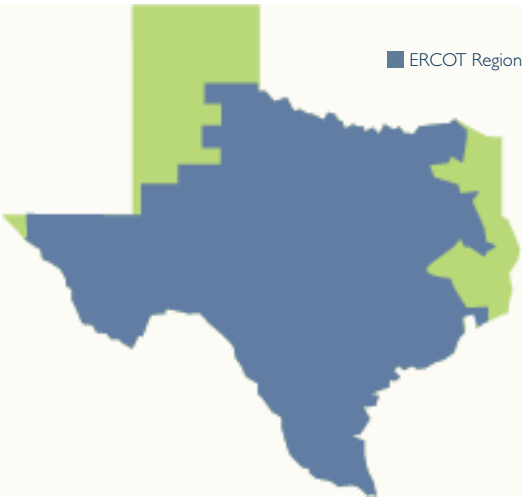
Rates have been higher and more volatile in the deregulated areas of Texas. But the state's more serious challenges relate to reliability and the adequacy of power supplies.

Summary

Texas is an important state to examine in the context of state deregulation of electricity markets, for a number of reasons. First, it was one of the earliest states to follow California in deregulating its electric industry—it began the effort in 1999 with the enactment of legislation for retail competition, and began full deregulation in 2002. Second, unlike a number of other states that began the process of deregulation but reversed course as they encountered problems, Texas has not abandoned deregulation. In fact, the organization that ranks and rates the various states on the degree of "competition" and "deregulation" rates Texas as the "competitive electricity market leader."[1] Third, although Texas is often classified as a "fully deregulated state," parts of Texas continue to operate under a fully regulated market structure, allowing for comparisons within the state of the impacts of deregulation and continued traditional regulation. Fourth, Texas is the only state in the nation that has jurisdiction over both the wholesale and retail electricity markets. All other states are limited to regulation over retail markets while the federal government—through the Federal Energy Regulatory Commission (FERC)—maintains regulatory authority over the wholesale market. Finally, Texas illustrates some of the key challenges that can plague deregulated electricity markets: reliability, affordability, and a number of unintended—and unanticipated—consequences.



History and Profile

Texas followed California and several other states in deregulating its electric industry. The state began this effort in 1995 by allowing generators open access in the wholesale market. Texas passed legislation for retail competition in 1999 and moved aggressively to introduce full deregulation on January 1, 2002. The transition continues to be a complex and lengthy process, with challenges to reliability and affordability.[2]

Texas's electric industry and regulatory framework are unique. It has limited electrical interconnection to other states and, therefore, the Public Utility Commission of Texas (PUC)—rather than the Federal Energy Regulatory Commission—has jurisdiction over electric transmission rates and the wholesale electric market within the Electric Reliability Council of Texas (ERCOT) region. Thus, the PUC oversees both the retail and wholesale markets within ERCOT, providing oversight over all aspects of the industry, including long-term reliability and retail and wholesale market operations. This avoids some of the challenges experienced in other states and the portion of Texas outside of ERCOT (East Texas, Panhandle, and El Paso region) that have overlapping state and federal jurisdiction related to electric deregulation.[3] The ERCOT region covers about 75% of the state's land area. Approximately 64% of the state's electric load (the majority of ERCOT) is under deregulation.

Texas relies on natural gas for the generation of electricity more than most other states, and this has influenced its wholesale and retail market design and performance under deregulation, as discussed further below.

TIMELINE

1995/1996—Wholesale competition introduced and ERCOT begins operations as independent system operator

1999—Deregulation law enacted; retail utility rates frozen as part of transition

2001—Retail access pilot; significant IT challenges for wholesale and retail billing

2002—Deregulation begins in ERCOT

2004—Stranded cost "true-up" proceedings

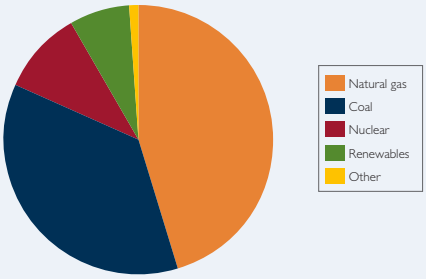
2006—Prices in deregulated areas peak, 62–88% higher than 2002 prices (compared to increase of only 24% in regulated areas during this time frame)

2011—ERCOT acknowledges reserve levels below target; experiences supply emergency during record-setting weather and peak demand in August; preceded by rolling power outages in February 2011 due in part to cold snap and unplanned generation outages

2012—The Brattle Group releases report for ERCOT on investment climate for new generation and options to address looming power shortages

2013—North American Electric Reliability Corporation (NERC) issues warning letter to ERCOT regarding reliability concerns due to low generation reserves

Generation by source (MWh)



SOURCE: Public Sector Consultants, based on data from Energy Information Administration (EIA): www.eia.gov/electricity/state/Texas/. Average electricity price is for the entire state, including both deregulated and regulated areas.

- Deregulated in 2002 within ERCOT (except municipally owned and electric cooperatives that do not opt in); remains regulated outside ERCOT
- Regional transmission organization (RTO)/independent system operator (ISO): ERCOT
- "Energy-only" wholesale market (no capacity market)
- Electricity sales (MWhs): 358,457,550 (#1 in nation)
- Average electricity price (cents/kWh in 2010): 9.34 (#21 in nation)

	California Experience	**Texas Response**
Surge in wholesale power prices with capped retail rates	Cap on retail rates resulted in wholesale prices exceeding retail prices and related problems, including financial distress for power providers and subsequent price spikes.	Rates for the default service charged by incumbents can fluctuate based on market conditions in order to keep incumbents solvent and attract and retain alternative suppliers.
Power shortages/ rolling blackouts	Regulatory restrictions and market conditions dampened new power plant investment. Weather and environmental restrictions limited access to hydro-electric generation supplies in Pacific Northwest, contributing to California's power shortages.	Texas had significant excess generation capacity and market conditions to support new generation. Texas not dependent on significant quantities of hydro-electric generation.
Overlapping federal and state jurisdiction	Claims that federal government did not intervene soon enough to prevent or mitigate market abuses by unregulated power generators such as Enron. Poorly designed wholesale market allowed manipulation and excessive prices.	Texas—not the federal government—can protect consumers from market manipulation by suppliers and properly designed market rules and state oversight can insure stable prices.

Texas deregulated the electric industry within the ERCOT region on the heels of the California meltdown in 2000 and 2001. Policy leaders in Texas emphasized how the state's situation was dramatically different from California, as highlighted above.

Indeed, Texas has been rated as the "competitive electricity market leader" for both residential and commercial markets in the *Annual Baseline Assessment of Choice in Canada and the United States* (ABACCUS) for numerous years, primarily because of customer "switching" rates and the number of alternative providers.

It is noteworthy that Texas has sustained this level of participation over time. Texas avoided some of the problems experienced in other states but has had its own share of challenges with reliability and affordability of electric service. The state continues to face problems, particularly related to the adequacy of power supplies.

Market Share Served by Alternative Providers

61%
of customers
(60% residential only)

76%
of load (MWh)

SOURCE: Public Utility Commission of Texas, 2013, Summary of Performance Measure Data (Non-Confidential Version). Available at: www.puc.texas.gov/industry/electric/reports/RptCard/Default.aspx (accessed 6-3-13.) Note that some of the "alternative providers" are the predecessors of the incumbent utilities serving other parts of the state. Percentages apply to deregulated areas of Texas as of December 2012.

Issues

Reliability

Proponents of deregulation suggest that generation will be built where and when it is needed under deregulation. Not only has this not occurred in Texas, but the opposite has happened—that is, investment has actually declined as documented need has increased. State officials touted Texas's very high reserve margins prior to deregulation, and the state is now faced with significant reliability challenges due to generation reserve shortages.

> *"The electricity utility industry employs a simple strategy for maintaining reliability: always have more supply available than may be required."*
>
> —Energy Information Administration (EIA)

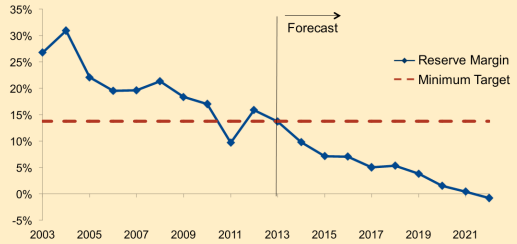
As with other areas of the country, Texas experienced a wave of new investment in the early 2000s, primarily natural gas plants. Investment losses followed, leaving investors more cautious and demanding more assurance that there will be stable revenues resulting from any new investments.[4] Meanwhile, population continued to grow steadily, with overall energy use and demand for electricity increasing about 2% annually on average in recent years. Extreme weather conditions in 2011 led to increased consumption and record-breaking peak demand that stressed the system. By the end of 2011, ERCOT reports revealed that development of new generation was not keeping pace with the need.[5] Investment had stalled despite reserve margins falling below target levels due to plant retirements and load growth.[6] A total of 15,223 MW of generation has been retired or mothballed since 1995 in ERCOT.[7] NERC, which is accountable for assessing the current and future reliability of the bulk-power system, issued a January 2013 warning letter to ERCOT, stating:

> *Capacity resources in ERCOT have **drifted to a level below the Planning Reserve Margin target** and are projected to **further diminish** through the ten-year period covered in the [reliability] assessment. It is clear to me that these levels imply higher **reliability risks** especially the potential for firm load shed, and ERCOT will need more resources as early as summer 2013 in order to maintain a sufficient reserve margin… **These concerns are not new**, as NERC has raised this issue in prior assessments.[8] (emphasis added)*

ERCOT has acknowledged that there is a significant chance that it will need to declare an energy emergency alert in the near future. And if there are higher-than-normal power plant outages during a period of high demand or weather similar to 2011's heat wave, ERCOT expects that "rotating outages could become necessary to maintain the integrity of the system."[9] Faced with these challenges, ERCOT commissioned a study by a well-known national energy consulting firm, the Brattle Group, to analyze the reliability issues and the market's ability to attract investment in new generation. In its June 2012 report, the Brattle Group found that reserves are projected to fall to 9.8% by 2014, substantially below the current 13.75% reliability target.[10] It further concludes:

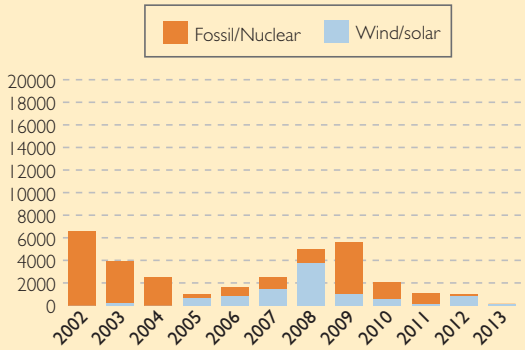
> *The year 2014 poses a particular challenge because it may be approaching too quickly to add some types of new capacity, even if market conditions would support such investments.*[11]

Dwindling Generation Reserves Put Reliability at Risk



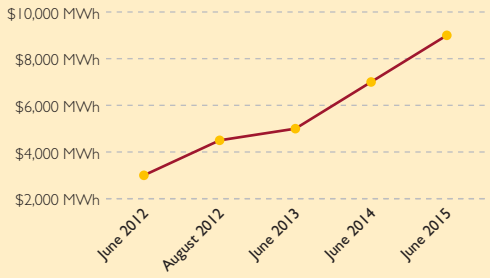
SOURCE: DTE Energy, March 25, 2013, Presentation at Detroit Forum for Readying Michigan to Make Good Energy Decisions, hosted by the MPSC and Michigan Energy Office, based on data from NERC (2012 Long-term Reliability Assessment) and Ventyx Velocity Suites – ERCOT.

Power Plant Investments Don't Keep Pace



SOURCE: PUCT, New Electric Generating Plants Since 1995 (excluding renewable), as of 1-23-13, www.puc.texas.gov/industry/maps/elecmaps/gentable.pdf (accessed 7-3-13).

Increasing Wholesale Price Caps



SOURCE: ERCOT, December 2012, Striking a Reliable Balance: 2012 State of the Grid Report, p. 9, www.ercot.com/content/news/presentations/2013/2012%20ERCOT%20State%20of%20the%20Grid_Web.pdf (accessed 7-3-13).

Faced with these challenges, the PUC responded, in part, by raising the cap on wholesale power prices–eventually to $9,000 per MWh, or roughly 300 times the average wholesale electricity price.[12] Generally, customers would not see this price directly, as prices would not reach that level except during extreme events and the rates actually charged to customers would level out these prices with lower prices during more normal conditions. Raising the cap allows wholesale prices to reach extremely high levels when supplies are tightest and should provide greater incentive for new investment given the shortages experienced and projected in Texas. However, prices would need to be sustained at extremely high levels with enough frequency to attract enough investment, and the greater the frequency, the greater the impact on prices. The Brattle Group concluded that **even with a $9,000 cap, a reserve margin of only 10% could be reached—far below the reliability target.**[13] NERC also points out the limitations of this partial solution in addressing the overall reliability concerns. And industrial customers in Texas—while supportive of efforts to ensure reliable power—cautioned that the increased cap could cost the state an additional $14 billion annually.[14]

Texas's challenges in the area of reliability are compounded by the mix of its generation. Low natural gas prices and new wind generation have led to lower margins for generators (which in turn lead to inadequate incentives to build new supply). The president of NRG Energy, the second largest generator in Texas, recently stated:

> *[T]here is little incentive for investors to build new, billion-dollar power plants because the price of electricity is so low. The cost of natural gas, among other factors, has driven energy prices down—good for consumers in the short term, but dangerous to long-term reliability because demand for power is growing faster than new generation is being built.*[15]

The market is responding to price signals—exactly what the proponents of deregulation want—and the signals are telling investors not to build new capacity. Ironically, even though demand for electricity is starting to outstrip supplies, it is difficult for merchant generators and the market as a whole to adapt to these market conditions and ensure that the right kind of generation is built at the right time. Unlike a regulated utility, investors are not looking at long-range needs to develop a balanced mix of generation based on cost, reliability, and supply diversity. Demand response does play an important role in Texas, but it does not obviate the need for additional supply-side resources.

Despite warning signs over several years and an urgent need for additional power sources to maintain reliability, there has not been the necessary investment. The PUC and ERCOT are considering whether additional interventions are necessary. Numerous entities, from generators to NERC to energy experts, have suggested that additional intervention beyond the increased price cap already adopted is needed to ensure adequate power supplies. One option

> *"The Texas economy is stronger than any other state's. We don't want to mess this up by creating conditions that lead businesses to believe Texas has an unreliable electric state."*
>
> —John Ragan, *Houston Chronicle* editorial, 6-11-13

that is under consideration is a capacity market similar to those in place in the Northeast. This would provide a mandated capacity payment to generation owners for being available in future years. This payment would be in addition to the payments to generators for the actual production of electricity and thereby provide a more stable revenue stream and incentive to build new generation. But like the increase in the price cap, capacity markets are expected to raise electricity costs overall. In an editorial advocating for a capacity market, NRG's president emphasizes the cost of inaction to the state's economy:

> *In years past, Texas had a healthy reserve, meaning that rolling blackouts and outages have largely been avoided with the exception of a couple of freak occurrences. But our reserve margin is shrinking each year and we have recently seen repeated calls for emergency conservation. If we do that again—or, worse, if the lights go out—businesses that recently moved here, employ our citizens, and invest in Texas will begin to question that decision and they, as well as businesses contemplating moving here, may look to other states where power is more reliable.*[16]

Capacity markets have been used in other regions, although there have been challenges in the design and implementation of capacity markets and their effectiveness in actually spurring new investment remains in question. To date, Texas has rejected this form of market intervention to address its reliability challenges in part because many consider it a violation of "free market" principles—i.e., a government mandate that results in price increases.

Affordability

States that deregulated faced the need to protect consumers yet "create a market" during the time of transition. Many states put in place rate freezes or reductions for residential and small business customers during the transition period. While the capped rates may have protected such consumers in the short term, they often undermined the ability to attract and retain new providers to compete with the incumbent (because the capped rates were below market at times due to fluctuating fuel and wholesale power prices). Texas did a better job of balancing these two objectives to encourage new entrants and protect customers.

Texas required that electricity providers affiliated with the incumbent utility charge a "price to beat" until the incumbent lost

sufficient market share to alternative providers. This price was designed as a price floor and ceiling. In other words, it was designed to prevent the incumbent from offering artificially low rates to stifle competition and undercut new market players. It was also intended to provide a cap, or ceiling, so that customers that didn't switch providers still received some benefit. When the price to beat was set, it included a 6% discount off the utility's base rates. (Rates were frozen as part of the restructuring law in 1999 and were expected to be reduced during this time period had regulation continued.)

Despite the 6% reduction, the fuel portion of the rate was indexed to natural gas prices, which fluctuated based on the market. This avoided some of the challenges that occurred in other deregulated states where the overall default rates were fixed, leading to significant unrecovered costs that were deferred and eventually caused large price spikes when the price caps expired. But Texans faced a different challenge—prices in the deregulated areas steadily climbed as natural gas prices rose in the mid-2000s. From 2002 to 2006, the price to beat rose 88% and the competitive offers rose 62%. In contrast, rates in regulated areas of Texas rose only 24% during this period. For over a decade, deregulated areas of Texas have consistently paid more for electricity than regulated areas of the state. And prices are more volatile in deregulated areas.

> *"With declining costs and the strong load growth in the State, it is likely that the commission could find itself facing a never-ending stream of rate cases in an attempt to harness utility over-earnings."*[17]
>
> —Public Utility Commission of Texas

This volatility is a function of deregulation. Regulated utilities pass through fuel costs without a markup. This includes the utility's actual costs based on its fleet of power plants (typically a mix of nuclear, coal, and natural gas). Although these costs and the amounts charged to customers can fluctuate over time as fuel costs change, the impact on customers is tempered because of the diversity in the fuel mix. In contrast, electricity prices in the deregulated areas are heavily dependent on the price of natural gas, which is often the marginal fuel used for electricity generation. Given the historic volatility of natural gas prices, this creates vulnerability for customers. Regulated areas have proven to be more adaptable to market fluctuations. Commercial and industrial rates in Texas have also been volatile, particularly under deregulation.

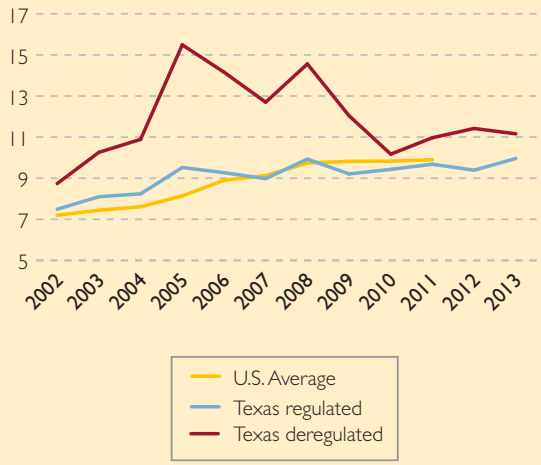
It was envisioned that deregulation would lower prices, but the data suggest the contrary occurred in Texas—prices in deregulated areas have been higher and more volatile than in regulated areas of the state.

Unintended Consequences

Texas policymakers crafted a comprehensive law to deregulate the electric industry with the goal of increasing competition and providing associated savings to customers. As the law was implemented, however, the state faced numerous unintended consequences, which illustrate the complexities and inherent uncertainties involved with deregulation. For example:

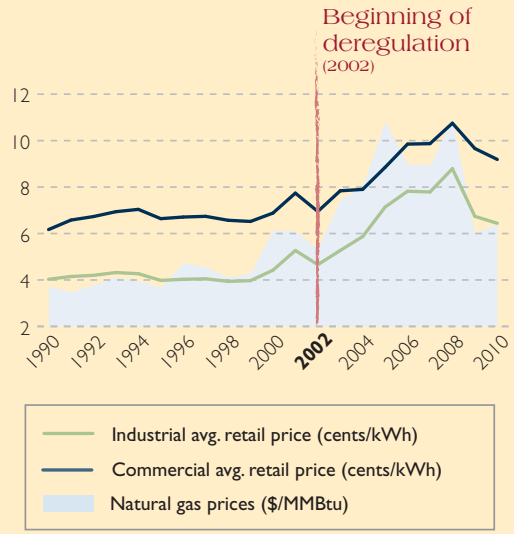
- IT struggles—Texas experienced major problems with billing and IT systems at the advent of the deregulation, which proved costly for customers and

Residential Rates
Texas vs U.S. Average



SOURCE: Public Sector Consultants, using data from Energy Information Administration and the Public Utility Commission of Texas.

C&I Electricity Prices vs. Natural Gas Prices
Texas 1990–2010



SOURCE: Public Sector Consultants, using data from Energy Information Administration and the Public Utility Commission of Texas.

providers.

- Provider of last resort—The state also faced major challenges setting up the "provider of last resort," or POLR, in deregulated areas because providers were unwilling to bid on such service as laid out in the law.
- Costly market redesign—There were also issues with market manipulation at times and a costly redesign of the wholesale market.
- Stranded costs—A major unintended consequence that will have a lasting impact on customers relates to stranded cost recovery. The Texas deregulation law allowed utilities to recover their stranded costs, or the difference between the market value and the book value of generation assets.

Estimates of stranded costs were calculated at various points during the transition to deregulation in order to provide for early mitigation and recovery, as applicable. Due to fluctuating market conditions over time and regulatory decisions, estimates of stranded costs ranged from negative $2 billion (during periods of high natural gas prices making higher-cost plants more economical) to over $6.5 billion. By the time the issue was fully litigated, the total amount customers will pay amounted to over **$9.5 billion**.[18] Even though customers are on the hook for this amount, private equity investors resold the assets at a significant profit under better market conditions. While the state's policy was well intended, it did not adequately anticipate the rapidly changing market conditions. This experience has been costly for businesses and residents of Texas, and underscores the complexities and trade-offs of deregulation.

Conclusion

Texas has been successful in attracting and retaining alternative suppliers. The rates charged by the default provider during the transition to deregulation were allowed to fluctuate based on natural gas prices. Texas's approach avoided the situation other states experienced with wholesale prices exceeding capped retail rates, resulting in price spikes after the caps expired (due to the collection of deferred costs) and/or bankruptcies or other financial distress in the industry. The rates in Texas were also sufficiently high to allow new providers to enter the market and serve customers, including residential. Deregulation did not, however, bring about lower rates as initially envisioned. In fact, rates have been higher and more volatile in the deregulated areas of Texas. The state's more serious challenges relate to reliability and the adequacy of power supplies. The reliance on market forces to incent the right mix of investments has not resulted in investments necessary to ensure an adequate supply of electricity to residents and businesses in Texas.

Endnotes

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4. The Brattle Group, June 2012, *ERCOT Investment Incentives and Resource Adequacy*, pp. 1–2 (prepared for ERCOT). Available: www.ercot.com/content/news/presentations/2012/Brattle ERCOT Resource Adequacy Review 2012-06-01.pdf (accessed 6-3-13).

5. ERCOT, December 2012, *Striking a Reliable Balance: 2012 State of the Grid Report*. Available: www.ercot.com/content/news/presentations/2013/2012 ERCOT State of the Grid_Web.pdf (accessed 6-3-13).

6. Brattle Group, p. 1.

7. Public Utility Commission of Texas (PUCT) data. Available: www.puc.texas.gov/industry/maps/elecmaps/gentable.pdf (accessed 6-3-13).

8. Letter from Gerry Cauley, President and CEO, North American Electric Reliability Corporation, to Trip Doggett, ERCOT President and CEO, January 7, 2013. Available: www.ercot.org/content/news/presentations/2013/NERCletterto TripDoggettonResourceAdequacyJan72013.pdf (accessed 6-3-2013).

9. ERCOT, May 1, 2013, *Seasonal Assessment of Resource Adequacy for the ERCOT Region*, Summer 2013. Available: www.ercot.com/content/news/presentations/2013/SARA-Summer2013.pdf (accessed 6-3-13).

10. Brattle Group, p. 1. The Brattle Group has a more conservative target of 15.25% because it accounts for 2011 weather.

11. Brattle Group, p. 6.

12. Based on ERCOT North region average bilateral prices for 2012. See Federal Energy Regulatory Commission, January 2013, *Texas Annual Average Bilateral Power Prices*. Available: http://ferc.gov/market-oversight/mkt-electric/texas/elec-tx-yr-pr.pdf (accessed 6-3-13).

13. Brattle Group, p. 3.

14. Texas Industrial Energy Consumers, Initial Comments, filed in PUC Rulemaking to Amend PUC Subst. R 25.505, Relating to Resource Adequacy in the ERCOT Power Region, Project No, 40268 (June 15, 2012).

15. Jonathan Ragan, "Ragan: Time for Texas to Add to State's Electric Grid," *Houston Chronicle*, June 11, 2013. Available: www.chron.com/opinion/outlook/article/Ragan-Time-for-Texas-to-add-to-state-s-electric-4594395.php (accessed 7-1-13).

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17. Public Utility Commission of Texas (PUC), January 1999, *Report to the 76th Texas Legislature: The Scope of Competition in the Electric Industry in Texas*. Available: www.puc.texas.gov/industry/electric/reports/scope/1999/1999scope_elec.pdf (accessed 7-3-13).

18. See: Public Utility Commission of Texas, January 2001, *Report on the Scope of Competition in Electric Markets*, available: www.puc.texas.gov (accessed 6-3-13); Texas Senate Committee on Business and Commerce, December 1, 2004, *Electric Utility Restructuring and Renewables: Interim Report to the 79th Texas Legislature*, available: www.senate.state.tx.us/75r/Senate/commit/c510/Downloads/EURRCh56.pdf (accessed 6-3-13). See also securitization orders in PUC Docket nos. 21665, 21528, 25230, 30485, 32475, 34448, 39809, and 39931, available: http://interchange.puc.state.tx.us/WebApp/Interchange/application/dbapps/login/pgLogin.asp (accessed 7-3-13). The current value of $9.5 B includes all amounts securitized including the amount authorized in TXU Electric (now Oncor) settlement. TNMP's stranded costs, which were not securitized, are also included.

Prepared by

PSC

PUBLIC SECTOR CONSULTANTS

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