



Texas Grid Overview

Presentation to the Public Safety and Homeland Security Committee

Houston City Council

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Nonresident Scholar

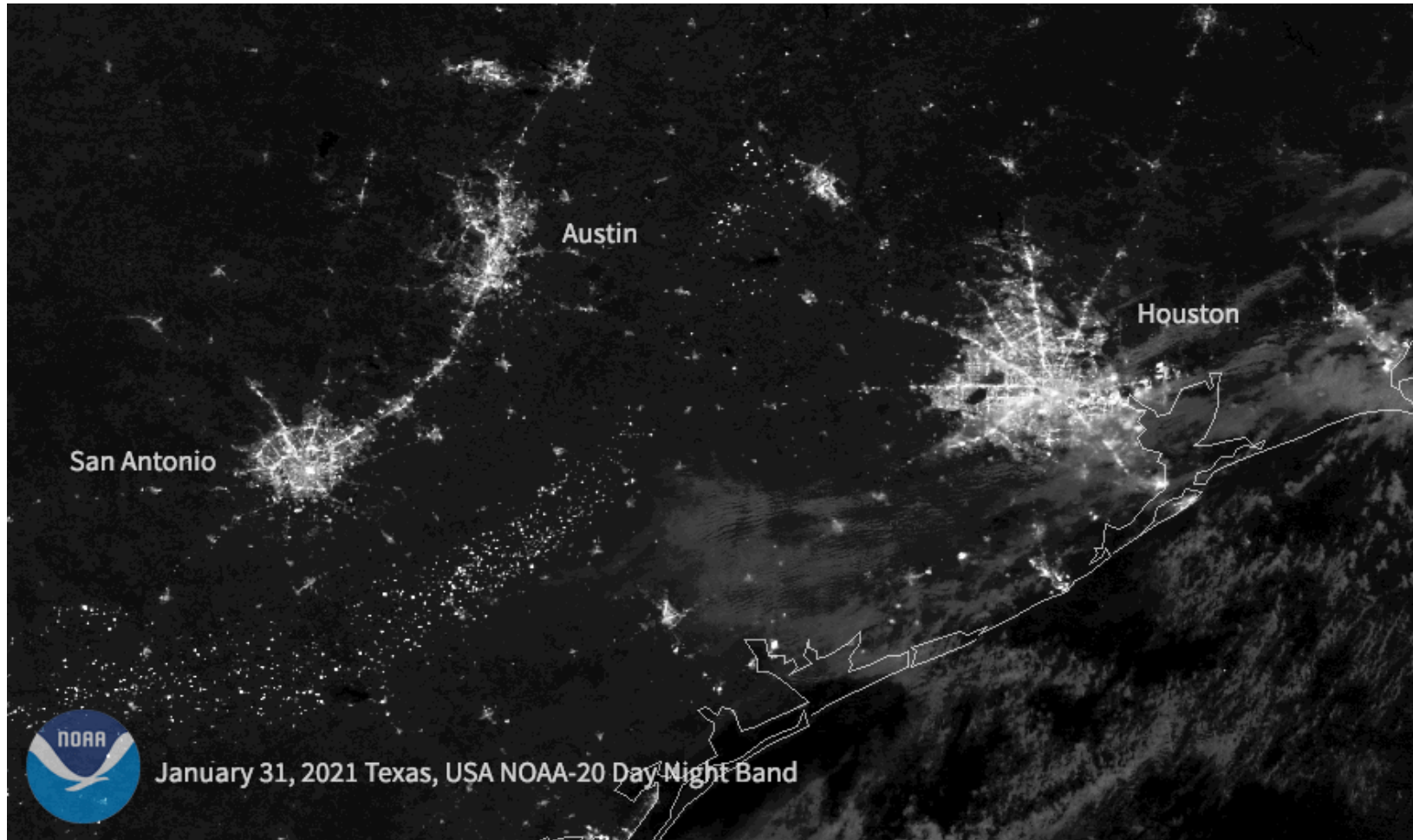
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Winter Storm Uri: February 10-20, 2021



Two Storm Systems Hit Texas

5,000,000+ lost power
12,000,000+ lost water service

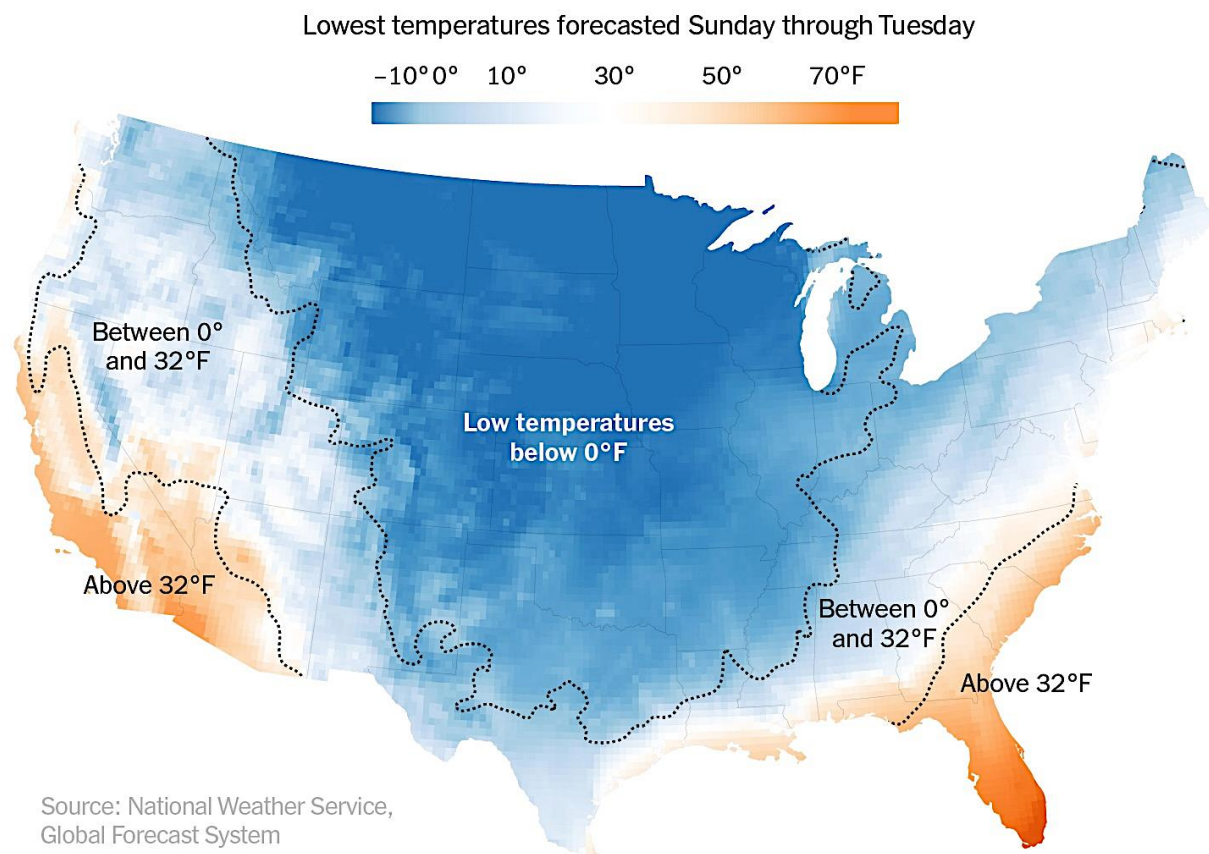
Disruptions to:

- Transportation
- Petrochemical industry
- Food and Fuel supplies

246 confirmed deaths due to hypothermia or carbon monoxide poisoning

Excess energy costs borne by ERCOT customers

Winter Storm Uri: Power Outages



Cold: Colder for longer

Demand: Insulation, electric heating

Generating Shortages:

- Equipment froze
- Natural gas generators had no fuel
 - Natural gas infrastructure froze*
 - Natural gas infrastructure had no power*
- Backup generation?
- Links to other grids?

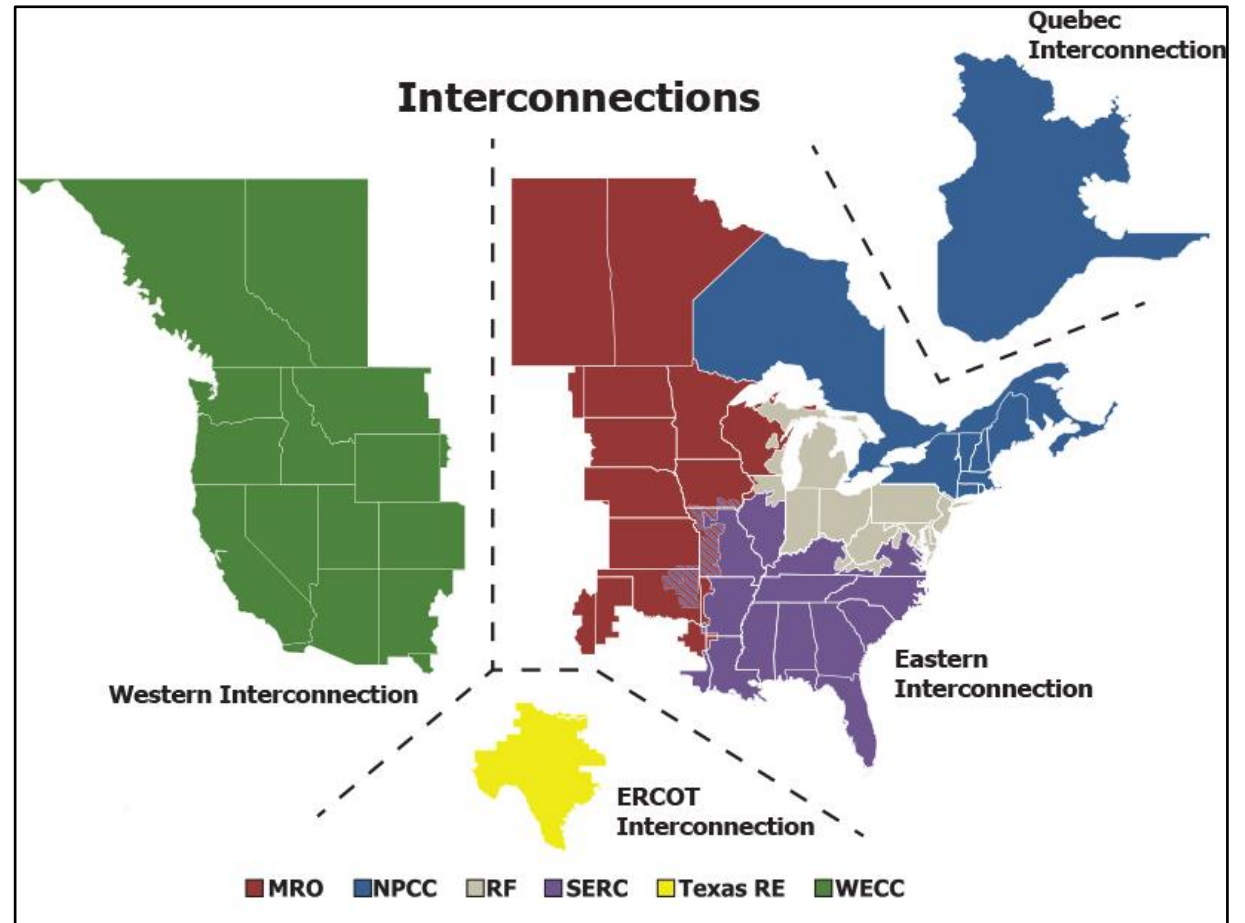
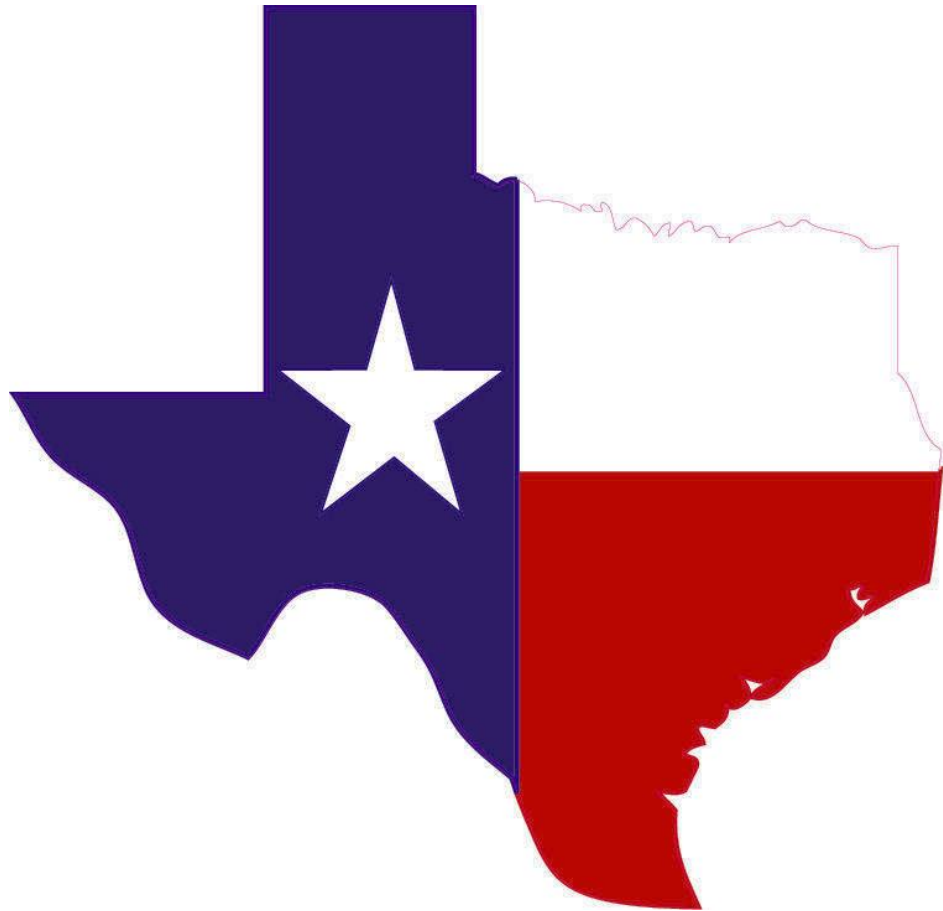
Curtailments:

- Reliability standards

Excessive energy costs:

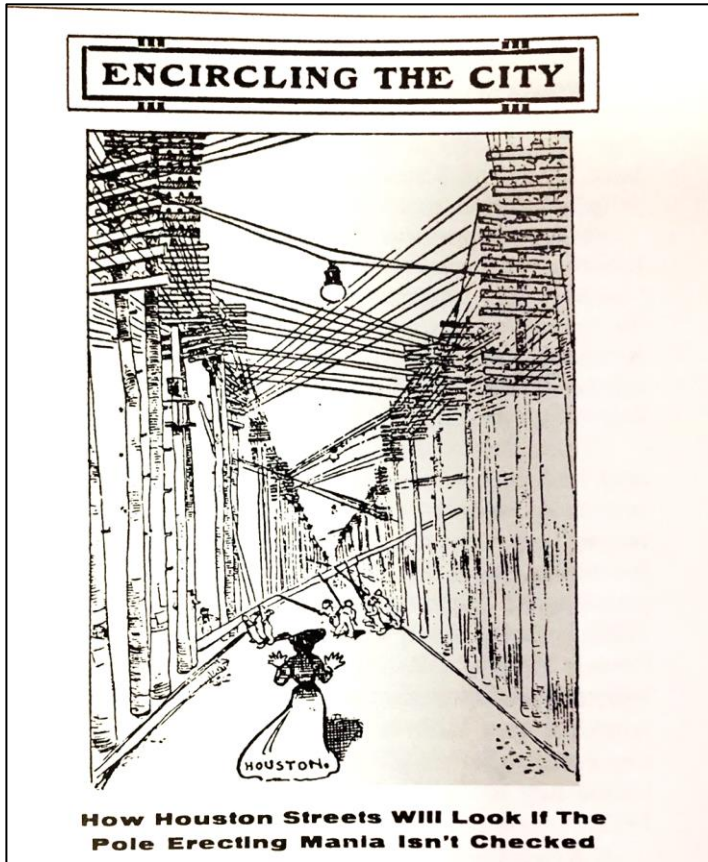
- Structure of wholesale power market
- Structure of retail power market
- Structure of intrastate natural gas market

The Isolated Texas Grid

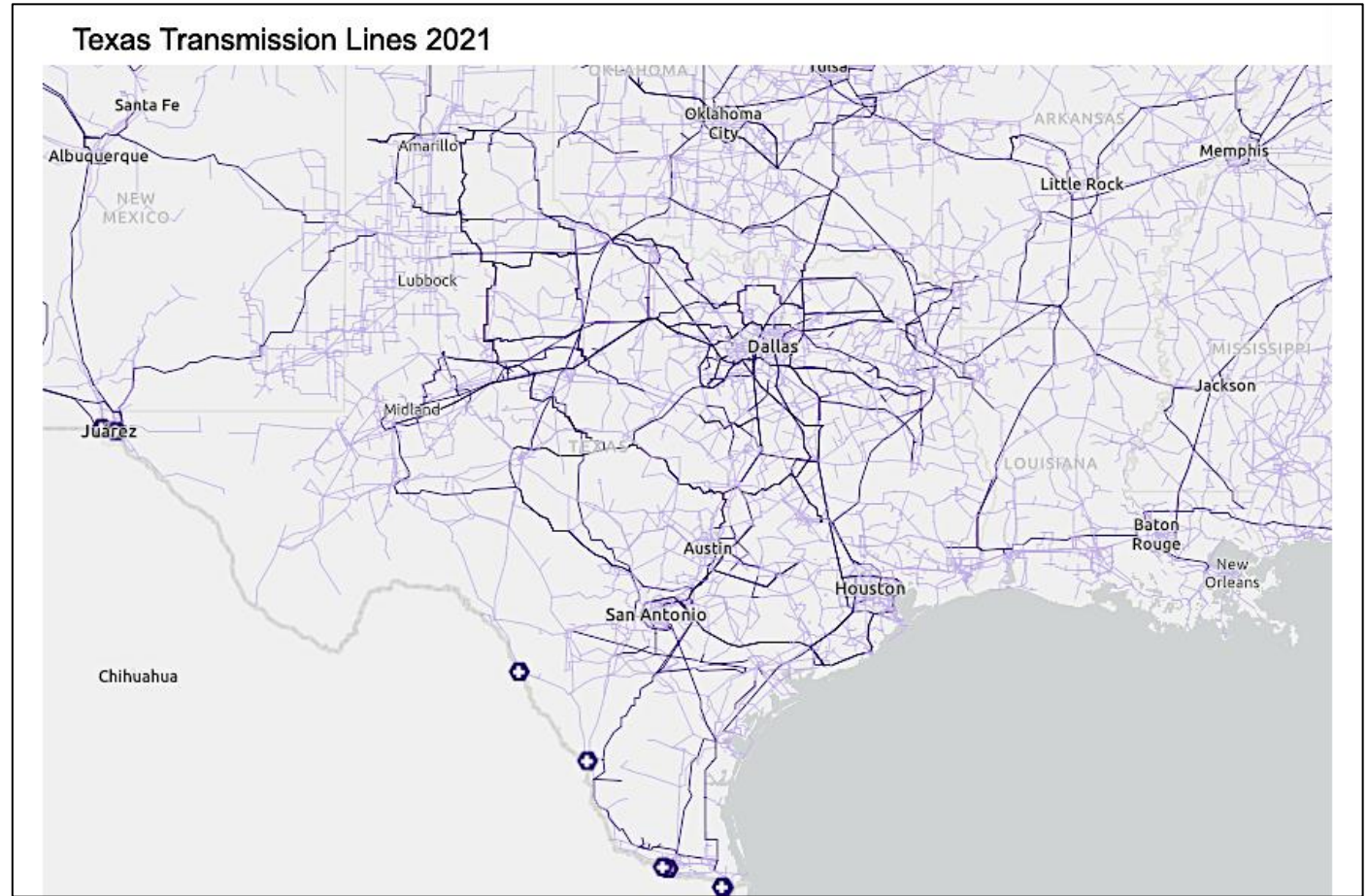


North American Electric Reliability Corporation (NERC) Interconnections Map

Very Quick History



The Houston Post, June 15, 1905



From This



To This

Texas is Unique

Geography and Economy

- Multiple energy resources
- Diverse economy
- Wide state

Renewables:

- Renewable Portfolio Standard (RPS) in 1999
- Expanded RPS in 2005
- CREZ - 2005

Regulation:

- Last state to regulate in **1975**
- Restructuring in 1995, 1999
 - Competitive wholesale power market: energy only
 - Competitive retail power market: could link to wholesale prices (Griddy)

Regulatory Framework

US

FERC (Federal Energy Regulatory Commission)

- Interstate wholesale power transactions
- Interstate transmission lines
- Reliability

NERC (North American Electric Reliability Corporation)

- Reliability standards
- Reliability enforcement

TRE (Texas Reliability Entity)

- Regional reliability enforcement



Texas Legislature

PUCT (Public Utility Commission of Texas)

- Competitive power markets
- Transmission and distribution utilities
- Retail rates outside ERCOT

ERCOT (Electric Reliability Council of Texas)

- Grid operator

TRRC (Texas Railroad Commission)

- Oil and gas Industries

ERCOT and Grid Stability

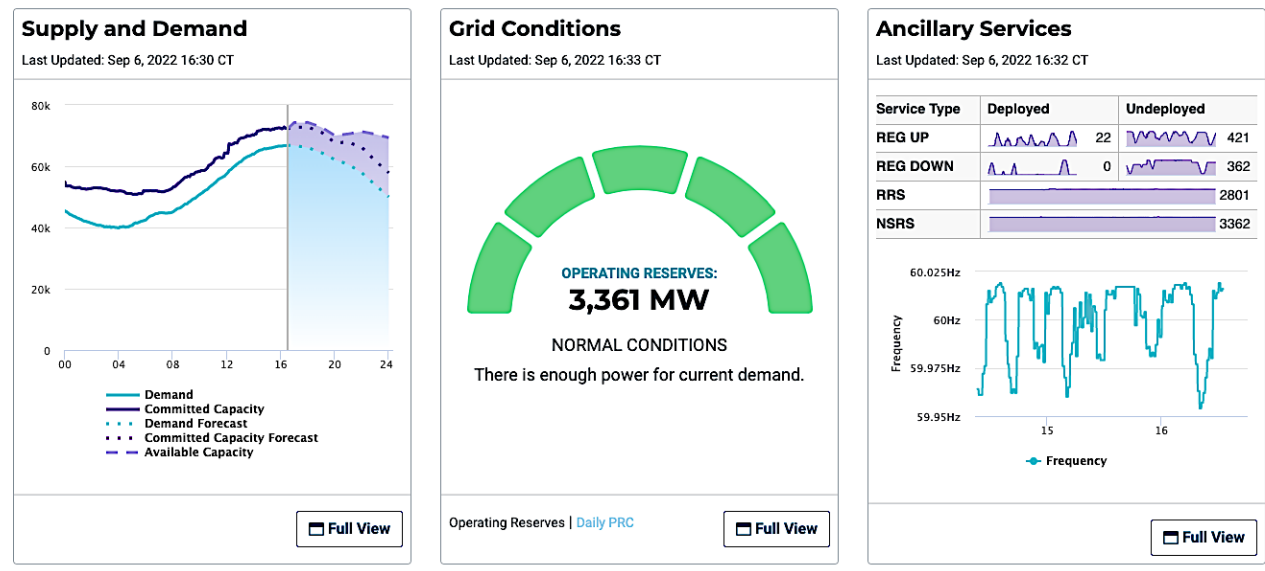
Statutory Duties:

- Maintain system reliability.
- Facilitate competitive wholesale and retail markets
- Ensure open access to transmission.
- Also: research, planning, public communication



Grid and Market Conditions

These dashboards offer a snapshot of current conditions in the ERCOT system. The timestamp on each indicates when the information was last updated. Click the Full View link on a dashboard for an expanded display.



Part of ERCOT Dashboard, <https://www.ercot.com/gridmktinfo/dashboards>

Post-Uri Legislative Changes

- Governance of PUCT and ERCOT
- New Planning and Oversight Bodies
- Wholesale and Retail Markets
- Designation of critical providers and customers
- Weatherization
 - Power generators - Done
 - Natural gas infrastructure – In 2023
- Cost recovery
 - On my August bill!

Regulatory Fees	
Gross Receipts Tax	\$6.67
Market Securitization (Debt) Financing Fee	\$1.28
Public Utility Assessment	\$0.56

Looking Ahead

- **Legislature:**
 - Shape markets
 - Set priorities for energy resources
 - Direct development of infrastructure
 - Provide regulatory frameworks
- **PUCT and TRRC:**
 - Regulation
- **ERCOT:**
 - System Planning
 - Information and Communication
- **Centerpoint:**
 - Distribution network
- **Competitive Retail Market:**
 - Energy Cost to Houstonians