

# WILL THE TEXAS MARKET SUCCEED, WHERE SO MANY OTHERS HAVE NOW FAILED?<sup>1</sup>

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*The Electric Reliability Council of Texas (ERCOT) market may be the last great hope for a model successful restructured retail market for electricity in North America. The market consistently receives high marks from retailers. Customer switching rates are relatively high. Competition has been enhanced in many segments of the market, providing consumers with new choices of suppliers and services, including pricing options. Many of the problems that plagued the California market have been avoided. The expiration of retail price caps (the price to beat or PTB) appears to have had no adverse consequences for market prices. In fact, allowing the retail electric provider (REP) affiliated with the traditional utility provider some pricing flexibility appears to have lowered competitive prices.*

*However, some policy goals remain elusive. In an era of high natural gas prices, electricity consumers in the competitive areas of Texas, where gas-units on the margin most of the times set market prices, face much higher electricity prices than their neighbors in areas not opened to retail competition, where prices are reflective of average fuel costs. Long-term resource adequacy remains a concern. Demand response has been very limited.*

*This paper reports on the progress achieved to date and a general assessment of the State's efforts to foster a competitive restructured market.*

## Introduction

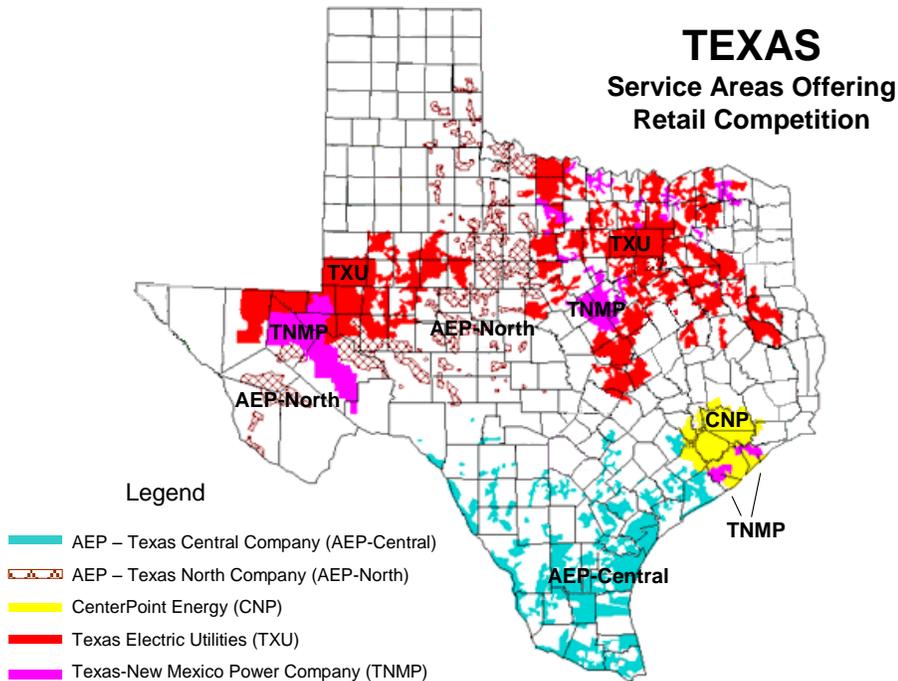
In this paper, we report on the state of the ERCOT market in mid-2007, as well as the issues and challenges that remain. The summer of 2007 marks six years since the ERCOT assumed “single control area” operations over its wholesale market and five and a half years since the introduction of customer choice in the service areas of the investor-owned electric utilities in the ERCOT power region (those areas identified in Figure 1). Retail price caps on the REPs affiliated with traditional utility providers (AREPs) expired on January 1, 2007. The success of electric utility restructuring was extensively debated during the 80<sup>th</sup> Regular session of the Texas Legislature in early 2007. ERCOT is now a maturing restructured market, although the wholesale

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<sup>1</sup> Any opinions expressed here are those of the authors and do not necessarily reflect the views of the Public Utility Commission of Texas or any other organizations to which the authors are associated.

market will soon undergo major market design changes to introduce a nodal structure. Upon its implementation in December 2008, the nodal structure is expected to further enhance market operations and provide more accurate pricing.

Figure 1



March 2003

In previous papers, we provided an introduction to the competitive ERCOT market. (See Adib and Zarnikau, 2006; Zarnikau, 2006; and Zarnikau, 2005). In addition, a variety of reports on ERCOT’s web site ([www.ercot.com](http://www.ercot.com)) and the *Scope of Competition in Electric Markets in Texas* series of reports (e.g., PUCT, 2007a) produced by the staff of the Public Utility Commission of Texas (PUCT) provide an excellent introduction to the ERCOT market and the state’s restructuring efforts.

The success of electricity market reform in other areas of North America has been limited. Restructuring efforts were reversed in California after retail competition had been introduced in 1998. New Mexico, Oklahoma, and Arkansas have reversed, suspended or delayed restructuring activities. (Potter, 2005) In the restructured states of Connecticut, Delaware, Illinois, Maine, Maryland, New Jersey, Pennsylvania, Rhode Island, and Virginia, concerns have arisen that prices may have increased faster than they would have under traditional regulation. (See Sioshansi, 2007)

Concerns regarding rising prices in areas of North America opened to retail competition have been widely reported in the press. Example articles include Barrionuevo, 2007; Johnson 2006; and Smith, 2006. Yet, recent analysis sponsored by the Edison Electric Institute (Brattle Group, 2006) concludes that “since restructuring discussions were initiated in the early-to-mid

1990s, rates in restructured and non-restructured states have trended similarly.”<sup>2</sup> Other studies produce conflicting results. Axelrod, DeRamus, and Cain (2006) claim that restructuring has lowered retail rates. Spinner (2006) notes problems in some of the recent studies claiming to have found benefits to consumers as a result of restructuring. Joskow (2006) found no consistent pattern in the trends in real industrial prices for states that implemented retail competition compared to states which had not.<sup>3</sup> Apt (2005) compares industrial rates among states within these two categories within various regions and finds no evidence that restructuring has led to lower prices of electricity to industrial energy consumers. Rose and Meeusen (2005) find no discernable overall benefit to consumers from restructuring.

Among those who rank the success of electricity market restructuring efforts, ERCOT is generally regarded as North America’s most successful attempt at establishing a competitive retail market. (See CAEM, 2003; and Treadway, 2007). However, the popular press within the state remains skeptical, linking restructuring to the high retail prices that have been established in the areas of the state where retail competition has been introduced. (For example, see Wilder, 2006).

Following a brief overview of the market structure, this paper examines some key indicators of the ERCOT market’s success and recounts the many challenges that remain.

## **Market Structure**

Texas Law permits traditional utility providers to remain involved in both regulated and competitive activities. However, vertically-integrated utilities were required to separate or *unbundle* their functions into separate regulated and unregulated entities prior to the start of customer choice on January 1, 2002. Regulatory oversight over the transmission and distribution of power was retained, as these operations continued to be regarded as natural monopolies. Code of conduct rules were established by the Commission and limitations were placed on the exchange of information and personnel between divisions or affiliates of the same entity that were involved in both regulated activities and competitive markets.

Two of the three largest incumbent utilities, the systems traditionally known as Houston Lighting and Power Company (with a transmission and distribution utility that became CenterPoint Energy) and American Electric Power, chose to fully divest their competitive operations from their regulated transmission and distribution services and are operating in Texas as transmission and distribution services providers (TDSPs). In contrast, TXU, the largest incumbent investor-owned utility (IOU) in Texas, continues to operate as a vertically-integrated, but functionally-unbundled, utility. However, TXU’s structure is likely to change when the acquisition of TXU by a group of private equity firms is complete.<sup>4</sup>

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<sup>2</sup> It should be noted that this particular study has a variety of limitations. There is no recognition that state markets have been restructured to various degrees. States like California that have abandoned their restructuring efforts are nonetheless categorized as restructured states. The study assumes that all states committed to restructuring their markets at the same time. This study also assumes that the entire electricity industry in each restructured state was restructured, although roughly one-third and one-fourth of the electricity consumers in California and Texas, respectively, have not been offered retail choice.

<sup>3</sup> This study also uses average statewide price data, which fail to distinguish restructured from non-restructured areas within a state.

<sup>4</sup> TXU News Release dated February 26, 2007: The news release indicated a buyout offer by an investor group led by KKR (Kohlberg Kravis Roberts & Co.) and TPG Inc. (formerly Texas Pacific) to acquire TXU in a transaction valued at \$45 billion.

Texas' wholesale market structure was designed to allow extensive reliance upon bilateral contracts. The ERCOT independent system operator (ISO) does not presently operate a centralized spot market for power. However, it operates a market for balancing energy with some similar attributes through which about 5% of ERCOT's energy needs are bought and sold.

ERCOT is sometimes categorized as a "min-ISO," since it does not presently perform a central dispatch of resources. In addition to managing congestion and operating the balancing energy market, ERCOT administers day-ahead ancillary services markets and acts as the provider of last resort for ancillary services for load-serving entities who decide not to self-arrange their services requirements.

The introduction of retail competition permitted new retailers to enter the retail market to compete with the retail affiliates of the incumbent utilities in the IOU service areas. All retailers have non-discriminatory open access to the transmission and distribution network.

Default retail prices were established for AREPs at the beginning of retail customer choice. These retail affiliates of traditional utility providers were required to reduce the electricity prices charged to residential and small commercial customers with a billing demand below 1 MW by 6%, adjusted for fuel rate revisions and certain stipulated base-rate reductions not yet in effect by January 1, 1999. The resulting price provided a benchmark PTB for potential competitors and a default price for consumers who do not exercise their right to change their retail supplier. This PTB gradually transitioned from a default price to a retail price cap in 2005 for many service areas and classes of customers, and fully expired on January 1, 2007. Adjustments to the fuel portion of the PTB were generally limited to two changes per year. Larger energy consumers in Texas received no price cap protection.

ERCOT serves as the *central registration agent* and maintains customer database for all consumers in the competitive market to track which customers are served by the various REPs and TDSPs. This role is unique among North America's restructured markets.

The following sections examine some key indicators of the performance of the restructured ERCOT market, including:

- Retail price trends
- Retail customer switching and competition in the retail market
- Competition, market power, and efficiency in the wholesale market
- Demand response

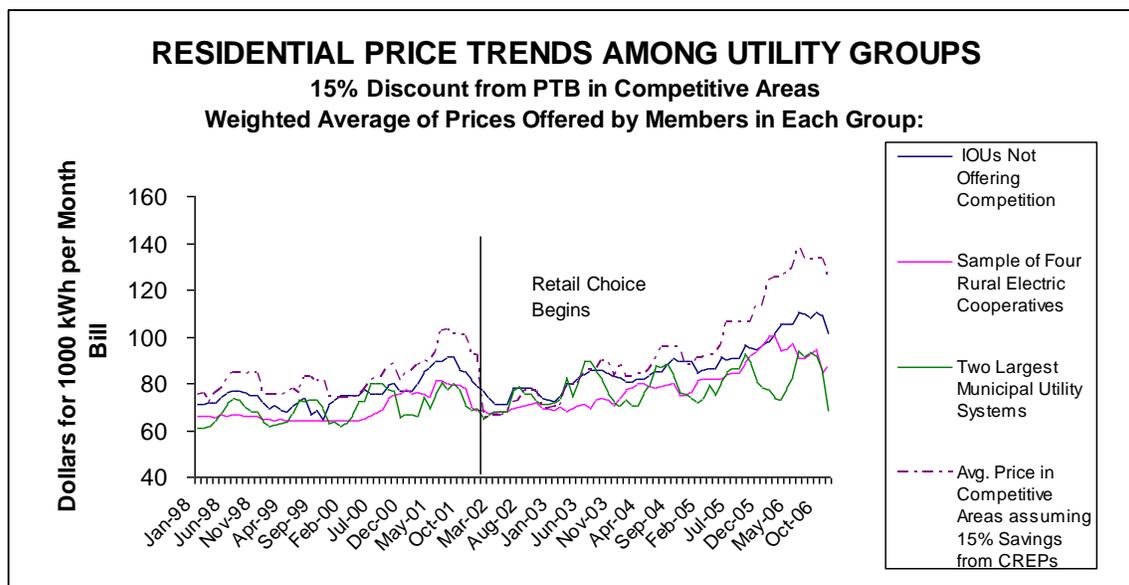
Certainly, these are not the only outcomes that could be used to gauge the success of the ERCOT market, and may necessarily be among the best ones. However, an examination of these metrics provides some interesting insights. Not surprisingly, the topics selected for review here also reflect our personal interests and research.

### **The Great Debate over Retail Electricity Prices**

While economists identify many benefits of moving toward more competitive markets for consumers and the economy, one common expected outcome of such move in any market, including electricity market, is downward pressure on prices. A perception that market restructuring leads to higher prices has stymied restructuring efforts in many states. This concern has been debated extensively in Texas, as well. In Texas, electricity price levels have clearly increased at a greater pace in areas of the state that have been restructured than in areas where customer choice has not been introduced. However, we explain here that high prices are not an inevitable consequence of restructuring.

Figure 2 provides estimates of residential prices in Texas from January 1998 to the end of 2006 for four groups of utility service areas: 1) all of the investor-owned utilities opened to retail competition, 2) the four investor-owned utilities that were not opened to competition, 3) a sample of four rural electric cooperative service areas not opened to competition, and 4) the two largest municipal utilities in Texas (City Public Service of San Antonio and Austin Energy). Weighted average prices are calculated for each group. To capture the effect of competitive offers to consumers within the areas opened to retail competition, it is assumed that the average consumer that switches to a competitive retailer achieves a 15% price discount relative to the price to beat charged by AREP to those customers who have not decided to switch. The prices are quoted for “new service” and may not represent the price paid by a consumer that signs an agreement with a competitive retailer during an earlier month.<sup>5</sup>

Figure 2



Prior to restructuring, prices charged by the IOUs that eventually introduced customer choice (the dashed line in Figure 2) tended to be higher than the comparison groups. During the final months of 2001, large fuel surcharges were included in the rates of many of the utilities serving areas about to offer competition, thus accounting for the jump in prices in the final months of 2001 in areas soon to offer competition. These fuel surcharges were unusually high because a large fuel cost under-recovery was being collected over a short period of time (before the start of retail competition). Had restructuring not been imminent, this under-recovery would

<sup>5</sup> An earlier version of this graph appears in Zarnikau and Whitworth (2005). However, the formulas used to weight prices within each group have been refined, and the dataset has been updated. While the authors still believe 15% discount is a reasonable assumption, one could argue that the discounts from the AREP’s prices offered by the competitive REPs have increased over time, which could slightly reduce the gap between prices in competitive areas and prices in other areas seen in this graph. Estimating the actual average discounts below the PTB achieved by customers who switched is difficult because 1) residential sales data for each of the Competitive Retailers (CRs) are not readily available, making it difficult to construct weighted averages; and 2) contracts are signed at different times and for different terms, and the prices associated with fixed price contracts may change frequently. This topic may merit further research.

have been collected over a longer period of time, and thus the increase in prices in late 2001 would have been more moderate.

Following the introduction of retail competition in January 2002, the prices in the areas offering customer choice became more competitive with the prices in the comparison groups, largely due to the mandated 6% decrease in base rates. However, the spread between competitive prices and the prices offered by the comparison groups has since increased. Particularly in 2006, average residential retail prices in the areas opened to retail competition were considerably higher than prices in the comparison group areas.

Despite the trends in the average prices charged in the areas of Texas opened to competition, some parties (including the PUCT) maintain that a motivated residential consumer who successfully “shops around” for power may be able to achieve some savings (PUCT, 2006). Thus, it is argued, that the *opportunities for savings* should be used to gauge the impacts of restructuring upon retail rates.

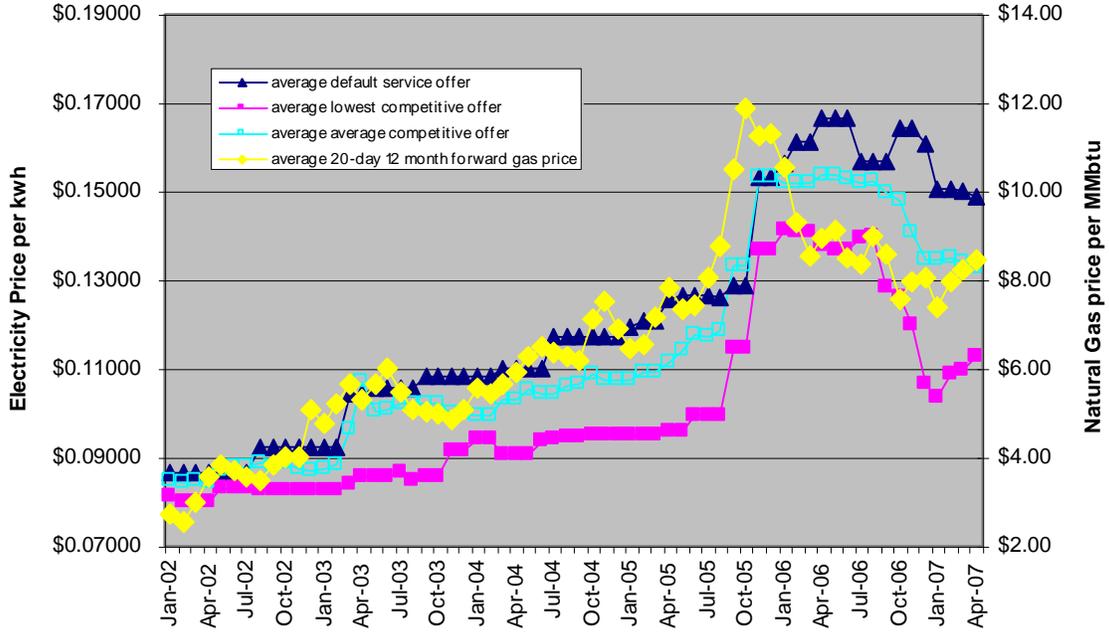
The PUCT’s Scope of Competition (2007) provides a useful comparison of the default service offer price (generally, the PTB) against the lowest prices available in the market. Figure 3 suggests that the discounts available in the retail market (relative to the default price) have increased over time. Counter-arguments have been made, including 1) switching to the lowest price was not always possible in the early months of the market due to problems with ERCOT’s IT systems, 2) the lowest-cost REPs tend to be risky suppliers and many have gone bankrupt, and 3) when the terms and conditions and miscellaneous fees charged by the lower-cost REPs are factored in, their discounts may not be as great as suggested by simple comparisons.<sup>6</sup> It should also be noted that there may be some “risk mitigation” benefits received by a customers who contracts with a CR for a fixed price, thus protecting the consumer from any upward changes in the PTB. This factor must also be considered in any comparison.

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<sup>6</sup> Testimony of Carol Biedrzycki of Texas ROSE before the Texas House Regulated Industries Committee, December 12, 2005.

Figure 3

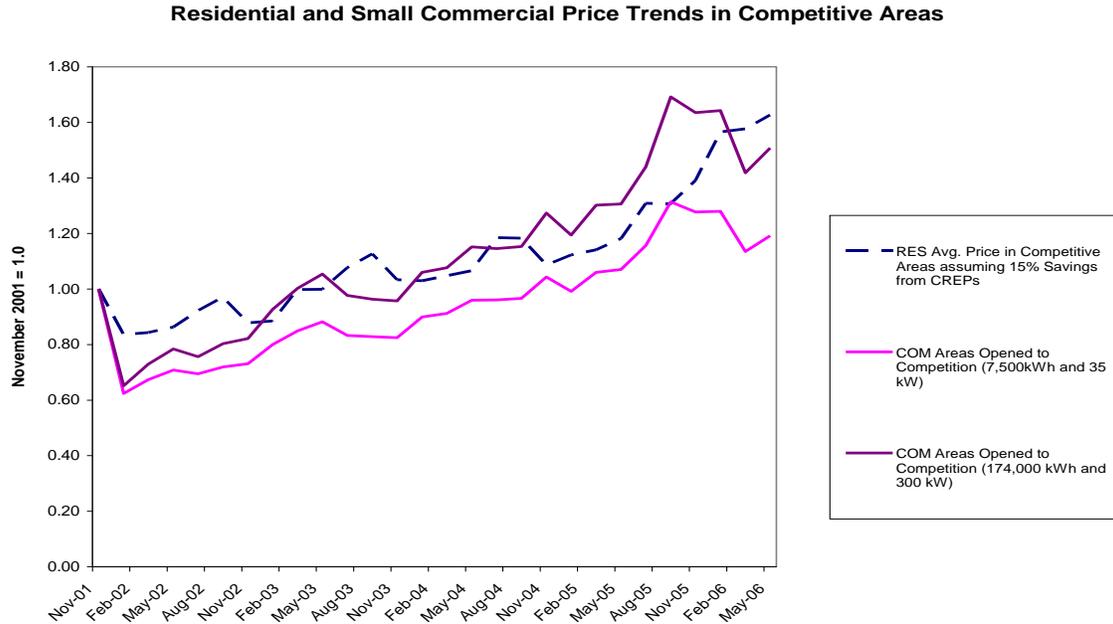
Competitive Offers vs. Natural Gas Price



Trends in prices for small commercial energy consumers in the competitive areas of Texas have largely mirrored trends in residential prices, as evident in Figure 4, which compares residential price trends to trends in commercial prices at two example usage levels and load factors.<sup>7</sup> We are not aware of any analysis of the prices of electricity to large commercial (with over 1 MW of billing demand) or industrial energy consumers since restructuring. There was no regulated PTB available to large commercial and industrial energy consumers. It is suspected that larger energy consumers may not have experienced the same levels of price increases that smaller consumers have faced in the areas opened to competition, given their purchasing power and greater price elasticity of demand.

<sup>7</sup> This figure is from Zarnikau, Fox, and Smolen (2007).

Figure 4



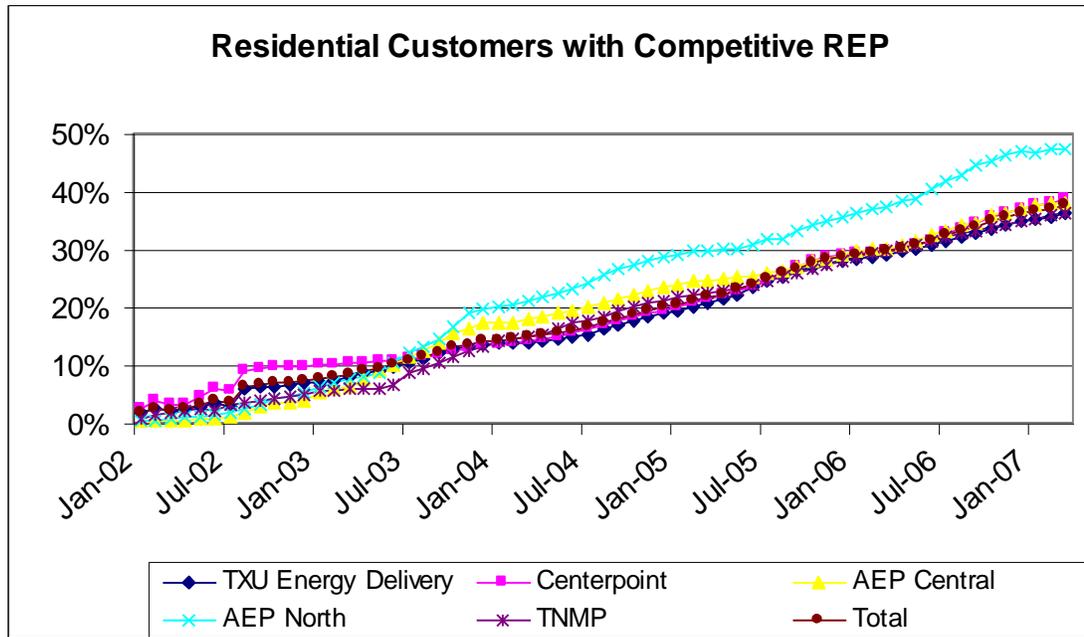
Market restructuring has tended to increase the sensitivity of retail electricity prices to changes in the price of natural gas, the marginal fuel used for generation in Texas. In Figure 3 the high degree of correlation between retail electricity prices in the competitive market and natural gas prices is apparent. Consequently, the rapid increases in the commodity price of natural gas following restructuring led to increases in electric rates in the restructured areas where retail price changes reflect changes in the marginal cost of generation (which is greatly influenced by natural gas prices in Texas). In contrast, price changes in the areas of Texas less affected by restructuring tend to reflect the utilities' *average* fuel costs (as opposed to *marginal* wholesale power costs). Average fuel costs represent a mix of fuel sources, and nuclear fuel, coal, and lignite costs have increased at much lower rates than natural gas prices in recent years.

Had natural gas prices declined during this period, electricity prices in competitive areas might have declined relative to the price levels in areas not opened to competition.

### Retail Customer Switching Activity and Retail Competition

The share of customers that switch to an alternative provider is a commonly cited (but often criticized) indicator of competition. The share of residential consumers who have switched to competitive retailers (CRs) has grown to over 35%. With no price-to-beat protections and greater opportunities for savings immediately following the introduction of retail choice, about 61% of large commercial and industrial customers served at primary and transmission voltage had switched by the end of 2006. (PUCT, 2007a, p. 68) Large commercial and industrial customers who have not switched to competitive REPs have been exposed to market-based prices since competition began in January 2002. Overall, CRs account for over 34% of the total customer base and over 56% of total energy sales in the areas of ERCOT open to retail competition. (PUCT, 2007a, p. 64)

Figure 5



Source: PUCT.

Switching rates have been quite high in ERCOT market relative to other markets in the U.S. where retail competition has been introduced. It is worth noting that in Texas, the competition has been on a “one customer at a time” basis. This is in contrast to the competition in the eastern U.S. for the right to provide default service to large groups of energy consumers through an auction process.

With low barriers to entry and the “level playing field” provided by the *central registration agent* function (following a very difficult first year of operations), ERCOT’s retail market enjoys considerable competition. ERCOT has handled over 3.5 million switches. Over 100 REPs are serving some loads (including some industrial energy consumers that serve as their own REP). Currently, there are 15 to 18 REPs serving residential customers in the larger service areas opened to competition. (PUCT, 2007b) Three REPs have more than 500,000 customers. Eight REPs have more than 100,000 customers. Fifteen REPs have more than 50,000 customers. Twenty five REPs have more than 20,000 customers. Fifty REPs have more than 2,700 customers.

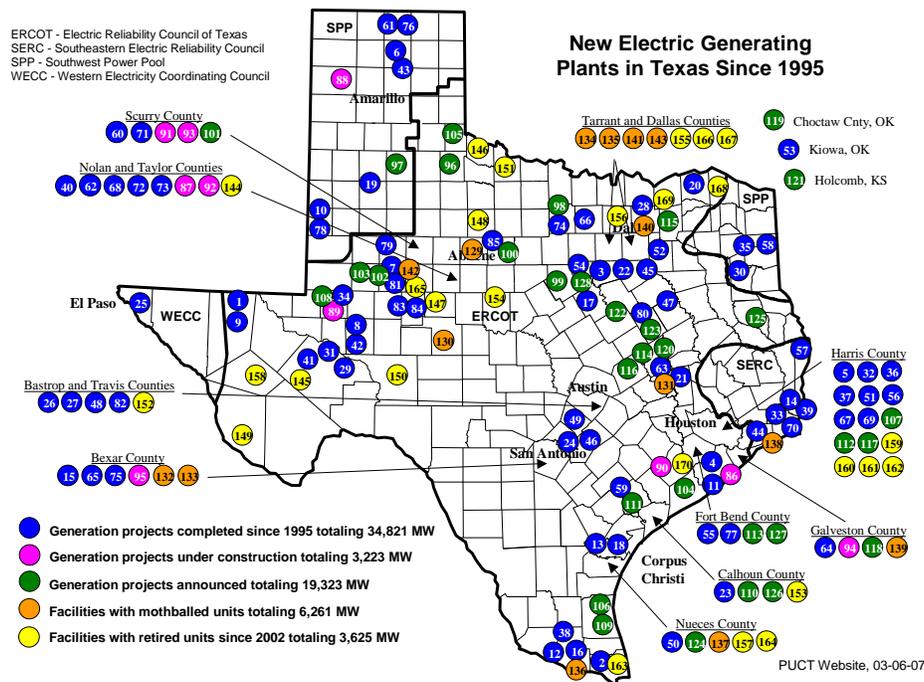
### Competition, Reliability, and Efficiency in the Wholesale Market

Efforts to enhance competition in ERCOT’s wholesale market have faced some unique challenges, given ERCOT’s limited interconnection with other power markets in North America, ERCOT’s limited size, limited liquidity in wholesale markets (due to the absence of formal day-ahead energy markets and a market structure that relies heavily on bilateral agreements), and the historical dominance of a handful of large IOU suppliers of generation.

To dilute market power, a single power generation company (PGC) can control no more than 20% of the installed generating capacity in ERCOT. This constraint affected TXU, which owned more than 27% of ERCOT's power plant capacity prior to the introduction of retail choice.<sup>8</sup> Further, each PGC associated with a utility with at least 400 MW of Texas-jurisdictional installed capacity was required to sell at auction entitlements to at least 15% of its capacity for the first few years of customer choice. Other market power constraints had been introduced in the 79<sup>th</sup> Texas Legislative Session in the first half of 2007. In particular, a bill was introduced that would have required further dilution of market share to only 25% within each ERCOT zone, however, that bill failed to pass.<sup>9</sup>

Since 1995, there has been about 35,000 MW of new capacity built in Texas. Forty-seven new power plants were added between 1995 and the introduction of retail competition on January 1, 2002, representing one-fourth of all power plants built in the nation during that period.<sup>10</sup> Nearly all of these additions to generating capacity were constructed by entities other than incumbent IOUs, mostly using natural gas. ERCOT has accounted for the vast majority of the wind power capacity additions in the U.S. since 1995 and now leads the nation in wind power generation with more than 3,000 MW of capacity currently and expected to pass 5,000 MW in the next two to three years. The following figure shows capacity addition in Texas as of March 2007 since wholesale competition began in Texas in 1995.

Figure 6



<sup>8</sup> Texas Senate Bill 7, that amended the Public Utility Regulatory Act in the 1999 Legislative Session, allowed significant amount of TXU's old gas-based capacity be excluded from installed capacity calculation.

<sup>9</sup> Two largest PGCs within ERCOT market, TXU and NRG, each have more than 40% of installed capacity in North Zone and Houston Zone, respectively.

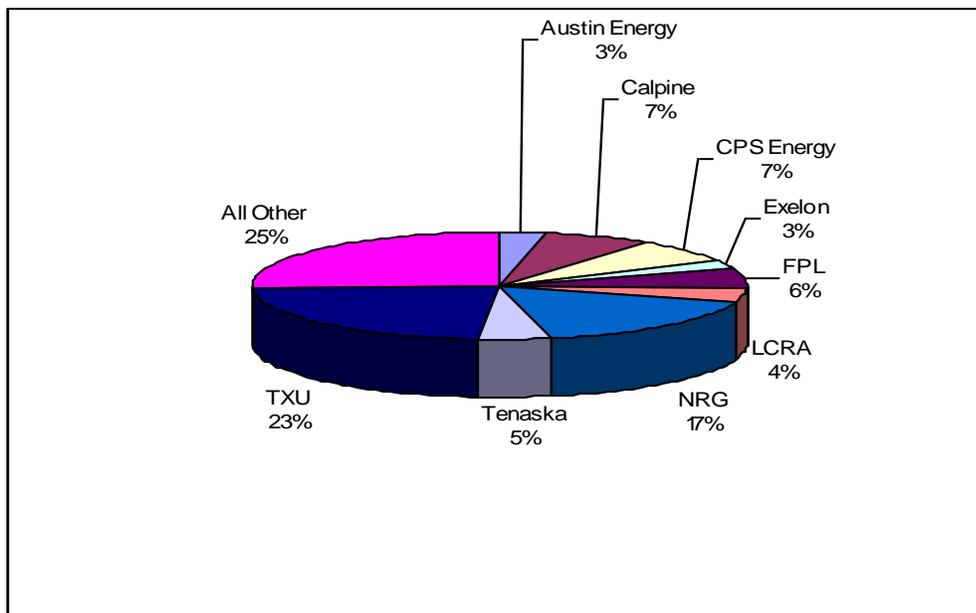
<sup>10</sup> PUCT, *Electricity Choice: Texas is Different from California*, Undated.

The boom in power plant construction may be traced to a number of factors, including a continuing robust annual growth in demand for electricity, perceived profit opportunities, faith in the “fairness” inherent in the market design, an abundance of natural gas, an aging and inefficient fleet of utility generation assets that requires replacement, generator-friendly interconnection policies, and the ease with which environmental permits may be obtained in many areas of the state.

Despite the large capacity additions by independent power producers, it has been difficult to dilute the market concentration of the traditional utility suppliers of generation, given their historical dominance. Prior to restructuring, the Herfindahl-Hirschman Index (HHI), suggested that the ERCOT market was either highly concentrated or moderately concentrated, and market concentration was even more of a concern in certain sub-markets within ERCOT. (Zarnikau and Lam, 1998; and Synchronous Interconnection Committee, 1999) Despite the enormous power plant construction, ERCOT remains probably the most concentrated of the deregulated wholesale markets in the U.S.<sup>11</sup> Figure 7 summarizes generation market share by PGCs with installed capacity above 2,000 MW.

Figure 7

**Generation Market Share in ERCOT**  
(As of December 2006)



Source: Calculated by the authors from data available from ERCOT and the PUCT.

Several antitrust lawsuits have been initiated before the federal courts raising allegations against TXU and some other market participants in the last two years.<sup>12 13</sup> Analyses by the PUCT

<sup>11</sup> Market Oversight Division, Public Utility Commission of Texas, *Comparison of Market Designs*, Project No. 26376: Rulemaking Proceeding on Wholesale Market Design Issues in the Electric Reliability Council of Texas, January 7, 2003.

<sup>12</sup> *Texas Commercial Energy v. TXU Energy, Inc., et al.*, C.A. No. C-03-249, USDC, Southern Dist. of Texas – Corpus Christi Division (2003).

staff and its consultant have demonstrated that TXU is often a pivotal supplier in the balancing energy market and its actions may (even unintentionally) have a considerable impact on market prices.<sup>14</sup>

In March 2007, the Commission Staff recommended, and the Commission Executive Director issued, a Notice of Violation against TXU for market power abuse taken place during June-September 2005. Staff relied on \$70 million market impact assessment by the Independent Market Monitor and recommended a total penalty of \$210 million against TXU.<sup>15</sup> This is the largest penalty recommended against an electricity market participant in the U.S. The case (Docket No. 34061) is before the State Office of Administrative Hearing and is scheduled for hearing in late April 2008.

In a major rulemaking activity, the Commission finalized its decision regarding Market Power (Substantive Rule 25.504) and Resource Adequacy (Substantive Rule 25.505).<sup>16</sup> As part of its market power rule, the Commission allowed PGCs whose installed capacity market share is at 5% or higher to file voluntary mitigation plan (VMP). TXU filed the first VMP on June 28, 2007 agreeing to offer all of its resources to the market under certain agreed upon offer caps. The plan was negotiated with the Commission Staff and ERCOT Independent Market Monitor before being filed. The plan was approved by the Commission on July 31, 2007. The authors believe this is a very important development in ERCOT market and will further minimize any concerns for market power abuse.<sup>17</sup>

Furthermore, as part of its resource adequacy rule, the Commission confirmed its desire to have ERCOT as an Energy-only electricity market. To support such an energy-only market, the Commission agreed to allow Offer Cap to increase to \$1,500 on March 1, 2007, \$2,250 on March 1, 2008, and \$3,000 by early 2009. Effective March 1, 2007, ERCOT became the only electricity market in the U.S. to have offer cap above \$1,000. Now, it is an empirical question to see if there is adequate cost recovery by investors to continue to invest in additional resources within ERCOT electricity market to meet its continuous increase in demand for electricity.

Wall Street Firms, particularly investment banking organizations, have become much more interested and involved in the ERCOT wholesale market. They are willingly participating in longer-term power contracts and helping to enhance the development of a robust competitive market within ERCOT. Their participation and ability of these financially sophisticated players to effectively address risk has facilitated the establishment of longer-term energy contracts.

A slow-down in power plant construction in the past few years has created concern over long-term resource adequacy. The boom in power plant construction from 1995 to 2002 led to over-capacity. This in turn diminished the profits available to generators. Higher natural gas

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<sup>13</sup> Utility Choice Electric and Cirro Group, Inc. d/b/a Cirro Energy Corp. v. TXU, et al., C.A. No. 4:05-cv-00573, USDC, Southern Dist. of Texas - Houston Division (2005).

<sup>14</sup> Market Oversight Division, *Staff Inquiry into Allegations Made by Texas Commercial Energy regarding ERCOT Market Manipulation*, Project No. 25937, Public Utility Commission of Texas, January 28, 2004, Austin. Potomac Economics, *Investigation into the Causes for the Shortages of Energy in the ERCOT Balancing Energy Market and into the Wholesale Market Activities of TXU from October 27 to December 8, 2004*, April 2005.

<sup>15</sup> The estimated amount of penalty is preliminary and may change due to the fact that the Commission Staff filed a request on July 27, 2007 requesting a two-month delay in the proceeding due to recent identification of an error in models used by the ERCOT Independent Market Monitor to estimate market impact.

<sup>16</sup> Public Utility Commission of Texas, Project No. 31972, *Order Adopting Amendment to Substantive Rule 25.502, New Substantive Rule 25.504, and New Substantive Rule 25.505*, September 2006.

<sup>17</sup> Docket No. 34480, *TXU Wholesale Companies' Request for Approval of Voluntary Mitigation Plan Pursuant to P.U.C. Subst. R. 25.504(e)*.

prices have reduced the attractiveness of new natural gas-fired generating units. And there is vocal opposition to the construction of new coal plants, unless gasification or carbon sequestration technologies are adopted. However, in addition to concerns raised about high associated costs, some have expressed concern about whether coal gasification technologies can be successful with Western coal.

A competitive wholesale (and retail) market requires the establishment of a strong transmission system to facilitate market transactions and limit local market power. The ERCOT grid was originally established to be operated as ten separate control areas (corresponding to some of the larger traditional utility service areas), with limited interconnection between those areas. More than \$2 billion had been invested in strengthening the transmission system over the 2002-2005 period and a similar amount of investment is expected in the next few years. Better means of selecting and prioritizing transmission investments are under consideration to further facilitate market operation within ERCOT region.<sup>18</sup>

Despite the investment in transmission and the consolidation of the ten control areas into a single control area providing centralized coordination, transmission congestion has remained a challenge. Certain major transmission lines, referred to as Commercially Significant Constraints or CSCs, serve to divide ERCOT into four or five zones. Within these zones, local congestion has been greater than anticipated, particularly in the Dallas-Fort Worth area, the Rio Grande Valley, Laredo, and West Texas. While congestion between zones is now being managed via transmission congestion rights and other means, the costs associated with managing local congestion are uplifted, leading to gaming opportunities and inefficient outcomes. Consequently, the market's present zonal structure is being abandoned and locational marginal pricing (LMP) will be introduced to better manage congestion by late 2008.

The implementation of the Texas Nodal market design is progressing satisfactorily. The implementation is taking place in stages with the final implementation to be expected by December 8, 2008. Adequate time is incorporated into the schedule for parallel operation, testing, and trial by market participants. The current budget is estimated to be \$263 million.

## **Demand Response**

As noted by U.S. Federal Energy Regulatory Commission (FERC, 2002): "Demand response is essential in competitive markets, to assure the efficient interaction of supply and demand, as a check on supplier and locational market power, and as an opportunity for choice by wholesale and end-use customers."

While ERCOT has been relatively successful in incorporating demand responses by major industrial customers within its ancillary service markets,<sup>19</sup> the aggregate response of consumers to wholesale price signals is very limited in ERCOT. An overall average own-price elasticity of demand of -0.000008 for industrial energy consumers served at transmission voltage has been estimated. (Zarnikau and Hallett, 2007). Further quantification of the price elasticity of demand of the twenty largest industrial energy consumers in Houston to wholesale electricity prices found that one or two are clearly responding to wholesale prices. (Zarnikau, Landreth, Hallett, and Kumbhakar, 2007) In addition, based on some simple comparisons of the aggregate load levels of transmission voltage (large industrial) energy consumers between days of likely

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<sup>18</sup> ERCOT Congestion Management Working Group (2006).

<sup>19</sup> Majority of these large industrial customers have generation facilities and participate in ERCOT ancillary service markets.

four Coincident Peak (4 CP) charges<sup>20</sup> and adjacent days, the ERCOT staff has identified about 600 MW of aggregate demand response, or about a 1% reduction in demand. (Jones, Wattles, and Krien, 2006) This very limited responsiveness to wholesale price signals may prove problematic in light of policy decisions to pursue an “energy only” resource adequacy mechanism for ERCOT.

Adopting a proposal by the ERCOT staff, the PUCT approved an Emergency Interruptible Load Service (EILS) program, designed to curtail load during emergency conditions. However, the first two “requests for proposals” for interruptible load failed to attract the 500 MW that ERCOT had set as a minimum program subscription level. Meanwhile, the ERCOT stakeholders hope to design additional “long-term solutions” to address reliability and resource adequacy concerns.<sup>21</sup>

The Commission finalized its decision regarding Advanced Metering in early June 2007. Minimum standards are imposed and full implementation within a few years is expected within utility service areas. Time-sensitive pricing options for residential customers and a better opportunity for demand response within ERCOT market are likely to result.

While demand response to price signals is minimal, ERCOT has had great success in fostering the participation of interruptible loads in ancillary services markets. The amount of load qualified as Load acting as a Resource (LaaR) is presently about 2,000 MW. However, the cap on LaaR participation providing responsive reserves of 1,150 MW tends to reduce the quantity of demand side resources that the ISO can rely upon to provide an ancillary service or interrupt to an emergency condition at any given time.<sup>22</sup>

### **Other Legislative and Regulatory Developments**

In response to Legislative mandate and market response, renewable resources are receiving significant attention by the Commission. In early June, the Commission conducted a week-long hearing with more than 40 parties involved to finalize appropriate rules. The Commission is expected to finalize its decision before the end of 2007 to identify several Transmission Corridors (referred to as Competitive Renewable Energy Zones or CREZs) to be built to facilitate transfer of significant amounts of power generated by renewable resources to load centers. Several thousand miles of proposed transmission lines are under consideration to accommodate several thousand Megawatts of generation capacity expected to begin operation in near future.

In the 2007 session of the Texas Legislature, restructuring was hotly debated and many bills were introduced to change, refine, or change the path of electricity market restructuring. However, very little changed in the end. A notable exception was House Bill 3693 which doubled the goals for the energy efficiency programs administered by the state’s investor-owned distribution utilities.

The Commission has taken a giant step to further focus on the enforcement of the Commission Rules, ERCOT Protocols, and ERCOT Operational Procedures. Staff has completed

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<sup>20</sup> These peak intervals during the summer months are used to assign transmission charges to load-serving entities and large industrial energy consumers.

<sup>21</sup> A variety of explanations for the problems in launching the EILS program have been offered, including the minimum 500 MW program subscription requirement, the limited \$20 million cap on program expenses, lack of consumer education, and difficulties in completing the program application.

<sup>22</sup> Note that a small, but increasing, amount of load, referred to as controllable load, provides regulation service and some load participates in non-spinning reserves.

more than a dozen enforcement cases in the last year and penalties up to \$150,000 are imposed for noncompliance by market participants. This trend is expected to continue given the fact that the Commission will also handle some of the noncompliance cases by market participants regarding the FERC's recently approved Reliability Standards that went into effect on June 18, 2007.

### **So, Will Texas Succeed?**

Restructuring in Texas has faced great challenges over the past six years. Yet, the market and the state's policy-makers have a good track record of overcoming the problems that have arisen.

Will Texas continue to be North America's most successful electricity market restructuring effort? Yes. It can. But its future success will depend on the ability of policy makers and stakeholder to address the following challenges.

*Implementation of a nodal wholesale market structure.* A fundamental change in the wholesale market structure is an enormous undertaking. And, as with any market change, this change will produce some winners and some losers. This market change is being approached with great caution and care, as is evidence with ample amount of time allocated to its implementation,<sup>23</sup> and we are optimistic that this change will prove successful in the long run.

*Demand response.* Much more can and needs to be done to foster the response of retail consumers to wholesale price changes and reliability problems, particularly if ERCOT continues to rely on an "energy-only" approach to long-term resource adequacy. There remains an enormous untapped potential for demand-side resources and demand response. Yet, what little real-time price response we are presently seeing in ERCOT may be reduced further when today's period of advance notice for balancing energy prices (presently about 10 to 15 minutes in advance of each 15-minute interval) disappears completely when the nodal market is implemented.

*Constraining market power.* In a market where a single PGC controls more than 20% of the generating capacity (and has much greater market concentration in certain geographical areas) and is pivotal in more than 50% of intervals within the ERCOT balancing energy service market, it is extremely difficult to distinguish the intentional exercise of market power from simply "doing what comes natural." Refining the market structure to reduce the potential for anti-competitive behavior is far superior to an enforcement system built upon the analysis of pricing strategies, administrative penalties, and lawsuits. It is fortunate to know that steps are taken in recent years to minimize concerns regarding the exercise of market power and potential harms that may result. Filing and approval of voluntary mitigation plan is a very important development in ERCOT market to further minimize such concerns. Furthermore, greater demand response, lower limits on the control of generating capacity by a single PGC, transmission system enhancements, and refinements to bidding rules through more market transparency could all play a role in fostering a more-competitive wholesale market.

*Long-term resource adequacy.* The Commission has taken necessary steps to reduce regulatory uncertainties by confirming its desire to have energy-only resource adequacy mechanism and a high willingness to allow for scarcity pricing through much higher offer caps

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<sup>23</sup> The Market Oversight Division of the Public utility Commission of Texas identified shortcomings of the current zonal market design for the first time in a filing under Project No. 23673 on September 9, 2002 and raised the need to move to nodal market design. It was not until September 2003 when the Commission approved Substantive Rule 25.501 ordering full nodal implementation by October 1, 2006. Later on, the Commission agreed to further postpone full implementation to January 1, 2009.

than any other markets in the United States. Now, it is an empirical question to see if there is adequate cost recovery by investors to continue to invest in additional resources within ERCOT electricity market to meet its continuous increase in demand for electricity. In contrast, it still remains a big challenge for policy makers to take effective steps that eventually result in meaningful demand response, which is the most important factor in achieving a workably competitive environment, in ERCOT market. Ensuring resource adequacy and mitigating market power in a nodal market will prove much easier if sufficient demand response is present.<sup>24</sup>

*Retail competition.* Our advice here is “leave it alone”!

*Retail prices.* Future run-ups in natural gas prices are inevitable, and retail electric rates in the areas of Texas opened to retail competition are exceptionally sensitive to natural gas prices for the reasons described earlier. Yet, it would be a mistake for policy makers to re-impose retail price caps or the PTB at the next sign of climbing natural gas prices. Retail price caps were responsible for many of California’s problems. And evidence suggests that relaxing the price constraints placed on AREPs has led to lower overall retail commercial sector electricity prices in ERCOT. (Zarnikau, Fox, and Smolen, 2007) Volatile retail prices are just part of the deal when you liberalize an electricity market. However, we strongly encourage policy makers to seriously encourage and accelerate the implementation of advanced meters and require REPs to begin aggressively pursue offering pricing options to enhance end-use customers’ ability to effectively respond to such volatility in retail prices.

If these challenges are successfully met, Texas will remain North America’s best restructured electricity market.

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<sup>24</sup> Schubert (2005b).

<sup>25</sup> Please note that some additional references to PUCT dockets are cited in the narrative.

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