Restructuring in Retrospect

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Executive Summary

When California first proposed to open its retail electricity market to competition and to replace its state-regulated system, retail electricity rates were high, utilities were faced with an overcapacity of power generation, natural gas prices were low and technology seemed to be forcing electricity prices inexorably downward. Twenty-five states eventually passed legislation to open their power markets to competition, and approximately half of those had actually opened their markets by early 2001. Although it is still early in many states' transition toward retail competition, it is nonetheless helpful to look back at the original motives for restructuring, and to investigate—in retrospect—some of the initial successes or problems with restructuring of retail power markets.

The year 2000 was a watershed year, however. Natural gas prices skyrocketed for a while and it became clear that, because few power plants had been built for close to a decade, the surplus of electricity generation capacity was almost nonexistent. Electricity prices jumped throughout the western United States, as well as in a great deal of the eastern half of the country. Almost daily, headlines described an ongoing electricity crisis in California that was expected to last well into 2001. California's crisis and the problems in other parts of the country prompted a reexamination of the success and potential for retail customers—especially the smallest customers—to benefit quickly from competitive markets.

Residential customers and other small electricity users can expect some savings from restructuring, as some limited experience demonstrates. However, the savings are likely to be small. Further, marketers are likely to have difficulty realizing a profit from serving the smaller customers. The cost to acquire a new customer ranges from $40 up to $200 or $300. With the low margins and low usage that characterize residential and small commercial customer markets, it takes time for marketers to earn a return on their initial investment in securing the new customer. All these factors have meant that residential customer markets have been slow to develop.

Industrial customers, on the other hand, have switched providers much more quickly than have the smaller electricity users. Data suggest that the largest industrial customers—those with greatest electricity usage—have the most to gain from choosing a new provider, that the marketers who serve them have the most to gain from doing so, and that these markets generally have been much more active than have markets for the smallest electricity users. In some cases, even those markets have proved difficult because wholesale electricity suppliers have been unable to offer power at the stable rates that would enable retail sellers to offer their own supplies at rates that beat those of the old regulated utility provider. It is clear, therefore, that wholesale markets for electricity must work well before retail markets—even for the largest customers—will be active.

State governments and the federal government fulfill different roles in the effort to make the retail and wholesale markets work. It is important, however, that state policymakers understand what part of the electric industry they can control directly, what the federal government controls and what state governments can influence, but not control.

Elements of Electricity Markets

Under State Control or Influence

- Retail electricity rates
- Retail electricity usage (through efficiency or pricing programs)
- Initial decision about whether to allow retail competition
- Power plant siting
- Power line siting
- State tax policy related to generation, efficiency, renewable energy, and transmission and distribution systems

Not Under Direct State Control

- Wholesale electricity rates and prices
- Wholesale natural gas prices
- Formation of regional electricity entities (often called regional transmission organizations)
- Electric rates and policies of federal utilities
- Transmission rates and policies
- Granting rights for a generator to sell power at "market based rates"

Source: NCSL, 2001.

A variety of state policies can influence both retail and wholesale markets, several of which are described in the final chapter of this publication.

This report provides policymakers with guidance as they examine past and future restructuring efforts and seek to determine how competitive markets can be of benefit to customers. Industrial and larger commercial customers may benefit from competitive markets, while residential and small commercial customers may not benefit unless legislators focus specifically on their needs. But it also has become evident that even the largest customers will save money only if the wholesale market functions smoothly. State policymakers have at their disposal numerous options that may enable both retail and wholesale power markets, but even five years into the experiment, it has yet to be determined which state policies will be most effective.

INTRODUCTION

It is unusual to hear anyone in the United States say that competition and free markets are bad or unproductive. Indeed, the U.S. economy is based on the idea that competition can deliver a great variety of products, services and innovations at reasonable prices for many types of consumers. Therefore, it seemed to make sense to many observers when the federal government and many state legislators and regulators began the process of dismantling the regulations and monopoly structures that had long governed the trucking, airline, securities, cable and telephone industries. The idea was that deregulation would produce competition, and that competition would, in turn, bring a wide variety of new products and services to the consuming public. Furthermore, these new products and services would be available at prices lower than were available under regulation. Reduced regulation and increased competition have arguably brought an array of new products and services to many consumers. However, in the electric industry, it is still too early to determine the success of efforts to restructure the market.

This report reviews the history of the 1990s movement to restructure the nation's electric industry and pinpoints some of the pitfalls and the potential savings that could result from the effort. It concludes the following.

1. The rationale for retail electricity restructuring rested on a combination of factors—including, in part, overcapacity and

steadily declining wholesale prices—that do not currently exist but that may recur in the next two to five years.

2. The initial attraction of restructuring was that it would provide relief from high retail rates and allow customers to pay prices closer to the inexpensive wholesale market rates. For the most part, that has not happened in any sustained way.

3. Under retail restructuring, customers have switched to new providers slowly. Large commercial and industrial customers switched at a much faster pace than residential customers.

4. In some areas, restructuring appears to have resulted in lower electricity prices for some customers. Many legislated rate reductions that occurred as a result of negotiated restructuring laws most likely would have happened even if the market had remained regulated.

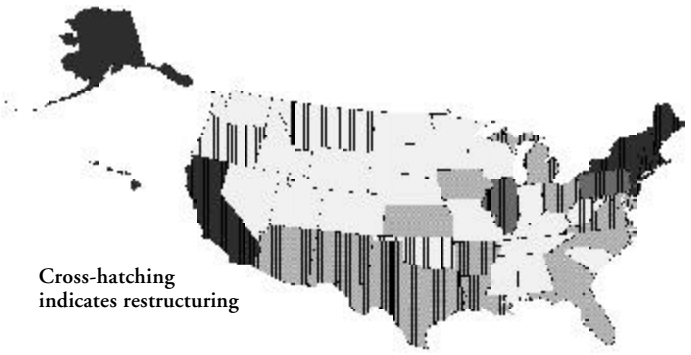
5. The potential for future savings relies on the proper structure and functioning of wholesale markets. Such functioning wholesale markets promote adequate generation and transmission system investments, greater efficiency and investments in new technologies, and the resolution of market power issues.

This report first reviews the rationale for and history of the U.S. electricity industry restructuring effort, then discusses the early results of these initiatives.

WHY RESTRUCTURING?

The electricity business was known by the early 1990s as the nation's last highly regulated industry. The 1980s and 1990s saw states and the federal government lift many regulations governing the airline, trucking, telecommunications and other industries. In states like California, Massachusetts, New Hampshire and New York, state policymakers began to ask whether it made sense to deregulate the business of generating electricity. High electricity prices fueled much of the ensuing debate. In the early and mid-1990s, electricity prices in California and several other states were well above the national average, largely due to investments made by utilities in those states. It is worth noting that nearly all those investments were made with the approval of the state utility commissions, and sometimes at the behest of those regulators, legislatures or even the U.S. Congress. Although observers have tried to assign blame for high electricity rates to either the commissions, the utilities themselves, the legislatures or others, the truth is that the blame can be spread among many. Figure 1 illustrates electric rates throughout the country in 1997, at the height of state interest in retail restructuring.

Figure 1. Residential Average Rates—1997 kilowatt-hours (kWh)



More than 130 percent of national average (11.5¢/kWh to 14.8¢/kWh)

110 percent to 129 percent of national average (9.9¢/kWh to 10.4¢/kWh)

90 percent to 109 percent of national average (7.5¢/kWh to 9.3¢/kWh)

Less than 90 percent of national average (5.0¢/kWh to 7.6¢/kWh)

Source: *EEI Statistical Yearbook Advance Release*, 2001.

Retail Rates Were High Due to Several Factors

Investments in Certain Large Power Facilities

Utilities had invested in increasingly large power plants from the 1960s into the early 1980s. Many of these facilities' costs—especially those of nuclear plants—ballooned, particularly after the disaster at Three Mile Island prompted the federal government to impose new, but costly, safeguards on nuclear facilities. In addition, some nuclear facilities suffered regulatory and operational problems that left them out of service for months at a time or kept them from commencing operation—always at tremendous cost. One prominent example, of this problem is the Shoreham nuclear facility on Long Island, which operated only briefly and eventually was shut down.[1] Another is the Seabrook facility in New Hampshire. High costs for both these facilities

were largely responsible for higher than average electricity rates of the Long Island Lighting Company (LILCO) and Public Service New Hampshire (PSNH).

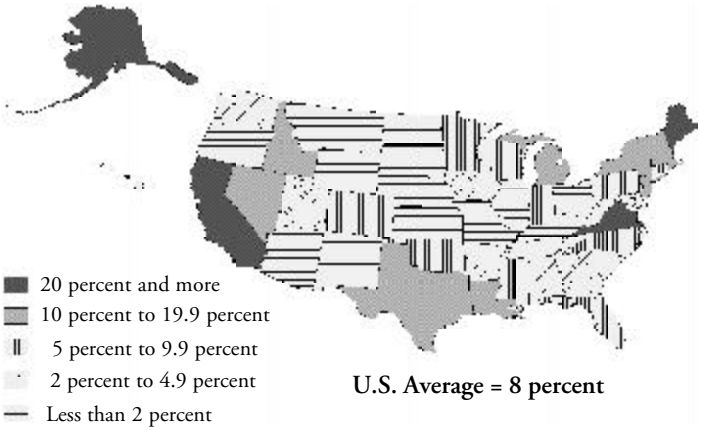
Contracts that Utilities Signed with Independent Generators

The U.S. Congress passed the Public Utilities Regulatory Policies Act of 1978 (PURPA) in an effort to diversify the nation's mix of fuels used to generate power. Because the marketplace relied on independent generation companies to sell power and on utilities to buy that power, PURPA also encouraged a new breed of power generator known alternatively as an independent power producer (IPP), non-utility generator (NUG), qualifying facility (QF) or various other names. These companies signed long-term contracts to supply power to utilities through contractually specified rates. Because IPPs generally relied on project financing from banks, they required long-term power sales agreements to support their financing. Often, the prices were fixed for the first 10 years or so of the contract, then were allowed to float with wholesale market prices. To further help these small power generators raise the money they needed to build their plants, some contracts were front-loaded, meaning that the utility paid a particularly high price for power during the early years of the power sales agreement and later paid a lower price.

The pricing for these long-term contracts was based on the best estimate at the time of future energy prices. Many of these contracts were signed during the 1980s—a time of rising energy prices—under the assumption that energy prices would continue to rise. As a result, many utilities signed contracts with generators to supply them power for more than 10 cents per kilowatt-hour (kWh). Numerous states enacted similar state versions of PURPA, sometimes known as mini-PURPA. In New York, a law once was in force that specified that all such contracts would be for at least 6 cents per kilowatt-hour. New Hampshire utilities signed contracts based on the utilities' own high-

cost generation, which was as much as 12 cents per kilowatt-hour or more. Figure 2 shows the penetration of non-utility generation. A comparison with figure 1 demonstrates the similarity between states with high levels of non-utility generation and states with high rates.

Figure 2. Nonutility Capacity by State as a Result of Each State's Total Capacity



Source: NCSL, 2001.

When wholesale electricity rates fell in the 1990s, these contracts appeared to be unwise investments. At the time they were signed, however—and given the expectation at the time of high energy prices—they appeared to be reasonable.

Contracts Utilities Signed with Other Utilities

In a few cases, utilities signed high-rate contracts for power supply with other utilities. Vermont utilities, for example, signed a contract with Hydro Quebec, a large Canadian utility, to buy hydroelectric power over a 30-year period. Like the contracts with non-utility generators, the contract with Hydro Quebec was set to reflect electricity prices that were expected to rise, and cost less than new generation options that were available at the time. When wholesale prices in the rest of the country and New

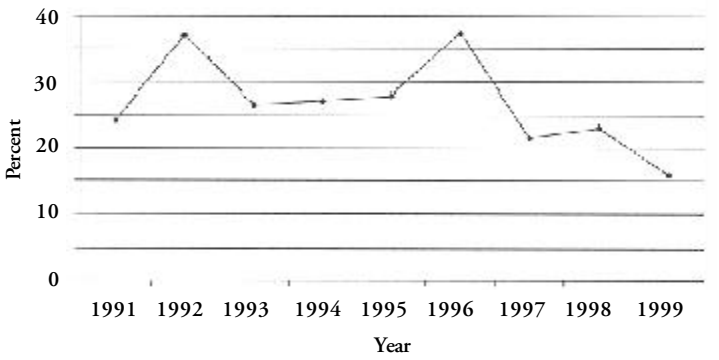
England began to fall in the late 1990s, Vermont's long-term contract with Hydro Quebec seemed overpriced.

Why Did Restructuring Appear Attractive?

By the early to mid-1990s, retail electricity rates had absorbed —and reflected—many of the high costs described in the previous section. By then, however, the wholesale electricity world had begun to change. With the success of many energy efficiency programs and a slower economy, it became clear that there was, in fact, more generation on-line in much of the country than appeared necessary. By the mid-1990s, reserve margins in some parts of the country reached 20 percent to as much as 25 percent and more, as figure 3 demonstrates for New York. Many analysts suggest that margins of approximately 15 percent are sufficient to maintain a reliable system. This oversupply put downward pressure on wholesale electricity prices, while retail prices stayed high.

Reserve margins represent a safety margin of generating capacity above what the industry would expect to need in an average year.

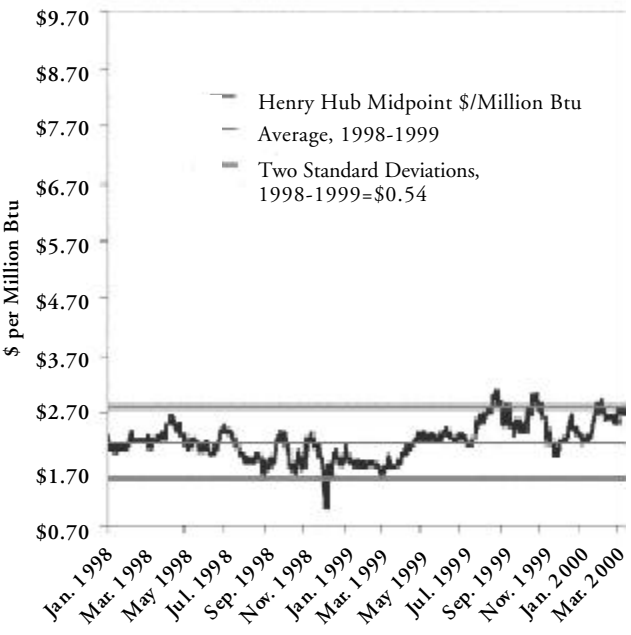
Figure 3. New York State Reserve Margins from the Late 1980s to the Early 1990s



Source: New York State Energy Research and Development Authority, 2001.

At the same time, natural gas prices were at historically low levels (figure 4). Since most of the new power generation facilities used natural gas, any new facility coming on line was likely to be able to produce power at rates far below the high retail costs embedded in the existing power system.

Figure 4. Natural Gas Prices Through March 2000



Source: *Gas Daily* and Reuters, 2000.

In some parts of the country, particularly in California, wholesale electricity prices fell still further because of particularly good hydroelectric power production in the Pacific Northwest. Power from the Pacific Northwest through the mid-1990s was available for less than 1 cent per kilowatt-hour (see figure 5).

Finally, new technologies such as efficient and relatively inexpensive natural gas turbines, combined with historically low

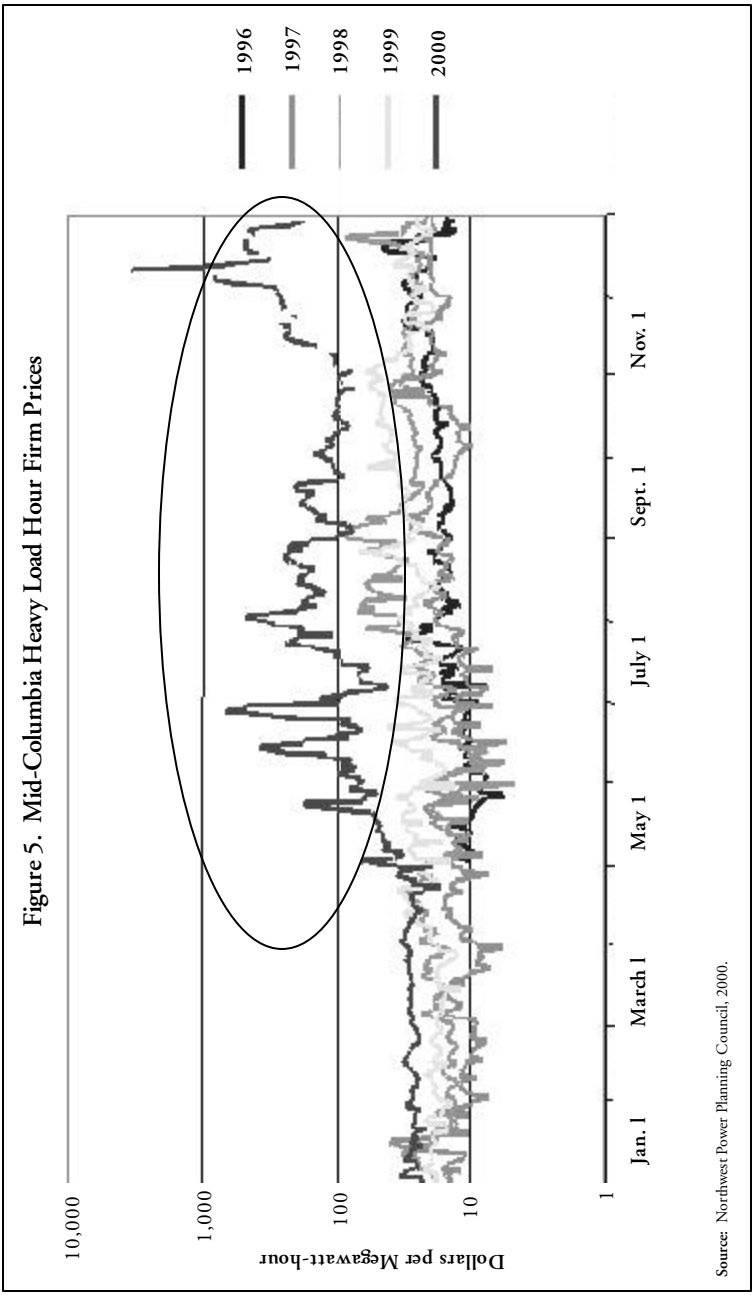


Figure 5. Mid-Columbia Heavy Load Hour Firm Prices

Source: Northwest Power Planning Council, 2000.

natural gas prices, were becoming available. Any new generator probably would be able to produce power more cheaply than the average of the existing generation system, at least in the states that traditionally had experienced high electricity prices.

When large consumers looked at low wholesale electricity prices and high retail prices, they began to seek ways to bypass the high retail rates and gain access to low-cost wholesale power. In some cases large power users even went "off the system" to build their own small power plants to serve their electrical needs. Restructuring the electric industry seemed to them to be a viable option (figure 6).

Figure 6. Six Reasons for Restructuring

1. High retail prices and low wholesale prices.
2. Oversupply of power on the market.
3. New, inexpensive gas generating technologies.
4. Low gas prices.
5. Laws and regulations that required customers to pay retail rates (that are an average of all the utilities' costs, including older, more expensive power plants) and forbade direct access to cheaper wholesale market prices.
6. The threat that some large customers would leave the system to generate power for their own use.

Did Advocates of Restructuring Get What They Wanted?

Advocates of restructuring wanted access to less expensive wholesale rates that reflected only marginal costs and to bypass retail rates that reflected the average of the utilities' costs. Their desire to gain access to those wholesale rates was driven by the fact that the short-term—or spot—wholesale rates were a great deal lower than the average wholesale prices built into the retail rates.

When most states enacted restructuring laws, they took what had been a "bundled" rate, and unbundled it. Customers previ-

ously saw only one charge on their electric bill that encompassed the cost of energy, the cost of transmitting the energy, the cost of delivering the energy, and a number of other utility activities such as energy efficiency, research and development, and renewable energy. Now the unbundled bill separates each of those activities into different cost components so customers can see the charge for each function.

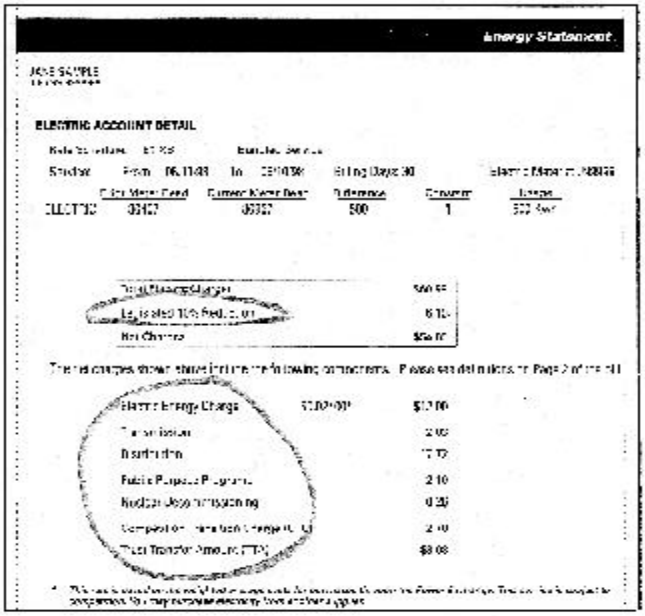
Another new component on many energy bills is a "competitive transition charge." This is a fee that every customer pays to help the utility recover the costs of its previous investments that it will be unable to recover in a competitive market. The transition charge represents the difference between the wholesale price—that so many large customers would have liked to pay—and the former retail rate. Recall that the retail rates generally reflect an average of all the utilities' costs, including their most expensive and their least expensive power plants. Wholesale rates at the time often reflected only the marginal and least expensive elements. Rather than remove the high-cost elements from rates and give customers an immediate break from the high costs, state regulation and legislation simply added those elements into the total rate under a new line item called the transition charge.

In a competitive market, a customer's bill would have looked like figure 7, with unbundled charges—including a transition charge—shown separately.

States have several reasons for using a transition charge. Utilities—that would have had to bear the brunt of the financial liability had states not imposed these transition charges—argued that regulators previously had approved all their major investments. In some cases, the regulators had actively encouraged the utilities to make many of the investments in power facilities. To not impose a transition charge and compensate the utilities for those investments would have been politically difficult and certainly subject to legal challenge. In New Hampshire, for instance, where the utilities disagreed with the level of

the transition charge that the commission set, a legal battle between the utility and the state lasted almost four years.

Figure 7. Sample Electric Bill

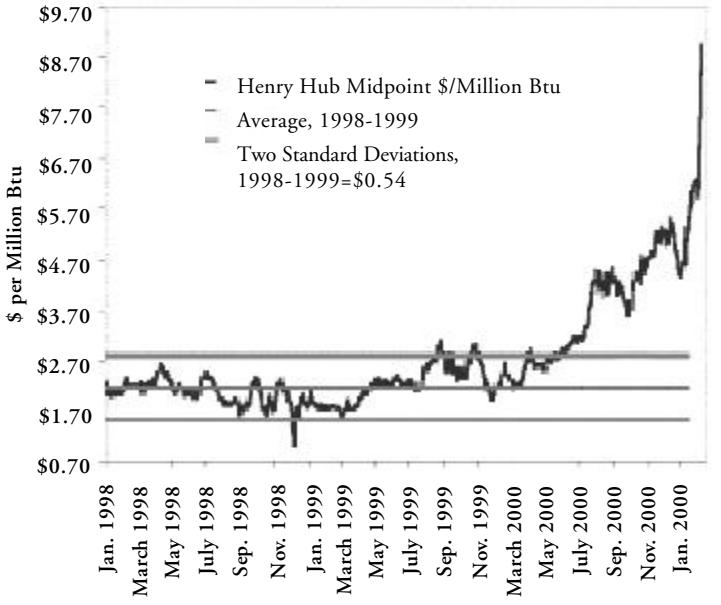


Source: NCSL, 2001.

As a result of these state decisions, the customers that wanted to bypass the higher retail prices and have access to the wholesale market prices did not get all that they wanted. They gained some access to wholesale power markets, but generally continued to pay the competition transition charge. For a time, the wholesale market seemed to perform well and enabled retail competition to deliver savings to customers who decided to buy from a non-utility competitor. The wholesale market conditions changed, however, between the early 1990s—when discussions about restructuring first began—and 2000.

By early 2001, capacity margins in most of the country had shrunk—in some places to dangerously low levels; in anticipation of retail competition, utilities had stopped building while the nonregulated power generation business was in its infancy. The price of natural gas had risen to more than triple its prior-year levels, driven by global energy markets, increased domestic demand and less than average storage of gas (figure 8). As a result, wholesale market prices were rising and becoming increasingly volatile. All these factors contributed to the early experiences with retail competition, described in the next chapter.

Figure 8. Natural Gas Prices: January 1998 to January 2000



Source: *Gas Daily* and Reuters, 2000.

The Early Experience

What Savings Did Restructuring Laws Deliver?

In most states, the transition to competition still is in its early stages. A few trends are becoming clear, however.

- The economics of the electricity business did not encourage small electricity customers to switch to new providers.
- In many cases, restructuring laws delivered savings through legislative fiat, not through competition.
- For a while, at least, some customers have received some savings that resulted from limited access to competitive markets, and larger customers appear to have garnered more savings than smaller customers. Because the industry remains in transition, it is difficult to ascertain at this point how much savings competitive markets ultimately will deliver to customers.

The Economics of the Electricity Business

Even outside the electricity business, analysts refer to a 5 percent rule, in which 5 percent of the customers buy 95 percent of an industry's output of—for example, beer, airplane tickets, telecommunications services, and so forth. Although the 5 percent figure may be neither precise nor accurate, the analogy holds in

the electricity business; the largest customers buy much of the electricity and account as a customer class for a disproportionate amount of the power companies' revenues. Residential and small commercial customers do not account for significant utility profits.

This basic fact about the electricity business has had major implications for the progress of retail competition. Three facts have emerged from states' early attempts to bring competition to the business.

1. In the electricity business, as in other similar businesses, the cost is high for securing each new customer.

2. Individual residential customers do not, as a rule, use a large amount of electricity compared to larger industrial customers; this means that individual residential customers may be less attractive prospects for power marketers than individual industrial customers.

3. The savings for residential customers usually are small.

The Cost of Securing Customers

Exact information that details how much it costs power marketers to convince new customers to buy electricity from them generally is proprietary to the power marketing companies. Such information about how much it costs to secure a new customer today, in an emerging market, also can be an unreliable predictor of how much it might cost in an established electricity market. That said, however, indications are that the cost of securing individual residential customers is high.

Interviews with power marketers reveal that costs to secure each customer range from $50 to $200 or more.

In the cellular telephone market—a somewhat analogous industry—the *New York Times* reports that the cost of marketing to

cellular telephone customers is approximately $300 per customer. The *New York Times* also reports that cell phone companies now place a high priority on keeping the customers they have and not losing them to competitors.

The costs to secure each customer would require power marketers to earn enough profit on each kilowatt-hour they sell to make a reasonable return on their investments. Since most individual residential customers do not use a great deal of electricity, however, the returns on the investment in securing each customer are small.

The Return from Serving Individual Residential Customers

Marketers report to NCSL that a typical profit margin per kilowatt-hour for most residential customers might be 1 cent. In other words, a 150,000 kilowatt-hour per month user would yield a monthly profit of $1,500 per month (less with a lower profit margin). An 800 kilowatt-hour per month user would yield a profit of $8 per month. Most residential customers fall into the lower range; many industrial customers will yield a much higher profit.

The Savings for Residential Customers

Finally, the interest on the part of most residential customers in switching to new providers generally has been lackluster. In part, this is because their potential for savings has been fairly low (figure 9).

Industrial customers and other large electricity users, on the other hand have more potential for savings—and more earnings potential for marketers.

Figure 9. Savings for Residential Customers

A Typical Residential Customer's Bill: $70.00
(**Source**: Energy Information Administration)

40 Percent of Typical Bill Is for Power Delivery $28.00

Portion of Bill Subject to Competition $42.00

Typical Savings Are from 2 percent to 10 percent .....
$.84 to $4.20 savings per month

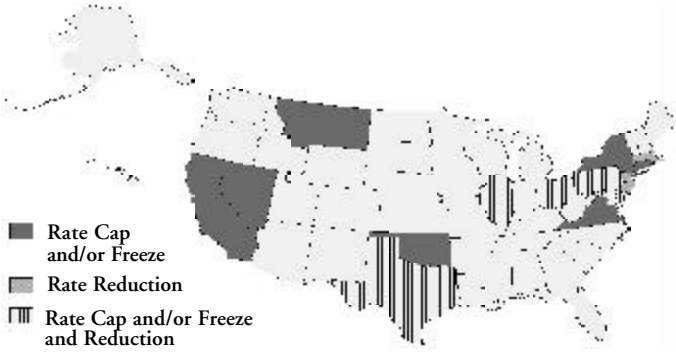
Source: NCSL, 2001.

Restructuring Laws Delivered Immediate Savings Through Legislative Fiat, Not Through Competition

Many restructuring laws delivered a set of mandated rate reductions, rate caps and rate freezes. As suggested below, many of these rate reductions were simply legislative means to achieve—in the very near term—what ultimately would have been achieved under the ordinary regulatory process. Savings that resulted directly from competition would have been an additional benefit for consumers. Many of the early rate cuts that occurred came about not because of competition but because of legislation. California's 10 percent rate reduction is an example of this. Figure 10 and appendix A describe where those rate caps or freezes were in place.

California mandated a 10 percent reduction in electricity rates for all residential customers. This rate reduction became effective on Jan. 1, 1998. The California Public Utilities Commission delayed the start of competition until March 31 of that year, but the rate reduction appeared on customers' bills in January. The rate reduction was not the result of competition, but, rather, the result of some clever financing arrangements and good luck.

Figure 10. Legislated Rate Reductions by State



Source: NCSL, 2001.

Approximately one-third of the reduction was the result of a complex process known as securitization, which allowed the state to sell bonds on behalf of the utilities and apply the proceeds of bond sales to the utilities' stranded costs. Since a state-sanctioned revenue stream—the competition transition charge discussed previously—served as the underlying revenue stream to pay off the bonds, the bonds received a high credit rating and benefited from a low interest rate. That lower interest rate was one part of the calculus that the state used to reduce overall electricity rates.

Stranded costs represent costs that utilities ordinarily would have been reimbursed through rates, but that no longer would be reimbursed in a competitive system .

The remainder of the 10 percent rate reduction came from some utility costs that the utilities, by good fortune, no longer would have to pay. The utilities had signed long-term contracts with independent energy producers that generally were set at high rates during the beginning of the contract, and then would float with market prices after 10 years. As it happened, many of those contracts were signed in the late 1980s and were approaching what was known as their "standard offer cliff." Simply put, the utilities' costs already were set to decline considerably. In their next rate case (the process through which the utility com-

mission sets rates for the utility), the utilities' rates would have been adjusted downward to account for this decrease in their costs.

Another source of funds for the legislated rate reductions in California and elsewhere came from asset sales that were far above book value. Power plants—particularly those located near large population centers, gas lines and electricity transmission lines—sold for more than most analysts expected. In some cases, they sold for double or more the value at which they were listed on the companies' accounting books. In many cases, the gains on these asset sales flowed to consumers to the extent that regulators wanted them to, and reduced the amount that consumers paid as a transition cost charge.

Massachusetts also reduced rates by 10 percent. Again, however, its rate reduction was not the direct result of competition. Massachusetts' regulators set the price for power—known as the standard offer price—at 2.8 cents per kilowatt-hour that initially was below the wholesale price of 3.5 cents per kilowatt-hour. The utilities kept track of any losses from selling power at this low rate, and subsequently would recover the losses—through a standard cost charge—from the same customers who received the discount.

In all these cases, however, customers did receive an immediate benefit from the law that was intended to establish competition. However, the benefit did not flow from competition. In these cases, too, the rate charged to customers that did not switch was an important factor in determining how many customers ultimately switched providers.

The Overall Trend Has Been to Cap or Freeze Retail Rates and to Leave Wholesale Power Rates to Fluctuate

The advantage of the rate cap or freeze is that it protects customers—especially smaller customers that may not have the resources to monitor electricity prices, the ability to reduce their electricity use or the means to search out alternative sources of supply—from rising energy prices. It further can protect customers that use relatively little power and that may be less attractive customers for retail marketers. Consumer advocates—who typically advocate for residential and smaller consumers—feel that rate freezes and caps are an essential component of a competitive market, at least until well-functioning competition can be shown to be effective.

Others, however, consider rate freezes and caps for retail customers an element of "partial deregulation," which allows the real market price of electricity to fluctuate but does not allow those market prices to flow through to retail customers. This situation was most marked in California, where wholesale electricity prices skyrocketed to many times their prior-year levels; retail prices, however, were not allowed to increase. In the end, utilities lost money on every kilowatt-hour they sold, and one—Pacific Gas & Electric—declared bankruptcy.

Critics of the regulated rate freezes and caps argue that electricity supply would have been less strained had customers' rates reflected the actual wholesale cost of electricity. Higher prices might have convinced people to reduce their electricity usage or to seek alternative sources of electricity, which would eventually have put downward pressure on electricity prices. They argue that this would have further helped to develop the competitive market that, in California and elsewhere, had been slow to develop.

As a consequence, some argue that the best way to achieve a relationship between supply and demand would be to install real-time meters in every customer's home and business, thus giving them the ability to shift their usage to off-peak hours should electricity prices become volatile. It is not yet clear whether real-time meters are cost effective for all classes of customers in all situations.

Real-time meters enable customers to see—and power companies to charge for—the cost of power as it changes from minute to minute. Most customers currently pay an average electricity rate.

Consumer advocates argue that this approach, particularly if combined with lifting of rate caps or freezes, would leave many consumers in a difficult financial situation. Many small consumers are unlikely to switch providers and many are equally unlikely to be able to adjust their habits quickly enough to respond to a one-day notice of an upcoming price spike. How much could the average low-income customer whose main energy usage comes from lighting and refrigeration adjust his or her usage?

Some Customers Received Some Savings in Some Markets for a While

Although wholesale electricity prices remained low in the late 1990s, some particularly large electricity customers were able to save money through deals they struck with power marketers. Most residential and small commercial customers were not directly exposed to retail competition. As a result, little empirical evidence is available to suggest how residential customers would have fared had retail competition been successful. The following sections address the experiences of residential and small commercial customers and larger customers, in turn.

With a few exceptions, retail markets nationwide have been quiet for most residential customers, with few marketers selling products and few small consumers buying. This means that only a

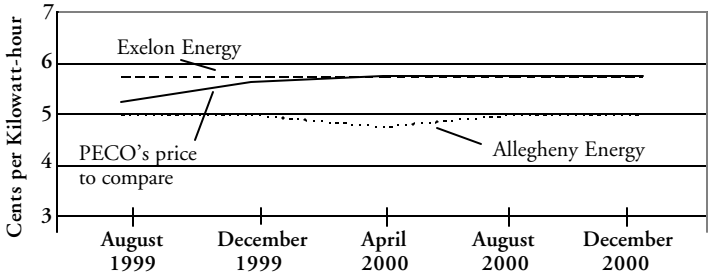
very few customers have sampled a competitive product. Paradoxically, one of the most important factors in how quickly deregulation takes hold is how regulators set the price for customers that do not choose a competitive provider. This regulated rate, if set high, allows competitors to beat the rate and still earn a profit. If set low, it often makes it difficult for competitors to both beat the price and earn a profit. This rate is alternately called a "default price," a "price to compare" or a "price to beat." The following section illustrates the importance of this regulated price in the "deregulated" market for three states.

Residential and Small Commercial Customers

Pennsylvania

In Pennsylvania, the price to compare in Philadelphia for customers of PECO was set at just above 5.5 cents per kilowatt-hour. For a time, at least, competitors could better that price by securing energy in wholesale markets and selling at a slight profit. In the PECO territory, for instance, approximately one-quarter to one-third of all customers had switched to a new provider and would have saved 1 cent to 2 cents per kilowatt-hour through these purchases. Some critics of Pennsylvania's model argue that the price to compare was set too high, and that it does not represent the "real" rate but, instead, an artificially inflated rate to encourage competition. Figure 11 illustrates the difference between the regulated "price to compare" in PECO territory and competitors' prices through mid-2000. Table 1 illustrates the percentage of customers that changed to one of PECO's competitors in the same time frame. The percentage of customers that switched providers far exceeds that of any other state.

Figure 11. PECO and Competitors' Rates



Source: NCSL, 2001.

Table 1. PECO Customers Switching as of October 2000

Residential	Commercial
15.18 percent	32.13 percent

Source: Pennsylvania Office of Consumer Advocate, 2001.

California

An example from California shows a pattern of customers choosing a premium product instead of a price-discounted product. In the first year or so of the competitive market, Californians flocked to "green" products—electricity products that were produced from wind, geothermal, solar or some other renewable resource. In general, however, these were more expensive than the non-green product offered through the utility. Subsequently, the California Energy Commission offered a subsidy for green products that lowered their cost to the equivalent of the non-green product offered through the utility. With this new price, almost 100 percent of the relatively small number of residential customers who chose a competitive power supplier chose the green product. Aside from green product offerings, few marketers could compete with the utility's regulated, capped retail rates in California. As a result, competitive power suppliers could not offer any additional savings to residential customers. Table 2 illustrates that the general pattern in California reflected the rest

of the country; larger customers tended to take advantage of competitive offerings. Most residential customers remained with their original utility supplier.

Table 2. California Customers Switching as of October 2000

Switches	Residential	Commercial
Customer	1.7 percent	7.5 percent
Load	2 percent	16.1 percent

Source: California Public Utilities Commission, 2000.

Massachusetts

Massachusetts joined most of the other New England states in passing a law to open its power markets to retail competition. Like most other states, it delegated many of the details of the implementation to its regulatory body, the Department of Telecommunications and Energy (DTE). One of the DTE's first tasks was to set the standard offer price for power—or the price that any customer that did not switch to a new provider would pay. The DTE initially set this price at a level somewhat below wholesale electricity prices in the New England market as part of an effort to deliver immediate savings to Massachusetts electricity customers. Over time, the DTE has refined this rate for the non-switching customer so that it has increased, varies by customer class, and varies within individual utility service areas. Nonetheless, the initial rate and its subsequent revisions have not set in motion a dramatic shift to alternative electricity providers (table 3).

Table 3. Massachusetts Customers Switching as of August 2001

Switches	Residential	Commercial/ Industrial
Customers	0.05 percent	0.85 percent
Load	0.067 percent	12.16 percent

Source: Massachusetts Department of Telecommunications and Energy, 2000.

The exception to this pattern has been buyers' groups, or aggregated groups of customers, that together solicit bids to serve their electricity needs. For instance, in the nation's largest-ever energy aggregation contract to date, Green Mountain Energy was selected to serve an aggregated group of more than 400,000 electricity customers in Ohio. In Rhode Island, the League of Cities and Towns negotiated a long-term contract to serve the electricity needs of its members.

It is still too early to tell how much savings the competitive market will deliver to residential and small commercial customers. Some critics argue that not only is it too early, but that considerable time will elapse before most residential customers benefit from competition.

Commercial and Industrial Customers

A far larger proportion of commercial and industrial customers have switched to alternative providers throughout the United States than have small commercial and residential customers (figures 11, 12 and 13 above illustrate this trend). This indicates that these customers were receiving enough savings by shopping for power to make it worth their time and effort to make the switch.

Information about the contracts set up between the large customers and electricity suppliers (known as bilateral contracts) is difficult to obtain, so little real information is available about industrial customers' savings.

Lawrence Berkeley National Laboratory in California gathered anecdotal evidence of large commercial and industrial customers' savings attributed to purchasing electricity in competitive markets. Their study, based on press releases and interviews with energy managers in large companies, indicated that, during the late 1990s, most large customers estimated they were saving between 1 percent and 5 percent (in California), between

5 percent and 10 percent or more (in Pennsylvania), and up to 10 percent (in areas such as Illinois and Massachusetts) (table 4).

Table 4. Industrial Customers Switching as of Fall 2000

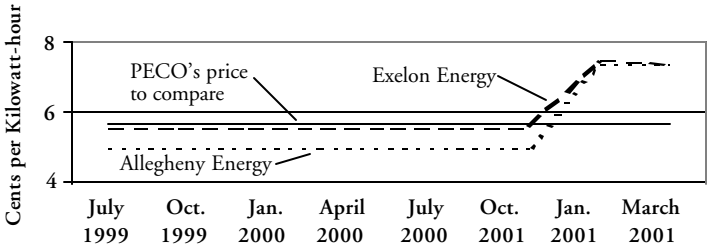
Switches	California	Pennsylvania	Massachusetts
Customers	12.8 percent	45.37 percent	7.2 percent
Load (kWh)	27.4 percent	40.63 percent	12.4 percent

Sources: California Public Utilities Commission, Pennsylvania Office of Consumer Advocate, Massachusetts Department of Telecommunication and Energy.

Retail prices for the largest electricity consumers appear to be rising, as are the rates for residential customers. As a result, even in states such as Pennsylvania—where many customers switched providers at first—some of those large customers returned to their original providers when marketers' prices began to exceed the regulated price to compare.

Even outside California's troubled experience with its electricity markets, retail markets for residential customers appear to be developing slowly. In Pennsylvania, where retail markets originally yielded some savings for residential customers who switched, wholesale prices later moved upward and customers began to switch back to the capped utility price to compare. The price to compare remains steady, while the competitors' prices continue to rise. This phenomenon of rising prices is due in large part to rising wholesale prices for electricity, which result mostly from increasing natural gas prices. Figure 12, which shows the situation in the PECO service territory, illustrates this situation. The capped retail rate that previously had appeared high enough to encourage competition now is lower than competitors' prices. As a result, customers started to switch back to their original utility provider at the regulated rate.

Figure 12. PECO and Competitors' Rates Through Spring 2001



Source: NCSL, 2001.

Table 5 further indicates that it was often the largest customers among the industrial class that switched in the greatest numbers.

Table 5. Percent of PECO Customers Switching as of July 2001

Residential	Commercial	Industrial
12.5 percent*	5.0 percent	4.7 percent
Load Switching		
Residential	**Commercial**	**Industrial**
13.7 percent	6.0 percent	7.0 percent

* The right to serve an additional 16.4 percent of PECO customers was assigned to a competitive producer through a 2001 competitive auction.

Source: California Public Utilities Commission, 2000.

The Road Ahead

The potential for any kind of structural or legal changes to the electric industry is preconditioned on wholesale power markets that function well. In other words, without sufficient generation, adequate means to deliver power through transmission lines, and an institutional structure to support power generation and transmission, retail market deregulation stands little chance of providing consumers with stable and affordable electricity rates.

Factors to Consider

Policymakers will want to consider a number of factors that are new to the electric industry, including the following.

Current Lack of Coordinated Planning or Oversight of Power Markets

Many state or regional efforts to at least monitor power markets fell by the wayside during the mid-1990s. Beginning in late 2000, more than a dozen states began concerted efforts to design some kind of state energy policy through either a legislative or executive branch initiative. Many observers suggest that some type of coordinated body could monitor the power market and make recommendations about where new transmission system investments should be made, what upgrades to the generation system should be made, and what role distributed resources and

energy efficiency should have in decisions about new generation and new transmission.

Dependence on Natural Gas

Almost every major new power generating facility in the country will use natural gas—the exceptions being a small number of coal- and wind-powered facilities. The new risks to the electric system will increasingly come from the natural gas market. How volatile will natural gas prices be? How much storage capacity for natural gas is in place to insulate companies and consumers from natural gas price fluctuations? When supplies of natural gas run short during a cold winter, will electricity generators have the flexibility to switch to other fuels if the available gas must be used for home heating? How robust is the current delivery system for natural gas?

Market Power

In newly competitive power markets, some observers express concern that a small number of companies could manipulate prices, or that they could—at certain times of day or year—charge prices significantly higher than a truly competitive market or a regulated market would allow. The assertions that such manipulation or overcharging has actually happened are difficult to substantiate, although many organizations are examining this possibility.

State policymakers will increasingly want to pay attention to market power concerns, even though it may mean finding ways to influence regional organizations and regional power markets. Electric power markets have been regional markets for a long time; however, the pace of the transition to regional markets will require more cooperation among states. One area that state policymakers may wish to consider is how the regional organizations that manage the power system can use a variety of different resources to meet electric power system needs, including not

only large generators but also small, distributed generators and customers' energy efficiency measures.

Transmission and Generation Siting

For the moment, states have full control over siting generation and transmission facilities. As power markets rapidly become more regional, these facilities become more difficult to site. Why should Kentucky residents bear the burden of power plants built to serve load in Ohio, for instance? Why should transmission lines be built through one state to deliver power to serve another? Although there are legitimate answers to these questions, they nonetheless arise in multiple situations.

Some of the issues that states may need to address also arose in California during 2000-2001. (Although the focus of this report is not on California, another NCSL publication—*California's Power Crisis: What Happened? What Can We Learn?*—discusses these factors in detail.)

Lessons from California

Many of the problems California encountered in 2000 and 2001 resulted from difficulties with its wholesale power market. These, in turn, created problems for the retail power market. A few of the most prominent lessons from California's experience follow.

1. California did not build sufficient generation to meet its needs and relied on imports from other states that also had built little new generation. In a regulated market, such a tight supply and demand balance may result in rolling brownouts and blackouts. In California's competitive market, it also yielded some price volatility and rate increases that thus far had not been seen in electricity markets.

   California's problems were the consequence not only of a shortage of summer power supply, but also of an unmanaged

winter power supply. Blackouts occurred in California during the winter months when the apparent supply of electricity should have been more then adequate. However, many power plants were off line for maintenance or did not sell into the market for other reasons. It remains a matter of debate as to how and why winter shortages occurred in California, but it is clear that no combination of market participants or government agencies under the current market structure had the full obligation, authority or ability to keep the lights on.

2. California's wholesale and retail markets were disconnected, such that price swings due to supply constrictions and increasing natural gas prices in the wholesale market were not reflected on retail customers' electricity bills. As a result, demand was unresponsive to the gyrations in the wholesale market. Some critics argued that it was unfair to make consumers respond to market prices. Nonetheless, it was a reality that the California electric system—both the utilities and the state—paid prices for power that they could not recover in retail rates.

3. The utilities remained the primary suppliers for California's electricity customers, but the utilities were restricted in how they could participate in the wholesale market. For instance, although most wholesale buyers outside California tried to secure power through a mixture of long-term contracts, some short-term contracts and some of their own generation, California's utilities could, for the most part, purchase power only on the spot market. This lack of flexibility hampered the functioning of the wholesale market.

The **spot market** is an instantaneous power market in which electricity trades for immediate sale. Spot markets tend to be more volatile than long-term or forward markets.

4. To some degree, a lack of adequate transmission capacity worsened California's problems. Although enough capacity

was available to move power into the state, transmission constraints kept power from moving between the northern and southern parts of the state and reduced the efficiency of the wholesale market. Transmission constraints can be worse in some other areas of the country and are the subject of heated debate.

5. It is difficult to prove that any single company has exercised any kind of market power or price manipulation, although many parties have tried to assess blame on one another. What is clear is that, although demand for power rose to some extent in California, prices rose at a far greater rate. No conclusions are drawn here about market power, but it is clear that, to some degree, the wholesale market in California was producing unexpected results.

What Can State Legislators Control?

State policymakers face a dilemma with electric industry markets; they are the first line of defense—the first people that the public contacts—when things go awry. Yet, state policymakers do not exert control over every facet of the market. State policymakers will want to be well aware of what they do and do not control, especially since a concerted public policy effort has begun to move toward less direct regulation and more competition. State policymakers can control some elements of electricity markets but have little direct control over other elements of the markets. (Another NCSL document, *The Electric Industry: State and Federal Jurisdiction,* discusses in more detail what is under state and federal control.)

In general, state policymakers can look to the following items that are under their control—and others that are not under their direct control (table 6). This division between what is and what is not under the direct control of states may help state policymakers to think of policies that they may pursue in their own states to influence the course of the electric industry. Alaska,

Hawaii and part of Texas are subject to different rules and generally are less subject to federal authority. State policymakers may be able to consider not only what they do and do not control directly, but also how they may use what they do control to influence the areas that they do not control.

Table 6. Elements of Electricity Markets

Under State Control or Influence	Not Under Direct State Control
• Retail electricity rates	• Wholesale electricity rates and prices
• Retail electricity usage (through efficiency or pricing programs)	• Wholesale natural gas prices
• Initial decision about whether to allow retail competition	• Formation of regional electricity entitites (often called regional transmission organizations)
• Power plant siting	• Electric rates and policies of federal utilities
• Power line siting	• Transmission rates and policies
• State tax policy related to generation, efficiency, renewable energy, and transmission and distribution systems	• Granting rights for a generator to sell power at "market based rates"

Source: NCSL, 2001.

Many of the problems with retail competition link directly to difficulties in wholesale power markets. These problems include a lack of adequate generation or transmission capacity and a still-developing set of rules governing who builds and pays for each of these. The federal government controls the price and policies for transmission lines and, in states that have restructured, can exercise a general authority over pricing and policies for generation.

States have more direct authority over whether a power plant or line is built, through siting authority. They also have influence over how much power consumers use, through energy efficiency programs. Through these authorities, states actually wield considerable influence over how well the wholesale markets work.

Linking Retail Demand with Wholesale Supply

One element of state authority that warrants considerable attention and discussion is the idea of creating a link between electricity demand and wholesale electricity supply and prices. Most customers do not adjust their electricity usage—as they might, for instance, for gasoline—if wholesale supplies constrict or prices increase. Indeed, it may not be desirable for all customers to feel the effects of wholesale price fluctuations.

A number of policy measures, some of which are under direct control of the states, may offer a way to allow at least some customers to adjust their demand for electricity when wholesale prices and supplies tighten. Some analysts refer to this as bringing a "demand response" to the market. One method of bringing some element of demand responsiveness into the power market is to install a special meter on customers' premises. When wholesale prices increase, the meter reflects increases in real time.

Instead of installing real-time meters on every business and home at great cost, another alternative would be to target a few customers for demand reduction and to compensate them for reducing their power demand. This could be effective because price spikes affect only a small number of hours during the year and because small reductions in demand—often as little as 5 percent of total demand during a few hours—can significantly reduce the strain on the power system.

Figure 13 shows power usage in California during summer 2000. Note the swiftly rising prices and usage during so-called "needle peak" periods. Needle peaks represent the brief periods when prices spike up to very high levels. Targeted methods of demand reduction can shave these needle peaks considerably.

Most analysts suggest that very small decreases in demand can produce large cost savings. Two methods to achieve this are detailed below.

Figure 13. PX Day-Ahead Electricity Prices

PX SP15 zonal prices
SCE and SDG&E purchase day-ahead electricity at the SP15 price

Source: California Power Exchange, 2000.

- ***Demand Bidding.*** Customers or their agents would be able to bid into the wholesale market to reduce their demand for power at certain times of day. These bids would compete on a price basis against bids to supply power during the same time. The market would decide which among the portfolio of demand and supply bids would be accepted.

- ***Demand Participation.*** A customer could set up a contract with its utility or electricity provider through which, when the electric system requires additional capacity, the customer would reduce usage. The utility then could sell these kilowatt-hours on the open market at the available price. The customer and the utility would split the proceeds of that sale according to some prearranged formula.

Another example comes from Washington, D.C., and Maryland. Customers receive a small discount on their electric bill and give their utility the right to install a small device on their air conditioner. The device, when activated, allows the utility to turn off the customer's air conditioner for a few minutes each hour during high-use periods. The short time that the air conditioner is turned off does not affect the customer's comfort in most cases, and the combination of many air conditioners being turned off helps the electric system meet its demand for power.

Some fundamental changes in the electric industry structure have occurred that alter the traditional role of the regulated electric utility. Increased opportunities for specialization in areas like power generation ownership and operation, wholesale electricity market trading, transmission system ownership, transmission system management, distribution system management, billing, and more led many utility companies to divest or out-source traditional electric company functions. One specialization of some note is ownership of nuclear units. Six companies have made clear their intent to acquire operating nuclear units from other, less committed, owners and to improve overall performance.

An outcome of this trend is that in many parts of the United States no one company can solve a public policy problem in the utility sector. A comprehensive view is beneficial in deciding which from among several system investments can best address growth. Power lines, large generation, small generation and efficiency all interact to address power system needs. Yet, these investments are, in many cases, controlled by different companies. With a fragmented industry, some states now are examining ways to develop a policy and planning process that integrates these many activities.

Conclusions

The early years of restructuring have produced a mixture of results and these results reflect a market in transition. It appears fair to say that competition *could* produce a broader array of innovations and products than regulation, and that it could do so while also keeping electricity costs stable and affordable for consumers. To date, most of the benefits of retail competition for electricity remain theoretical. Achieving the benefits probably will be more difficult than expected by even the strongest advocates of retail competition. It also seems apparent that it will be difficult to achieve the conditions under which retail competition could produce this broad array of products at lower cost. Appendix B contains some questions that state policymakers may wish to consider as they determine a path for their states.

Many retail competition advocates promoted the idea of retail electric competition with the promise that that it would lower rates for everyone. That has, however, proved difficult to deliver, not so much because retail competition could not ultimately make the electric system more efficient, but because prices under competition remain subject to many of the same forces that affect prices under regulation. When natural gas prices increased in 2000, wholesale electricity prices increased as well. Retail markets, without the benefits of well-functioning wholesale markets, proved less efficient than many had hoped and made it

difficult to achieve real savings from retail market competition. The question that perhaps remains unanswered is not whether retail competition will lower rates for all consumers, but whether competition will make electricity rates lower than they otherwise would have been under regulation. The answer to that question remains elusive.

Appendix A. Rate Caps, Freezes and Reductions Established in State Electric Industry Restructuring Legislation

State	Cap	Freeze	Reduction
Arizona	✔		10%
California	✔		20% small customers
Connecticut	✔		
Delaware	✔	Transition period	7.5% residential
Illinois		1996 rates through 2004 nonresidential	20% residential (ComEd, Ill. Power); 5% residential (CILCO)
Massachusetts	✔		10%-15%
Maryland	✔		3%-7.5% residential
Montana	✔		
Nevada	✔		
New Jersey	✔		10%

Appendix A. Rate Caps, Freezes and Reductions Established in State Electric Industry Restructuring Legislation (continued)

State	Cap	Freeze	Reduction
New York	✔		
ConEd (NY)			25% immediate rate decrease for large industrial customers, to remain fixed for five years. 10% rate decrease for all other customers, phased in over five years.
Central Hudson Gas & Electric (NY)			Base electric rates will be frozen at 1993 levels through June 30, 2001, for all customers. (Base rates do not reflect changes in fuel costs.) 5% per year rate reductions for large industrial customers; customers may choose to continue to buy electricity from Central Hudson and receive a discount until mid-2001, or they may select an energy services company (ESCO) whose price will be determined by the market.

Appendix A. Rate Caps, Freezes and Reductions Established in State Electric Industry Restructuring Legislation (continued)

State	Cap	Freeze	Reduction
Orange and Rockland (NY)	O&R's rates for the sale and delivery of electricity will be set by the PSC until May 1, 1999. The PSC will continue to regulate delivery rates after that time. Prices for the generation portion of electricity after May 1, 1999, will be set by the competitive market.		1995-1996: 4% average residential, 4%-14% commercial and industrial 1997: 1% residential 1998: 1% additional for residential 1997: 8.5% large industrial ***For customers that participate in PowerPick by choosing to buy electricity from an energy services company (ESCO):*** Large industrial customers may have additional rate benefits in the range of 3.5% Smaller customers may have additional rate benefits in the range of 2%
Rochester (NY)	RG&E rates for sale and delivery of electricity are set until mid-2002. The PSC will regulate the utility's rates for delivery after 2002. Prices for electricity generation after 2002 will be determined by the competitive market.		7.5% residential, small commercial 8% other commercial, most industiral 11.2% large industrial All phased in over five years 5% for five years, for industrial and large commercial users with more than 500 kW of load capacity

Appendix A. Rate Caps, Freezes and Reductions Established in State Electric Industry Restructuring Legislation (continued)

State	Cap	Freeze	Reduction
New York State Electicity and Gas (NY)	NYSEG's rates for both supply and delivery of electricity are capped until 2003. The PSC will continue to regulate rates for delivery after 2003. Prices for electricity for all customers after 2003 will be set by the competitive market. In a settlement approved by the PSC, NYSEG has agreed to forego two previously authorized rate increases, saving customers more than $522 million through 2002.	Residential and small commercial/industrial customers rates will be frozen at the current levels for two years.	1% residential in third year. 5% residential total deduction by fifth year. For industrial and commercial customers that are not eligible for the five annual 5 percent rate decreases, the plan provides financial incentives for load growth, thereby encouraging business expansion.

Appendix A. Rate Caps, Freezes and Reductions Established in State Electric Industry Restructuring Legislation (continued)

State	Cap	Freeze	Reduction
Niagara Mohawk (NY)	Niagara Mohawk rates for electricity and its delivery are set until Sept. 1, 2001. In 2001 and 2002, Niagara Mohawk may request limited rate increases, but the PSC must review and approve any request.		4.3% overall average. 3.2% average for residential and commercial over three years. 13% industiral
Ohio	✔	Five years	5% residential
Oklahoma	✔		
Pennsylvania	✔		Allegheny 17% for Duquesne customers 2.5% for GPU (Met-Ed) customers 3.0% for GPU (Penelec) customers 8% all cusomers 1999 6% for 2000 PECO customers 4% for PA Power & Light customers 2.5% West Penn

Appendix A. Rate Caps, Freezes and Reductions Established in State Electric Industry Restructuring Legislation (continued)

State	Cap	Freeze	Reduction
Rhode Island	✔		
Texas		Three years	6% residential, small commerical
West Virginia	✔		

Source: NCSL, 2001.

Appendix B. Suggested Questions for Legislatures to Consider Regarding Electric Industry Restructuring

What Is the Goal of Restructuring in Your State?

1. *Immediate Reductions in Electric Rates for All Customers.*

    a. How will you accomplish those rate reductions? If through legislative or regulatory order, would these rate reductions have occurred under regulation anyway?
    b. Who will pay for the immediate rate reduction, if it is offered?

2. *Competition and switching among residential and small commercial customers.*

    a. What prices will be charged to customers who do not switch and what enticements will be offered to encourage people to switch?

b. If residential customers do not represent big profit-centers for power marketers, how will you attempt to make the residential market more attractive for marketers?
c. How long a transition period do you intend to provide?
d. How will you protect those customers who have not switched providers during the transition?

3. *Protection of residential and small commercial customers while allowing or encouraging larger customers to switch providers.*

a. How will the rates for the non-choosing customers be determined?
b. What products will the non-choosing customers be offered, assuming some type of regulation of residential markets continues?
c. How will rates for the non-choosing—but eligible-to-choose large customers—be determined?

4. *Promotion of environmental benefits through retail sales of "green" electricity.*

a. Will you require some type of standard "green" product information disclosure by providers?

5. *Long-term efficiencies but a slow transition to a market in which significant numbers of customers have switched.*

a. How long will your transition period be?
b. What will be your measure of success during the transition?
c. How will you continue to regulate the business while it is in the transition to competition?

What Is the State of Wholesale Electricity Markets in Your State and Your Region?

1. Is there, in your state and the region:

a. Adequate generation capacity?
b. Adequate transmission capacity?
c. A clearly defined set of rules governing generation planning, transmission access, transmission planning, transmission expenditures and investments?
d. An effective demand response program in place that ties demand in the retail market in some way to conditions in the wholesale power market?

2. To what risks is your state exposed from the fuels that feed the generation mix in the state and region?

a. If gas will serve as a feedstock for new generation, is there adequate pipeline capacity into the region?
b. Which fuels currently, and in the future, determine the price of generation in the region? How will the price of natural gas, coal, oil or other fuels bear on electricity prices in your state?

Notes

1. Nuclear facilities have, in recent years, been operating much more reliably and for a greater percentage of the hours in a year, according to an article in *Global Energy Business 2*, no. 6, November/December 2000.

2. William Golove, Rodrigo Prudencio, Ryan Wiser and Charles Goldman, *Electricity Restructuring and Value-Added Services: Beyond the Hype* (Lawrence Berkeley National Laboratory, August 2000).