



ERCOT Legislative Day

January 13, 2005
Texas State Capitol



Welcome

ELECTRIC RELIABILITY COUNCIL OF TEXAS

- Presenters:
 - Tom Schrader, President & CEO
 - Sam Jones, Executive VP and COO
 - Ray Giuliani, VP, Chief of Market Operations
- Staff Resources:
 - Margaret Pemberton, VP & General Counsel
 - Kent Saathoff, Director of System Operations
 - Mike Petterson, Controller

Agenda

1. Welcome and Introductions
2. ERCOT Overview
3. Background – the Texas electric grid
4. ERCOT going forward
 - a. Vision & Mission
 - b. Goals
 - Reliability & Congestion Management
 - Retail Transaction Processing Success
 - Wholesale Access, Settlement & Billing
 - Management Systems & Business Practices
 - Financial Management & Cost-Effectiveness
 - Oversight Responsiveness & Communications
5. Current issues (ERCOT as a resource)



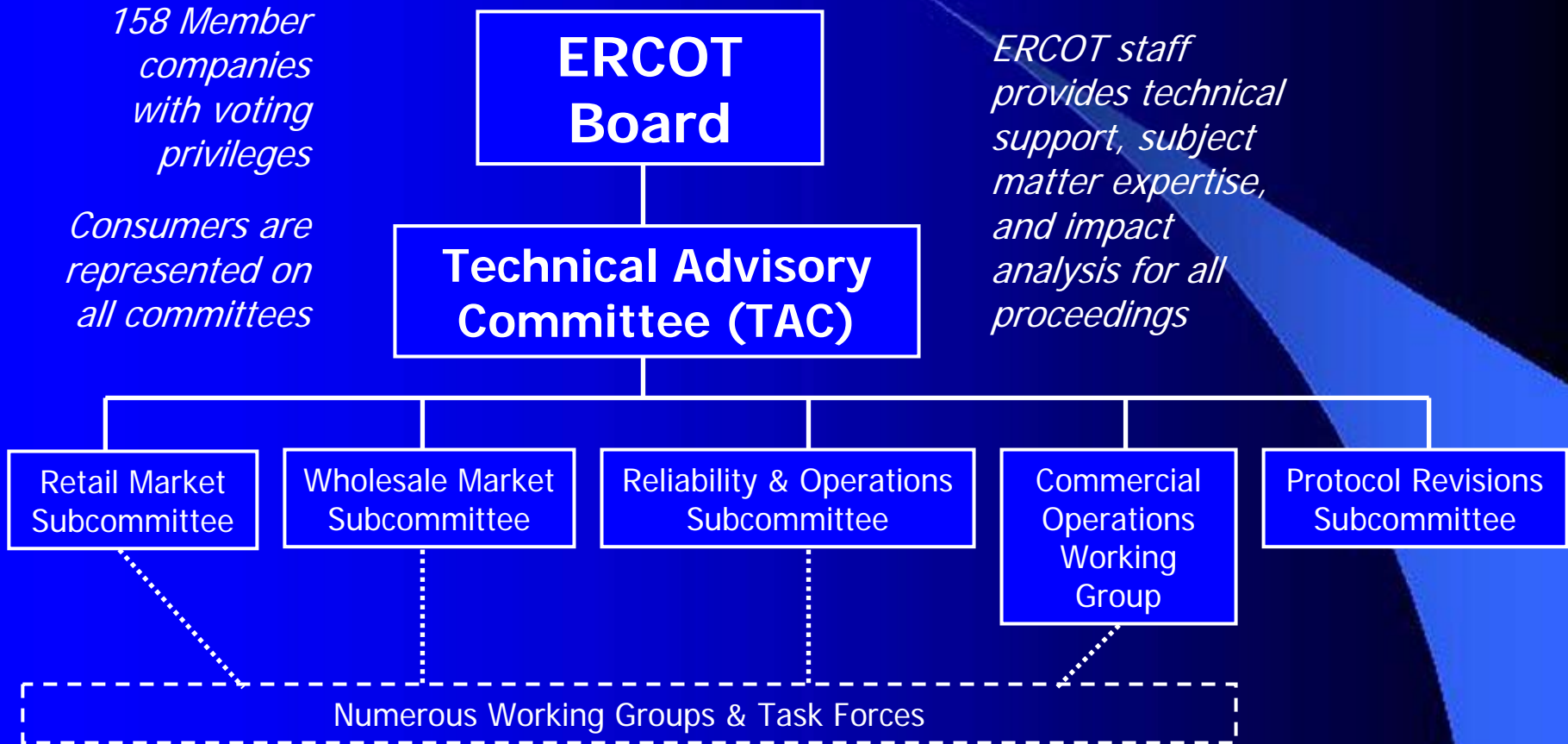
Our Commitment

For the benefit of Texas consumers, ERCOT will...

- Ensure a reliable and efficient electric system
- Provide open and fair access to electric transmission services and the competitive electricity market
- Enable robust and efficient wholesale and retail electricity markets



ERCOT Stakeholder Process





ERCOT Board Structure

14-member 'Hybrid Board'

- 6 stakeholder members selected by market participant segment:
 - IOUs
 - Municipal utilities
 - Electric cooperatives
 - Independent REPs
 - Independent Generators
 - Independent Power Marketers
- 3 consumer members
 - Industrial
 - Commercial
 - Residential (OPUC)
- 3 unaffiliated (independent) members
- ERCOT CEO
- PUCT Chair (ex-officio, non-voting)

Two-thirds majority vote required for Board action

Stakeholder Board model required by SB7 due to complexity of market startup
Governance structure has been modified over the years to fit changing circumstances



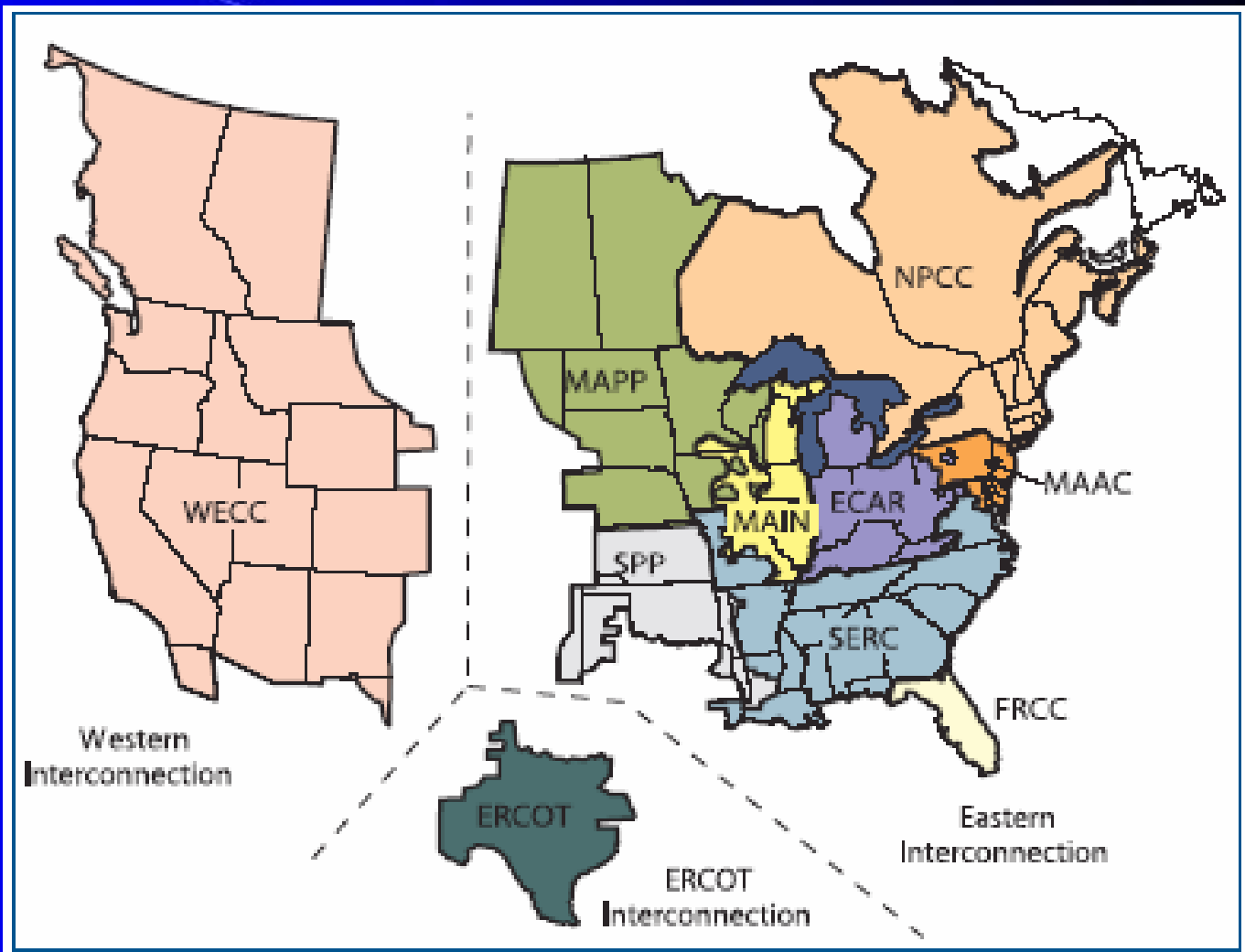
The Texas Electric Grid

- ERCOT grid covers 75% of Texas and serves 85% of Texas load
 - Assets are owned by transmission providers and generators, including municipal utilities and cooperatives
- ERCOT Region is 1 of 3 North American grid interconnections
 - Grid interconnections based on Alternating Current (AC) -- electricity flows on path of least resistance
 - ERCOT Connections to other grids limited to Direct Current (DC) ties, which allow control over flow of electricity
- Non-ERCOT parts of Texas:
 - Panhandle
 - El Paso area
 - 2 areas of East Texas

North American
Interconnected
Grids

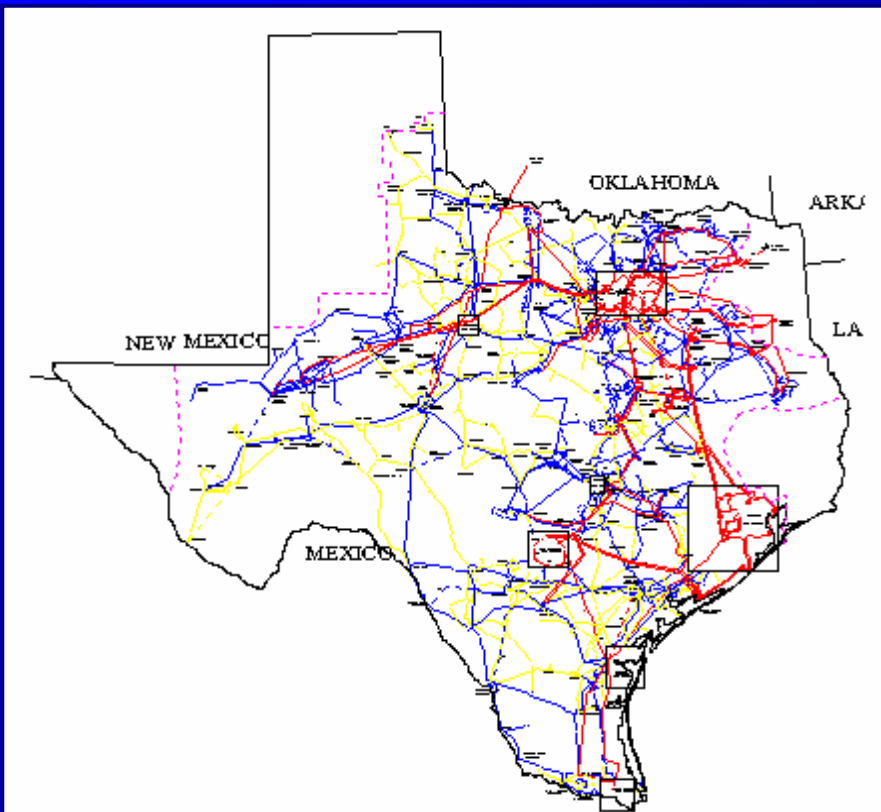
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NERC Reliability
Council Regions



ERCOT Region

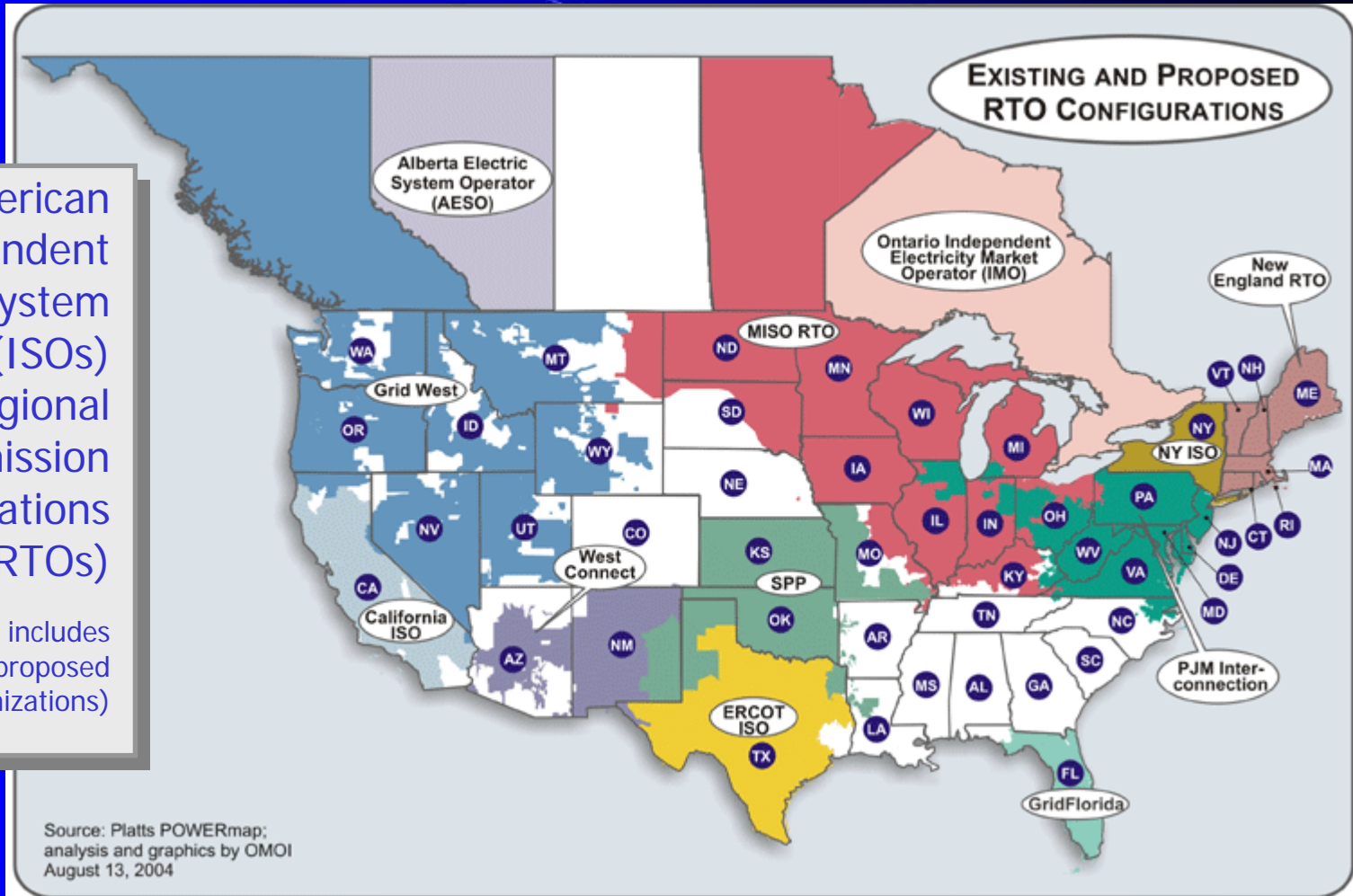
Facts & Figures



- 200,000 Square Miles
- 38,000 miles of Transmission Lines
 - Nearly 700 miles of 345 kV lines added since 1999
- 77,000+ MW of Generation
- Generating capacity has increased 47.5% since 1996
- 60,095 MW Peak Load (2003)
- Recent plant closures are reducing reserve margin
- 3 DC Ties
- Single point of control
 - Quick response to disturbances

North American Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs)

(Map includes existing and proposed organizations)



The many definitions of ERCOT

- A geographical area (region) defined by electrical facilities and customers
- Regional Reliability Council within NERC (one of 10)
- Independent System Operator (grid operator) – one of 9 in U.S. and Canada – with multiple roles:
 - Responsible for grid operations and reliability
 - Administrator of the wholesale power market (deregulated 1996)
 - Administrator of the retail electric market (restructured 2002)
 - Supervising entity for transmission planning
 - Administrator of the Renewable Energy Credit program for the State of Texas (2002)
- A term frequently used to describe the collaborative stakeholder process developing protocols & guides

ERCOT is a nonprofit 501(c)(6) corporation



Brief ERCOT History

- Texas Interconnected System (TIS) was formed during WWII to supply power to the Gulf Coast to support the war effort
 - Previously, local utilities were not interconnected
- ERCOT created in 1970 by TIS entities to comply with the developing NERC organization
- In 1981, TIS merged with ERCOT, which became the official reliability organization for the region
- ERCOT became an Independent System Operator (ISO) in 1996
- 10 control areas consolidated into single control area in 2001



ERCOT under Senate Bill 7

(76th Legislature, 1999)

As the designated independent organization, ERCOT was assigned these SB7 responsibilities:

- Ensure open access to transmission and distribution systems
- Ensure reliability -- "Keep the lights on"
- Ensure timely conveyance of information needed to support customer choice – retail switching
- Ensure accurate accounting for electricity production and delivery

Going Forward

Vision & Mission

- ERCOT's Vision is to be recognized for providing outstanding, reliable operation of the bulk electric system and for serving as a catalyst for market success.
- ERCOT's Mission is to create value for Texas electric consumers through electric grid reliability, market efficiency, and fairness.



We will accomplish our mission through...

- An open and collaborative process involving industry, consumers and regulators
- Operating performance that meets or exceeds our responsibilities as defined by NERC, the Legislature, PUC, and ERCOT Protocols
- Cost-effective use of resources to meet our obligations
- Highly qualified employees working together and with market participants and the PUC to...
 - Operate the grid reliably and cost-effectively
 - Provide accurate and timely information to support market transactions and customer choice of electric providers
 - Administer the ERCOT protocols and market rules
 - Lead the planning of cost-effective infrastructure additions to the electric grid
 - Implement sound business practices and project management processes
 - Leverage technologies to address reliability, security, and market requirements
 - Enhance wholesale market efficiency
 - Provide the predictable business and operating environment necessary to attract new industry investment by a variety of service providers
 - Meet or exceed the oversight requirements and information needs of the PUCT and Legislature

ERCOT's Goals

1. Reliability & Congestion Management
2. Retail Transaction Processing Success
3. Wholesale Access, Settlement & Billing
4. Management Systems & Business Practices
5. Financial Management & Cost-Effectiveness
6. Oversight Responsiveness & Communications
7. Organizational Readiness

ERCOT's Role in Reliability 'Job One'

- ERCOT "directs traffic" on the grid to maintain reliability
 - Coordinates scheduling of power so generation matches load at all times (Balancing Energy)
 - ✓ Electricity cannot be stored
 - Analyzes grid conditions continuously in real-time
 - Secures and deploys Ancillary Services (capacity reserves) to meet reliability requirements
 - Relieves transmission system congestion
 - ✓ Dispatches resources to solve congestion problems
 - ✓ Identifies and contracts with Reliability Must Run (RMR) resources
 - Coordinates emergency recovery
 - ✓ Identifies and contracts with 'Black Start' resources
- Ensures compliance with NERC standards
 - For TDSPs, generators and ERCOT system operators

Reliability (continued)

- Network reliability has been maintained
- DC interconnections with other grids limit effect on ERCOT of disturbances in other regions (e.g., Northeast Blackout of Aug. 2003)
 - But...also limits ERCOT's ability to procure power from other grids in an emergency
 - Overall – a plus for ERCOT and a plus for Texas
- Managing transmission congestion is a challenge
- Single control area has functioned well
- 'Never say Never!'

Issues Facing the Market: **Resource Adequacy**

- Comfortable reserve generation margin provided security to launch of market and kept prices down
 - As late as last October, margins were projected at over 20% through 2009
 - Minimum reserve for reliability is 12.5%
- Recent announcements of decommissioning and mothballing of plants are being studied and could significantly decrease projected reserve margins
- PUC open project on Resource Adequacy, to be taken up in 2005, now has more urgency

Issues Facing the Market: Fuel Diversity

Electric generation fuel sources in ERCOT

<i>Fuel Source</i>	<i>% Capacity (Dec. '04)</i>	<i>% Energy (Jan.-Nov. '04)</i>
Natural Gas	63%	38%
Dual Fuel*	10%	
Coal	19%	42%
Nuclear	6%	18%
Renewables	2%	2%

** Natural Gas or Diesel Fuel; all plants currently configured for gas*

Issues Facing the Market: Transmission Planning

- Transmission planning is a long-term reliability issue as well as an economic issue for the market
- Transmission system expansion faces competing priorities:
 - West Texas (wind power)
 - North Texas (DFW area responsible for ~50% of local congestion costs in ERCOT)
 - Rio Grande Valley
- Providers & regulators must evaluate costs & benefits
- NIMBY ('Not In My Back Yard')

Issues Facing the Market: Wind Power



- 1,300 MW of wind capacity is now online in West Texas (1200 MW since SB7)
- 550 MW more to go online in 2005

- Texas is well on its way to meeting 2,000 MW renewable mandate from SB7
- West Texas is a premium site for wind energy due to geography & weather patterns
- Wind energy not as controllable or predictable as traditional sources
 - Thermal and voltage constraints require stabilization + line capacity
- Power must be delivered hundreds of miles to population centers in the east
- Identified upgrades to transmission system could accommodate existing mandate, but not a significant increase

Issues Facing the Market: **Grid Security**

- Numerous potential causes for grid disturbances
 - Weather event
 - Multiple generator or equipment failures or line outages
 - Terrorism
- ERCOT is prepared for an emergency regardless of cause
 - Prevention & mitigation
 - Emergency curtailment plan
 - Black Start

Issues Facing the Market: **Grid Security** (continued)

- In response to homeland security issues, ERCOT has developed a Security Alert Plan
 - ERCOT communicates alert level changes to Security Response Group (Transmission Operators and Scheduling Entities)
 - May be triggered by:
 - ✓ Dept. of Homeland Security
 - ✓ NERC (Electric Sector Information Sharing and Analysis Center)
 - ✓ ERCOT can initiate independently
 - ERCOT communicates suggested security actions appropriate to the alert level
- Emergency procedures for communicating information to state government and the public are continuously under development and refinement

The ERCOT Markets

- Wholesale electric market deregulated in 1996:
 - All wholesale market participants provided equal access to the transmission system
 - Simplified transmission rates
 - Vertically-integrated utilities retained captive customer bases
 - ERCOT ISO created to oversee these activities

Restructuring Impact

Senate Bill 7 Passes in 1999

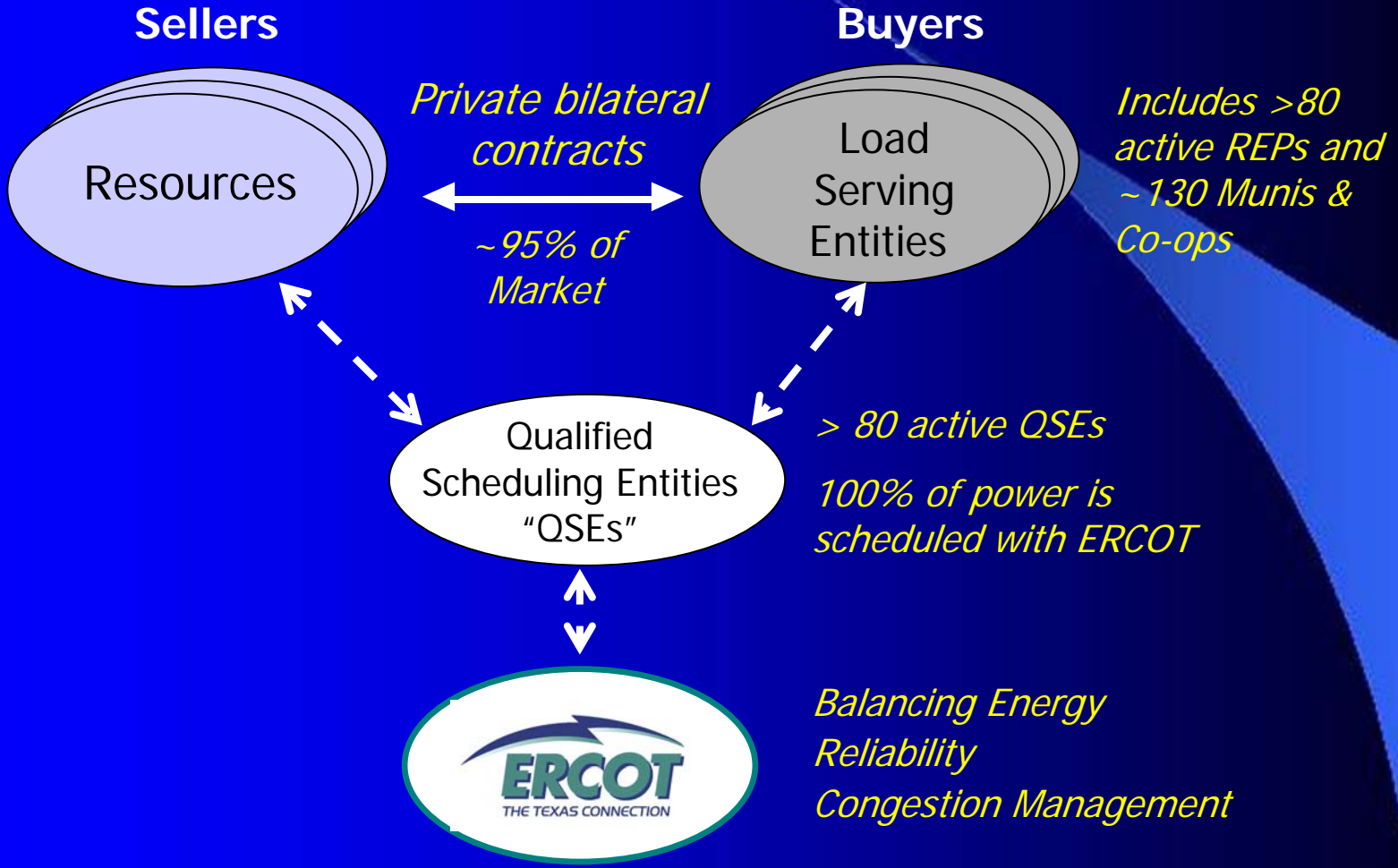
- PUC Chairman Pat Wood starts the clock:
 - 2.5 years from SB7 passage to market launch
 - Required creation of a competitive retail electricity market by 1/1/02
- Investor-Owned Utilities (IOUs) unbundled into 3 parts:
 1. Generation (with limited ownership of assets)
 2. Transmission & distribution (“wires”) – remained fully regulated
 3. Retail (customers defaulted to Affiliated Retail Electric Providers)
- Renewable Energy Mandate
 - 2000 new megawatts by 2009

SB7 & ERCOT

- ERCOT assigned “independent organization” role
 - ‘Starts’ with 40 employees operating existing wholesale ISO
- Stakeholders draft and pass Protocols
 - Thousands of hours of meetings & markup sessions
 - Creation & definition of several new Market Participant categories
- 10 control areas consolidated to 1
- Massive market systems design & build-out
 - Retail transactions
 - Wholesale Market & Scheduling (EMMS)
 - Load profiles & settlement systems
- Long hours by ERCOT staff, market participants, PUC staff and commissioners

The ERCOT Market

Bilateral Bias





GOALS: Retail Transaction Processing Success

Restructuring (SB7) Impact

- Retail Electric Providers (REPs) are now the primary point of contact for customers in areas previously served by IOUs
- Law required REPs affiliated with incumbent IOUs to charge a regulated "Price to Beat" to residential & small commercial customers in their traditional service areas
- Municipal Utilities and Cooperatives allowed to decide whether and when to opt-in to competition
 - 25% of ERCOT load is served by munis and co-ops



Retail Market

ERCOT's Unique Role

- 5.9 million customers have the "Power to Choose"
- ERCOT is central hub of retail transaction system
 - Registration agent for all of these customers and their retail providers
 - Independent, neutral entity to facilitate customer switching
 - Handles meter data for 5.9 million meters and manages financial settlement of the market
- No other ISO in North America has this responsibility
 - Neutral registration agent has been cited as a major reason for success of this market

Retail Market

Making it Work

- 'Only ISO to launch on time & on budget' (Pat Wood)
- Complex retail transaction system encountered start-up problems when the market first launched
 - Customer billing issues
 - Move-ins & move-outs – oops!
 - Reliability maintained in new system
- Intense pressure from Legislature, PUC and market to make it work
- Problems were attacked, system is functioning smoothly today
- ERCOT has completed more than 12 million transactions (switches, move-ins, move-outs, etc.)
 - Switching averaged 38,000 per month during 2004
 - Move-ins averaged 9,000 per day
- Major upgrade of system (Texas SET 2.0) implemented on schedule in 8/04 -- streamlines the move-in/move-out "stacking" challenge



Retail Market

Where We are Today

- ERCOT's centralized approach is now an acclaimed model for retail competition
- Many "moving parts" must function well (ERCOT, TDSPs, REPs)
- Billing timeliness & accuracy rates of 98-99% are now equivalent to pre-restructuring levels
- ERCOT strives to synchronize market data on a daily basis
- Challenges remain with the ability to resolve data issues on "point-to-point" transactions (between Market Participants without ERCOT involvement)



Switches: Customers Served by Competitive Retail Providers

As of 10/31/04

<u>Category</u>	<u>Customers</u>	<u>Load</u>
Residential	19%	22%
Small Non-residential	23%	60%
Large Non-residential*	63%	67%

Large customers have been free since market opened to negotiate lower rates with incumbent REPs (no Price to Beat).

* > 1MW in peak demand



Issues: Price to Beat

- Regulated rate applies to Affiliated REPs (unbundled from IOUs)
- Original PTB set at 6% below rates in effect on 12/31/01
 - Adjustable only for fuel costs, requiring PUC approval
- RESIDENTIAL:
 - AREPs must offer PTB to residential customers through 1/1/07
 - As of 1/1/05, AREPs are free to offer alternative residential pricing in addition to PTB
- SMALL COMMERCIAL:
 - More than 40% of "Small Non-Residential" load previously served by Affiliated REPs switched to competitive retailers by 1/1/04
 - AREPs no longer required to offer PTB to Small Non-Residential customers in 5 competitive choice service areas:

AREP

TXU Energy
Reliant Energy
CPL Retail
WTU Retail
First Choice

TDSP Service Area

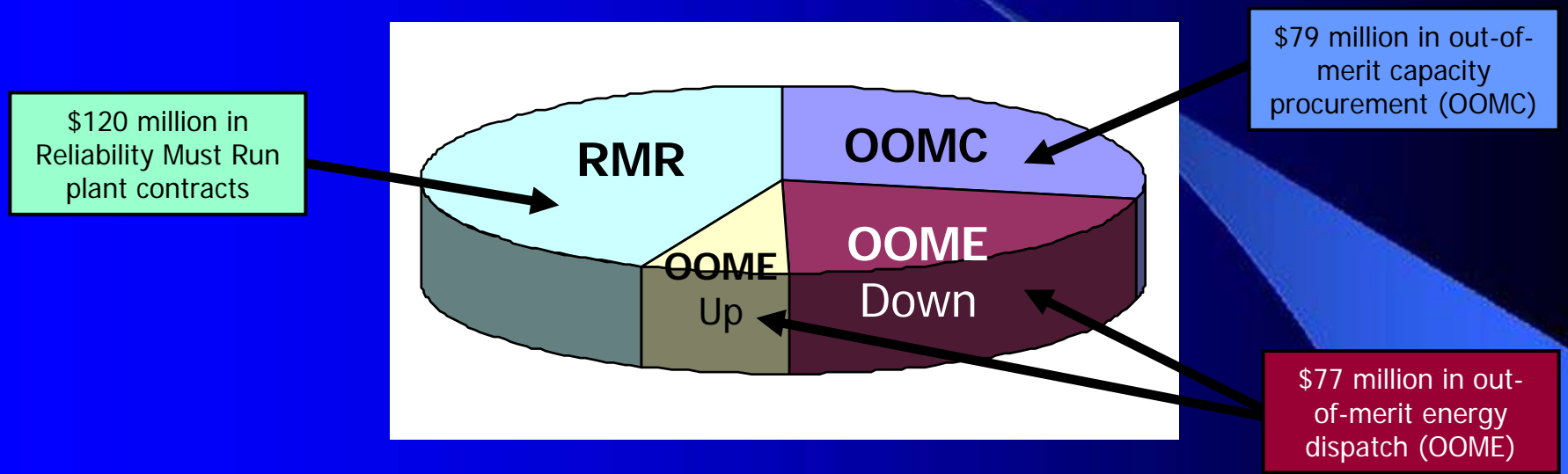
TXU Electric Delivery	DFW, Waco, Round Rock...
Centerpoint	Houston area
AEP Central	Corpus Christi, Rio Grande Valley
AEP North	West Texas
TNMP	North & West Texas, Gulf Coast

Transmission Congestion

- Overall costs of transmission congestion in the new market were higher than anticipated
- Inter-zonal congestion costs are now assigned directly to the entities causing the congestion
 - ERCOT region currently consists of 5 congestion zones
- Market participants were unable to agree on how to assign local congestion costs in the zonal market
- Local congestion costs are currently “uplifted” to (shared by) the entire market, regardless of zone
- Local congestion costs have led the PUC to consider the “Nodal” pricing model

Transmission Congestion

Local Congestion Cost Breakdown



- \$276 million in ERCOT local congestion costs in 2004
 - ~1.3% of \$21 billion market

(Complete thru Nov. '04 with Dec. numbers estimated)



Issues: Texas Nodal

- PUC Subst. R. §25.501 (9/03) requires a significant redesign of the ERCOT wholesale market
- Major features:
 - More efficient dispatch of electric generation
 - ✓ Generators would provide ERCOT more complete information about how each plant will operate each day
 - ✓ ERCOT's ability to anticipate system conditions and predict transmission congestion would improve
 - Direct assignment of the costs of transmission congestion
 - "Day-ahead" energy market
 - ✓ Help market participants meet load obligation and improve opportunities to "hedge" against real-time balancing energy costs
 - Improved market oversight with expanded ERCOT role in market monitoring
- Major objectives:
 - Allow ERCOT to assign the costs of all congestion
 - Encourage efficient location of new transmission and generation facilities
 - Add transparency to the market
 - Provide more accurate and reasonable energy pricing
 - Provide more opportunities for load participation

Texas Nodal Process Overview

- Rule requires implementation by 10/06
- PUC to decide on market design in mid-2005
- Stakeholders -- Texas Nodal Team (TNT) -- working toward consensus on details of the Nodal market design, subject to adoption by PUC
- Independent facilitators, supplemented by ERCOT staff, are leading the TNT process
 - Dozens of public meetings with web-cast access
 - ERCOT-funded cost benefit analysis (recently completed) will provide PUC with information on how to proceed with market redesign mandate
 - ERCOT has also funded contributions of independent economists
- ERCOT will file proposed Protocols, based on Board-approved white papers, that are intended to comply with the Commission's rule

ERCOT in Transition

Start-up to an Operating Organization

<i>Launch</i>	<i>Transition</i>	<i>Operating</i>
Start-up		On-going
Technology enabled	Core systems work	Customer focused
Hard driving	Assessment	Operating excellence
Make it work	Org. development	Business processes
Make it work	Change	Continuous improvement



ERCOT in the News

- Internal investigation into employee misconduct
- Employees either quit or were terminated
- Investigation turned over to DPS – looking into possible criminal actions of a few employees
 - 'Vendor irregularities'
 - ERCOT fully supportive of investigation
- Grand Jury empaneled in November
 - AG's office is prosecuting
- No compromises to grid reliability or market data

ERCOT Audits

- Audits ordered and overseen by PUC:
 - Vulnerability to hacking (CanAudit)
 - Assessment of internal controls (Deloitte)
 - Internal security procedures (Ernst & Young)
- Other audits:
 - SAS 70 -- market participant data integrity (PwC)
 - Annual financial audit (PwC)
 - ERCOT Internal Audit program (ongoing)
- No compromises to grid reliability or market data found in any of the audits



ERCOT Management Action

- ERCOT commits to major effort to improve internal controls, as identified by audits
 - Management Action Plan under way
- Legislature and PUC offer tough scrutiny of ERCOT
 - Internal controls and business processes
 - Spending and fiscal discipline
 - Communications and responsiveness
- ERCOT agrees to Fee reduction after settlement discussions led by PUC Staff
 - Effective \$6 million budget cut for 2005

Management Action Plan (MAP)



The ERCOT Budget

- ERCOT's 2005 budget is ~\$127 million
 - Equal to ~0.6% of \$21 billion ERCOT electricity market
- Fully regulated by the Public Utility Commission of Texas
- Approximately 480 employees in Taylor and Austin
- ERCOT debt currently stands at \$178 million



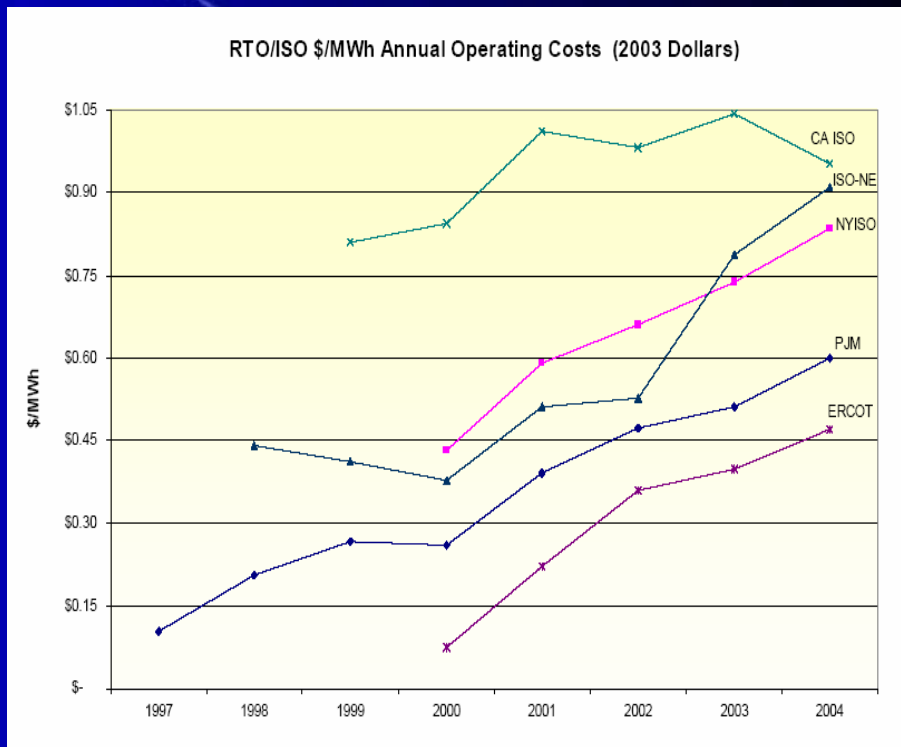
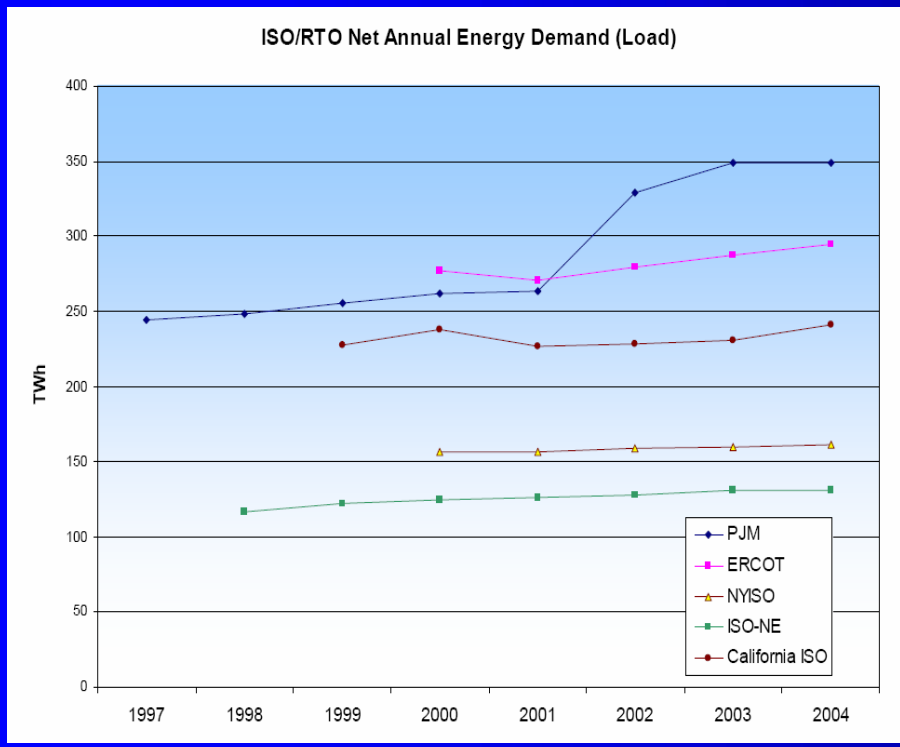
How ERCOT is Funded

The ERCOT Administration Fee

- ERCOT is funded primarily by a PUC-approved Administration Fee
 - Paid by QSEs representing load in the wholesale market
 - Applied to each MWh of electricity scheduled
- ERCOT is not funded by tax dollars
- ERCOT Fee is not charged directly to retail customers
 - Not a line item on retail customer invoices
- ERCOT Fee currently set at \$.42
 - Currently, each \$.01 of the ERCOT Fee generates ~\$3 million in revenue
 - Other ISOs' costs range from \$.54 to \$.98 per MWh



Comparing ISOs: Energy Demand & Operating Costs



Source: 'Comparative Analysis of RTO/ISO Operating Costs,' Margot Lutzenhiser, Public Power Council, 8/04



The ERCOT Fee

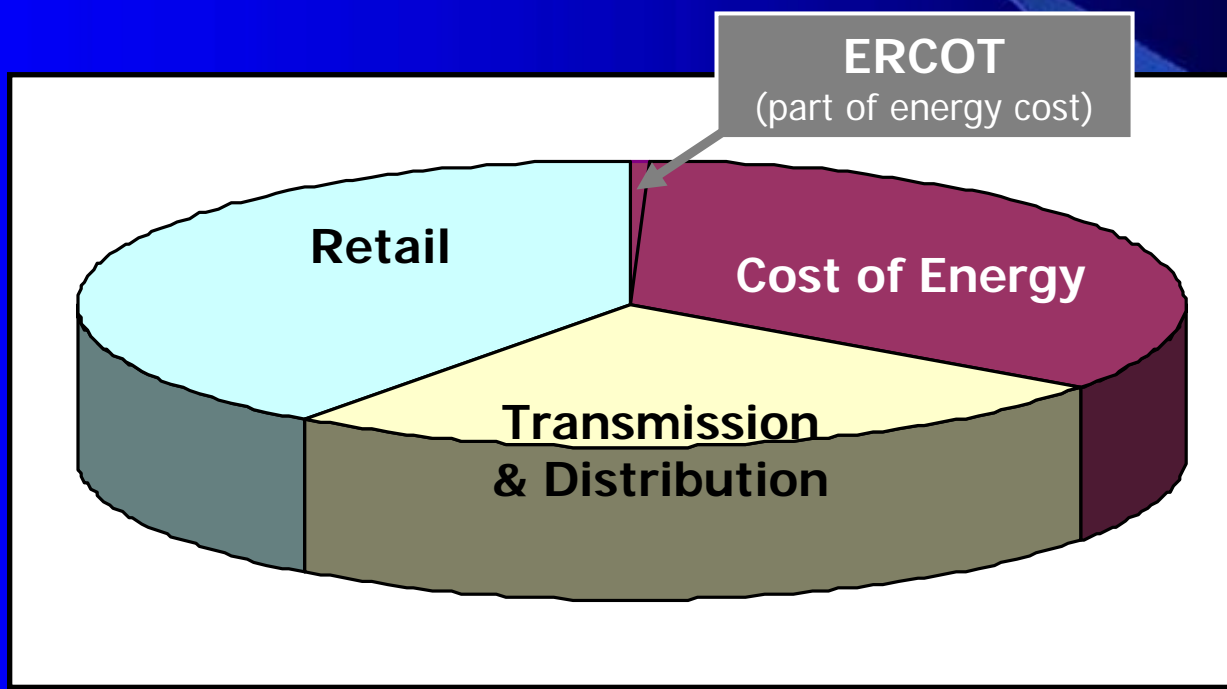
Impact on a Residential Customer

- \$.42 Fee is applied to a purchase of 1 MWh of wholesale energy
 - At \$35 per MWh*, Fee = 1.2% of total wholesale energy cost
- Assuming cost of Fee is passed directly through to consumer, ERCOT Fee would equal ~0.42% of the customer's monthly bill
 - 42 cents of a \$100 monthly electric bill* would go to fund ERCOT

** Approximate market averages*

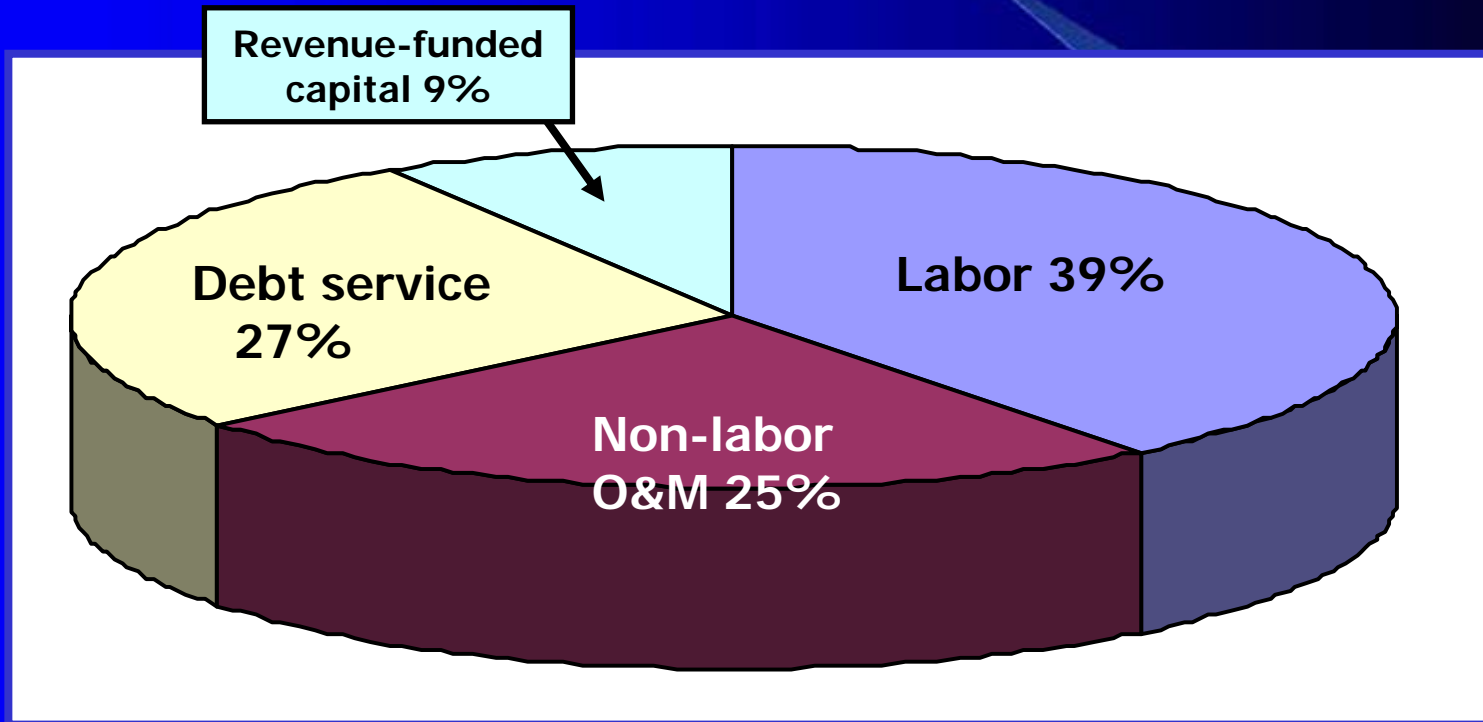
Residential Electric Bill

Approximate breakdown



ERCOT Budget

\$127 million in 2005



ERCOT Debt

- ERCOT used debt financing to acquire facilities & systems
 - Spreads costs of capital investments over useful life
 - Allows more consistency and predictability in Administration Fee
 - Matches benefit with payment
- All borrowing is Board-approved & consistent with adopted financial policy
- Debt policy is consistent with other ISO practices
- ERCOT debt currently stands at \$178 million
- Overall debt is scheduled to begin decreasing in 2005



GOALS: Responsiveness & Communications

ERCOT Public Accountability

- Responsiveness & communication driven by public oversight
- Texas Legislature and PUC oversee ERCOT and Texas electric market
- Legislative Oversight
 - Senate Business & Commerce Committee
 - House Regulated Industries Committee
 - Electric Utility Restructuring Legislative Oversight Committee (EURLOC)
- Public Utility Commission
 - Approves ERCOT Fee
 - Approves market protocols
 - Monitors and oversees the market

Commitment to Openness

- All ERCOT Board and stakeholder committee meetings are open to the public and posted well in advance
 - Only exceptions: Board executive sessions (for personnel, contract and litigation matters), and certain system planning meetings involving confidential market information
 - RSVPs are not required to attend any meeting
- PUC now posts Board meetings as PUC Open Meetings to allow all 3 commissioners to attend
- Dial-in service is available for the vast majority of meetings to help enable participation by all entities
- Online Information Request process is available for inquiries from the public

Legislative Oversight

- Jurisdictional committees & Sunset Commission have made recommendations on numerous ERCOT-related measures
- ERCOT supports the recommendations & will serve as a resource throughout the process

Legislative Recommendations

- Refine Board structure; increase number of independent Board members
- Rotate Board chairmanship among independents
- Require Board members to recuse themselves from votes related to their company's interests
- Grant explicit authority to PUC:
 - to require detailed financial information from ERCOT related to approval of the Administration Fee
 - for oversight over ERCOT budget and finances

Legislative Recommendations

(continued)

- Require ERCOT Board meetings to be open to the public, with advance notice similar to Open Meetings Act
- Strengthen market monitoring role with an increased responsibility for ERCOT
 - ERCOT to fund the independent market monitoring entity
 - Monitor would report to PUC
 - Enforcement responsibility to remain with PUC

ERCOT as a Resource

- ERCOT is a neutral and independent source of facts on electricity issues for policymakers
- Facilitates discussion and provides subject matter expertise
- Does not advocate positions on policy
- Provides system impact analysis for proposed Protocol or Rule changes
- Ensures proposals will not affect system reliability
- Identifies possible conflicts with other provisions

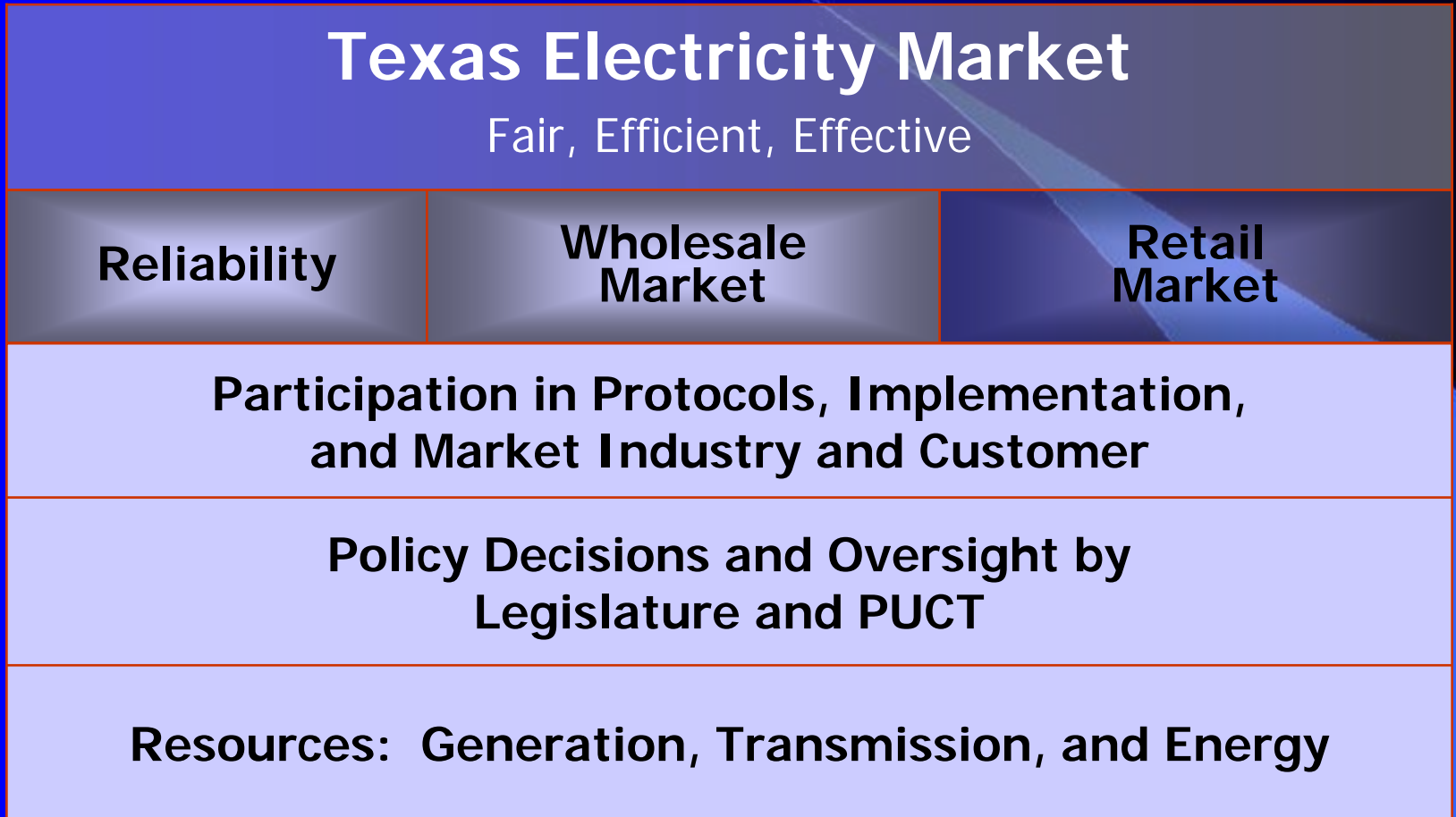
ERCOT as a Resource

Issues Recap

- Electric grid physical and cyber-security
- Transmission congestion
- Texas Nodal
- Transmission planning
- Renewable energy requirements
- Resource adequacy
- Fuel diversity
- ...others



Why the Texas Market Works



Challenges in the Market

Successful Markets Require:

- Reliability & Security
- Consistency
- Smooth transitions in market policies
- Appropriate price signals
- Adequate rates of return
- Fairness & oversight

QUESTIONS?

Working together with market participants & policymakers to create value for Texas consumers, ERCOT will ensure grid reliability, enable the market and serve as a catalyst for improvement.



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