THE STORY OF ERCOT

THE GRID OPERATOR, POWER MARKET & PRICES UNDER TEXAS ELECTRIC DEREGULATION

FEBRUARY 2011

A SPECIAL RESEARCH PROJECT BY
THE STEERING COMMITTEE OF CITIES SERVED BY ONCOR &
THE TEXAS COALITION FOR AFFORDABLE POWER

THE ERCOT REGION

THE STORY OF ERCOT

ABOUT THIS REPORT

The Electric Reliability Council of Texas, also known as ERCOT, is the non-profit corporation that oversees the Texas power grid. The organization also has responsibility for settling transactions in the state's wholesale spot market for electricity. But the term "ERCOT" also is used loosely in other ways. For instance, the term can describe the geographical footprint for retail electric deregulation in Texas. It is also sometimes used to describe the state's wholesale energy market. This report touches upon policy questions relating to all these conceptualizations of ERCOT: as an organization, as an energy market, and as the area of Texas with competitive electric suppliers.

To distinguish between these meanings, the term "ERCOT" will be used whenever practicable to refer to the organization, "the ERCOT region" will be used to refer to deregulated areas of the state, and "ERCOT market" will be used to describe the wholesale energy market within the ERCOT region. The reader should note that the Texas Public Utility Commission typically has responsibility for setting the highest level ERCOT market policies, while the ERCOT organization oversees grid operations.

THE REPORT, AT A GLANCE

- *The Executive Summary, Major Findings, and Recommendations begin on page 7.*
- *The Story of ERCOT is organized chronologically, with preliminary sections describing the early history of the Texas electricity grid and later sections describing annual developments from 2000 through 2010. The chronology begins on page 17.*
- *The Story of ERCOT includes a number of subsections that highlight key issues. These subsections are interspersed chronologically throughout the report. These subsections have green backgrounds.*
- *The Story of ERCOT includes articles that focus on important concepts, such as transmission congestion management (page 41) and nodal markets (page 61).*
- *The Story of ERCOT includes charts and graphs that describe ERCOT spending and electric prices in deregulated regions of the ERCOT market. Key charts can be found on pages 81, 84, 85 and 87.*

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THE STEERING COMMITTEE OF CITIES SERVED BY ONCOR

The Steering Committee of Cities Served by Oncor (and its predecessor organization, the Steering Committee of Cities Served by TXU Electric) has been representing the interests of electric consumers for more than two decades. Formed in 1989 to provide cities a united front at the Public Utility Commission, the Steering Committee over the years has helped save Texans more than $1 billion. The organization began its work with the representation of consumers during the PUC's regulatory review of construction costs of the Comanche Peak Nuclear Plant. It later negotiated a sweeping deal with the North Texas electric utility relating to certain costs associated with electric deregulation, and has represented consumer interests in rate cases. The non-profit coalition also represents the interests of municipalities and their citizens at the Electric Reliability Council of Texas, which oversees the state's power grid.

THE 146 CITIES THAT COMPRISE THE STEERING COMMITTEE INCLUDE:

Addison
Allen
Alvarado
Andrews
Anna
Archer City
Argyle
Arlington
Bedford
Bellmead
Belton
Benbrook
Beverly Hills
Big Spring
Breckenridge
Bridgeport
Brownwood
Buffalo
Burkburnett
Burleson
Caddo Mills
Cameron
Canton
Carrollton
Cedar Hill
Celina
Centerville
Cleburne
Coahoma
Colleyville
Collinsville
Comanche
Commerce
Coppell
Copperas Cove
Corinth
Crowley
Dallas
Dalworthington Gardens
DeLeon
De Soto
Denison
Duncanville
Early
Eastland
Edgecliff Village
Euless
Everman
Fairview
Farmers Branch
Fate
Flower Mound
Forest Hill
Fort Worth
Frisco
Frost
Gainesville
Garland
Glenn Heights
Grand Prairie
Granger
Grapevine
Gunter
Haltom City
Harker Heights
Henrietta
Hewitt
Highland Park
Honey Grove
Howe
Hurst
Hutto
Iowa Park
Irving
Jolly
Josephine
Justin
Kaufman
Keller
Kerens
Krum
Lake Worth
Lakeside
Lamesa
Lancaster
Lewisville
Lindale
Little Elm
Little River Academy
Malakoff
Mansfield
McKinney
Mesquite
Midland
Midlothian
Murchison
Murphy
Nacogdoches
New Chapel Hill
North Richland Hills
Oak Leaf
Oak Point
Odessa
O'Donnell
Ovilla
Palestine
Pantego
Paris
Plano
Pottsboro
Prosper
Ranger
Rhome
Richardson
Richland Hills
River Oaks
Roanoke
Robinson
Rockwall
Rosser
Rowlett
Sachse
Saginaw
Seagoville
Sherman
Snyder
Southlake
Springtown
Stephenville
Sulphur Springs
Sunnyvale
Sweetwater
Temple
Terrell
The Colony
Tyler
University Park
Venus
Waco
Watauga
Waxahachie
White Settlement
Wichita Falls
Willow Park
Woodway
Wylie

THE TEXAS COALITION FOR AFFORDABLE POWER

The Texas Coalition for Affordable Power ("TCAP"), a political subdivision corporation, enjoys a unique vantage point within the ERCOT market. Originally two separate non-profit corporations – the Cities Aggregation Power Project and the South Texas Aggregation Project – TCAP pools together the resources of its 158 member political subdivisions to purchase electricity in bulk for the needs of local government authorities.

The price TCAP's member cities pay for electricity impacts their ability to fund essential services. TCAP members purchase in excess of 1.3 billion kilowatt-hours of power each year for street lighting, office buildings, water plants and other municipal needs. An increase of a single penny in the price can equate to the loss of millions of taxpayer dollars. Increases can also impact the welfare of city residents. TCAP wants what all Texans want: a fair system for delivering electricity.

THE 158 POLITICAL SUBDIVISIONS THAT COMPRISE THE TEXAS COALITION FOR AFFORDABLE POWER INCLUDE:

Abilene
Addison
Alamo
Alice
Allen
Alton
Anna
Aquilla WSD
Aransas County MUD
Aransas Pass
Arlington
Austwell
Beeville
Bellmead
Belton
Benbrook
Benbrook Library District
Benbrook WSA
Bishop
Brownwood
Burkburnett
Burleson
Calhoun Port Authority
Carrizo Springs
Cedar Hill
Celina
Charlotte
Cisco
Cleburne
Clyde
Colleyville
Colorado City
Comanche
Commerce
Copperas Cove
Corinth
Corpus Christi
Corpus Christi HA
Corpus Christi RTA
Crockett
De Soto
Decatur
Denison
Dickinson
Dilley
Dublin
Duncanville
Eastland
Edgecliff Village
Edna
Euless
Everman
Falfurrias
Flower Mound
Forest Hill
Fort Stockton
Frisco
Fulton
Gainesville
George West
Godley
Grand Prairie
Grapevine
Haltom
Hamilton
Harker Heights
Harlingen
Harlingen HA
Henrietta
Highland Park
Howe
Hurst
Ingleside
Ingleside on the Bay
Johnson County SUD
Kaufman
Kennedale
Kingsville
La Feria
La Marque
Laguna Vista
Lake Jackson
Lancaster
Lewisville
Lorena
Los Fresnos
Lovelady
Lyford
Mansfield
McAllen
McAllen HA
Mercedes
Merkel
Midlothian
Mission
Mission HA
Missouri City
Murphy
Nacogdoches
North Richland Hills
Oak Point
Odem
Odessa
Orange Grove
Palestine
Pantego
Paris
Pearland
Plano
Pleasanton
Point Comfort
Port Aransas
Port Lavaca
Portland
Premont
Prosper
Red Oak
Refugio
Richland Hills
Rio Grande City
Robinson
Rockport
Rockwall
Rotan
Rowlett
Sachse
Saginaw
San Angelo
San Juan
Seadrfit
Sherman
Sinton
Snyder
South Padre Island
South Texas WA
Spring Valley
Springtown
Sugar Land
Sunnyvale
Sweetwater
Taft
Terrell
Texas City
The Colony
Trophy Club
University Park
Upper Leon River MWD
Vernon
Victoria
Watauga
Webster
West Central Texas MWD
White Settlement
Whitney
Wichita Falls
Woodsboro
Woodway
Wylie

EXECUTIVE SUMMARY

The Electric Reliability Council of Texas, or ERCOT, is the term used to describe the quasi-governmental organization that manages the state's power grid. There are few institutions in Texas that are more important. If Texas suddenly lost the grid, homes and factories would go dark. Even the briefest of outages can put public safety at risk. But "ERCOT" also has a second very important meaning. As a term of art, it can describe the geographical footprint of electric deregulation in Texas. Efficiency in this market is absolutely vital for the state economy.

This report, provided as a guide by the Texas Coalition for Affordable Power and the Steering Committee of Cities Served by Oncor, examines governance issues related to ERCOT as an organization as well as deregulation issues related to ERCOT as a region. No serious examination of electric policy in Texas would be complete without both.

KEY FINDINGS INCLUDE:

- *The ERCOT organization has a history of mismanaging major projects. A management scandal in 2004 led to several convictions.*
- *Some wholesale generators operating within the ERCOT region can engage in activities that likely would be considered anti-competitive in other markets. Where anti-competi tive behavior has been alleged, minimal penalties have been assessed with no restitution to harmed parties.*
- *Consistently high electricity prices in Texas under deregulation have led to a massive drain to the consumer economy.*

KEY QUESTIONS RAISED IN THE STORY OF ERCOT INCLUDE:

- *Should ERCOT, as an organization, overhaul its management practices?*
- *Should there be adjustments to the makeup of the organization's board?*
- *Is the deregulated market in the ERCOT region sufficiently competitive?*
- *What steps can be taken to enhance competition, reliability and oversight?*
- *Is Texas justified in maintaining an island relationship to the rest of the United States transmission grid?*

The Story of ERCOT includes a short description of the grid's early history, sections that describe ERCOT-related developments from 1995 to the present, and an appendix that lists important milestones. There are sections that explain key concepts, such as nodal pricing and congestion management, and sections that raise questions about electricity prices and market efficiency under deregulation.

MAJOR FINDINGS

THE ERCOT ORGANIZATION

ERCOT has a history of mismanagement.

» *From the deregulation pilot project to the nodal market overhaul, major projects overseen by ERCOT have consistently run over-budget and behind schedule. A management scandal in 2004 led to several convictions.*

ERCOT has increased borrowing and spending to alarming levels.

» *ERCOT's spending and use of debt have increased substantially over the last decade. Much of the new spending and borrowing have been driven in recent years by cost-overruns in the nodal project.*

The ERCOT board does not sufficiently represent consumers.

» *Utility industry representatives dominate the ERCOT board and committees. Although consumers directly or indirectly finance all ERCOT operations and residential consumers account for most energy consumption in Texas, consumer representatives remain a minority on the board. Utility industry representatives on the ERCOT board have an incentive to craft market rules and policies that favor their economic interests.*

ERCOT has become more open in recent years, but problems remain.

» *In previous years ERCOT refused to disclose details about its annual budget and did not open its meetings to the public. New rules from the PUC and the Texas Legislature have changed that. However, ERCOT still remains exempt from the Texas Public Information Act, and the organization's current disclosure policies provide less transparency than that which is required of state agencies.*

THE ERCOT MARKET

A legal loophole allows some companies in the ERCOT market to engage in anti-competitive activities without fear of reprisal.

» *Although they possess the ability to impact the overall ERCOT market, relatively small generators under current rules cannot be pursued by the Public Utility Commission for activity that would otherwise be considered market power abuse.*

No requirement exists requiring restitution from companies found to have damaged the ERCOT market through anti-competitive activities.

» *One of the state's largest electric companies paid only $15 million in penalties for a violation said to have caused $57 million in damages to the ERCOT market. The alleged market abuser did not have to repay those who lost tens of millions of dollars because of the anti-competitive activity.*

Flaws and potential abuse in the ERCOT-managed energy market can drive up costs to consumers.

» *Generators in Texas have sold their power into the wholesale spot market at levels well above their marginal cost, a sign that the Texas market is insufficiently competitive.*[1] *Several parties have alleged anti-competitive behavior by market participants in lawsuits filed in federal courts.*[2]

Policymakers have retreated from initiatives that could protect the market from anti-competitive practices.

» *Regulators have rejected rules that would limit excessive bids in the state's spot market for wholesale electricity.*[3]

ELECTRICITY PRICES IN THE ERCOT REGION

Increases in the residential price of electricity in Texas have exceeded increases in most other states, including most deregulated states.

» *Between 1999 and the middle of 2010, only eight states registered larger residential price increases.*

Electricity prices above the national average have resulted in a massive drain to the consumer economy.

» *Prices above the national average in Texas have cost residential consumers an extra $11.5 billion since the beginning of deregulation. The added cost to all classes of consumers — residential, commercial and industrial — is even greater.*

Prices below the national average were the norm prior to the adoption of the retail deregulation law. That trend has largely continued in Texas – but only in areas of the state outside deregulation.

» *The average residential price of electricity in deregulated areas of the ERCOT region have been as much as 42 percent above the national average.*

Deregulated electric providers within the ERCOT region typically charge more for electricity than providers exempted from deregulation.

» *The price differential appears during every year for which there exists federal data to make the comparison.*

A decline in the cost of natural gas explains recent price drops in the ERCOT region, but prices still do not reflect healthy competition.

» *Residential prices in Texas have remained consistently higher than prices in adjoining states with a similar reliance on natural gas.*

RECOMMENDATIONS

THE ERCOT ORGANIZATION

Improve consumer representation at ERCOT.

- *The ERCOT board should be made up of members that are independent of the electric industry.*
- *Electric consumers should have at least six representatives on the ERCOT board.*
- *Increase oversight of ERCOT spending.*
- *ERCOT should obtain PUC approval for its annual budget.*
- *ERCOT should obtain PUC approval for all uses of debt financing.*
- *ERCOT should be subject to review by the legislative Sunset Advisory Commission, concurrent with the Commission's review of the PUC.*

THE ERCOT MARKET

Protect competition in the ERCOT market.

- *Market rules should be changed such that all generators are barred from engaging in anti-competitive activity.*
- *So-called "hockey stick" bidding (which contributed to the market meltdown in California) and any activity defined as anti-competitive by the Federal Energy Regulatory Commission should be expressly prohibited in Texas.*
- *The PUC should be granted new authority to order restitution for parties harmed by anti-competitive behavior.*
- *Regulatory caps that require prompt public disclosure of information regarding companies selling spot market power at elevated prices should be reinstated.*

WHAT IS ERCOT?

The ERCOT organization, technically a non-profit corporation, was created in 1970. It is responsible for the flow of power across 40,000 miles of transmission lines to more than 22 million Texans in a region covering about 75 percent of the state. It facilitates operations of the wholesale electricity market, supervises transmission planning, ensures a sufficient supply of power on the grid, and manages congestion on transmission lines.

ERCOT operates on $191.1 million in annual revenues,[4] which is provided in part through a 41.71 cents per megawatt/hour System Administration Fee assessed on wholesale power. That amounts to about 54 cents per month for a typical home consumer.[5] ERCOT also assesses a separate fee on generators to pay for an overhaul of its market management system. This so-called "nodal implementation surcharge" would amount to about 48.8 cents per month for the average household if assessed directly.[6] (For more about nodal, see the report on page 61.) Stakeholders — that is, representatives of electric generators, transmission companies, consumers and other interested market participants — set ERCOT policy and determine the rules by which the wholesale market operates.

WHAT ARE ERCOT'S RESPONSIBILITIES?

The ERCOT organization functions both as a technical operator for the transmission grid and a decision-making organization that creates rules for the wholesale electricity market.

As an independent system operator, ERCOT employs technicians and engineers at two control centers in the Austin area. Using complex computer systems, these technicians manage the flow of electricity by continually ordering generators to increase or decrease the production of electricity, scheduling transmission outages, and operating markets for certain kinds of standby capacity. Due to the physics of electricity, if demand for electricity cannot be balanced with generation supply, blackouts can result.

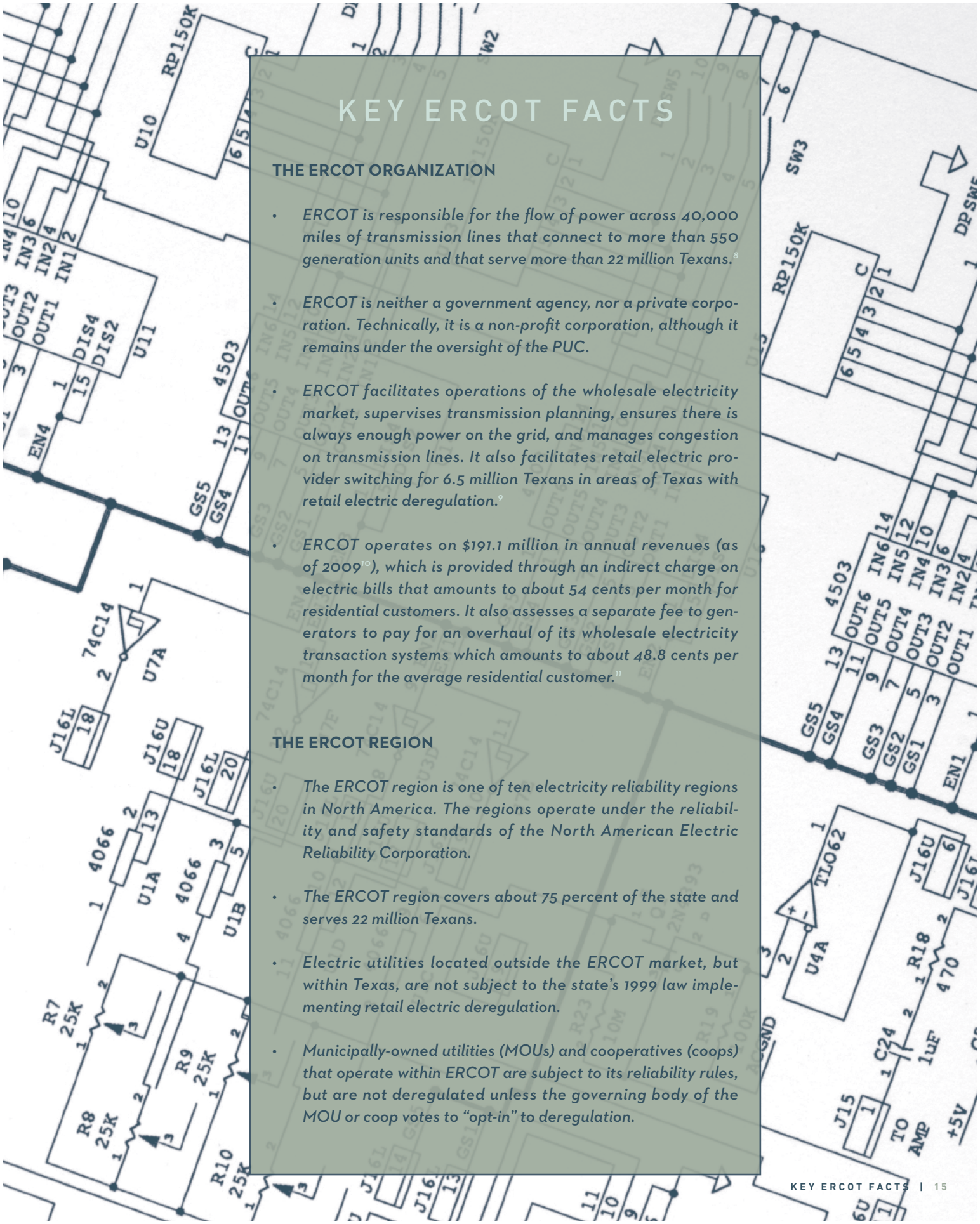
ERCOT technicians must also manage congestion on transmission lines by limiting, increasing or redirecting power flows. During a crisis, ERCOT can cut electricity to large commercial customers that have previously agreed to interruptible service. It also can order rolling blackouts to avoid a complete shutdown of the grid.

As a decision-making forum, ERCOT depends upon interested market participants to study, debate and ultimately recommend or reject complicated wholesale market rules. These stakeholders — men and women representing power generators, retail electric providers, transmission and distribution companies and customers — make recommendations to the full ERCOT board, which in turn makes binding decisions for the market. However, ERCOT board decisions can be overruled by the PUC.

THE ERCOT BOARD

The most important decisions made by ERCOT stakeholders relate to the complicated rules governing the wholesale electricity market. These rules are known as "protocols." Attempts to change ERCOT protocols typically begin with a work group or task force, which is comprised of interested stakeholders who make decisions by votes or consensus. From there, suggested protocol changes go to the "Protocol Revision Subcommittee," then to the "Technical Advisory Committee," and finally to the full Board, which usually has the last word. However, as noted above, the PUC can overrule the Board.

The ERCOT Board is made up of 16 men and women, most of whom represent various segments of the market, including retail electric providers, generators and consumers. There are also independent members.[7] ERCOT stakeholders from each of the market segments elect their own Board representatives. Non-voting Board seats are reserved for the chief executive officer of ERCOT and the chairperson of the PUC.



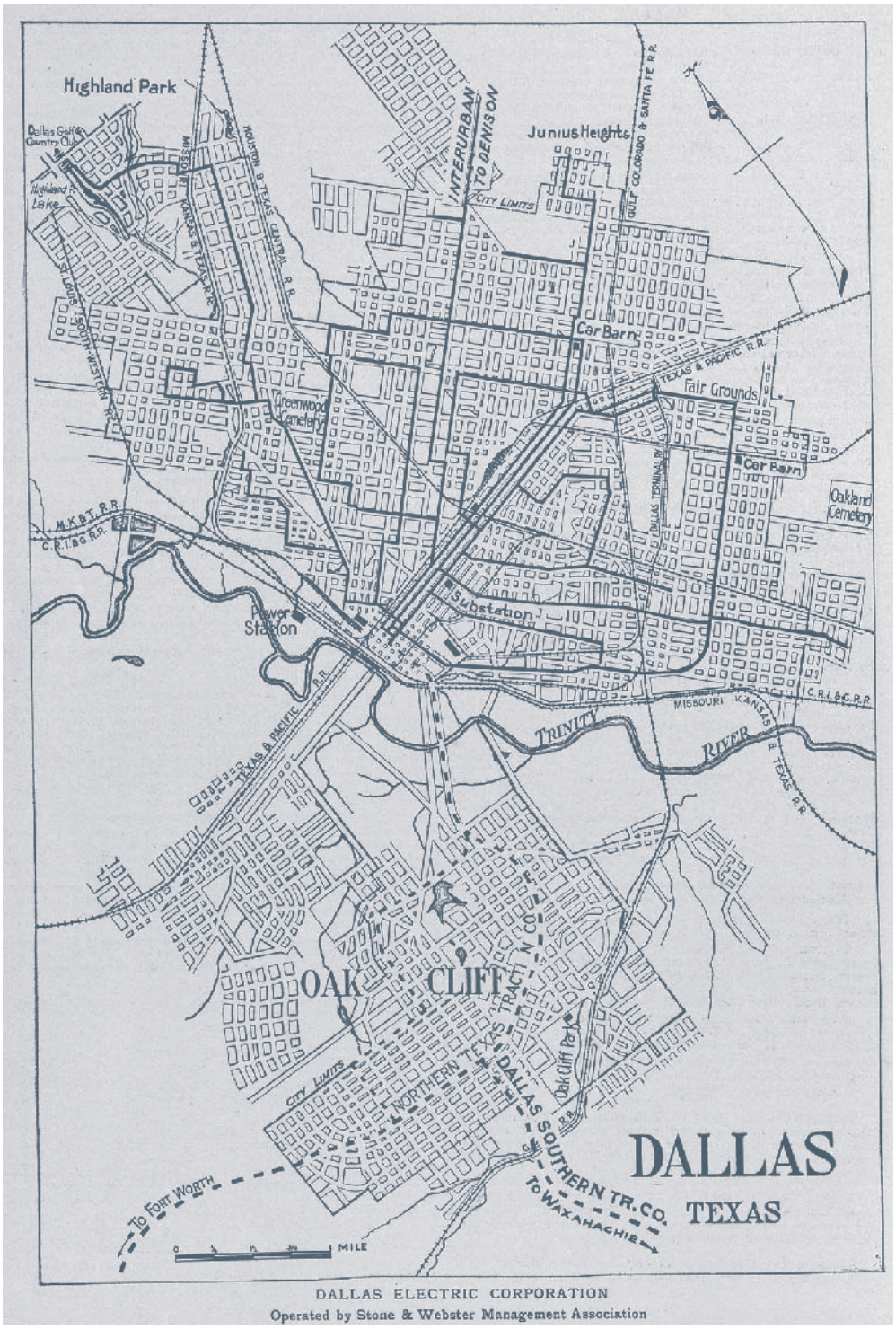
KEY ERCOT FACTS

THE ERCOT ORGANIZATION

- *ERCOT is responsible for the flow of power across 40,000 miles of transmission lines that connect to more than 550 generation units and that serve more than 22 million Texans.*[8]
- *ERCOT is neither a government agency, nor a private corporation. Technically, it is a non-profit corporation, although it remains under the oversight of the PUC.*
- *ERCOT facilitates operations of the wholesale electricity market, supervises transmission planning, ensures there is always enough power on the grid, and manages congestion on transmission lines. It also facilitates retail electric provider switching for 6.5 million Texans in areas of Texas with retail electric deregulation.*[9]
- *ERCOT operates on $191.1 million in annual revenues (as of 2009*[10]*), which is provided through an indirect charge on electric bills that amounts to about 54 cents per month for residential customers. It also assesses a separate fee to generators to pay for an overhaul of its wholesale electricity transaction systems which amounts to about 48.8 cents per month for the average residential customer.*[11]

THE ERCOT REGION

- *The ERCOT region is one of ten electricity reliability regions in North America. The regions operate under the reliability and safety standards of the North American Electric Reliability Corporation.*
- *The ERCOT region covers about 75 percent of the state and serves 22 million Texans.*
- *Electric utilities located outside the ERCOT market, but within Texas, are not subject to the state's 1999 law implementing retail electric deregulation.*
- *Municipally-owned utilities (MOUs) and cooperatives (coops) that operate within ERCOT are subject to its reliability rules, but are not deregulated unless the governing body of the MOU or coop votes to "opt-in" to deregulation.*



DALLAS ELECTRIC CORPORATION
Operated by Stone & Webster Management Association

THE EARLY YEARS:
FROM ELECTRIC TROLLEYS TO ELECTRIC RELIABILITY

Electric utilities have existed in Texas since the late 1800s. Each utility served individual cities with their own generation plants and power lines, operating independently, with little or no oversight by either state or city governments. Needless to say, early service was unreliable.

As a former PUC staffer, Harold L. Hughes, noted in his brief history of the electric industry, "The electric utilities in Texas could best be described as plants set up in towns intended to serve only the immediate community."[12] Hughes wrote that these early systems were typically created to power electric trolley systems and public lighting. "There were few interconnections with other communities or systems. Most systems had a single distribution circuit, and, if trouble occurred, the entire town would be without power until repairs were made," Hughes explained.

It was not reliability, but rather the public's demand for an electric trolley system that led Texas utilities in 1913 to take their first tentative steps toward an interconnected grid. It was in that year that a 60,000-volt line was created for the purpose of providing power for the new Dallas-Waco Interurban Electric Trolley Car System. The line connected Texas Power & Light's plant in Waco with the Fort Worth Power & Light plant and ran through Cleburne and Hillsboro.

The grid took another step forward in 1923 with the development of new transmission poles by Texas Power & Light. Stronger and more economical, these new creosote pine poles allowed for the construction of the first 132 kilovolt transmission line in Texas. They also allowed utilities to increase their interconnections, while at the same time extending service to more communities. Transmission lines during this period typically served only urban areas, where Texans had begun using small electrical devices such as vacuum cleaners and refrigerators. Rural customers in the 1920s remained largely outside the nascent interconnected system.[13]

In 1935 President Roosevelt signed Executive Order 7037 establishing the Rural Electrification Act ("REA"). Electric companies had largely ignored the state's farming communities prior to Order 7037 because there was no economic incentive to serve sparsely populated areas. The REA led to the creation of numerous rural cooperatives, including the Bartlett Community Light and Power Company (now the Bartlett Electric Cooperative), which, on March 9, 1936, began operating the first energized electric cooperative transmission lines in the nation.[14]

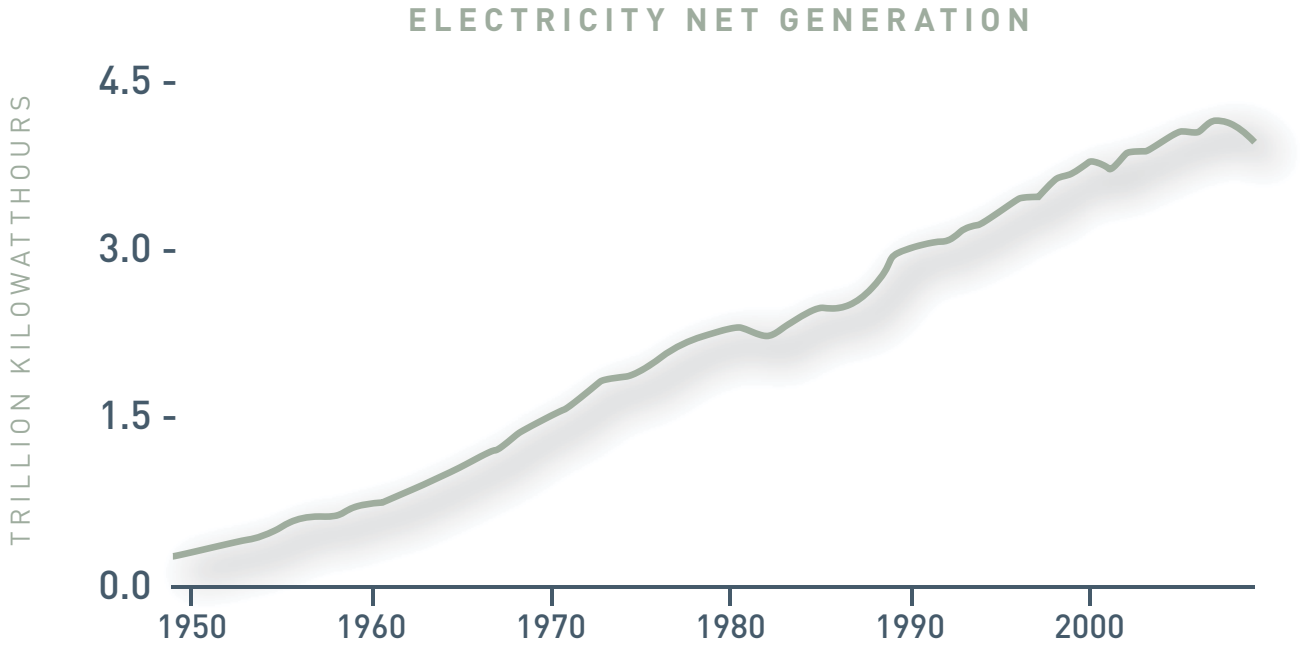
Also during this period, the Public Utility Holding Company Act became law.[15] A principal goal of the Act was to restructure the public utility holding companies into manageable and regulated entities.[16] This act marked the first important move by the federal government to regulate private utilities.[17] Congress likewise expanded the Federal Power Act (previously the Federal Water Power Act) to allow for the "regulation of electric utility companies engaged in interstate commerce." Seeking to avoid such federal oversight, the state's largest utilities in 1935 cut their power line connec-

"This new, independent, not-for-profit corporation was staffed by two retired utility employees. It was not considered to be a government entity that exercised state power, but rather a 'voluntary membership organization.' It's formation predated the creation of the PUC in 1975, which meant that ERCOT — as well as the Texas electricity market in general — then operated without comprehensive state government oversight."

tions to other states.[18]

Shortly thereafter came the creation of the Texas Interconnected System ("TIS"), the first real precursor of ERCOT. As part of the war effort in 1941, a number of Texas utilities joined together to create the TIS in order to pool energy and share transmission lines. Through the TIS, the utilities directed their excess power to heavy Gulf Coast industries engaged in the energy intensive process of aluminum smelting. Texas utilities maintained the TIS after World War II and eventually the organization established two monitoring centers, both located within the control centers of utilities in north and south Texas.[19]

The construction of both generation plants and transmission lines expanded significantly during the post-war years.[20] New suburban homes during the 1950s were typically powered completely by electricity and included electric ranges and water heaters. Electricity consumption in residential households in the United States more than doubled during the decade, from about 72 billion kilowatt/hours in 1950 to 201 billion kilowatt/hours in 1960.[21] During the later part of the decade nuclear fuel began to be used to generate electricity in some areas of the country.[22]



Total electricity net generation nationwide grew from 0.3 trillion kilowatthours in 1949 to 4.1 trillion kilowatthours in 2009, failing to increase in only 4 years (1982, 2001, 2008, and 2009) over the entire span.[23]

THE MIDNIGHT CONNECTION

Prior to the creation of the PUC during the 1970s, state and federal regulation of the state's utilities was almost non-existent. The transmission grid that would be overseen by ERCOT was designed to serve specific communities, with limited interconnections for reliability purposes. The state's major utility monopolies vigorously protected their own territories and resisted federal oversight. Consider, for example, the famous story of the "Midnight Connection" in which an unnamed technician from the Central and Southwest Corp. secretly opened a substation connection between Vernon, Texas and Altus, Oklahoma. Through this unprecedented action, CSW sought to preserve its status as an interstate electric power holding company, which would allow it to come under integration provisions of the Public Utilities Holding Company Act that were legally advantageous to the company.[30]

However, the "Midnight Connection presumably placed the entire state of Texas and all its utilities under federal jurisdiction," wrote U.S. 7th Circuit Appeals Court Judge Richard Cudahy in a colorful academic journal article about the May 4, 1976 event.[31] *"While such a clandestine surge of power may seem insignificant, under the controlling Supreme Court cases the simple transmission of power over interstate lines establishes federal jurisdiction. These utilities had arguably suffered the irrevocable taint of interstate power."*[32]

Cudahy, who at the time was providing legal representation for CSW, said the utility apprised "Texas utilities of the breach in their battlements" shortly after it established its connection to Oklahoma. The "drastic, totally unprecedented" response from two of the state's largest utilities was to cut their connections from other major utilities, he said. This had the effect of delinking the utilities from the Oklahoma grid — but also potentially putting the entire ERCOT system at risk.[33] *The Midnight Connection led to years of legal wrangling and, by an indirect route, to the important 1980 agreement establishing direct-current interconnections between the Texas grid and Oklahoma.*[34] *Because the power flowing across these DC ties can be controlled, ERCOT has been permitted to maintain its limited connections to areas outside the state while at the same time steering clear of the federal jurisdiction that typically accompanies interstate commerce. For more about Direct Current, see the box at lower left.*[35]

ALTERNATING CURRENT vs. DIRECT CURRENT

The transmission of electricity in the United States is accomplished largely through the use of alternating current (AC), which is characterized by an alternating reversal in the flow direction of electrical current. By contrast, under direct current (DC) the flow of electricity continues in the same direction at all times. Direct-Current interconnections provide bridges between otherwise separate AC power grids by converting alternating current to direct current, and then back to alternating current. Alternating Current became the grid standard in the United States early in the 20th century, while Direct Current is the European standard.[36]

On November 9, 1965, nearly 30 million people in the northeastern United States and southeastern Ontario, Canada were suddenly plunged into darkness. It was the largest blackout in U.S. history. Some customers were without power for 13 hours.[24] Utilities responded with the creation of the National Electric Reliability Council, a voluntary membership organization devoted to the creation of standards, guidelines and criteria to ensure grid security. NERC later changed its name to the North American Electric Reliability Council and eventually to the North American Electric Reliability Corporation — although the acronym remained NERC.[25]

In 1970, as a consequence of new NERC guidelines, TIS created the Electric Reliability Council of Texas, ERCOT. This new, independent, not-for-profit corporation was staffed by two retired utility employees.[26] It was not considered to be a government entity that exercised state power, but rather a "voluntary membership organization."[27] It's formation predated the creation of the PUC in 1975, which meant that ERCOT — as well as the Texas electricity market in general — then operated without comprehensive state government oversight.

In 1978, Congress adopted the Public Utility Regulatory Policy Act, which represented the first meaningful change to the Depression-era Public Utility Holding Company Act of 1935.[28] To a limited degree, this new legislation allowed for competition in the generation of electric power. This was in line with the general trend toward deregulation, including the deregulation that same year of the airline industry, and the eventual deregulation of the telecommunications industry.[29]

In 1981, members of the TIS transferred all operating functions to ERCOT, making the organization the central operating coordinator for the state's transmission grid. ERCOT opened its first office in 1986 and hired four full-time employees.[37]

In 1992, the federal government adopted the Energy Policy Act, which was intended to provide open access to the transmission grid for all generating companies.[38] But non-utility generators reported that traditional utilities continued to hamper free access. In response, federal regulators issued a set of policies that acknowledged that the transmission of electricity remained a natural monopoly (and should be treated as such), but that also created more openings for deregulation of the generation sector.[39]

Eventually ERCOT came to be comprised of ten control areas, including those of investor-owned utilities, city-owned utilities, cooperatives, a municipal power pool and the Lower Colorado River Authority (LCRA).[40] This was in line with a transmission system in Texas designed to serve specific regional utilities, with interconnections limited for the most part to support reliability. ERCOT's membership was restricted at this time to approximately 80 investor-owned, municipal and cooperative utilities that together controlled about 85 percent of the electric generation in Texas.[41]

YEARS 1995 - 1999

THE TRANSITION TO DEREGULATION

FERC and NERC

The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates interstate transmission of natural gas, oil, and electricity. Its purpose is to protect the public and energy customers, and to ensure that regulated energy companies act within the law. As such, FERC monitors energy markets and sometimes conducts market abuse investigations. FERC is composed of up to five commissioners who are appointed by the President of the United States. The agency possesses limited jurisdiction over the ERCOT market because the market remains geographically confined within the borders of Texas.[47]

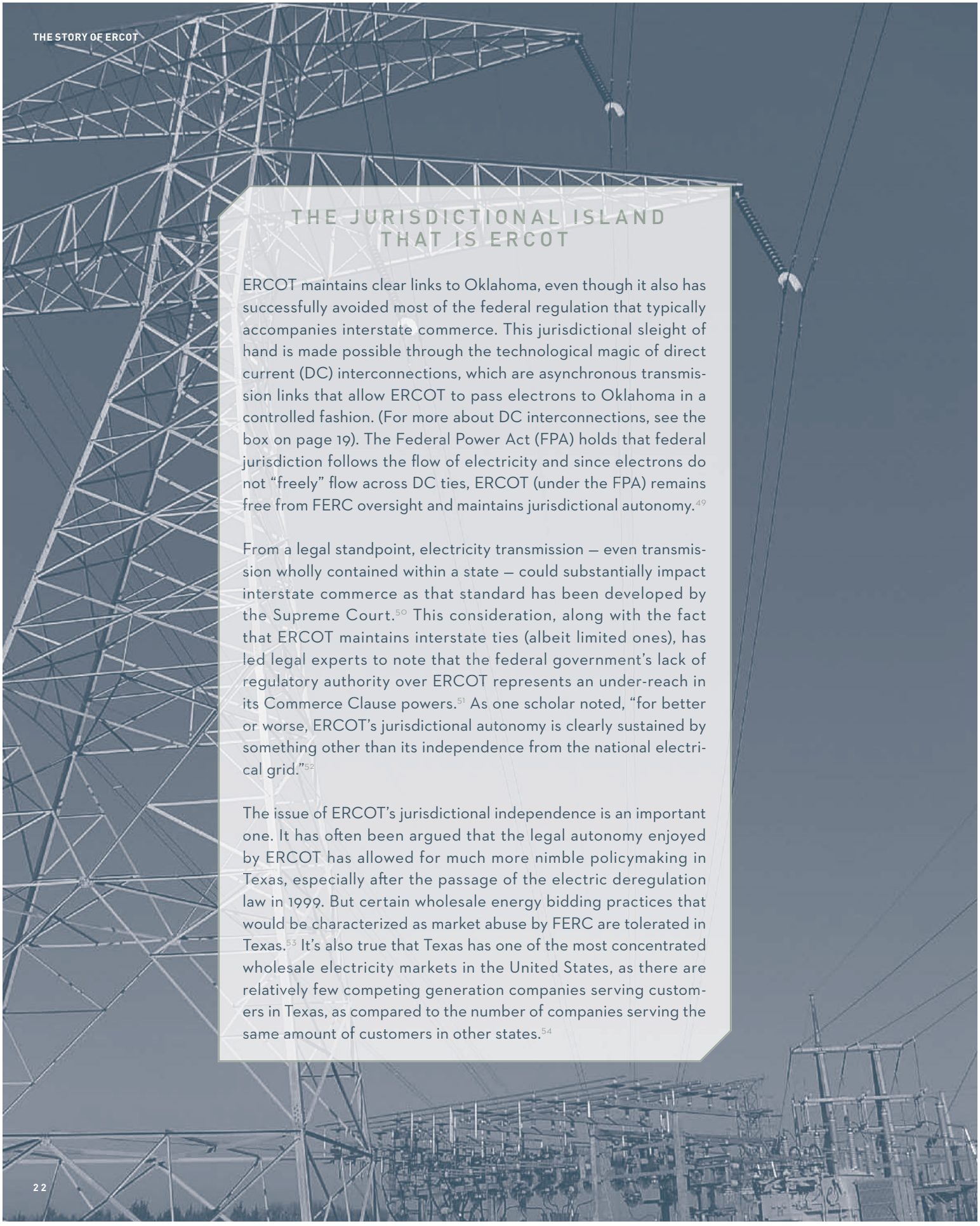
The North American Electric Reliability Corporation (NERC), formerly known as the North American Electric Reliability Council, draws its membership from the electric industry. Market segments represented within NERC include investor-owned utilities, rural electric cooperatives, municipal utilities, independent power producers, power marketers and end-use customers. NERC sets standards for the reliable operation and planning of electric systems and enforces compliance with those standards.[48]

In 1995, state lawmakers adopted Senate Bill 373, which called for the deregulation of the wholesale power market in Texas. Signed by then-Governor Bush on June 16th, SB 373 allowed independent wholesale generators, power marketers and utility affiliates to compete to supply wholesale power. It also stipulated that utilities must provide would-be competitors with rates and terms for transmission service no different from the rates and terms of service for the utilities' own use of their own systems.

As a consequence of Senate Bill 373, the PUC adopted a policy of "postage stamp pricing" for transmission services. Under this system, ERCOT would enforce uniform pricing for transmission services (like a postage stamp) whereby any company putting power on the grid would pay a set megawatt/hour price for transmission — regardless of whether that power was needed across town or across the state. Enron, which had become very involved in the early planning for deregulation, led a group of energy marketers pushing for new ERCOT rules to ensure them easy access to the grid.[42]

On August 21, 1996, the PUC took another big step by agreeing to transform ERCOT into an Independent System Operator (ISO), an impartial, third-party organization to oversee non-discriminatory access to transmission networks. The PUC decision became official the next month, on September 11, when the ERCOT board voted to reorganize itself as the first utility industry ISO in the United States.[43]

That Texas managed to create its own ISO in such a short period is the result of the state's unique geography. Because ERCOT is located completely within the confines of a single state, there was no need for Texas policymakers to seek approval for the ISO from the Federal Energy Regulatory Commission, which is the government agency charged with overseeing the nation's interconnected electricity markets.[44] In April 1996, FERC issued Order 888, which called for open access to transmission lines and contemplated the creation of ISOs as one means for U.S. power regions to ensure transmission access.[45] But those other regional power pools under FERC jurisdiction (such as the Pennsylvania-New Jersey-Maryland Interconnection) had to wait years to obtain FERC approval, while in Texas, the approval process took about nine weeks.[46]



THE JURISDICTIONAL ISLAND THAT IS ERCOT

ERCOT maintains clear links to Oklahoma, even though it also has successfully avoided most of the federal regulation that typically accompanies interstate commerce. This jurisdictional sleight of hand is made possible through the technological magic of direct current (DC) interconnections, which are asynchronous transmission links that allow ERCOT to pass electrons to Oklahoma in a controlled fashion. (For more about DC interconnections, see the box on page 19). The Federal Power Act (FPA) holds that federal jurisdiction follows the flow of electricity and since electrons do not "freely" flow across DC ties, ERCOT (under the FPA) remains free from FERC oversight and maintains jurisdictional autonomy.[49]

From a legal standpoint, electricity transmission — even transmission wholly contained within a state — could substantially impact interstate commerce as that standard has been developed by the Supreme Court.[50] This consideration, along with the fact that ERCOT maintains interstate ties (albeit limited ones), has led legal experts to note that the federal government's lack of regulatory authority over ERCOT represents an under-reach in its Commerce Clause powers.[51] As one scholar noted, "for better or worse, ERCOT's jurisdictional autonomy is clearly sustained by something other than its independence from the national electrical grid."[52]

The issue of ERCOT's jurisdictional independence is an important one. It has often been argued that the legal autonomy enjoyed by ERCOT has allowed for much more nimble policymaking in Texas, especially after the passage of the electric deregulation law in 1999. But certain wholesale energy bidding practices that would be characterized as market abuse by FERC are tolerated in Texas.[53] It's also true that Texas has one of the most concentrated wholesale electricity markets in the United States, as there are relatively few competing generation companies serving customers in Texas, as compared to the number of companies serving the same amount of customers in other states.[54]

LEGISLATURE ADOPTS ELECTRIC DEREGULATION LAW

"'If all consumers don't benefit from this, we will have wasted our time and failed our constituency,' said state Senator David Sibley, a key author of the bill."

Adopted on May 21, 1999, Senate Bill 7 (SB 7) is perhaps the single most important piece of electricity-related legislation ever created in Texas. Its purpose was to lower electric prices and provide consumer choices by allowing electric retailers to compete for business. "If all consumers don't benefit from this, we will have wasted our time and failed our constituency," said state Senator David Sibley, a key author of the bill.[55] SB 7 included a number of important deadlines, including a limited deregulation pilot project to be overseen by ERCOT in 2001 and then the opening of full-scale deregulation on January 1, 2002. Senate Bill 7 also thrust dramatic new responsibilities onto ERCOT. No longer an obscure organization with an even more obscure mission, ERCOT would now play a key role in both the transition to deregulation and deregulation itself. Among other things, ERCOT was now tasked with getting the deregulation pilot project running, with switching customers between new competitors on a timely basis, and with overseeing transactions in the wholesale spot market for energy.

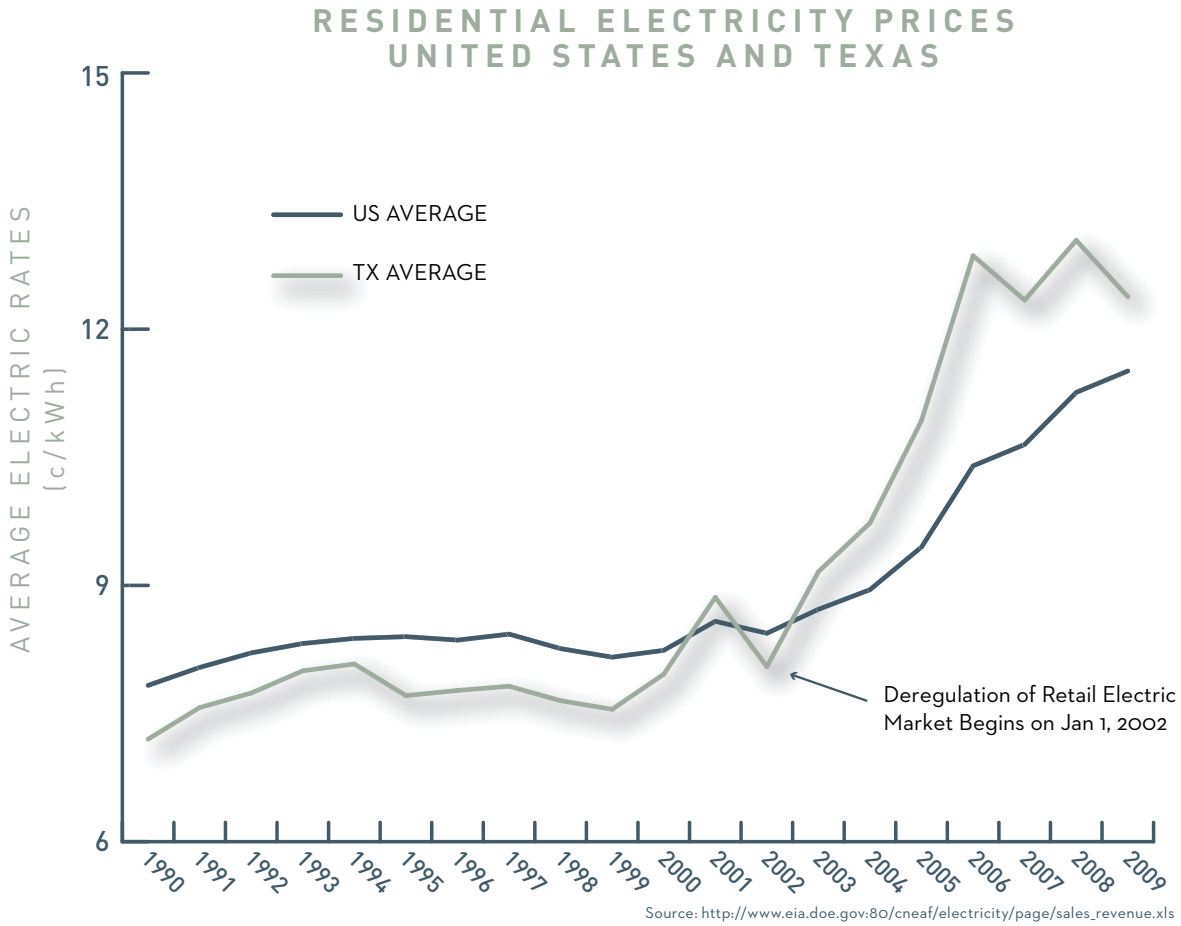
THE STAKEHOLDERS

It was also through SB 7, and the transition to deregulation, that ERCOT's stakeholder process was born. Through this process, an interested group of market participants — that is, the "stakeholders" — would hash out new rules for how the grid operator would handle the scheduling and dispatch of energy, the management of line congestion, the coordination of planned power outages and other tasks. Because ERCOT is not technically a state agency, but rather a group of cooperating electric operators, these stakeholders have great significance. With public governance relatively limited at ERCOT, it has been the stakeholders who largely set the organization's direction.

The main tools of governance for stakeholders are the ERCOT protocols — that is, the organization's rules. The stakeholders met for thousands of hours between 1999 and 2000 to develop the initial protocols for the new market, which were approved both by the ERCOT Board and the PUC. These complicated rules now fill around 800 pages and have been amended hundreds of times. It is unlikely that anyone — not even ERCOT insiders — can claim complete familiarity with the details of all the protocols. They're often extremely complex, and touch on virtually every aspect of the state's utility system.

"It is unlikely that anyone – not even ERCOT insiders – can claim complete familiarity with the details of all the protocols. They're often extremely complex, and touch on virtually every aspect of the state's utility system."

On July 31, 2001, ERCOT consolidated its existing ten control areas into a single control area. Wholesale power sales between electric utilities began to operate under new guidelines, including those calling for the centralization of power scheduling and the procurement of ancillary services. (Ancillary services are generation services for backup energy that ERCOT often needs to ensure grid reliability.) Commercial functions, including the acquisition of meter data and the profiling of electrical consumption, were centralized at the single control area and there was statewide registration of retail premises to facilitate the switching of customers between competitive electricity providers.



Source: http://www.eia.doe.gov:80/cneaf/electricity/page/sales_revenue.xls

For years, Texans enjoyed electricity prices well below the national average. But after the state deregulated its retail electricity markets, residential prices shot up above the national average. Note the spike in rates in 2001, just prior to the beginning of retail electric competition. This spike reflects, in part, regulatory decisions that allowed utilities in Texas to collect revenues in excess of those levels typically allowed for monopoly providers. Utilities were also permitted then to collect fuel surcharges in excess of the actual price of fuel. Regulators made these decisions in anticipation of the state's move to deregulation. Rates dropped once the market opened, reflecting the expiration of the high fuel surcharges and a rate cut mandated by Senate Bill 7, the deregulation law. Between 2003 and 2009 average residential rates in Texas remained above the national average. In 2010, as natural gas prices began to decline, the Texas and national average prices began to converge. Average prices for 2010 are not shown here because of the lack of complete annual data at the time of publication.

YEAR: 2000

NEW ERCOT CEO: "THE CLOCK IS TICKING."

The deregulation transition was in full swing by the year 2000, with stakeholders meeting on a daily basis to discuss everything from outage coordination to ancillary services. There were debates about energy scheduling and dispatch, congestion management, load profiling, and alternative dispute resolution. There were also debates about market information systems, renewable energy credit trading, market data collection, billing and how financial debits for retailers purchasing wholesale power would be matched with credits for the generators selling that power. In the years leading up to deregulation, stakeholders met literally for thousands of hours.[56] The new system would require a bewildering array of new rules that needed to be in place by day one. The work before ERCOT was daunting.

Unfortunately, this already complicated transition was further complicated by one other factor: the stakeholder process itself. The behind-the-scene decision makers represented different interests — generators, retailers, consumers — and to a large extent each of these groups pursued their own agenda. Generators might want to avoid paying certain costs, for instance, or might oppose bidding rules that could open them up to penalties. Electric retailers needed to make sure there was a seamless process with which to switch customers between companies. Industrial consumers might want to push certain system-wide costs onto residential or small commercial customer groups.

Residential consumers were woefully outgunned. The then 21-member board included only four consumer representatives, including those advocating for residential, commercial and industrial users.[57] They were outnumbered by representatives of utilities and prospective competitors who intended to profit under the market rules they were drafting.

On May 1, Tom Noel joined the organization as its chief executive officer.[58] Noel was a Vietnam War veteran,[59] a graduate of the U.S. Military Academy at West Point, a former Assistant Secretary of the U.S. Department of Energy (appointed by President Ford), and a former director of the nation's Strategic Petroleum Reserve, which he helped create.[60] His loaded resume also included leadership positions at various corporate organizations, including a stint as head of a subsidiary of Amoco. At the same time Sam Jones,

"But like other dealings at ERCOT, the terms of that contract were kept secret. ERCOT acknowledged there would be subcontractors working with Andersen Consulting, but little else. As a private corporation, ERCOT remained beyond the reach of most open-government laws."

a 35-year veteran of the municipally-owned utility in Austin who already had a nearly five-year history with ERCOT, was named the organization's chief operating officer.[61] The PUC expressed early confidence in the leadership team. "We are absolutely confident that ERCOT has the skills and the tools to perform the very important role they're going to perform in the marketplace," said then PUC Commissioner Brett Perlman.[62]

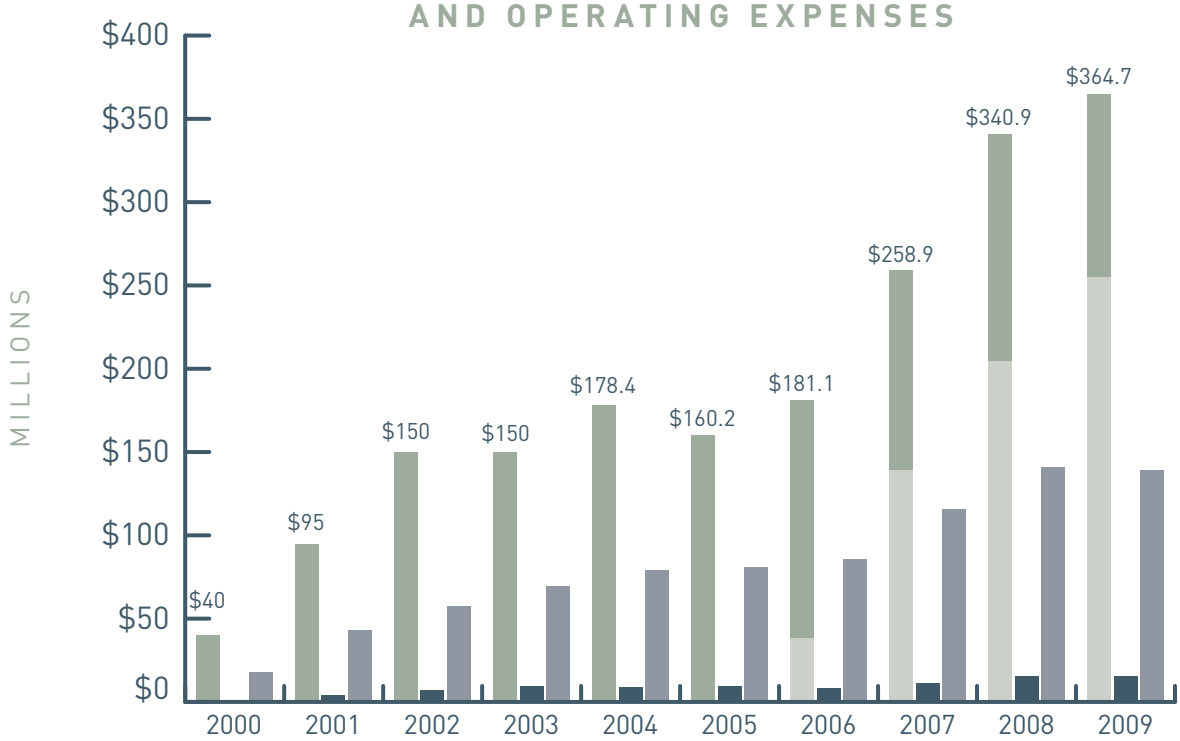
Shortly thereafter, ERCOT retained Andersen Consulting. The consulting firm would create technical systems and procedures that ERCOT could use to control power flows, oversee market operations and track commercial transactions. It would also help create the systems ERCOT would use to archive and retrieve data. Andersen (which would eventually rename itself Accenture after a split from the Arthur Andersen consulting firm) would have a hand in nearly all aspects of the entire transition process. Its contract was then among the largest ever awarded by the organization. But like other dealings at ERCOT, the terms of that contract were kept secret.[63] ERCOT acknowledged there would be subcontractors working with Andersen Consulting, but little else. As a private corporation, ERCOT remained beyond the reach of most open-government laws.[64]

In August, ERCOT announced the construction of two new facilities, including a 45,000-square-foot structure in Austin and an even larger 85,000-square-foot structure in Taylor, about 50 miles to the north.[65] These buildings would form the new operations centers and both would include banks of computers, office space, and diesel generators to provide backup power. "We've got a full plate and the clock is ticking," Noel said in the official ERCOT statement announcing the new construction projects. "We've established priorities and goals and we've got a timeline in place to assure that we'll be ready when we need to be."[66]

The facilities eventually would be staffed 24 hours a day. The Taylor office would serve as the main operations center, while the Austin facility would serve as an executive headquarters and a secondary facility "in the event that either a natural disaster or other debilitating event causes the Taylor ISO to become incapacitated," according to Noel.

ERCOT also announced that it would hire more than 100 additional employees in the aggressive ramp-up for the new market. The employees would include lawyers, engineers, accountants, economists, technicians and clerks.[67] About 35-40 employees would work at the Austin facility, which was scheduled to be ready by March 2001. Another 160-170 employees would take positions at the Taylor facility, which was scheduled to be ready by the early winter of 2002.

GROWTH OF ERCOT DEBT, DEBT SERVICE, AND OPERATING EXPENSES



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Non-Nodal Debt	$40	$95	$150	$150	$178.4	$160.2	$142.5	$123.4	$128.6	$107.3
Nodal Debt	$0	$0	$0	$0	$0	$0	$38.6	$135.5	$212.3	$257.4
Debt Service	$0	$4.47	$7.13	$9.36	$9.3	$9.48	$8.62	$11.15	$15.46	$15.48
Operating Expenses	$18.2	$42.9	$57.7	$69.4	$79.1	$80.8	$85.9	$115.8	$141.1	$139.1

Since 2001, ERCOT's total debt has nearly quadrupled. Much of the new debt is the result of work on the nodal project, which has consistently run over budget. ERCOT's operating expenses have more than tripled.[68]

YEAR: 2001

THE PILOT PROJECT

TRANSMISSION CONSTRAINTS

PUC Chairman Pat Wood III warned in early 2001 that a shortage of transmission lines and power plants in the Dallas-Fort Worth area could complicate the transition to deregulation.[69] Agency officials also warned during a legislative hearing that more wholesale power would end up getting purchased from the volatile spot market because a lack of transmission would create barriers to the free flow of power within the ERCOT region.[70]

Regulated systems place less of a burden on transmissions systems than do deregulated systems. This is because under a regulated system, utilities typically create their own system of wires to serve their own customers in their own service territories. For instance, for many years the Houston utility controlled a network of wires that exclusively served its own local customers and that connected to its own generators. The same was true for the electric utility in the Dallas-Fort Worth area. In neither case were the utilities dependent upon lines constantly wheeling power from one end of Texas to another.

But for electric deregulation to work efficiently, companies needed access to the cheapest power available — no matter where it was generated. That meant that an electric retailer with customers in Dallas might want to enter into a contract for power from a generator in Houston. In order to carry out such contracts, there had to be sufficient transmission lines to carry the power between the two areas. As a consequence, transmission challenges were sure to emerge with the adoption of Senate Bill 7.

Such obstacles would color much of the work ahead for the ERCOT organization, which has as its principal responsibility the management of the interconnected transmission system and the management of the wholesale electricity spot market created for deregulation. ERCOT engineers were aware of the challenges early on. In a report filed in 2001, for instance, the organization identified six areas of the state that would require more transmission construction. It noted that both the Houston and Dallas areas were highly dependent on power wheeled in from surrounding areas. And as demand continued to grow, so would the need for more lines. This report on transmission needs was released just a few months prior to market opening.[71]

ERCOT'S TRANSMISSION SYSTEM AND DEREGULATION

The transmission system in Texas evolved over many decades — and never with deregulation in mind. Instead, regional utilities prior to deregulation would string together their lines only to serve their own home customers. The relatively few lines they used to link to one another only existed for reliability purposes. This lack of interconnectivity hampered the free exchange of electricity under deregulation, and thus hampered competition in general. The dearth of power lines also meant that the existing ones could easily become congested, which put the entire system at risk for blackouts. The cost for ERCOT to relieve congestion was spread to market participants, adding another cost to consumers because of deregulation. Building new lines — lines that might not have been necessary under the old system — also put upward pressure on prices.

But ERCOT's top official also insisted that solutions were in the works. "We're moving ahead on planning and constructing what we need," CEO Tom Noel told the Houston Chronicle, in an article that also cited the development of eight major transmission related projects. "If we do nothing, there will be substantial issues," continued Noel. "This is a dynamic system and it is one that requires continuous improvement to stay current."[72]

Industry officials also cited in 2001 a massive new transmission line to serve the Dallas-Fort Worth area. The new 88-mile line, the largest built in two decades, would double the amount of power that could flow from South Texas to North Texas. It cost $62 million. The line was completed a year early at the urging of ERCOT officials, who wanted to avoid problems similar to those confronting California during its troubled transition to deregulation.[73]

On May 15, NERC, the nonprofit organization that helps coordinate activities on the nation's power grids, warned of possible trouble for ERCOT. It was not the transmission system that attracted NERC's attention, but rather the potential for missteps during the early stages of deregulation as ERCOT switched from ten separate control areas to a single area.[74] In a report issued about the nation's electricity markets, NERC put ERCOT on its watch list.[75]

THE PILOT PROJECT

In April, ERCOT began testing some of the new systems that it would need to administer the state's deregulated electricity market.[76] More testing would also come with the scheduled June kickoff of a deregulation pilot project. SB 7 contemplated this "mock market" as a test run for full-scale deregulation. That is, the pilot project would give ERCOT engineers an opportunity to test their systems — but under real world conditions. The pilot project was set to begin six months before the deregulation launch date and was open to 5 percent of the electric customers living in areas that would eventually come under deregulation.

The plan was this: On February 15th, Texas businesses and residential consumers who chose to participate in the pilot project could begin signing up for new service from a competitive electric provider. Businesses would begin receiving information about the pilot project in their February electric bills. More substantial out-

reach to residential customers would begin in March. Because the number of interested business consumers would almost certainly outstrip available spots, business participants would be selected through a lottery. Electric companies would announce the lottery winners by March 21st. ERCOT expected to switch 21,000 customers daily during the pilot project, which was to begin on June 1st, 2001.[77] The larger market would open to competition on January 1, 2002.

But when it came to the pilot project, very little went according to plan. On May 15th, for instance, ERCOT announced that it was abandoning its original time table. Instead of starting the pilot project on June 1st, the new startup date would be July 16th.[78] ERCOT cited continuing technical problems for the six-week delay. ERCOT also announced that some customers would not receive service under the pilot project until August,[79] and that the first bills could come as late as September.[80]

"Some market participants openly described the transition process as a 'train wreck.' Others – including entities that were not even fully participating in deregulation – said multi-million dollar billing errors, if uncorrected, could drive them to bankruptcy. 'At the time of this filing, Austin Energy has not received a single accurate settlement,' wrote Bob Kahn, then-vice president of Austin Energy."

ERCOT officials began implementing manual "work-arounds" – that is, they used manual processes instead of automated computerized ones to fulfill grid functions. But consumer advocates and business representatives recognized that a strategy of work-arounds would do nothing to ensure ERCOT's computerized system was ready for full-scale deregulation. "You're forcing companies to detour resources to create a short-term fix," said Chris Schein, a spokesman for TXU. He described the use of "virtual" switching by ERCOT, which he said was no different from "trophy" switching – that is, actions that would allow officials to boast that switching was possible, but without usefully addressing the underlying technical challenges.[81]

In 2001 there were about 2,000 large businesses and industrial users in Texas that consumed more than 1 megawatt of power at peak usage. Electric retailers were already fighting hard for those accounts even in those days before the pilot project was underway. But there was less enthusiasm for residential customers:[82] the pilot project was open to 205,025 residential spots, but by mid-May, only 21 percent had been taken. State Senator David Sibley, co-author of the Texas deregulation law, suggested that many residential consumers were reluctant to participate in the pilot project because of the California power meltdown. "The public is

confused by the situation in California, even though we have been trying to get the word out that their deregulation system is much different from the Texas plan," he said.[83]

On June 1st, the same day the pilot project was originally supposed to begin, ERCOT christened its new 45,000-square-foot, $12 million facility in Austin. It did so with much fanfare during a press conference in which CEO Tom Noel and others touted the organization's bright and exciting future. But, behind the scenes, engineers continued to scramble. Noel said "we're making progress every day," yet the system was nowhere close to being able to handle the 21,000 automated customer switches promised earlier by ERCOT planners.[84]

"PUC Commissioner Brett Perlman called for the creation of a special team to get the pilot project back on track. 'There is a risk to the marketplace,' he said. 'This performance is unacceptable.' All along the way, Noel and other ERCOT officials continued making excuses."

On July 2nd, ERCOT postponed the go-live date for the pilot project once again — this time until July 20th. "Their systems need more work," said Terry Hadley, a PUC spokesman. ERCOT officials reported difficulty maintaining proper frequency on the grid and said that customer switching was still a major problem. They also said there were persistent problems with the security system.

On July 17th, three days before the revised go-live date, ERCOT announced another delay: this time until July 31st. An ERCOT spokeswoman reported persistent bugs with the settlement and billing processes and with the communications systems. Some market participants openly described the transition process as a "train wreck."[85] Others — including entities that were not even fully participating in deregulation — said multi-million dollar billing errors, if uncorrected, could drive them to bankruptcy. "At the time of this filing, Austin Energy has not received a single accurate settlement," wrote Bob Kahn, then-vice president of Austin Energy. He said that statements received from ERCOT contained gross errors, including one statement showing Austin Energy owed $90 million when in reality it owed nothing.

PUC Commissioner Brett Perlman called for the creation of a special team to get the pilot project back on track. "There is a risk to the marketplace," he said. "This performance is unacceptable."[86] All along the way, Noel and other ERCOT officials continued making excuses. When newspaper reporters asked about one setback, Noel responded: "There are aspects (of the pilot project)

that will occur later than we thought."[87] When problems with security arose, he denied the system was broken.[88]

After two months of delays, at the stroke of midnight on July 31st, ERCOT finally began its pilot project. The 90,543 residential customers who signed up for service under the project were only about a third of those eligible.[89] Noel said many of the technical problems continued, although he insisted they had been reduced somewhat. Switching continued to be a major headache, in that the system that was supposedly going to automatically handle 21,000 switch requests each day could only manage about 75. This meant that only a limited number of those customers who signed up for service under the pilot project would receive that service during the first few weeks. [90]

But Noel and others nonetheless characterized that first day as a historic first. "Texans can now choose their electric company the same way they choose other goods and services in their everyday lives," said then-PUC Chairman Max Yzaguirre.[91]

PROBLEMS CONTINUE: PRICE SPIKES

Immediately upon go-live, more worrisome problems arose: price spikes. They began on the very first day of the new market when power skyrocketed to $1,000 per megawatt-hour from a more typical price of $10-$45 per megawatt-hour. While that amounts to an increase of 2,000 to 10,000 percent, the spikes likely would have been even greater if not for caps imposed by the PUC to guard against price gouging.[92] Those caps were opposed by ERCOT and generators.[93] Noel blamed an electric company mistake for the error. "The guilty party knows exactly who they are, and I don't think we're going to see it repeated," he said.

A week later, on August 8th, wholesale prices briefly spiked again — this time to $999 per megawatt-hour. During several other instances prices hit the $500 level.[94] In one instance, it spiked all the way to $10,000, but was adjusted downward because of the $1,000-per-megawatt-hour price cap.[95]

On August 9th, a mysterious computer failure shutdown a portion of the market for four hours. "It got some high prices at around 5:30 this morning — and then it just stopped," said Sam Jones,

"In August, ERCOT could manage about 330 switches per day – far short of the 21,000 switches it had predicted – and even then only during those days the system did not shut down altogether because of computer problems."

ERCOT's chief operating officer. He said ERCOT brought the "factory people" in to fix the problem.[96]

Switching problems persisted. By the third week of August only 250-300 customers were receiving power from new competitive providers.[97] "Our backlogs are getting bigger, not smaller – and there are more transactions in the pipeline," said ERCOT officer Bill Bojorquez.[98] During that month, ERCOT could manage about 330 switches per day – far short of the 21,000 switches it had predicted – and even then only during those days the system did not shut down altogether because of computer problems. "We've managed to break some things," said Bojorquez.[99]

ERCOT announced in August that some Texans would not get power under the pilot project until late October and that some bills would not arrive until November – one month before the scheduled conclusion of the deregulation test run. Problems also persisted in the processing of new billing information and the ability of customers to get timely meter data.[100] "We're running out of time," said a clearly exasperated Brett Perlman.

"'The power grid market is severely flawed and in desperate need of repair' said Milton Lee, an official with the San Antonio city owned utility."

Panic also appeared to set in with market participants, with many calling for a delay in competition rather than allowing ERCOT to proceed with the January 1 go-live date.[101] "We're more concerned each day," said Vanus Priestly, the CEO of an electric retailer.[102] "The power grid market is severely flawed and in desperate need of repair" said Milton Lee, an official with the San Antonio city owned utility.[103] "Unexplained delays from ERCOT have placed revenue from our more than 47,000 Texas customers at risk," one company reported in an earnings report.[104]

On October 10, a coalition of consumer groups filed an official pleading with the PUC calling upon the regulatory agency to delay market opening. "It is in the best interest of consumers and the industry to be sure that when the market is open, it is also functional," the coalition declared in its filing. The groups called for ERCOT to meet various benchmarks before pulling the trigger.[105] But the PUC and lawmakers plowed ahead, deciding on December 5 to give the final green light for the deregulation project. The decision came just days after the spectacular collapse of Enron.[106] Yzaguirre, then-chairman of the PUC, was a former Enron executive.[107]

MORE SECRECY AT ERCOT

At this point the existing ten control areas under ERCOT had been merged together and came under the control of a single operating center. The organization that until recently operated with a $5 million budget and fewer than 50 employees, had about 250 employees in 2001[108] and in November approved a new $94 million budget.[109] A fee of about 22 cents on a typical residential bill would support the budget. That represented roughly a 47 percent increase in one year.

But despite the spending hikes — and the promise of more as ERCOT continued to update its computer systems — details of the organization's spending plan remained almost wholly confidential. Other than the disclosure that it planned to spend $52 million for operations and management, $36 million for capital expenditures and $6 million for debt service, its 2002 budget remained a secret.[110]

"But despite the spending hikes — and the promise of more as ERCOT continued to update its computer systems — details of the organization's spending plan remained almost wholly confidential."

In September, ERCOT came under fire for the contract it signed with its chief technical consultant, Accenture. The company had business deals with several energy firms, including TXU Electric and Reliant, and lawmakers during a hearing questioned whether there was a conflict of interest.[111]

ERCOT officials argued that because the organization is not a state agency, it was under no obligation to release data to ratepayers, watchdog groups, or the media. "The presumption is that somehow, by putting this out before the public, that's going to do something for you — but I don't think it's functionally required," said Noel. ERCOT also argued that because of competitive concerns, many of their contracts required secrecy.

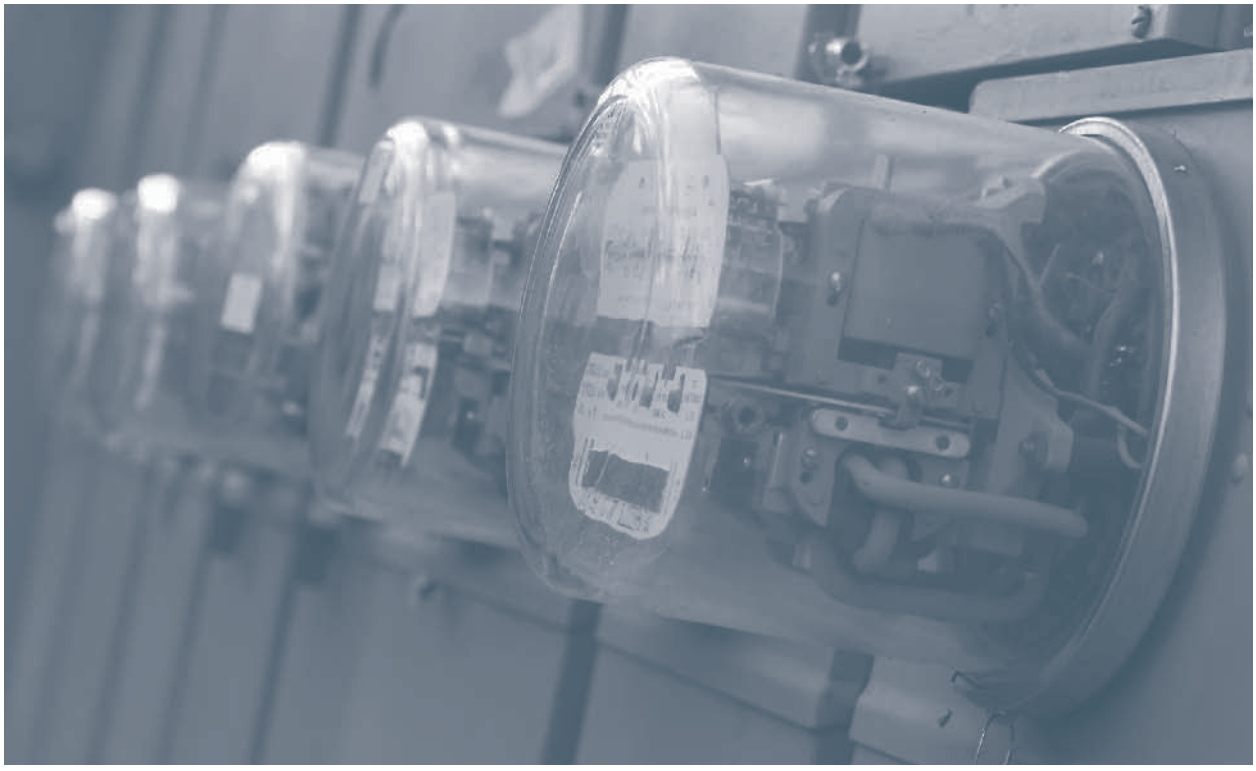
Consumer groups complained of a lack of accountability at ERCOT, which, prior to the year 2000, barred reporters and the public from its meetings. They noted that under common regulatory practice, ERCOT could reveal relevant spending data without disclosing proprietary business data. "They adopt their budget in secret … and the budget results in a fee on every consumer electric bill," noted one consumer advocate.[112]

Consumer groups also complained about a lack of consumer representation on its board of directors. Only four of those members

"In September, ERCOT came under fire for the contract it signed with its chief technical consultant, Accenture. The company had business deals with several energy firms, including TXU Electric and Reliant, and lawmakers during a hearing questioned whether there was a conflict of interest."

represented consumers — including those for residential, commercial and industrial consumers[113] — while most others represented business interests, such as generation plant and transmission line owners.[114] Moreover, the board chairman was an executive from Reliant Energy[115] and in December, representatives of retail electric providers were also added to the board.[116]

During meetings in 2001, the legislative committee overseeing deregulation began discussing the possibility of exerting more state oversight of ERCOT. "I guess they would like them to operate more like a public agency, and they think there are still some things left to do," said Jess Totten, electric division director for the PUC. "I think that is a pretty straightforward cue for the commission to take those issues up."[117] The committee included both co-sponsors of the 1999 deregulation law — state Representative Steve Wolens, and state Senator David Sibley.



YEAR: 2002

MARKET OPENING

"ERCOT was at the center of the market switch and the startup glitches nearly overwhelmed it. Far from being easily fixed, the problems persisted months on end. So massive were these problems that they led to budget setbacks and a crisis in governance."

ERCOT, an organization that had remained almost wholly unknown to the public for the entirety of its 30-year existence, was now at the center of the state's momentous and controversial switch-over to electric deregulation. The old ERCOT, the one created in 1970, had employed just a handful of engineers at satellite offices. But, by the late 1990s that staff had grown to 50, and in 2002 it would stand at nearly 300. A 45,000-square-foot facility in Austin had replaced ten tiny control centers.[118] A second even larger facility was under construction in Taylor. "ERCOT has gone from this tiny little group in the state to really being the linchpin of the market," said TXU spokesman Chris Schein. "What they have done at ERCOT is basically create, from the ground up, an entity that controls an electric market bigger than some national systems."[119]

Would the organization be prepared to take command of the complicated new market? ERCOT CEO Noel described the previous summer's setbacks as growing pains, insisting his organization was up to the challenge.[120] But business and consumer groups were not so sure. Although the organization had claimed headway, the problems that had become so obvious during the pilot project continued to cause alarm: billing errors remained uncorrected, switching remained delayed, and computer glitches remained pervasive.

PROBLEMS PERSIST

"'Who here can fire you?' state Senator Kim Brimer asked Noel during a blistering exchange."

On January 1, 2002, Texas entered into the age of electric deregulation. For the first time ever, the state would allow companies to compete for retail electric customers. Both Texas electric consumers, and the economy in general, would never be the same. As feared, problems were numerous. ERCOT was at the center of the market switch and the startup glitches nearly overwhelmed it. Far from being easily fixed, the problems persisted months on end. So massive were these problems that they led to budget setbacks and a crisis in governance. In fact, 2002 must now be considered one of the most difficult years ever for ERCOT.

Take, for instance, the switching mistakes. Much of these were the result of technical problems at ERCOT, and many were the result of the added layer of record-keeping that became necessary under deregulation [see the sidebar on page 37]. Either way, the initial switching problems left some residential customers without

DEREGULATION PERMANENTLY DELAYS MOVE-IN PROCESS

Under the old system, customers typically could expect to wait for a day or two for new service to begin. But under deregulation — even if all systems were working perfectly — getting the electricity turned on could take a week or more. Under the previous system a vertically integrated utility would handle the entire process. Under the new system, the transmission and distribution utility was required to communicate with both ERCOT and the retail electric company. Not only that, but transferring accounts between entities also now required 14 different handoffs of data — with each handoff presenting a risk for a fumble.[132] *"Now, there are three different entities involved, and it may never be as quick as the 24-hour service they had in the past," said one Houston electric company official, speaking to the* Houston Chronicle. *"We are asking our customers to give us a little more time because it's a brand-new system."*[133]

ERCOT's CEO, Noel, also acknowledged that the delays were here to stay, saying Texans had "traded off reduced rates for a little less convenience." However, as would be demonstrated later, rates were not reduced but rather remained consistently higher under the state's deregulation law.[134]

power for extended stretches — including one Corpus Christi family that went without power for such a long period that they were forced to move into a motel.[121] Nearly a quarter of electric customers in the Central Power & Light Service Territory failed to receive their bills in a timely fashion.[122] "We're aware that in the first few days of the year, there were significant problems — some of the retail providers may have told people it would take seven to 14 days to get hooked up and that is not acceptable," said PUC spokesman Terry Hadley.[123]

More problems came to light during a legislative oversight committee hearing — including the fact that as many as 150,000 TXU customers had gone without bills for a period of time, some customers for as long as four months. Lawmakers expressed outrage. But ERCOT officials testified during the May committee hearing that far from being fixed, the switching delays would continue for at least another six months.[124] "Who here can fire you?" state Senator Kim Brimer asked Noel during a blistering exchange.[125]

Noel blamed the problems on data input errors and miscommunication with power companies. "I am doing everything I know to do and my staff is doing everything they know to do," he said.[126] Lawmakers warned they were considering reopening the electric deregulation law during the next legislative session just so they could reign in the seemingly out-of-control organization.[127]

In news accounts that appeared about a month later it was reported that roughly 300,000 of the 1.2 million service switches that had been attempted thus far had been mishandled in some fashion. Most of the problems related to late-delivered bills or lost account information. TXU acknowledged it had lost track of about 90,000 of its 2.8 million customer accounts. The City of Euless said the process of transferring billing from the old incumbent provider to the new retail electric provider was "impossible to follow." The City of Paris characterized the process as a nightmare.[128] Noel made more excuses, but also acknowledged that ERCOT had to take at least some of the blame. "There's been a lot of finger-pointing," but, "in reality, we all are responsible," he said.[129]

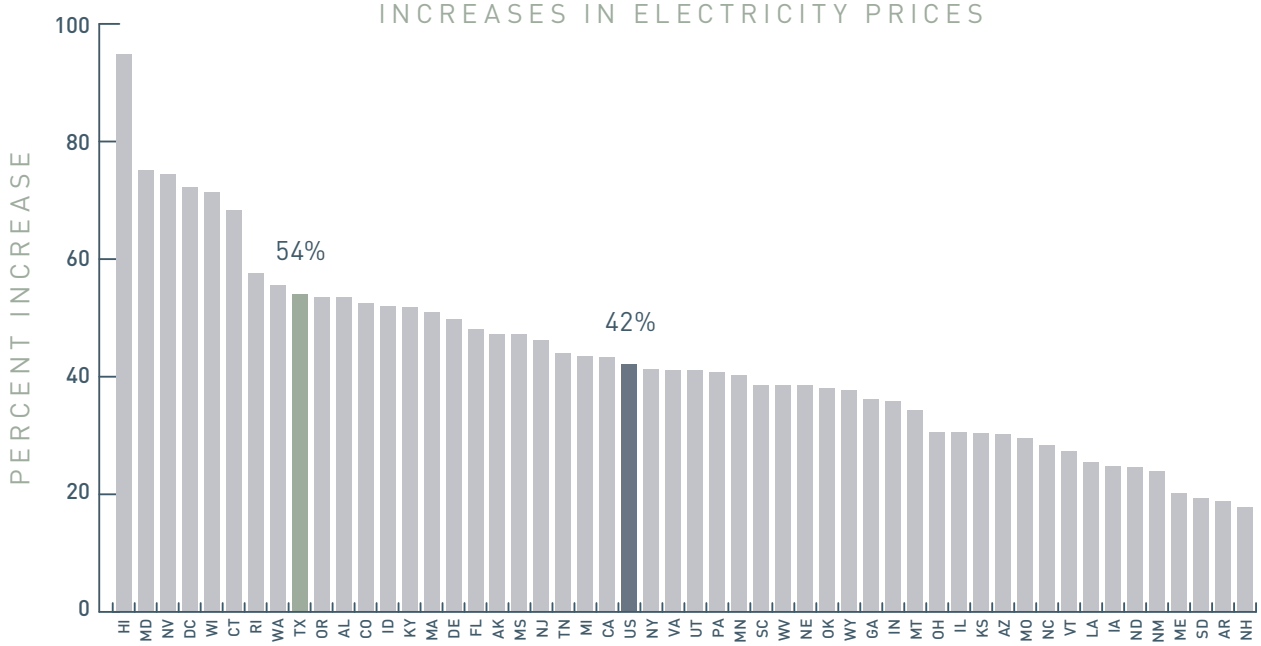
In September, a full nine months after market opening, the billing

ERCOT's CEO, Noel, also acknowledged that the delays were here to stay, saying Texans had "traded off reduced rates for a little less convenience." However, as would be demonstrated later, rates were not reduced but rather remained consistently higher under the state's deregulation law.

problems continued.[130] According to PUC figures, about 1.5 percent of all customers on the electric grid – or 82,000 Texans – had had at least one electric bill go missing since the state deregulated its retail electric market. Consumer complaints were also substantially increasing. The Commission reported a more than four-fold increase in complaints – from 2,062 the previous year, to 8,547 in the fiscal year ending in August, 2002.[131]

RESIDENTIAL ELECTRIC PRICE INCREASES 1999 - 2010*

TEXAS RANKS 9TH IN NATION FOR
INCREASES IN ELECTRICITY PRICES



*Through September 2010
Source: http://www.eia.doe.gov:80/cneaf/electricity/page/sales_revenue.xls

Only eight other states have had steeper increases in average residential electricity prices since 1999, which is the year that lawmakers adopted the electric deregulation law in Texas.[135]

BUDGET INCREASES

"'They are already incurring expenses, initiating contracts for millions of dollars, when those expenses have not been examined by the PUC – (ERCOT's) freewheeling way of doing business must stop,' said one."

ERCOT also appeared to be exerting little discipline over its spending – a situation that became all the more troublesome after the technical glitches began to exert additional pressure on the organization's finances. In early January, the organization was projecting its 2002 expenditures at $65.5 million – up 3 percent from the $63.6 million in 2001 – and it proposed to spend even more in 2003 and 2004. ERCOT officials went before the PUC to request a fee increase to pay for the new expenditures. It also proposed increasing its debt for the next three years.[136]

In March 2002 the ERCOT board voted to borrow an additional $14.5 million to address the technical problems – including $2.5 million to address problems associated with connecting and disconnecting Texans who change residences.[137] Other systems were also causing expensive headaches for ERCOT. By proposing to borrow this new money – as opposed to increasing fees – ERCOT avoided the necessity of appearing again before the PUC. Considering the persistent and growing public criticism of ERCOT management, such an appearance would have been awkward at best. [see sidebar]

In response to growing criticism of ERCOT, the PUC in March 2002 ordered a top-to-bottom review of the organization's expenditures. It would be the first such review. But the review would not be complete until July – seven months into ERCOT's budget year, and well after the organization had blown through much of its cash. ERCOT observers said the review should have come sooner. "They are already incurring expenses, initiating contracts for millions of dollars, when those expenses have not been examined by the PUC – (ERCOT's) freewheeling way of doing business must stop," said one.[139]

Under pressure from consumer advocates and reeling from reports in the press, ERCOT in June also agreed to cut $18,500 in spending for its sponsorship of a minor league hockey team, $29,000 for a holiday party at a posh hotel and other expenditures. Instead, it would use the money to fix its systems.[140] But that did not stop Noel in August from calling upon the Commission to nearly double the fee used to finance ERCOT's operations, from 22 cents per megawatt-hour to 42 cents. "It is virtually certain to do the things that are needed, the fee is going to have to be

ERCOT'S CEO TOM NOEL: "This needs to remain a private sector operation"

When the ERCOT board voted on March 19, 2002 to increase its debt, it did so without explicit approval from the PUC. At the time, the agency was exercising relatively little control over ERCOT's spending. It was the PUC's position that ERCOT could not hike its fees without the agency's permission, but otherwise ERCOT could set its own budget and take on more debt as it wished. ERCOT's CEO Noel consistently defended this arrangement, claiming that ERCOT spent its money wisely. He said the ERCOT board had scrubbed the ERCOT budget, even if public regulators had not. "I believe this needs to remain a private sector operation," Noel said.[138]

increased," Noel said.[141]

With pressure mounting, the organization's chairman, Jack K. Hawks, resigned.[142] He was replaced by Mike Greene, president of TXU's transmission and pipeline division.[143]

PROPOSED REFORMS

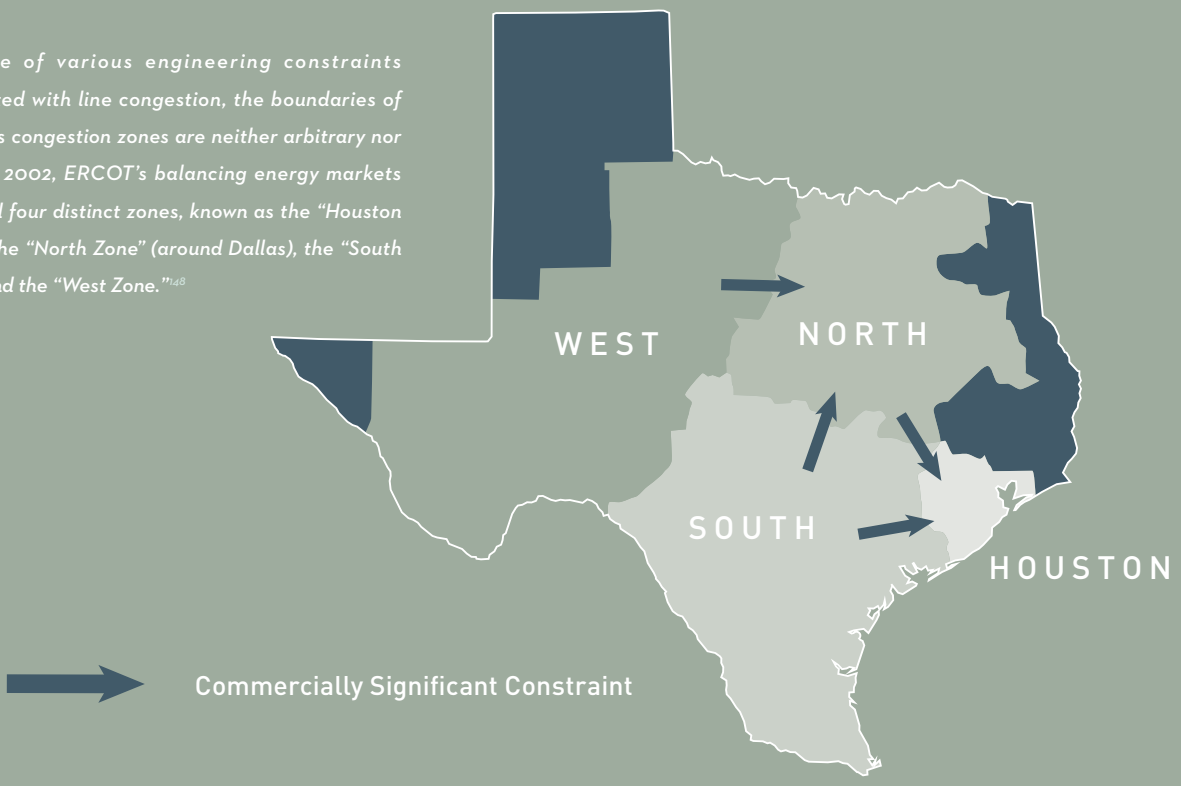
In June, ERCOT adopted new rules intended to make energy transactions more transparent. Consumer groups and some lawmakers had called for the changes to help protect the Texas market against the sort of manipulation that had plagued the California market. The revised policies would allow ERCOT to disclose transaction information within more limited time frames. "The main value of releasing this information is that it should give more confidence after the fact," explained Sam Jones, ERCOT's chief operating officer.[144]

Representative Wolens, one of the architects of Senate Bill 7, also called for the creation of a completely new board for ERCOT. Wolens said that the 25-member panel was too large to act efficiently.[145] Under Wolens' proposal, the new board would be independent from the industry that it governed. That is, the stakeholders — mostly company representatives that for years had dominated the organization — would no longer be in charge. Under Wolens' plan, an ERCOT board nominee would be barred from receiving compensation for products and services from any participant in the ERCOT market for one year prior to his or her nomination. Neither could the ERCOT nominee owe more than $10,000 in securities or other types of investment to any ERCOT market participant, under the proposal.[146] Market participants expressed opposition to the proposal, and ultimately it failed.[147]

Also in 2002, with the current system still not fully functional, market participants proposed the creation of a completely new ERCOT process for managing congestion on transmission lines. This proposed new system, known as a "locational marginal pricing" system or a "nodal" system, would require a massive overhaul of ERCOT's hardware and software. The PUC took the recommendation under consideration in 2002, with the expectation that it would come to a decision in 2003. Under the proposal, ERCOT would arrange for the payment of wholesale spot power at thousands of distinct locations, or "nodes." Besides transforming the process whereby ERCOT managed congestion on overburdened transmission lines, the nodal system also would provide price signals to incentivize the construction of generation plants at specific geographical locations. (For more about the nodal system, see the report on page 61). The system would replace ERCOT's current process of managing congestion in and between broad regions of the state, known as "zones." (For more about transmission congestion, see the sidebar on page 41.)

RELIEVING TRANSMISSION CONGESTION IN THE ERCOT MARKET

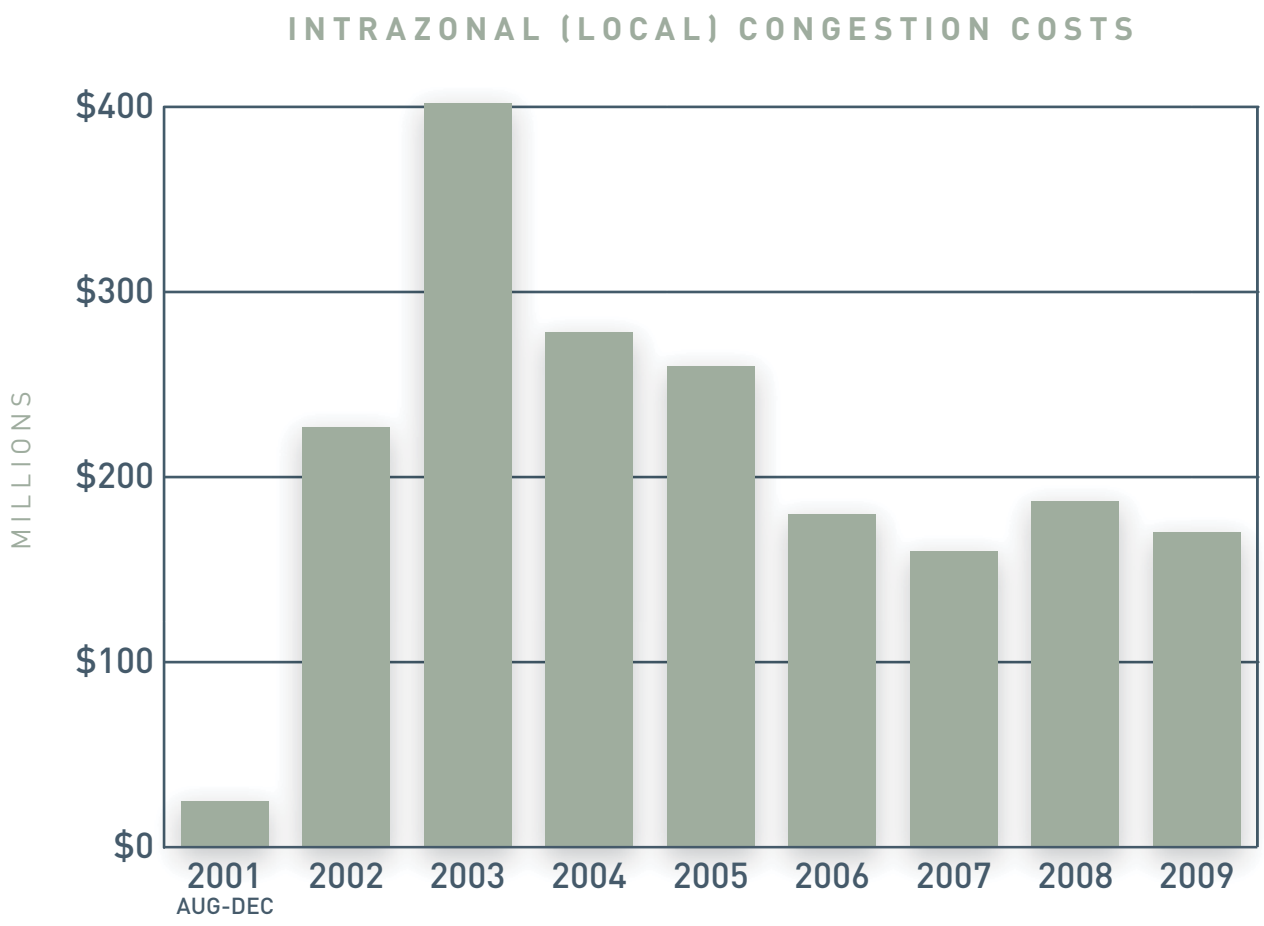
Because of various engineering constraints associated with line congestion, the boundaries of ERCOT's congestion zones are neither arbitrary nor fluid. In 2002, ERCOT's balancing energy markets included four distinct zones, known as the "Houston Zone," the "North Zone" (around Dallas), the "South Zone" and the "West Zone."[148]



Electric deregulation would create other great challenges for the ERCOT organization — systemic challenges. The grid was not created with deregulation in mind. Instead, it evolved over many years as the state's traditional utilities built lines to serve their own regional customers. That is, utilities would build power plants, and then a transmission path to connect that plant to their customers. But deregulation would require state-spanning lines capable of transmitting electricity to the far corners of the state. To support the new system, massive amounts of power now needed to be transmitted freely — and across great distances. Line congestion would sometimes occur when electricity flowed from one part of the state to another. Left unchecked, congested lines could overheat and even lead to outages.

ERCOT managed this problem in the deregulated market by arranging for generators to ramp up or ramp down production during periods of high congestion. That is, the grid operator would arrange for the generation of more power on one side of a congested line, or arrange for the generation of less power on another side of a congested line. In this way, ERCOT would keep the system in balance, while ensuring that power supplies remained adequate. As the PUC explains: "Congestion is relieved through rearranging or 'redispatching' generation such that the flow of electricity on the grid is altered, and the constraining line is no longer in danger of being overloaded."[149] However, as the PUC also notes, arranging for such "balancing energy" services does not come without a cost. "Generating units that are ordered by ERCOT to lower or increase their output to relieve congestion receive payments to do so from other market participants."[150] ERCOT arranges for the payment of generators willing to ramp up or ramp down production during periods of high congestion in one of two ways — on a "zonal" basis and on a "local" basis.[i]

[i] *ERCOT also creates markets for various forms of reserve capacity — that is, ERCOT will pay generators just to remain standing by and ready to go in case ERCOT requires power from them quickly. ERCOT needs such standby power as system reliability insurance for those occasions in which the system suffers a sudden loss of power, such as when wind turbines suddenly stop spinning when the wind stops blowing.*



Source: ERCOT.com

Local congestion costs — that is, the expense associated with relieving overburdened power lines with ERCOT's four separate zones — have increased dramatically through 2003. However, those costs have been relatively flat in recent years.

ZONAL CONGESTION

Say that the lines between Houston and Dallas become congested. Under its zonal system, ERCOT could address this problem by arranging for the generation of a specified quantity of extra power in Houston through the creation of an "Up Balancing Energy" market — but only for that area. Houston area generators willing to ramp up their production would bid their power into a market set up by ERCOT for this specific purpose. ERCOT would accept the offered energy, starting with the least expensive first, until it had sufficient power to meet its requirements in the Houston area. The same could be true, say, in the north zone around Dallas: if ERCOT required generators to ramp down production there, it could call for a specific amount of "Down Balancing Energy." Generators would similarly bid in offers to ramp down production, and ERCOT would accept all offers until it had met its requirements.

In such cases, all generators that offer such energy services accepted by ERCOT — even the generator that offers the least expensive bids — get paid as if they had offered their energy at the highest accepted bid. This controversial "market clearing price" system is common among energy markets and, for economic reasons, is thought to make bidding more efficient. However, this market clearing price system is also ripe for abuse, as it can lend itself to gaming strategies.

As of February 2002, ERCOT assigned the cost of paying for these Balancing Energy bids to those buyers and sellers of electricity that caused the congestion in the first place.[151] Under that (pre-nodal) practice, only the cost of zonal congestion is directly assigned to parties who arrange for power to be transmitted between zones. The cost of local congestion is spread to consumers system-wide.

It is also worth noting that the boundaries of these zones — that is,where balancing energy markets appear during times of congestion — are neither arbitrary nor fluid. Rather, they are very definable and somewhat permanent. This rigidity results from various engineering constraints associated with line congestion. In 2002, ERCOT's balancing energy markets (which come into play only during times of congestion) included four distinct zones, known as the "Houston Zone," the "North Zone" (around Dallas), the "South Zone" and the "West Zone."[152]

LOCAL CONGESTION

ERCOT has utilized a separate strategy to respond to line congestion that occurs completely within the boundaries of these zones, but not between them. This sort of congestion is called "local" or "intra-zonal" congestion. In such cases, ERCOT simply orders generators to ramp up or ramp down production as needed — there is no bidding involved — and these generators receive "out of merit" payments based on rules pre-established by ERCOT stakeholders. ERCOT establishes no "market clearing price" for such energy — it simply pays for power on a generator by generator basis. The cost of paying these generators to relieve local congestion is spread out evenly across the entire ERCOT market.

In 2002, shortly after the opening of the new market, the cost of relieving such local congestion shot up rapidly. At the time, the PUC had called upon ERCOT to implement direct assignment of local congestion costs to market participants should the cost of relieving that congestion exceed $20 million.[153] On March 5, 2002, ERCOT reached this $20 million target. However, many market participants balked at implementing a direct assignment approach within the zonal market and instead proposed a new kind of market, a so-called "nodal" market, which used a system whereby ERCOT would relieve congestion at thousands of district locations or "nodes." This new market would eliminate the distinction between "zonal" and "local" pricing. It would also essentially require a massive redesign of ERCOT's systems.[154]

YEAR: 2003

TRANSMISSION LINES

COMPLAINTS CONTINUE

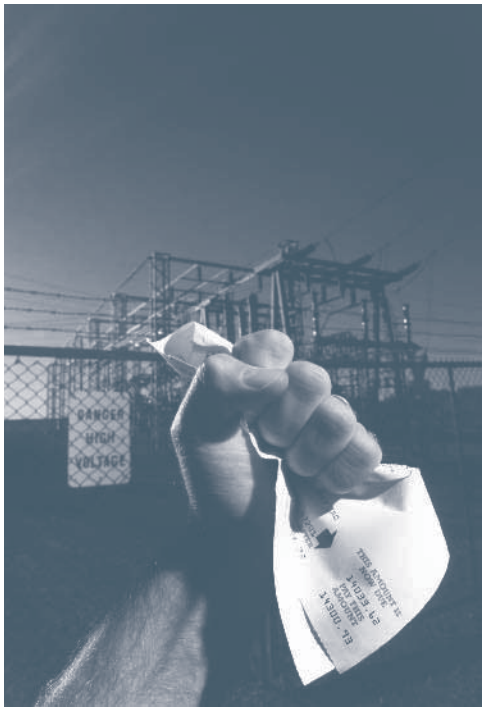
ERCOT announced plans in 2003 to hire an additional 100 workers and to expand its Taylor control center.[155] And yet for much of the year, the organization still failed to consistently switch customers from one provider to another without committing some sort of error.[156] Monthly complaints relating to electric service flooded into the PUC at a rate six times higher than the typical level prior to deregulation. The lion's share of these new gripes related to the poor performance of ERCOT and transmission providers,[157] with some apartment tenants reporting that they had gone six months without electricity bills.[158] Tens of thousands of Texans also reported late bills. ERCOT CEO Tom Noel, the man who had taken much of the criticism for the organization's poor performance, announced his retirement in October.[159]

PRICE SPIKES

It wasn't just complaints that were on the rise under ERCOT's watch, it was prices too. A mysterious tripling of wholesale prices in the ERCOT market raised the specter of possible market manipulation. Although the spikes corresponded with a three-day winter storm in February, 2003, it was not clear that the weather alone was to blame. "The three commissioners are concerned," said wholesale market oversight division director, Parviz Adib.[160]

No load was lost during the February 24-26 storm, and yet prices in the balancing energy market spiked to about $990 per megawatt/hour for brief periods. Prices in the ancillary services market also spiked to $967 per megawatt.[161] Under more common circumstances, balancing energy and ancillary services easily can sell for one-tenth these amounts. The surge in prices had harmed several power providers — and led to an outright bankruptcy of one, Texas Commercial Energy ("TCE"), a company with about 1,500 commercial customers.[162] TCE claimed that the wholesale spot market for electricity had been fraudulently manipulated and sued ERCOT and other companies over the incident.[163]

The PUC, in an investigation, concluded that a wholesale market strategy known as "hockey stick" bidding was partially responsible for the price disruptions.[164] Deemed illegal in other jurisdictions and responsible for many of the problems in California's deregulation meltdown,[165] hockey stick bidding occurs when a market participant offers most of its available capacity or energy at a



"The PUC, in an investigation, concluded that a wholesale market strategy known as 'hockey stick' bidding was partially responsible for the price disruptions."

relatively typical price, but then also offers a small portion at an extremely high price. Under the rules of the ERCOT spot market, the highest accepted bid for power — in this case, a very high hockey stick bid — sets the price of all bids accepted by ERCOT during that period. This becomes the "market-clearing price of energy," or MCPE. "Under normal circumstances, these small amounts of energy and capacity are not needed, and therefore do not affect prices — however, during the extreme weather event, ERCOT needed all of the energy bid into the Balancing Energy Market, and the resulting price was set by a hockey stick bid," the PUC explained in its 2005 Scope of Competition report.[166] According to the PUC, as a result of the hockey stick bid, the additional cost of balancing energy during the period was $17 million.[167]

The Commission also found separately that TXU, by virtue of its size alone, was guaranteed to have its balancing energy bids routinely accepted — regardless of TXU's asking price.[168] "This … is of fundamental concern because it provides a supplier with the potential to harm the competitive process," the PUC concluded.[169] However, the investigation by the PUC (which was limited to only those allegations that could be analyzed using actual market data) found no violation of ERCOT rules by TXU.[170]

The PUC in August adopted new rules that it hoped would mitigate the impact of hockey stick bidding. The rules called for new bidding limits during those periods when no congestion existed on the transmission lines and yet, for whatever reason, ERCOT was still compelled to accept all energy bids into the balancing energy market.[171] The PUC also adopted a "sunshine policy" that called for the automatic identification of those entities that sold power into the ERCOT spot market at very high prices — those exceeding $900 per megawatt/hour.[172] But at the urging of generation companies, the agency later abandoned both of these policies.[173]

Consumer advocates called for more reforms, including an overhaul of the ERCOT board. Tim Morstad, a policy analyst with the Texas Office of Consumers Union, noted that ERCOT's leadership was largely made up of big industry players with interests often at odds with that of the public. Some generators, for instance, could benefit from a shortage of transmission lines because such a shortage could reduce the flow of power from a competitor, he

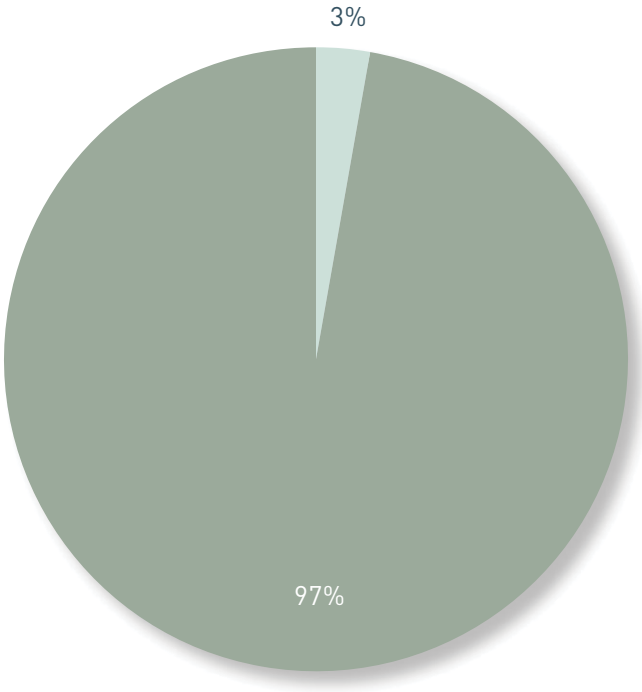
said. "But we want to make sure the grid is overseen in the public interest, and not just by who is going to pay the most," he said.[174]

PRICES UP IN THE ERCOT REGION

It also had become clear by 2003, through an examination of retail prices in the ERCOT region, that the market was not functioning as efficiently as it should be. Deregulated retail prices were on the way up, especially in relationship to prices in other parts of the nation. This is in contrast to many years of below-the-national-average prices prior to the 1999 deregulation law.

In 2003 competitive suppliers charging below the national average served only three percent of residential consumers in deregulated areas of ERCOT. The other 97 percent were getting power from retail electric providers charging above the national average. Overall, the cost of power from competitive suppliers in the ERCOT region had shot up to a level 11 percent higher than the national average. By contrast, residential prices in Texas outside deregulation in 2003 remained below the national average.[175]

RESIDENTIAL ELECTRIC SERVICE IN THE ERCOT MARKET FOR 2003



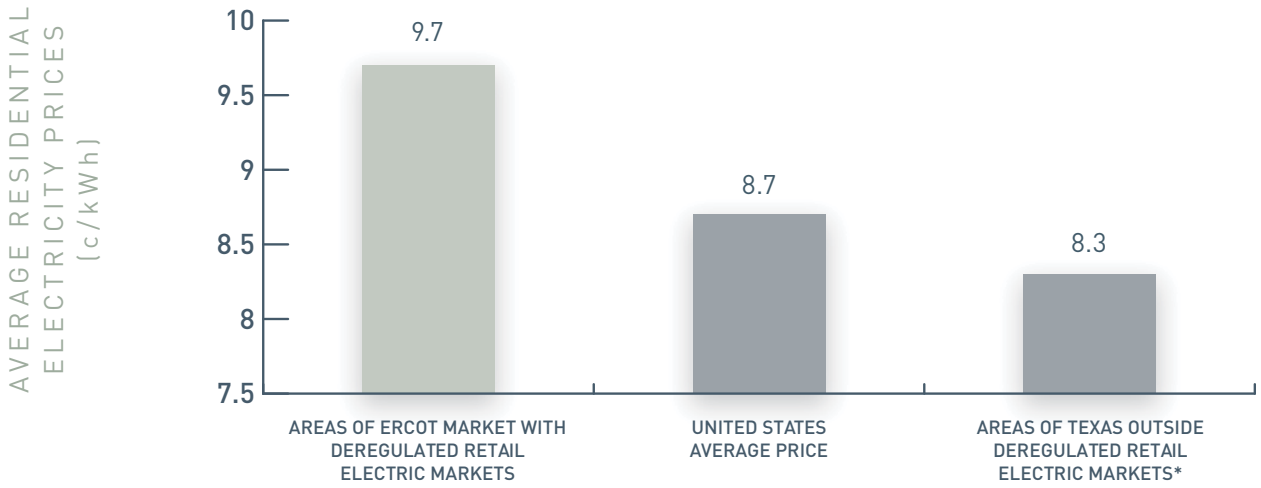
Only 3 percent of Texans in deregulated areas of the ERCOT market were served by REPs with average prices below the national average.

CUSTOMERS OF RETAIL ELECTRIC PROVIDERS CHARGING AVERAGE PRICES BELOW THE NATIONAL AVERAGE: 142,839

CUSTOMERS OF RETAIL ELECTRIC PROVIDERS CHARGING AVERAGE PRICES ABOVE THE NATIONAL AVERAGE: 4,785,148

AVERAGE RESIDENTIAL ELECTRICITY PRICES

ERCOT REGION, AREAS OUTSIDE DEREGULATION, UNITED STATES, 2003



*Areas outside deregulation include municipally-owned utilities and cooperatives.
Source: United States Energy Information Administration:
http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

BLACKOUT

A massive blackout, the largest in years, knocked out power in the Northeast United States and parts of Canada. The November 14 outage drew public attention to the nation's power grids, including the grid managed by ERCOT. News accounts outlined the need for more transmission in many parts of the United States, including Texas.[176] The news accounts noted that in some measure, these shortages were related to the move to deregulation. For instance, Fred Zalcman, director of the Pace University Law School Energy Project near New York, explained that the relationship between generation and transmission had become much more complicated under the new market structures. "You're not necessarily increasing the demand [for electricity], but you're moving it over greater distances," he said.[177]

In Texas, the state's largest transmission provider, Oncor Electric Delivery Company, announced that it was spending about $250 million annually in an attempt to keep up with demand. The north Texas transmission and distribution service provider said the additional line construction was crucial, given that the peak load during the summer months in North Texas can approach 16,000 megawatts, but local generators could not even produce 10,000 megawatts.[178] That meant the difference would have to be brought in from outside the region. "Things are not perfect here, and they could get bad in a hurry," said Joseph Beal, an ERCOT board member, in reference to the state's transmission challenges.

YEAR: 2004

QUESTIONING INTERNAL CONTROLS AT ERCOT

"Already battered by criticism over its poor performance during the transition to deregulation, ERCOT in 2004 faced more criticism over its management practices, its subpar showing in a public audit and — most significantly — a major financial scandal."

Already battered by criticism over its poor performance during the transition to deregulation, ERCOT in 2004 faced more criticism over its management practices, its subpar showing in a public audit and — most significantly — a major financial scandal. "This series of events has led me to the point where I have a crisis of confidence in the internal controls (of ERCOT)," PUC Chairman Paul Hudson declared that year as details began to emerge about alleged insider dealing and corruption in the organization.[179]

The Texas Commercial Energy lawsuit also continued apace. Recall that TCE sued ERCOT and several companies after wholesale prices spiked during a cold snap in 2003. In February 2004, TCE produced tape recordings purporting to show fraudulent practices by energy company traders. TCE President Mike Shirley said the recordings provided "unequivocal evidence of the same kind of market manipulation that we saw three years ago in California." It was Shirley's contention that ERCOT failed to guard against such practices. In the trader tapes, energy company officials were quoted as saying "get them prices up," "some of the small folks got hurt last week," and "that could bankrupt someone." TXU representatives disputed the significance of the recordings.[180]

"Consumer groups, however, continued to call for more dramatic changes, such as severing the clear ties between ERCOT's governing board and the electric industry. Some consumer groups said this could be accomplished by transforming the organization into a government-run agency."

In 2004, the PUC also enacted new rules further clarifying ERCOT's role as the daily overseer of market operations. The new rules banned market manipulation, and specifically prohibited the creation of artificial grid congestion. Also banned: the execution of prearranged and offsetting trades that raise prices, the offering of electricity that cannot be delivered, the misrepresentation of a trading company's financial condition, collusion to manipulate the price or supply of electricity, and the exertion of market power by withholding electricity. The PUC retained final authority in cases in which there were allegations of market abuse.[181] Consumer groups, however, continued to call for more dramatic changes, such as severing the clear ties between ERCOT's governing board and the electric industry. Some consumer groups said this could be accomplished by transforming the organization into a government-run agency.[182]

THE PROCUREMENT SCANDAL

By far ERCOT's greatest challenge in 2004 was the well-publicized scandal over fraud. The public first became aware of the allegations when the PUC called an emergency meeting on June 2nd to discuss a heretofore unknown investigation by the Department of Public Safety. The commissioners said they had only recently been informed about this investigation, and would begin an investigation of their own. "Because the PUC has recently obtained information that calls into question the integrity of security – even the slightest hint of a potential breach calls for immediate action," said PUC Chairman Paul Hudson. At this point, neither Hudson nor anyone at ERCOT was saying much about the nature of the allegations. PUC spokesman Terry Hadley said only that they involved some sort of improper dealings by an outside vendor.

Gradually, however, details began to emerge. On June 10th The Dallas Morning News reported that several top staffers at ERCOT also served as directors of an outside security consulting firm that conducted business with ERCOT – an obvious conflict of interest. That firm, ECT Global, did not appear to have any sort of traditional office, but rather made use of residential addresses and post office boxes. The company dissolved itself on May 18th, which happened to be the same day that ERCOT CEO Noel referred the case to law enforcement investigators.[183]

The Dallas Morning News also reported potential conflicts involving other firms, including those relating to a company called the DSS Group. A high-ranking manager at ERCOT founded DSS and then apparently used it to charge ERCOT hundreds of thousands of dollars for work, according to the newspaper. What is worse, two of the men whom DSS claimed performed that work stated that the assertions were untrue – "that is so far from the truth as to be laughable," said one.[184] Another man supposedly working on behalf of DSS was, in fact, a dead person.[185]

Not surprisingly, the widening scandal drew the attention of lawmakers, who called hearings during 2004 for no other purpose than to discuss what appeared to be growing dysfunction within the organization. "There appears to have been some serious breakdowns of internal controls and management practices at ERCOT," said state Senator Troy Fraser, chairman of the Senate Business and Commerce Committee.[186] State Representative

Wolens, co-author of the Texas deregulation law, suggested the ERCOT board should be sued in order to "find out why those same board members were asleep at the wheel when all the manipulation and self-dealing was going on."[187]

ERCOT'S RESPONSE DRAWS FIRE

ERCOT did little to help its own case. Its response to the growing scandal drew rebukes from consumer groups, regulators and lawmakers. For instance, ERCOT appointed a special committee to cooperate with investigators — but as soon as the committee members were selected, the panel closed its meetings to the press and public.[188]

"ERCOT appointed a special committee to cooperate with investigators — but as soon as the committee members were selected, the panel closed its meetings to the press and public."

The organization also drew fire for its response to anonymous email complaints about its management practices. In emailed correspondence obtained by consumer groups, one anonymous ERCOT employee wrote: "If you speak up about anything, you are labeled a troublemaker and blacklisted and then fired if you don't leave on your own." Another described ERCOT as a wasteful organization "managed by fear." ERCOT responded by suing two internet service providers in order to determine the identity of the whistleblowers. ERCOT only withdrew the lawsuits after lawmakers learned of them.[189] "I can't imagine why ERCOT would file this lawsuit — a nonprofit is supposed to serve the public," said state Representative Phil King.

"In emailed correspondence obtained by consumer groups, one anonymous ERCOT employee wrote: 'If you speak up about anything, you are labeled a troublemaker and blacklisted and then fired if you don't leave on your own...' ERCOT responded by suing two internet service providers in order to determine the identity of the whistleblowers."

Moreover, ERCOT waited months to disclose information about the procurement investigation to regulators, which outraged PUC commissioners.[190] "So any misconduct that would go on at ERCOT is none of our business — I guess that's what you're saying," Commissioner Julie Parsley told ERCOT CEO Tom Noel during a heated exchange. She added: "It appears it was concealed from the PUC. ... This is grave, Tom."[191] The ERCOT CEO defended his decision, saying the organization wanted first to conduct its own investigation before alerting others.

At the end of November, five months after the public first learned of the corruption allegations, Williamson County District Attorney John Bradley requested a grand jury investigation. Texas Attorney General Greg Abbott also assigned a special prosecutor to the case.[192] And Noel, who had been under fire for much of his tenure,

made good on his earlier commitment to retire. His handling of the scandal in 2004 undermined his already tenuous standing with regulators, lawmakers and the public. Noel was replaced by Thomas F. Schrader, former president of the Wisconsin Gas Company.[193]

REFORM EFFORTS

ERCOT took the following steps in response to the procurement scandal — some of them mandated by regulators, others the result of public pressure. The Sunset Advisory Commission, an advisory body to the Texas Legislature, also recommended changes.

- After having first attempted to identify anonymous whistleblowers, ERCOT reversed course in June 2004 by launching a telephone hotline and website for anonymous tipsters.[194]
- Also in June, the PUC mandated new requirements that ERCOT post its board meetings in advance and open those meetings to the public.[195]
- The PUC ordered a review of ERCOT's management practices by outside auditors. Reflecting the lack of confidence in ERCOT's leadership, Commissioner Julie Parsley said CEO Noel should have no oversight role in the audit.[196]

The state's Sunset Advisory Commission said the PUC should receive new authority to review ERCOT's finances. The Sunset Commission also recommended that ERCOT board members disclose any conflicts of interest and to remove themselves when voting on matters relating to those conflicts.[197]
But many of these reforms and proposed reforms were nothing new. At least four consumer organizations unsuccessfully called for similar oversight in the past — including calling for the creation of an independent inspector general to be placed inside ERCOT to report directly to the PUC. If that recommendation had not been rejected and if some of the Sunset Advisory staff recommendations had been implemented earlier the scandal likely could have been avoided.[198]

AUDIT REPORTS AND INVESTIGATIONS

"ERCOT released a market perception survey on October 31 revealing widespread concerns regarding the organization's practices and systems."

ERCOT released a market perception survey on October 31 revealing widespread concerns regarding the organization's practices and systems. Only entities with direct ERCOT experience were questioned. Problems identified included the organization's spending practices, the manner in which it managed congestion, the effectiveness (or lack thereof) of implementing system changes, an inability by ERCOT to effectively consider both reliability and market issues when planning decisions, its failure to meet deadlines, reliability, and usability problems relating to its website.[199]

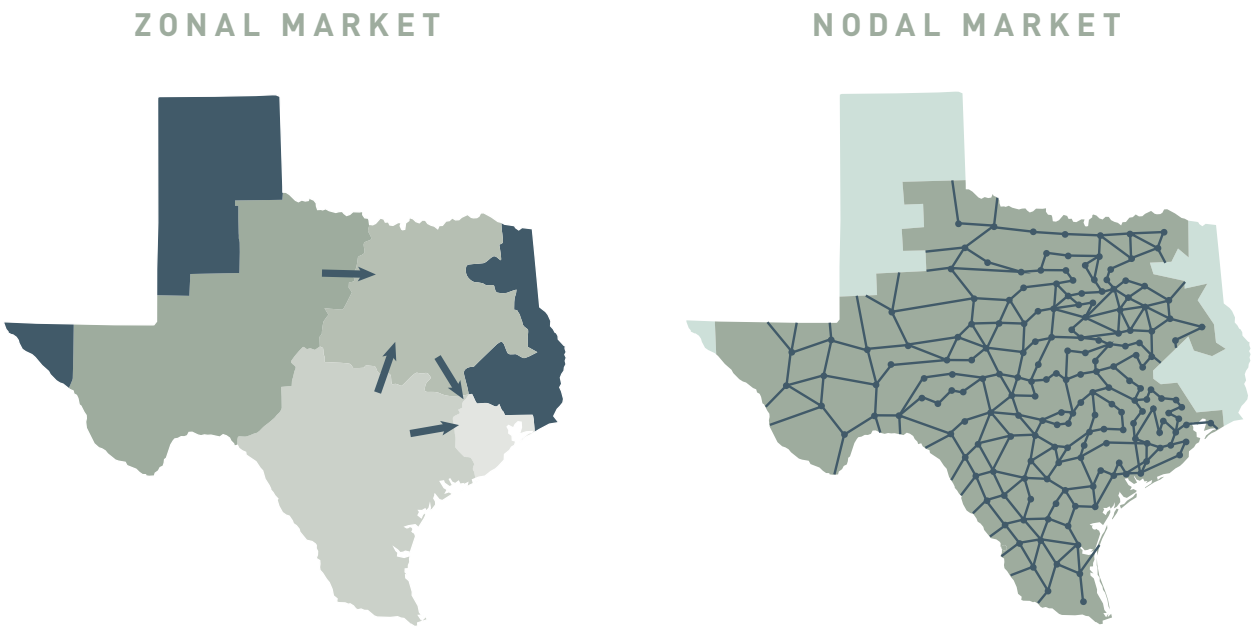
"An independent audit released on November 16th raised more concerns, and included a troubling finding that ERCOT consistently bent or avoided rules."

An independent audit released on November 16th raised more concerns, and included a troubling finding that ERCOT consistently bent or avoided rules. Performed by Deloitte & Touche, the audit concluded that ERCOT lacked formal policies and documentation for most of its key business practices. Deloitte & Touche also concluded ERCOT needed guidelines and documentation for everything from the hiring of contractors to how it conducted background checks for new hires. Financial management was as important as grid reliability — and ERCOT should transform its corporate thinking accordingly, the auditors stated. Deloitte & Touche said new leadership would be useful.[200]

A separate audit conducted by Ernst & Young in 2004 found ERCOT was insufficiently concerned about information security, as evidenced by the insufficient staffing assigned to the security function and the lack of key processes setup to protect the organization.[201] Ernst & Young wrote that "the fundamental culture at ERCOT is one of trust. Because a trusted, malicious user has greater knowledge of business practices, systems and counter measures, attacks from insiders tend to be well-targeted and much more difficult to detect."[202]

KEY FINDINGS OF THE DELOITTE & TOUCHE PERFORMANCE REPORT

- *ERCOT lacked a list of authorized vendors and contractors. Deloitte & Touche found that some work performed by contractors should have remained in-house.*
- *ERCOT lacked any sort of coherent policy to periodically manage and assess risk. ERCOT's internal auditor was not fully independent, nor did the auditor possess sufficient resources.*
- *ERCOT needed much better supervision over its accounts payable functions. Deloitte & Touche cited, as an example, that ERCOT did not have any requirement that workers accessing its payment systems first get approval.*
- *ERCOT could track only 15 percent of its fixed assets —that is, items like computers. Employees who were fired or who quit sometimes took their computers with them on the way out.*[203]



The ERCOT organization was tasked with transitioning from a "zonal" system for pricing electricity in the wholesale spot market to the new "nodal" system. This transition cost several times more than original estimates. Questions also have been raised as to whether these systems in other jurisdictions have led to consumer savings.

THE NODAL PROJECT

In the midst of all the negative audits and reviews — and an actual grand jury investigation into ERCOT — policymakers in 2004 began considering a dramatic market change that would result in even more performance pressures for the organization. Since 2002, some within the PUC and within the electric industry called for Texas to switch from its"zonal" wholesale market structure to a "nodal" one.[204] If the PUC gave the final okay, ERCOT would be charged with making technical changes so complex that they would rival those required for the original switchover to deregulation itself. Given that complexity, the potential expense involved, the impact to the market, and the real doubts as to whether ERCOT could pull it off, the nodal proposal was controversial from the start.

In theory, a nodal market would create a more efficient market for wholesale power by (among other things) allowing ERCOT to oversee an automated system whereby wholesale spot prices would be set at thousands of specific points, or "nodes." This

"A Massachusetts-based consultant, Tabors Caramanis & Associates, released a cost-benefit analysis purporting that the new system would be worth the expense. The consultant estimated ERCOT's cost of implementing a nodal system at between $59.7 million and $76.3 million. PUC commissioners had tentatively scheduled implementation for the fall of 2006."

would be a change from the "zonal" system, whereby a single price is set for a handful of zones, each covering large areas of the state. The nodal market is supposed to set price signals at those specific points on the grid where generation is needed most. This would (again, in theory) make the market more efficient. The thinking was that high prices at specific nodes would give investors an economic incentive to build new generation where that generation was most needed.

In November, the Regulated Industries Committee of the state House of Representatives released a report favoring implementation. Also that month — as it turned out, precisely on the same day that a grand jury began looking into ERCOT's management — a Massachusetts-based consulting firm, Tabors Caramanis & Associates, released a cost-benefit analysis purporting that the new system would be worth the expense. The consultants estimated ERCOT's cost of implementing a nodal system at between $59.7 million and $76.3 million.[205] PUC commissioners had tentatively scheduled implementation for the fall of 2006.[206]

"'The biggest concern remains the potential rise in home electricity bills and harm to economic development,' the Fort Worth Star-Telegram reported, noting that a New England industrial group had found that a similar system there had driven up bills by 60 percent."

Consumer groups reacted with deep skepticism. First, they noted that the Tabors Caramanis cost-benefit analysis did not include any consideration of the nodal system's effect on home electric bills.[207] They also noted that several factors other than price considerations drive construction decisions. For instance, power companies typically must site plants near large water supplies. Federal clean air guidelines also discourage new plant construction in most metropolitan areas where the nodal market would create the highest prices. This means the new nodal market would theoretically create high prices for city residents. "The biggest concern remains the potential rise in home electricity bills and harm to economic development," the Fort Worth Star-Telegram reported, noting that a New England industrial group had found that a similar system there had driven up bills by 60 percent. "If we're talking about energy costs spiking, then (businesses) will hire less people, or lay off people, and there'll be foreclosures," said Diane Weklar, executive director of the DFW Electric Consumer Coalition.[208]

Skeptics also warned, presciently, that this complicated switchover could lead to more headaches for ERCOT. The organization

had not successfully managed the pilot project, nor had it successfully managed the switch requests and billing during the early days of deregulation. Most recently it was rocked by the procurement scandal. How, then, was it supposed to oversee this critical market transition?

BUDGET CUTS

The organization in 2004 continued to come under fire for its heavy spending, including the $120,000 it paid on average salary and benefits to each employee. ERCOT officials also typically received bonuses of 20 to 40 percent, according to a budget official who testified for the Sunset Advisory Commission.[209] The organization's budget and debt load had been steadily rising.[210] Responding to criticism, ERCOT, late in 2004, announced budget cuts of about 5 percent, or $6 million annually. The organization said its new goal was "to hold the fee steady by increasing internal efficiencies and making tough management decisions."[211]

YEAR: 2005

FALLOUT FROM THE PROCUREMENT SCANDAL CONTINUES

Charges were brought in January against five former ERCOT officials and one contractor stemming from their alleged involvement in the 2004 procurement scandal. A Williamson County Grand Jury alleged the men had schemed to cheat ERCOT of $2 million by setting up phony consulting and security firms. A separate grand jury in Travis County also issued indictments in August relating to the same case.[212] Charges included those alleging organized criminal activity, theft and bribery. They carried prison terms of up to 99 years each. The accused also faced fines of between $100,000 and $800,000.[213] "The maze of illicit business dealings going on within ERCOT over a year's time is simply stunning," said Texas Attorney General Greg Abbott. "This is not about electricity. It's about corruption at top levels of ERCOT and flagrant violations of an agreed-upon ethics policy."[214]

In August, one of the conspirators pleaded guilty and agreed to cooperate with prosecutors.[215]

THE LEGISLATURE RESPONDS

Comptroller Carole Keeton Strayhorn also found continuing and persistent management irregularities at ERCOT. After reviewing more than 4,400 ERCOT documents and interviewing numerous ERCOT employees, her office reported in May that some of the organization's contract files lacked basic information and that ERCOT inconsistently documented employee reimbursements. The Comptroller called for the creation of a special task force to monitor ERCOT.[216]

Lawmakers also pressed for more state oversight of the organization. "We need to eliminate the possibility of these events ever occurring in the future, and I'm confident that this legislation is a positive step," said state Senator Troy Fraser, sponsor of Senate Bill 743,[217] which would have given the PUC authority to inspect ERCOT's facilities. SB 743 also called for financial audits of ERCOT and would subject the organization's board of directors to the Texas open meetings laws. A separate House version proposed during the 2005 legislative session, House Bill 1083 by state Representative Phil King, included an amendment subjecting ERCOT to open records laws.[218]

"'During historic summer peaks, you can only count on wind to generate 2.6 percent of its capacity. Wind energy does mean you will use fewer amounts of coal and oil, but it does not mean you will replace any power plants. You will still need the same number because wind is variable.'"

Both Senate Bill 743 and House Bill 1083 failed, although many of the same reforms ended up in a Sunset bill later that year.[ii] The legislation, Senate Bill 408 by state Senator Jane Nelson, increased the number of independent representatives on the ERCOT board, required board members to disclose conflicts and required them to recuse themselves when necessary. Significantly, Senate Bill 408 also called for the creation of an independent monitor that would be charged with keeping an eye on the wholesale market.[219] Governor Rick Perry signed Senate Bill 408 into law on June 17th.[220]

Separate and apart from such reform bills, the 2005 Texas Legislature also adopted legislation calling for the PUC to demarcate so-called "Competitive Renewable Energy Zones" – CREZs for short – that would mark the site of future transmission construction. These transmission lines would extend to the western part of the state and the Panhandle, and would serve the wind industry, which had begun a rapid expansion in Texas. The multi-billion dollar expense would be passed onto consumers statewide.[221]

The effort to expand wind power would create new reliability challenges for ERCOT because the variable nature of wind would require ERCOT to stand by ready to dispatch alternative generation (probably gas-fired plants) during those periods when the wind suddenly stopped blowing. "You cannot plan your grid around it," said Bill Bojorquez, ERCOT's director of system planning, referring to wind generation. "During historic summer peaks, you can only count on wind to generate 2.6 percent of its capacity. Wind energy does mean you will use fewer amounts of coal and oil, but it does not mean you will replace any power plants. You will still need the same number because wind is variable."[222]

[ii] *Sunset Bills are those authorizing the continued existence of state agencies.*

THE NODAL MARKET

"John Rainey, an official with the Denton Municipal Electric utility, noted during a conference in October that energy costs had increased by nearly 30 percent in a northeastern U.S. market that implemented a nodal system."

"When it was originally proposed, the PUC had called for Texas to have a nodal system by the fall of 2006. Now, PUC commissioners were saying it would not be operational until 2008. Later, that deadline also would be abandoned."

In 2005, the PUC gave the official go-ahead for the transition to a nodal market.[223] Under the PUC's direction, ERCOT would oversee the transition from a wholesale spot energy market in which certain prices are determined in four broad zones to one in which prices are set at thousands of distinct nodes. Proponents insisted the new system would result in added efficiencies. Several experts continued to express skepticism.

John Rainey, an official with the Denton Municipal Electric utility, noted during a conference in October that energy costs had increased by nearly 30 percent in a northeastern U.S. market that implemented a nodal system. "As a load-serving entity, we've been slow to see some of the benefits come to market," said Rainey, who had some experience operating in the northeastern nodal market. Ron McNamara, a Midwest grid manager, defended their nodal market, but said it was important for ERCOT to keep deadlines as it ramps up its own system.[224]

Already, however, the nodal system in Texas was beginning to fall behind. When it was originally proposed, the PUC had called for Texas to have a nodal system by the fall of 2006. Now, PUC commissioners were saying it would not be operational until 2008.[225] Later, that deadline also would be abandoned.

"SHAME CAPS"

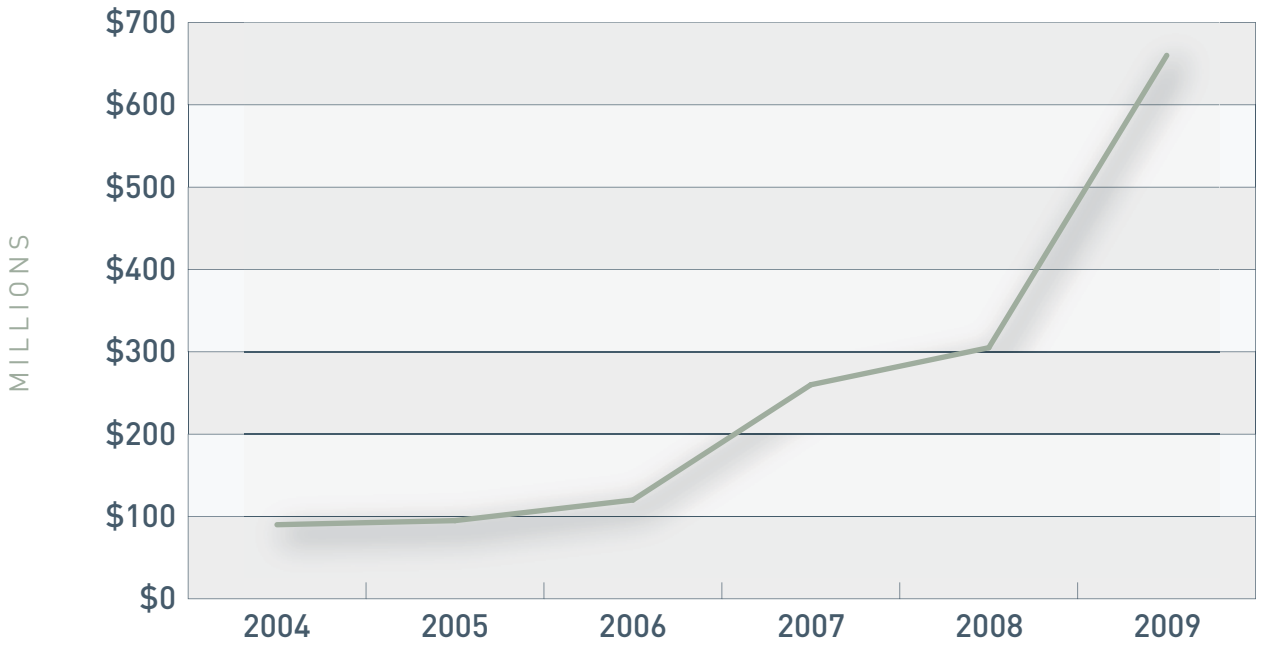
In January the PUC amended its "sunshine policy," which was the policy that required the automatic identification of those generation entities that offered accepted ERCOT spot market bids exceeding $900 per megawatt/hour. The sunshine policy was implemented in 2003 to discourage so-called hockey stick bidding, which is that anti-competitive trading strategy whereby companies sell a very small quantity of their available power well above their marginal cost in order to drive up prices for all their power.[226] Under the new policy — colloquially known as the "shame cap" — the new threshold was lowered to $300 per megawatt/hour. This meant that any company successfully selling energy on the ERCOT spot market for a price that exceeded $300 per megawatt/hour would be identified publicly for doing so. This new rule corresponded with a policy previously accepted on a voluntary basis by ERCOT stakeholders.[227]

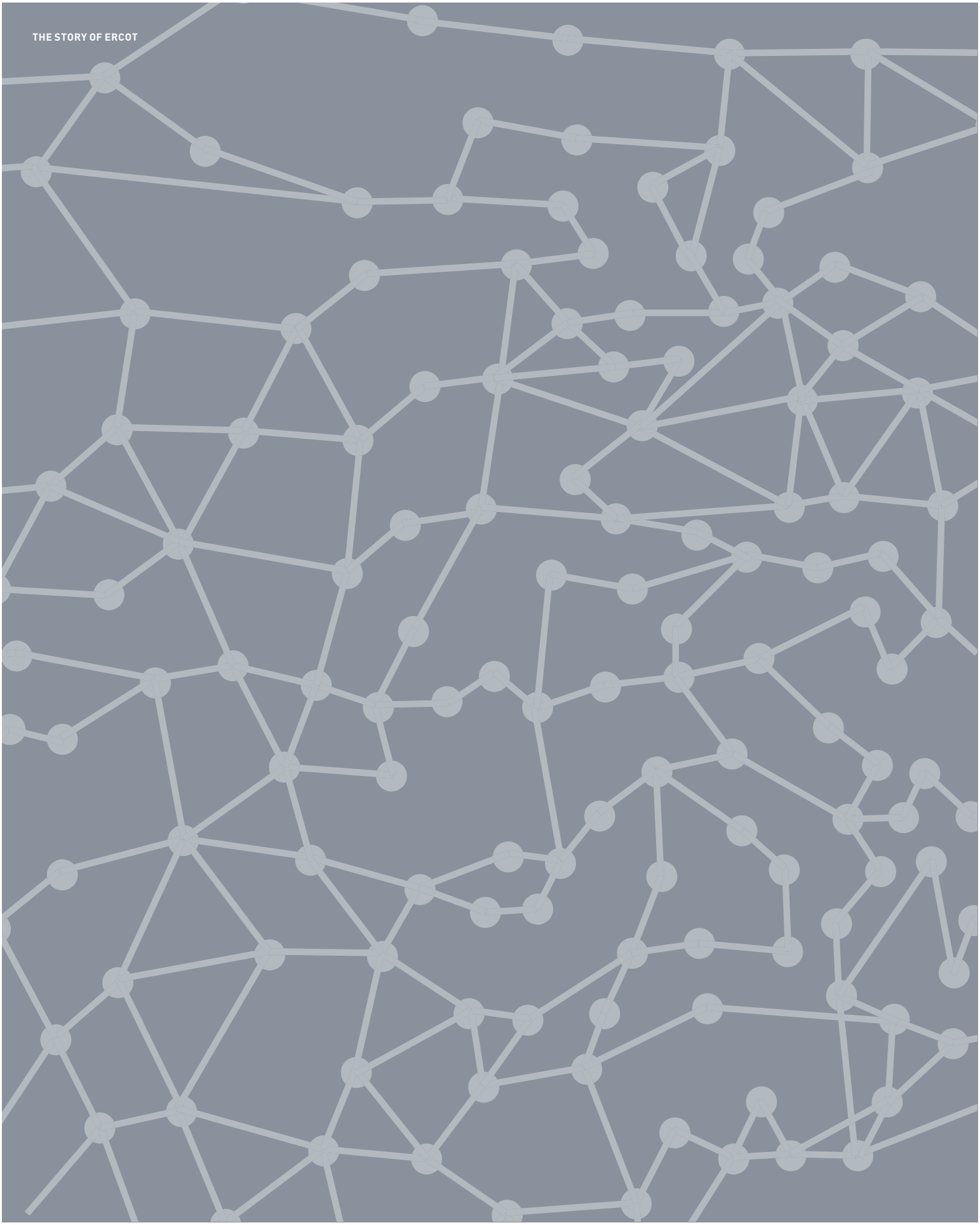
"'If you can determine market power exists, you've got to do something about it,' said John Meyer, vice president for Reliant Energy, which favored the cap."

Generation companies complained vociferously about the new rule. TXU, for instance, suggested that it would discourage power from ever being offered at prices above the cap – even when such power was needed during times of scarcity. Some PUC commissioners expressed concern that the rule might encourage large players to leave the market.[228]

But PUC Chairman Hudson said that the cap had not resulted in such problems[229] and other market participants said the price caps helped prevent large generation companies from abusing their dominant positions in the market. "If you can determine market power exists, you've got to do something about it," said John Meyer, vice president for Reliant Energy, which favored the cap.[230]

NODAL TRANSITION COST INCREASES SINCE 2004





NODAL 101

"In February 2006, a report conducted by the American Public Power Association concluded that many of the supposed benefits of nodal had been oversold by proponents. "Simply implementing (a nodal system) does not guarantee competitive markets, nor does it prevent the abuse of market power," the report stated."

Power lines can handle only so much electricity without overheating. This can become a problem when lines become congested, that is — when there is too much power and too few wires. Under its zonal-based system, ERCOT has managed congestion in four large zones by ordering generators to ramp up or ramp down production during peak energy-use periods. ERCOT pays generators for these services and then spreads the costs out uniformly among those purchasing electricity in the wholesale market.

A nodal system would allow ERCOT to change how it handles congestion. It would replace the four large zones with thousands of smaller "nodes" that would correspond to points on the transmission grid where power is either added or removed by generators or users.

Using a bank of new computers and complicated software, the new system would spit out rapid-fire price calculations at nodes with congestion on transmission lines. This would give ERCOT the ability to calculate higher prices for generation near congested lines, and — at least in theory — provide financial incentives for the construction of generators in areas with the least congestion.

By definition, a nodal market increases revenues to some market participants while conversely increasing costs to others. Nodal is also known as a "locational marginal pricing" market because it allows for distinct electricity transactions at each of these separate nodes. The new nodal computers will also give ERCOT the ability to model electricity demand, the ability to manage a trading system similar to that operated by eBay, and could improve ERCOT's energy-management system to help guard against outages. The new technical systems are also expected to improve ERCOT's ability to collect and aggregate technical data, which can help the organization guard against market abuses.

But the PUC and ERCOT could have ordered many of these system improvements — and others — without going forward with this expensive nodal overhaul. There is nothing inherently "nodal" for instance, with collecting and aggregating technical data. Likewise, some nodal supporters favor its ability to assess wholesale electricity prices at five-minute intervals, as opposed to the standard 15-minute interval within the current system. But again, that change could have been ordered without moving to a nodal system.

In February 2006, a report conducted by the American Public Power Association concluded that many of the supposed benefits of nodal had been oversold by proponents. "Simply implementing (a nodal system) does not guarantee competitive markets, nor does it prevent the abuse of market power," the report stated. The American Public Power Association concluded that consumers living in the Northeast United States failed to realize any cost savings at all as a result of the nodal system, nor did the nodal system provide incentives for investment in some areas with overburdened power lines. "In terms of investment signals ... there is simply no evidence that the price signaling associated with (a nodal system) has been an effective spur to investment in generation (or) transmission," the report stated.[231]

Even more troubling, the new market design was projected by some to add costs for many consumers in highly congested areas, such as those living in South Texas or the North Texas Metroplex. This meant that millions of Texans could be stuck footing both the bill for the new nodal systems, plus paying the potentially higher electricity costs the new system will create.

YEAR: 2006

ROLLING BLACKOUTS ROIL ERCOT POWER GRID

"It took a blackout to remind many people how much they depend upon the grid for their day-to-day lives. Gas pumps stopped operating. Cash drawers would not open. The loss of traffic signals snarled traffic and led to collisions."

In early 2006, rolling blackouts in Texas left more than 200,000 people unexpectedly without power, including about 78,000 customers in the CenterPoint Energy service territory (around Houston) and about 80,000 customers in the North Texas service territory of TXU Electric Delivery.[232] Homes, schools and businesses all lost power in 15-minute intervals. Even traffic signals went dark. The April 17th rolling blackouts, massive and statewide, were the first in more than a decade. They also came on the orders of ERCOT engineers, who feared the alternative: a catastrophic, uncontrolled, massive blackout such as had recently gripped the northeastern United States.[233]

The crisis began at about 2:00 p.m. when ERCOT first saw usage begin to peak and concluded that it might not have enough generation online to meet demand. At 3:25 p.m. ERCOT launched emergency procedures to prevent a blackout. These procedures included its call for power producers to fire up everything available.[234] But demand continued spiking, and at about 4:00 p.m. ERCOT cut power to various industrial customers. And then at 4:05 p.m. four power generators in Central and North Texas suddenly went off-line. This loss of 920 megawatts of electricity was too much for the system to bear and so ERCOT called the rolling blackouts. They lasted about two hours.

It took a blackout to remind many people how much they depend upon the grid for their day-to-day lives. Gas pumps stopped operating. Cash drawers would not open. The loss of traffic signals snarled traffic and led to collisions. "I thought it (the signal) was green," said one motorist who plowed his car into another because of the blackout.[235] A north Texas police official complained his department was left flatfooted by ERCOT. "It would be nice if we had known it was coming so we could get some people out there," he said.[236]

State and federal regulators and lawmakers questioned the organization's handling of the blackouts. State Senator Troy Fraser complained about ERCOT's failure to contact local law enforcement and emergency officials. "It is evident to me that the organization continued to operate with a misunderstanding of its relationship and commitment to the Legislature that created it, the PUC that oversees it, and the rights of the general public in

Texas," Fraser wrote in a letter. PUC Chairman Paul Hudson was not notified of the problems until 4:00 p.m. via a voicemail left with his assistant. ERCOT's own board wasn't notified until 8:30 p.m., after the blackouts were over.[237] "I do have grave concerns that ERCOT suggesting that a message left with my administrative assistant ... is the same as reaching me prior to instituting rolling blackouts," said Hudson.

"Fraser, who chaired the committee, said: 'There's an ongoing, cavalier attitude over there (at ERCOT) that you are a stand-alone entity and not responsible to the people of the state. ... We've got to find a way to allow you to do what you're doing but also make sure the public's interest is taken care of.'"

Speaking before a Senate Committee, Hudson also said "it is my considered opinion that ERCOT leadership often views the Public Utility Commission staff and commissioners as bureaucratic and political obstacles to its organizational efforts rather than as a constructive partner."[238] Fraser, who chaired the committee, said: "there's an ongoing, cavalier attitude over there (at ERCOT) that you are a stand-alone entity and not responsible to the people of the state. ... We've got to find a way to allow you to do what you're doing but also make sure the public's interest is taken care of."[239]

ERCOT blamed a confluence of events, including the planned outage of about 14,000 megawatts of capacity for plant maintenance, a spate of unseasonably hot weather that went unpredicted by ERCOT's computers, and some unexpected last-minute plant shutdowns.[240] Officials pledged to make course corrections to better handle such events in the future. But not long afterwards, another ERCOT CEO left under fire. Tom Schrader, who replaced the embattled Tom Noel, resigned May 16th, after having been at the organization just two years.[241]

MORE ERCOT INDICTMENTS

The bribery and corruption scandal resulted in more indictments, guilty pleas and convictions in 2006. More details also emerged about the corruption allegations. According to reports, ERCOT's chief information officer, Kenneth Shoquist, took $120,000 in checks from DSS Group, a company owned by an ERCOT co-worker Stephen Wallace. Shoquist had encouraged ERCOT to hire Wallace, who, in turn, billed ERCOT for work that was never done. Shoquist also was responsible for hiring co-defendants Christopher Uranga, Christopher Douglas and Carlos Luquis, according to prosecutors. Texas Attorney General Greg Abbott said each of these men used their positions within ERCOT to misapply funds.[242]

In January, Wallace and Luquis were indicted. Wallace received a 12-year prison sentence.[243] Luquis was fined $10,000, ordered to pay $205,000 in restitution[244] and received 12 years in prison. In March, Shoquist pleaded guilty to organized criminal activity relating to commercial bribery. He received eight years in prison and was ordered to pay more than $100,000 in restitution. John Cavazos, a non-employee contractor, also pleaded guilty. He was sentenced to four years probation and paid $8,700 in restitution. Uranga, ERCOT's former director of information technology, agreed to pay restitution exceeding $500,000.[245] Christopher Douglas, ERCOT's former chief financial officer, cooperated with the investigation. He served 90 days in jail and received nine years probation.

THE PUC REJECTS ERCOT MARKET PROTECTIONS

"In August, the PUC abandoned various rules designed to guard against manipulation of the ERCOT market."

In August, the PUC abandoned various rules designed to guard against manipulation of the ERCOT market. For instance, it rejected rules that limited bids in the balancing energy market to no more than $1,000 per megawatt/hour. Under the revised rules, the limits gradually would increase to $2,250 in 2008, and then to $3,000 after the completion of the nodal system. The PUC also abandoned a 2003 rule designed to limit payments to generators that otherwise would have benefitted from the submission of anti-competitive "hockey stick" bids.[246] Additionally, the "shame caps" enacted in 2005 that had required the quick and public disclosure of certain information about companies that sold spot market power at elevated prices were abandoned.[247] These rules originally had been implemented to give the PUC additional tools to guard against market manipulation and to discourage hockey stick bidding, which had helped undermine the California energy market during 2000 and 2001. However, the PUC, as mandated by Senate Bill 408 (adopted by the Texas Legislature the year before), also drafted rules setting forth the establishment of an independent market monitor for the ERCOT wholesale market. It selected Virginia-based Potomac Economics to fulfill that role, and tasked the company with reviewing transactions in the balancing energy and ancillary services markets with an eye toward identifying market inefficiencies and opportunities for market manipulation. Potomac Economics was also charged with recommended changes to ERCOT's rules in the event that it identified design flaws. ERCOT would fund the independent market monitor's operations, but would not have authority over its monitoring and investigative activities.[248]

The PUC selected Potomac (from six applicants) in part because the company had previously served as an advisor to the agency. In July, for instance, Potomac released a report finding that "current market rules and procedures are resulting in systematic inefficiencies." However, Potomac also had found that changes in market

"Current market rules and procedures are resulting in systematic inefficiencies."

"PUC Commissioner Julie Parsley suggested flatly that ERCOT appeared insensitive to the public. 'They should review every expenditure and say, "Would a ratepayer of the state of Texas think this was a good expenditure?"' she said. Parsley characterized ERCOT as an arm of the state — and said the organization should act accordingly. 'They're using public funds, they should at least have public sensibilities,' said Parsley."

rules had reduced the cost of resolving local congestion on power lines by 4 percent over the last year. Potomac also put great faith in the nodal market for correcting other problems it had identified.[249]

But nodal implementation remained remote, and costs continued to rise. In March, the ERCOT board voted unanimously to recommend creation of a new electricity surcharge to pay for its ongoing development efforts.[250] At the time, planners were saying they would need $125 million for just the *initial* work[251]— or about twice the earlier estimates for the project's *complete* implementation.[252] The ERCOT board in March also authorized ERCOT to borrow up to $20 million to finance the nodal project until such time as the PUC had approved a cost-recovery plan. Nearly a half million dollars had already been spent on program implementation.[253] Pursuant to a PUC order, implementation was now scheduled for January 1, 2009 — well beyond the original implementation target for the fall of 2006.

Rising expenditures and lax business practices appeared to be a perennial problem for ERCOT. During the contentious legislative hearing that preceded Schrader's resignation, PUC Commissioner Julie Parsley suggested flatly that ERCOT appeared insensitive to the public. "They should review every expenditure and say, 'Would a ratepayer of the state of Texas think this was a good expenditure?' " she said. Parsley characterized ERCOT as an arm of the state — and said the organization should act accordingly. "They're using public funds, they should at least have public sensibilities," said Parsley.[254]

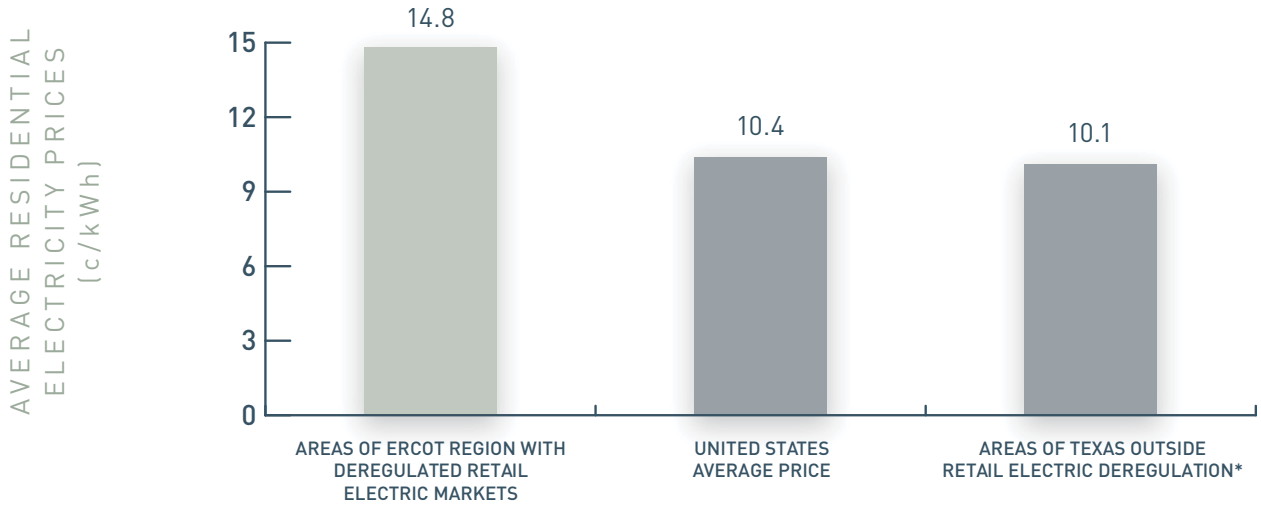
THE RETAIL MARKET IN THE ERCOT REGION CONTINUES DELIVERING SUBPAR PRICES DURING 2006

Continued inefficiencies in the state's deregulated market showed up in 2006 where it hurts the most: in home electric bills. According to information from the United States Energy Information Administration, the average price of electricity among deregulated providers in the ERCOT region was more than 42 percent higher than the average price nationwide. By contrast, the average price of electricity in areas of Texas outside deregulation — including average prices among municipally-owned utilities and electric cooperatives — was nearly 3 percent lower than the national average. This followed a trend, starting in 2003, in which prices in deregulated areas of the ERCOT region remained substantially higher than the average price nationwide.

Also in 2006: retail electric providers charging average prices below the national average served less than one-tenth of one percent of residential consumers in the deregulated regions of the ERCOT market. The other 99.96 percent were getting power from retail electric providers charging more than the national average.[255]

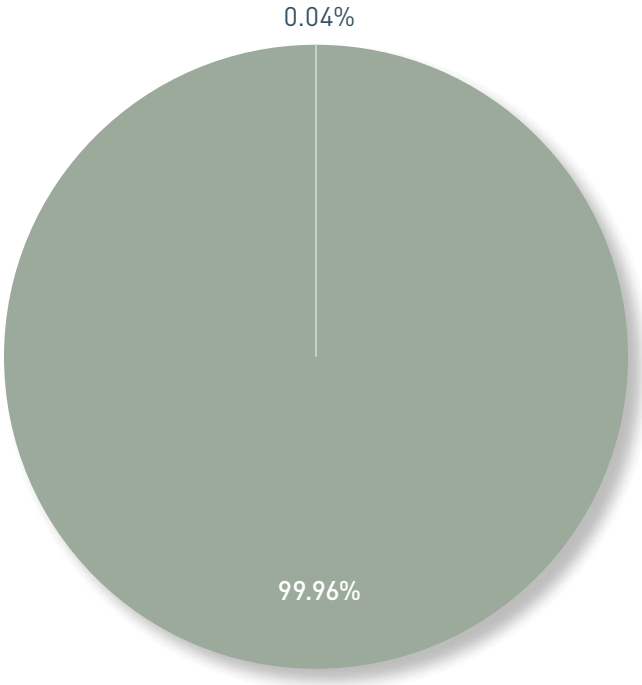
AVERAGE RESIDENTIAL ELECTRICITY PRICES

ERCOT REGION, AREAS OUTSIDE DEREGULATION, UNITED STATES, 2006



*Areas outside deregulation include municipally-owned utilities and cooperatives.
Source: United States Energy Information Administration:
http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

RESIDENTIAL ELECTRIC SERVICE IN THE ERCOT REGION FOR 2006



Less than one-tenth of one percent of Texans in deregulated areas of the ERCOT market were served by REPs with average prices below the national average.

CUSTOMERS OF RETAIL ELECTRIC PROVIDERS CHARGING AVERAGE PRICES BELOW THE NATIONAL AVERAGE: 1,917

CUSTOMERS OF RETAIL ELECTRIC PROVIDERS CHARGING AVERAGE PRICES ABOVE THE NATIONAL AVERAGE: 5,263,034

YEAR: 2007

MARKET MANIPULATION IN THE ERCOT WHOLESALE MARKET?

With size comes an ability to control prices, and the PUC's own staff had previously concluded that TXU was so large that its bids would sometimes set wholesale spot prices – whether it was TXU's intention to do so or not.[256] Such market dominance is bad news for consumers, who end up paying higher prices as a result. But the ERCOT grid operator is not equipped nor charged with guarding against manipulation. "The operator does not make a decision based on price – the main concern is reliability, not price," said Parviz Adib, formerly the director of the PUC's market oversight division.[257]

Three significant developments in 2007 highlighted persistent concerns over manipulation in the ERCOT market, and the potential fallout to consumers.

» *In March 2007, the PUC staff announced it had found evidence that TXU had committed serious violations of market rules and, as a consequence, recommended a fine of $210 million. If it had been approved, it would have represented the largest such fine in Texas history.*[258] *The proposed fine related to alleged unfair trading practices in 2005 that had resulted in an estimated $20 million in undue profits for the company. Outside experts hired by the agency concluded "TXU's behavior constitutes market power abuse."*[259]

» *In April, a former TXU employee alleged in a lawsuit against the company that his supervisors had encouraged him to engage in market-manipulation type behavior and that "ERCOT is so ignorant that they would never figure out what TXU was doing."*[260] *The former employee alleged that he and other employees were told by their supervisors "to make particular units unavailable" when filing daily reports with ERCOT about the company's available power.*[261] *Because of a few basic facts about electricity, that sort of withholding can dramatically drive up prices.*

» *In April, balancing energy prices in the wholesale market spiked on multiple occasions to the $1,500 per megawatt-hour regulatory cap. Adib, then-director of the PUC's market oversight division, noted that a relatively small generator submitted bids that might have been considered manipulation had they been submitted by a larger player. Adib also said that market rules enforced by ERCOT allowed smaller players to engage in certain bidding practices that would be unacceptable for larger players. Proving manipulation "is such a difficult thing" and as a result "you rarely see fines," he said.*[262]

IS THE ERCOT WHOLESALE MARKET SUFFICIENTLY COMPETITIVE?

Is the ERCOT market truly competitive? Troubling evidence has emerged over the years that design flaws have allowed companies to sometimes act like monopolists and make money hand over fist at the expense of consumers. Regulators, for instance, have found that, at times, a single company has the ability to unilaterally impact prices — no matter the pricing strategies of competitors. There have been anti-trust lawsuits filed in federal court and the ERCOT market has frequently experienced wholesale and retail prices well above those one expects from a market with healthy competition.

IN 2007, AVERAGE RESIDENTIAL PRICES IN DEREGULATED AREAS OF ERCOT WERE 32 PERCENT HIGHER THAN THE NATIONAL AVERAGE.[263]

However, guarding against market abuse can be difficult. First, consider that electricity cannot be efficiently stored which means that grid operators must exactly balance consumption and generation to avoid blackouts. Electricity is also absolutely essential for the public's health and welfare. Taken together, these factors may lead to sellers getting the benefit of the doubt in any close-call questions of market manipulation. The transmission system in Texas was not created with deregulation in mind, but rather, built to serve the geographically-limited service territories of the former monopoly utilities. ERCOT's transmission system is also largely disconnected from the rest of the nation, which means that generators in Texas do not face competition from outside the state.

It may not be so surprising then that large generation companies in Texas can often fetch prices well above their cost of service. As noted by one regulatory expert, "the lack of competition (in ERCOT) has created wholesale prices well above marginal cost."[264]

TROUBLING EVIDENCE OF A REOCCURRING LACK OF COMPETITIVENESS IN THE ERCOT MARKET INCLUDE:

- *Companies in 2003 engaged in questionable trading practices in Texas very similar to those that helped undermine the California market during that state's energy crisis. Known as "hockey stick" bidding, the practice in that instance cost the market an extra $17 million, according to a PUC report. It also led to the bankruptcy of a competitive electric provider.*[265]
- *The PUC issued a report in 2004 that determined that TXU (now Luminant) was often a "pivotal" supplier, meaning that it had the ability to unilaterally set prices in the spot, or balancing energy market — regardless of the actions of its competitors. "The result of this study shows that TXU's market position is so pivotal that just about anything the company does with respect (to that segment of the wholesale market) will affect balancing energy prices, regardless of the reasons behind its decisions," the study said.*[266]
- *TXU engaged in activities during 2005 that led the PUC staff to recommend that the company pay fines of $210 million for market power abuse.*[267]
- *As late as 2006, TXU controlled 23 percent of generation in the overall ERCOT market — not just in the North Texas zone where the company is located.*[268] *That TXU exceeded what is generally considered the statutory limit on generation capacity within the overall ERCOT market was made possible because the Texas Legislature in 1999 exempted older gas-fired plants from such considerations.*[269]
- *A report from 2007 cited evidence that TXU, at least in the then-recent past, had been a pivotal supplier about half the time in the ERCOT region. Also, a separate company in 2007 acknowledged engaging in practices in Texas that appeared very similar to hockey stick bidding, which has been found to violate market rules elsewhere in the nation.*[270]

Given these realities — and the fact that the ERCOT system operator is not charged with watching out for market abuse — one might expect extra vigilance from policymakers. But there is also evidence that policymakers have passed up opportunities for reform:

- *The Texas Legislature rejected proposals during successive legislative sessions that would have placed further limits on the concentration of generation capacity within ERCOT. Proposals that would limit the ability of companies with less capacity to engage in questionable trading practices have been similarly rejected.*
- *As noted previously, the PUC staff recommended a $210 million fine against TXU for anti-competitive behavior. But the PUC ended up assessing only a $15 million fine in that case, which is even less than the approximately $19 million profit that the company reportedly reaped from its improper behavior.*
- *The PUC, in a self-evaluation report released to the Texas Sunset Advisory Commission in 2009, noted that it had not conducted a single investigation for market power, market design, or anti-competitive behavior during the 2008 fiscal year.*[271] *The independent market monitor (the independent market watchdog created by Senate Bill 408 in 2005*[272]*) also has not assessed any fines in any market power case between 2007 and 2008.*[273]
- *Regulatory caps intended to guard against price spikes increased to $2,250 per megawatt hour — which is far in excess of the $1,000 seen in other U.S. markets. Under Commission rules, that cap will increase to $3,000 early in 2011.*[274]

TRANSMISSION CONSTRUCTION: THE NEW GOLD RUSH?

As part of an earlier legislative mandate, the Commission in 2007 continued the process of designating broad "Competitive Renewable Energy Zones," or CREZs. These zones, located in the Panhandle and West Texas, were meant to encourage wind development by marking the site of future transmission construction. Wind developers who chose to build in a CREZ zone knew they would not lack a transmission link to the major metropolitan areas. But in early 2007, even as regulators were moving forward with this initiative, no one was yet sure how much the new CREZ lines would eventually cost — not even the PUC. Some estimates put the tally at $5 billion. "But what is known is higher transmission and (other) charges associated with new wind generation will increase the electricity costs paid by all Texans," said Jeffry Pollock, testifying on the issue on behalf of the Texas Industrial Energy Consumers.[275]

The aggressive ramp up of wind power also created reliability challenges for ERCOT, which must keep the demand and consumption of power balanced on the grid at all times.[276] According to ERCOT estimates, wind blows only about 35 percent of the time — and typically not during the hottest part of the day, when the power is most needed.[277] Also, the wind is unpredictable. When it stops blowing, ERCOT is left scrambling for replacement power. This meant that even with the new wind power and the expensive transmission lines, Texas would continue to depend upon construction of fossil fuel-fired plants to provide backup power.

The expensive new CREZ projects were not the only transmission lines contemplated in 2007 by the PUC and ERCOT. Separately, the construction of roughly $6.1 billion in new transmission lines needed to improve grid efficiency was under consideration. Policymakers were also considering another $1 billion of construction to allow a regulated utility in southeast Texas to connect to the ERCOT region, although those interconnections were eventually put on hold.[278]

NEW CEO

Bob Kahn, who had served as deputy manager of Austin Energy, took over ERCOT on July 9th as its newest chief executive officer, under a five-year contract. Kahn was the organization's fourth CEO since 2000.[279] Of his three predecessors, two left under fire.

YEAR: 2008

NODAL COSTS CONTINUE TO RISE

"But the PUC contracted with experts associated with the same company (Tabors Caramanis & Associates), which had produced the first cost-benefit analysis that had been widely off the mark. That Tabors Caramanis was so optimistic about the development of a nodal market might not be so surprising given that the firm's president, Richard Tabors, helped develop the theories upon which nodal markets are based. By contrast, the American Public Power Association, an independent public interest group, had found in a separate study that the benefits of nodal markets had been exaggerated by supporters."

The ERCOT board voted in early January to add another $62 million to its budget for the nodal transition project. That would bring the total price tag to $311.3 million[280] — up from the most recent estimate of $248.9 million (and the original estimate of less than $100 million). The ERCOT board also requested a 34 percent hike in overall fees.

In May, ERCOT officials announced another indefinite delay in the nodal project, saying the organization was forced to push back the start-up date because a vendor had failed to deliver required software.[281] Six months later, on the day before Thanksgiving, ERCOT announced additional delays and another cost increase. It was now estimated the project would not be ready before the end of 2010,[282] and the cost would be an estimated $660 million.[283] That is eight times greater than the original cost estimate.

"When do we pull the plug on a bad deal? Do you wait until you've blown a billion dollars?" asked a perturbed Senator Chris Harris during a legislative hearing. Lawmakers also received word that ERCOT had signed open-ended contracts with some of its vendors, which gave the organization little leverage when vendors failed to meet performance goals.[284]

Responding to these mounting concerns, the PUC called for an updated cost-benefit analysis.[285] But the PUC contracted with experts associated with the same company (Tabors Caramanis & Associates), which had produced the first cost-benefit analysis that had been widely off the mark. That Tabors Caramanis was so optimistic about the development of a nodal market might not be so surprising given that the firm's president, Richard Tabors, helped develop the theories upon which nodal markets are based.[286] By contrast, the American Public Power Association, an independent public interest group, had found in a separate study that the benefits of nodal markets had been exaggerated by supporters. According to the public utility group, nodal systems did not save money for consumers in those states where they were already implemented.[287]

DROP IN WIND POWER NEARLY CAUSED BLACKOUTS

A sudden and near total drop off in wind, coupled with other factors, nearly caused statewide blackouts on February 26. Energy from wind production had dropped from about 1,700 megawatts to less than one-fifth that amount during a short period, prompting ERCOT system operators to cut power to large business customers who had agreed in advance to receive interruptible service. ERCOT Vice President for System Operations Kent Saathoff said the near blackout demonstrated the reliability challenges associated with the state's increasing reliance on wind power.[288]

But rapid wind energy development in Texas nonetheless continued. In May, for instance, Dallas billionaire investor T. Boone Pickens announced plans to purchase 667 wind turbines to serve what he said would be the world's largest wind farm in the Texas Panhandle.[289] His company, Mesa Energy, was to purchase these multi-billion-dollar turbines from General Electric, a company that had earlier advised ERCOT that aggressively ramping up wind power would not raise serious reliability problems for the Texas grid.[290] Luminant, the power generation unit for Energy Future Holdings (formerly TXU Corp.), also announced plans to team with Shell WindEnergy to build a 3,000-megawatt wind farm.[291]

"Combined together all this new transmission would cost ratepayers an estimated $9.1 billion – or more than $400 for every man, woman and child served by ERCOT."

According to a 2008 report, wind plants in Texas were expected to receive at least $1.8 billion in local tax breaks and credits over the following decade.[292] A separate report estimated that wind developers already received about $23 in federal tax incentives for each megawatt of power they produce.[293] That is almost 100 times greater than the per-megawatt incentives received by the operators of natural gas-fired plants.[294] Through the Competitive Renewable Energy Zone process, ratepayers throughout ERCOT would also subsidize at least $4.9 billion in new transmission lines to be built specifically to serve wind generators.

That CREZ development process[iii] remained on track in 2008, with ERCOT releasing a study in April that compared four alternative CREZ scenarios. The least ambitious would cost about $3 billion. The most ambitious would cost about $6.4 billion.[295] The PUC eventually settled on a mid-range plan at an estimated cost of $4.93 billion. This new expense was to be added to the roughly $1.2 billion in non-wind related transmission upgrades already completed in 2008, and the roughly $3 billion in non wind-transmission

[iii] *Recall that the Legislature in 2005 called for the establishment of these renewable energy zones (again, referred to as CREZ zones) to spur the construction of transmission lines to wind farms in West Texas and the Panhandle.*

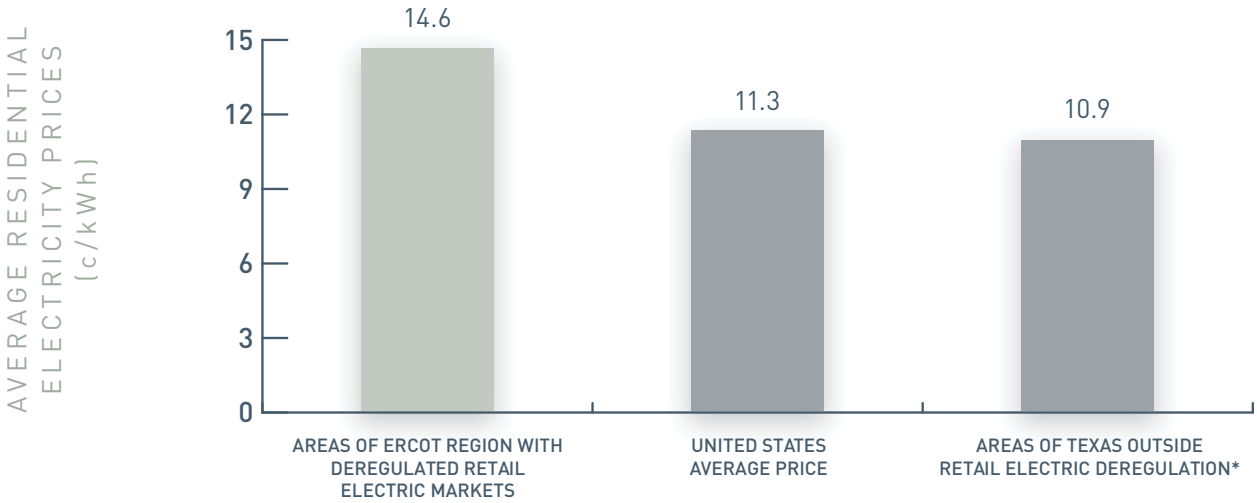
"More than 99.9 percent of retail electric providers in Texas were selling electricity at prices above the national average."

contemplated for the next five years.[296] Combined together all this new transmission would cost ratepayers an estimated $9.1 billion – or more than $400 for every man, woman and child served by ERCOT.

But Texans inside the ERCOT region were already paying too much for electricity. According to federal data, Texans taking power from competitive suppliers paid 29.3 percent above the national average during 2008. By contrast, Texans living outside deregulation paid nearly 3 percent less than the national average. Also in 2008: more than 99.9 percent of retail electric providers in Texas were selling electricity at prices above the national average.[297]

AVERAGE RESIDENTIAL ELECTRICITY PRICES

ERCOT REGION, AREAS OUTSIDE DEREGULATION, UNITED STATES, 2008



*Areas outside deregulation include municipally-owned utilities and cooperatives.
Source: United States Energy Information Administration: http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

PRICE SPIKES CONTRIBUTE TO FAILURE OF RETAIL ELECTRIC PROVIDERS

On March 1, as per a 2006 PUC order, a new $2,250 cap went into effect in the ERCOT spot market. Although designed as a limit to potentially sky-high wholesale electricity prices, the new cap nonetheless represented an increase from the previous ERCOT cap, and was more than double similar caps in other electric markets.

"The April and May spikes did not occur during the hottest part of a summer day — when such spikes might be more expected — but rather during the afternoon and during the middle of the night, which raised more questions about competitive defects in the wholesale market."

On March 3, just two days after it went into effect, prices spiked to the new limit. A generator that controlled less than 5 percent of the market offered the astronomically high-cost electricity with bids that ended up setting the price for all accepted bids during three separate 15-minute intervals.[298] One month later, even more serious price spikes occurred — this time setting prices that actually exceeded the $2,250 limit. This ended up contributing to the financial ruin of five electric retailers[iv] and, as a result, more than 42,000 customers were forced to find other electric service providers.[299] Many were dumped to the high-priced Provider of Last Resort.[300]

According to reports, the balancing energy price topped $3,800 per megawatt/hour in the Houston area on April 25, and hit $3,460 and $4,233 in Houston and South Texas respectively on May 23rd.[301] Generators in the ERCOT market could offer to sell their balancing energy electricity for no more than $2,250 per megawatt hour, but there was no prohibition against them receiving a price greater than that amount under certain circumstances. These circumstances occur, for instance, when the generation of several megawatts of power are required in order to relieve a single megawatt of congestion. In ERCOT parlance, such prices are referred to as "shadow prices," and, as noted above, can exceed the ERCOT balancing energy cap of $2,250.[302]

The April and May spikes did not occur during the hottest part of a summer day — when such spikes might be more expected — but rather during the afternoon and during the middle of the night, which raised more questions about competitive defects in the wholesale market.[303]

"The last several weeks have been challenging," said PUC Chairman Barry Smitherman during an emergency meeting to discuss the market failures. ERCOT officials acknowledged that software shortcomings played a role.[304] To address the problem, the organization instituted various protocol changes intended to give it greater flexibility in addressing congestion. Also, at the PUC's direction, ERCOT implemented new rules to create a true "price" cap, as opposed to an "offer" cap.[305] That meant that balancing energy prices could no longer top $2,250 per megawatt hour, no matter the effect of shadow pricing.

[iv] *National Power in Houston, PreBuy Electric from Bridgeport, Denton-based E-tricity (also known as HWY 3 MHP LLC) , Riverway Power and Blu Power of Texas.*

YEAR: 2009

THE 81ST TEXAS LEGISLATURE

"Constituents were complaining about electric rates that had soared above the national average."

Gathering in Austin for the 81st Texas Legislature, lawmakers in 2009 promoted bills requiring ERCOT to abandon the over-budget and behind-schedule nodal project.[306] The bills required a top-to-bottom review of the organization's operations and management, and also required ERCOT to dramatically change its board structure. Some lawmakers pointed to the organization as part of the problem with deregulation generally. Constituents were complaining about electric rates that had soared above the national average. "People are not happy with their electric bills – they don't understand why in 10 years of deregulation they are paying higher bills than they were under the regulated system." said state Representative Jim Keffer, author of some of the legislation.[307]

"2009 marked the seventh straight year under the deregulation law in which residential prices remained stuck above the national average."

In fact, 2009 marked the seventh straight year under the deregulation law in which residential prices remained stuck above the national average. For much of this period, electric prices within Texas, but outside of deregulated areas, remained below the national average. Residential electricity prices had been consistently below the national average prior to the adoption of the deregulation law in 1999.[308]

AVERAGE RESIDENTIAL ELECTRICITY PRICES

ERCOT REGION, AREAS OUTSIDE DEREGULATION, UNITED STATES, 2009

*Areas outside deregulation include municipally-owned utilities and cooperatives.
Source: United States Energy Information Administration:
http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

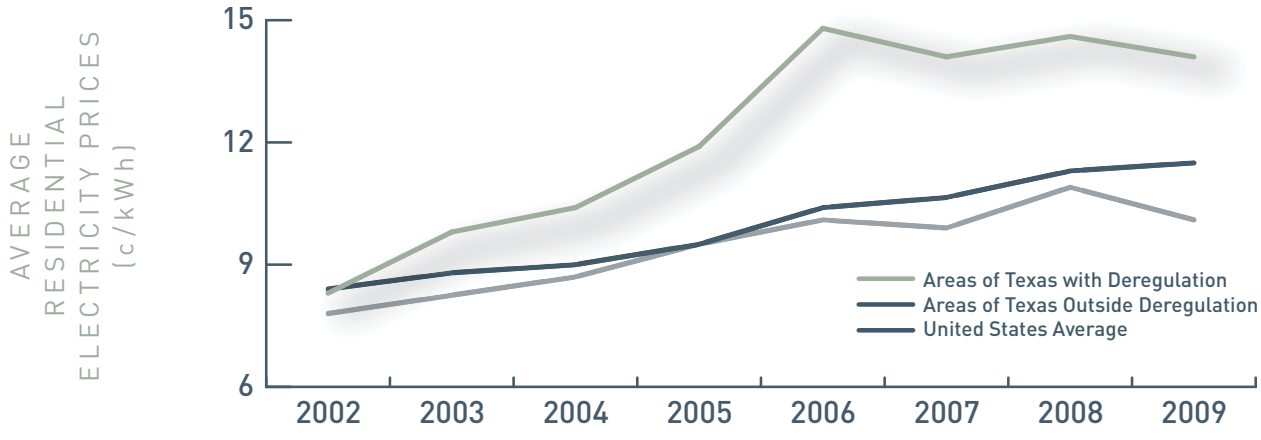
"Under the guidance of Representative Solomons, lawmakers included in Senate Bill 2 a requirement that ERCOT come under special review by the Sunset Commission in 2010. The conclusions of that Sunset "special purpose review" are expected to form the basis for ERCOT-related legislation to be filed for the 2011 legislative session."

Some of the ERCOT-related bills that could have helped consumers were designed to address ongoing concerns over market manipulation. For instance, one bill by Representative Keffer would have put new limits on market share by generators. Both Keffer and Representative Burt Solomons, chairman of the House State Affairs Committee, pushed separate bills to give the PUC greater authority to assess fines in market manipulation cases. State Representative Todd Smith and state Senator Rodney Ellis also sponsored legislation to create more transparency within the ERCOT spot market. Their legislation was pegged to an American Association of Retired Persons ("AARP") study showing that with more market transparency, Texas electric consumers could potentially save nearly $1 billion annually — or more than $50 per year for the average household.[313]

But despite bold pledges of reform, most of the ERCOT-related legislation failed due to industry pressure or as a result of unrelated political maneuvering. One exception, however, was an amendment added to Senate Bill 2, a bill that more generally related to the operations of the Sunset Advisory Commission. Under the guidance of Representative Solomons, lawmakers included in Senate Bill 2 a requirement that ERCOT come under special review by the Sunset Commission in 2010.[314] The conclusions of that Sunset "special purpose review" are expected to form the basis for ERCOT-related legislation to be filed for the 2011 legislative session. Lawmakers also adopted House Bill 1783, likewise sponsored by Solomons, that requires ERCOT to broadcast its board meetings on the Internet.[315]

TEXAS RESIDENTIAL ELECTRICITY COSTS

AREAS INSIDE AND OUTSIDE DEREGULATION



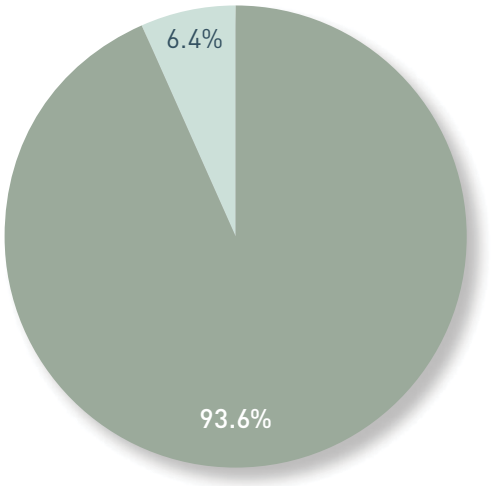
Source: United States Energy Information Administration: http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

Average prices in competitive areas of Texas have remained consistently above the national average in the years Texas deregulated its retail electricity markets. Meanwhile, prices in areas outside deregulation have remained consistently below the national average.

RESIDENTIAL ELECTRIC PRICES - 2009

UNDER DEREGULATION

More than 93 percent of Texans served by deregulated providers were served by companies charging ABOVE the national average.

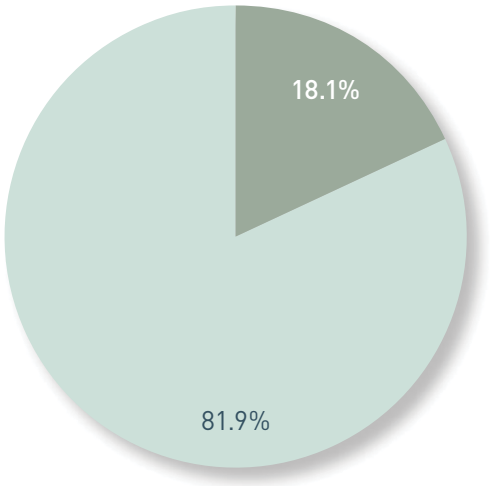


CUSTOMERS OF DEREGULATED PROVIDERS WITH AVERAGE PRICES ABOVE THE NATIONAL AVERAGE: 5,074,781

CUSTOMERS OF DEREGULATED PROVIDERS WITH AVERAGE PRICES BELOW THE NATIONAL AVERAGE: 348,027

OUTSIDE DEREGULATION

More than 81 percent of Texans outside deregulation were served by providers with prices BELOW the national average.



CUSTOMERS OF NON-DEREGULATED PROVIDERS WITH AVERAGE PRICES ABOVE THE NATIONAL AVERAGE: 736,788

CUSTOMERS OF NON-DEREGULATED PROVIDERS WITH AVERAGE PRICES BELOW THE NATIONAL AVERAGE: 3,325,216

ELECTRIC PRICES FROM DEREGULATED ELECTRIC PROVIDERS FAIL BY COMPARISON

Approximately 57 percent of residential electric customers in Texas receive power from deregulated providers.[309] All other Texans receive power from investor-owned electric utilities operating outside the ERCOT region, municipally-owned utilities or electric cooperatives. According to an analysis of data gathered by the federal government, Texans served by deregulated providers consistently pay more for electricity than Texans served by non-deregulated providers. This has been true for every year for which the data is available.[310] In 2002, the first year of the retail deregulation law, Texans served by competitive providers paid nine percent more for electricity than Texans served by providers outside deregulation.[311] In 2009 the difference was even greater, at 16 percent.[312]

Moreover, the vast majority of Texans served by deregulated providers were served by companies charging average prices higher than the average price nationwide. The opposite was true for Texans served by providers exempted from the deregulation law. On average, customers of municipally-owned utilities, cooperatives and regulated investor-owned utilities paid less than the national average. And while rates in both regulated and deregulated areas in Texas have declined since 2008 – largely due to the decrease in the price of natural gas – the decline has been much more pronounced in areas of Texas without deregulation (see the chart on page 81). This suggests that deregulated retail providers in the ERCOT region do not react as nimbly to changing market conditions as do providers exempted from the deregulation law.

ANOTHER ERCOT CEO RESIGNS

In September, ERCOT CEO Bob Kahn announced his resignation, effective in November. It is "the right time to leave," Kahn told board members. Neither the CEO nor the board offered much by way of explanation. Kahn had been the successor to the embattled Thomas Schrader, who had left in 2007 under criticism.[316] The board named H.B. "Trip" Doggett, ERCOT's chief operating officer, to serve as Kahn's interim replacement during the executive search process.[317]

TEXAS SURPASSES ENERGY RECORDS

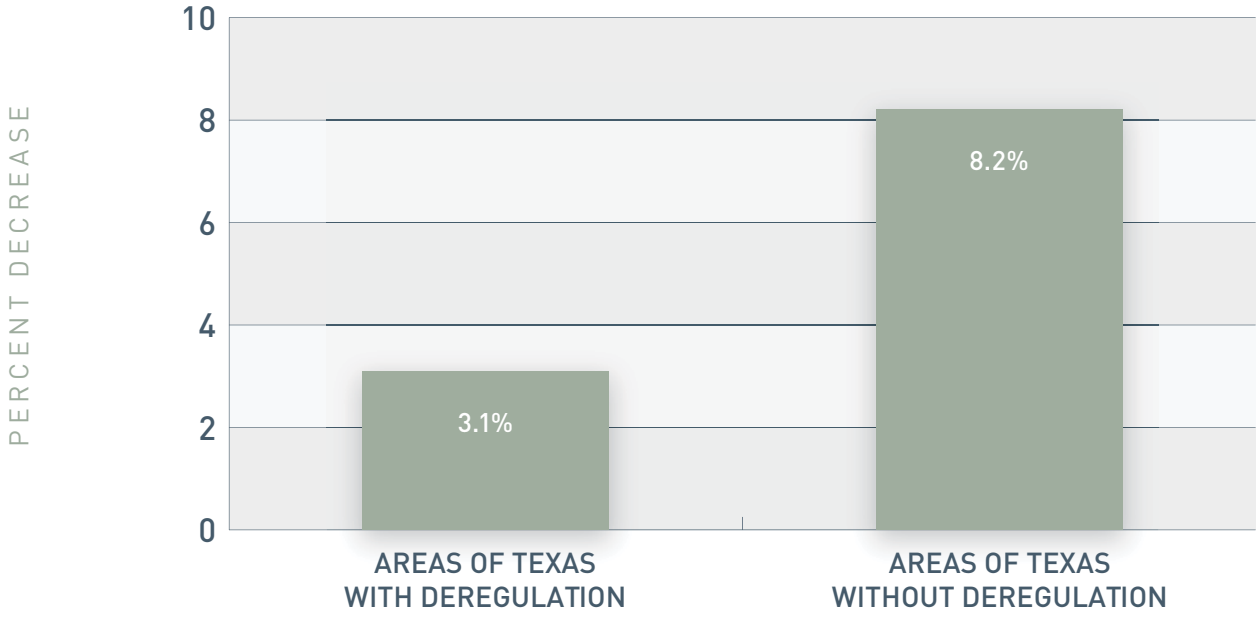
Texas energy consumption continued to increase during 2009, with the state hitting a new record. Largely the result of the summertime use of air conditioners, demand on July 8 reached 62,786 megawatts. The previous record was 62,339 megawatts, set just a few weeks earlier. As a result of this high use and unexpected outages of power plants, ERCOT also called upon Texans on July 8 to conserve energy. ERCOT said that undisclosed generators capable of producing 4,400 megawatts of power had gone offline.[308]

Texas surpassed another record on the evening of October 28. At precisely 8:19 p.m. Texas wind generators hit the 6,223-megawatt mark, which was the most wind power ever produced and successfully absorbed by the ERCOT grid. Wind power accounted for about 17.5 percent of all energy flowing across the grid at that time.[319] Earlier in the evening, wind power had accounted for an even greater proportion of total load — about 25 percent.[320]

The increasing development of wind power in Texas attracted the attention of FERC Chairman Jon Wellinghoff, who said policymakers should consider linking the ERCOT grid to other states. "If Texas could be more strongly interconnected to the Midwest, for example, they could integrate even more wind into the system," said Wellinghoff. ERCOT is wholly located within the boundaries of Texas and has very limited connections with outside grids, which makes it free from most federal oversight. Wellinghoff said that he understood the concern of many Texas policymakers that more connections could lead to federal control of ERCOT, but he insisted that such a takeover was not FERC's intention.[321]

Also in 2009, T. Boone Pickens, the billionaire Texas oilman, announced his intention to scale back his much publicized plans to build the world's largest wind farm in Texas. Part of the problem was the drop in natural gas prices, he said. In an interview with the Dallas Morning News, Pickens said that he had already ordered an initial round of wind turbines (from his plan to purchase nearly 700 from GE), and that officials with his Mesa Energy were considering locating them in various sites in addition to Texas – including Wisconsin, Oklahoma and Kansas.[322]

2008-2009 RESIDENTIAL ELECTRICITY PRICE DECLINES (TEXAS)



Source: United States Energy Information Administration: http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

DEREGULATED MARKET IN TEXAS IS SLOWER TO RESPOND TO CHANGING CONDITIONS, AS COMPARED TO PROVIDERS IN REGULATED AREAS.

Although residential electric prices declined in Texas in 2009 (as compared to prices in 2008), they, nonetheless, remained in 2009 above the national average. The decline was largely due to changes in the commodity cost of natural gas, which is used to fuel many of the state's generating plants. As the exhibit above illustrates, residential prices declined at a rate more than 2.5 times greater in areas of the state without deregulation, as compared to areas with deregulation. This indicates that the deregulated market within the ERCOT region was much less nimble in its response to changing conditions, as compared to providers in areas of Texas that remained regulated.

YEAR: 2010

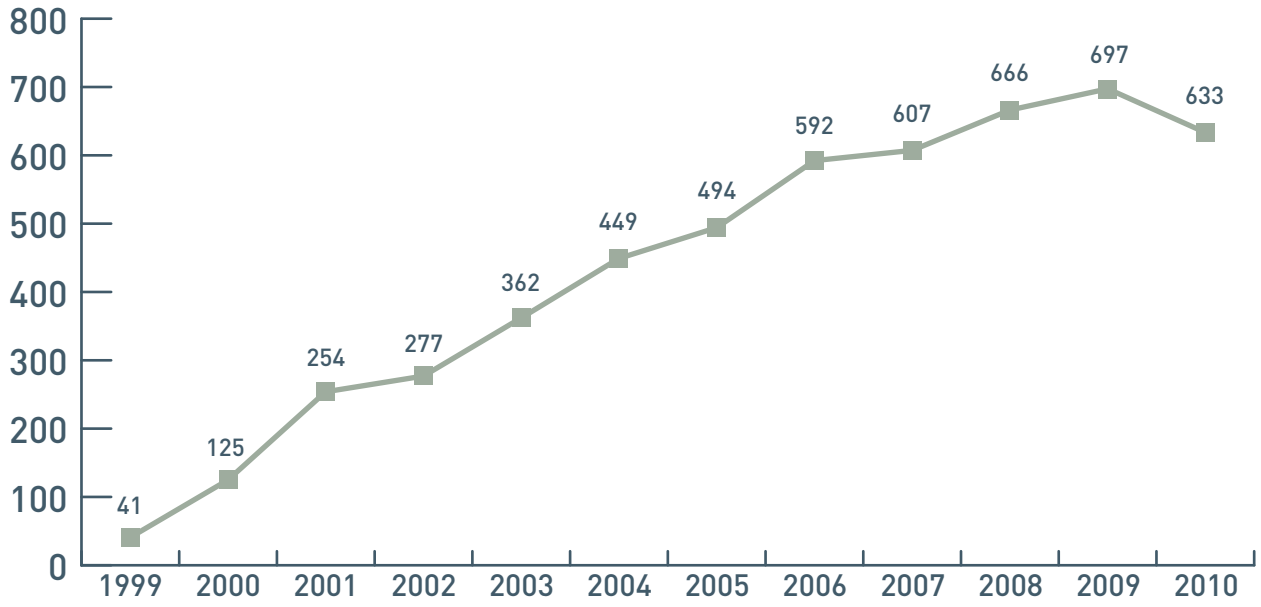
RAMPING UP TO NODAL

"'Most interviewees believe that ERCOT needs to upgrade its people, but is hampered by broken performance management process, compensation issues, and excessive leadership turn-over,' noted the consulting firm."

A package of ERCOT reforms, including proposals for the PUC to exercise more oversight over the organization's spending and borrowing, was endorsed by a special legislative panel in May. The panel, known as the Sunset Advisory Commission, has responsibility for the legislative reauthorization of various state agencies. The Sunset Advisory Commission's recommendations to oversee ERCOT's spending paralleled those favored by many consumer organizations.[324]

In specific terms, the Sunset panel in May agreed to recommendations that would require ERCOT to obtain pre-approval for its annual budget from the Public Utility Commission. The reforms also would mandate that ERCOT obtain pre-approval from the PUC for all uses of debt. The reforms endorsed by the Sunset panel will become the subject of state legislation in 2011.[325]

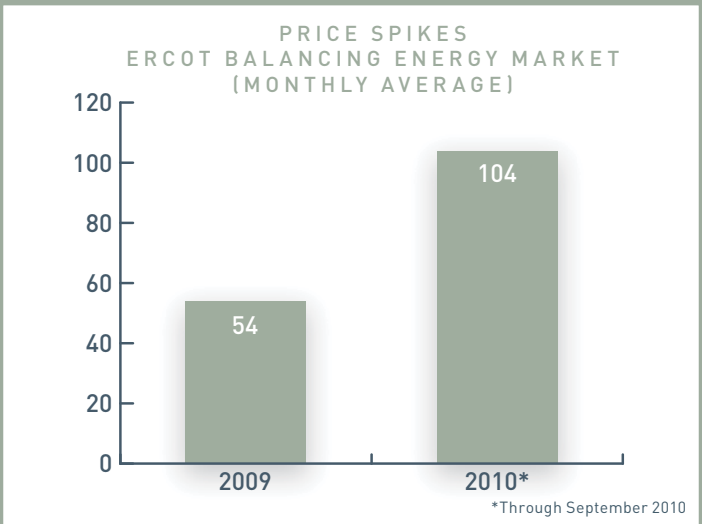
ERCOT EMPLOYEES BY YEAR



The ERCOT workforce has grown by more than 400 percent over the last decade.[323]

RECORD NUMBER OF WHOLESALE PRICE SPIKES IN 2010

When the PUC declares that prices have spiked, they are referring to very dramatic increases – prices at least 1,700 percent higher than fuel costs. On average, there were 54 such spikes in the state's spot market for energy during 2009. But during the first nine months of 2010, that average more than doubled – to an average 104 spikes each month, according to a PUC draft report. The sharp increase was due largely to a record number of spikes in August, including one spike in which a $2,200 megawatt-hour price was recorded.[329] *Typically, such spot energy sells for $50 per megawatt-hour or less.*

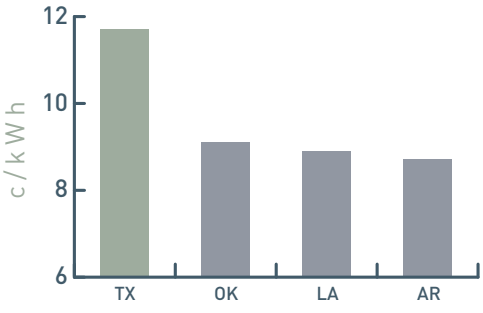


Source: Report to the 82nd Texas Legislature, Scope of Competition in Electric Markets of Texas (Draft), January 2011, Page 44

"Price spikes account for a small portion of total intervals, but they have a significant impact on overall price levels," the PUC noted in the draft report. The agency reported that the spikes raised the average price for spot energy by 18 percent in 2009 and 19 percent in 2010.[330] *Although energy on the spot market makes up just 5 to 10 percent of all wholesale energy in Texas, the price of spot market energy nonetheless impacts overall wholesale energy prices.*[331] *Dramatic price spikes also can impact what home consumers pay to light their homes.*

AVERAGE RESIDENTIAL PRICE OF ELECTRICITY

YEAR TO DATE
(AS OF SEPTEMBER 2010)



Source: United States Energy Information Administration
http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

In June a company hired by ERCOT to review its management practices recommended additional reforms at the organization. The company, known as "Market Reform," said ERCOT needed a much smaller board, and one in which the majority of members were independent from the industry. The consulting company also described the overall organization as over-staffed with "dead wood" and said that ERCOT had personnel who suffer from "skill deficits."

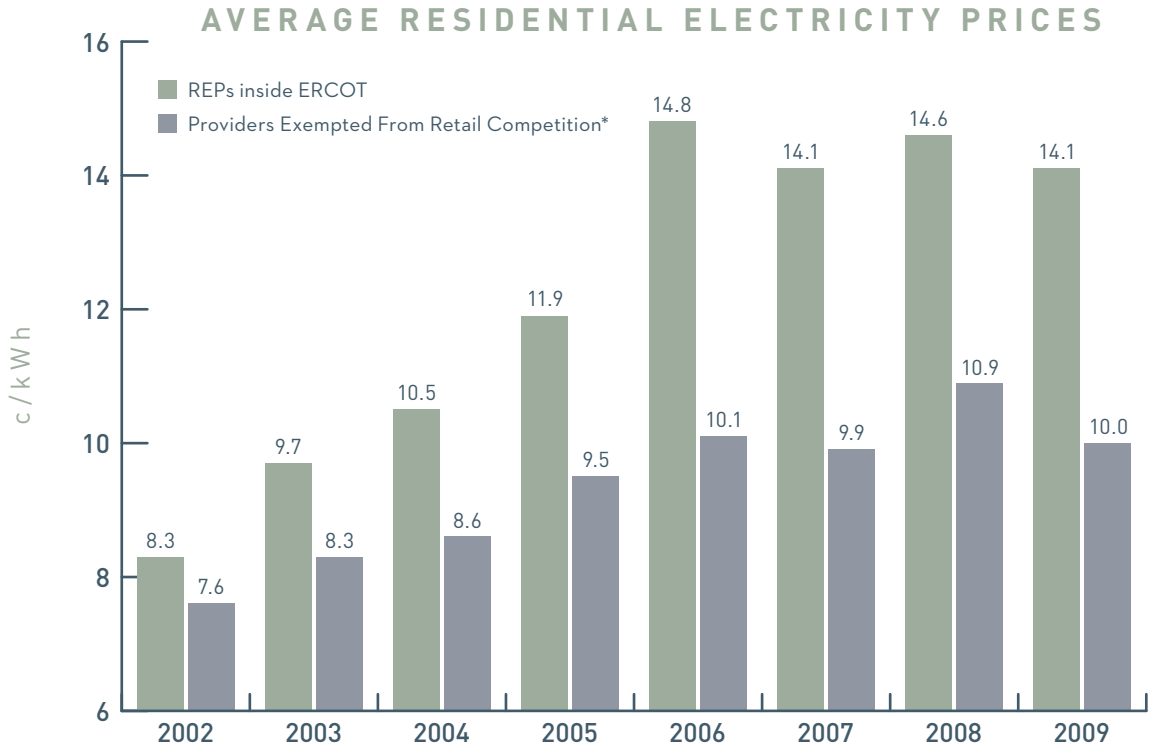
"Most interviewees believe that ERCOT needs to upgrade its people, but is hampered by broken performance management process, compensation issues, and excessive leadership turnover," noted the consulting firm.[326] In producing the document, the management consultants interviewed ERCOT board members, ERCOT staff, commissioners of the PUC, and various industry representatives. The company suggested that ERCOT reduce its staff from around 700 to about 534.[327] Four months later ERCOT announced less extensive layoffs – about 37 positions, or a staff reduction of about 5.5 percent.[328]

THE ERCOT RETAIL MARKET

"Had electric prices remained at the national average – not below it, just at it – Texas residential consumers would have saved more than $11 billion since the implementation of deregulation, according to the federal data."

Electric prices in Texas were down in 2010, as compared to peaks hit in 2008 and 2009. According to most recently available year-to-date data in November 2010, residential prices had decreased by about 8.3 percent in Texas from 2008.[332] This decline, however, is due to a precipitous drop in the price of natural gas. Natural gas prices largely determine the price of electricity in the ERCOT market. This means that when natural gas prices go down – as they have with the downturn in the economy during 2009 and 2010 – so too does the price of electricity.

Nonetheless, residential prices in Texas remained stuck above the national average for much of 2010, as they have in past years.[v] This was in contrast to many years prior to the passage of the deregulation law when residential prices were consistently below the national average. Electricity prices in Texas also remained higher

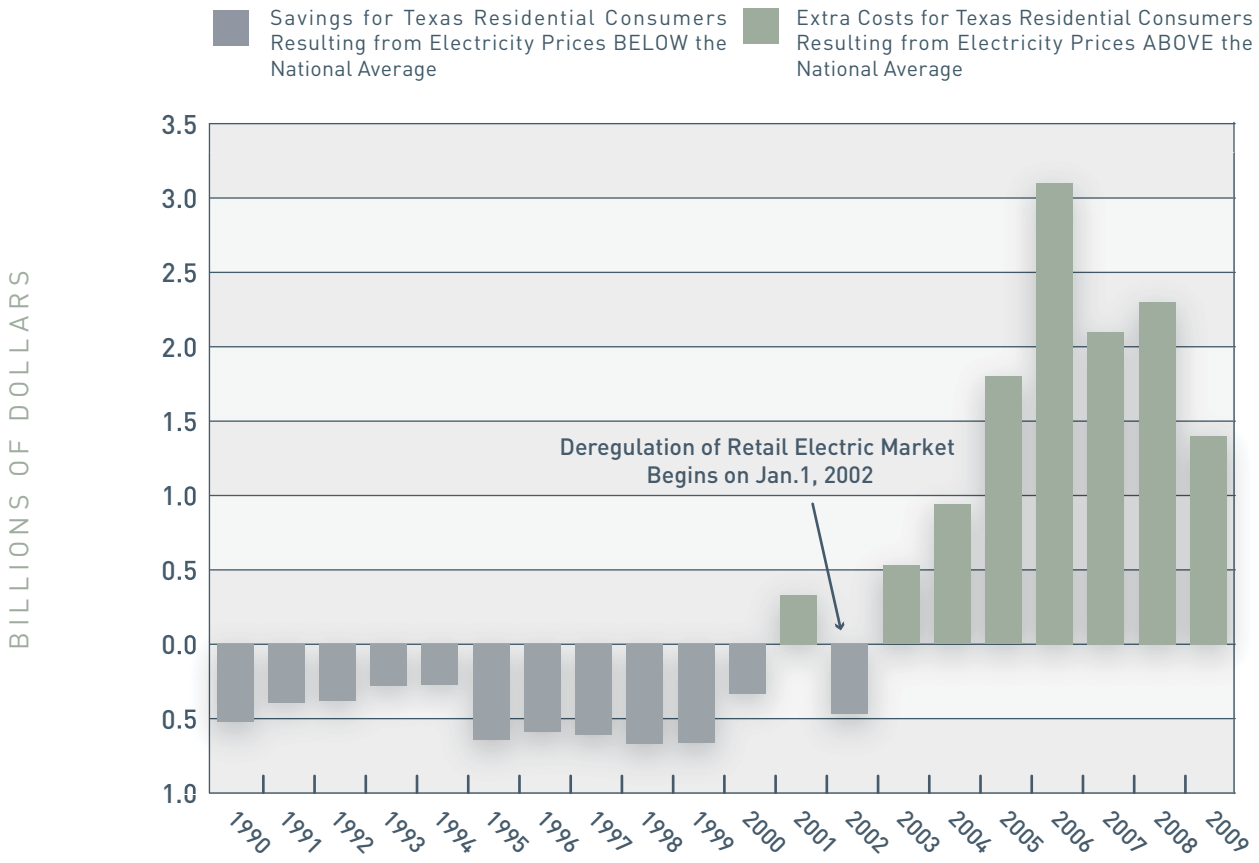


**Regulated investor utilities, municipal utilities and electric cooperatives inside and outside ERCOT*

[v] *According to the latest available data as of November 2010 from the United States Energy Information Administration (http://www.eia.doe.gov/cneaf/electricity/page/eia826.html), the average year-to-date price for residential electricity in Texas was 11.96 per kilowatt/hour, while the average year-to-date price nationwide was 11.45 cents per kilowatt/hour*

THE PRICE OF INEFFICIENCY

HIGH ELECTRIC PRICES DURING DEREGULATION HAVE COST TEXAS RESIDENTIAL CONSUMERS MORE THAN $11 BILLION



Source: United States Energy Information Administration: http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

The green bars represents the annual extra expense to Texas residential consumers each year caused by paying above the national average for electricity. Had electric prices remained at the national average after the adoption of the retail electric deregulation law, Texans would have saved more than $11 billion. That's money that could have been spent on other priorities.

DID YOU KNOW?

There have been 6,593 circuit miles and $4.4 billion in transmission improvements added in the ERCOT region since 1999. Another 2,888 miles are currently under study.[337] Many of the proposed transmission lines will serve wind generators in West Texas and the Panhandle, rather than being used to directly relieve pressure on lines connecting metropolitan areas such as Houston and Dallas.

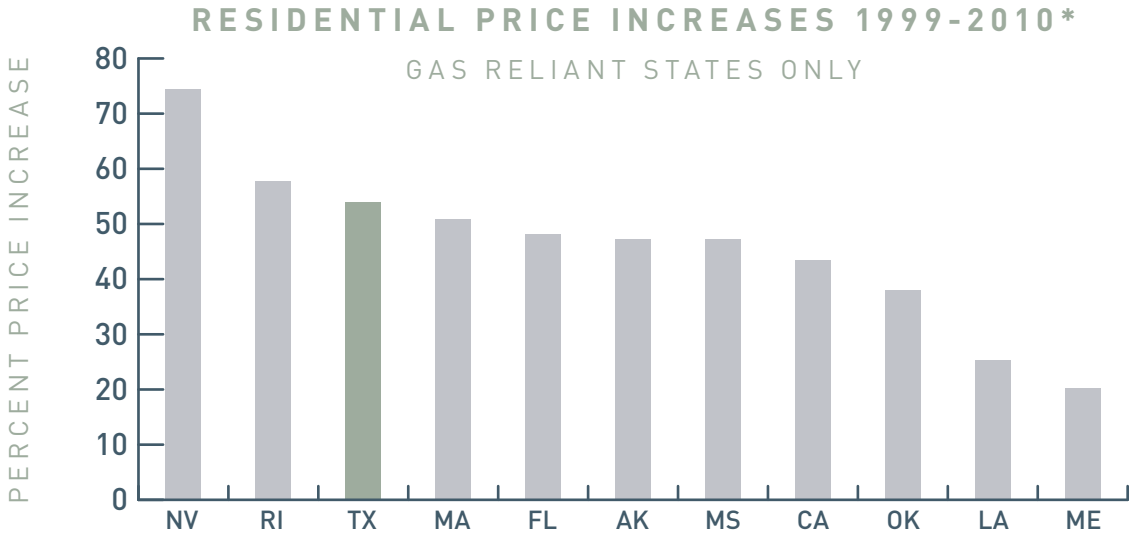
than prices in neighboring states, even higher than in those states that also rely heavily upon natural gas to fuel their power plants.[333] Between 1999 and the first six months of 2010, Texans suffered greater increases than residents in all but six other states, according to federal data.[334] Had electric prices remained at the national average — not below it, just at it — Texas residential consumers would have saved more than $11 billion since the implementation of deregulation, according to the federal data. The entire market — commercial, industrial and residential customers — would have saved $15.5 billion had prices remained at the national average. In the 10 years leading up to the deregulation law, all groups of Texas consumers collectively paid $17.6 billion less than the national average.[335] Price increases in Texas, from 1999 through much of 2010, also outstripped price increases in most other states with deregulation.[336]

NODAL

The ERCOT board on October 19 certified that all the new systems for the proposed nodal market were sufficiently operational, and could begin operations before the end of the year. ERCOT engineers had already conducted 37 weeks of technical trials, including one test that lasted 168 hours. Although engineers managed to identify and resolve many of the problems, more remained. "(But) none of the remaining issues are significant enough to prevent moving forward with the implementation of activities," said ERCOT chief operating officer Mike Cleary.[338]

The plan now was for "soft launch" on Nov. 15, and a full-scale launch of the nodal market on Dec. 1. During the soft launch various non-essential aspects of the new system market would begin operations. However, ERCOT would continue to simultaneously operate the existing zonal system.[339] "Rather than a helicopter take-off, we want a runway takeoff," said Cleary. On Nov. 30th, the ERCOT market generated its last traditional zonal price.[340]

The PUC had originally contemplated nodal would go live by the fall of 2006.[341] The original price tag was also predicted to be less than $100 million.[342] Now it was four years and a half a billion dollars later and still the nodal market was far from perfect. The defects referenced by ERCOT's chief operating officer would remain at least through 2011.[343] Concerns also arose about nodal's possible impact to retail electric providers and consumers. One analyst warned that those electric retailers that failed to sufficiently prepare for new risk from the nodal market could default, or push extra costs onto consumers.[344] He also noted that some retailers in 2010 had even added language to contracts that could allow them to charge customers for extra nodal-related costs.[345]

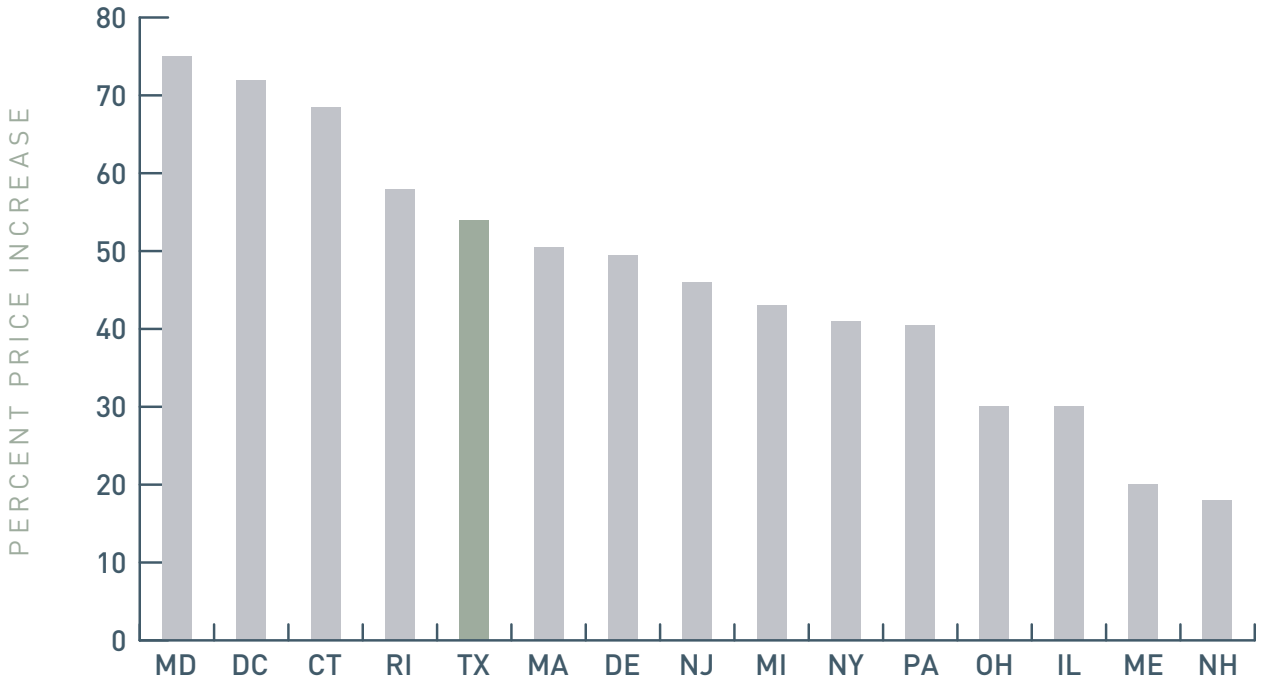


*Through September 2010

Source: United States Energy Information Administration: http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

RESIDENTIAL PRICE INCREASES 1999-2010*

STATES WITH DEREGULATED RETAIL ELECTRIC MARKETS



*Through September 2010

Source: United States Energy Information Administration: http://www.eia.doe.gov/cneaf/electricity/page/eia826.html

Preparing for the unexpected, the PUC also agreed to temporary wholesale power offer caps for the first 45 days of the nodal market. Under the new rule, generators could not offer their power into the nodal market at prices that exceeded either the greater of $180 per megawatt-hour or a multiplier related to the price of natural gas.[346] Although this temporary cap would permit wholesale spot market prices to rise to levels somewhat higher than those typically found in the ERCOT market, it should nonetheless guard against the $1,000 spikes that rocked the market shortly after the implementation of retail deregulation in 2002. Even larger spikes contributed to the failure of several retail electric providers in 2008.

After the temporary cap expires in early 2011, a new cap comes into place that will allow offers as high as $3,000 per megawatt hour. That's three times the level of similar caps in power markets elsewhere in the United States.[347] On Oct. 29, just one month before the go-live date, ERCOT filed an application with the PUC to reallocate a portion of its nodal budget to the "stabilization" of the new market in 2011. The organization estimated that it would complete the project at approximately $92.5 million less than the full budgeted amount.[348] However, even with the adjustment, the nodal transition will cost nearly seven times more than the original estimate considered by the Commission in 2004.[349]

TRANSMISSION-ASSOCIATED COSTS CHANGE IN 2010

The operation of the state's transmission system has an indirect cost on home electric bills. For instance, transmission utilities in Texas charge fees for the use of their lines, A correlation also exists between the transmission system and the cost of wholesale electricity. Regulatory changes and other developments during 2010 had an important impact on the assessment of these costs.

TRANSMISSION SERVICE PROVIDERS

In August 2010, the Commission adopted new rules that give the state's transmission utilities the authority to seek or adjust special surcharges twice per year.[350] Unlike traditional transmission rates that are set after an examination of the utility's overall revenues and expenditures, these surcharges receive less substantial review and relate narrowly to expenditures for new capital investments. Such expenditures can include depreciation costs, federal and state taxes, and the application of the utility's authorized rate-of-return. The transmission utility can seek such an interim surcharge (known as Transmission Cost Recovery Factor, or "TCRF") even if its overall revenues are on the rise, or even if other expenditures are declining.

These costs do not flow directly to the end-use customer, but rather are assessed to the distribution utility, which is the company that operates the poles and wires that connect to individual homes. (This is in contrast to the transmission utility, which generally operates larger lines.) The distribution utility then passes on the TCRF surcharge to the retail electric provider, which in turn passes it along to the home customer.[351]

PRICES IN THE NODAL MARKET

In December 2010, the state's new nodal market became operational. While energy prices in this market are not, in themselves, transmission costs — the prices nonetheless correlate to the operations of the transmission system. That's because the nodal market is sensitive to congestion on transmission lines. During periods of high congestion, prices at nodes tend to be higher. At nodes with no congestion, prices tend to be lower. These costs flow indirectly to home customers, but not through the distribution utilities, but rather through entities representing retail electric providers, municipal utilities and others that have contracted to schedule power on the transmission grid.

APPENDIX I:
ERCOT RESPONSIBILITIES*

RELIABILITY

REAL TIME GRID RELIABILITY

ERCOT is responsible for ensuring that the electric grid is reliable in real time. ERCOT's reliability functions maintain grid frequency and voltage, monitor system and equipment limitations, and manage transmission congestion. ERCOT designs and maintains grid management software.

ENERGY SCHEDULING

ERCOT oversees the scheduling of the deployment of electricity on the grid. It provides weather information and historical data to assist in developing day-ahead schedules, and evaluates and manages the schedules to maintain a balance between load and electricity generation in real time.

ANCILLARY SERVICES

ERCOT provides grid management tools that maintain the resources required to meet grid reliability goals. Examples include "Black Start" resources, which allow for a rebooting of the electric grid if there is a grid-wide generation black-out.

BALANCING ENERGY SERVICES

ERCOT oversees the Balancing Energy Services market. This market resolves real-time differences between actual load and scheduled generation by allowing the submission of bids on behalf of generators to produce more power, when needed. ERCOT then deploys the energy of the lower bidders. The organization also accepts balancing energy bids to resolve congestion on transmission lines between the four ERCOT zones.

LOAD PARTICIPATION PROGRAMS

ERCOT manages a number of programs to prevent electricity shortages and rolling blackouts. These programs provide incentives for retail, commercial, and industrial customers to reduce their electricity usage during peak-use hours, to agree to stop using power upon the request of ERCOT, and to consent to ERCOT shutting off their power when necessary to ensure grid reliability.

*Source: ERCOT.com

NERC REGIONAL RELIABILITY COUNCIL

Under the supervision of the North American Electric Reliability Corporation, ERCOT sets and enforces reliability standards.

DEREGULATED ELECTRICITY MARKET

ERCOT develops the procedures and standards governing the deregulated electricity market. ERCOT facilitates hundreds of stakeholder meetings to develop and revise its Protocols and Guides.

TRANSMISSION SERVICES

INTERCONNECTION

ERCOT exercises independent planning authority over the interconnection of new or additional generation. It collects data, develops models, and conducts economic assessments to create policies, strategies, and methodologies for the planning and reliable operation of the grid. It also facilitates new generation and customer interconnections with the grid.

OPEN PLANNING PROCESS

ERCOT hosts an open transmission planning process that permits input by interested parties. It maintains a database of all planned transmission projects with status, cost and timeline information, and leads the regional planning groups, which analyze transmission networks and make recommendations for future developments or modifications to its transmission infrastructure.

TRANSMISSION CONGESTION MANAGEMENT

ERCOT performs continuous system monitoring and dispatches resources to keep facilities operating within reliability limits. It also forecasts future congestion and analyzes projects to reduce congestion, e.g. new line construction, as well as evaluates and approves Transmission Outage requests.

MARKET OPERATIONS

CENTRAL REGISTRATION

ERCOT manages market participant data. It facilitates customer choice by transmitting switch requests and meter consumption data between Competitive Retailers (CRs) and Transmission and Distribution Service Providers (TDSPs) and keeping track of the association between premises and load serving entities.

RENEWABLE ENERGY CREDITS

ERCOT manages the Renewable Energy Credits trading program. This program allows traditional combustion-based generators to comply with Texas' renewable portfolio standard by purchasing renewable energy credits from renewable energy generators.

ENERGY LABELING ADMINISTRATION

ERCOT creates and maintains a database of Competitive Retailer's Electricity Fact Labels, which disclose the fuel mix and environmental impact of electricity sold to customers.

MARKET TRANSPARENCY

ERCOT makes public market data — balancing energy clearing prices, congestion costs, load profiling data, etc. — available online.

CLIENT SERVICES

MARKET PARTICIPANT COMMUNICATIONS

ERCOT provides notifications when there are changes to market processes, operating procedures, and the ERCOT system. It also fields ad hoc inquiries and hosts conference calls for issues involving multiple parties.

ACCOUNT DEVELOPMENT SERVICES

ERCOT provides services to assist new market participants transition into the ERCOT market. These services include: site visits, account plan development, training, contact management, and assistance with issue resolution. It also assists new market participants seeking qualification for ERCOT programs.

TRANSACTIONAL SUPPORT

ERCOT responds to inquiries by market participants, and manages dispute resolution. It also provides notifications regarding the day-to-day operations of market participants.

MEETING MANAGEMENT

ERCOT manages the voting and seating of market committees. It records and posts the agenda and minutes for all market meetings online, and surveys market participants regarding ERCOT services and targets improvement opportunities for training, communications, and process.

APPENDIX II:
NOTABLE MILESTONES IN ERCOT HISTORY

1935 » *After the passage of the Federal Power Act, which was New Deal legislation, the state's largest utilities cut their power line connections to other states in order to keep the federal government from asserting jurisdiction over their operations.*[352]

1941 » *As part of the war effort, several utilities joined together to create the Texas Interconnected System, the first real precursor of ERCOT. Through the Texas Interconnected System, utilities directed excess power to heavy manufacturing operations along the Gulf Coast.*

1965 » *A blackout in the northeastern United States and southeastern Ontario, Canada impacts 30 million people. As a consequence, the electric industry creates the National Electric Reliability Council (now called the North American Electric Reliability Corporation, or NERC) to maintain the reliability of the interstate electric transmission system.*[353]

1970 » *To comply with NERC guidelines, the Texas Interconnected System creates the Electric Reliability Council of Texas,*[354] *a not-for-profit organization then staffed by two retired utility officers. The council operated mostly without government oversight.*

1975 » *The Texas Legislature creates the Public Utility Commission of Texas.*

1981 » *The Texas Interconnected System transfers all operating functions to ERCOT, making it the central electric grid operations coordinator for Texas.*

1995 » *Texas lawmakers adopt Senate Bill 373 to deregulate the state's wholesale electricity market. The legislation allowed independent wholesale generators, power markets and utility affiliates to compete to supply wholesale power.*

1996 » *The Federal Energy Regulatory Commission, or FERC, issues Order 888, which clarifies that utilities must provide open access to transmission lines.*[355] *Order 888 also suggests the concept of impartial third-party organizations known as "Independent System Operators" or ISOs as one method of providing non-discriminatory access to transmission.*[356] *In August, in a separate action, the PUC transforms ERCOT into an "Independent System Operator."*[357] *However, unlike other ISOs created later in other areas, the ERCOT ISO is not subject to FERC oversight.*

1999 » *In May, the Texas Legislature adopts Senate Bill 7, a watershed law that allows competition in the state's retail electricity market. In July, ERCOT consolidates its ten existing control areas into a single area.*

2001

» *A pilot project to open up to 5 percent of the market to competition is scheduled to begin on June 1. However, technical problems at ERCOT cause repeated delays. ERCOT manages to begin the pilot project about two months late only by abandoning misfiring automated procedures in favor of various manual "work-arounds." Prices in the wholesale market began spiking almost immediately. ERCOT had serious problems switching customers and managing billing.*

2002

» *On January 1, ERCOT launches the competitive retail electric market, as created by Senate Bill 7. Under the deregulation system, new retail electric providers can compete for residential and commercial customers. Under Senate Bill 7, municipal utilities and electric cooperatives – approximately one quarter of the ERCOT load – remain out of the system unless they opt in.*[358] *According to an analysis of ERCOT data, approximately 35 percent of the overall electric load within Texas remains outside of competition.*[359]

» *ERCOT begins formal discussions regarding the implementation of a locational marginal pricing market, better known as a "nodal" market. Such a transition would substantially change how ERCOT addresses congestion problems on the grid.*[360]

2003

» *A blackout in August affects 40 million people in the Midwest and northeastern United States and 10 million people in eastern Canada. Like the massive blackout in 1965, it eventually leads to regulatory changes that will impact ERCOT.*[361]

» *In September, the PUC gives ERCOT the initial green light to develop a nodal wholesale market design. It was projected to be operational by October 1, 2006.*[362]

2004

» *Nueces Electric Cooperative ("NEC") becomes the first, and so far only, cooperative or municipal utility to opt into the deregulated system. NEC enrolled its first customer on September 1.*

» *ERCOT is rocked by scandal after revelations of self-dealing by high level officials and security contractors.*

» *The PUC adopts an order calling for the implementation of a nodal market by October, 2006. ERCOT tells the PUC that it will make sure that the implementation timeline is followed.*[363]

» *Consultants hired by the PUC estimate that the cost for ERCOT to create a "nodal" market system should not exceed $76.3 million.*[364]

2005

» *The Texas Legislature adopts Senate Bill 408, which calls for the demarcation of "Competitive Renewable Energy Zones" to mark the site of future transmission line construction to serve wind generators. As will be estimated in 2009, the new construction will cost billions of dollars – a cost that will be passed on to ERCOT customers statewide.*

» *In response to the previous year's scandal, lawmakers in 2005 also push legislation to reform ERCOT.*[365] *Although most of the reform measures failed, the legislature did adopt a bill to increase the number of independent representatives on the ERCOT board and to designate an independent monitor for the wholesale electricity market.*[366]

» *Partially in response to the 2003 blackout, the U.S. Congress adopts the Federal Energy Policy Act of 2005 in July. This act brings ERCOT under FERC and NERC jurisdiction for reliability purposes. Prior to the adoption of this law, ERCOT followed NERC reliability rules only on a voluntary basis.*[367]

2006

» *ERCOT comes under fire for its handling of rolling blackouts that left 200,000 Texans without power. Soon afterwards, ERCOT Chief Executive Officer ("CEO") Tom Schrader resigns.*

» *The PUC signs an order on April 5 approving the stakeholder-developed protocols for the nodal market, with a new implementation date of January 1, 2009.*

» *As part of a financing request at the PUC, ERCOT makes a preliminary request for $125 million to fund the nodal transition project. That is more than 60 percent over the original estimate. ERCOT's vice-president says development should be complete by 2008, two years later than originally anticipated.*[368]

» *As a consequence of the Federal Energy Policy Act of 2005 and a separate FERC order, ERCOT establishes an independent Texas Regional Entity with the power to impose FERC-approved penalties for violation of reliability standards.*[369]

2007

» *In January, ERCOT revises the nodal budget to $248.9 million, approximately three and a half times the original estimate.*[370]

» *Lawsuits by TXU traders and a proposed $210 million fine against the energy giant raise questions about the possibility of manipulation in the ERCOT-managed wholesale spot market for electricity.*

2008

» *The price tag for the nodal transition increases again, with the PUC approving an increased surcharge to recover an approximately $311 million budget.*[371] *ERCOT Chief Executive Officer Bob Kahn also tells the PUC that the organization cannot meet the most recently announced "go live" date of January 1, 2009 and instead will need until December 2010 to complete the project.*[372] *The additional delay puts the project four years behind the original implementation deadline set forth by the PUC.*[373]

» *A sudden and near-total drop off in the wind, coupled with the failure of several energy providers to reach scheduled production and a spike in electricity usage, nearly prompted more statewide blackouts in February.*[374]

» *Price spikes in the ERCOT market contribute to the failure of several retail electric providers.*

2009

» *In response to yet more cost overruns, the PUC authorizes ERCOT's request to spend $643 million on the nodal project. This newest budget means the nodal project will cost about eight times the original estimate. ERCOT's new spending plan also includes $58.6 million for "discretionary" spending and $77.7 million for financing costs.*[375] *Both amounts are close to the original estimated cost for the entire nodal project, which in 2004 was between $59.7 million and $76.3 million.*[376]

» *The 81st Texas Legislature rejects various customer-protection bills relating to ERCOT, including legislation that would have cancelled development of the nodal project and legislation that would have provided extra safeguards against abuses in the wholesale electricity market overseen by ERCOT. However, the legislature passes House Bill 1783 that requires internet broadcast of ERCOT board meetings.*[377] *It also adopts (during a special session) Senate Bill 2 that brings ERCOT under special review by the Texas Sunset Advisory Commission.*[378]

2010

» *Electricity prices decline from highs in 2008 and 2009. However, Texas prices remain higher than those in neighboring states, and price increases in Texas have exceeded those in most other states, including most states with deregulation.*

» *Sunset Advisory Commission in May recommends a package of reforms, including proposals for the PUC to exercise more oversight over the organization's spending and borrowing.*

» *In June a company hired by ERCOT to review its management practices described the overall organization as over-staffed with "dead wood" and said that ERCOT had personnel who suffer from "skill deficits." ERCOT later announces layoffs.*

» *On Dec. 1, after years of broken deadlines and broken budgets, the Nodal system goes live.*

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