



**ELECTRIC RELIABILITY COUNCIL OF TEXAS**

**2007 ANNUAL REPORT**



# ERCOT Quick Facts

## At a glance

72,820 megawatts (MW) generating capacity  
62,339 MW system peak demand (August 2006)  
13.8% reserve margin for 2008 (12.5% target)  
38,000 miles of transmission lines  
550 generation units  
21 million Texans served  
307 billion kilowatt-hours of power delivered annually  
85% of Texas load  
75% of Texas land area  
\$30 billion market size  
95% bilateral wholesale market  
5% ERCOT-run balancing energy and ancillary services market  
\$1.9 billion in annual billings

## What do we do?

Senate Bill 7 (1999) restructured the Texas electric market by unbundling the investor-owned utilities and creating retail customer choice in those areas, and assigned ERCOT four primary responsibilities:

- System reliability – planning and operations
- Open access to transmission
- Retail switching process for customer choice – Only ISO with responsibilities as registration agent for retail transactions
- Wholesale market settlement for electricity production and delivery

### Other Organizational Functions

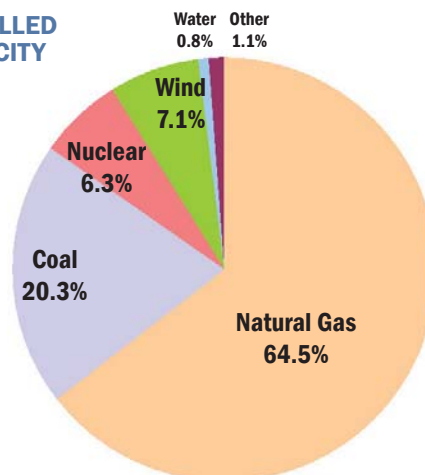
Wholesale market administration  
Ancillary services market administration  
System planning coordination  
Renewable Energy Credits management (statewide)  
Market participant/stakeholder activity support

## How are we doing?

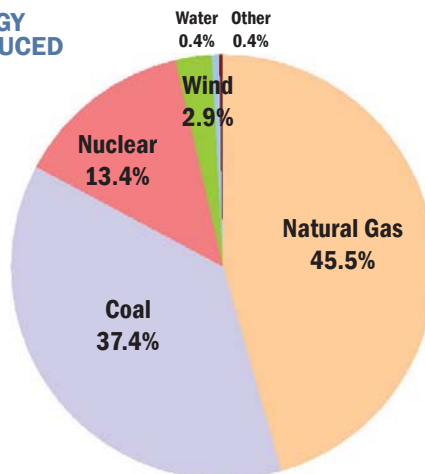
### Generation Development

- 34,000 MW new generation added since 1996
- 10,245 MW of committed resources through 2013 (generation with interconnection agreements and air permits); includes 4,258 MW wind (effective load-carrying capacity of 370 MW)
- 104,000 MW of generation interconnection requests in the queue, including approximately 49,000 MW wind, 15,500 MW nuclear, 31,000 MW natural gas, and 8,500 MW coal (April 2008)

**INSTALLED  
CAPACITY  
2008**



**ENERGY  
PRODUCED  
2007**



### Transmission Investment

- 6,200 circuit miles of transmission built since 1999
- 2,538 circuit miles of transmission under study
- \$3.9 billion investment in transmission placed in service since 1999
- \$3 billion under development

### Retail Service by Competitive Retailers

- 46% of residential load
- 66% of small commercial load

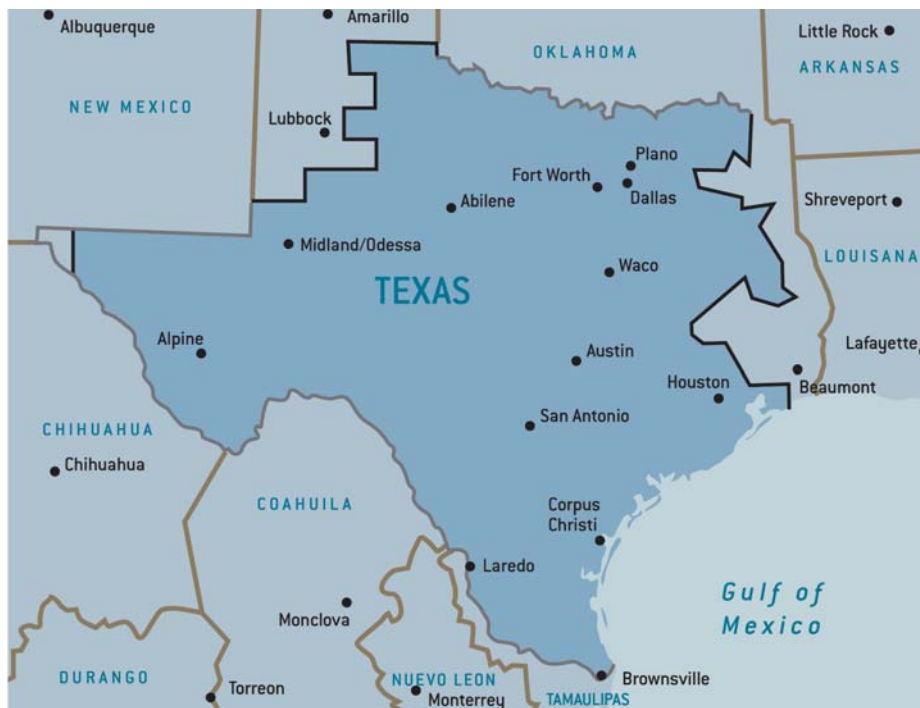
## What's ahead?

Comprehensive nodal market implementation, anticipated launch in 2009, to include:

- Nodal locational marginal pricing for generation
- Congestion revenue rights
- Day-ahead energy and ancillary services co-optimized market
- Day-ahead and hourly reliability unit commitment
- Price cap increases phased in through 2009

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The Electric Reliability Council of Texas (ERCOT) manages the flow of electric power to approximately 21 million Texas customers – representing 85 percent of the state’s electric load and 75 percent of the Texas land area. The ERCOT Region includes Houston, Dallas, Fort Worth, San Antonio, Austin, Corpus Christi, Abilene and the Rio Grande Valley. ERCOT does not include the El Paso area, the Texas Panhandle, Northeast Texas (Longview, Marshall and Texarkana), and Southeast Texas (Beaumont, Port Arthur, and the Woodlands).



**Mark Armentrout**  
Board Chairman

# From the Chairman

The Electric Reliability Council of Texas, Inc., had a very successful 2007, meeting or surpassing virtually all of our metrics for reliability, open access to the market, customer choice, and ensuring accurate and timely information. We also successfully launched a new independent division of ERCOT, the Texas Regional Entity, to comply with new federal regulations stemming from the 2005 US Energy Policy Act.

Other highlights for ERCOT's 2007 performance include Moody's Investor Service's upgrading our credit rating to Aa3, reducing borrowing costs, and receiving an unqualified opinion on our SAS 70 audit, a first for ERCOT.

But perhaps most importantly, the Board wants to recognize the efforts, talents, and skills of the staff of ERCOT and all the staffs of the market participants who achieved these goals for the benefit of the people, communities and businesses who rely on the Texas electric grid and the ERCOT market. Without them doing their part, Texas would not be the great place to do business that it is.

The Board of Directors is looking forward to a challenging year as we get ready for the launch of the nodal market. We are very supportive of the ERCOT staff and the market participants working diligently on market readiness tasks and training on a tight timeline.

In July 2007, ERCOT welcomed Bob Kahn as chief executive officer, following the retirement of Sam Jones. We are pleased to have someone with his seasoned experience to lead ERCOT into its future.

Mark Armentrout  
Chairman of the Board

## Board of Directors

**Mark Armentrout**  
Chairman  
(unaffiliated)

**Michehl Gent**  
Vice Chairman  
(unaffiliated)

**Don Ballard**  
Office of Public Utility Counsel  
(residential consumer, ex-officio)

**Brad Cox**  
Tenaska Power Services  
(independent power marketer)

**Andrew Dalton**  
Valero Energy Corporation  
(industrial consumer)

**Miguel Espinosa**  
(unaffiliated)

**Nick Fehrenbach**  
City of Dallas  
(commercial consumer)

**Carolyn Lewis Gallagher**  
(unaffiliated) *April 2005-March 2008*

**Bob Helton**  
International Power America  
(independent generator)

**Charles Jenkins**  
Oncor Electric Delivery  
(investor-owned utility)

**Bob Kahn**  
CEO, ERCOT  
(ex-officio)

**Clifton Karnei**  
Brazos Electric Cooperative  
(cooperative)

**Jan Newton**  
(unaffiliated)

**Barry Smitherman**  
Chairman  
Public Utility Commission  
(ex-officio, non-voting)

**Robert Thomas**  
Green Mountain Energy  
(retail electric provider)

**Dan Wilkerson**  
Bryan Texas Utilities  
(municipal utility)



**Bob Kahn**  
President and CEO

# From the CEO

In my first year as CEO, I quickly learned why ERCOT is recognized as one of the top electric markets in the world. First, we have the solid foundation of a well-designed competitive market as established by the Texas Legislature and implemented under the guidance and oversight of the Public Utility Commission.

Second, and perhaps most fundamental to our success, is the collaborative stakeholder process – market participants, customers, industry members, and regulators working side by side with the ERCOT staff to enable the development and evolution of an effective and highly reliable electricity market.

A few examples of why the ERCOT market is widely considered to be one of the most successful in the world:

- More than 104,000 megawatts (MW) of new generation projects are in the queue, including 15,500 MW of nuclear and 49,000 MW of wind – more interest than in any other state;
- 1,619 MW of wind generation came online last year, maintaining ERCOT's leadership in integration of renewable generation in the nation;
- More than 6,200 miles of transmission lines have been built since 1999 – 2,500 miles in just the last two years;
- 46 percent of residential customers had switched from the incumbent utility, at the end of 2007, just five years after launching the retail market.

Finally, I have been very impressed with the skills and expertise of the ERCOT staff. I believe that working collaboratively, we – the Commission, ERCOT staff, and the stakeholders – can look forward to more successes.

Bob Kahn  
President and CEO

## Vision

**ERCOT is recognized as a world-class independent system operator of reliable, open and non-discriminatory electric markets.**

## Mission

**ERCOT nurtures the development of an effective and highly reliable electricity market in Texas by:**

- Providing independent advice to facilitate and enable innovation;
- Collaborating with customers, industry members, and regulators;
- Delivering high quality and cost-effective services;
- Developing a highly qualified expert staff.

**To fulfill its statutory obligations established by the Texas Legislature, ERCOT will:**

- Ensure access to the transmission and distribution systems for all buyers and sellers of electricity on nondiscriminatory terms;
- Ensure the reliability and adequacy of the regional electric network;
- Ensure that information relating to a customer's choice of retail electric providers is conveyed in a timely manner to the persons who need the information;
- Ensure that electricity production and delivery are accurately accounted for among the generators and wholesale buyers and sellers in the region.



# System Operations

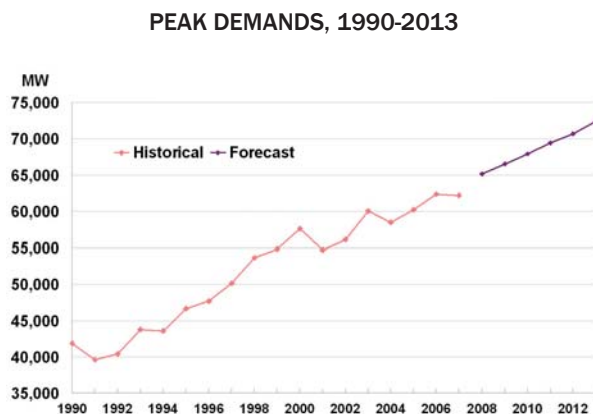
## Operators weather ice storm

Shortly into 2007, icy weather fell upon much of the state. ERCOT system operators weathered the mid-January storm with no major operational issues. Many system operators and engineering support staff spent several nights in nearby hotels between their shifts to ensure that they would be able to get to work despite the icy conditions. The peak demand during the ice storm was 50,404 megawatts (MW) – a 31 percent increase over the previous year's January peak.

## Energy consumption up slightly

Energy consumption for the year increased less than 1 percent over the 2006 total, at 307 million megawatt-hours (MWh) compared to last year's 305 million MWh of net energy for load.

The highest hourly demand for 2007 was 62,188 MW on August 13, slightly less than the all-time maximum peak demand of 62,339 MW, set on August 17, 2006.

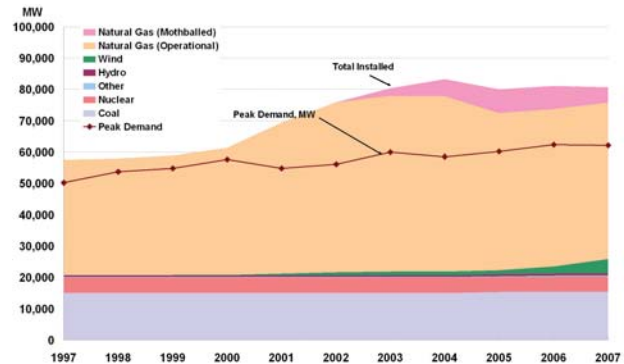


## New operator training simulator completed

The new control center simulator system at ERCOT's Taylor training facility went "live" in May following a year of implementation work by ERCOT staff and the vendor. Four cycles of simulator training for ERCOT ISO system operators and the region's transmission operator operations personnel were completed.

The simulator allows operators to receive hands-on

## GENERATION CAPACITY BY FUEL TYPE, 1997-2007



training on extreme system conditions without any impact to the grid. The system replicates the ERCOT control center computer systems and also includes a power system model to mimic the behavior of power systems and a subsystem to create events under various operating conditions. The simulator system also incorporates real-time market data in parallel with the normal real-time operation of the ERCOT system. In addition, operations and notifications of energy scheduling entities are included to simulate their expected actions.

ERCOT has a total of 48 system operators staffing two control centers, one primary and one backup facility. The control rooms run two shifts all day, every day, with eight individuals on every shift. Each operator receives more than 120 hours of training per year. Federal reliability standards require that grid operators receive continuing training (depending on the operator's responsibilities) for operator re-certification, which occurs every three years. ERCOT operators hold the highest level of certification, which requires 200 hours of continuing training. The certification standard also requires that a minimum of 30 hours of simulator training is included.

## Operators coordinate region-wide storm drill

Operators received additional training during the annual storm drill. In November, 33 transmission operators and energy schedulers from across the ERCOT region participated in a severe weather drill.

The drill simulated a severe winter storm with multiple transmission outages and generation shortages, which culminated in rotating blackouts over 200,000 households to prevent a system-wide blackout. Energy schedulers and transmission and distribution providers were able to test backup emergency plans and practice communications with ERCOT during events leading up to the simulated ice storm and the rotating outages, as well as restoration activities.

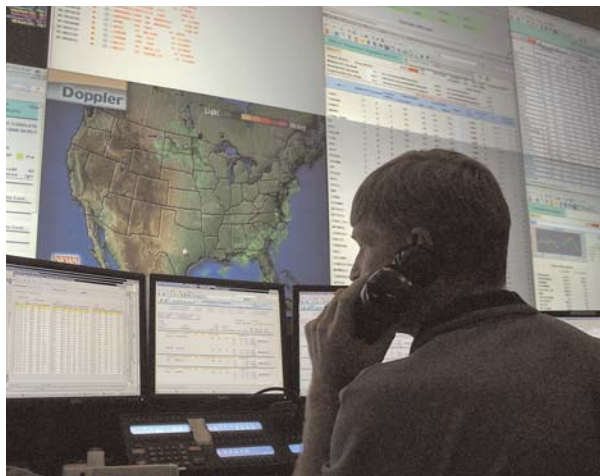
### Operating standards department established for compliance

An operating standards department was established with initial staffing dedicated to maintaining compliance with NERC Reliability Standards and ERCOT Protocols. The first audit addressed was from NERC/Texas Regional Entity and resulted in an accepted mitigation plan for six minor deficiencies with no penalty.

Also, ERCOT's internal audit department conducted an audit of system operators and found them in compliance with 99.8 percent of operating procedures with the one exception being a low-risk violation that has been remedied.

### Nodal activities impact market operating systems staff

The market operating systems staff redeployed 75 percent of its workforce to work on the nodal market project, while maintaining necessary support of zonal activities. Accomplishments for the year included:



- Completed Nodal Market Management System (MMS) design and walk-through, including updating of MMS Baseline 1 and 2 business requirements;
- Completed MMS Pre-Factory Acceptance Testing;
- Initiated Common Interface Model (CIM) engagement, which is a critical requirement for nodal implementation.

### Additional accomplishments

Other 2007 achievements in system operations included:

- Implementation of Real-time Constraint Activity Manager, enabling real-time evaluation of the effect of individual generating units on a transmission constraint in order to dispatch units more effectively for local congestion; necessary for Nodal Security Constrained Economic Dispatch operations;
- Completion of 14 capital projects within budget, including the operator training simulator, mid-term load forecast phase I and improvements to the reliability of frequency input into control systems;
- Implementation of a temperature-dependent reserve discount factor in place of a fixed 7 percent. The discount factor now varies from 4 to 7 percent, based upon temperature, and more accurately represents actual reserves on the grid, reducing the need for and cost of maintaining additional reserves.

# System Planning

## ERCOT leads nation in wind energy

The ERCOT region has garnered recognition as a national leader in integrating wind energy. At the end of 2007, ERCOT had more than 4,700 MW of installed wind generation – significantly higher than any other state. An additional 2,700 MW of wind plants are already scheduled to begin operations in 2008, and over 44,000 MW are in various stages of interconnection studies.

As the transmission system nears the limits of how much wind energy transfer it can handle, the Public Utility Commission is working on the designation of Competitive Renewable Energy Zones (CREZ), as instructed by Texas Senate Bill 20 (2005) to facilitate transmission development.

ERCOT system planning staff provided expert testimony and related support for the CREZ docket. At the commission's direction, the planning staff developed a process for analyzing four specific CREZ scenarios. The PUC is expected to designate the CREZ zones in mid-2008, with specific transmission-project filings to follow.

## Renewable Energy Credit program most active in US

In 2007, ERCOT administered the Texas Renewable Energy Credits (REC) trading program for 68 resource entities and 318 other market participants, issuing almost 10 million RECs to Texas renewable energy generation companies. Companies must generate a megawatt-hour of energy to earn one REC. Ninety-one competitive retail electricity providers retired 3.4 million RECs in order to satisfy the annual mandate within the portfolio standard. An additional 1.6 million RECs were retired in the voluntary market. Entities retire RECs in the voluntary market to substantiate their “green energy” support of the clean-air initiative in Texas.

The REC program in Texas is the longest running and the most active in the US, and it is accomplishing its goal of bringing “clean” renewable resources into Texas at a record pace.

The REC trading program was established as part of the Legislature's restructuring of the state's electricity market in 1999. The original statutory goal of the program was to install 2,000 MW of additional, new renewable

resource generation in Texas by the year 2009, adding to the 880 MW already existing. In 2005 the renewable portfolio standard was increased to 5,880 MW of renewable generation by 2015.

Texas has rapidly moved beyond the original goals. More than 4,000 MW of wind power has been added since 2001. Texas surpassed California in 2006 as the leading state in the US in wind capacity.

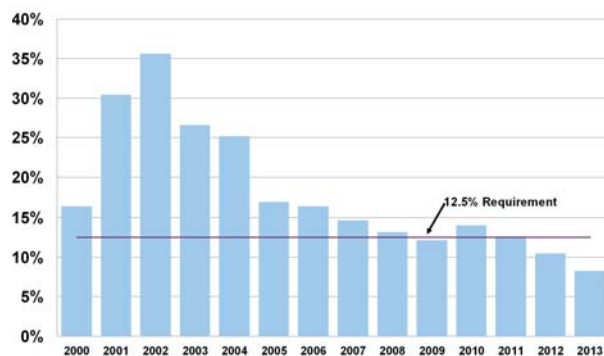
## Generation short-term outlook improves

System planning released the annual summer assessment and five-year projection in May, showing the generation reserve margin dropping below the 12.5 percent minimum as early as 2009. The winter update in December reflected an improved short-term outlook due to the addition of 836 MW of planned generating capacity beginning in 2009 plus 2,460 MW in 2010.

Based on the forecast's “snapshot in time,” reserves continue to look tight in 2011, 2012 and 2013. Potential resources that are not added to the assessment include over 4,000 MW of generation capacity which is currently mothballed but could be brought back into service or re-powered to take advantage of the present fuel and transmission infrastructure.

Other potential resources include units that are in the final phase of an interconnection study but lack either an air permit or an executed interconnection agreement. At the end of 2007, ERCOT was tracking new generation proposals in the final phase totaling 15,517 MW by 2013.

ERCOT RESERVE MARGINS, 2000-2013





Also during the year, the system planning division:

- Completed the analyses and recommendations for 17 transmission projects through the Regional Planning Group review process;
- Processed a record 127 generation interconnection requests and completed more than 100 interconnection screening studies.

### \$3 billion in transmission improvements proposed

ERCOT's annual transmission planning report issued in December 2007 included \$3 billion in proposed projects for the next five years, expected to add 2,538 miles of transmission lines and autotransformer capacity.

The major 345-kV transmission lines planned include:

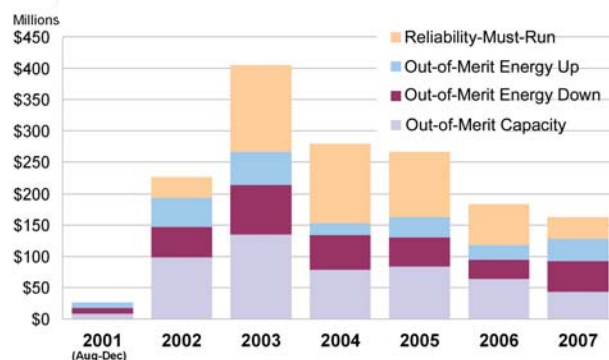
- 88 circuit miles, Bell County East – Twin Oaks, operational 2012
- 198 circuit miles, Red Creek – Killeen line, operational 2012
- 38 circuit miles, Oklaunion – Bowman line, operational 2012
- 22 circuit miles, Nacogdoches – Lufkin line, operational 2012
- 103 circuit miles, Clear Spring – Salado, operational 2010/2011
- 110 circuit miles, San Miguel – Laredo, operational 2010

### TRANSMISSION IMPROVEMENTS



Numbers are based on projects being completed in the designated year and may not reflect actual investment in that year. Costs may be spread over several years.

### INTRAZONAL (LOCAL) CONGESTION COSTS



- 7 circuit miles, West Levee – Norwood (Dallas/Fort Worth), operational 2009.

Since 2005, ERCOT transmission service providers have completed more than 2,500 circuit miles of transmission lines and approximately 28,000 MVA of autotransformer capacity, with an estimated capital cost of \$2.2 billion.

### Congestion costs decreasing

The transmission report also analyzed costs to resolve zonal congestion (between zones) and intrazonal congestion (local). After several years of decrease, transmission congestion costs appear to be level between 2006 and 2007, but overall costs may trend higher until planned lines are added, the report noted.

Intrazonal congestion costs are highly dependent on local generation availability, the limits of the transmission infrastructure, the local area demand, and projected load growth. ERCOT has worked with market participants to develop short-range and long-range plans to minimize intrazonal congestion costs. Due to new transmission and other operational improvements, annual intrazonal congestion costs were reduced from \$405 million in 2003 to \$183 million in 2006 and about \$163 million in 2007.

Moving to the nodal market design will allow more efficient congestion management through improved dispatch efficiencies at the resource level, rather than by portfolio. The nodal market is expected to achieve lower congestion costs by allowing more direct assignment of local congestion.

# Market Operations

## ERCOT staff supports stakeholder process

Market participants and ERCOT staff worked together to continue refining the wholesale and retail markets. ERCOT staff played a critical role in the stakeholder process by providing meeting management and technical support for more than 700 stakeholder meetings in 2007, compared to 601 in 2006. The staff managed all activities for 168 market rule changes, including 49 Protocol Revision Requests (PRRs), 56 nodal PRRs, and more than 63 guide revisions, plus more than 576 accompanying recommendation reports.

ERCOT staff also provided business support for 348 market participant entities involved in day-to-day ERCOT operations, drafted and distributed 821 market notices across a diverse range of technical topics, and delivered 1,748 days of structured education sessions for all stakeholders, up from 1,000 in 2006.

## Electronic transaction system upgraded

Upgrades and improvements delivered by the project teams included development of version 3.0 of Texas Standard Electronic Transaction (SET), the electronic transaction system that supports the retail market.

The project teams also completed an automated solution for mass transition of ESI-IDs (Electric Service Industry Identifier, the unique identifier for each retail customer

in ERCOT), creation of new data marts in the operational data store, and upgrades to load profiling and metering software application systems. All projects were implemented without market disruption.

The testing staff administered four market-wide test flights required for recertification on Texas SET 3.0.

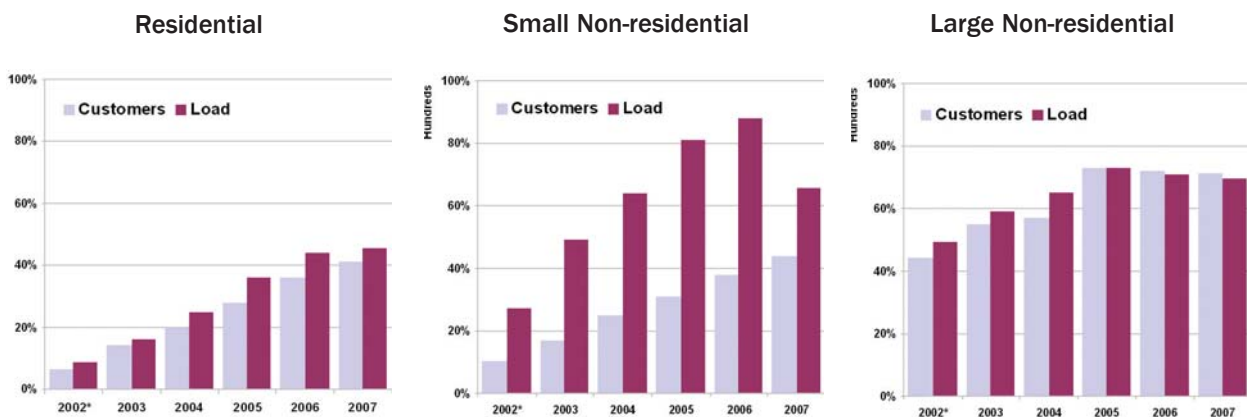
ERCOT also tested more than 5,000 compilation and computing code changes and resolved over 900 defects before releasing new systems into production.

## Switching and related retail transactions top 5 million for the year

ERCOT is unique among independent system operators with its central role in assuring conveyance of retail customer switch requests, move-ins and move-outs, and meter-read data. In 2007 ERCOT processed 5.1 million retail transactions – including retail switches, move-ins and move-outs and other transactions, at nearly 100 percent within protocol.

The Texas retail electricity market continued to set the standard nationally for success in customer choice. By year's end, 41 percent of residential customers were served by a retail electric provider other than the incumbent utility, compared with 36 percent in 2006. Competitive service to commercial customers was at 44 percent, and industrial at 71 percent.

### CUSTOMER SWITCHING: CUSTOMERS CHOOSING COMPETITIVE RETAIL PROVIDERS



\* 2002 numbers are estimates

Staff implemented new PUC provider-of-last-resort rules outlined in Substantive Rule 25.43. There were no market-wide mass drops to the providers-of-last-resort during 2007.

More than 14 new retail electric providers joined the ERCOT market in 2007.

### Settlement processing 100 percent accurate

Managing the data and the settlements and billings processes that support the \$30 billion wholesale market is a critical function of market operations.

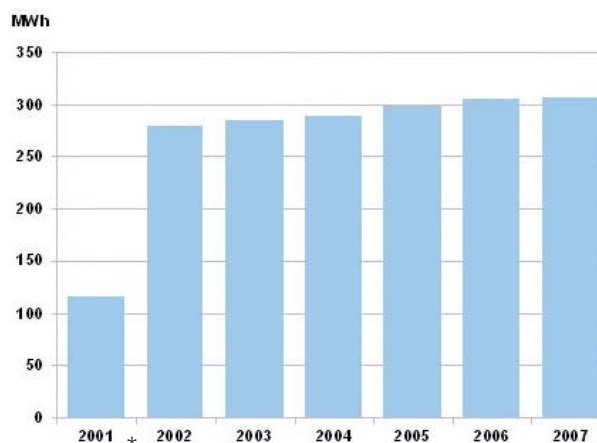
Staff processed more than 128,000 wholesale statements and invoices with 100 percent accuracy and 99.3 percent timeliness.

### Over \$66 million auctioned in Transmission Congestion Rights

In addition to managing the settlements and billings processes, ERCOT conducted Transmission Congestion Rights (TCR) auctions totaling \$66.7 million. A TCR is a financial instrument that enables market participants to hedge against the risk of incurring congestion charges between pricing zones.

In the nodal market, TCRs will be replaced by Congestion Revenue Rights (CRR). A CRR is a financial instrument that enables market participants to hedge

### TOTAL ADJUSTED METERED LOAD



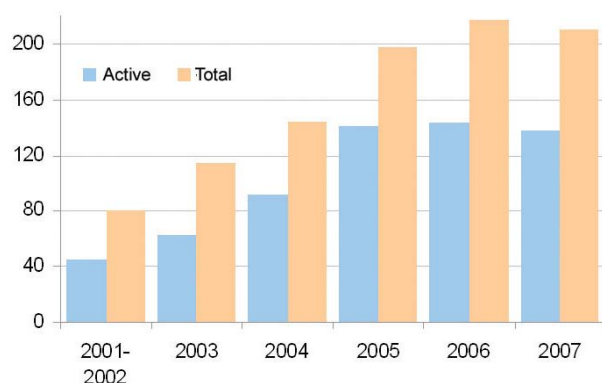
\*2001 represents a partial year

against the risk of incurring congestion charges between pricing nodes.

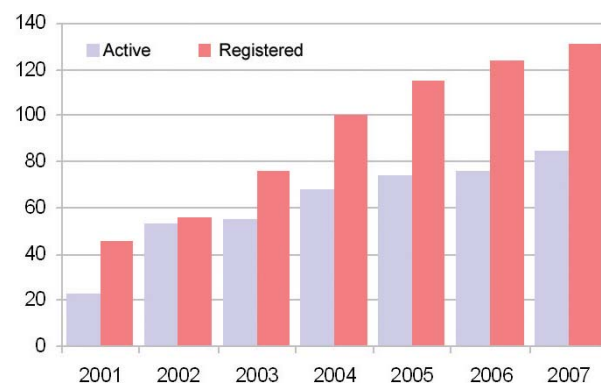
CRRs are defined by a megawatt amount, settlement point of injection, and settlement point of withdrawal. CRR owners will pay or get paid the product of the CRR megawatt amount and the locational-marginal-pricing difference between the CRR injection and withdrawal settlement points. CRRs will be auctioned by ERCOT monthly and annually, and auction revenues will be returned to loads.

### MARKET PARTICIPANT GROWTH

#### Qualified Scheduling Entities



#### Competitive Retailers





# Information Technology

## Technology infrastructure investments

In 2007 ERCOT information technology continued on its mission to further align with the needs of the market, to operate under the notion of a business-within-a-business, and to strive for operational excellence.

ERCOT made the needed investment in hardware and software to meet the technology demands of the upcoming nodal market and to enable the continued growth of the existing ERCOT market.

In preparation for the nodal market, ERCOT information technology completed a major migration of enterprise class servers and also increased the number of deployed servers by 109 percent. This migration in conjunction with a successful server virtualization initiative allowed ERCOT to deploy the quantity of systems required to launch the nodal market while remaining within ERCOT's current data center footprint. ERCOT also continued to add the needed data storage environment to support this growth and solidify the reliability of the operating environment.

## The right tools for the job

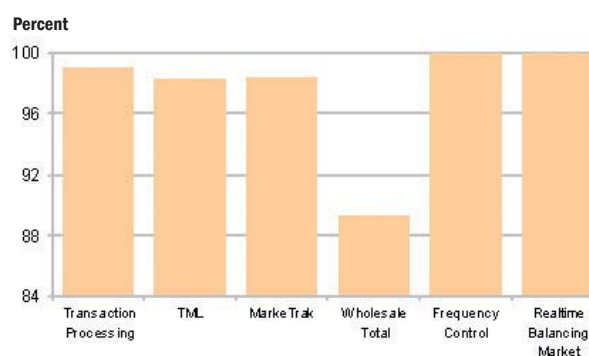
As the technology demands of the nodal market became clear, ERCOT invested in technology management tools to automate best-practice methodologies. Migration to best-practice incident and problem management tools that enable staff to resolve problems more quickly were completed. These tools, complemented by new systems-monitoring software and staff training to utilize the new tools, will ensure that the information technology staff has the information needed to support ERCOT's mission.

## Customer focus

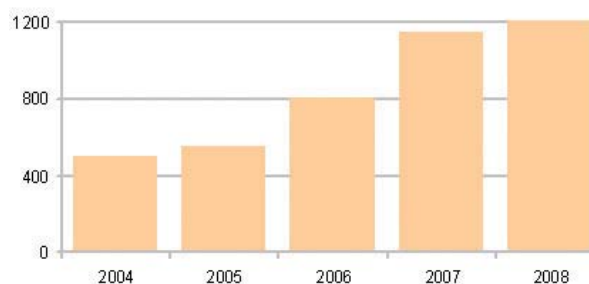
ERCOT information technology formalized its first service-level agreement with market participants for the ERCOT retail transaction processing platform in 2006. Building upon the success of this agreement and working with market participants, the scope of the service-level agreements was expanded in 2007 to include two additional key retail market participant tools, Texas Market Link and MarkeTrak, a tool used by the market to follow issues through resolution.

Information technology also began discussions with market participants regarding the formalization of service-level agreements for the delivery of reports and extracts of key market data that will be completed in 2008.

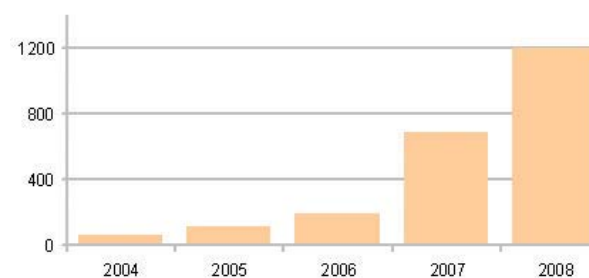
MAJOR SYSTEMS AVAILABILITY, 2007



NUMBER OF SERVERS, 2004-2008



TERABYTES OF STORAGE, 2004-2008



The systems and applications required to run the nodal market will have service levels negotiated with market participants before the systems enter a production capacity.

### **Additional accomplishments**

Other accomplishments for the year included:

- Successfully implementing Texas SET 3.0;
- Analyzing the retail switching systems and development of a plan to improve performance in this area;

- Reducing PaperFree duplicate transactions;
- Extending the life of Austin and Taylor data centers and adding additional server capacity through new virtualization technologies;
- Implementing new electronic data warehouse tools to improve the reliability and speed of getting information out to the market.

# Nodal Market Implementation

## **ERCOT, market participants work together on tight schedule**

The ERCOT staff and market participants worked steadily during the year in preparation for the nodal market implementation.

The biggest challenges ahead include a tight timeline for the delivery and testing of the Market Management System; infrastructure constraints (power, space and cooling limiting the speed of some projects and trials); and integration issues (building 400-500 interfaces and working with the three main vendors on integration of models and communications).

Nearly all systems and their integration will be independently checked and tested prior to the final qualification test. It will be conducted by the intended users of the systems, and all market participants will be required to participate.

## **Major milestones accomplished**

Several key items were achieved in accordance with schedule including:

- Implementation of Locational Marginal Pricing module;
- Implementation of new hardware infrastructure;
- Launch of the market participant registration system;
- Multiple software deliveries for early delivery systems;
- Market participants able to sign onto the nodal systems and begin their development and testing;
- Significant improvement in quality measurement program for nodal;
- Completion of draft nodal service-level agreement.

# Texas Nodal

## Zonal Market



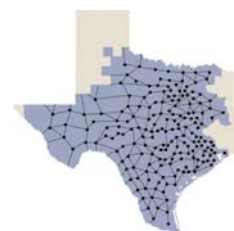
In today's zonal market, the grid is divided into Congestion Management Zones (CMZs), which are defined by the Commercially Significant Constraints (CSCs). Several limitations have been identified with the current zonal model:

- Insufficient price transparency - This results in less efficient power dispatch, less efficient congestion management tools and muted or distorted signals for investment.
- Resources grouped by portfolio - Qualified scheduling entities (QSEs) submit schedules for a group of resources (portfolio) in a specific zone, and ERCOT operators have limited options to efficiently resolve congestion.
- Indirect assignment of local congestion - Participants who contribute to local congestion are not appropriately assigned the associated costs.

## Nodal Market

Moving to a nodal design will satisfy the PUC order to directly assign local congestion.

In the nodal market, the grid will consist of more than 4,000 nodes, replacing today's CMZs. The Texas Nodal design is expected to achieve lower overall costs through:



- Improved price signals - More granular pricing will encourage additional generation and/or transmission investment in the proper locations.
- Improved dispatch efficiencies - Dispatching at the resource level will yield a lower overall cost of power supply and more efficient congestion management.
- More direct assignment of local congestion - Settlement prices are based on locational marginal costs.

## SUMMARY OF CHANGES

### Today's Zonal Market

### Tomorrow's Nodal Market

|                                                               |                                                                                                  |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Transmission congestion rights                                | Congestion revenue rights                                                                        |
| No day-ahead energy market                                    | Day-ahead energy and ancillary services co-optimized market                                      |
| Day-ahead market for ancillary services procured for capacity |                                                                                                  |
| Replacement reserve service and out-of-merit capacity         | Day-ahead reliability unit commitment                                                            |
| Hour-ahead studies                                            | Hourly reliability unit commitment                                                               |
| Portfolio-based offers by zone                                | Resource-specific for local congestion                                                           |
| Balancing energy service (BES) every 15 minutes               | Security constrained economic dispatch generally every five minutes (still 15-minute settlement) |
| Zonal congestion management by portfolio for CSCs             | All congestion management will be resource-specific                                              |
| Resource-specific for local congestion                        | Enhanced load frequency control                                                                  |
| Zonal average shift factors for resources                     | Actual shift factors for resources                                                               |
| Zonal market clearing prices for BES for generation and loads | Nodal locational marginal pricing (LMP) for generation                                           |
|                                                               | Zonal weighted LMP for loads                                                                     |



# Five-year Summary

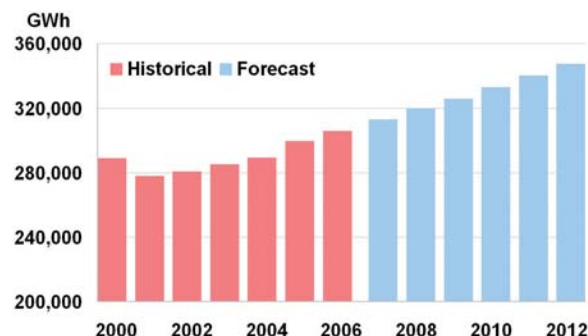
| FINANCIAL DATA (\$/millions)                  | 2003      | 2004      | 2005      | 2006      | 2007      |
|-----------------------------------------------|-----------|-----------|-----------|-----------|-----------|
| Revenue                                       | 97.2      | 129.7     | 127.9     | 135.1     | 165.9*    |
| Direct Operating Expenses                     | 69.4      | 79.1      | 80.8      | 85.9      | 115.8     |
| Depreciation/Amortization                     | 38.0      | 44.7      | 49.0      | 42.2      | 33.9      |
| Net Interest Expense/(Income)                 | 8.1       | 8.0       | 7.7       | 5.4       | 4.3       |
| Total Expenses                                | 115.5     | 131.8     | 137.5     | 133.5     | 154.0     |
| Debt: Long Term                               | 136.4     | 149.0     | 134.1     | 108.0     | 181.8     |
| Debt: Short Term                              | 13.6      | 29.4      | 26.1      | 73.1      | 77.1      |
| Capital Expenditures                          | 36.0      | 59.7      | 25.3      | 68.2      | 132.7     |
| Administration Fee (per MWh)                  | \$0.33    | \$0.44    | \$0.42    | \$0.417   | \$0.417   |
| OPERATING DATA                                | 2003      | 2004      | 2005      | 2006      | 2007      |
| Peak Demand (MW)                              | 60,095    | 58,531    | 60,274    | 62,339    | 62,188    |
| Energy (GWh)                                  | 284,954   | 289,113   | 299,219   | 305,692   | 307,064   |
| Reserve Margin (%)                            | 26.7      | 25.2      | 16.5      | 16.4      | 14.6      |
| Transmission Improvements (\$ millions)**     | \$424.7   | \$360.1   | \$557.4   | \$749.4   | \$919.5   |
| Wind Generation Added (MW)                    | 196.6     | 114       | 628       | 1,021     | 1,619     |
| Local Congestion Costs (\$ millions)***       | \$405.2   | \$279.0   | \$266.6   | \$183.6   | 163.5     |
| RETAIL TRANSACTIONS DATA                      | 2003      | 2004      | 2005      | 2006      | 2007      |
| Competitive Choice Customers                  | 6,000,199 | 6,079,456 | 6,199,966 | 6,298,374 | 6,401,101 |
| Switches Completed (cumulative)               | 1,188,829 | 1,646,346 | 2,287,492 | 3,134,197 | 3,849,436 |
| Switches by Year                              | 653,044   | 457,517   | 641,146   | 846,705   | 715,239   |
| Residential                                   | 538,914   | 335,253   | 479,830   | 656,218   | 578,727   |
| Small Non-residential                         | 112,873   | 121,210   | 160,339   | 189,482   | 135,586   |
| Large Non-residential                         | 1,257     | 1,054     | 976       | 1,004     | 926       |
| Total Load Migrated from AREP (MW)            | 15,676    | 20,211    | 25,640    | 29,721    | 26,473    |
| Residential                                   | 3,535     | 5,156     | 7,454     | 9,601     | 9,831     |
| Small Non-Residential                         | 6,768     | 8,739     | 11,063    | 13,337    | 9,937     |
| Large Non-Residential                         | 5,373     | 6,316     | 7,123     | 6,783     | 6,705     |
| Competitive Retail Total Transactions (000's) | 95,826    | 89,060    | 92,368    | 94,857    | 93,684    |

\* Includes \$32 million from nodal surcharge and \$2 million from NERC ERO fee

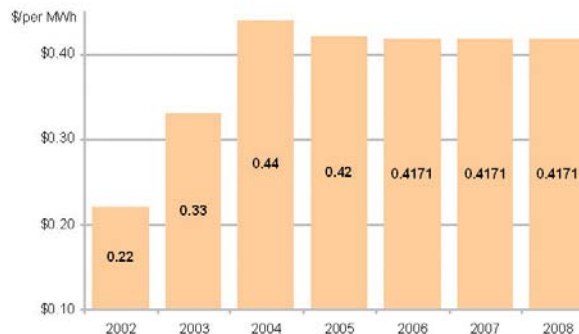
\*\* Based on projects completed in the designated year; may not reflect annual costs since costs may be spread over several years

\*\*\* Methodology has changed during the five-year period. Past years' updated to reflect changes following re-settlements and true-ups.

**ANNUAL ENERGY, 2000 - 2012**



**ERCOT SYSTEM ADMINISTRATION FEE, 2002-2008**



# ERCOT Members

|                                 |                                  |                                  |                                   |
|---------------------------------|----------------------------------|----------------------------------|-----------------------------------|
| 7-Eleven                        | City of Irving                   | Formosa Plastics                 | Rainbow Energy Marketing          |
| Accent Energy Texas             | City of Keller                   | Fort Belknap Electric Coop.      | Rayburn Country Electric Coop.    |
| AES Corporation                 | City of Killeen                  | Fortis Energy Mkt & Trading      | Reliant Energy                    |
| Air Liquide Large Industries US | City of La Feria                 | FPL Energy                       | Rio Grande Electric Cooperative   |
| Air Products and Chemicals      | City of Lewisville               | Fulcrum Power Services           | Safeway                           |
| Airtricity                      | City of Los Fresnos              | Garland Power & Light            | San Bernard Electric Coop.        |
| American Electric Power         | City of McAllen                  | Georgetown Utility Systems       | San Patricio Electric Cooperative |
| Andeler Corporation             | City of McKinney                 | GEUS                             | Sempra Energy Solutions           |
| Austin Energy                   | City of Midlothian               | Gexa Energy                      | Sharyland Utilities               |
| Austin White Lime               | City of Murphy                   | Golden Spread Electric           | Sid Richardson Carbon and         |
| Barclays Bank                   | City of North Richland Hills     | Cooperative                      | Energy                            |
| Bartlett Electric Cooperative   | City of Odessa                   | Grayson-Collin Electric Coop.    | Signal Hill Power                 |
| Bear Energy                     | City of Ovilla                   | Green Mountain Energy            | Sitara Energy                     |
| Big Country Electric Coop.      | City of Paris                    | Gregory Power Partners           | South Plains Electric Coop.       |
| Big Lots                        | City of Plano                    | Guadalupe-Blanco River Auth.     | South.Texas Aggregation           |
| Blu Power of Texas              | City of Point Comfort            | Halliburton Energy Services      | Power Project.                    |
| BOC Energy Services             | City of Port Lavaca              | Hamilton County Electric Coop.   | South Texas Electric Coop.        |
| BOC Gases                       | City of Portland                 | HEB Grocery Company              | Southwest Texas Electric Coop.    |
| BP Energy Company               | City of Robinson                 | HILCO Electric Cooperative       | StarTex Power                     |
| Brazos Electric Power Coop.     | City of Rockport                 | Himalaya Power                   | Strategic Energy                  |
| Brownsville Public Utilities Bd | City of Rowlett                  | Integrays Energy Services        | Stream Energy                     |
| Brubaker & Associates           | City of Sachse                   | International Power America      | Suez Energy Marketing NA          |
| Bryan Texas Utilities           | City of San Angelo               | J. Aron & Company                | Sweetwater Wind 2                 |
| Calpine Corporation             | City of Snyder                   | J. Pollock                       | TAC Residential Consumer Rep.     |
| Cargill Power Markets           | City of Sweetwater               | J-A-C Electric Cooperative       | Tara Energy                       |
| CenterPoint Energy              | City of Tyler                    | Jackson Electric Cooperative     | Taylor Electric Cooperative       |
| Champion Energy Services        | City of University Park          | JCPenney                         | Tenaksa Power Services Co.        |
| Chaparral Steel Company         | City of Victoria                 | Just Energy Texas                | Tenaska Energy                    |
| ChevronPhillips Chemical        | City of Waco                     | Karnes Electric Cooperative      | Texas Independent Energy          |
| Cielo Wind Power                | City of Waxahachie               | Kerrville Public Utility Board   | Texas Industries                  |
| Cirro Group                     | City of Whitney                  | Keystone Energy Partners         | Texas Instruments                 |
| Cities Aggregation Power Proj.  | CMC Steel Texas                  | Kohls Department Store           | Texas Municipal Power Agency      |
| Citigroup Energy                | Cobisa Corporation               | Liberty Power Corp.              | Texas Petrochemicals              |
| City of Abilene                 | Coleman County Electric          | Limited Brands                   | Texas-New Mexico Power Co.        |
| City of Alamo                   | Cooperative                      | Lowe's Home Centers              | The Colony                        |
| City of Alice                   | Comanche Electric Cooperative    | Lower Colorado River Authority   | Topaz Power Group LLC             |
| City of Allen                   | Commerce Energy                  | Lyondell Chemical Company        | Town of Addison                   |
| City of Arlington               | Concho Valley Electric           | Magic Valley Electric Coop.      | Town of Flower Mound              |
| City of Belton                  | Cooperative                      | Marathon Oil Company             | Town of Highland Park             |
| City of Benbrook                | ConocoPhillips Company           | McDonald's USA                   | Town of Laguna Vista              |
| City of Brownwood               | Constellation Energy             | McLennan Co. Electric Coop.      | Town of South Padre Island        |
| City of Carrizo Springs         | Commodities Group                | Medina Electric Cooperative      | Town of Woodsboro                 |
| City of Carrollton              | Constellation NewEnergy          | Mid-South Electric Coop. Assoc.  | Tri-County Electric Cooperative   |
| City of Cedar Hill              | Cooke County Electric            | Mirant Energy Trading            | TriEagle Energy                   |
| City of Cleburne                | Cooperative Association          | MorganStanley Capital Group      | TXU Electric Delivery Company     |
| City of College Station         | Coral Power                      | Navarro County Electric Coop.    | TXU Energy Company                |
| City of Colleyville             | CoServ Electric                  | Navasota Energy Management       | TXU Generation Co.                |
| City of Corpus Christi          | CPS Energy                       | Navasota Valley Electric Coop.   | United Cooperative Services       |
| City of Crockett                | DB Energy Trading                | New Braunfels Utilities          | Valero                            |
| City of Dallas                  | Denton Municipal Electric        | North American. Energy Credit    | Valero Refining - Texas           |
| City of Dilley                  | Direct Energy                    | & Clearing                       | Verde Renewable Energy Inc.       |
| City of Duncanville             | Dow Chemical Company (The)       | NRG Texas                        | Victoria Electric Cooperative     |
| City of Eastland                | Dynegy Power Corp.               | Nucor                            | W Power and Light                 |
| City of Farmers Branch          | Eagle Energy Partners I          | Nueces Electric Cooperative      | Walgreens                         |
| City of Gainesville             | Econnergy Energy Co.             | Occidental Chemical Corp.        | Wal-Mart Stores                   |
| City of George West             | Exelon Generation Company        | Occidental Power Services        | Weatherford Municipal Utility     |
| City of Grand Prairie           | ExxonMobil Power & Gas Svcs      | Office of Public Utility Counsel | Wharton County Electric Coop.     |
| City of Grapevine               | Federated Department Store       | PetSmart                         | Whole Foods                       |
| City of Harker Heights          | First Choice Power               | PPM Energy                       | Wise Electric Cooperative         |
| City of Harlingen               | Flint Hills Resources            | PSEG Texgen I                    | Wolf Hollow I                     |
| City of Honey Grove             | Floresville Electric L & P Syst. | Radio Shack                      | Xtend Energy                      |

# ERCOT Governance

## Board of Directors

**Mark Armentrout**

Chairman  
(unaffiliated)

**Michehl Gent**

Vice Chairman  
(unaffiliated)

**Don Ballard**

Office of Public Utility Counsel  
(residential consumer, ex-officio)

**Brad Cox**

Tenaska Power Services  
(independent power marketer)

**Andrew Dalton**

Valero Energy Corporation  
(industrial consumer)

**Miguel Espinosa**

(unaffiliated)

**Nick Fehrenbach**

City of Dallas  
(commercial consumer)

**Carolyn Lewis Gallagher**

(unaffiliated) *April 2005-March 2008*

**Bob Helton**

International Power America  
(independent generator)

**Charles Jenkins**

Oncor Electric Delivery  
(investor-owned utility)

**Bob Kahn**

CEO, ERCOT  
(ex-officio)

**Clifton Karnei**

Brazos Electric Cooperative  
(cooperative)

**Jan Newton**

(unaffiliated)

**Barry T. Smitherman**

Chairman  
Public Utility Commission  
(ex-officio, non-voting)

**Robert Thomas**

Green Mountain Energy  
(retail electric provider)

**Dan Wilkerson**

Bryan Texas Utilities  
(municipal utility)

## Officers

**Bob Kahn**

President and Chief Executive Officer

**Bill Bojorquez**

Vice President of System Planning

**Steve Byone**

Vice President and Chief Financial Officer

**Nancy Capezzuti**

Vice President of Human Resources and Organizational Development

**Ray Giuliani**

Vice President and Chief of Market Operations

**Mike Grable**

Vice President and General Counsel

**Ron Hinsley**

Vice President and Chief Information Officer

**Kent Saathoff**

Vice President of System Operations

## BOARD AND STAKEHOLDER PROCESS

The ERCOT Board of Directors has general overall responsibility for managing the affairs of ERCOT, including approval of the budget and capital spending priorities, approval of revisions to ERCOT protocols and guides, and endorsement of major new transmission infrastructure recommendations. The Board also oversees the affairs

of the Texas Regional Entity (Texas RE), the independent division that FERC established in 2006 to serve as the regional entity for the ERCOT region, pursuant to the reliability provisions of the federal Energy Policy Act of 2005 (EPAAct).

Under the Board's oversight, ERCOT's stakeholder process is responsible for developing policies, procedures, and guidelines for power grid coordination, reliability, and market operations. Six standing committees and subcommittees supported by numerous working groups and task forces function within the stakeholder process.

## LEGISLATIVE OVERSIGHT

Other than on issues arising under federal EPAAct provisions, ERCOT is subject to oversight by the Texas Legislature and is fully regulated by the Public Utility Commission of Texas (PUC). The PUC approves the ERCOT system administration fee, which provides 98 percent of ERCOT's revenues, and has general oversight authority including the ability to conduct or order audits. Texas RE funds under EPAAct are administered separately.

For most purposes, ERCOT, like the PUC, is accountable to the Texas Legislature and its jurisdictional committees, including the Senate Business and Commerce Committee, House Regulated Industries Committee, and the joint Electric Utility Restructuring Legislative Oversight Committee. For EPAAct purposes, ERCOT is accountable to the Texas RE, NERC, and the Federal Energy Regulatory Commission.

The Electric Reliability Council of Texas (ERCOT) manages the flow of electric power to approximately 21 million Texas customers – representing 85 percent of the state's electric load and 75 percent of the Texas land area. As the Independent System Operator for the region, ERCOT schedules power on an electric grid that connects 38,000 miles of transmission lines and more than 550 generation units. ERCOT also manages financial settlement for the competitive wholesale bulk-power market and administers customer switching for 6 million Texans in competitive choice areas. ERCOT is a membership-based 501(c)(4) nonprofit corporation, governed by a board of directors and subject to oversight by the Public Utility Commission of Texas and the Texas Legislature. ERCOT's members include consumers, cooperatives, independent generators, independent power marketers, retail electric providers, investor-owned electric utilities (transmission and distribution providers), and municipal-owned electric utilities.



**Electric Reliability Council of Texas, Inc.**

**Austin  
7620 Metro Center Drive  
Austin TX 78744  
512/225-7000**

**Taylor  
2705 West Lake Drive  
Taylor TX 76574  
512/248-3000**