



Expecting the Unexpected: Networks, Markets, and the Failure of Electric Utility Restructuring in California

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In this paper, I place California's disastrous recent experiences with market-oriented restructuring of its electric utility industry in the context of broader historical and economic themes. The history is in some respects an ironic one. Whereas advocates of electric utility regulation during the early twentieth century distrusted the market and believed government intervention necessary to prevent monopolistic abuses, the architects of California's electric utility restructuring idealized market forces. Yet, California's electric utility restructuring constituted a far more radical intervention into industry structure than did earlier state and federal regulatory initiatives. I conclude that we can gain insights into the failure of the California restructuring experiment by examining incentives faced by vertically as compared to non-vertically integrated electric utility firms and by considering problems that changing conditions, and measurement and monitoring issues, presented to both regulators and market participants.

On September 23, 1996, California Governor Pete Wilson signed into law an ambitious plan intended to restructure the state's electric utility industry and usher in a new era of marketplace competition, consumer choice, and low prices. As is now well-known, the initiative failed. Whereas the law promised "competitive low cost and reliable electric service," wholesale electricity costs spiked dramatically in 2000 and 2001 even as many areas of the state suffered shortages and rolling blackouts. In this context, legal provisions intended to cap consumer costs and to guarantee existing electric utility firms equitable recovery of costs "associated with uneconomic utility investments and contractual obligations" also functioned very differently than plan architects and utility executives expected.¹ By the summer of 2001, major features of the restructuring plan had been abandoned and the state government played a

¹ The quotes are from California Assembly Bill No. 1890 (Approved by Governor Pete Wilson, 24 Sept. 1996), 3.

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greater rather than lesser role in electricity provision than before the initiation of the market-oriented reforms. To the present day, controversy continues over the debacle's causes and the steps taken by state and federal governments to address the situation. In this paper, I strive to place these events in the context of broader themes in U.S. electric utility industry history.

Growth and Development of Electric Utilities in the United States: A Brief Historical Overview

Big Dreams and Small Systems: The First Years of the Electric Utility Industry. From the very first years of the electric utility industry in the United States, development has been shaped by profit-seeking entrepreneurs, concerns over monopoly and the exercise of undue economic and political power by both private and government-owned enterprises, and visionary and even utopian notions of the technology's powers to transform society. Even at the outset, during the 1880s and 1890s, the mysterious ability of electric current to somehow be conveyed over thin strands of wire, the incandescent electric light bulb's amazing ability to furnish illumination without fire or smoke, and electric power's extraordinary adaptability for use in myriad of labor-saving, useful, and amusing devices inspired visions of riches for entrepreneurs and a better world for all.² Despite grand visions, however, early electric utilities operated on a very small scale.

In San Francisco, for example, the pioneering California Electric Light Company initiated service in 1879 with an installation composed of two Brush arc light dynamos with a combined capacity of twenty-one lamps. Although production and consumption of electricity increased rapidly in San Francisco and other cities during the years that followed, constraints on the scale of economical production and distribution continued to make for high costs and limited expansion opportunities. In general, during the late nineteenth century, most electric utility firms served relatively small distribution areas and were vertically integrated, with the same company owning both the plants used to generate electricity and the networks of wires used to distribute the current to customers.

Regarding public policy, a largely laissez-faire environment prevailed. Municipal governments in many cities freely granted nonexclusive franchises to firms seeking to enter the electric utility market. For private consumers, franchises typically left firms free to make their own decisions as to price and service quality. For provision of the specifically public good of street lighting, municipal governments typically awarded firms short-term, 1-3 year contracts to provide the service based

² A fine account of the transformative and utopian possibilities associated with electricity can be found in David Nye's *Electrifying America: Social Meanings of a New Technology, 1880-1940* (Cambridge, Mass., 1990).

on (hopefully) competitive bid offers. As would be expected, given the fixed, long-lived, and “natural monopoly” attributes of electric utility facilities, public policies that left the door open to competition by no means guaranteed that such competition would actually occur. Episodes of duplicative competition rarely lasted for long, and a single firm usually dominated service provision in any given area. To the extent that it occurred at all, head-to-head competition for street light contracts also tended to diminish over time.

Nevertheless, price wars and costs incurred in buying out competitors could be a source of financial strain on even the most dominant of electric utility firms. The companies also had to contest for market share with a well-entrenched gas utility industry and with large consumers who could economically generate their own current. In San Francisco during the 1880s and 1890s, for example, the municipal government contracted for many more gas than electric lamps for illuminating streets and other public spaces. Many large users of electricity, such as the Mills Building, the Baldwin Hotel, and the Phelan Building also found it more economical to generate their own power during this period than to purchase current from the city’s electric utility firms.

Market forces also produced incentives for technological innovation. Only by overcoming constraints on scale economies could electric utility entrepreneurs profitably expand their businesses and conquer new markets. Crucial steps included the development of alternating current which could easily “be stepped up” to higher voltages for economical transmission and then “stepped down” again for use by customers; and the introduction of rotary converters, which made it possible for independently constructed direct and alternating current networks to be fed off the same generating plant. Largely in place by the first decade of the twentieth century, these innovations, in turn, laid the technological groundwork for the economical provision of larger distribution areas by electric utility firms and for the increased exploitation of economies of scale in the generation and transmission of power during the years that followed.³

The Rise of Large-Scale Electric Utility Systems and the Turn to State Regulation. The electric utility industry enjoyed explosive growth in the United States during the first decades of the twentieth century. Indeed, from the years 1907 through 1937, annual output of electricity generated by private utility firms increased almost twenty-fold from less than 6 billion kilowatt hours (kWh) to almost 110 billion kWh.⁴ Costs declined with increased production. Progressively larger and more efficient

³ Jacobson, *Ties That Bind*, 77-83, 93-95.

⁴ These figures are taken from U.S. Dept. of the Commerce, Bureau of the Census, *Census of Electrical Industries* for 1927 and 1937.

generating units, the replacement of reciprocating engines by steam turbines, and the use of higher steam pressures in boilers all lowered costs and increased economies of scale in electricity production. At the same time, the introduction of progressively higher voltages in electricity transmission permitted larger quantities of power to be transmitted over longer distances at higher efficiencies.⁵

Patterns of development and ways in which different enterprises deployed these innovations differed from place to place. Although production and consumption of electricity increased dramatically in Boston and its environs during the first decades of the twentieth century, for example, the Boston Edison Company confined its operations to a relatively compact and densely populated distribution area of 500 to 600 square miles and produced electricity using coal-fired generating units located relatively close to customers. By contrast, on the west coast of the United States development of regional electric utility systems sprawled over far larger areas during this period. By 1914, for example, the Pacific Gas and Electric Company (PG&E) in northern California owned, controlled, and operated an integrated system of generation, transmission, and distribution facilities serving an area of about 37,000 square miles. Transmission lines stretched over distances of more than 100 miles and the company generated power using both hydroelectric plants in the Sierra Nevada and oil-fired generating stations located close to consumption centers in the Bay Area.⁶

Nor was system-building entirely confined to areas served by individual firms. Over the years, electric utilities throughout the United States built connections between their systems, making it possible for firms serving different locales to exchange power with one another under a variety of sale and contracting arrangements. Nevertheless, electric utility companies during the early and mid-twentieth century largely functioned as vertically-integrated enterprises, owning and independently operating their own generation, transmission, and distribution facilities. Although the enterprises were larger and tended to enjoy securer monopolies over distribution areas than in earlier years, forms of market discipline also persisted.

Because electric utilities could not store significant amounts of power for future use, maintaining the ratio of average to peak consumption (load factor) at a high level was of critical importance for utilities to obtain a high level of remuneration from their increasingly

⁵ For a lucid contemporary description of technological developments in the electric utility industry concentrating on the period 1910-1927; see George Wittig, "Technical Developments," in Bureau of the Census, *Census of Electrical Industries 1927: Central Electric Light and Power Stations* (Washington, D.C., 1930), 82-92.

⁶ Jacobson, *Ties that Bind*, 95-97; Thomas P. Hughes, *Networks of Power: Electrification in Western Society* (Baltimore, Md., 1983), 278.

large-scale and expensive capital facilities. To balance the nighttime demand for illumination and increase their load factor, electric utility firms began to make vigorous efforts to encourage use of electricity for household tasks and also began to compete more aggressively in the markets for industrial power and traction. In developing these latter markets, electric companies faced competition from potential purchasers who were also capable of generating their own electricity and sometimes found it economical to do so. To succeed, electric utility firms had to provide high quality, reliable service, and to design their rate structures in such a way as to set prices low in off-peak markets with high demand elasticities.⁷

Nevertheless, the politics of electric utility ownership and regulation could be highly contentious. Private electric utility firms came under criticism for charging consumers excessively high prices, for exercising undue influence over governmental decision-making, and for not investing in facilities needed to fulfill economic development or other public goals. As the best means of addressing such problems, some advocated outright government ownership of electric utilities. Calls for government ownership were particularly well-received in California and other Pacific coast states, with municipal governments in Los Angeles, Sacramento, and Seattle all developing their own government-owned electric utility systems between 1900 and 1950. Strong calls for municipal ownership also emerged in San Francisco, although distribution of electricity in that city remained in private hands.

To varying degrees in Seattle, Los Angeles, and other cities in which successful municipal ownership movements emerged, concerns with democratic government and undue political power on the part of private utility firms played a part in driving calls for change. At the same time, civic leaders and influential local business elites viewed government ownership largely as a means to gain access to enhanced development of hydro-power resources, believed essential to economic development.⁸ Throughout the United States, however, even on the west coast, private ownership survived in most locales and state regulation emerged as the predominant form of government involvement.

By 1935, regulatory commissions possessing the authority both to limit rates charged by private utility firms and to protect the enterprises against duplicative competition were in place in the District of Columbia and 37 states, including California. At least in part, the trend can be

⁷ Jacobson, *Ties That Bind*, 77-83.

⁸ Accounts of events in Los Angeles and Seattle can be found in Jay Brigham, *Empowering the West: Electrical Politics Before FDR* (Lawrence, Kans., 1998), 96-142. Events in Seattle and San Francisco are also described in Jacobson, *Ties That Bind*, 93-128. For a brief account of Sacramento, see Sacramento Municipal Utility District website, <http://www.smud.org/about/facts/history.html>; accessed 27 Jan. 2004.

understood as a product of Progressive Era faith in apolitical administration and in the uses of professional expertise to reconcile public and private interests. At the same time, leading utility executives believed that credible state regulation would protect their firms against what they believed to be extortion by corrupt municipal officials, stave off calls for outright municipal ownership, and limit threats presented by duplicative competition.

At the national level, in the spring and summer of 1907, this convergence of views was reflected by the issuance of two reports advocating state regulation: one by the National Civic Federation (an organization in which reformers, academics, and business leaders all played important roles) and the other by the Committee on Public Policy of the National Electric Light Association, the trade association of the electric utility industry. The National Civic Federation report advocated regulation as a means of both preventing utilities from abusing their monopoly positions and of enhancing good government. With elected municipal officials no longer awarding franchises or setting utility rates, the reformers hoped utility firms would have less incentive to improperly influence political decision-making. From an industry perspective, the National Electric Light Association (NELA) report supported regulation as a means for utilities to escape threats posed by municipal ownership initiatives, more hostile regulation by city officials, and duplicative competition.⁹

In California, such episodes as a San Francisco gas pricing scandal in which 15 of 16 members of the city's Board of Supervisors accepted bribes from PG&E in return for moderating promised rate reductions prompted some Progressive reformers to support state utility regulation as a means of reducing corruption and promoting good government.¹⁰ Led by Governor Hiram Johnson, such reformers hoped that state regulation would eliminate the corruption arising from utility involvement in politics, while preventing both monopoly exploitation and unfair rate discrimination by utility firms. As in other states, executives of major electric and gas utility firms also threw their support behind the reform. In 1910, PG&E, the Pacific Lighting Company, and the Los Angeles Gas and Electric Company set up committees to lobby the state legislature for the imposition of state regulation. A reflection of the strength of this political coalition between Progressive reformers and utility firms, the Public Utilities Act extending Railroad Commission jurisdiction to electric utilities passed both houses of the California Legislature by unanimous vote on November 28, 1911.¹¹

⁹ Douglas Anderson, *Regulatory Politics and Electric Utilities* (Boston, 1981), 56.

¹⁰ Walton Bean, *Boss Ruef's San Francisco* (Berkeley, Calif., 1952), 89, 90, 193, 197.

¹¹ Mansel Blackford, *The Politics of Business in California* (Columbus, Ohio, 1977), 86-89.

In practice, state regulation in California and elsewhere generally impinged little on either the structure of the electric utility industry or decision-making by private electric utility firms. As in the past, decisions as to construction and operation of system facilities and service quality remained in the firms' hands. Nor, despite "rate-of-return" rhetoric, did regulators seek to tightly constrain profits earned by electric utility firms. The California Public Utility Commission's dealings with PG&E during the 1920s were a typical example.

Based on an elaborate 2-year investigation, the Commission placed a valuation on the physical property of the company in 1923 of \$109,724,000, which was about a third less than the \$170,711,000 claimed by the firm. The Commission ordered rate cuts amounting to only about 10 to 12 percent, however. As it turned out, company profits actually increased following the rate cut, because of growth in demand and declines in cost of production. Despite this increase, the Commission did not find it necessary to order additional rate cuts in the years that followed so as to constrain the utility's rate of return to a given percentage of its physical valuation.¹²

Weaknesses in State Regulation and the Public Utility Holding Company Act of 1935. Looseness in state regulation did not escape the attention of industry critics and government ownership advocates during the 1920s and early 1930s. Problems cited by critics of regulation included inadequate staffing of regulatory commissions, lack of jurisdiction over wholesale interstate power sales, and obstacles presented by judicial intervention. Changes in industry structure, according to critics, magnified the effects of such gaps and weaknesses in regulatory arrangements.

The rise of large utility holding companies represented a particular concern. Rather than merging local utilities into regionally-integrated systems, as did PG&E in California, many of the holding companies controlled scattered collections of utility firms that continued to operate independently of one another. Furthermore, many of the enterprises were structured by managers and financiers in baroque ways designed to channel enormous profits to a relatively few equity holders perched on top of highly leveraged financial pyramids.¹³

¹² "Pacific Gas and Electric Rates to be Reduced" *Electrical World* (Jan. 6, 1923); "Six Month's Gain in Business Offsets Rate Decrease" *Electrical World* (4 Aug. 1923).

¹³ A Twentieth Century Fund report on the electrical utility industry summarized the opportunities for abuse as follows: Subsidiary management and construction companies provided opportunities, which certain holding companies were not loath to take advantage of, to drain considerable sums from operating companies into the pockets of a few people who controlled the holding companies. Contracts with operating companies were usually secret, monopolistic, and outside the control of state commissions. The holding company, therefore, provided a means

At the same time, visionaries such as William S. Murray, Morris Cooke, and Gifford Pinchot, among others, proposed strong government action to further extend distribution systems to rural areas and to spur development of regionally-integrated electric utility networks far larger in scale than most privately-owned systems of the day. From this perspective, holding company assemblages of scattered utility enterprises in different parts of the country represented a kind of bad parody of regional development and stood in the way of more rational schemes of consolidation. Critiques of weaknesses in state regulation and private utility development gained further political traction with the onset of the Great Depression in 1929 and with Franklin Delano Roosevelt's overwhelming victory in the presidential election of 1932.

The Great Depression brought down the more fragile and highly leveraged holding company structures. Many small investors, including those enticed by assorted utility customer ownership campaigns, were wiped out and deeply embittered as a consequence. Reports by the Federal Trade Commission criticizing financial abuses by holding companies and media exposés of industry propaganda efforts contributed to the industry's public relations problems.¹⁴ The Roosevelt administration used the political openings thus created to expand the powers of the federal government to close gaps in state regulation and to break up the holding companies.

The Federal Power Act and the Public Utility Holding Company Act of 1935 gave the Federal Power Commission authority to regulate wholesale prices for electricity marketed across state lines, and the Securities and Exchange Commission authority to regulate holding companies' issue of securities, to order them to simplify their corporate structure, and to require service organizations to serve operating companies at cost. Most important, the law mandated outright dismemberment of holding companies that did not serve geographically unified areas. The law set forth the "single integrated public-utility system" as the basic unit of industry operation, mandating that each holding company "take such action as the [Securities and Exchange Commission] shall find necessary to limit...operations to a single integrated public utility system, and to such other businesses as are

whereby the benefits of large-scale management could be diverted from stockholders and consumers to those in control. Furthermore, it enabled relatively few people to obtain control of vast properties. See The Twentieth Century Fund, *Electric Power and Government Policy* (New York, 1948), 34.

¹⁴ For a biting and entertaining contemporary exposé of utility industry propaganda drawn from documents compiled by the Federal Trade Commission, see Ernest Gruening, *The Public Pays: A Study of Power Propaganda* (New York, 1931).

reasonably incidental or economically necessary or appropriate to the operations of such integrated public-utility system.”¹⁵

Nor were changes confined to the private utility industry. In sharp contrast to his Republican predecessors, President Roosevelt also supported government ownership initiatives as means to bring electric utility service to rural areas and as regional development tools. During his administration, for example, the Tennessee Valley Authority was established, and the Army Corps of Engineers and the Bureau of Reclamation developed large-scale water and power projects on the Columbia River in the Pacific Northwest, the Central Valley of California, and other locales.

Attacked as radical extensions of federal authority, Roosevelt-era dismemberment of the holding companies and expansion of government ownership in the electric utility industry attracted enormous controversy. Viewed in retrospect, however, the continuities are equally if not more striking. Although the Public Utility Holding Companies Act of 1935 mandated major changes in utility industry financial structures and holding company arrangements, the act was very conservative, mostly drawing the line at intervening in the affairs of the individual enterprises actually providing service. Indeed, at the heart of the legislation lay the principle that vertically integrated and operationally unified enterprises should not be broken up. For all of the *sturm* and *drang* of government ownership initiatives during the 1930s, the bulk of the electricity consumed in the United States at decade’s end still came from privately-owned utility firms.

In other respects, as well, development of the electric utility industry continued along more or less established paths. While demand for electricity did drop during the early years of the Depression, the tide of electrification in both industry and households was still clearly running extremely strong despite the general economic downturn. Indeed in contrast to almost every other sector of the economy, in 1939 electricity output was substantially higher than it had been 10 years earlier. Economic good times after World War II brought yet more growth, with consumption of electricity increasing at an average rate of almost 8 percent per annum from 1945 through 1965.

The Electric Utility Industry under Strain. After 1965, many of the technological, economic, and political factors underlying traditional growth paths in the electric utility industry began to shift. Technologically, the sort of incremental increases in steam temperatures and pressures and improvements in generator and turbine design that had brought about steady reductions in fuel consumption per kilowatt hour for

¹⁵ Federal Power Act of 1935 (49 Stat. 838, 847-854) 26 Aug. 1935. Power Committee and Power Survey Research Staff, Twentieth Century Fund, *Electric Power and Government Policy* (New York, 1948), 43. Public Utility Holding Company Act of 1935 (49 Stat. 803, 820), (26 Aug. 1935).

more than 50 years in coal-and-oil fired generating plants finally began to be played out after 1965.¹⁶ Efforts to lower cost through exploitation of scale economies also began to run into trouble, with many large units furnishing power far less reliably than expected.¹⁷ Nor did nuclear power turn out to be the panacea many hoped for during the period. As with conventional thermal plants, rapid scaling up made for unexpected difficulties in ensuring reliable operation of nuclear facilities.¹⁸ During the 1970s, inflation and high real interest rates magnified both the costs of meeting changing safety and environmental standards and the financial consequences of delays in construction of the already highly capital intensive facilities.¹⁹

Sharp spikes in fuel prices and supply interruptions during the energy crisis years of the 1970s and early 1980s and subsequent declines during the years that followed further whipsawed the industry. During the energy crisis years, utility managers and regulators made decisions concerning plant investment and other matters based on assumptions that fuel prices would continue to remain high and that shortages would recur. If it was believed that fossil fuels prices would continue to rise, for example, continued investment in a nuclear plant could appear to make economic sense to a utility firm even as the costs of the facility skyrocketed. Similarly, entering into long-term “take-or-pay” contracts for natural gas in which utilities committed themselves to pay for set quantities of gas at a set price could appear to make sense in a context in which it was believed that prices would rise and scarcities recur in the future. After energy prices fell in the early 1980s, however, such investments and contractual arrangements (“stranded costs” in industry parlance) constituted heavy burdens for some utility firms and their customers in many parts of the country, including California.

The ideological and political terrain also shifted. During the first decades of the twentieth century, regional development visionaries criticized private utility firms for insufficient investment in large hydroelectric dams or other facilities believed necessary for electric utility

¹⁶ Richard F. Hirsh, *Technology and Transformation in the American Electric Utility Industry* (Cambridge, U.K., 1989), 4.

¹⁷ Overall, during the 1960s and 1970s, larger generating units (greater than 600 MW) were substantially less reliable than their smaller counterparts greatly raising costs of operation. See Hirsh, *Technology and Transformation in the American Electric Utility Industry*, 96. Discussions of reliability problems in newer and larger generating units can also be found in The Federal Power Commission, “The 1970 National Power Survey” Part 1 (Washington D.C., 1971) 1-5-10, 1-5-11, 1-16-9.

¹⁸ Charles Komanoff, *Power Plant Cost Escalation: Nuclear and Coal Capital Costs, Regulation, and Economics* (New York, 1981), 249.

¹⁹ For a detailed account of such a set of events in the case of the Shoreham nuclear plant on Long Island, see David P. McCaffrey, *The Politics of Nuclear Power: A History of the Shoreham Nuclear Power Plant* (Dordrecht, 1991).

development to realize its full potential for social and economic change. Electric utilities, as discussed, were quite aggressive in exploiting economies of scale and scope. However, the cry by such critics was largely for “more” and “bigger.”

During the 1960s and 1970s, by contrast, increasing numbers of people came to believe that sustainable improvements in human welfare and environmental well-being could best be realized not by increasing use of electricity, but by tapping such renewable and nonpolluting resources as the sun and the wind and by enhancing the efficiency with which all forms of energy were utilized.²⁰ Some alternative energy advocates also viewed development of small-scale solar, wind, and other renewable energy resources as desirable on social and political grounds. For some of the more romantic, individual and community development of such systems represented means to strike back against the impersonality of both markets and bureaucracies, build community, and gain economic empowerment. Think, at least for those Americans of a certain generation, of the *Whole Earth Catalogue*.

Although a few people sought (or seek) to live entirely “off the grid,” even many advocates of community-oriented small-scale energy development did not wish to return to the world of individual generators and competing and incompatible networks that characterized the very first days of the industry. Rather, unified electric utility networks came to be seen as mechanisms for linking diverse mixes of energy producers and consumers in ways more efficient and environmentally-friendly than those afforded by traditional vertically-integrated utility firms. Signed into law by President Jimmy Carter in 1978, the Public Utilities Regulatory Act (PURPA) helped lay the groundwork for steps in this direction.

Avowed purposes of the legislation included “providing for increased conservation of electric energy, increased efficiency in the use of facilities and resources by electric utilities, and equitable retail rates for electric consumers.”²¹ In accord with its emphasis on conservation and renewable resources, the law required electric utilities to purchase power from independent “qualifying facilities” (QFs) at a price equal to the cost that would be borne by the utility in generating power itself. QFs could be co-generators of any size or plants of under 80-megawatts capacity that ran on waste products, wind, solar energy, hydropower, or other renewable resources.²²

²⁰ For a 1970 statement of this point of view, see Garrett De Bell, “Energy,” in *The Environmental Handbook*, ed. Garrett De Bell (New York, 1970), 66. See, for example, Gary Coates, ed., *Resettling America: Energy, Ecology and Community* (Andover, Mass., 1981).

²¹ Public Utility Regulatory Policies Act of 1978, 92 Stat. 3117, 3119 (9 Nov. 1978).

²² Public Utility Regulatory Policies Act of 1978, 92 Stat. 3117, 3135-3136, 3144-3147 (9 Nov. 1978). Edward Kahn, *Electric Utility Planning and Regulation* (Washington, D.C., 1988), 201.

Court challenges during the early 1980s stymied federal enforcement of these provisions, and many states were slow to stipulate prices for power purchases. Nevertheless, independent power producers accounted for about 5 percent of the country's electricity production during the early 1990s and for about half of the new generating capacity added each year. In California, state regulators established particularly favorable terms for alternative power producers and the rate of increase was even greater. By 1990, non-utility generators accounted for 51,087 (about 20 percent) of 252,355 gigawatt hours (GWh) generated in the state.²³ Although by far the largest share of the state's electricity continued to come from conventional sources, alternative energy also flourished, with non-utility production of wind power increasing from 50 GWh in 1983 to 2,418 GWh in 1990. Production of electricity from solar plants increased from 2 to 679 GWh during the same period.²⁴

Experiences under PURPA in California and other states established that electric utilities did not have to be exclusively vertically-integrated and that independent non-utility firms could cost-effectively build and operate some generating plants without impairing overall system reliability. The growth of an independent power market also helped spur technological innovation. Although they received less public attention than wind, solar, and other renewables, innovations in co-generation based on gas-turbine technology proved particularly important in this regard. By the early 1990s, gas turbine cogeneration units obtained thermal efficiencies greater than much larger conventional central station utility plants and could be installed far more quickly and easily.²⁵

At the same time, problems arose. Although independent power producers relied upon long-term contracts to ensure that their investments would be recompensed, many utilities claimed that the arrangements reduced flexibility and harmed consumers. In practice, it proved no straightforward matter to set prices for independently-generated electricity based on costs avoided by utilities in not generating the power by themselves. Such avoided-cost determinations under PURPA involved judgments concerning hypothetical future events and could be highly controversial. Even if the independents had an initial cost advantage, critics charged, declining energy prices sometimes resulted in

²³ "California Electrical Energy Generation, 1983 to 2002," California Energy Commission, July 2003.

²⁴ Ibid.

²⁵ Paul J. Joskow, "Deregulation and Regulatory Reform in the U.S. Electric Power Sector," in *Deregulation of Network Industries: What's Next?*, ed. Sam Peltzman and Clifford Winston (Washington, D.C., 2000), 126-127. For a brief discussion of combined cycle gas turbine cogeneration, see Richard Hirsh, "The Public Utility Regulatory Policies Act," at Smithsonian Institution, Powering a Generation Website, <http://americanhistory.si.edu/csr/powering/past/h4main.htm>, 3; accessed 25 April 2004.

utilities being forced to buy power at higher costs than if they had generated it themselves. In the case of California, a report by the state energy commission attributed high electricity prices during the early 1990s to both utility investment in overly expensive nuclear facilities and to “state imposed long-run fixed-price contracts ...for too much of the alternative generation ...at prices pegged to fuel price forecasts that, in hindsight, were too high.” According to the report, “those investment and regulatory decisions are major reasons why California’s IOU [investor owned utility] rates are nearly 40 percent higher than the national average.”²⁶

Some regulators and utility executives during the late 1980s and early 1990s advocated addressing such problems by writing off competition in the supply of electricity as a failure and returning to a world of regulated vertically-integrated electric-utility firms. Legislation signed into law by President George H. W. Bush in October 1992, however, took a different course. The Energy Policy Act of 1992 represented the greatest change in federal oversight of the private electric utility industry since the Federal Power and the Public Utility Holding Company acts of 1935. Those acts reinforced state regulation over electric utilities and broke up geographically dispersed holding company enterprises.

The 1992 act, by contrast, permitted utility firms to own independent power producers outside their own service areas. The law also created a whole new category of independent power producers called the exempt wholesale generator, free to sell power in wholesale markets without either the security of guaranteed utility purchases or the restrictions on size and renewable fuel use faced by qualifying facilities under PURPA. As a further step toward facilitating competition in wholesale electricity markets, the law also expanded the authority of the Federal Energy Regulatory Commission (successor agency to the Federal Power Commission) to order utilities to expand transmission service to support wholesale power transactions.²⁷

These changes set the stage for California’s experiment in electric utility restructuring during the 1990s. The politics of restructuring in California played out in highly traditional ways in certain respects, but in a rather interesting irony, pro-market ideologues, strongly supported by many business interest and groups, wrought structural change in the private electric utility industry far more radical than anything contemplated by the Roosevelt administration during the 1930s. The

²⁶ California Energy Commission, *1994 Electricity Report*, Introduction and Executive Summary (Nov. 1995), 7-8 at <http://www.energy.ca.gov/reports/ER94.html>, accessed 9 Feb. 2004.

²⁷ Paul J. Joskow, “Deregulation and Regulatory Reform in the U.S. Electric Power Sector,” in *Deregulation of Network Industries: What’s Next*, ed. Sam Peltzman and Clifford Winston (Washington, D.C., 2000), 129.

results of the experiment played out quite differently than both advocates, and even many opponents, anticipated.

Restructuring California's Electric Utility Industry

Working Out the California Restructuring Model. Following passage of the Energy Policy Act of 1992, both federal regulators in Washington, D.C., and state regulators in California enthusiastically embraced competitive and market-oriented approaches to addressing electric utility issues. At the Federal Energy Regulatory Commission (FERC), decision-makers took a number of steps intended to open up wholesale power markets to increased competition. The most important of these came in April 1996 with passage of Order No. 888, "requiring all public utilities that own, control or operate facilities used for transmitting electric energy in interstate commerce to have on file open access non-discriminatory tariffs that contain minimum terms and conditions of non-discriminatory service." The commission's avowed goal was to "remove impediments to competition in the wholesale bulk power marketplace and to bring more efficient, lower cost power to the Nation's electricity consumers."²⁸

In California, leading figures in state government during the 1990s professed strong beliefs in free market ideals and strongly supported steps to open the electric utility industry to even greater competition. Economist Richard Bilas, for example, served as official economist at the California Energy Commission from 1987 through 1995 and for a brief period later in the decade served as president of the California Public Utilities Commission. A proud member of the free-market oriented classically liberal Mont Pelerin Society (which included among its members such luminaries as Milton Friedman and F. A. Hayek), Bilas authored newspaper columns on such subjects as "Life without Government Regulation."²⁹ Although disagreeing at times with the methods of implementation, California Public Utilities Commission members Daniel Fessler, Jessie Knight, and P. Gregory Conlon also shared

²⁸ 75 FERC 61, 080, Order No. 888, Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities: Recovery of Stranded Costs by Public Utilities and Transmitting Utilities (24 April 1996), 1. A discussion of preceding case-by-case steps in this direction taken by the commission can be found on pages 30-42.

²⁹ Commissioner Richard A. Bilas, biography, ca. Nov. 1998 at <http://web.archive.org/web/19981202061122/www.cpuc.ca.gov/commissioners/bilas/bilas.htm>; accessed 12 March 2004. Commissioner Richard A. Bilas, biography, ca. June 2002 at <http://www.energy.ca.gov/commission/commissioners/bilas.html>; accessed 14 March 2004. For a brief statement of the Mont Pelerin Society's principles, see <http://www.montpelerin.org/aboutmps.html>; accessed 30 April 2004.

a dedication to market-oriented reform of the state's electric utility industry.³⁰

The decision-makers acted in accord with this perspective. On February 3, 1993, the California Public Utilities Commission Division of Strategic Planning issued a report entitled "California's Electric Services Industry: Perspectives on the Past, Strategies for the Future." This staff report concluded that "[m]ounting competition among energy service providers and increased pressure to allow consumers to benefit from competition through greater choice will shape the future structure of the [electric utility] industry." Regulatory reform was needed, according to the report, "in order to ensure that California is well positioned to benefit from a competitive future."³¹ In April of the following year, the California Public Utilities Commission instituted formal rulemaking, sketching out broad goals for a radical restructuring of the state's electricity market.

The April 1994 rulemaking declared that "[c]ommand-and-control and cost-of-service regulation and government central planning are fundamentally at odds with and ill-suited to, the increasingly competitive electric services industry confronting California and its utilities...."³² High electricity prices represented a particular concern. According to the California Public Utility Commissioners, their exploration of alternatives to the current regulatory framework was prompted by the "distressing fact" that California's electric utilities charged some of the highest prices in the country.³³ The commissioners sought instead to "establish a new framework that does a considerably better job of exerting downward pressure on the prices California's residential and business consumers must pay for investor-owned electric services."³⁴ Elements of the promised new framework included direct access for California consumers to competitive generation suppliers, continued regulation of those

³⁰ Commissioner P. Gregory Conlon biography, Feb. 1999 at <http://web.archive.org/web/19990203205133/www.cpuc.ca.gov/commissioners/conlon/conlon.htm>; accessed 12 March 2004. For brief references to Fessler and Knight, see Arthur J. O'Donnell, *Soul of the Grid: A Cultural Biography of California's Independent System Operator* (New York, 2003), 13-14.

³¹ Division of Strategic Planning, California Public Utility Commission, *California's Electric Services Industry: Perspectives on the Past, Strategies for the Future* (3 Feb. 1994), 140 as excerpted in California Public Utilities Commission, "Order Instituting Rulemaking on the Commission's Proposed Policies Restructuring California's Electric Services Industry....," Decision No. 95-12-063 (20 Dec. 1995) as modified by Decision No. 96-01-009 (20 Jan. 1996), *1996 Cal. PUC Lexis 28*, Appendix B, Detailed Procedural History, 3.

³² California Public Utilities Commission, Order Instituting Rulemaking and Order Instituting Investigation of Proposed Policies Restructuring California's Electric Services Industry and Reforming Regulation, Rulemaking 94-04-31, Investigation 94-10-032, *1994 Cal. PUC LEXIS 336* (20 April 1994), 3.

³³ *Ibid.*

³⁴ *Ibid.*

elements of transmission and distribution systems where natural monopoly persisted, and replacement of regulation with the “discipline of market forces” in those elements of the system (primarily generation) where competition was superior.³⁵

Over the next year and a half, the California Public Utilities Commission proceeded to work out further market design details in consultation with major interest groups and stakeholders. These included the state’s major privately-owned utility firms (PG&E, the Southern California Edison Company, and the San Diego Gas and Electric Company), groups representing large consumers and manufacturers such as the California Manufacturers Association, and groups representing independent energy producers. Environmental groups and groups representing small consumers, such as TURN (Toward Utility Rate Normalization) participated in discussions and hearings at times, but played a more peripheral role than did the larger stakeholders.

By this time, California’s private utility firms had accepted that some form of industry restructuring was inevitable and even foresaw the potential for new business opportunities. At the same time, the utilities sought recompense for stranded costs arising from investments in uneconomic nuclear plants and from contractual commitments to purchase high-priced power from independently owned qualifying facilities under PURPA. Large consumers, by contrast, believed that they could obtain electricity from other sources at prices far lower than those charged by California’s privately-owned electric utilities and had an interest in paying as little as possible for stranded cost recovery.

Disagreements as to market design also arose that cut across these lines of division. One approach advocated by the Southern California Edison, the San Diego Gas and Electric Company, and a majority on the California Public Utilities Commission provided for the establishment of a “Poolco” independent of the state’s existing electric utility firms. The new enterprise would “serve as a central forum for all energy supplies to compete against each other to meet California’s electric demand.” Under the new regime, “California’s investor owned utilities would be functionally separated into transmission, distribution, and generation functions,” and each “utility’s transmission services would be open on a non-discriminatory basis to all...generators,” thus ensuring that “all generators can fairly compete against each other to meet California’s energy needs.”³⁶

PG&E, large electricity consumers, and Commissioner Jessie Knight, by contrast, proposed that electricity consumers be free to contract

³⁵ Ibid., 13-14.

³⁶ Commissioner P. Gregory Conlon’s Comments, “Order Instituting Rulemaking on the Commission’s Proposed Policies Restructuring California’s Electric Services Industry...,” Decision No. 95-05-045 (24 May 1995), *1995 Cal. PUC Lexis* 429 at 3.

directly with generators and that any participation in power exchanges or pooling arrangements be voluntary. “[P]roceeding down the path of a government-mandated Poolco, in which market participants have no choice but to participate,” Knight warned, “simply places California at too great a risk.” Although the controversy grew heated at times, the extent of the disagreement should not be exaggerated. Knight, as well as the other commissioners, strongly supported greater competition in the electric utility industry and believed that transmission, generation, and distribution functions needed to be separated, that operation of the transmission system needed to be independent of the utilities so as to ensure fair market access, and that provision needed to be made for California’s existing electric utility firms to recover a large proportion of their stranded costs.³⁷

On September 14, 1995, Southern California Edison, the Independent Energy Producers (an organization representing non-utility generators), the California Large Energies Consumers Association, and the California Manufacturers Association announced a memorandum of understanding, melding together elements of both the pool and direct access structures. The proposal provided for both creation of a power exchange on which electricity would be purchased or sold and for gradual implementation of arrangements under which retail customers would be able to contract for power directly from generators. An independent system operator would be responsible for operating the transmission system, and for arranging for transmission of electricity both purchased on the power market and obtained through direct contracting.³⁸

The California Public Utilities Commission accepted the proposal and on December 20, 1995, issued a decision providing for a restructuring of the state’s electric utility industry in the manner prescribed. The commissioners reaffirmed their “single minded dedication” to strategies and mechanisms that would place “sustainable, downward pressure on the cost of electricity” and their preference for “competition and market mechanisms” as the best means of realizing this goal.³⁹ In accord with

³⁷ Commissioner Jessie Knight, “Customer Choice Through Direct Access: Charting a Sustainable Course to a Competitive Electric Services Industry,” in “Order Instituting Rulemaking on the Commission’s Proposed Policies Restructuring California’s Electric Services Industry...,” Decision No. 95-05-045 (24 May 1995), *1995 Cal. PUC Lexis 429* at 12-13.

³⁸ Arthur J. O’Donnell, *Soul of the Grid*, 17-19. “Order Instituting Rulemaking on the Commission’s Proposed Policies Restructuring California’s Electric Services Industry...,” Decision No. 95-12-063, 12/20/1995 as modified by Decision No. 96-01-009 (20 Jan. 1996), *1996 Cal. PUC Lexis 28*, at 26 and Appendix B, Detailed Procedural History, 6.

³⁹ California Public Utilities Commission, “Order Instituting Rulemaking on the Commission’s Proposed Policies Restructuring California’s Electric Services Industry...,” Decision No. 95-12-063 (20 Dec. 1995) as modified by Decision No. 96-01-009 (20 Jan. 1996), *1996 Cal. PUC Lexis 28*, at 2.

recommendations in the September memorandum of understanding, the commission called for vesting operation of the transmission grid and of the power market in two separate organizations, the “Independent System Operator” (ISO) and the “Power Exchange.”⁴⁰

The commissioners acknowledged that the proposed division might make for complicated coordination issues and raise transaction costs. Nevertheless, the commission opted to divide the functions on the grounds that if a single organization controlled both the transmission of electricity and operation of the Power Exchange, such an entity might use its control over the transmission system to favor, or to appear to favor, fulfillment of Power Exchange transactions over those of parties exercising their right to buy and sell electricity outside the exchange. The commission also decided that both the Power Exchange and the ISO needed to be independent of existing utility firms on similar grounds. Such independence was needed, according to the commissioners, in order to prevent California’s existing electric utility firms from favoring their own interests in either administering the market or in affording access to the transmission system.⁴¹

Under the proposed regime, individual utility firms would continue to own and maintain their own transmission facilities. However, the ISO would operate the transmission grid, and would be responsible for coordinating schedules of electricity deliveries, managing transmission constraints and congestion, and maintaining overall reliability.⁴² The Power Exchange, the commissioners envisioned, would serve as a spot market for electricity, providing a “transparent auction for generation with hourly or half-hourly price signals evident to immediate users and long-term investors.”⁴³ At the outset, California’s private utility firms would be required to purchase all of their electricity from the Power Exchange and to bid all power generated at their own plants into the market.

The Power Exchange needed to be jump-started in this way, according to the Commission, to provide a market benchmark for determining the dimension of stranded assets, to “ensure that those customers who elect to rely upon their distribution utility to procure their electric energy will receive the benefits of...competitive market prices, and [to] provide a sufficient depth to the Exchange that its market signals may be relied upon as a benchmark for choices to opt for contracts for differences or direct access arrangements.”⁴⁴ After a 5-year transitional period, however, consumers would be able to continue to purchase power from their local distribution utility, obtain electricity traded on the Power

⁴⁰ Ibid., 4.

⁴¹ Ibid., 10, 20-21.

⁴² Ibid., 10-15.

⁴³ Ibid., 4.

⁴⁴ Ibid., 17.

Exchange, or to purchase power directly from independent generating firms under long- or short-term contracting arrangements.

The commission also sought to address concerns that concentrated ownership or control of generating facilities could result in a single entity controlling “enough assets to alter the supply-demand equilibrium and [to] thus be able to increase prices by withholding generation from the market (decreasing supply).”⁴⁵ To prevent such abuses, the commission required PG&E and Southern California Edison to file plans to “voluntarily divest themselves through a spin-off or outright sale to a nonaffiliated entity of at least 50 percent of their fossil generating assets.” Such a divestiture, the commission hoped, would “resolve many, if not most, of the market power problems identified by the Department of Justice and FERC and allow for a competitive market.”⁴⁶

In sum, the California Public Utility Commission in its December 20, 1995, ruling took a variety of steps intended to prevent California’s private electric utility firms from using their existing dominance over electricity generation, transmission, and distribution to prevent the emergence of truly competitive electricity markets in the future. At the same time, the commission viewed with great solicitude the utility firms’ claims that they deserved to be guaranteed compensation for losses on investments that might prove unremunerative in the competitive market envisioned.

“Many of today’s high costs,” according to the commission, “result from past regulatory promises ...regarding the timing of the recovery of depreciation and taxes, past requirements to diversity sources of power that in hindsight have high costs, and costs incurred by utilities (most notably associated with QFs and nuclear power) that were reviewed and deemed reasonable when occurred.”⁴⁷ To enable utilities to recover a large proportion of such stranded costs during the transition to full competition, the commission called for a mandatory competitive transition charge to be levied on all consumers.

Under the proposed arrangement, ratepayers would bear most of the burden of recouping utility firms’ stranded costs.⁴⁸ At the same time, the commissioners also expressed concern that recovery of transition costs could frustrate the goal of lowering prices paid by consumers for electricity “because it is possible that the surcharge will exceed price decreases in a given year, resulting in higher electricity-related costs for consumers.” To prevent this outcome, the commissioners stated, “we will cap transition

⁴⁵ California Public Utilities Commission, “Proposed Policies Governing Restructuring California’s Electric Services Industry...,” Decision No. 95-12-063 (20 Dec. 1995), *1995 Cal. PUC LEXIS 2d 1*, at 48.

⁴⁶ *Ibid.*, 49.

⁴⁷ *Ibid.*, 51-52.

⁴⁸ *Ibid.*, 51-52. 55-56.

cost recovery so that the price for electricity does not rise ...above current levels in effect as of January 1, 1996, without adjustment for inflation.”⁴⁹ *Finalizing the Plans.* In March and April 1996, California’s electric utility firms submitted plans to restructure ownership, operation, and governance along the lines demanded by the California Public Utilities Commission. As requested by the commission, both PG&E and Southern California Edison promised to divest at least half of their fossil-fueled generating plants.⁵⁰ PG&E also proposed a “comprehensive plan to accelerate the transition to greater competition and customer choice in California’s electric power supply industry.” Elements of the plan included accelerated depreciation of the company’s Diablo Canyon Nuclear Power Plant and other generation assets and a guarantee that customers’ electric prices would remain flat during a 5-year transitional period in which the cost of the facilities would be recouped. The plan, PG&E chief executive Stanley Skinner promised, “would make sure that customers aren’t on a rate roller coaster from now to 2001.”⁵¹

On April 29, 1996, California’s three major privately-owned electric utility firms jointly outlined governance and regulatory arrangements for the ISO and the Power Exchange. Under the plan, both the ISO and the Power Exchange would be nonprofit public benefit corporations governed by boards composed largely of market participants, with some public representation as well. In accord with previous suggestions by the California Public Utilities Commission, FERC would exercise regulatory jurisdiction over both the ISO and the Power Exchange, while regulation of electricity distribution would remain with the state.⁵²

With these broad agreements in place, action on electric utility restructuring largely took place in the state legislature. Under an August 1994 legislative resolution, the Public Utilities Commission was urged to refrain from issuing a final restructuring order without proper legislative

⁴⁹ Ibid., 62.

⁵⁰ “PG&E May Sell Gas-Fired Plants: It’s Part of Plan to Increase Competition,” *San Francisco Chronicle*, 20 March 1996, C-3.

⁵¹ “PG&E Calls for Accelerating Electric Industry Competition,” PG&E News Release (29 March 1996) 2 at http://web.archive.org/web/19970522073919/www.pge.com/whats_new/news/releases/latest/960329r.html; accessed 11 March 2004.

⁵² “Utilities Seek Approval of Nation’s First Comprehensive Electric Restructuring Proposals” Joint News Release, PG&E News Releases, 29 April 1996 at http://web.archive.org/web/1997052207383/www.pge.com/whats_new/news/releases/latest/960429r.html; accessed 9 Feb. 2004. California Public Utilities Commission, “Order Instituting Rulemaking on the Commission’s Proposed Policies Restructuring California’s Electric Services Industry...,” Decision No. 95-12-063 (20 Dec. 1995) as modified by Decision No. 96-01-009 (20 Jan. 1996), *1996 Cal. PUC Lexis* 28, at 14-15, 20.

consultation and involvement.⁵³ During the spring and summer of 1996, Democratic Senator Steve Peace from the San Diego area and Republican Assemblyman Jim Brulte from Rancho Cucamonga oversaw a special committee of six lawmakers from both political parties and legislative houses established to take up the questions of restructuring. The main concerns of legislators and interest groups during this period lay not with the architecture of the restructured industry but with questions of stranded cost recovery and of rate relief for large and small consumers.

For example, the Western States Petroleum Association objected to a proposed version of the restructuring law in the spring of 1996 because it imposed a competitive transition charge on large consumers, such as oil refineries, that chose to generate their own electricity or to purchase from an immediately adjacent supplier. Similarly, the Southern California Gas Company objected to the competitive transition charge being imposed on customers who switched from electricity to natural gas. TURN also opposed the proposed statute at this time, on the grounds that small consumers should be offered rate cuts as a result of restructuring rather than just a rate freeze.⁵⁴

Influential legislators of both parties also supported calls for rates to be cut for residential and small commercial customers. At a legislative hearing in August 1996, for example, Senator Peace stated to an audience of utility and large consumer lobbyists that “[u]ntil you are able to embrace a proposal that brings a benefit to residential rate payers in the form of actual rate decrease, ...we’re not going to get to the other issues.”⁵⁵ Conservative Republican Senator Bill Leonard of San Bernardino also demanded a rate cut for small consumers, stating that “I have more little dogs than big dogs in my district.”⁵⁶

In August 1996, Peace and Brulte’s joint legislative committee crafted a compromise on stranded costs, rate cuts for small consumers, and other outstanding issues in a series of marathon day-and-night meetings characterized by one lobbyist’s wife as the “Peace Death March.”⁵⁷ The committee approved the compromise by a vote of 6 to 0 on August 28, 1996. A wide range of companies and interest groups supported the compromise measure including PG&E, Independent Energy

⁵³ “Order Instituting Rulemaking on the Commission’s Proposed Policies Restructuring California’s Electric Services Industry...,” Decision No. 95-12-063 (20 Dec. 1995) as modified by Decision No. 96-01-009 (20 Jan. 1996), *1996 Cal. PUC Lexis 28*, Appendix B, Detailed Procedural History, 5.

⁵⁴ Bill Analysis, Senate Committee on Energy, Utilities, and Communications, AB 1890 as amended 8 April 1996, Hearing Date, 11 June 1998.

⁵⁵ Greg Lucas, “Electricity Deregulation Plan Draws Fire: Legislators Demand Residential Rate Cut” *San Francisco Chronicle*, 10 Aug. 1996.

⁵⁶ *Ibid.*

⁵⁷ Greg Lucas, “State Panel OKs New Utility Plan: Rates would be competitive, monopoly phased out by 2003,” *San Francisco Chronicle*, 28 Aug. 1996, A16.

Producers, the Western States Petroleum Association, and the Natural Resources Defense Council.⁵⁸ Although declining to support the measure, TURN withdrew its opposition.⁵⁹ Further action in the state legislature came swiftly. The California General Assembly approved the bill by a unanimous vote of 77 to 0 on August 30, 1996. One day later, the state Senate passed the law by a unanimous vote of 39 to 0. On September 23, 1996, California Governor Pete Wilson signed the restructuring act into law.⁶⁰

The new law did not appreciably modify earlier decisions by the industry stakeholders and the California Public Utilities Commission concerning the creation of the ISO and the Power Exchange. To appease environmental advocates and state legislator Tom Hayden, the new law provided greater support for energy conservation and alternative energy programs than originally proposed by the Public Utilities Commission.⁶¹ The law also differed in its treatment of stranded cost recovery for utilities and rate relief for consumers. The Public Utilities Commission and PG&E had proposed that consumers pay for a large proportion of utility's stranded costs for a transitional period, but that rates not be increased as a consequence.

In actuality, California's restructuring law provided for a 10 percent reduction in residential and small consumer rates beginning in 1998 and continuing until the "earlier of March 31, 2002, or the date on which the commission-authorized costs for utility generation-related assets and obligations [stranded costs] have been fully recovered."⁶² The law provided that this rate reduction would not come at the expense of the utility firms. Rather, it was to be financed through "rate reduction bonds" issued by the California Infrastructure and Economic Development Bank and backed by competitive transition charges.⁶³

Passage of the law did not completely end controversy over the stranded costs issue and rate cuts for small consumers. In November 1997, TURN, Californians Against Utility Taxes (CUT), and the Public Media Center filed a ballot initiative intended to prevent nuclear plants from being counted as stranded assets and to stop utilities from financing the rate cuts through securitization of the competitive transition charges. These organizations also filed an action in the State Supreme Court asking for a stay on the sale of the rate reduction bonds. Although the Supreme

⁵⁸ Bill History, A.B. No. 1890 at http://www.leginfo.ca.gov/pub95-96/bill/asm/ab_1851-1900/ab1890_bill_history.html; accessed 4 Feb. 2004.

⁵⁹ Greg Lucas, "State Panel OKs New Utility Plan: Rates Would be Competitive, Monopoly Phased Out by 2003," *San Francisco Chronicle*, 28 Aug. 1996, A16.

⁶⁰ Bill History, A.B. No. 1890 at http://www.leginfo.ca.gov/pub95-96/bill/asm/ab_1851-1900/ab1890_bill_history.html; accessed 4 Feb. 2004.

⁶¹ Arthur J. O'Donnell, *Soul of the Grid*, 24-25.

⁶² California Assembly Bill No. 1890 (24 Sept. 1996), 34.

⁶³ *Ibid.*, 53-56.

Court denied the stay, and the bonds were sold in January 1998, backers of the initiative succeeded in having it placed on the November 1998 ballot as Proposition No. 9.⁶⁴

The proposition's backers articulated their goal as one of advancing rather than halting California's transition to a competitive electricity market. "Instead of creating a fully competitive market for electricity," the initiative stated, California's restructuring law "unfairly favors existing electric utility monopolies by forcing customers to pay rates more than 40 percent higher than the market price in order to bail out utilities for their past bad investments."⁶⁵ According to TURN Executive Director Nettie Hoge, Proposition No. 9 would actually enhance competition in California's electric utility market by making it possible for new entrants to compete with established utilities without the burden of hefty competitive transition charges. According to Hoge, the "marketplace should be more robust as a result of the fact that the [competitive transition charge] will not be fully recovered. This gives new entrants new opportunities."⁶⁶

The state's major utility firms strongly opposed the measure, as did both major gubernatorial candidates, a large array of other groups, and the state's major newspapers. They claimed that the measure would halt the movement toward utility competition, endanger public benefits guaranteed under the existing restructuring law, and potentially make state taxpayers liable for paying off the rate reduction bonds.⁶⁷ The proposition's opponents also outspent its supporters by a margin of about 30 to 1.⁶⁸ At the election held in November of 1998, California voters defeated Proposition No. 9 by a vote of 5,710,140 to 2,064,623.⁶⁹ By this

⁶⁴ "Ballot Initiatives in California & Massachusetts: Nov. 1998" at Smithsonian Institution Powering a Generation Website, <http://americanhistory.si.edu/csr/powering/dereg/current4.htm>; accessed 2 Feb. 2004.

⁶⁵ Proposition 9, Full Text of the Proposed Law, California Secretary of State at <http://vote98.ss.ca.gov/VoterGuide/Propositions//9text.htm>; accessed 20 Feb. 2004.

⁶⁶ Nettie Hoge, "Pro: Proposition 9 Promises Lower Rates and Benefits the Economy with Real Competition," *Leapnext* (July and Aug. 1998) Guest Perspective at <http://www.leapnext.com/default.cfm?exec+Article.View&ArticleID=2426>; accessed 7 March 2004.

⁶⁷ Allan Zaramberg, "Con: Proposition 9 Promises Higher Rates and Higher Taxes," Guest Perspective at <http://www.leapnext.com/default.cfm?exec+Article.View&ArticleID=2426>; accessed, 7 March 2004. "Prop. 9 Will Delay Electric Rate Reform," *San Francisco Chronicle*, 6 Oct. 1998, A 20. "No on Proposition 9: Too Risky to Rewrite Rules of Electricity Restructuring," *Sacramento Bee*, 5 Oct. 1998, B6.

⁶⁸ Rebecca Smith, "Money Power: Utilities Bankroll 'No on 9' Campaign," *San Francisco Chronicle*, 17 Oct. 1998.

⁶⁹ "Ballot Initiatives in California & Massachusetts: Nov. 1998 at Smithsonian Institution Powering a Generation Website, <http://americanhistory.si.edu/csr/powering/dereg/current4.htm>; accessed 2 Feb. 2004.

time, the restructuring of California's electric utility industry was well under way.

Premises and Expectations of Restructuring. For all of the controversies, the question of whether or not California should move to a retail and wholesale electricity market attracted remarkably little public debate or even attention over the years from 1992 through 1998. Although consumer groups such as TURN avowed skepticism, no influential party explicitly took issue with the broad vision of an electric services marketplace in which independently-owned generating firms enjoyed open access to utility transmission and distribution networks, firms competed to offer the best price and service terms, and consumer choice reigned. Instead, debate largely focused on how to manage the transition and on if (and how) utility firms should be recompensed for stranded costs. Indeed, even Proposition No. 9 supporters did not attack the notion of competitive electricity markets per se, rather they argued that stranded costs provisions impeded emergence of a truly competitive market and forced consumers to bear the burden of utilities' own investment mistakes.

In large part, the restructuring of California's electric utility industry took the form that it did because of bargaining over the stranded cost issue. In particular, the utility firms acceded to restructuring and a cap on consumer rates during a transitional period in return for all consumers (even those who switched to alternative suppliers) bearing the burden of stranded cost recovery. This bargain was reached in a context of virtually flat demand for electricity, generating capacity that exceeded demand, and attribution of the high costs of electricity to a legacy of unduly expensive investments in both nuclear and alternative energy generating capacity.⁷⁰ For the future, informed observers projected declines in California electricity costs during the late 1990s and early 2000s, even in the absence of restructuring, due to "reduced prices paid to qualifying facilities...lower natural gas prices and reduced depreciation expenses for nuclear plants."⁷¹

The more thoughtful advocates of restructuring believed that the main benefits of a greater role for markets in the provision of electricity lay not in immediate price cuts for consumers (which were expected to occur

⁷⁰ California electricity consumption amounted to 227,748 million KWh in 1990 and 230,990 million kWh in 1996, an increase of only about 1.5% for the entire 6-year period. California Energy Commission, "California Energy Consumption by Sector," (2 Oct. 2002) at http://www.energy.ca.gov/electricity/consumption_by_sector.html. For a reference to excess generating capacity in western states at this time, see Congressional Budget Office, *Causes and Lessons of the California Electricity Crisis* (Washington, D.C., Sept., 2001), 4.

⁷¹ California Energy Commission, *1994 Electricity Report*, Introduction and Executive Summary, Nov. 1995, 6 at <http://www.energy.ca.gov/reports/ER94.html>; accessed 9 Feb. 2004.

in any case) but in avoiding the problems of overinvestment in generating facilities which had raised prices in the past. In a restructured market, they promised, “electricity producers will not build generation facilities unless demand for electricity shows more facilities are needed.”⁷² More broadly, the architects of California’s restructuring plan believed that market mechanisms rather than “command-and-control regulation” would afford a powerful and reliable means of attaining “sustainable, downward pressure on the cost of electricity” for both the immediate future and the longer term.

Utility executives also shared the view that market prices for electricity could be expected to fall as markets opened up. In a 1997 speech before the Commonwealth Club in San Francisco, for example, Robert D. Glynn Jr, the chief executive of PG&E, described initiatives to open up electric utility markets to increased competition in California and elsewhere as presenting a “huge opportunity for consumers to lower their energy costs, [and] a huge opportunity for energy companies to prosper as national energy providers.”⁷³ In February 1998, Glynn articulated his firm’s strategy to stockholders as one of “divesting power plant assets currently owned by our California utility where our returns would be unacceptably low under state regulation, and ...investing in power plant assets through [another subsidiary] in regions with attractive markets where we can create shareholder value as an unregulated plant owner and operator.”⁷⁴

In fact, PG&E and California’s other major privately-owned utility firms chose to divest a far larger proportion of their generating capacity than the 50 percent mandated by state regulators. By May 1999, PG&E, Southern California Edison, and the San Diego Gas & Electric Company had sold all of their fossil fuel generating plants in California.⁷⁵ During the year that followed, California’s privately-owned electric utilities owned only 15 percent of the generating capacity in the state.⁷⁶ Although the firms retained some nuclear, hydro, and out-of-state generating capacity,

⁷² California Public Utilities Commission, “How Electric Industry Change Will Affect You” March 1997 at http://web.archive.org/web/19971211090640/www.cpuc.ca.gov/electric_restructuring/restruc-plain.htm; accessed 9 Feb. 2004.

⁷³ Robert Glynn Jr., “Change, Choice, and Competition in the Energy Industry: What’s in it for you?” Remarks before the Commonwealth Club of California, 24 Oct. 1997, p. 2 at http://www.pge-corp.com/news/speeches/102497_sp.html accessed 9 March 2004.

⁷⁴ “Question & Answer,” Attached to PG&E Corporation *Annual Report, 1997* at <http://www.pgecorp.com/financial/reports/1997annualreport/letter.html>; accessed 19 Jan. 2004.

⁷⁵ California Energy Commission, “Power Plant Divestiture in California,” at <http://www.energy.ca.gov/electricity/divestiture.html>; accessed 10 March 2004.

⁷⁶ Michael Kahn, Chairman Electricity Oversight Board and Loretta Lynch, “California’s Electricity Options and Challenges: Report to Governor Gray Davis,” (Summer 2000), 6.

their lot (and that of their consumers) now lay in the hands of California's restructured electricity market.

California's Electric Utility Market in Action

The First Two Years of Restructuring. California's new power market opened on March 31, 1998. Under the new regime, the Power Exchange operated day-ahead and day-of-market power auctions, with all bidders receiving the same market-clearing price.⁷⁷ The Power Exchange, in turn, submitted schedules based on the winning bids to the ISO, which scheduled dispatch of both these deliveries and those arranged under bilateral contracts. The ISO then performed its own auctions for "ancillary services," generation capacity that might be needed to cope with sudden fluctuations in demand or other unexpected events such as the downing of a transmission line or a power plant outage. Reflecting its commitment to market mechanisms, the ISO even employed a congestion management market to allocate transmission capacity in situations in which demand for this resource exceeded supply.⁷⁸

Recall that under the terms of California's restructuring bargain utilities acceded to modest rate cuts in the retail price of electricity in return for retail and small commercial consumers not fully sharing in the benefits of the even lower cost electricity expected to be available on the wholesale markets from competitors. For about 2 years, these expectations were fulfilled. In 1999, for example, PG&E obtained power on the wholesale markets at an average cost of 3.7 cents/kWh, a rate far cheaper than the approximately 5.4 cents/kWh charged to consumers under California's restructuring law. Electricity obtained on the wholesale markets also cost the firm less than three-fifths of the 6.3 cents/kWh cost of power obtained under long term contracts from QFs.⁷⁹ Based on interviews with a diverse array of marketplace participants, observers, and

⁷⁷ If on 15 June 1998, to take a hypothetical example, California's three privately owned utilities anticipated a total of 1,500 MWh of demand for the period 1:00 to 2:00 on the afternoon of the following day, and one bidder offered 1,000 MWh at \$10/MWh, a second bidder offered 500 MWh at \$30/MWh, and a third bidder offered 500 MWh at \$50/MWh; then the first two bids would be accepted with both bidders receiving the \$30/MWh price offered by the higher of the two.

⁷⁸ Roger E. Bohn, Alvin K. Keveorick, and Charles G. Stalon, Market Monitoring Committee of the California Power Exchange, *Second Report on Market Issues in the California Power Exchange Energy Markets*, prepared for the Federal Energy Regulatory Commission (9 March 1999), 8-9. Market Surveillance Unit, California Independent System Operator, *Annual Report on Market Issues and Performance* (June 1999), 1-1 to 1-8. For discussion of various types of ancillary services, see Timothy J. Brennan, Karen L. Palmer, and Salvador A. Martinez, *Alternating Currents: Electricity Markets and Public Policy* (Washington, D.C., 2002), 109-110.

⁷⁹ PG&E Corporation, *1999 Annual Report*, 9. PG&E Corporation, *2000 Annual Report*, 8.

critics, a *San Francisco Chronicle* article on the first anniversary of California's electricity restructuring concluded that the "unabashed goals of the bold move—lower prices for all, greater reliability and robust technical innovation—are within reach."⁸⁰

At least in retrospect, however, elements of the market dynamics that ultimately resulted in the unraveling of California's experiment in electric utility restructuring could already be discerned during this period. Price volatility characterized the markets from the start. During 1998, prices on the Power Exchange ranged from an average of \$11.90/MWh in May and June (due to record high hydro conditions in California and the Pacific Northwest) to an average of \$40.00/MWh in August (a period of record heat conditions and high air conditioning loads).⁸¹ At their lowest, according to a December 1998 California Energy Commission staff analysis, prices on the Power Exchange were significantly below the incremental operating costs of most generating units.⁸²

For the future, the analysts concluded that "during the spring-runoff months and low load-autumn months it will be extremely difficult for in-state gas-fired generators to make money."⁸³ In such a context, profit-seeking private enterprises had little incentive to gamble on investment in new generating capacity. Yet even as average wholesale electricity prices remained low in 1998 and 1999, demand for electricity increased sharply in California and throughout the West, and the margin of extra capacity needed to serve consumers at times of peak demand or of expected or unexpected plant outages largely disappeared.⁸⁴

Furthermore, even during 1998 and 1999, intermittent but extraordinarily sharp price spikes occurred at times of short capacity and in situations where a particular generating plant needed to be operated in order to maintain the functioning of the entire electricity grid. Such issues first arose on the ISO's ancillary services markets. During the markets'

⁸⁰ Rebecca Smith, "Power Deregulation: A Year Later Most Players Think New Systems Work," *San Francisco Chronicle*, 31 March 1999.

⁸¹ Joe B. Klein and Richard Grix, "1998 Market Clearing Price forecast for the California Energy Market: Forecast Methodology and Analytical Issues," *California Energy Commission* (22 Dec. 1998), 13-14. Arthur J. O'Donnell, *Soul of the Grid*, 93.

⁸² Joe B. Klein and Richard Grix, "1998 Market Clearing Price forecast," 13-14. Arthur J. O'Donnell, *Soul of the Grid*, 93.

⁸³ Joe B. Klein and Richard Grix, "1998 Market Clearing Price forecast," 5.

⁸⁴ After remaining virtually flat during the first half of the 1990s, consumption of electricity in California increased from 230,990 million kWh in 1995 to 253,684 million kWh in 1999. In 2000, annual consumption amounted to 263,493 million kWh. "California Energy Consumption by Sector," 2 Oct. 2002 at http://www.energy.ca.gov/electricity/consumption_by_sector.html. For a brief discussion of the decline in reserve capacity, see Congressional Budget Office, *Causes and Lessons of the California Electricity Crisis* (Washington, D.C., Sept., 2001), 16.

first few months of operation, California's privately-owned utilities operated almost all of the generating units in the ISO's ancillary services markets and cost-based regulation by FERC kept prices in the range of \$5.00 to \$12/MWh.⁸⁵ Matters began to change in June and July of 1998, however, as divestiture resulted in non-utility firms owning an increasing proportion of ancillary capacity and as FERC (over the protests of the ISO) permitted the new suppliers to charge market-based rates unconstrained by any price cap at all.⁸⁶

On July 9 and 13, 1998, price spikes of \$5,000/MWh and \$9,999/MWh occurred on the market for replacement reserve power (an ancillary service). On July 9, the ISO immediately needed an extra 1,000 MW to meet higher than expected demand due to hot weather, and only one plant was available to bid. Although the price for the power on that day did not rise above \$5,000/MWh, the ISO software (unbeknownst to the bidder) would have cleared a bid of any price, no matter how high, for the needed 1,000 MW. As it was, electricity that would have cost less than \$1,500 under the utility price caps, cost \$1.5 million. The scenario was similar in the case of the even higher \$9,999 price spike 4 days later.⁸⁷

In response to the price spikes, the ISO requested and FERC approved the imposition of a price cap of \$250/MWh on electricity procured on the ancillary services markets.⁸⁸ Although the price cap prevented more extreme market movements, prices on the ancillary services market bumped up against the limitation on a number of occasions during the weeks that followed.⁸⁹ Brief price spikes occurred again in December 1998 and, on occasion, during the summer and early fall of 1999.⁹⁰ On September 30, 1999, for example, generating plant and

⁸⁵ Market Surveillance Unit, California Independent System Operator, *Annual Report on Market Issues and Performance* (June 1999), 1-11 to 1-12.

⁸⁶ Arthur J. O'Donnell, *Soul of the Grid*, 101. Market Surveillance Unit, California Independent System Operator, *Annual Report on Market Issues and Performance* (June 1999), 1-15.

⁸⁷ Arthur J. O'Donnell, *Soul of the Grid*, 104. Market Surveillance Unit, California Independent System Operator, *Annual Report on Market Issues and Performance* (June 1999), 1-14.

⁸⁸ Arthur J. O'Donnell, *Soul of the Grid*, 104. Roger E. Bohn, Alvin K. Keverorick, and Charles G. Stalon, Market Monitoring Committee of the California Power Exchange, *Second Report on Market Issues in the California Power Exchange Energy Markets*, prepared for the Federal Energy Regulatory Commission (9 March 1999), 6 and 7.

⁸⁹ Market Surveillance Unit, California Independent System Operator, *Annual Report on Market Issues and Performance* (June 1999), 1-14 and 1-15.

⁹⁰ Roger E. Bohn, Alvin K. Keverorick, and Charles G. Stalon, Market Monitoring Committee of the California Power Exchange, *Second Report on Market Issues in the California Power Exchange Energy Markets*, prepared for the Federal Energy Regulatory Commission (9 March 1999), 19-20-67. California Public

transmission line outages, coupled with high demand due to hot weather, forced the ISO to declare a Stage Two emergency, with utilities asked to curtail about 1,100 MW in demand from customers with interruptible power contracts. After the price cap was raised from \$250/MWh to \$750/MWh the next day, prices on the ISO's transmission market hit \$690/MWh for 4 hours, for a difference of about \$9 million in the cost of power under the new as compared to the old price cap.⁹¹

As divestiture of utility-generating plants proceeded in 1998 and 1999, concerns also arose as to strategic behavior on the part of the new owners. On the transmission markets, for example, there were instances when generation owners overscheduled deliveries on a given line and then sought payment for reducing the load.⁹² More importantly, problems also arose due to generators withholding bids from one market in order to reap higher rewards in another. At times of high demand, for example, generating companies could choose not to bid capacity into the Power Exchange's day-ahead markets in the hopes of realizing higher prices on the Independent System Operator real-time ancillary service markets. Working from the other direction, utility companies sometimes under-scheduled day-ahead demands on the Power Exchange in hopes that gains from a uniformly lower market-clearing price there would make up for having to pay higher prices for extra power on the ancillary service markets.⁹³

Even in a competitive market without deliberate manipulation by participants, price spikes could be expected at times of high demand and limited capacity. Indeed, at least in theory, such episodes could play a valuable role in encouraging generators to build necessary capacity and in encouraging consumers to moderate demands. In a setting in which average costs for much of the year were lower than marginal costs for some generators, as was the case in California in 1998 and 1999, price spikes could represent the only hope of some firms staying in business. At the same time, in a setting in which prices spiked sharply higher at times of shortage, profit-seeking private firms had strong incentives to take

Utilities Commission, *Report on Wholesale Electric Generation Investigation* (Sept. 2002), 10.

⁹¹ Arthur J. O'Donnell, *Soul of the Grid*, 110.

⁹² On 17 Oct. 2002, Enron energy trader Timothy N. Belden pled guilty to engaging in these and other improper energy trading activities on the California markets. See Timothy N. Belden Plea Agreement, *United States v. Timothy N. Belden* (unsigned) United States District Court, Northern District of California, San Francisco Division. PDF document accessed at <http://www.findlaw.com>, accessed 30 May 2004. "Enron Trader Guilty of Rigging California Prices," *San Jose Mercury News*, 17 Oct. 2002, at <http://www.mercurynews.com/mlid/siliconvalley/business/columnists/gmsv/4311949.htm?1c>; accessed 30 May 2004. Arthur J. O'Donnell, *Soul of the Grid*, 110-112.

⁹³ Arthur J. O'Donnell, *Soul of the Grid*, 139-140.

action that would create such a situation and to exploit even the smallest loophole in design and enforcement of market rules in doing so.

To the extent that it occurred, such behavior raised costs higher than would be expected in a fully competitive market and impaired the ISO's ability to economically and reliably dispatch and deliver electricity. Unlike under a traditional regime, however, owners of generating facilities did not have a clearly defined duty to serve, and boundaries between legitimate arbitrage and illegitimate market-manipulation remained ill-defined. The question even remained open as to if, or under what circumstances, it was legal for generators to withhold capacity in one market in hopes of realizing higher prices later. Distinguishing between plant outages for legitimate reasons (for example, maintenance) and illegitimate reasons (hoping to reap a higher price on the markets later) also presented serious informational and enforcement difficulties. The ISO had a market analysis unit that sought to determine if such behavior might be occurring, but ultimate authority to remedy market dysfunctions and to define and sanction violations remained with FERC. In addition, FERC declined either to police the market itself or to delegate the authority to do so.⁹⁴

The Unraveling. These brewing issues boiled into a full-fledged crisis in the spring of 2000. Consistent with past trends, average prices for electricity on the Power Exchange hovered roughly in the range of \$30 to \$31/MWh between January and April 2000. In May, however, prices on the Power Exchange began to rise sharply. Factors driving the rise included the early arrival of high summer heat, a tight natural gas market with prices double those of the year before, cutbacks in hydroelectric deliveries from the Pacific Northwest, and both scheduled and unscheduled generating plant outages in California itself. On May 22, a day of record breaking temperatures in Southern California and the Southwest, prices on the Power Exchange soared to \$863/MWh at one point and remained over \$300/MWh for seventeen consecutive hours. As reserves dwindled, the ISO declared a Stage Two emergency and utility customers with interruptible contracts were required to curtail consumption.⁹⁵

Conditions deteriorated further in June, with daytime Power Exchange prices reaching a high of \$663/MWh on June 14, and power shortages and problems in grid management resulted in power being cut off to 97,000 PG&E customers.⁹⁶ For the month as a whole, prices on the Power Exchange averaged \$146.77/MWh, more than twice the record level reached the month before.⁹⁷ On June 28, the ISO Board passed a measure

⁹⁴ Ibid., 110-111.

⁹⁵ Ibid., 137 and 140.

⁹⁶ Ibid., 138.

⁹⁷ From Chart prepared by California Public Utilities Commission and downloaded from California Public Utilities Commission website (Jan., 2004).

reducing the price cap on ancillary services to \$500/MWh and urging generators to make all their resources available on the market when loads exceeded 38,000 MW. However, as historian of the ISO Arthur O'Donnell has pointed out, the organization had no power to enforce the request.⁹⁸

In any event, the months that followed brought little relief, with more rather than less generating plant capacity out of service at peak times than in the previous year and far higher prices on the Power Exchange.⁹⁹ During 1998 and 1999, as discussed, prices on the electricity markets had spiked to extraordinary heights on occasion. However, such spikes were generally very brief and had only modest effects on the overall price of electricity. Although prices on the Power Exchange peaked at \$190.94 in September 1998, for example, prices for the month averaged only \$34.01/MWh.¹⁰⁰ During the summer and fall of 2000, by contrast, prices remained unrelentingly high, with wholesale electricity prices on the Power Exchange averaging \$112.06/MWh in July 2000, \$167.93/MWh in August, and \$118.55/MWh in September.¹⁰¹

The effects of these developments on utility systems and their customers varied. Municipally owned utilities, such as those in Los Angeles and Sacramento, were not subject to most provisions of California's restructuring law and experienced few problems with either price spikes on the wholesale markets or service interruptions. Indeed, in some instances, the enterprises reaped additional revenue by selling power into the markets when they had surpluses available. The San Diego Gas & Electric Company occupied another extreme. The company had paid off its stranded costs in 1999 and was no longer subject to retail rate ceilings under California's restructuring law. Without the ceiling, the electric bills of some San Diego Gas & Electric customers soared more than threefold during the late spring and summer of 2000.¹⁰² Finally, in late August and early September, the California legislature and governor stepped in,

Data prepared by California Independent System Operator and Department of Water Resources Revenue Requirement, Draft Filing (19 Oct. 2001).

⁹⁸ Arthur J. O'Donnell, *Soul of the Grid*, 141.

⁹⁹ Staff Report to the Federal Energy Regulatory Commission on Western Markets and Causes of the Summer 2000 Price Abnormalities (Nov. 2000), 2-19 and 2-20.

¹⁰⁰ Roger E. Bohn, Alvin K. Keveorick, and Charles G. Stalon, Market Monitoring Committee of the California Power Exchange, *Second Report on Market Issues in the California Power Exchange Energy Markets*, prepared for the Federal Energy Regulatory Commission (9 March 1999), 19 and 20.

¹⁰¹ From Chart prepared by California Public Utilities Commission and downloaded from California Public Utilities Commission website, Jan. 2004. Data prepared by California Independent System Operator and Department of Water Resources Revenue Requirement, Draft Filing (19 Oct. 2001).

¹⁰² Christian Berthelson, "Genesis of State's Energy Fiasco: String of Bad Decisions on Regulation Could End up Costing Consumers \$40 billion," *San Francisco Chronicle*, 31 Dec. 2000.

enacting a law capping the energy cost component of the company's charges to residential and small commercial customers at 6.5 cents/kWh.¹⁰³

Because PG&E and Southern California Edison remained under the retail rate ceiling through the summer and fall of 2000, their customers were largely spared the immediate impact of the price rises on the wholesale electricity markets. However, the firms' financial positions sharply deteriorated as they found themselves buying electricity at prices higher than that at which it could be sold. The crisis came to a head in late 2000 and early 2001. On January 16 and 17, 2001, PG&E's outstanding bonds were downgraded to below investment grade, and the company defaulted on some of its obligations. By this time, both Pacific Gas and Electric Southern California Edison had also ceased to make full payments on amounts owed to QFs and independent generators.¹⁰⁴

The utilities' financial problems and failures to pay suppliers in turn increased problems in maintaining reliability of California's electricity grid and forced the ISO to resort to increasingly desperate (and expensive) out-of-market expedients to obtain urgently needed supplies.¹⁰⁵ In this context, the average wholesale price of electricity in California soared to a new extreme of \$294.19/MWh for the month of December 2000. Prices remained at this level in subsequent months, averaging \$271.91/MWh and \$304.42/MWh in January and February 2001, respectively.¹⁰⁶ On December 14, 2000, the U.S. Department of Energy issued an emergency order requiring some suppliers to make electricity available to the ISO if power was otherwise unavailable in the marketplace.¹⁰⁷ Nevertheless, California experienced repeated power shortages in December and January, with customers in Northern California experiencing blackouts on January 17, 18, and 21, 2001.¹⁰⁸

With California's privately-owned utilities no longer paying for much of their electricity, the state government stepped in. Citing blackouts "affecting millions of Californians," dramatic increases in

¹⁰³ California Bill AB 265, Chaptered 7 Sept. 2000.

¹⁰⁴ PG&E Corporation, *2000 Annual Report*, 9. Arthur J. O'Donnell, *Soul of the Grid*, 158.

¹⁰⁵ Arthur J. O'Donnell, *Soul of the Grid*, 158-161.

¹⁰⁶ Chart prepared by California Public Utilities Commission and downloaded from California Public Utilities Commission website, Jan. 2004. Data prepared by California Independent System Operator and Department of Water Resources Revenue Requirement Draft Filing (19 Oct. 2001).

¹⁰⁷ "Energy Secretary Extends Emergency Power Order for California," U.S. Department of Energy Press Release (5 Jan. 2001) at http://web.archive.org/web20010701091924/www.energy.gov/HQPress/release_s01/janpr.pr01004_v.htm; accessed, 30 May 2004.

¹⁰⁸ California Public Utilities Commission, *Report on Wholesale Electric Generation Investigation* (Sept. 2002), 10. "Governor Davis Announces Auction for Long Term Energy Contracts," Press Release (22 Jan. 2001).

electricity prices, and the prospect of “widespread and prolonged disruption of electricity service,” Governor Davis declared a state of emergency on January 17, 2001, and ordered the state’s Department of Water Resources (the agency in charge of existing state-owned hydroelectric facilities) to “enter into contracts and arrangements for the purchase and sale of electric power ...to assist in mitigating the effects of the emergency.”¹⁰⁹ The governor approved laws more formally defining the Department of Water Resource’s authority to purchase electricity on both the spot markets and under long-term contracting arrangements on January 19, 2001 and February 1, 2001.¹¹⁰

The state-initiated power purchases on January 18 and by the end of the month had spent over \$500 million on electricity on the spot markets and under short-term purchasing arrangements. In February, it expended an additional \$1.4 billion on short-term purchases in order to keep the electricity grid from collapsing.¹¹¹ So as to ease pressure on the markets and secure supplies for the longer term, the state also mounted an intensive effort to enter into long-term contracts with energy suppliers. By March 2, 2001, according to a California State Auditors’ report, the state had committed to contracts with electricity generators totaling \$35.9 billion in power costs over 10 years. By August 17, the state had committed to contracts with an additional cumulative cost of \$6.7 billion.¹¹²

With average prices on the wholesale markets averaging \$248.99/MWh in March, \$265.89 in April, and \$239.49 in May, the fiscal burden was enormous. In May 2001, California authorized a \$13 billion bond issue to aid in financing the electricity purchases.¹¹³ In other respects as well, the situation remained precarious, with electricity

¹⁰⁹ Governor Gray Davis, Proclamation of State of Emergency (17 Jan. 2001).

¹¹⁰ “Governor Davis Signs Bill to Give State Authority to Purchase Power” California Governor’s News Release (19 Jan. 2001). Assembly Bill No. 1X (1 Feb. 2001). For a brief summary of major provisions of the law, see California State Auditor, *California Energy Markets: The State’s Position has Improved, due to Efforts by the Department of Water Resources and Other Factors, but Costs Issues and Legal Challenges Continue* (Sacramento, April 2003), 9.

¹¹¹ California State Auditor, *California Energy Markets: Pressures have Eased, but Cost Risks Remain* (Sacramento, Dec. 2001), 73.

¹¹² California State Auditor, *California Energy Markets: Pressures have Eased, but Cost Risks Remain* (Sacramento, Dec. 2001), 80 and 119.

¹¹³ Chart prepared by California Public Utilities Commission and downloaded from California Public Utilities Commission website, Jan. 2004. Data prepared by California Independent System Operator and Department of Water Resources Revenue Requirement Draft Filing (19 Oct. 2001). Congressional Budget Office, *Causes and Lessons of the California Electricity Crisis* (Washington, D.C., Sept., 2001), 5.

shortages and rolling blackouts in March and May.¹¹⁴ To alleviate the financial crisis faced by the state's privately-owned utilities, the Public Utilities Commission approved an immediate rate increase averaging 3 cents/kWh in March 2001.¹¹⁵ Nevertheless, PG&E declared Chapter 11 bankruptcy on April 11, 2001 after taking legal steps to ensure that assets of PG&E's other subsidiaries could not be utilized to recoup losses incurred in California.¹¹⁶ As justification for this action, the company cited un-reimbursed wholesale electricity costs mounting up at a rate of \$300 million or more, and California Public Utility Commission decisions "economically disadvantaging the utility...." According to PG&E's report to its stockholders, "[w]e chose to file for Chapter 11 reorganization, affirmatively because we expect the court will provide the revenue needed to reach a solution, which the state and the state's regulators have been unable to achieve."¹¹⁷

A Kind of Resolution. The architects of California's restructuring experiment sought to promote the emergence of self-sustaining market institutions free from the specters of private sector monopoly on the one hand and "command-and-control regulation" on the other. Even before 1998 and 1999, some analysts expressed fears that independent owners of generating plants might be able to exercise market power under some conditions, and that markets themselves might be subject to sharp price spikes. However, the restructuring architects' primary concern regarding market design lay elsewhere. In particular, they sought to foreclose any possibility that utility firms might use their control over access to monopoly transmission networks to prevent independent generators from emerging as viable competitors. This concern lay at the heart of decisions to place the transmission system in the hands of an independent ISO and to encourage utility firms to divest large proportions of their generating capacity. At FERC too, the main concern during the 1990s lay with ensuring open access to the transmission system and not with exercise of market power by generators.

Although the Democratic Davis administration which took office in 1999 was far less enamored of market mechanisms than its Republican predecessor, ultimate authority to oversee wholesale electricity markets in California during the crisis period lay not with state officials in Sacramento but with the federal government and FERC in Washington,

¹¹⁴ Arthur J. O'Donnell, *Soul of the Grid*, 180. Congressional Budget Office, *Causes and Lessons of the California Electricity Crisis* (Washington, D.C., Sept., 2001), 5. California Public Utilities Commission, *Report on Wholesale Electric Generation Investigation* (Washington, D.C., Sept., 2002), 10.

¹¹⁵ Congressional Budget Office, *Causes and Lessons of the California Electricity Crisis* (Washington, D.C., Sept., 2001), 5. Arthur J. O'Donnell, *Soul of the Grid*, 172.

¹¹⁶ PG&E Corporation, *2000 Annual Report*, 2 and 11.

¹¹⁷ *Ibid.*, 2.

D.C. Moreover, here commitment to electricity markets transcended party divisions. Under both the Democratic Clinton administration and the Republican Bush administration that followed, a majority of FERC commissioners retained a commitment to electricity markets, a skeptical attitude toward allegations that withholding of capacity by private firms might be a serious problem, and an aversion to imposing price caps on wholesale markets or other measures smacking of “command and control” regulation. As events unfolded in California, actions taken by FERC reflected this pro-market and anti-interventionist orientation.

On July 26, 2000, FERC initiated a staff investigation of electricity wholesale markets “to determine whether markets [were] working efficiently and, if not, the causes of the problems.” However, the findings were only to be reported on November 1 and the emphasis was on systemic and market design rather than enforcement issues.¹¹⁸ During the fourth week of August, FERC ordered the wholesale market investigation to focus more specifically on issues in the California power markets, but left the November 1 deadline unchanged and denied a motion by San Diego Gas & Electric to impose a broad \$250/MWh price cap on all sellers of electricity in California. The electric utility, according to FERC, “did not present evidence that all potential sellers in California have market power, nor did it show why a broad price cap would be an appropriate response....”¹¹⁹

As conditions worsened in late fall of 2000 and early winter of 2001, FERC remained reluctant to take steps which might be construed as interfering with market forces. On December 15, 2000, for example, FERC issued an order avowedly intended to enable the “markets to catch up to current supply and demand problems and not to reintroduce command and control regulation that has helped to produce the current crisis.”¹²⁰ Actions included elimination of California’s requirement that privately-owned utilities purchase electricity through the Power Exchange and ordering that the stakeholder board controlling the ISO be replaced by one made up of more independent figures. As during the summer, however, FERC declined to impose broad price caps on wholesale power markets.

As for concerns that exercise of market power by generators was both worsening power shortages and contributing to price spikes, FERC announced that it would “continue to monitor the California markets to ensure that there was no abuse of market power.”¹²¹ In remarks in early January 2001, however, outgoing FERC chairman James Hoeker acknowledged that the commission had still “not made clear how it will

¹¹⁸ “FERC Directs a Probe of Electric Bulk Power Markets,” FERC News Release (26 July 2000).

¹¹⁹ “Commission Addresses California Electricity Markets, Orders Investigation,” FERC News Release (23 Aug. 2001).

¹²⁰ FERC News Release, Docket Nos. EL00-95-000, et al. (. 15 Dec. 2000), 1.

¹²¹ *Ibid.*, 5.

determine what is “just and reasonable” under the standards of the [Federal Power Act] in the world of market-based rates.”¹²² Furthermore, according to Hoeker, FERC did not have the legal authority to order refunds for “alleged violations or inequalities” more than 60 days in the past. “Much as I sympathize with the plight of San Diegans last summer,” Hoeker stated, “the simple truth is that the [c]ommission would be violating the law by ordering retroactive refunds.”¹²³

Although rhetorical devotion to deregulation and the virtues of market forces continued, FERC finally intervened more forcefully in late spring of 2001. Under a ruling issued on April 25, 2001, FERC expressly prohibited generators in California from withholding available power. Because “all generators need to participate in helping to solve California’s problems,” the commission’s public announcement stated, “all generators in California...are required to sell into the ISO’s real-time market as a condition of their use of the ISO’s interstate transmission lines.”¹²⁴ FERC also ruled that prices on the wholesale markets at times of shortage would be capped at a level equal to “marginal costs of the highest-cost generator called on to run.”¹²⁵ On June 18, 2001, FERC issued an order capping wholesale prices at all times and extending both the must-offer requirements and price caps throughout the western states.¹²⁶

According to FERC’s June 18 news release, the order did “not put cost-based caps in any markets or on any prices.” Instead, according to the announcement, the order established “price mitigation, based on market-oriented principles, that will apply to all wholesale sales of energy in *spot markets*...”¹²⁷ Despite such rhetoric, FERC’s April 25 and June 18 orders did impose broad price caps and represented a genuine shift in policy. Commissioner William Massey who had long advocated that FERC move in this direction expressed satisfaction. The June 18 order, according to Massey, “provides price protection in the entire Western interconnection 24 hours a day, seven days a week, it absolutely prohibits gaming and so-called megawatt laundering [sale of power outside the state and subsequent resale inside at a higher price], and will last 2 summers.”¹²⁸

¹²² FERC Chairman James Hoeker, Concurring Opinion on Commission’s Order of 15 Dec. 2000, Docket No. EL-00-95-000, et al. (4 Jan. 2001), 9.

¹²³ Ibid.

¹²⁴ “Commission Establishes Prospective Mitigation and Monitoring Plan for California Wholesale Electric Markets,” FERC News Release, Docket No. EL00-95-012 (25 April 2001).

¹²⁵ Ibid.

¹²⁶ “Commission Extends California Price Mitigation Plan for Spot Market to All Hours, All States in Entire Western Region,” FERC News Release, Docket No. EL00-95-031...,” (18 June 2001).

¹²⁷ Ibid. [italics in original].

¹²⁸ FERC Commissioner William L. Massey as quoted in Ibid.

In the wake of these orders, a number of factors came together to reduce problems presented by power shortages in California and to sharply reduce prices on the wholesale markets. After May 1, 2001, generating plant outages plummeted, as did the frequency of power supply emergencies. On July 1, 2001, megawatts of unavailable power stood at 3,227 megawatts as compared to about 12,500 megawatts 2 months before. Addition of new generating capacity, lower natural gas prices, reduced demands for electricity due to higher prices and conservation initiatives, and increased procurement of electricity through longer term contracts further reduced price pressures on the spot markets.¹²⁹ By October 2001 prices on the spot market were back under \$38/MWh, a price far lower than that purchased by California under its long term electricity contracts executed the winter before.¹³⁰

The situation has largely remained stable up to the time of this writing. However, the new electric utility landscape in California is very different from that envisioned by the architects of the state's 1996 restructuring plan. They envisioned a world free of both private monopoly and the heavy hand of government regulation: a world of market competition, consumer choice, and sustainable downward pressure on electricity prices. In such a setting, they believed, the discipline of the market would make for wiser decisions as to plant investment than in the past, and the burden of any future mistakes would be borne by investors rather than consumers. No longer, after the transitional period was past, would consumers have to bear the costs of such mistaken decisions as those by utility executives to keep investing in nuclear plants as costs escalated or those by public officials to force utilities to enter into unduly expensive long term power contracts under PURPA.

As matters stand, by contrast, the state government of California plays a greater rather than lesser role in electricity supply, both as an overseer of the ISO which continues to control the state's transmission grid, and as a purchaser of electricity under long-term contracts executed during the crisis period. Costs of electricity under the contracts has been far higher than that again generally available on the spot market after the summer of 2001, and numerous controversies have arisen over the terms and propriety of the agreements. Although state officials managed to renegotiate some of the contracts starting in 2002, consumers of electricity remained burdened by far higher prices than before the restructuring.¹³¹ Costs of buying power during the crisis period and under

¹²⁹ California State Auditor, *California Energy Markets: Pressures have Eased, but Cost Risks Remain* (Sacramento, Dec. 2001), 134-136.

¹³⁰ *Ibid.*, 133.

¹³¹ California State Auditor, *California Energy Markets: The State's Position has Improved, due to Efforts by the Department of Water Resources and Other Factors, but Costs Issues and Legal Challenges Continue* (Sacramento, April

the contracts have also placed a broader burden on the state budget and taxpayers. Finally, California politics continues to be roiled by questions of responsibility for problems during the crisis period and of the best path for the future of the state's electric utility industry.

Conclusion

There are striking similarities between the politics of electric utility regulation during the first decades of the twentieth century and the more recent market-oriented reforms and attempts to eliminate such regulation. In the case of both the regulatory and deregulatory initiatives, advocates sought to supplant what they believed to be messy and inefficient forms of political decision-making with more apolitical, efficient, and impersonal mechanisms. Thus, early-twentieth-century regulatory advocates asserted that creating apolitical expert commissions with authority to regulate utility prices and services represented the best means of both preventing abuses by privately-owned natural monopolies and of stopping such monopolies from falling into the hands of allegedly corrupt and incompetent municipal governments. In part to foreclose the far more threatening alternative of municipal ownership, electric utility firms also threw their support behind regulation in California and other states. In practice, regulation generally functioned in the manner desired by the firms. Regulators left electric utility companies largely free to manage their own affairs and did not seek to tightly constrain profits.

For their own part, advocates of market-oriented reforms during the 1990s placed regulation itself in their sights. With numerous companies competing to provide the lowest cost electricity or other energy services, they asserted, the invisible hand of the market could be counted upon to protect consumer interests and to enhance consumer choice far more effectively than even the most apolitical and expert of human regulators. Here too, electric utility firms threw their support behind the reform in part as a means of foreclosing a more threatening alternative: open markets for generation without recovery of stranded costs. As with regulation early in the twentieth century, utility firms also calculated that they could prosper under the new regime. In contrast to what occurred under regulation, however, the gamble on a new regime clearly went awry, although controversy continues over the extent to which the firms have shielded themselves from the consequences through measures such as PG&E's strategic declaration of bankruptcy.

As did more ideological advocates of market oriented reform, utility executives assumed that competition among generators could be expected to lower (or at least not raise) the costs of obtaining electricity and that acceding to a ceiling on retail charges did not present an undue business risk. For about 2 years, wholesale electricity costs remained low enough

2003) 12. Energy Information Administration, State Electricity Profiles, California, 1999 and 2002.

for the utility companies to profit from retail sales under the price ceiling. The firms also benefited at the outset from receiving even higher prices than expected for sale of divested generating plants. In retrospect, however, it appears that neither utility firms nor regulators gave sufficient consideration to the question of why buyers of the generating plants believed that the assets would be so valuable.

In an essay published in 2000 (unfortunately), economist Paul Joskow hailed utility divestiture of large numbers of generating plants on the grounds that the independent owners “now have high-powered incentives to optimize performance.”¹³² Whether or not this proved to be the case, however, experiences in 2000 and 2001 also suggest that the owners of the generating plants had “high-powered incentives” to price power as expensively as possible at times of capacity shortage and peak demand and to act in such a way as to increase the occasions on which shortages arose. Results, in economic terms, included transfers of wealth from consumers to producers and inefficiencies due to the withholding of generating capacity for which willingness to pay was greater than marginal cost.

Some market-oriented critics of restructuring in California have asserted that the real cause of the problems was not too little regulation and government involvement but too much. Aspects of the restructuring that come under criticism from this perspective include both the price caps on consumer rates imposed for the transitional period and decisions to require California utilities to buy power on the spot markets and to limit their ability to engage in long-term contracting. Yet it is hard to see why any significant number of people in California would (or should) have bought into the restructuring experiment if markets did not afford some promise of lower prices in the future than under existing regulatory arrangements. And while greater use of long-term contracting and more vertical integration undoubtedly would have been helpful for avoiding some of the problems that arose in 2000 and 2001, unduly expensive contractual commitments and economically and environmentally questionable plant investments on the part of the utilities under regulation were themselves some of the problems which restructuring was intended to address.

In fact, the mix of markets, politics, and regulatory and legal institutions has always been more complicated and interesting than is suggested by simple-minded dichotomies of markets versus politics or consumer choice versus “command-and-control” regulation. Even under state regulation during the early decades of the twentieth century, for example, vertically-integrated electric utility firms faced market discipline from a variety of quarters, including occasional competition between the

¹³² Paul J. Joskow, “Deregulation and Regulatory Reform in the U.S. Electric Power Sector,” in *Deregulation of Network Industries: What's Next?*, ed. Sam Peltzman and Clifford Winston (Washington, D.C., 2000), 185.

firms themselves, self-generation by large consumers, and inter-product competition from manufactured and natural gas. Indeed, the very fluctuations between peak and non-peak demands that helped open up opportunities for generating firms to exercise market power under California's restructuring experiment also served in earlier years as more positive incentives for vertically-integrated electric utility firms to cut prices in some markets, so as to maintain high load factor.

In this context, such control as state commissions exercised over electricity prices resembled what is now known as "price cap" regulation. That is, regulators prevented utilities from raising consumer prices above a certain level but left the firms largely free to reap higher profits through greater efficiencies and exploitation of scale economies.¹³³ Tasks faced by regulators in overseeing service quality and reliability were also eased by the fact that market incentives provided some impetus for good performance, and that with a single firm providing service in any given area, responsibility for problems could be easily ascertained and sanctions imposed. Interestingly, the price caps and must-offer requirements imposed by FERC on generators in California in April and June 2001 are reminiscent in certain respects of the rather light-handed style of oversight exercised by state regulators over vertically-integrated electric utility firms during the early and mid-twentieth century.

Just as market forces have continued to play a role in shaping electric utility development even under different forms of regulation, raw politics and conceptions of broader public interests have also shaped if and how markets functioned. California's restructuring experiment, although an avowedly pro-market reform, itself constituted a far more radical governmental intervention into the structure of the industry than did either state regulation during the first decades of the twentieth century or the Public Utility Holding Company Act of 1935. Rather than making it possible for regulatory institutions to wither away, the restructuring made for new and, in some respects, more difficult regulatory challenges.

In sum, large-scale electric utility systems remain of central importance to the social and political, as well as economic, functioning of modern societies. In settings as diverse as California in 2000 and 2001, and Iraq over the last year and a half, failures to maintain the reliable functioning of these systems have had serious political as well as economic consequences. In the United States, both good-government reformers during the early twentieth century and market-oriented reformers in more recent years have tended, with some reason at times, to distrust the role of political decision-making in shaping electric utility systems. Yet, neither apolitical regulation nor the invisible hand of the market completely

¹³³ For a discussion of rate-of-return versus "rate cap" or "incentive regulation," see Timothy Brennan, Karen L. Palmer, and Salvador Martinez, *Alternating Currents: Electricity Markets and Public Policy* (Washington, D.C., 2002), 83-86.

obviate the need for such decision-making. Politics, and questions concerning the accountability and functioning of governmental institutions, have been, and will likely remain, of critical importance in both articulating what constitute desirable paths of development for the electric utility industry and in determining whether or not such visions are realized.