

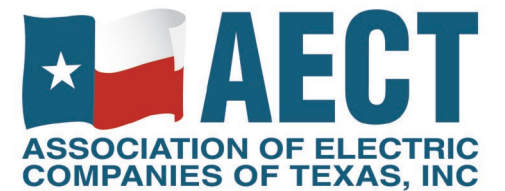


# Electricity 101



January 2024

*Legislative advertising paid for by: Association of Electric Companies of Texas  
1005 Congress, Suite 1000, Austin, TX 78701 • 512-474-6725 • [www.aect.net](http://www.aect.net)*





# AECT Member Companies





## Our Mission

The Association of Electric Companies of Texas, Inc. (AECT) is a trade organization that provides a forum for member companies to exchange information about public policy and to communicate with the public and government officials.

## Our Vision

AECT is dedicated to reliable, affordable and sustainable electricity to meet the needs of today and support the future growth and economic success of Texas.

## Our Principles



### Reliability

Modern infrastructure and diverse resources for reliable and resilient supply and delivery of electricity.

Fair and predictable oversight and regulation to promote investment and ensure the stability of Texas' electric industry.



### Affordability

Efficient competitive markets that are fair to customers and market participants.

Advanced technologies and innovative programs to support energy efficiency and cost-savings for customers.



### Sustainability

Pioneering technologies that support a sustainable environmental future for Texas.

Investment in Texas' economic and energy prosperity with a meaningful and positive impact on the communities we serve.



### Security

Ongoing efforts to mitigate supply chain risks, supporting reliable electric operations and ongoing system resilience and investment.

Vigilant defense against cyber and physical attacks on Texas' electric systems.



# Summary of the Tax Impact of AECT Member Companies



## AECT member companies pay and collect significant taxes to bolster state and local revenues

- The electric industry is a major source of state and local tax revenue in Texas.
- In 2021, members of AECT paid **\$1.99 billion** in state and local levies. On average, this cost is about **\$90,000 per employee**.
- AECT companies also collected **\$329.2 million** in sales taxes from end-use customers.

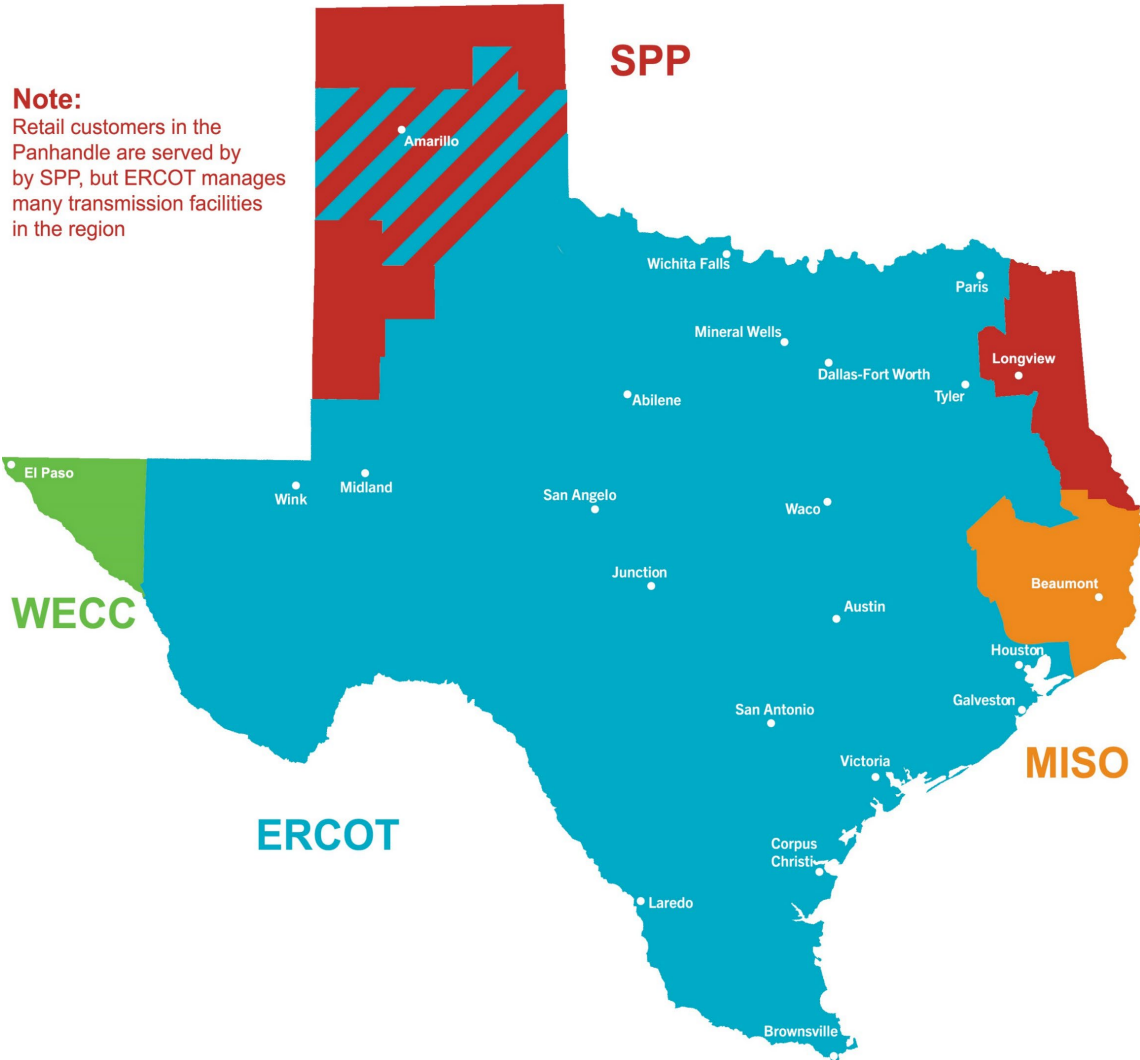
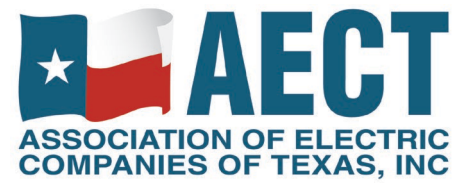
### State and Local Taxes Paid or Collected by AECT Member Companies in 2021

TAXES IMPOSED ON AECT COMPANIES	Millions of Dollars
State Taxes	
Gas, Electric & Water Utility Tax	\$211.6
Public Utilities Gross Receipts Assessment	25.7
State Sales & Use Tax (Paid on Company purchases)	185.6
State Franchise Tax	90.2
Local Taxes	
Property Taxes	851.7
Local Sales & Use Taxes (Paid on Company Purchases)	47.0
Municipal Franchise Fees	574.7
<b>Subtotal, Company Taxes</b>	<b>\$1,986.5</b>
SALES TAXES ON AECT ELECTRIC SALES	
State Sales & Use Tax (Collected from Customers)	216.7
Local Sales & Use Taxes (Collected from Customers)	112.5
<b>Subtotal, Customers' Taxes</b>	<b>\$329.2</b>
<b>TOTAL, STATE &amp; LOCAL TAXES</b>	<b>\$2,315.7</b>

Source: Association of Electric Companies of Texas



# AECT Companies Within ERCOT



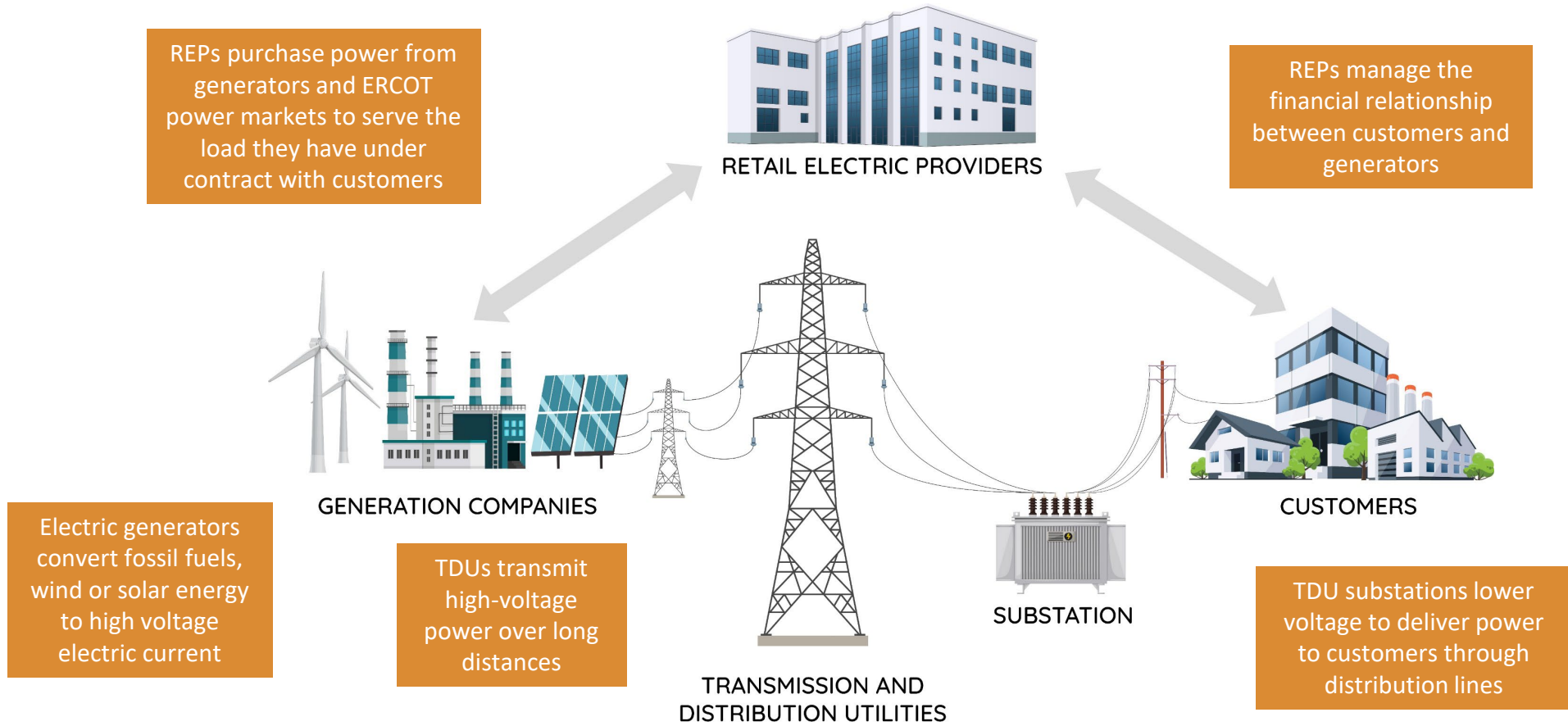
Retail Electric Providers

Transmission & Distribution Utilities

Generation Companies



# Getting Power from Generation to Consumer in the ERCOT Competitive Electric Market



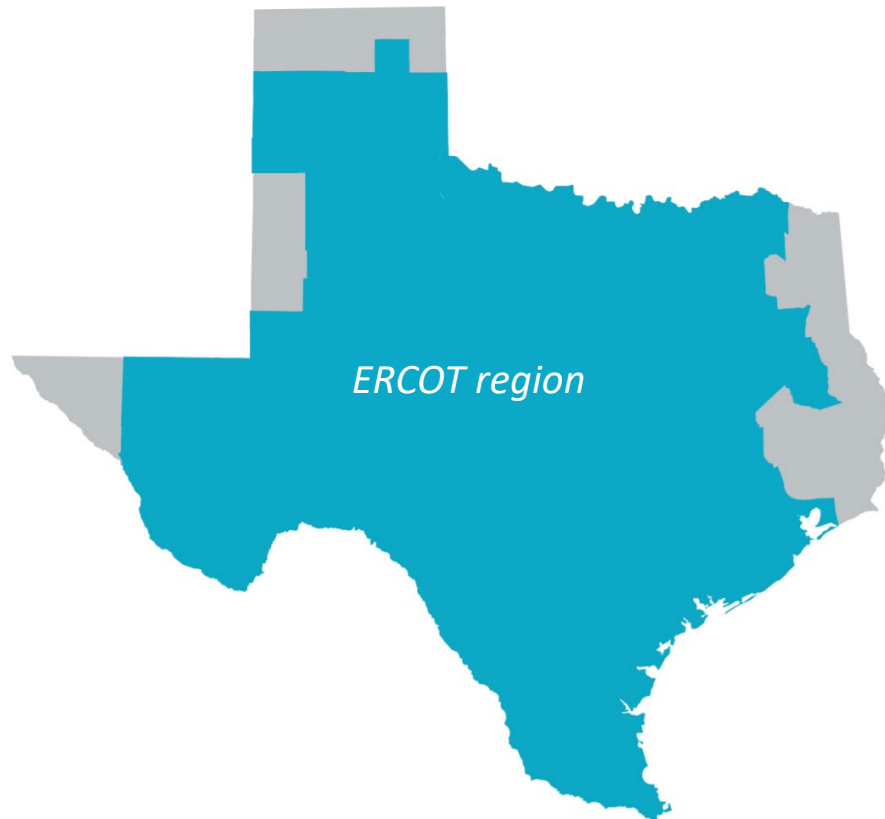
**The Role of ERCOT in Ongoing Electric Operations**

**Electric Power Transactions:** ERCOT operates energy markets to allow retailers to purchase needed power on balancing markets

**Transmission System Planning:** ERCOT assesses system needs for new transmission lines to support long-term reliability

**Retail Switching:** ERCOT administers the competitive electric market for consumers.

**Systemwide Assessments:** ERCOT provides regular assessments of available generation and expected electricity demand to help market participants make financial decisions in the market



## ERCOT Responsibilities

- System reliability – planning and operations
- Wholesale market settlement for electricity production and delivery
- Retail switching process for customer choice
- Open access to transmission

## ERCOT: By the Numbers

- 90% of the electric load in Texas is in ERCOT
- 75% of ERCOT's load is in the competitive market, including 26 million customers
- 1,030 generating units, providing over 91,000 MW of generating capacity during peak demand
- 52,700+ miles of high-voltage transmission



# The Electric Market was Deregulated to Bring Better Prices and Investment

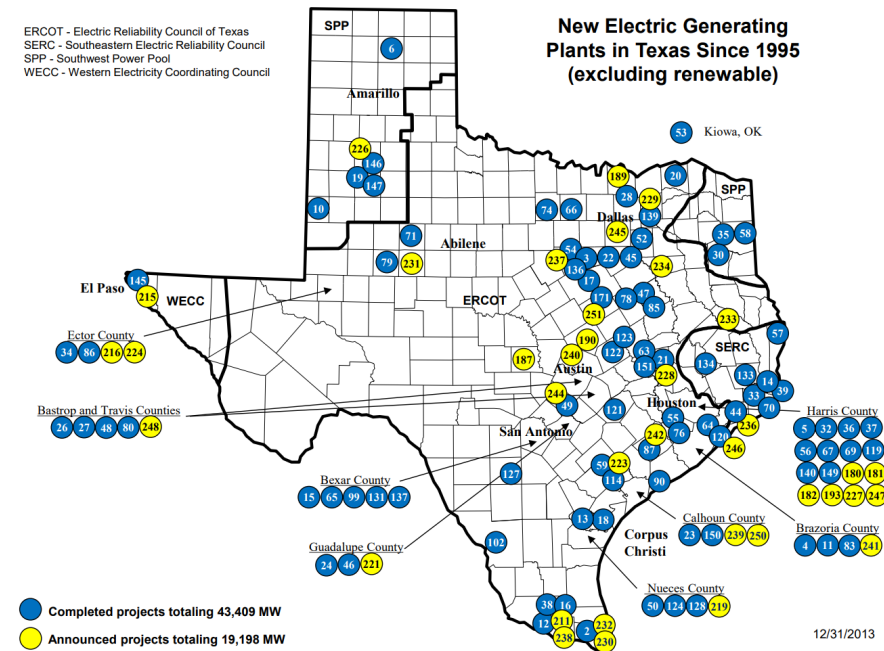


## Texas Electricity Prices Have Performed Far Better than the U.S. Average Over 20 Years

- From 2001 to 2021, the U.S. average electricity price has increased by 57%, remaining flat when adjusted for inflation
- Over that same period, Texas average prices have only increased by 26%, and actually dropped by 20% when adjusted for inflation

## ERCOT Market Has Seen Significant New Generation Investment Since 2001

- Much of the investment in new, non-renewable generation in Texas occurred from 1995 through 2013
- Efforts to revitalize the competitive wholesale market in ERCOT are ongoing, with a focus on enhancing investment in dispatchable generation



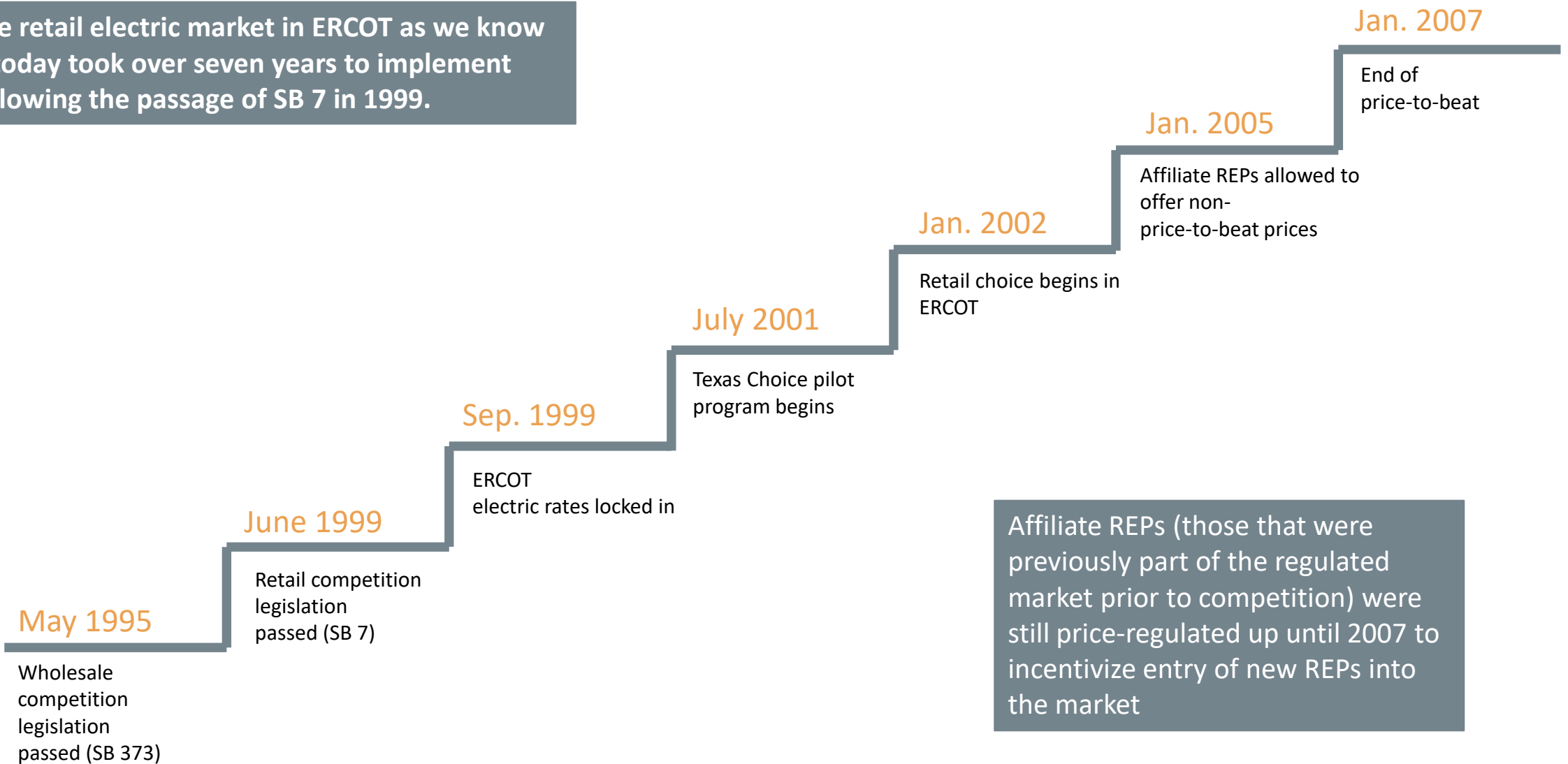
Source: Public Utility Commission of Texas (12/31/2013 Data)





# Retail Competition Took Years to Implement

The retail electric market in ERCOT as we know it today took over seven years to implement following the passage of SB 7 in 1999.

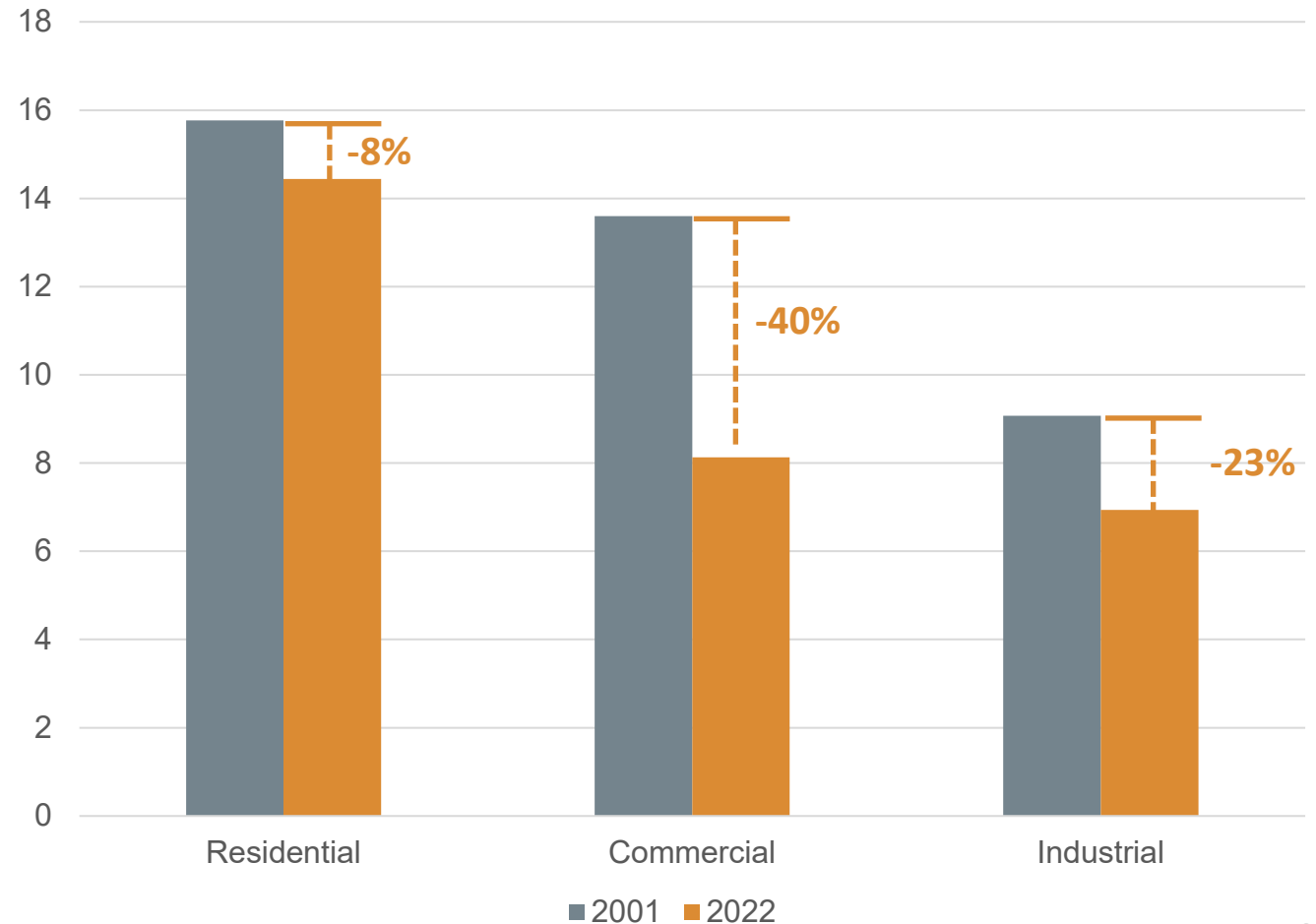




# Electric Competition in ERCOT Keeping Prices Low

- Prices in the competitive market are lower today than in 2001, just before the market opened, when adjusted for inflation.
- Customers in the competitive market have also gained access to new services, like time-of-use electric rates, and the ability to choose their own fuel mix, such as 100% renewable products.
- Large commercial and industrial customers have seen the largest decrease in inflation-adjusted prices.

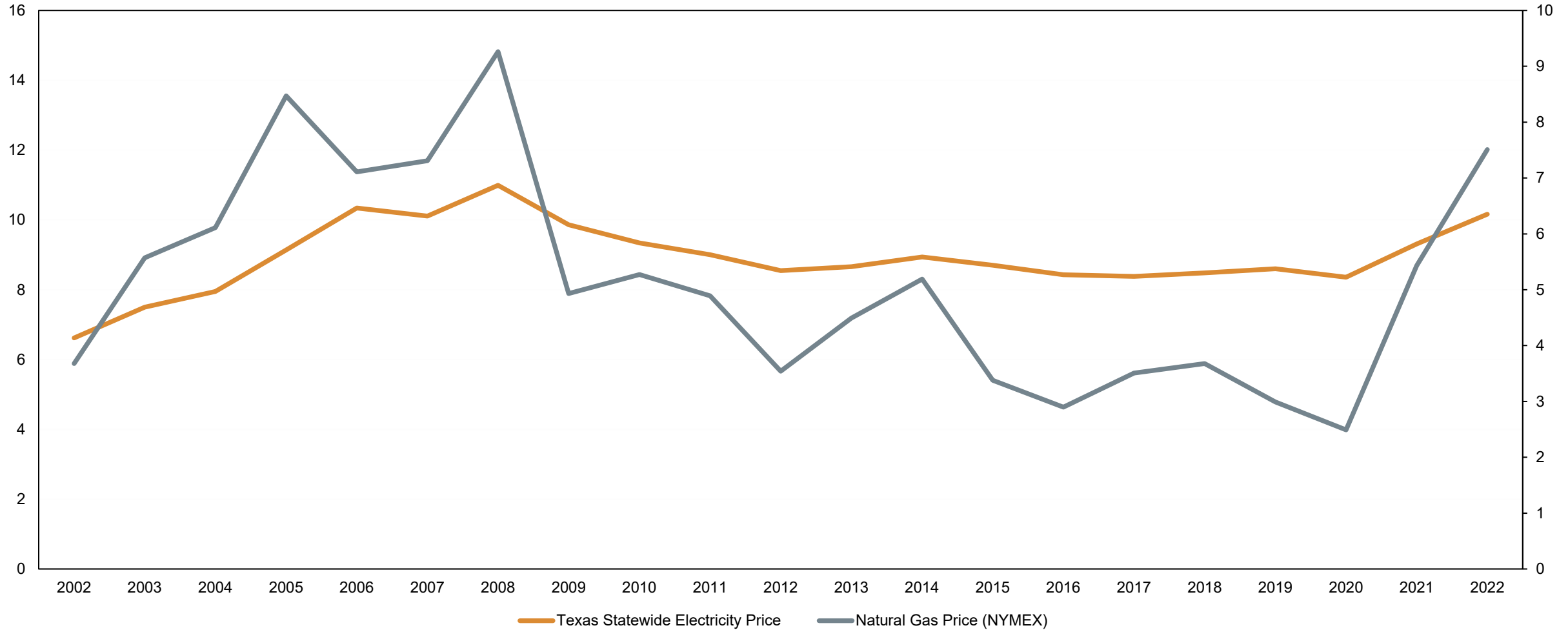
### ERCOT Electricity Prices 2001-2022 (inflation-adjusted)





# Relationship Between Texas Electricity and Natural Gas Prices

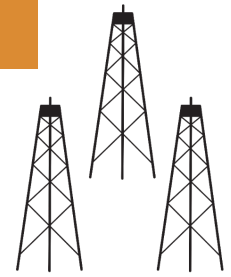
## Texas Electricity Prices Influenced by Natural Gas Prices



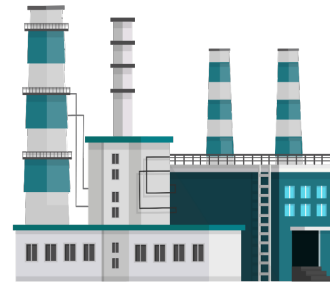


# Natural Gas Generation is Strongly Dependent on the Natural Gas Supply Chain

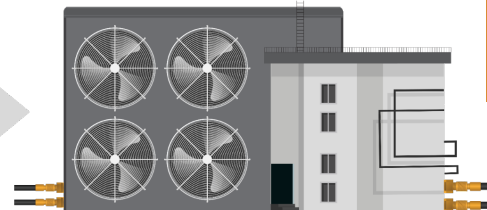
Natural gas processing means removing nonhydrocarbon gas and other impurities



PRODUCTION FIELDS

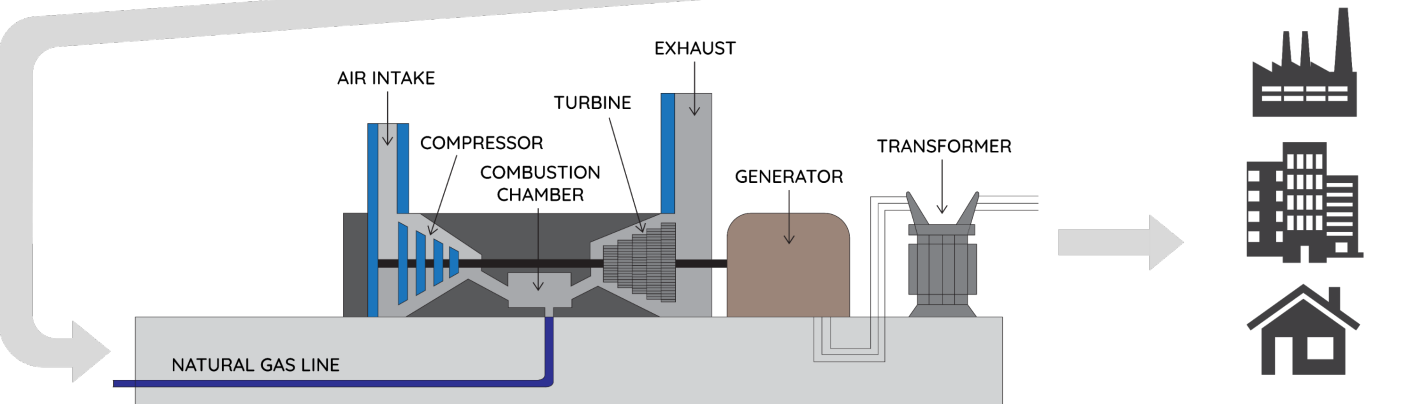
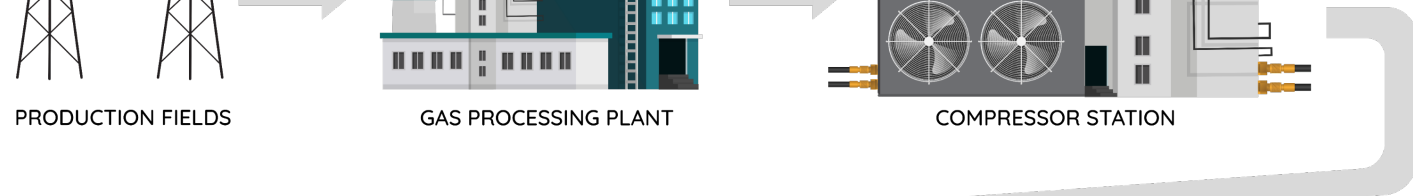


GAS PROCESSING PLANT



COMPRESSOR STATION

Compressor stations maintain the flow and pressure of natural gas by receiving gas from the pipeline and re-pressurizing it, allowing transport to continue



Pipelines must retain high pressure to transport gas to a major user, such as a natural gas power plant



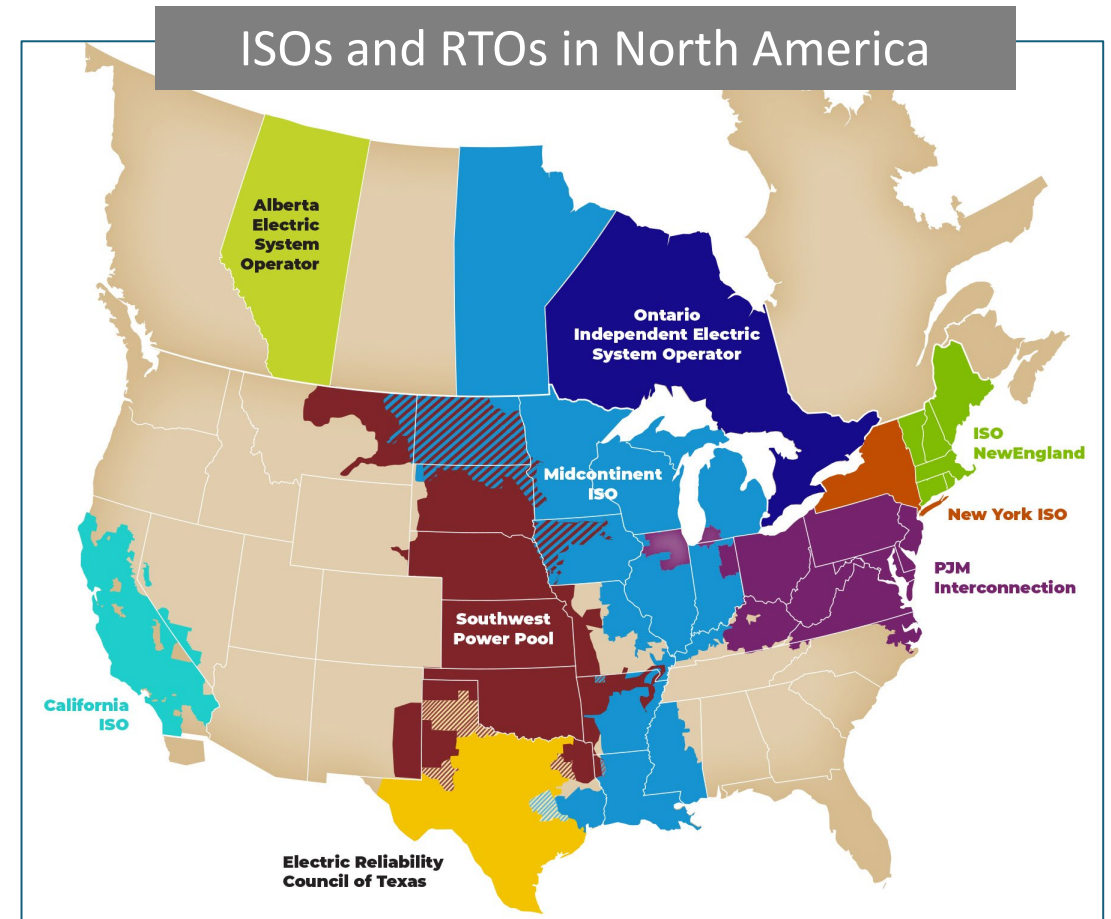
CONSUMERS

The power plant combusts natural gas to power a turbine, converting fuel to electricity, to distribute to consumers



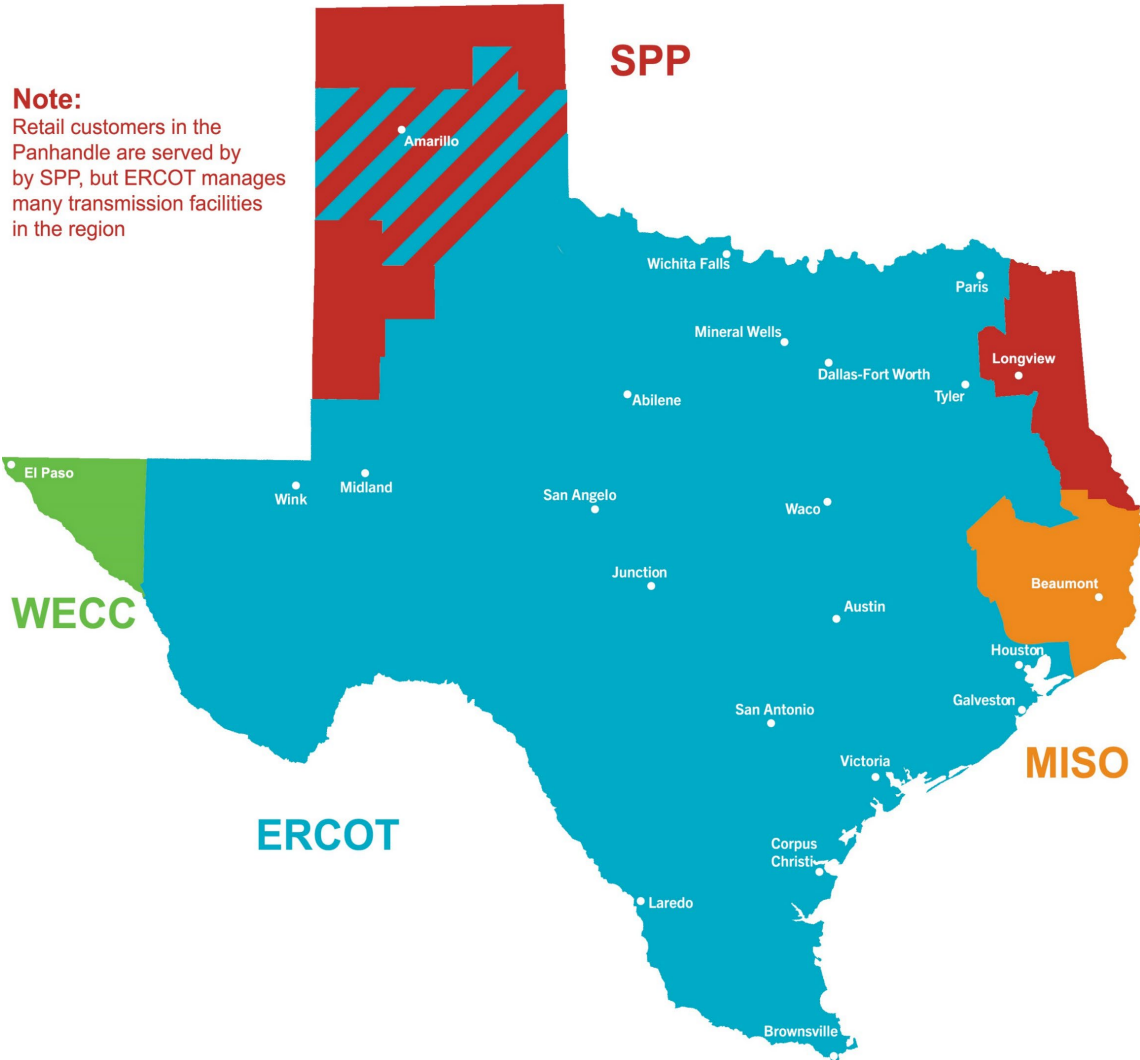
## TDUs are part of Regional Transmission Operators, Independent System Operators and Regional Coordinating Councils

- FERC regulates the transmission and wholesale sales of electricity in interstate commerce
- RTOs, like SPP and MISO manage the flow of electrons across multiple, interconnected states.
- ISOs, like ERCOT, do so within a single state.
- Areas without RTOs or ISOs are managed by regional coordinating councils, which provide fewer market services
- RTOs are regulated by FERC and state regulators in each state where they operate
- ISOs are not closely regulated by FERC





# AECT Companies Outside of ERCOT



Southwest Power Pool (SPP)

Midcontinent Independent System Operator (MISO)

Western Electricity Coordinating Council (WECC)

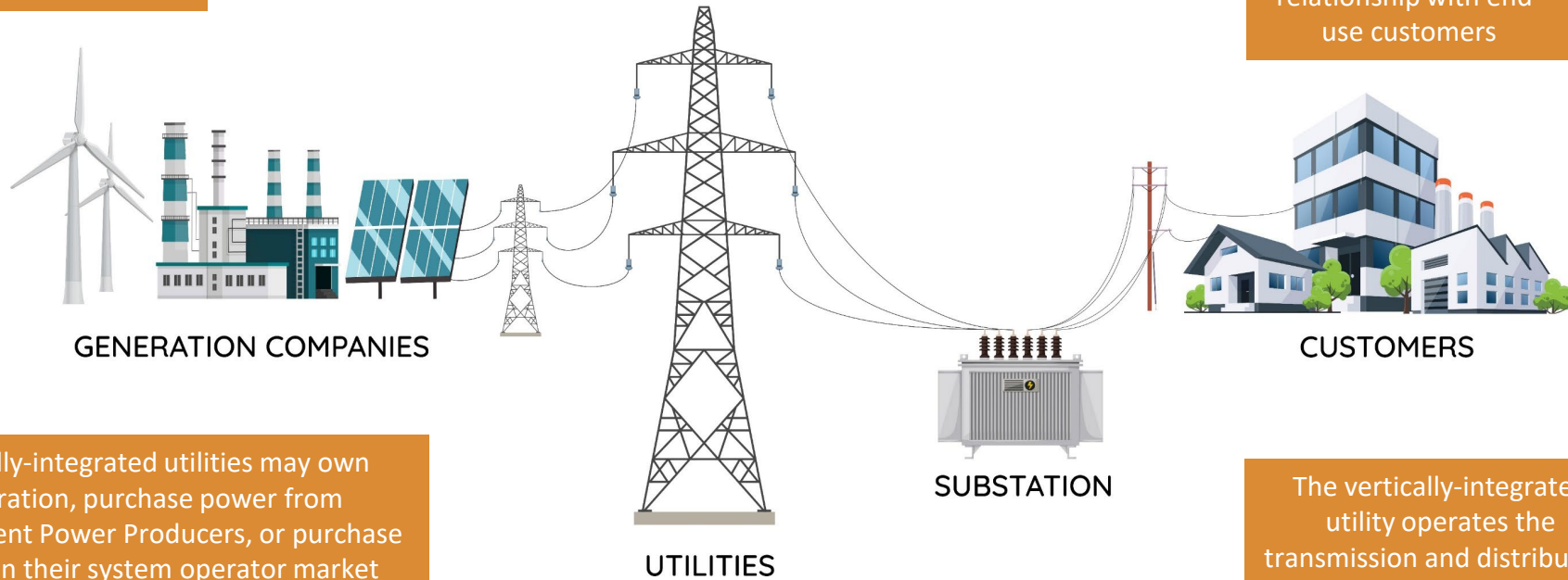
El Paso Electric



# Getting Power from Generation to Consumer in the Non-ERCOT Regions

In fully regulated markets, the PUC sets retail electric rates

The vertically-integrated utility maintains the relationship with end-use customers



Vertically-integrated utilities may own generation, purchase power from Independent Power Producers, or purchase power on their system operator market

The vertically-integrated utility operates the transmission and distribution infrastructure

**The Role of ISOs in Ongoing Electric Operations**

**Electric Power Transactions:** ISOs operate energy markets to allow utilities to purchase needed power on balancing markets

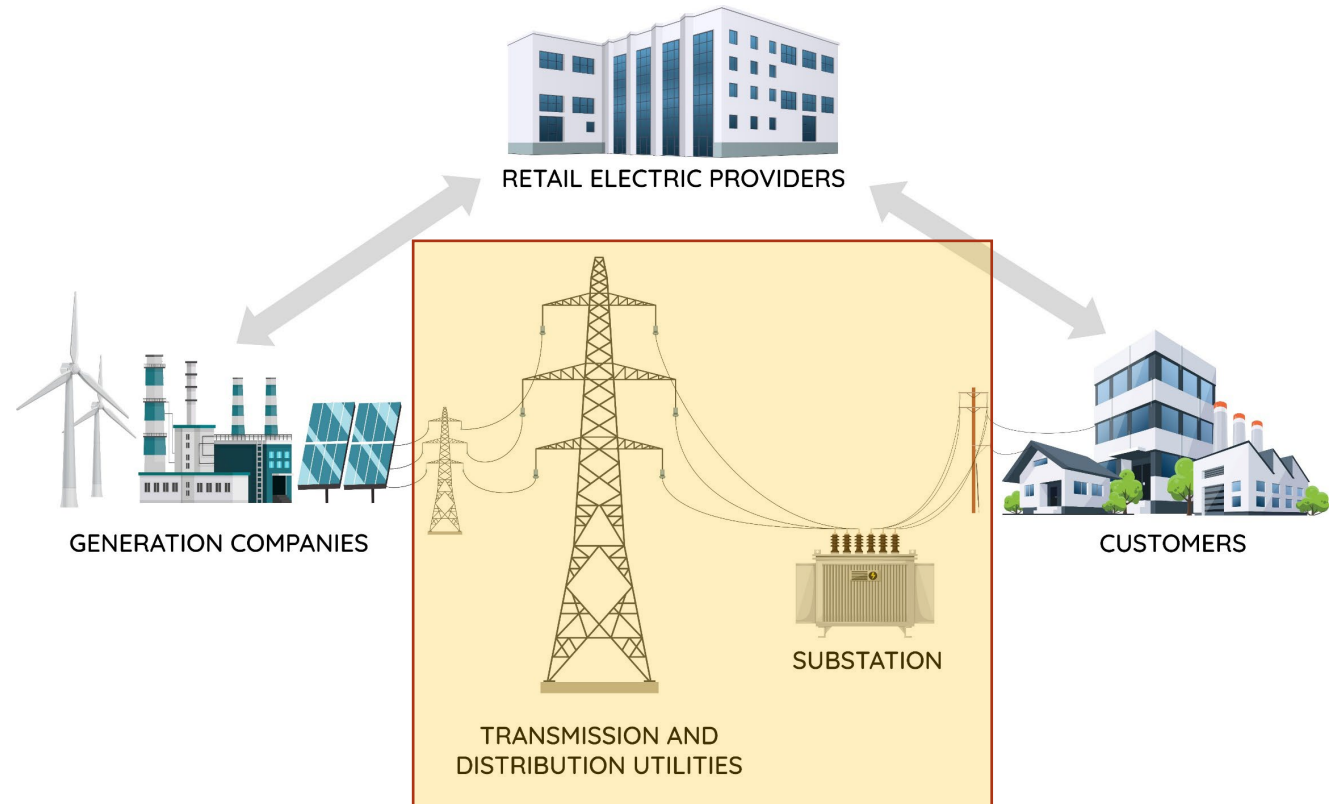
**Transmission System Planning:** ISOs assess system needs for new transmission lines to support long-term reliability

**Systemwide Assessments:** ISOs provide regular assessments of available generation and expected electricity demand



# Role of Transmission & Distribution Utilities

- Utilities are required to serve all customers in their territory
- In exchange, the utility is allowed to retain their territorial monopoly and earn a limited profit, which is regulated by the PUC
- Regulating utilities in this manner avoids having multiple utilities competing to serve each customer over separate, competing transmission lines







# Building Transmission Lines is a Multi-Year Process

	Year 1				Year 2				Year 3				Year 4			
	Qtr 1	Qtr 2	Qtr 3	QTR 4	Qtr 1	Qtr 2	Qtr 3	QTR 4	Qtr 1	Qtr 2	Qtr 3	QTR 4	Qtr 1	Qtr 2	Qtr 3	QTR 4
Need/ERCOT Evaluation	█															
Routing Study			█													
CCN Preparations				█												
File CCN																
CCN Proceeding **					█											
Permitting										█						
ROW Acquisition										█						
Engineering & Material Acquisition									█							
Construction												█				

- Transmission lines take several years of processing before construction can begin.
- Building long transmission lines can affect many landowners, often requiring a lengthy and extensive easement acquisition effort.
- The transmission line siting process must take into account the impact of those lines on environmentally sensitive and historically significant lands.



# Statutory Timeline of a Rate Case

Utility files a statement of intent to file a rate case with Original Jurisdiction authorities (either its cities or the PUC). Original Jurisdiction authorities also have the authority to demand the utility file a rate case.

After the rate case is filed, the PUC may suspend the effective date of proposed rates by an additional 150 days beyond the notification period

After filing the rate case, PUC Staff, cities, affected ratepayer groups and OPUC may intervene and begin sending discovery requests to the utility.

- Rate cases are almost always referred to SOAH, where an ALJ establishes a procedural schedule to allow the PUC to decide the case before the deadline.
- Intervenor then file written testimony on the rate application.
- The utility may then file testimony rebutting intervenor testimony.
- If a hearing occurs, it's normally around 100 days after filing.
- The ALJ will issue a proposed order (if no hearing) or a proposal for decision (if contested) and refer the case back to the PUC.

The PUC must approve or deny the case by day 185, or the case is deemed approved. The utility may voluntarily extend the timeline.

Day 1

Day 35

Day 135

Day 185



# Protecting Against Threats to the Grid



**Promote Awareness:** Utilities, national, state and local governments and agencies warn residents of impending storms, including hurricanes, tornadoes and major ice storms.



**Develop Mitigation Strategies:** Utilities implement protocols to reduce likelihood of electrocution from downed lines



**Harden Facilities:** Utilities promote robust construction to allow for quick recovery and look for opportunities to cost-effectively harden systems, such as through undergrounding lines, animal guards and security and online drills.



**Cyber Hygiene:** Maintain best practices, share information with other utilities and hold regular briefings to defend against grid hacking activities.

**Investment:** Major hardware and software investment specifically aimed at identifying cyber attack activity, plus investment in cyber security divisions staffed with financial industry and military backgrounds

**Maintain Backup Equipment:** Strategically position replacement parts and facilities to quickly rebuild where needed



### **Reliability and Resiliency**

- The entire grid is facing rapidly increasing load, due to economic growth, electrification of oil & gas equipment, electrification of heating systems, the interest of Crypto miners in Texas and other factors.
- Texas frequently faces widespread inclement weather throughout the year. The electric grid will benefit from investment to allow for more rapid recovery from one-time events.

### **Affordability**

- Texas' economic strength depends on a strong electric system that maximizes the benefits of competitive wholesale and retail markets.

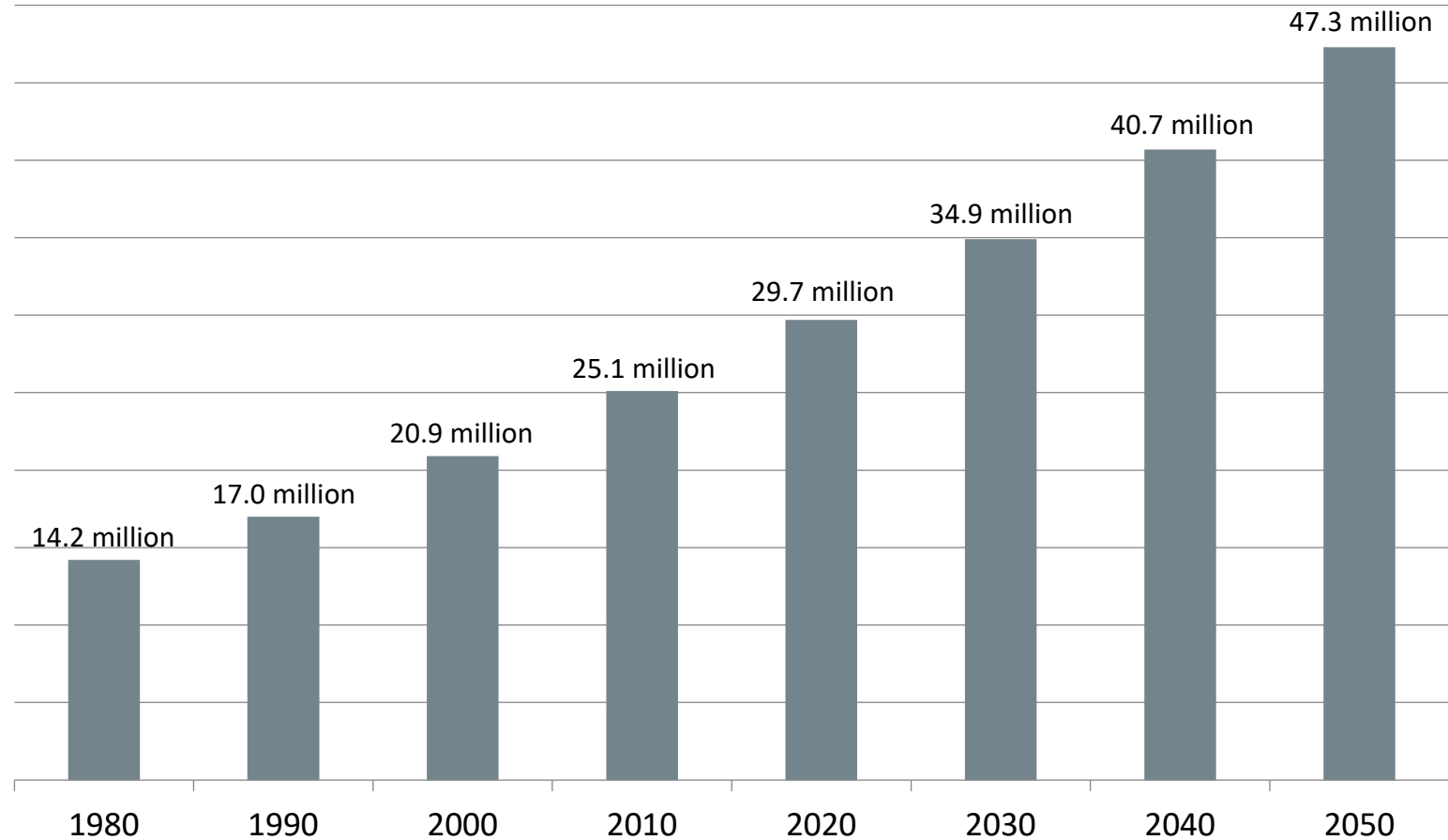
### **Sustainability**

- The transmission network in ERCOT has evolved to bring more wind and solar generation from rural areas of the state to population centers
- The local electric utility distribution networks face increasing demand for distributed energy resources, such as rooftop solar, customer-owned generators, home battery storage and the adoption of electric vehicles



Population, economic growth, electric vehicle adoption, crypto mining and electrification of homes and oil & gas processing will further increase electric use

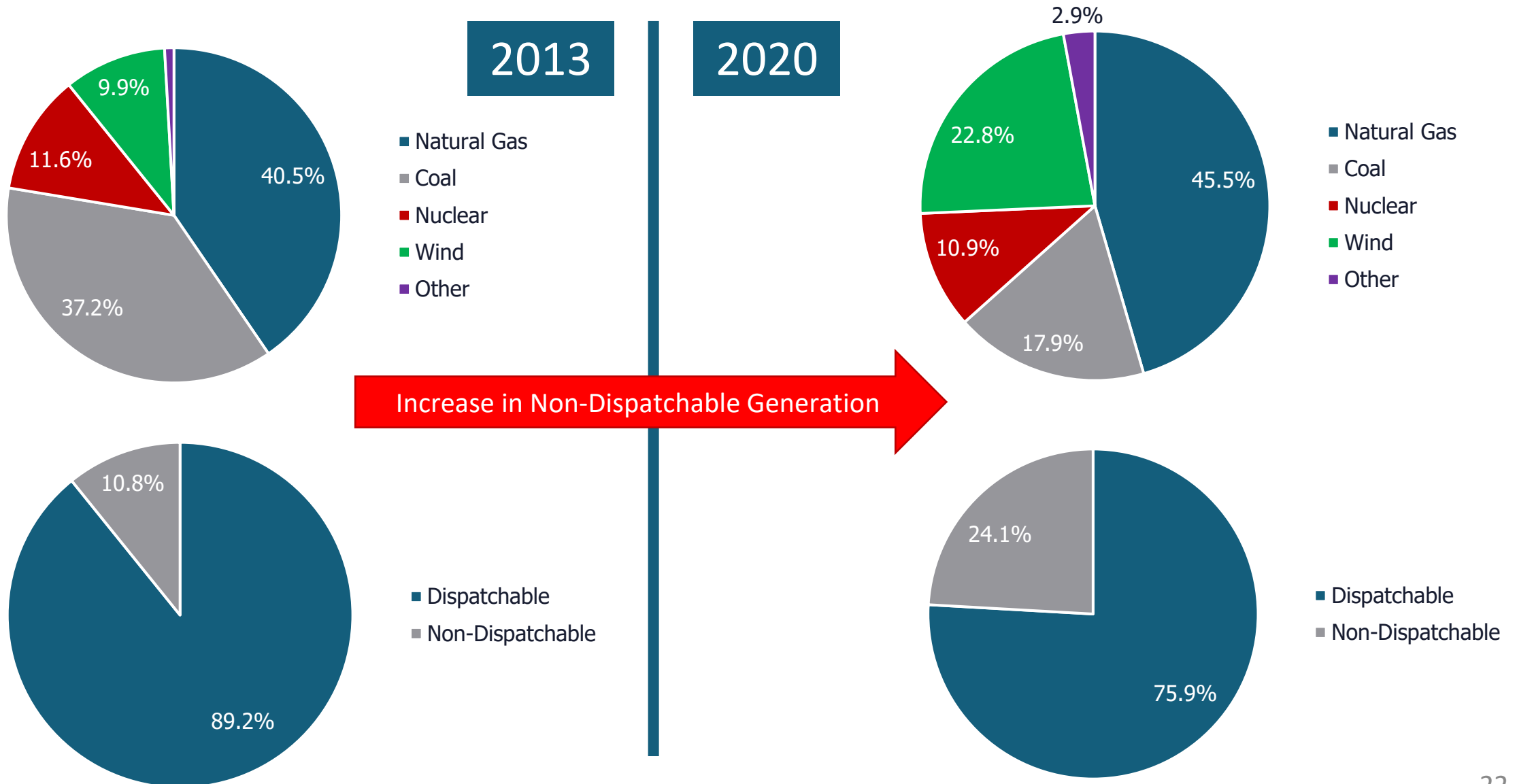
### Texas Population Growth 1980-2050



Sources: U.S. Census, Texas Demographic Center



# ERCOT's Changing Generation Mix





## ERCOT Load Zones: Impact of Regional Congestion

- One of ERCOT's roles is to determine which generating units will operate and for what time after considering the costs of operating each unit
- This includes ramping up and powering down electric generating facilities based on the actual electric load, transmission constraints and other issues, creates additional costs, which are assessed by ERCOT





## Overview of Distributed Energy Resources (DERs)

### Examples of Distributed Generation (DG)

Small DG (Under 1 MW)



Large DG (1MW – 10 MW)



- **Distributed generation (< 1 MW):** Rooftop solar, small diesel, or gas generators. May be paid for energy exports, but not make offers or sell ancillary services
- **Distributed generation resources (DGRs) and Distributed energy storage resources (DESRs):** Larger on-site generation such as batteries. These entities must register as a power generating company if they are putting energy on the grid.
- **Generation resources >10 MW:** Treated like any other traditional generation resource and seldom located on the distribution system

### Examples of Demand Response (DR)

Residential



Large Commercial and Industrial



- **Residential load curtailment:** Opt-in smart thermostat programs and manual thermostat programs to reduce power usage, offered by some REPs, municipally-owned utilities and electric cooperatives.
- **Wholesale market participation:** Bids to buy electricity and provide certain ancillary services; compensation received for ancillary services
  - Often used by large industrial customers
  - Growing use by crypto mining facilities





# How to Reach Us



AECT.net



@aectnet



Association of  
Electric Companies  
of Texas



Association of  
Electric Companies  
of Texas

