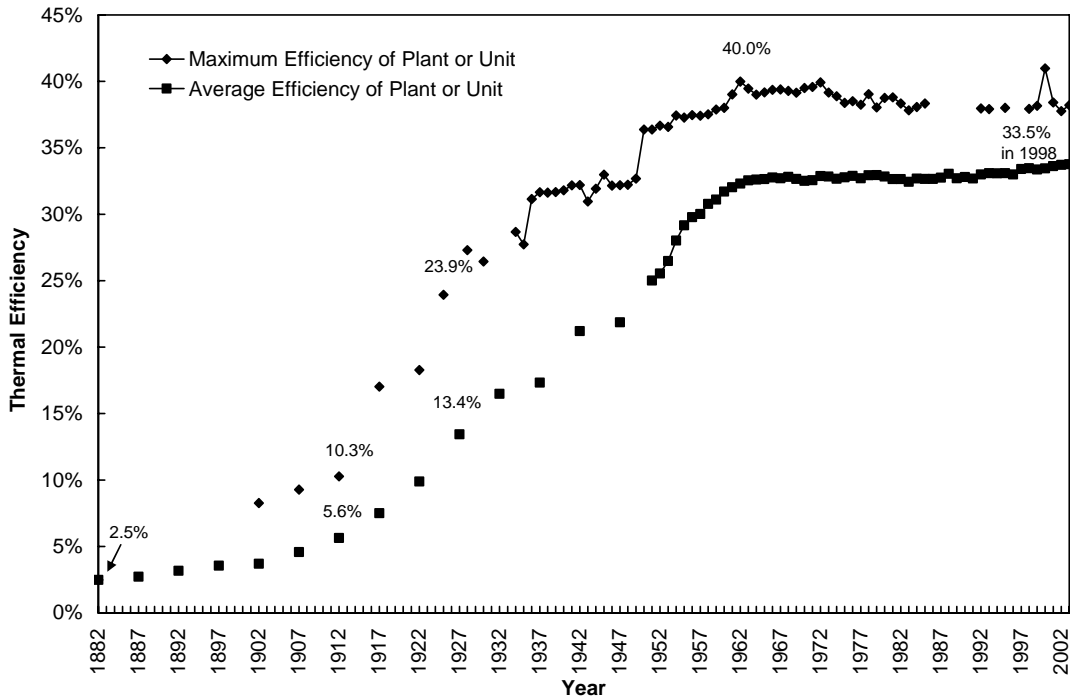
Average and Maximum Capacity of Power Units, 1903-1965



Beyond economies of scale, Insull and his colleagues took advantage of equipment that converted raw fuel (such as coal) into electricity with greater efficiency. They did so by using equipment (built with sophisticated metal alloys) that raised the temperatures and pressures of the steam used in turbines. Constructed largely by General Electric and Westinghouse in the United States, these turbines (and accompanying generators and associated equipment) boosted thermal efficiencies dramatically. While Edison's first plant only converted about 2.5% of the energy from coal into electricity, Insull's best plant in 1913 obtained efficiencies four times greater. Incremental improvements in the technology continued throughout the decades, such that the best units converted about 40%

of the energy into electricity. More commonly, power plants operated at an efficiency rate of about 35%.

Thermal Efficiency of Power Plants (or Power Units), 1882-2002



Perhaps most surprisingly, Insull recognized the value of regulation as an important element that allowed him to pursue the growth of his firm. Though some of his business contemporaries viewed government oversight with horror, Insull realized as early as 1897 that state regulation would permit power companies to win designation as “natural monopolies.” Defined as entities that could produce goods and services more efficiently than could a host of competing bodies, natural monopolies would win state approval to operate in an environment that allowed expansion and use of ever-larger generation technologies. From the state legislation that created them (first in Wisconsin and New York in 1907), regulatory bodies obtained the final say about the price of electricity charged by utilities, thus protecting consumers from monopoly abuses. But the oversight commissions also ensured the legitimacy of power companies as monopolies within specified geographical regions. Most importantly, Insull appreciated that state regulation would make it easier for utilities to attract investment funds, because regulators had an implicit obligation to ensure that power companies earned enough money to pay bond interest and stock dividends. Regulation helped convert investments in a new, capital-intensive industry from speculative to conservative. As early as 1916, people had already begun talking about utility securities as ideal investments for “widows and orphans.”<sup>3</sup>

<sup>3</sup> Samuel Insull, "Public-Utility Commissions and their Relations with Public-Utility Companies," address delivered in Dubuque Iowa, at a joint session of the Iowa Section of the National Electric Light Association,

The combination of scale economies, increased thermal efficiency (along with other advances in transmission and control technologies), and regulation allowed power companies to produce more electricity at lower unit costs. Insull realized the value of these factors earlier than most managers. He also understood that if he could sell large amounts of power to customers who would consume it at times of the day when his firm had plenty of spare capacity, he could increase his profit, even if he decreased the unit price. (This approach is known as improving the “load factor”—the ratio of the average amount of power produced over a designated amount of time to the peak load occurring during that period.) In 1898, his company earned about 9 cents per kilowatt-hour (kWh) of electricity sold. In 1912, the firm’s average income dropped to a bit more than 2 cents per kWh (in nominal terms), yet the company remained profitable because of the increased consumption induced by lower prices.

Utility managers around the country emulated Insull, using what is sometimes referred to as the “grow-and-build strategy.” As demand for electricity increased, utilities built new, technologically advanced, and larger power units. Because the unit cost for power declined with these new plants, the companies could decrease its price. Lower prices stimulated new and expanded use of power, so the demand for power increased again, creating the need to build more, further advanced power plants in an apparently unending cycle.

By 1965, the strategy yielded an amazing set of statistics: Consumption of power grew at a 12% annual rate from 1900 to 1920; from 1920 to 1965, it leaped ahead at about 7% per year. Such rapid rates of electricity consumption exceeded the growth rate for all energy sources together by a factor of 4 to 5.5 times. As consumption increased, the price of power declined: in 1965 cents, power used by residential customers dropped from about 581 cents per kWh in 1892 to about 14 cents in 1965 (in inflation-adjusted 2006 terms). At the same time, utility companies themselves benefited, as increased sales meant higher profits and stockholder dividends. Investors flocked to utility stocks, which saw prices reach post-Depression highs in 1965.<sup>4</sup>

Statistics do not tell the entire story, however. The rapid escalation of consumption occurred simply because electricity proved to be a highly versatile and greatly valued source of energy. When factories switched from steam engines to small electric motors for powering machinery, productivity soared, allowing more products to be made at lower cost. On the domestic front, electricity powered an increasing number of appliances that

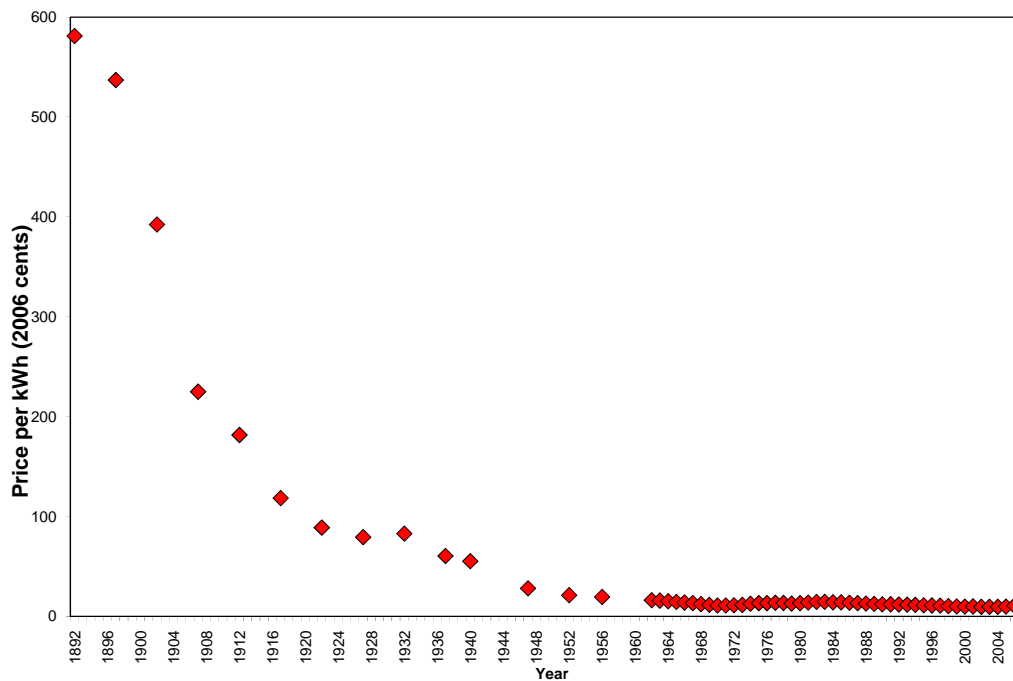
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Iowa Street and Interurban Railway Association and Iowa District Gas Association, 11 May 1916, in William E. Keily, ed., *Public Utilities in Modern Life: Selected Speeches (1914-1923) by Samuel Insull* (Chicago: Privately Printed, 1924), p. 63. .

<sup>4</sup> In August 1929, Moody’s average of electric utility stocks peaked at 169.80 (monthly average). The Great Depression and the reorganization of the utility industry in 1935 (with passage of the Public Utility Holding Company Act and the Securities and Exchange Act) caused investors to spurn utility stocks, and Moody’s average for power company securities plummeted to 11.41 in April 1942. But the postwar success of power companies to exploit new generation and transmission technologies gave investors cheer: in 1958, the Moody average stood at 57.96 (an average for the year); in April 1965, it had reached a post-Depression high of 119.57.

improved the material standard of living. Despite the effects of the Great Depression, for example, a growing number of people could afford electric refrigerators. Electric radios, ranges and stoves, washing machines, and scores of other appliances that people initially viewed as novelties quickly became necessities in the wired homes of the vast majority of Americans. (Even rural customers began enjoying these appliances after the federal government encouraged electrification of farms and areas outside big cities.) In the 1950s, the number of appliances continued to proliferate in the home, as air conditioners and televisions became popular with the postwar masses. Generally, electricity became viewed by most people to be a commodity that made life more pleasant and more productive. “Live better electrically”—an advertising slogan employed by the utility industry in the late 1950s—should not be viewed cynically as an advertising pitch from selfish hucksters. Rather, it reflected a generally accepted truth about the value of electricity. In this light, one can understand why most utility managers took special pleasure in their work. Not only did they help their companies produce more power at lower rates; they also helped improve the lives of their customers.

Price of Residential Electricity, 1892-2006  
(Adjusted for inflation, in 2006 cents)



To the casual observer, then, the utility industry in the 1960s appeared as an example of a superb technological system. Manufacturers produced continuously improving hardware for generating electricity, and utility companies used it to benefit their companies, their shareholders, and their customers.

## The Energy Crisis, PURPA, and Beginnings of Restructuring<sup>5</sup>

The continued success of the electric utility system—in all its technical and human dimensions—seemed well established and, like other elements of the nation's energy system, it appeared to have no end in sight. Yet the electric utility system began to lose its momentum in the late 1960s.<sup>6</sup> That loss of momentum would have serious ramifications for policy creation a decade later.

The challenge to continuously growing momentum in the 1960s first expressed itself first in the technological realm. In great detail elsewhere,<sup>7</sup> I have demonstrated that the traditional technologies used to generate electricity—the technologies largely responsible for reducing the cost of electricity—stopped improving in the 1960s and 1970s. I call this phenomenon "technological stasis," which had its roots in hardware problems and (as importantly) in the behavior of utility executives, engineers, and manufacturers.

After decades of improvement in steam turbine-generator technology, manufacturers found that increasing the thermal efficiency of generating units produced diminishing returns. Reaching apparent limits (due to metallurgical problems) to raising steam temperatures and pressures, the hardware could be coaxed to yield higher efficiency, but only at tremendous capital and maintenance costs. Ultimately, power companies shied away from the most thermally efficient plants, deciding instead to operate less-efficient but more reliable plants.<sup>8</sup>

At almost the same time, they witnessed a decline in the quality of power turbine-generators that grew to greater than 1,000 MW of capacity. Responding to utilities' needs to obtain economies where possible, manufacturers pushed the technology beyond good operating and design experience, resulting in equipment that suffered twisted turbine blades, furnace problems, and other defects that hampered performance and reliability.<sup>9</sup> Effectively, the industry had run into another barrier to technological improvement.

Technological stasis meant that utilities no longer had a way to drive down the cost of power production or to mitigate effects of inflation or other causes of higher costs. And just as stasis struck, so did increased costs, especially for fuel. Striking in 1973, the energy crisis caused the cost of all energy resources to increase dramatically. As the cost of oil and coal for the generation of power increased, utilities needed to boost prices—a dramatic reversal of decades of practice. Responding to higher electricity bills, customers cut back

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<sup>5</sup> Parts of this section draw on Richard F. Hirsh, *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System* (Cambridge, MA: MIT Press, 1999).

<sup>6</sup> For a discussion of the concept of momentum, see Richard F. Hirsh, "Power Struggle: Changing Momentum in the Restructured American Electric Utility System," *Annales historiques de l'électricité* (No. 2, June 2004): 107-123.

<sup>7</sup> Hirsh, *Technology and Transformation*.

<sup>8</sup> "The Retreat from 1,100 F Steam," *Electrical World* 154 (3 October 1960): 33; and "The Retreat from 1,100 F Takes Effect," *Electrical World* (25 October 1965): 5. Also see Hirsh, *Technology and Transformation*, pp. 89-94.

<sup>9</sup> *Ibid.*, pp. 103-4.

on usage, producing a few years (1974 and 1982) of negative growth rates of consumption, followed by years of growth at a tepid annual rate of less than 3 percent.<sup>10</sup>

Adding to utilities' problems, the environmental movement gained political support and substantively affected momentum in the electric utility system. In particular, environmental groups opposed nuclear power plant construction and won allies among regulators and legislators. On another front, they forcefully promoted energy conservation and improved efficiency. In some states, they pressed for legislation and regulatory policies that required utilities to help customers reduce power consumption. The efforts constituted a culture shock to utility managers, who previously believed that increased usage correlated to a better standard of living for customers. And the new measures meant that utility managers faced other participants in the system who challenged their formerly unilateral decisions.

While Presidents Nixon and Ford made stabbing efforts at addressing the energy crisis, their politically hobbled administrations had little lasting impact. By contrast, President Jimmy Carter made energy policy an immediate priority. The new president recalled recent history vividly: how the Arab members of the Organization of Petroleum Exporting Countries imposed a five-month embargo of oil, causing economic and social havoc on a country dependent on cheap and abundant energy supplies.<sup>11</sup> After the embargo ended, the cost of oil (and its competitor fuels) rose dramatically. Nevertheless, American imports of petroleum continued to grow to 42 percent of total oil consumption in 1976, up from 36 percent in 1973.<sup>12</sup> This continued growth made the United States increasingly vulnerable to another supply disruption caused by OPEC or other oil suppliers. Seeking to avoid such scenarios, President Carter vowed to develop a viable, long-term energy strategy.

The president revealed his views on energy policy in a speech on 18 April 1977, when he urged the nation to respond to the energy crisis with the "moral equivalent of war." Addressing television and radio audiences in a somber tone, Carter lamented the fact that the United States wasted more energy than any other country. Speaking most forcefully of the ways by which the energy crisis challenged American attitudes and values, the president declared that the cornerstone of his new energy policy would be conservation—"the quickest, cheapest, most practical source of energy."<sup>13</sup> Two days later,

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<sup>10</sup> From 1975 to 1984, the annual growth rate of electricity consumption was 2.7%. Data from U.S. Department of Energy, Energy Information Administration, at <http://www.eia.doe.gov/emeu/mer/txt/mer7-1> (obtained 22 May 2002).

<sup>11</sup> "Carter Energy Bill Fails to Clear," *CQ Almanac* 33 (1977): 713.

<sup>12</sup> In 1970, imports met 23 percent of U.S. oil demand. In 1973, that percentage had increased to 36 percent, where it remained until 1976, when it rose to 42 percent. Data from Independent Petroleum Association of America and *Monthly Energy Review* as cited in Congress, House, "National Energy Act: Report of the Ad Hoc Committee on Energy," 95th Cong., 1st sess., Report No. 95-543, 27 July 1977, vol. 1, p. 6.

<sup>13</sup> Jimmy Carter, "President's Proposed Energy Policy," delivered 18 April 1977, *Vital Speeches of the Day* 43 (No. 14, 1 May 1977): 418-20, reprinted in the *New York Times* (19 April 1977), p. 24. Also see Charles Mohr, "Carter Asks Strict Fuel Saving; Urges 'Moral Equivalent of War' to Bar a 'National Catastrophe,'" *New York Times* (19 April 1977), p. 1.

the President gave Congress more details of his energy plan,<sup>14</sup> which proposed to offer tax credits to people who adopted energy-efficiency measures. Less benevolently, the president advocated a host of new taxes. One would disadvantage owners of "gas guzzler" automobiles that did not meet stringent fuel economy standards. Another would hurt all car drivers: if gasoline consumption continued to exceed established goals over the following ten years, a graduated tax would increase by five cents per gallon annually, yielding a maximum tax of fifty cents per gallon. The president also sought the gradual removal of price controls on oil and natural gas, allowing prices to rise to world levels. This last step would motivate the reduced use of the fuels since they would become more expensive. The tax would spur exploration for new supplies too. Beyond conservation, Carter wanted to encourage industries to use more domestic coal and less oil and natural gas.<sup>15</sup> He further proposed to streamline procedures for approving atomic power plants, thus allowing nuclear-produced electricity to replace premium fossil fuels.<sup>16</sup>

The so-called National Energy Plan gave electric utility executives and lobbyists much to digest. As presented to Congress in one large bill in 1977, the plan would have required power companies to provide energy audits of homes so owners could determine which conservation measures they should take.<sup>17</sup> Besides forcing utilities to enter a business that they had little interest in pursuing, the initiative would have reduced their revenues by decreasing sales, because energy-efficient homes and businesses consumed less electricity.<sup>18</sup> More burdensome, the bill would have restricted combustion of natural gas and petroleum in new and existing electric power plants. Instead of using these increasingly expensive fuels, utilities would have been required to convert plants to burn coal, which enjoyed greater availability in the United States.<sup>19</sup> The provision constituted a reversal of federal policy. Due to the desire to improve environmental conditions, power companies had previously been encouraged to switch some of their plants from dirty-burning coal to cleaner gas or oil. Now, utilities would need to spend money to convert back to coal.

Despite the initial enthusiasm demonstrated for Carter's plan, Congress refused to pass legislation that would have implemented the harshest measures suggested by the president (most notably the tax on gasoline). Instead, Congress divided Carter's proposals into five separate bills. The Public Utility Regulatory Policies Act<sup>20</sup> appeared to be the

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<sup>14</sup> Jimmy Carter, "The Moral Equivalent of War," delivered 20 April 1977, *Vital Speeches of the Day* 43 (No. 14, 1 May 1977): 420-23, reprinted in *New York Times* (21 April 1977), p. B8. Also see Charles Mohr, "Carter Calls for Fight on Energy Waste; Asks Congress to Help in 'Thankless Job,'" *New York Times* (21 April 1977), p. A1.

<sup>15</sup> "The Energy War," *Time* (2 May 1977), pp. 10-22.

<sup>16</sup> Carter, "President's Proposed Energy Policy," p. 420; Carter, "The Moral Equivalent of War," p. 421; and Executive Office of the President, Energy Policy and Planning, *The National Energy Plan* (Washington, DC: U.S. Government Printing Office, 1977), p. 4.

<sup>17</sup> Congress, "National Energy Act: Report of the Ad Hoc Committee on Energy," vol. 1, pp. 11-2.

<sup>18</sup> The President's original bill required utilities to lend money to consumers and perform much of the energy conservation work. Congress, "National Energy Act: Report of the Ad Hoc Committee on Energy," vol. 2, p. 6.

<sup>19</sup> Executive Office of the President, *The National Energy Plan*, pp. 63-6. Congress, "National Energy Act: Report of the Ad Hoc Committee on Energy," vol. 1, p. 22.

<sup>20</sup> Public Law 95-617, signed 9 November 1978.

least offensive of the five.<sup>21</sup> Most of the law dealt with the design of rate structures that would encourage customers to use power more wisely. It required state utility commissions to examine the rate structures and disallow those (such as some declining-block rates) that appeared to give customers incentives to use increasing amounts of power.

One small part of the law, however, sought to stimulate electric power production in novel ways. Section 210 of the legislation provided special terms for nonutility companies to produce and sell electricity. Though several parties can claim responsibility for elements of this provision, the major actors consisted of lobbyists representing a New England company that sought to profit by obtaining good rates for power produced by its cogeneration plant—a unit that burned (in this case) wood to produce steam for industrial purposes and which used waste heat to produce electricity. Familiar since the earliest days of the power business, cogeneration had lost favor as utility-owned, central power plants offered low-cost power without the need for companies to produce it themselves. By 1978, cogeneration facilities in the U.S. produced just 3.5% of the nation's electricity.<sup>22</sup>

With so many huge issues at stake during the 18-month-long debate over President Carter's energy plan, lobbyists for the cogeneration company obtained favorable terms for itself (and other cogenerators) in the final bill, which House-Senate conference members negotiated from December 1977 through September 1978. The bill ultimately gave cogenerators, along with those that produced power from renewable energy sources (such as flowing water, the sun, and the wind), the right to sell their power to regulated utilities at rates that equaled their "avoided cost" of generation. Not expecting much to come from this part of the bill, and exhausted by the long debate over energy policy in the 95th Congress, legislators and utility lobbyists allowed the terms to become law.<sup>23</sup> In fact, when referring to PURPA at all, most utility spokesman gave it the shorthand term of the "rate reform" measure, which indeed constituted the main focus of the legislation. Even the president called it this when he signed the bill, suggesting that the most noteworthy parts of the bill consisted of requirements to evaluate rate structures. Reflecting the view of many utility managers, William Hayes, the editor of the industry trade magazine, *Electrical World*, asserted that "the Public Utility Regulatory Policies Act appears to contain no nasty surprises..."<sup>24</sup>

It took a few years before utility managers recognized some nasty surprises, indeed. After surviving utilities' legal contests that ended in the US Supreme Court, Section 210 gave nonutility companies huge benefits that stimulated development of new cogeneration and renewable energy technologies in the 1980s. Many cogeneration plants used modestly sized natural gas-burning turbines, similar to those developed for military use, which had

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<sup>21</sup> The five laws consisted of Natural Gas Policy Act, the Powerplant and Industrial Fuel Use Act, the National Energy Conservation Policy Act, the Energy Tax Act, and the Public Utility Regulatory Policies Act.

<sup>22</sup> Edison Electric Institute, *EI Pocketbook of Electric Utility Statistics*, 34th ed. (Washington, DC: Edison Electric Institute, 1988), p. 6.

<sup>23</sup> For details, see Hirsh, *Power Loss*, pp. 81-8.

<sup>24</sup> William C. Hayes, "The National Energy Act Isn't," editorial in *Electrical World* 190 (15 December 1978), p. 3.

become especially efficient and cheap.<sup>25</sup> Meanwhile, environmentally preferable technologies, such as wind turbines, saw their use increase and the cost of power they produced decrease substantially. In states such as California, whose regulatory commission offered its own set of incentives to enhance those provided by PURPA, nonutility companies produced power in increasing volume. Most notably, by the mid-1980s, electricity produced from some of these small-scale and independent generators cost the same or less than the power being produced by behemoth—and troubled—generating plants recently built by utility companies.

### **PURPA's Consequences for Restructuring**

The significance of these PURPA producers cannot be overestimated: their success contributed to the movement to deregulate the industry by discrediting the notion that power companies constituted natural monopolies. Viewed as entities that made the most efficient use of society's resources, natural monopolies deserved regulation, according to the political and economic theory that led to government oversight of utilities. But in the 1980s, cogenerators and renewable energy companies demonstrated that they could exceed the 35-to-40 percent efficiency mark obtained by utilities' large-scale power plants, while meeting or exceeding environmental requirements. At the same time, they could produce power at a cost comparable to that of regulated utilities. As some regulators and legislators took note of this fact, they openly wondered if utilities warranted bureaucratic supervision or whether market forces should be allowed to discipline the system.<sup>26</sup>

As the consequences of PURPA began to be understood, pressures for electric utility deregulation intensified because of the removal of government oversight in other industries. Encouraged by President Carter, for example, economist-turned-regulator Alfred Kahn brought market-based principles to the airline industry.<sup>27</sup> Deregulation also appeared in the natural gas, petroleum, financial services, and railroad freight transportation businesses.<sup>28</sup> Carter's successor, Ronald Reagan, continued the trend by spurring deregulation of the telecommunications industry.<sup>29</sup> Providing sustenance to the critics of regulation, customers initially benefited from price declines and the introduction

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<sup>25</sup> See chapter 6, "Radical Technologies in the PURPA Era," in Hirsh, *Power Loss*.

<sup>26</sup> Much of this discussion comes from chapter 7, "PURPA, Natural Monopoly, and Market Principles," in Hirsh, *Power Loss*.

<sup>27</sup> President Carter signed legislation that began the process of phasing out federal regulation of the airline industry on 24 October 1978.

<sup>28</sup> President Carter signed the Natural Gas Policy Act, Public Law 95-621, on 9 November 1978. In other efforts to reduce regulation, Carter signed the Depository Institutions Deregulation and Monetary Control Act of 1980, Public Law 96-221, on 31 March 1980, which gradually eliminated interest rate ceilings and other restrictions on banking institutions. On 14 October 1980, Carter also approved the Staggers Rail Act, Public Law 96-448, which gave railroad companies increased flexibility to set rates. Information from Thomas, Legislative Information on the Internet, Library of Congress, at <http://thomas.loc.gov/> (obtained 11 February 1998). Also see Paul L. Joskow, "Regulatory Failure, Regulatory Reform, and Structural Change in the Electrical Power Industry," *Brookings Papers on Economic Activity: Microeconomics* (1989): 125.

<sup>29</sup> AT&T agreed in January 1982 to divest itself in light of a 1974 antitrust suit. Divestiture took place on 1 January 1984.

of new services.<sup>30</sup> Many observers advocated the restructuring of the utility system to achieve equally positive results.

Deregulation of the power business received a boost from passage of the 1992 Energy Policy Act. With fears of oil shortages resulting from the Gulf War of 1991, Congress crafted a law that sought to spur more production of domestic energy sources and to improve the efficiency of energy-using devices. Holding market-based systems as the centerpiece of the legislation, the law required that transmission wires be available to all power producers (utility and nonutility producers alike) and wholesale customers. In other words, the transmission lines would now serve as common carriers, making it possible for the creation of competitive wholesale markets for electricity. Believing that efficiency inevitably results from increased competition, the creators of the law expected openly available transmission lines to yield low-cost power that could be purchased throughout regional markets. The law also allowed individual states to implement retail competition, thereby permitting customers to negotiate contracts with sellers of electricity outside of the traditional, regulated system of monopoly utility companies.

Retail competition came first to states that had high electricity rates and where competition looked appealing (in theory, at least) as a way to reduce those rates. Consisting of the fifth or sixth largest economy in the world and having high-cost power, California became an early adopter.<sup>31</sup> Often a trendsetter, the Golden State also had a huge number of politically astute and active participants who gained a hand in crafting the deregulation legislation. Demonstrating that power company managers no longer had absolute control over the utility system, the 1996 law that restructured the California utility system did not do everything that managers would have liked. For example, the law recognized the political power of consumer groups, which won provisions for rate caps on the price of power for residential customers, just in case deregulation immediately caused costs to increase. Academic economists and conservative proponents of market-based systems, meanwhile, pushed for provisions that required utilities to sell off a large number of their generation plants and to make their transmission network available to all parties. They argued successfully that competition requires competitors, and if the vertically-integrated utilities continued to own all the generating plants, then competition could not flourish. Consequently, the utilities that had previously generated, transmitted, and distributed power had now become middlemen, buying power from a myriad of producers and selling it via their wires to consumers. (The state even created a new organization, the Independent System Operator, to manage the transactions of power over the utilities' transmission lines.)<sup>32</sup>

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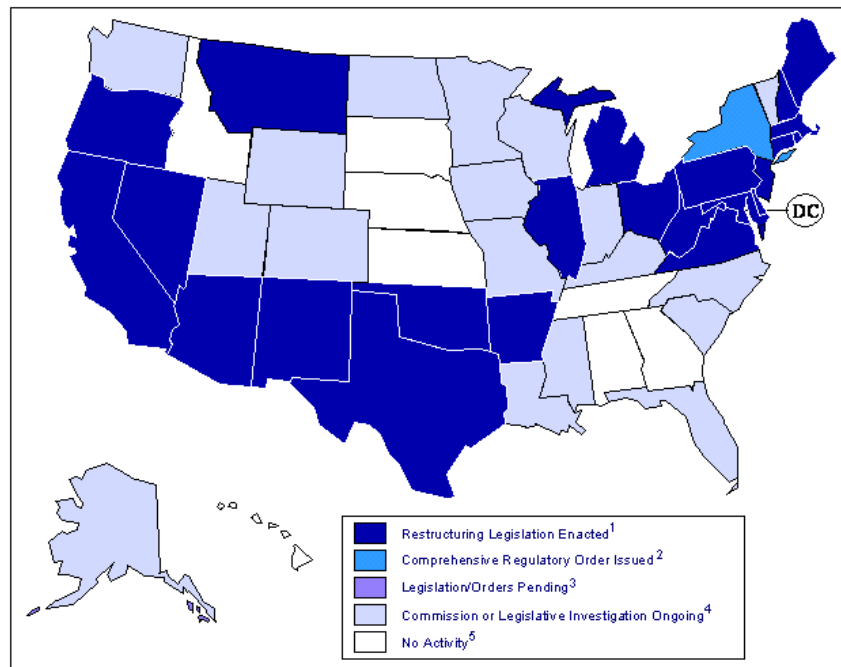
<sup>30</sup> For discussions of deregulation initiatives begun during the Reagan administration, see George C. Eads and Michael Fix, eds., *The Reagan Regulatory Strategy: An Assessment* (Washington, DC: Urban Institute Press, 1984); Marshall R. Goodman and Margaret T. Wrightson, *Managing Regulatory Reform: The Reagan Strategy and Its Impact* (New York: Praeger, 1987), and Roger E. Meiners and Bruce Yandle, eds., *Regulation and the Reagan Era: Politics, Bureaucracy and the Public Interest* (New York: Holmes and Meier, 1989).

<sup>31</sup> Actually, the New Hampshire legislature passed a restructuring law earlier than did California's legislature, but implementation was delayed due to lawsuits by the Granite State's utilities.

<sup>32</sup> California Governor Pete Wilson signed the restructuring bill, AB 1890, into law on 23 September 1996. "Complete Bill History," of AB 1890, at <http://www.sen.ca.gov/leginfo/bill/current/ab/from>

California-style restructuring occurred in other states, such that in 2001, 23 states (and the District of Columbia) had passed comprehensive laws for competitive electricity markets. In New York, the public service commission established the new free-market framework, while in 24 other states, commissions and legislative bodies had begun examining various restructuring plans.

Restructuring Status as of September 2001<sup>33</sup>



## Restructuring in the New Century

The process of restructuring the American electric utility system has not been kind to its advocates. Begun a decade ago, the opening of markets and increased competition in the formally monopolistic system was promised to yield innovative new services and lower costs, just like restructuring and deregulation of other industries had done earlier. But in California (and to a certain extent in other states) during 2000-2001, the restructuring process brought poorly designed markets, scandals, bankruptcies, rotating blackouts, disillusionment, and—worst of all in the minds of many—higher power prices. Ultimately, the state ended its experiment with restructuring, seized control of the electricity procurement process and transmission lines, and re-imposed state regulation. The 2003 blackout of more than 50 million customers in the northeast again focused attention on the fragile electric utility system and the apparent inadequacy of free markets

1800/ab1890/history.txt (obtained 1 October 1996). The political wrangling over the bill is described in Jonathan Weisman, "Congress Looks West for Lesson in Utility Deregulation," *Congressional Quarterly Weekly Report* 55 (15 February 1997): 412-9.

<sup>33</sup> U.S. Department of Energy, Energy Information Administration, U.S. DOE, EIA at [http://www.eia.doe.gov/cneaf/electricity/chg\\_str/regmap.html](http://www.eia.doe.gov/cneaf/electricity/chg_str/regmap.html).



In Virginia, legislators halted restructuring of the state's utilities, though their passion to do so may not have been greatly motivated by projected price increases. While it appeared that rates would increase somewhat when the rate freeze ended, lawmakers in April 2007 approved a reregulation measure, originally proposed by the state's major utility company, that promised to limit price hikes for a few years. But the law also will reward the firm financially for construction of, for example, nuclear power and "clean coal" plants while also limiting the authority of state regulatory agency to disapprove of utilities' actions.<sup>37</sup>

The retreat from restructuring means that a bold new model for introducing innovation through the competitive market will not be fully tested in the electric utility system. In most cases, the fear of short-term increased prices for consumers has motivated legislators to pull back from restructuring. As consequences (in some states), novel approaches such as "demand response" measures, in which consumers can aggregate their efforts to reduce energy consumption quickly (and profit from it) will not be permitted. Nor will some large retail customers be able to produce their own power and sell excess energy into the wholesale market at favorable prices. And in many cases, competitors that planned to offer power produced by renewable energy sources will not be able to enter the business.

These consequences of reregulation have disturbed some policy makers. At the Federal Energy Regulatory Commission, for example, at least one commissioner, Jon Wellinghoff, continues work to implement policies that permit equal access to the wholesale markets for those who supply energy-efficiency resources as well as energy supplies.<sup>38</sup> But he remains frustrated by the regulatory policies of several states that inhibit the ability of retail customers (and the companies that aggregate their resources, such as Energy Curtailment Services<sup>39</sup>) to contribute vitally beneficial services.<sup>40</sup> To be sure, some states that have pulled back from restructuring, such as Nevada in 2001, still retain integrated resource planning, renewable portfolio standards, and even energy-efficiency standards.<sup>41</sup> But other states, such as Virginia, have returned to a modified model of the traditional system that restores (and even increases) the power of the vertically integrated

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<sup>37</sup> S.B. 1416, "relating to the regulation of electric utility service," approved by Governor Timothy Kaine, 11 April 2007. Full disclosure: I played a small role in this bill's history. Invited by Delegate Harvey Morgan, I presented comments on the value (positive and negative) of regulation to a House Committee on Commerce and Labor hearing on 19 February 2007. The role of the state's major utility in advocating the reregulation legislation is noted in Warren Fiske, "Kaine, with some caveats, gets behind Dominion bill," *The Virginian-Pilot*, 28 March 2007, <http://content.hamptonroads.com/story.cfm?story=121872&ran=86876>.

<sup>38</sup> Interview of FERC Commissioner Jon Wellinghoff by Richard Hirsh, 7 June 2007 (by telephone) and 19 October 2007 (in his FERC office).

<sup>39</sup> ECS claims to manage up to 2,5000 MW of demand resources that can be dispatched at a moment's notice. ECS Inc., homepage, <http://www.ecsny.com/index.php>, (accessed 24 October 2007).

<sup>40</sup> For the value of demand response measures, see, for example, Ahmad Faruqui, Ryan Hledik, Sam Newell, and Hannes Pfeifenberger, "The Power of 5 Percent," *The Electricity Journal* 20 (#8, October 2007): 68-77.

<sup>41</sup> Interviews of Wellinghoff. Nevada Assembly Bills No. 369 and 661, enacted in 2001. See Vibeke Laroi, "Nevada repeals power deregulation plan," Reuters News service, 19 April 2001, [global.factiva.com](http://global.factiva.com) (accessed 26 October 2007).

utilities whose interests conflict with those that advocate greater use of competitive markets, renewable resources, and energy efficiency.

## **Conclusion**

Among other things, the organizers of this conference wanted participants to provide an understanding of present-day energy policy by looking at the context for policy creation in the 1970s. Indeed, this paper has argued that legislative actions in that decade—in particular the passage of the Public Utility Regulatory Policies Act—proved essential for the restructuring of the utility system in the subsequent three decades. I would love to report that the lawmakers who crafted and passed that law acted in an informed and rational manner, seeking to employ market forces to eliminate inefficient and illogical bureaucratic practices and thus yielding a lower-cost, more environmentally friendly way of producing and using electricity.

Of course, I can tell no such story. Instead, I relate a history of corporate lobbyists who influenced uninformed and time-constrained legislators. When they passed PURPA in 1978, lawmakers thought (if they thought about it at all) they would make a marginal impact on improving energy efficiency of utility companies while appearing to do something substantive after the 1973 energy crisis. But as often happens in the legislative process, creation of policies have unintentional consequences.

In this case, the restructuring of the electric utility system constituted a bizarre and unanticipated result of an innocuous law passed in the Carter administration. During the first decade of the twenty-first century, customers and politicians have seen huge price hikes, examples of corporate greed and mismanagement, and technical failure. But it will be impossible (and inadvisable) to set the clock back to 1977 and restore traditional regulation.<sup>42</sup> The restructuring effort forced utilities to divest assets and give up rights to transmission lines, while encouraging new entities into the market that provided new services to wholesale and retail customers. To be sure, new federal and state energy policy will seek to remedy recently emerging problems. One can only hope that lawmakers will craft legislation that achieves clear and widely supported goals without also creating policy that has unintended and unseemly consequences.

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<sup>42</sup> Few policy analysts advocate a return traditional regulation, which, for example, provides incentives for increased energy consumption and disincentives for energy efficiency.