



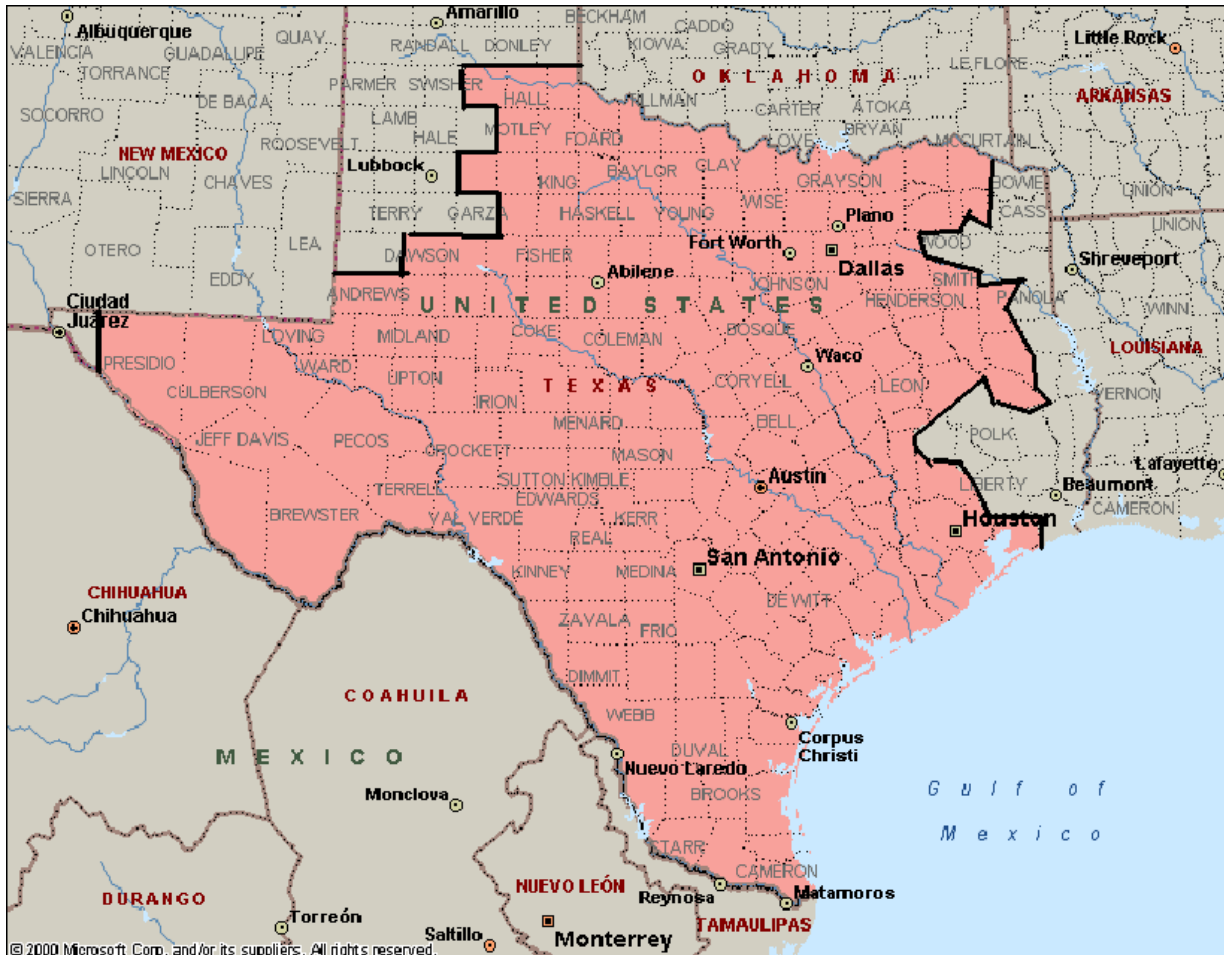
ERCOT Update 2010
TPPA Marketing & Customer
Service Conference



What is ERCOT?



ERCOT Covers 85 Percent of Texas



- 22 million Texans
- \$34 billion electricity market
- 63,400 MW peak 7/13/09
- 308 billion kWh in 2009
- 40,327 miles transmission lines
- 550+ connected generators



What is ERCOT?

- The Electric Reliability Council of Texas is many different things:
 - A region of the State (sort of).
 - A collection of wires and the equipment connected to them.
 - A member-governed Texas non-profit corporation.
 - The operator of the transmission network in most of Texas.
 - An independent organization established by State law with legally enforceable rules and procedures.



Why Should I Care?



Why Should I Care?

- You pay for it.
 - And you will pay more if things get messed up.
- It's growing—rapidly.
- A lot of key decisions are made in the ERCOT stakeholder process.
- ERCOT's rules carry the force of law—with possible financial penalties.
- I'm paranoid about retail market competition.
- SPP is becoming more and more ERCOT-like.



Origins of ERCOT

- Prior to WWII—electric utilities operated independently of each other.
- 1940's, Texas Interconnected System (TIS)—During WWII, electric utilities in Texas began to interconnect to provide reliable power to supply manufacturing facilities critical to the war effort.
- 1970—ERCOT officially formed to monitor electric system security throughout the interconnected power system in Texas.
- Senate Bill 373, 1995—The Texas Legislature establishes a competitive *wholesale* electric market in Texas.



Origins of ERCOT (con't)

- 1996—The Public Utility Commission directs ERCOT to establish the ERCOT Independent System Operator (ISO), responsible for:
 - Ensuring open access to the transmission system;
 - ▶ Ability of new generators to connect to the transmission system;
 - ▶ Ability to schedule power sales over the transmission network;
 - Coordinating future transmission planning; and
 - Carrying out security operations for the bulk power system.



The Modern ERCOT—Senate Bill 7

- Senate Bill 7, 1999—establishing a competitive *retail* electric market in Texas.
- Establishes an “independent organization” with four key functions:
 - Nondiscriminatory access to the transmission and distribution systems;
 - Ensure the reliability and adequacy of the regional electrical network;
 - Ensure that customers’ choices of retail providers are conveyed in a timely manner; and
 - Accurate accounting among the wholesale buyers and sellers in the marketplace.



The Modern ERCOT (con't)

- March 2000—the PUC certifies ERCOT as the Independent Organization established in Senate Bill 7.
- All market participants are required by law to comply with ERCOT rules:
 - “A retail electric provider, municipally owned utility, electric cooperative, power marketer, transmission and distribution utility, or power generation company shall observe all scheduling, operating, planning, reliability, and settlement policies, rules, guidelines, and procedures established by the independent system operator in ERCOT. Failure to comply with this subsection may result in...the imposition of an administrative penalty...” (S.B. 7, §39.151(j))

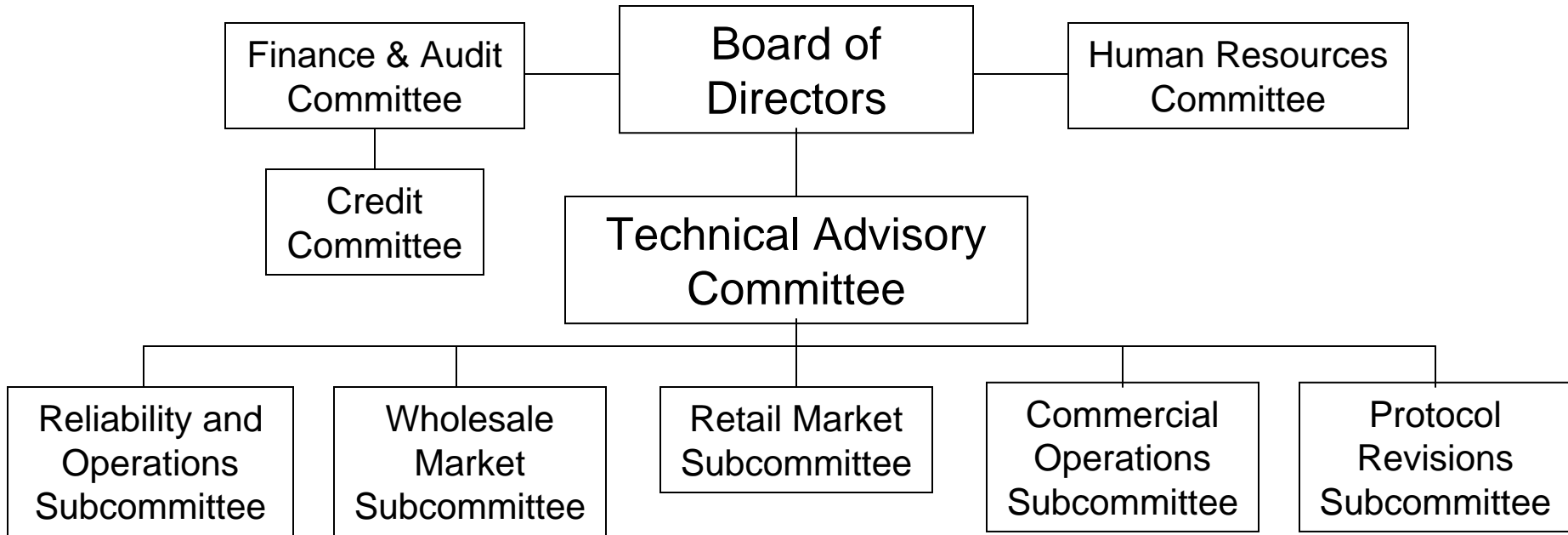


ERCOT Governance

- A Texas non-profit corporation.
- Stakeholder members in 7 market segments:
 - Investor-owned utilities, municipally owned utilities, cooperatives, independent generators, independent retail providers, independent power marketers, and consumers.
- ERCOT Board—16 members:
 - 3 consumers: industrial, commercial and the Public Utility Council representing residential and small businesses.
 - 1 representative from each stakeholder member segment.
 - 5 independent members.
 - The ERCOT CEO.
 - The Public Utility Commission chair (non-voting).
- The ERCOT Board chair must be from the independent members.



ERCOT Governance--Structure



The Finance and Audit Committee and the Human Resources Committee are committees comprised of members of the ERCOT Board of Directors.

The Technical Advisory Committee (TAC) is a 30 member stakeholder committee—made up of 4 members from each market segment plus 6 consumer members—that advises the ERCOT Board on technical, reliability, and market issues. The TAC has 5 subcommittees and approximately 25 standing working groups and tasks forces that report to the subcommittees.

Municipal market segment staff members are active participants in all ERCOT committees.



The Modern ERCOT—the Organization

- ERCOT is directed by a CEO hired by the ERCOT Board of Directors and approved by the PUC.
- The approved ERCOT headcount stands at 739 employees (for 2010).
 - Plus approx. 120 contractors on the nodal project.
- The approved ERCOT budget stands at approximately \$177 million (for 2010).
- ERCOT is financed through a fee—assessed by the Board and approved by the Commission—currently set at approximately 42 cents per megawatt hour of retail load.
 - Nodal surcharge of \$0.375 per MWh (through end 2012).
- Municipal utilities pay more than \$20 million annually.



The Key Functions of ERCOT: Non-discriminatory Access

- ERCOT conducts transmission interconnection studies for new generators.
- ERCOT tests and qualifies generation units for participation in ERCOT markets.
- ERCOT certifies QSEs ("Qualified Scheduling Entities") to participate in ERCOT operated markets for power and ancillary services.
 - Generators and retail electric providers must schedule all ERCOT-related transactions through a Qualified Scheduling Entity.



The Key Functions of ERCOT: System Reliability and Adequacy

- ERCOT is the operator of the transmission network in the ERCOT region.
 - ERCOT operates hourly markets for energy and daily markets for ancillary services (*i.e.*, reserves).
 - ERCOT manages transmission congestion to protect the transmission network.
- ERCOT conducts studies of the long-run capacity of the transmission network.
 - Through a stakeholder process, ERCOT recommends to the PUC major upgrades of the transmission network.



The Key Functions of ERCOT: Customer Switching

- ERCOT oversees the switching of retail customers between competitive providers.
 - ERCOT oversees and operates a complex system of information collection, aggregation and exchange among wires companies and competitive retailers needed to process accurately switches between one competitive retailer and another.
 - ERCOT exchanges meter data needed for retail billing between wires companies that read the meters and competitive retailers that send out customer bills.



The Key Functions of ERCOT: Wholesale Settlements (accounting)

- Settlement statements: ERCOT calculates charges for each wholesale and retail market participant for each hour of every day for as many as 60 plus different charge types.
- Invoicing: Weekly invoices sent to each market participant.
- Financial settlement: ERCOT collects from each paying market participant and pays out to each receiving market participant.



Market Operations Governed by the ERCOT Protocols

- The ERCOT Protocols: the detailed rules of operation of ERCOT's various wholesale and retail market functions.
 - Contain explicit operating procedures that must be followed by ERCOT operators and market participants.
 - Developed by the ERCOT stakeholders in a multi-year design process and approved by the PUC.
 - Updated continually through the Protocol Revision Subcommittee.
 - Failure to comply with the Protocols can lead to restrictions on market participation and enforcement actions by the Public Utility Commission.



ERCOT's Successes

- Reliable operation of the electric system
- 2001 Wholesale Market Opening
- Standardized Interconnection Requirements
- Extensive Transmission Expansion
- Switching Performance
- Settlement Performance
- Superior Technical Staff
- Expansion and Integration of Wind Resources
 - Cutting Edge Forecasting
- Rapid Response:
 - 2001 Congestion Blowout
 - Switching Problems
 - Response to Defaults
 - 2007 Price Spikes
- The ERCOT Stakeholder Process
 - Exploits industry know how and continuity along with ERCOT expertise
 - ▶ ERCOT Protocols
 - ▶ Nodal Protocols
 - Assures due process
 - Requires (at least) supermajority agreement
 - Minimizes disputes and litigation



Growing Pains: ERCOT's Had a Few

- Hiccups—Initial market start-up.
- Criminals—Insufficient oversight and controls.
- Scope Creep—Failure to understand mission.
- Bankruptcies—\$24 million uplift from defaults.
- Lights Out—April 2007.
- Unreasonable Expectations—Nodal schedule.
- Budget Creep—Nodal budget.
- RISKY INVESTMENTS(?)—Caught up in banking crisis.
- CEO's—we've had a few.
- More Hiccups Ahead?—Nodal start-up.



Key Challenges Today

- Nodal Market Cutover
 - Ordered by the PUC in 2003
 - ERCOT cutover on December 1, 2010
- ERCOT Leadership Challenge
- Budget
- Sunset Review
- Wind Integration

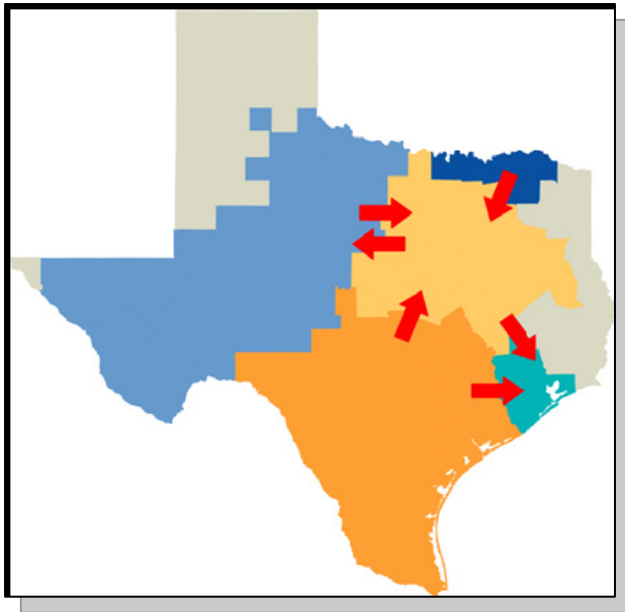


What is the Nodal Market?

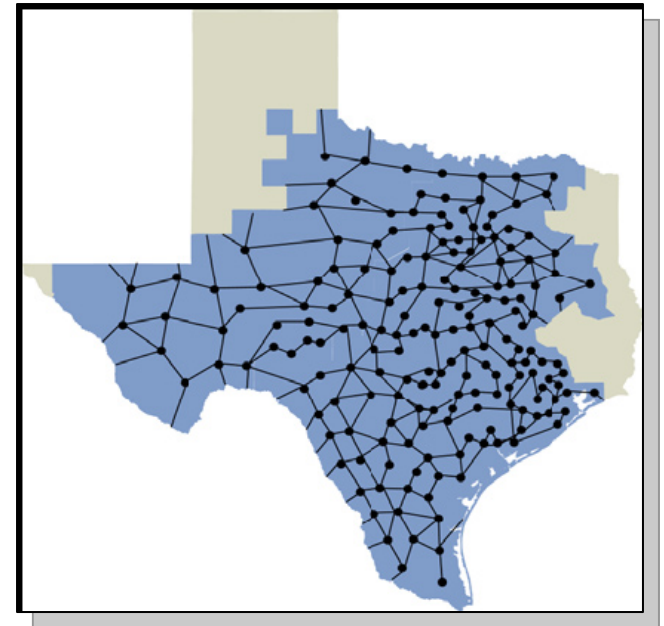


What is the Nodal Market?

Zonal Market



Nodal Market





Why Go Nodal?

- Capture greater market efficiencies for the benefit of customers.
- Wholesale market deregulation created some efficiencies:
 - Comparable access to the wholesale power market.
 - Old, inefficient power plants retired.
 - Congestion costs (some, at least) assigned to congestion causers.
- Promise of nodal market:
 - Short-run efficiencies:
 - ▶ Only cheapest plants dispatched.
 - ▶ Congestion costs fully assigned to congestion causers.
 - Long-run efficiencies:
 - ▶ New plants and new customers will consider congestion in locational choices.



Nodal Cutover Risks

- Remember the hiccups.
- Extremely complex systems (*e.g.*, SEM).
- Market participant preparedness.
- Accuracy of settlement systems.
- Credit policy.
- Everybody is watching.
 - The Legislature comes to town.

- But the ongoing market trials are going well.
 - Right timeline, right staff, right budget, right training and testing plan.



Executive Management Recruiting

- Current openings in the executive management ranks:
 - CEO
 - CFO
 - General Counsel
 - VP Human Resources and Chief Administrative Officer
- ERCOT Board currently interviewing candidates for the CEO opening.
 - Key challenge of the CEO:
 - ▶ Build an effective executive management team
 - ▶ Nodal market success
 - ▶ Develop a new strategic vision
 - ▶ Effectively communicate with the PUC, Legislature, and other stakeholders



Post Nodal Funding

- ERCOT annual revenue requirement above \$175 million.
- Current fee will collect approx. \$130 million annually.
 - 2009 budget balanced with debt and with one-time tax refunds.
- PUC and legislative pressure to:
 - Keep costs low.
 - Keep debt manageable.
- Good luck new CEO!



Sunset Review

- 2009 legislature required ERCOT to undergo Sunset Review along with the PUC.
 - Committee hearings end of May.
- Anticipated recommendations:
 - Annual PUC approval of ERCOT budget.
 - PUC approval of all debt issuances.
 - All independent Board of Directors.
 - ▶ Appointed and removed by the PUC.
- How will ERCOT function in the future?
 - Can ERCOT be sufficiently independent to attract and keep qualified personnel?
 - Can ERCOT maintain stakeholder involvement?
 - Will ERCOT retain the ability to quickly solve problems?



Wind Integration

- Over 9,000 MW wind installed in ERCOT.
 - Max of +/-6,000 due to transmission constraints.
 - >20% of total ERCOT supply in some intervals.
- 18,000 MW anticipated after CREZ build out.
- Several challenging scenarios have occurred.
- Responses to wind integration challenges:
 - New wind forecasting techniques.
 - Additional reserves.
 - ▶ Who should pay costs of those reserves?
 - New (old?) reliability standards for wind farms:
 - ▶ Low voltage ride through; primary frequency response, voltage support.
 - ▶ Who should pay for costs of enhanced reliability?



Challenges Ahead

- Ancillary Services Costs
- Right-sizing ERCOT
- Strategic Plan



Ancillary Services Costs

- It's all about wind—but not entirely.
- Should ERCOT take on cost causation of ancillary services as the next step in market evolution?



Right-sizing ERCOT

- Nodal, nodal, nodal.
 - 739 current staff
 - 122 current on-site contractors
- What should the ERCOT organization and staff look like after nodal implementation?
 - Ongoing consultant study to make recommendations.
 - Alignment with new budget required.



Strategic Plan

- What is ERCOT's current strategic plan?
 - Nodal, nodal, nodal!
- Objectives identified in 2010 kick-off of 5 year strategic plan:
 - Manage the grid reliably.
 - Manage changing wholesale and retail markets (*e.g.*, smart grid)
 - Manage the interdependencies between reliability and markets.
 - Stabilization of nodal market and systems.
 - Meet demands of NERC/FERC compliance.
 - Plan for further infrastructure development.
 - Attract and retain talented staff.
 - Assure adequate funding.
 - Develop and maintain productive external relationships!
- Good luck, new CEO!