

Electricity Troubles in California: Who's Next?

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Residents of the 23 other states and the District of Columbia that, like California, have passed legislation for restructuring their electric power industries should take note of California's electricity problems: consumers are warned to restrict their electricity use; prices are high and volatile; some areas have had service interruptions; and the outlook for the future is uncertain.

Certainly, here in Massachusetts, where restructuring is in the offing, we are concerned that we are headed for similar problems. Time and again we hear reassuring arguments that the state's restructured power industry will work well under perfect market conditions. The claim is made that competition, set to begin soon in Massachusetts, will lead to efficient supply, as well as efficient use, of electricity, because the up-and-down movement of spot prices will communicate electricity's real value to both providers and users.

But today's market is far from perfect. California's problems in its transition from regulation to competition will no doubt be mirrored elsewhere, if steps are not taken to intervene [see figure, next page, and related story on pp. 24–28].

Core problem: inconsistency

Regulation in today's electric power industry is a combination of the old and the new. Under the old regulatory rules, prices to the consumer are based on suppliers' costs plus a set rate of return. In contrast, the new regulatory rules are uncertain and inconsistent. For example, only new power suppliers—those using new generating plants or old plants divested by utilities—are allowed to compete. Utilities that still own power plants are subject to a variety of makeshift rules intended to prevent them from influencing electricity prices. They may not, for instance, generate and sell electricity directly to their customers, but must sell the power to, and buy it back from, the regional spot market.

Thus, to sell electricity, they are required to bid into the daily spot market strictly at their production cost. Nor may they establish long-term bilateral contracts with groups of users, but must purchase electricity daily on behalf of their customers under the old "obligation to serve" rubric, regardless of the pre-

vailing price and what it will cost them.

"Wire" companies—those that transmit electricity over long distances and distribute it locally—are separate remnants of the divested utilities and remain fully regulated. There are no regulatory or market mechanisms under which they may offer services based on their value to the consumer.

Possibly the most damaging regulation is on the customer side. In both California and Massachusetts, legislation was passed several years ago meant to help establish retail competition: each user would eventually choose a power supplier—but not right away. To ease the transition to retail competition, the legislation created a grace period during which a "standard offer"—representing, in effect, a compromise—would protect both utilities and consumers. Utilities would be forgiven their debt on nuclear and other power plants that were no longer competitive, while electricity users would be guaranteed that prices would go no higher than preset caps for several years to come.

Meanwhile, retail competition beyond state borders remains unfettered. For example, California customers, including households, industrial users, and utilities, can buy electricity from federally owned power plants in the northwest, and Massachusetts customers can choose suppliers from New York and Canada. Yet there are no clear and enforceable rules for such exchanges, further complicating the retail competition process.

Substantial consequences

The consequences of these regulatory inconsistencies are substantial and already apparent in California. The process of moving from cost-based rules to competition in only parts of the electricity sector (as in new generation and divested old power plants) can only lead to cherry picking. Competitive suppliers select the most attractive electricity customers (large industrial users), leaving small residential customers—about a third of total demand—vulnerable during the transition once the standard offer expires.

Meanwhile, the terms of the shortsighted standard-offer legislation lulled such small customers into believing that restructuring would lower their electricity bills without lowering quality of service. Not surprisingly, when the standard offer expired in the San Diego area first (once the "stranded" cost of the old power plants of the local utility was paid for) residential customers were not prepared to deal with their sudden exposure to highly volatile wholesale prices. Low prices had effectively blocked the creation of load aggregators, whose sole purpose would have been to offer residential and other customers long-term contracts, assuring them of continuous service and taking on the risk of volatile electricity prices.

In addition, customers were not supplied with equipment—

such as automated meter reading, Internet-based response to electricity prices, and control equipment to automatically adjust use in response to price changes—that would enable them to conserve electricity when market prices were high. With prices low, distribution companies like Pacific Gas & Electric and Southern California Edison had no incentive to invest in load-smoothing equipment for small customers. As peak use rose, so did electricity prices. Moreover, the owners of new power plants (the power marketers) charged unreasonable prices (far beyond their production costs) which skyrocketed spot market prices.

As for the remnants of the divested utilities, they remained noncompetitive, last-resort providers for small customers, and without regulatory permission to enter into long-term contracts with suppliers. Yet electricity demand was growing as California's economy recovered from its lull in the early '90s. Utilities, with Pacific Gas & Electric and Southern California Edison among them, ended up having to purchase from volatile electricity markets and sell their power at their production cost. The result has been huge negative cash flows and near-bankrupt utilities.

Opportunities to increase the efficiency of electricity delivery were therefore lost.

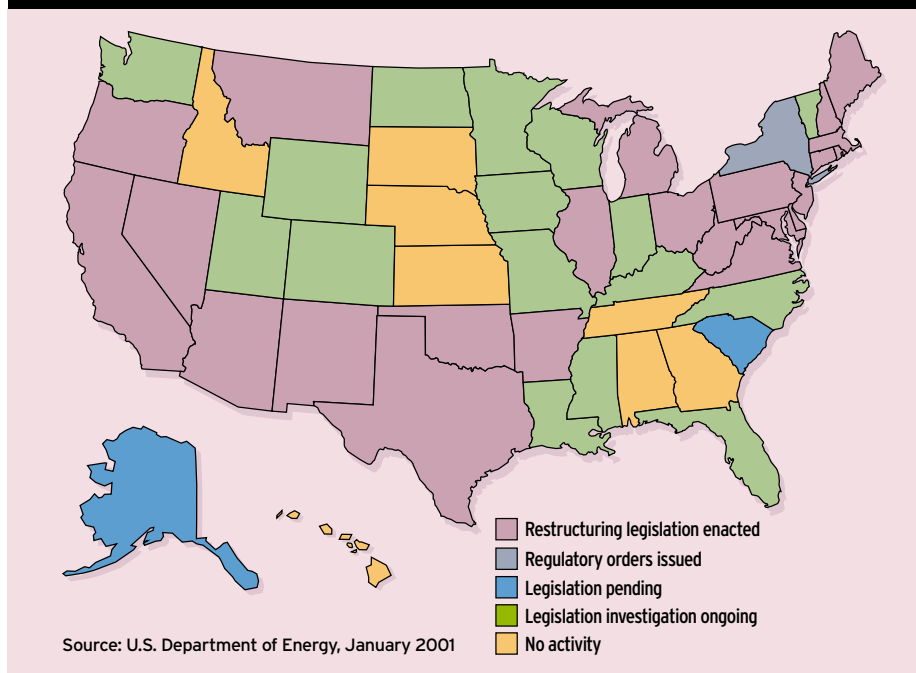
What's more, no major generating capacity has been added in recent years because of uncertainty about the evolving industry, low prices, and state emissions limits restricting the issue of building permits for new plants. Imported electricity from the northwest—which could have provided the missing supply—is now unavailable because of low hydropower conditions.

Problems to come

Given the current conditions in Massachusetts (and elsewhere), there is good reason to assume that a similar series of events may unfold about the time the state's standard offer expires in a few years, unless something is done in the meantime. Historically, utilities have maintained plenty of generating capacity to meet electricity demand. Typically, excess reserves (intended to cover unexpected demand peaks and equipment outages) were almost 20 percent above projected peak demand. To meet their long-term (regulatory, not contractual) obligation to serve customers in their area of

Electric Industry Restructuring Activity

Twenty-four states plus the District of Columbia have enacted legislation calling for the restructuring of their electric power industry. Restructuring in one state, New York, is being guided by regulatory orders from its Public Service Commission.



service, utilities could foresee the need for expanded capacity, so there was little time lag between the need for new capacity and its availability.

Since restructuring began in 1996, the picture in New England has changed considerably. The region never had a fully sufficient supply, and has always been somewhat dependent on imports. These came from neighboring regions, but customers were faced with little uncertainty in supply. This situation continued when the energy market was opened in New England in September 1999; between then and December 2000, for example, there were several periods where weekly peak demand would have exceeded generating capacity if imports from Canada and New York had not been available.

And even with the imports, at times of low generating capacity, now dependent on market and uncoordinated maintenance activities within the region, spot prices too often dramatically exceeded typical electricity prices. However, customers saw no consequences of these spot prices, because the standard offer was still in effect. Utilities were losing money at those times, though, because they were selling at cost and paying much more, an unsustainable situation over long periods of time. Once the standard offer expires in Massachusetts, the situation will be identical to what happened in San Diego: without imports, prices skyrocket, usage cutbacks are ordered, and blackouts occur.

The missing pieces

How can Massachusetts and the restructuring states avoid California's fate? Several steps must be taken. The most

important is to establish pricing rules that provide meaningful signals to all industry participants. Such signals, in the absence of regulatory requirements, give suppliers the incentive to make capital investments in new generating capacity, in the development of environmentally sustainable technologies, and in excess reserves.

Most important are true prices on the wholesale spot market and the prices in long-term contracts on forward markets. Neither signal has been available in California: high wholesale prices led to the imposition of artificial caps on spot prices, and utilities were forced to bid into the spot market rather than being allowed to establish long-term contracts with customers.

High spot prices can encourage generation investment, but increases in capacity lag the growth in demand indicated by higher prices. Therefore, the prices and quantities prevailing in long-term forward contracts are critical. Such contracts can provide early information on future demand requirements, reducing the lag between needing new capacity and having it available. The resulting reduction in times of imbalance between supply and demand can reduce the volatility of spot prices.

More accurate price signals would also encourage the creation of a critical player now largely missing in both California and Massachusetts, and, likely, elsewhere: the load aggregator. Called energy service providers (ESPs) in California and load-serving entities (LSEs) in Massachusetts, these firms would enter into long-term contracts with electricity suppliers and wire companies on behalf of aggregated small customers. A lively market of high-tech, profit-motivated, competitive LSEs could effectively hedge risk-averse consumers from volatile electricity prices. Moreover, customers could choose among several levels of service, for example, paying a higher price to ensure uninterrupted supply.

LSEs could also be pivotal in creating demand elasticity. Through technologies such as automatic meter reading and Internet-based trading, LSEs could give customers both the incentive and the ability to conserve electricity when prices are high because supply is short. Then the difference between peak and normal demand would shrink, reducing overall generation capacity needs.

New rules of the game

Another critical need is for the adoption of clear rules for multimarket transfers, that is, transfers of power from electricity markets outside the region. Both California and New England depend on imported electricity to make up for occasional shortfalls in generating capacity. Without imports from Canada and New York, New England could face real generation deficiencies in the next few years. But trading outside existing market boundaries is currently difficult because of the lack of predictable multimarket regulatory rules for power delivery across large areas. Such regulatory rules must be developed at the Federal level to expedite the delivery of emergency supplies of electricity from other regions as soon as they are needed. Such rules would define how the transfer capacity between regions is to be used, and how that capacity and the transmission lines should be paid for. Moreover, well-managed

imports and exports would make it easier for an LSE to buy energy directly from the cheapest supplier.

On the wire side, establishing the value of interregional wires (for example, the tie-lines between New England and New York, and New England and Canada) would set a basis for investing in technologies to facilitate these interstate trades. One could easily imagine a market for facilitating delivery of electricity between different states, while allowing sufficient autonomy for individual regions to design their own internal rules.

More active intervention by independent system operators (ISOs) is also needed, to buffer the effects of possible shortages. These entities are responsible for operating the electric power system reliably in real time, accepting only those transactions between sellers and buyers (including LSEs) that do not violate the engineering constraints of the power system. ISOs need to develop the hardware and software that will provide LSEs and their customers with real-time price signals, enabling them to adjust their consumption accordingly.

In addition, ISOs must improve information- and software-supported operating practices. In particular, they need intelligent software to enable them to supply as many customers as possible when electricity supply is limited, notably during equipment outages. All industrial customers (including LSEs) should have designated reliability levels that specify who gets cut first when reserves are low. During emergencies, ISOs could respond automatically and effectively; and during

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times of normal operation, they could operate with a lower level of capacity reserves than they have traditionally maintained.

Assuming generating capacity is sufficient, the last task is to ensure the delivery of electricity to the distributing utility and the consumer. Transmission and distribution companies are still fully regulated, with prices based on their costs plus a fixed fee. Regulatory rules should be changed so that wire companies can set prices based on the market value of their product and their performance. Under those rules, wire companies could stop focusing on cutting costs and could begin delivering electricity to LSEs and other customers under well-defined contractual terms. With prices based on performance, wire companies could begin to invest in improvements to ensure the most efficient delivery of electricity.

Moving toward a restructured electric power industry is a dynamic process that involves the interaction of market forces, regulatory actions, and engineering advances. Steps must be taken on all fronts to ensure the best outcome for all participants. With a carefully planned agenda, we can turn a potentially difficult situation into an opportunity for the development of a 21st century electric power industry characterized by business, regulatory, and technical innovation. ●