

Overview of the Electrical System in Texas



Elements of Electric System

- Generally, the electric system is composed of three elements
 - Generation
 - Transmission & Distribution (T&D)
 - Retail
- Additionally, the electric market in Texas is primarily overseen by four different entities
 - Legislature
 - Public Utility Commission of Texas (PUC)
 - Independent Market Monitor (IMM)
 - Reliability Monitor (Texas RE)
 - Electric Reliability Council of Texas (ERCOT)
- ERCOT Power Region vs. Non-ERCOT Region (Southwest Power Pool (SPP), Mid Continent Independent System Operator (Miso), Western Electricity Coordinating Council (WECC))
 - ERCOT is generally independent of federal regulation via the Federal Energy Regulatory Commission (FERC), but Non-ERCOT regions are FERC jurisdictional



Generation

- These are typically power plants (10 MW-2000+ MW) that produce electric power, generally defined by their various fuels, and produce power on a large (“utility”) scale
 - Natural Gas 52.8%
 - Coal 14.5%
 - Nuclear 5.1%
 - Wind 23.3%
 - Utility-Scale Solar 2.2%
 - BioMass, Geothermal (other) 2.0%
 - Energy Storage 0.1%
- There are also resources, known as “Distributed Generation” resources, that produce smaller amounts of power (less than 10 MW), and are also defined by fuel source
 - Diesel
 - Natural Gas
 - Rooftop Solar
 - Small Wind
 - Energy Storage
 - Waste Heat
 - Geothermal



Transmission & Distribution System

- Often referred to as the “Grid,” “T&D,” “TDU,” or the “wires and poles,” the electric transmission and distribution system is charged with moving power from generation facilities to the end user across Texas
- Wires and poles are broken down by size
 - “Transmission” lines are larger, high voltage power lines that move power across long distances
 - “Distribution” lines are smaller, lower voltage lines that connect the transmission lines to homes and smaller businesses
 - “Substations” and “transformers” ratchet power up and down to flow across the lines

Retail

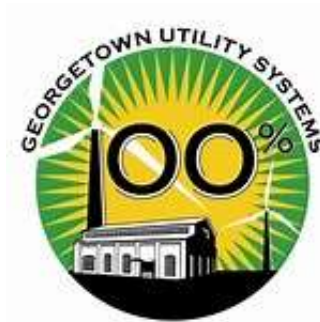
- “Retail” generally means sales of electricity to consumers, including billing, electric plan offerings and customer support, that electric providers rely on to interface with the end-use customer
- Retail functions typically include
 - Marketing and product design
 - Hedging & risk management
 - TDU and wholesale settlements
 - Billing, collection
 - Provision of usage information to the customer
 - Customer Support

Utility Ownership Models & Governance Structures

- Historically, there have been 3 types of electric utility governance models
 - Municipally-Owned Utilities (“Munis” or MOUs)
 - Cooperatives (Coops)
 - Investor Owned Utilities (IOUs)
- Each model has a different market orientation, rate-setting procedures and oversight
 - After 2002 market open, ERCOT IOUs became rate regulated for only “wires and poles” companies as transmission & distribution utilities (TDUs) (non-ERCOT utilities remain fully rate-regulated)

Municipal Utility Systems (Munis)

- Ownership: Owned and managed by the City, either through the city council or through an oversight board
- Market Design: Usually “vertically integrated” – the city owns the generation assets, builds and maintains the T&D system, and interfaces with customers; however, must participate in competitive wholesale electric market
- Utilities Code PURA provides an option to enter into retail competition, but does not require it
- Rates: Munis set their own rates; Appeals can be made to the PUC by customers living outside the city limits
- Customer Base: City residents and those in the ETJ or nearby communities
- Regulatory Oversight: The Legislature, city leadership, and voters, PUC in limited circumstances, and ERCOT
- Lobby Interests: Texas Public Power Association



Electric Co-operatives (Co-ops)

- Ownership: Owned by the member customers who elect a Co-op board
- Market Design: Often vertically integrated (though like Munis they must participate in a competitive wholesale market); may own little if any generation, and instead buy on the open market
- PURA provides an option to enter into retail competition, but does not require it
- Rates: Set by the Co-op Board; Not subject to PUC rate cases except for transmission costs
- Customer Base: Residents within the boundaries of the Co-op
- Regulatory Oversight: The Legislature, Co-op leadership, and co-op members, the PUC in limited circumstances, and ERCOT
- Lobby Interests: Texas Electric Co-operatives Association (TECA)



Investor Owned Utilities (IOUs)

Ownership: Private or publicly traded companies, such as Oncor, CenterPoint, American Electric Power (AEP), Southwestern Public Service Company (SPS), El Paso Electric, and Entergy

- Market Design
 - ERCOT IOUs are transmission & distribution only (TDUs) and statutorily barred from providing competitive energy services such as generation (including energy storage)
 - Non-ERCOT IOUs are vertically-integrated owning generation, T&D, and retail
- Rates: Set by the PUC, subject to rate case review
- Customer Base: Residents and businesses within the boundaries of the certificated service territory
- Regulatory Oversight: The Legislature, PUC, and company management, ERCOT and Texas RE for ERCOT IOUs, SPP or MISO or WECC and FERC for non-ERCOT IOUs
- Lobby Interests: Association of Electric Companies of Texas (AECT)



Examples of IOUs in Texas

Non-ERCOT Utilities

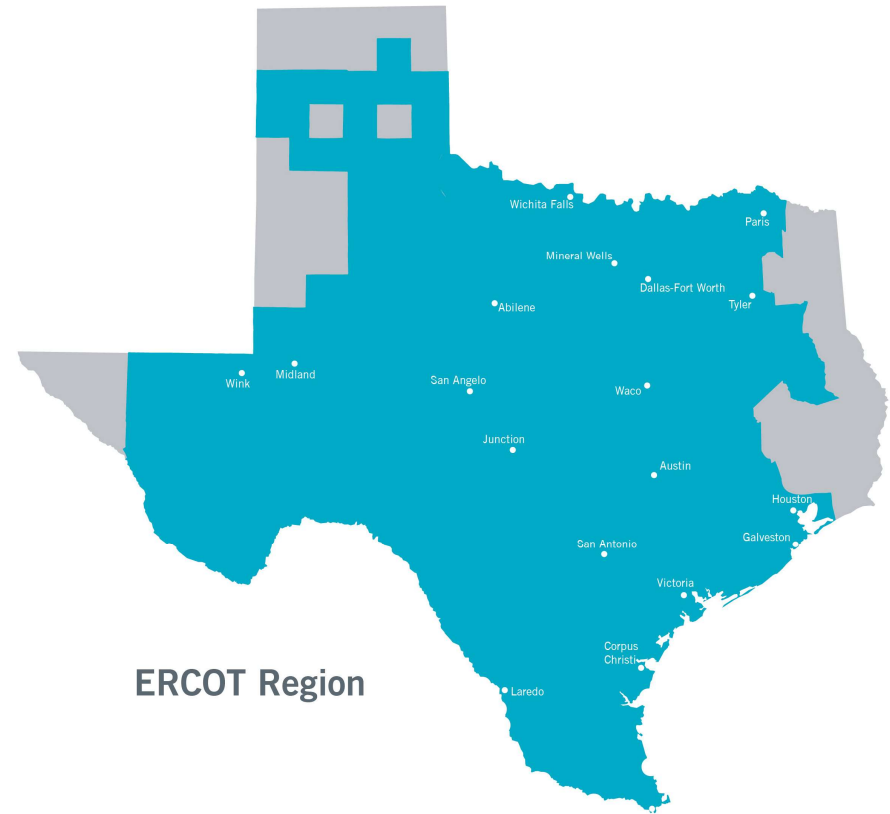


ERCOT TDU IOUs



What Happened in 1999?

- Growth of Independent Power Producers
- Low-Cost Natural Gas
- Environmental Concerns
- Regulatory Inefficiencies
- Market “True Believers”

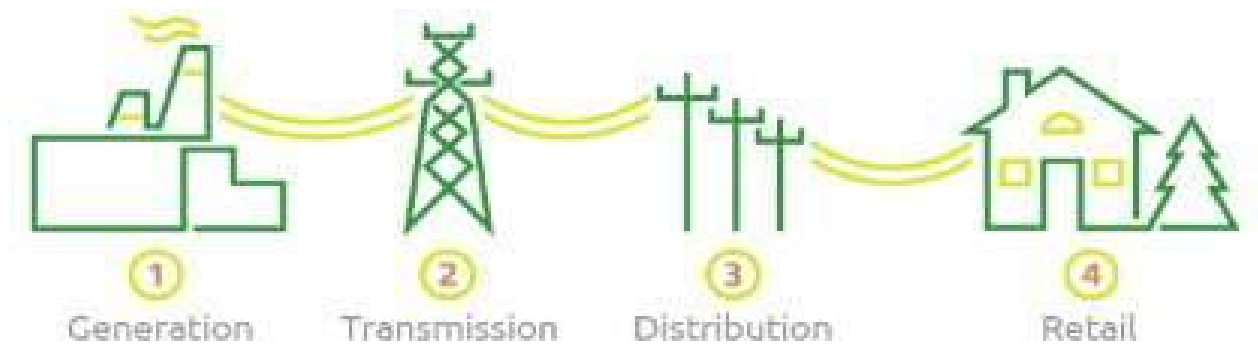


Senate Bill 7 (1999)

- Dismantled “vertically-integrated” IOUs into separate Generation/T&D/Retail within ERCOT power region
- Broadly eliminated rate-setting function of PUC for wholesale (generation) and retail (customer prices set by REPs)
- Preserved PUC rate-setting & siting for T&D investments
- Broadly eliminated PUC review of power plant construction within ERCOT (Certificate of Convenience & Necessity (CCN) decision to build based on market prices)
- Increased Role of ERCOT and Independent Market Monitor (IMM)
- Increased market opportunities for independent power producers
- Deferred competition and unbundling for NON-ERCOT utilities
- Munis & Coops provided ability to opt-in to retail competition but not required
- Eliminated governmental price setting
- Opened retail competition to millions of Texans
- Opened the generation market to new competition



Effect on ERCOT IOUs



- No longer owned by TDU
 - No defined sales territory
 - No cost recovery
 - No ROE
 - No longer regulated
 - Suppliers compete
- Remains regulated
 - Has defined service price set by PUC
 - Remains utility responsibility
 - Cost recovery
 - ROE
 - Captive customers
 - Includes substations
 - CCN cases before PUC
- Choose generation Suppliers
 - Develop innovative products
 - Competes for customers throughout ERCOT
 - No defined service territory
 - Variety of contract terms

Examples of Competitive Companies in Texas

Generation Resources and Power Marketers



Examples of Competitive Companies in Texas

Retail Electric Providers (REPs)



Market Participant Associations

- Texas Competitive Power Advocates (TCPA) – represents generators & power marketers
- Alliance for Retail Markets (ARM), Texas Energy Association for Marketers (TEAM) – represent retail electric providers
- Advanced Power Alliance (APA) – formerly The Wind Coalition, represents wind energy generators
- Texas Industrial Energy Consumers (TIEC) – represents large industrial manufacturers & chemical plants in electric consumer issues (a.k.a. Texas Association of Manufacturers or TAM)
- Texas Solar Power Association (TSPA) – represents solar energy providers
- Solar Energy Industries Association (SEIA) – represents solar manufacturers, installers, providers across the country
- Association of Electric Companies of Texas (AECT)
- Texas Public Power Association (TPPA)
- Texas Electric Cooperatives (TEC)

Current Role of PUC After Deregulation

- Oversees electricity, retail water utility rate, regulation and some telecommunications
- Oversees ERCOT, ensures reliability & market function
- Market design and oversight
- Sets T&D rates and approves siting (CCNs)
- Implements & enforces customer protection rules
- Oversees rates cases and other contested proceedings
- Selects and administers IMM and reliability contracts
- Cyber security



Role of ERCOT After Deregulation



- Member-based 501 (C) (3), recognized in statute but governed collaboratively by market participants through stakeholder-led committees, task forces, and work groups
- Controls the dispatch of generation resources to manage the flow of power, grid congestion, and balance with demand
- Identify and resolve transmission constraints
- Electric load & resource forecasting and monitoring;
- Schedules production of power based on most economic resources available at the time
- Procures ancillary services to manage resource risks
- Financial settlement for wholesale power purchases
- Administers retail switching of consumers for day-to-day choices as well as mass transitions
- Monitors credit-worthiness of market participants serving customers

Role of Office of Public Utility Counsel (OPUC)

- OPUC Public Counsel appointed by the governor and confirmed by the Senate to a two-year term
- Agency created in 1983
- Represents residential and small business consumers, as a class, before the PUC, ERCOT, SOAH, and in court in regulatory matters for electricity as well as water, wastewater, and telecommunications
- Represents only the interests of those consumer classes in cases in contrast to PUC staff who represents the public interest in these cases
- Public Counsel serves as an ex-officio voting member of the ERCOT Board of Directors and an ex-officio non-voting member of the Texas RE Board of Directors

Benefits of a Competitive Market

- Cost and risk shifted from ratepayers to shareholders & investors
- Lower electricity prices than at market open or in most non-competitive areas
- Consumer ability to choose their preferred provider based on criteria important to them including price
- Innovative products and services lead to advancement in demand response and time-of-use adoption
- Increased efficiency of generation fleet
- Competition among market participants



Challenges Facing the Competitive Market

- Impacts of subsidized renewable resources
- Lack of a resource adequacy mandate creates uncertainty in electricity “reserve margins”
- Regulated transmission and distribution costs are increasing the portion of the consumer bill that customers cannot compete away
- Cost allocation for transmission system construction, maintenance, and operation based on assumptions that are no longer accurate & do not align with peaks
- Stakeholder governance can be inequitable



QUESTIONS ?





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