TEXAS BUSINESS REVIEW

Bureau of Business Research • McCombs School of Business • The University of Texas at Austin

OCTOBER 2001

Plugging into the Texas Electricity Market

Avoiding the Mistakes of California

by Jay Zarnikau

Frontier Associates
Austin, Texas

If all goes as planned, by January 1, 2002, customer choice will have been introduced to most Texans currently served by investor-owned electric utilities. In some other states, the transition to a competitive retail electricity market has proven disastrous. Governor Gray Davis of California declared his state's restructuring initiative to be a "colossal and dangerous failure." Under the California initiative, increased prices, limited customer choices, and price spikes are common, and one of the nation's largest utilities has filed for bankruptcy protection.

Texas policymakers, however, remain optimistic that they have crafted a successful electricity market restructuring scheme. Will this plan lower retail electricity rates, increase choices for energy consumers, and encourage innovation? Or, will the flaws in the market structure adopted in California similarly plague the establishment of an efficient and competitive market for electricity in Texas?

The "Colossal Failure"

In an attempt to counteract historically high electricity prices, California introduced competition into the generation and retail sectors of its retail electricity markets in 1996. The three incumbent vertically integrated electric utilities were ordered to sell most of their generating capacity, retaining ownership of their transmission and distribution assets. New retailers were permitted to compete with the incumbent utilities to make retail sales to energy consumers. A power exchange (PX) was created, through which generating companies sold, and retail companies purchased, generation to meet the electricity needs of consumers at a market-clearing price. An independent system operator (ISO) was established to coordinate the physical operation of the market and preserve reliability.

In retrospect, policymakers and energy analysts concede that this model of a restructured electricity market contained several severe flaws:

- *A shortage of generating capacity* in the market prompted wholesale electricity rates to increase once price controls were lifted.
- *Transmission system constraints* in many areas of the state resulted in impaired reliability.
- Transmission constraints led to the creation of *multiple markets*.[1]
- Environmental regulations *inhibited the construction* of new power plants and transmission lines.
- Pipeline constraints *limited natural gas import capability*.
- Electricity restructuring coincided with a *general increase in natural gas prices* (and thus was probably unjustifiably blamed for some problems).
- *Caps on the retail electricity rates* made it impossible for incumbent utilities to pass on to consumers increases in wholesale electricity prices.
- Long-term contracts and financial risk management instruments were discouraged. Most wholesale electricity transactions had to be conducted through the PX, essentially an hourly spot market for electricity, creating *considerable price volatility*.
- Fixed or flat electricity rates failed to reflect actual wholesale electricity costs, thus retail consumers had *little incentive to curtail electricity demand* in response to high prices.
- Price reversals--wherein a lower-valued electricity service received a higher price than a more valuable service--sometimes occurred in ancillary services markets for various operating reserves.

Inside:

Less hour-to-hour volatility is expected in Texas because most wholesale transactions will have fixed pricing predetermined through bilateral contracts.

Texas Versus California

Senate Bill 7, passed in May 1999, permits customers of most of the investor-owned utilities in Texas to choose among various retail electric providers (REPs) beginning in January 2002. (Some pilot programs began in summer 2001.) Consumers will continue to receive transmission and distribution "wires service" from their local utility. Rural electric cooperatives and municipal utility systems can "opt in" or "opt out" of the retail part of the restructured market. The introduction of customer choice will be delayed in some areas (e.g., the Panhandle and El Paso) where transmission constraints are likely to hamper competition among power generators. The Electric Reliability Council of Texas (ERCOT) will serve as an ISO for most areas of Texas, with a mandate to preserve reliability, foster the final design of the market, coordinate the scheduling of transactions among market participants, and assist with financial settlements.[2]

Electric utility restructuring initiatives in Texas and California share a fundamental goal: to unleash competition in hopes of lowering retail rates, rewarding innovative and efficient producers, and providing greater customer choice and service. Under both plans, the generation and retail sectors of the market foster competition, while regulatory controls are maintained in the natural monopoly activities of transmission and distribution. Yet, the design of the Texas market and the general market environment in the state differ from those of California in many key respects:

Market Structure

In California, short-term spot market wholesale transactions are encouraged through a power exchange. This centralized market has exhibited price volatility, with certain generators exercising market power during periods of high demand. Less hour-to-hour volatility is expected in Texas, however, because most wholesale transactions will have fixed pricing predetermined through bilateral contracts. The use of financial instruments will further shield, to some extent, REPs and their ultimate customers from price volatility. While a short-term spot market (e.g., the balancing energy market[3]) will be established in ERCOT, it will be used to trade "odds and ends" and to establish prices for energy used to address any mismatches between the generation supply arranged by a REP and the electricity demanded by a REP's customers for settlement purposes. A relatively small share of all wholesale transactions is expected to be consummated through volatile short-term markets.

Price Caps

Retail price caps established in California prevented two incumbent utilities from passing on increased wholesale power costs to consumers. This led to financial crises for those utilities. In Texas, the REP associated with the incumbent utility will be required to reduce the electricity prices paid by residential and small commercial customers by roughly 6 percent, thus establishing a benchmark "price to beat,"[4] which will remain in effect for five years. However, the incumbent utility's REP can begin charging rates other than the price to beat after 36 months *or* when the REP loses at least 40 percent of its residential and small commercial customer load to competitors. Then the price to beat establishes only a ceiling, and the REP affiliated with the incumbent utility may reduce prices. Unlike the California price caps, the price to beat in Texas can periodically be adjusted for changes in fuel costs. Larger energy consumers in Texas will receive no price cap protection.

Supply and Demand of Electricity Generation

California's price spikes were partly due to a deficiency in generating capacity, as well as the market power of pivotal generators during periods of high demand.[5] In contrast, Texas faces a near-term surplus in generating capacity. Although Texas and California have similarly sized electric grids and similar growth in power demand, Texas has added 47 new power plants since 1995, representing one-fourth of all power plants built in the nation. In that time, California has built only two large-scale power plants. Texas requires a lead time of two to three years to construct new power plants; California, approximately seven years.

Transmission Infrastructure

Ample generating capacity is not always sufficient to avoid price spikes. The transmission network must be sufficiently strong

Texas has added 47 new power plants since 1995, representing one-fourth of all power plants built in the nation. In that time, California has built only two large-scale power plants.

to ensure that power can be moved to where it is required. Texas policymakers recognize the importance of a strong transmission system and a construction boom in transmission lines is underway. Nonetheless, there remain many areas (the Dallas-Fort Worth area, for example) where transmission constraints remain a concern.

Demand Responsiveness to Price Changes

Because of retail price caps and the structure of retail electricity rates, Californians failed to reduce their consumption of electricity in response to wholesale market price spikes. In recent months, California policymakers have sought to respond to this problem by establishing new curtailment programs, providing energy consumers a payment in return for agreeing to curtail electricity use during peak periods.

At least in theory, the Texas market structure provides energy consumers with a variety of incentives to reduce electricity usage during times of shortage or high wholesale prices. Larger customers will be permitted to offer their "demand-side resources," or ability to curtail electricity usage, to the ERCOT market and receive a market-based payment for such resources.

Wired to Work? The Challenges for Texas

Many of the problems experienced in California are less likely to short-circuit the Texas electricity market. Nonetheless, it is premature to declare victory. As noted, localized transmission constraints (particularly, in the Dallas area) remain a concern. More work remains in order to ensure that the demand side of the Texas market will respond to price changes. Also, the scheduling and settlement of power transactions and ancillary services pose a formidable challenge. The computer systems designed to track power flows and customer switching among REPs are not yet fully operational.

Several expectations have gone unmet. Many of the larger REPs decided to stay out of the pilot programs, and many of the deadlines established by the Public Utility Commission of Texas proved unrealistic. Only about one-third of all customers accepted in the pilot programs succeeded in contracting with a REP competing with their local utility. In addition, ERCOT has reported that a number of existing utility-owned power plants have failed to meet new performance standards established for the new market. And finally, our state's heavy reliance on natural gas leaves electricity prices vulnerable to natural gas market prices, regardless of whether electricity markets are restructured.

As always, "the devil is in the details." Flaws with some very technical design features can easily lead to market failure. Some of the technical details still under debate include whether our "zonal approach" to managing any transmission network congestion should be replaced with a "nodal approach," whether ERCOT's proposed system of "load profiling" will adequately represent an actual customer's true temporal pattern of electricity use, and how to measure the quantity of the resource that a customer who curtails electricity use at the request of the ISO is providing to the system.

Finally, the importance of customer education cannot be underestimated. After all, the primary impetus for electricity market restructuring is to provide consumers with new energy choices. Yet, after hearing about California's experiences with electricity market restructuring, will Texans be eager to make new electricity choices?

Notes

1. Transmission constraints inhibit the power flows that lead both to equalized prices and to the creation of separate markets, each with different market-clearing prices. Thus, in a constrained network, the location of a resource affects the value of the resource, and the location of an energy consumer affects the short-run marginal cost of serving that consumer.
2. About 80 percent of Texans are within the ERCOT power region. Areas in other power regions include El Paso, the Panhandle, and most of east Texas.
3. The balancing energy market will be a day-ahead market (although offers can be adjusted up to an hour ahead of the settlement period). The settlement periods will be 15-minute intervals.
4. In Texas, the price to beat will be applied to customers with a billing demand below 1 megawatt, which is roughly the electricity demand of a large department store.
5. See California ISO Department of Market Analysis, *Request to Extend Price Caps*, August 10, 2000, p. 5.◆

Buying Power

A Guide to the Competitive Electricity Market in Texas

by Lino Mendiola

Attorney
Mayor, Day, Caldwell & Keeton, L.L.P.
Austin, Texas

and Stephanie Kroger

Partner
Mayor, Day, Caldwell & Keeton, L.L.P.
Austin, Texas

Buying electricity once involved little more than purchasing from the incumbent monopoly supplier under standard tariffed rates with virtually no ability to negotiate over price, terms, power quality, or delivery options. On January 1, 2002, this will change. Customers served by investor-owned utilities (IOUs) in most of Texas will have the power to choose their electricity suppliers. While most residential and small commercial customers will shop among a handful of retail electric providers (REPs), offering standardized products, larger customers can negotiate highly customized electricity contracts with competitive REPs. A customer's knowledge of its specific electricity needs, how the market operates, the continued regulatory framework, and the cost components of the electricity rate will determine whether the customer or the REP strikes the best bargain.

Background

The most significant of the sweeping changes to the Public Utility Regulatory Act of Texas approved by the legislature in 1999 was the introduction of retail electric competition. If the prerequisites for competition are met, IOUs are required to separate their services into three unbundled businesses—a power generating company (PGC), a retail electric provider (REP), and a transmission and distribution company (TDC). The PGC and the REP will operate in what are intended to be competitive markets and will not be regulated.

Theoretically, the competition among PGCs to sell wholesale power and REPs to sell retail power will result in lower prices. For residential and small commercial customers, the legislature promised price protection, known as the "price to beat." To qualify, a customer must have a load[1] of less than 1,000 kilowatts. Affiliated REPs must charge these customers rates that are 6 percent lower than the bundled rates in effect on January 1, 1999.[2] To attract new residential and small commercial customers, competitive REPs will attempt to undercut the price to beat. Customers with demand greater than 1,000 kW, however, have no price guarantees and must purchase power on the open market, negotiating to secure the best deal.

Buyer Beware

Specific electricity requirements must be determined in order for the customer to (1) purchase the most advantageous electricity products, (2) secure savings associated with its usage patterns, and (3) recognize opportunities to improve load shape to maximize savings. Most energy sold will be "full requirements" firm power, meaning that the REP will purchase generating capacity to serve that customer's load. Discounted "interruptible" power allows REPs to interrupt a customer's power flow when generation or transmission availability is scarce. A customer with self-generation capabilities should consider buying only backup or standby power. Customers may also be able to purchase specific blocks of power to serve "base" load[3] at lower prices and other blocks of power to serve "peaking" load at higher prices.

Other customers may have specific power quality needs. Some manufacturing customers, for example, are particularly susceptible to voltage or frequency excursions, fluctuations, or other wave distortions and thus may require power generated from a dedicated resource or delivered over particular portions of the transmission network.

Perhaps the most important information for a customer to know, historical and future "load shape"—the graphical depiction of electricity usage—is also often the most difficult to ascertain. A customer whose use is consistent has a flat load shape, which is extremely desirable in negotiating supply contracts. By contrast, a customer whose power needs vary according to season or time of day shows a very choppy load shape and is more difficult to serve because a REP must buy power to serve the peaks but does not want to be stuck with power that goes unused during the valleys. Some larger customers have specialized interval data recorder (IDR) meters that measure real-time demand levels, making load shape determination easy. Most, however, have more traditional meters that simply measure the number of kilowatt-hours used and must rely on a standard "load profile" developed by the Electric Reliability Council of Texas (ERCOT).

Risk Allocation

The larger the load, the more customized the contract. In conceptualizing what type of deal to strike, large customers must decide how much regulatory risk to accept and how much to place on REPs.

Moving to an unregulated electricity market required the development and implementation of a large infrastructure of delivery protocols. ERCOT is primarily responsible for managing the electric grid in Texas,

employing an Independent System Operator (ISO) to ensure that electricity is delivered fairly and efficiently. The existing transmission grid in ERCOT, however, was designed to serve load within each single utility's service area. In some areas, power cannot flow freely at all times because of transmission constraints. Without an independent party responsible for moving power around the grid, imbalances between load and generation could develop, causing wild swings in spot market prices. Such volatility is a serious hindrance to attracting REPs and could also result in reliability problems.

REPs fund the mechanisms that the ISO uses to keep the grid in balance and will attempt to pass the cost on to consumers. When a generation plant suffers an unscheduled outage with no reduction in its load, an imbalance between supply and demand develops. Without balancing mechanisms, the spot market in the constrained area compensates by creating a spike in the price. To alleviate such constraints and to create more stability in the retail market, ERCOT has implemented a detailed set of protocols. Not surprisingly, numerous fees attend the ISO's attempts to keep the market in balance. The Qualified Scheduling Entity (QSE) fee and the Commercially Significant Constraint (CSC) congestion management fee, provide good illustrations of regulatory risks that must be allocated in an electricity contract.

Every REP must be associated with a QSE, which matches load with generation and schedules the delivery of power through ERCOT. QSE services are competitive, and its fees are the subject of bilateral contracts with the REP. REP actions, such as failing to purchase sufficient wholesale power, can affect its QSE fees. If the REP attempts to pass the cost of the fee directly on to the customer, the provider's incentive to take care in securing generation to match load could be diminished.

ERCOT has established an initial $20 million fund to which REPs will contribute amounts proportionate to the loads they serve. Once the fund is expended or on January 1, 2003, whichever is first, ERCOT will move to a direct assignment of CSC congestion management fees to pay generators who provide additional generation in one area to serve load that cannot be served by remote generation due to transmission congestion constraints. The conduct of REPs determines the level of these fees, so a pass-through to the customer is not an efficient allocation of incentives. Ultimately, customers and REPs must decide who bears the risk of the fluctuation of these costs.[4]

Because of the risk of paying these imbalance fees, REPs will generally require that customer electricity usage stay within a specified deviation of the load profile on which the electricity charge is based. If a customer exceeds the permitted amount, REPs may require an additional charge. Customers should know both their historical and projected future usage to minimize exposure to such additional fees.

Finally, a number of more generic contract issues should be negotiated, including the term of the contract, renewal terms, payment and billing, delivery of notices, credit and deposits, assignment and events of termination, dispute resolution, limitations of liability and confidentiality. None of these terms need to be standard; each can and should be negotiated to fit the needs of the customer.

Conclusion

With only a handful of REPs currently certified by the Public Utility Commission, the retail electric market in Texas remains in its infancy. Nevertheless, the new market is extremely complicated and pricing will not be immediately transparent. Because of the number and variety of ERCOT fees and the lack of regulation governing how they will be collected by the REPs, information is key to the striking of fair deals. At the very least, customers must have specific knowledge about their usage patterns and carefully consider the allocation of risks associated with each component of the contract. In the future, a more standardized approach will certainly develop, but for now customers must proceed with caution to ensure that competition works for them.

Notes

1. Amount of demand customer places on a generator.
2. Affiliated REPs are allowed to adjust the price to beat to account for increased fuel costs.
3. Base load refers to power that is always needed, such as for critical operations.
4. In addition to the regulatory charges, there are other "non-bypassable" charges that REPs must collect from customers as ordered by the Public Utility Commission of Texas. REPs must also pay tax assessments to the municipalities in which they serve customers and will recover these charges from customers. ◆

Without an independent party responsible for moving power around the grid, imbalances between load and generation could develop, causing wild swings in spot market prices. Such volatility is a serious hindrance to attracting REPs and could also result in reliability problems.

Texas Business Review is published six times a year (February, April, June, August, October, and December) by the Bureau of Business Research, University of Texas at Austin. Subscriptions are available free upon request. Views expressed in this newsletter are those of the authors and do not necessarily reflect the position of the Bureau of Business Research.

Research and service activities of the Bureau of Business Research focus on the ways Texas industries can become nationally and globally competitive. The Bureau is policy oriented and dedicated to public service. The Bureau is located on the sixth floor of the College of Business Administration building.

Editor: Bruce Kellison
Bruce.Kellison@bus.utexas.edu

Managing Editor: Sally Furgeson
sallyf@mail.utexas.edu

Sales Office: (888) 212-4386
(512) 471-1063 fax
Rita.Wright@bus.utexas.edu

General: **bbr@uts.cc.utexas.edu**

WWW:
http://www.utexas.edu/depts/bbr/tbr/

BUREAU OF BUSINESS RESEARCH
21st and Speedway
CBA 6.444
Austin, Texas 78712

Change Service Requested

NONPROFIT ORG.
U.S. Postage
P A I D
Austin, Texas
Permit No. 391

Glossary of Acronyms

CSC — commercially significant constraint
ERCOT — Electric Reliability Council of Texas
IDR — interval data recorder
IOU — investor-owned utility
ISO — independent system operator
PGC — power generating company
PX — power exchange
QSE — qualified scheduling entity
REP — retail electricity provider
TDC — transmission and distribution company

Announcement

The Bureau of Business Research and the McCombs School of Business will present a conference for currently enrolled and matriculated MBA students entitled "Women and the MBA: Opportunities and Challenges." The Friday, February 15, 2002 event will feature panels of business leaders, entrepreneurs, and managers discussing topics such as managing in the corporate environment, balancing work and home life, and working in a small high-tech firm. Registration is free but space is limited. Call (512) 475-7813 for information.◆