



## **Item 4: Emerging Grid and Planning Matters**

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Urgent Board of Directors Meeting

ERCOT Public

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## Key Themes

- Transmission constraints are likely to increase over the next five years
  - Notable constraints include Northwest Dallas-Fort Worth import, West Texas export, Delaware Basin load serving, South Texas import and export, and Houston/ Freeport import
- Stability constraints will present an ever increasing challenge for ERCOT and stakeholders going forward
- Planning studies have not shown that transmission constraints will have an impact on resource adequacy at this time

# The Big Picture Overview

**Remedial Action  
Schemes:**  
New Generation Interconnection

**Delaware Basin:**  
Reliability-Driven,  
Stability Constraints

**West Texas Export:**  
Economic-Driven,  
Stability Constraints

**South Texas Export:**  
Economic-Driven,  
Stability Constraints

**Northwest Dallas-Fort Worth:**  
Reliability and Economic-Driven,  
Thermal Constraints

**Houston/ Freeport Import:**  
Reliability and Economic-Driven,  
Thermal and Stability Constraints

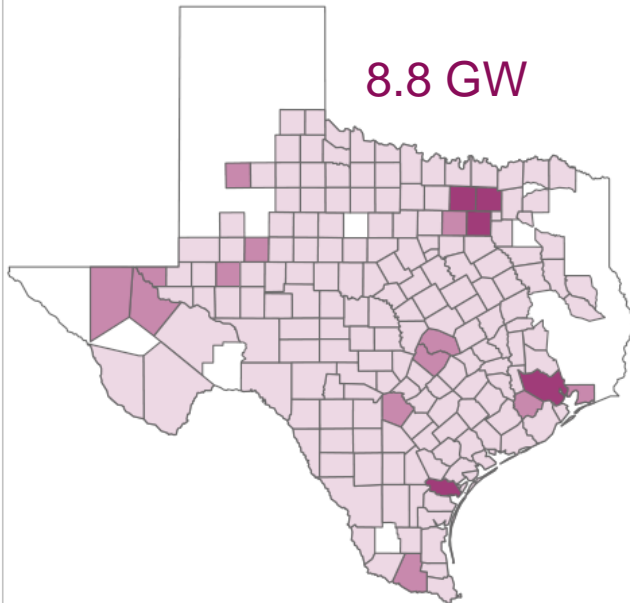
**South Texas Import:**  
Reliability-Driven,  
Stability Constraints

# Load and Generation Changes

## Load

Load growth (2020-2025) from 2019 Regional Transmission Plan (RTP) cases

8.8 GW

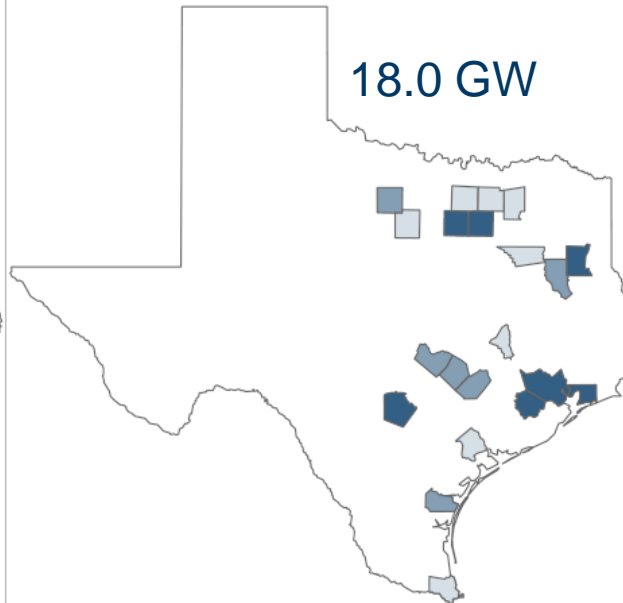


- 100 MW or less
- 101 MW to 500 MW
- more than 500 MW

## Generation

Existing thermal units older than 40 years

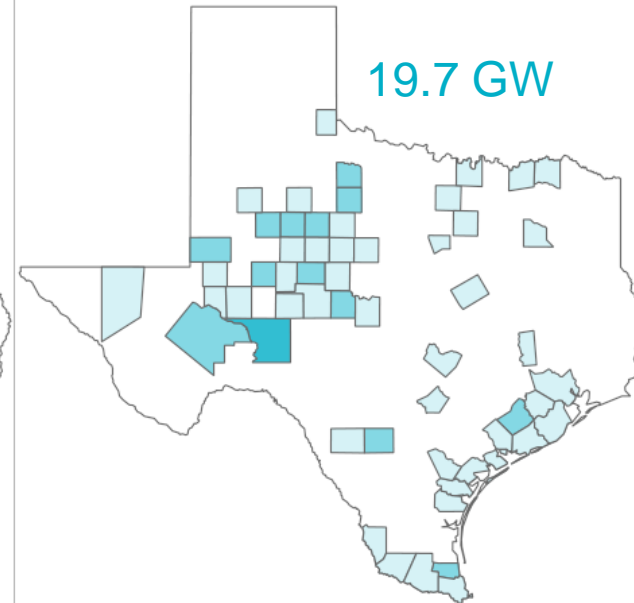
18.0 GW



- 500 MW or less
- 501 MW to 1,000 MW
- more than 1,000 MW

Planned generators that meet Planning Guide Section 6.9 (1)

19.7 GW



- 500 MW or less
- 501 MW to 1,000 MW
- more than 1,000 MW

Existing thermal unit capacities are from the Final Summer 2020 SARA report and planned generation capacities are from the June 2020 GIS report. <http://www.ercot.com/gridinfo/resource>

# Northwest Dallas-Fort Worth Import

- The combination of generation development northwest of the Dallas-Fort Worth area and load growth within the metroplex is expected to exceed transmission capacity in this region
- This is one of the highest congested areas in recent planning studies and ERCOT is actively analyzing project options to relieve these constraints



# West Texas Export

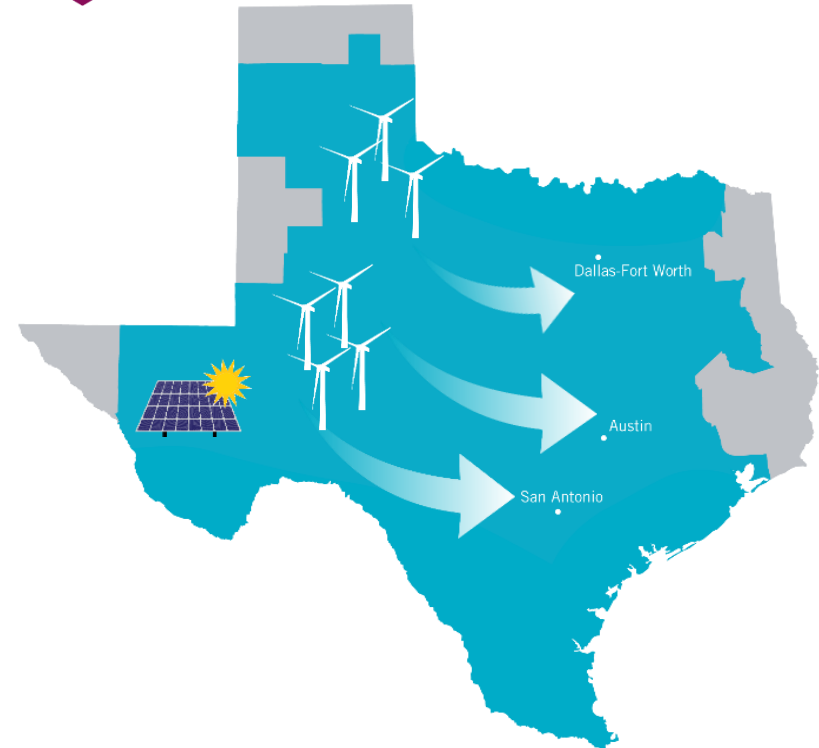
- Stability limitations are expected to lead to high levels of congestion on West Texas exports
- ERCOT is analyzing transmission upgrades to relieve this congestion as part of the 2020 Regional Transmission Plan

Competitive Renewable Energy Zone plan was designed to accommodate **18.5 GW** of wind generation

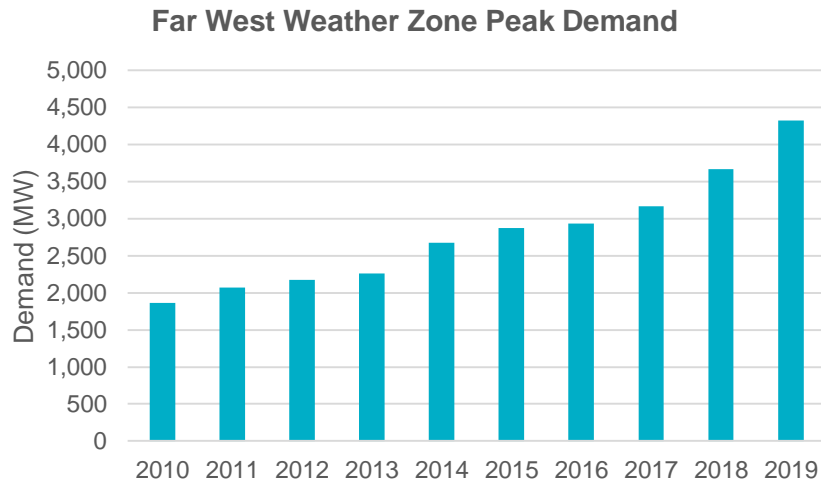
2013

**28 GW** of renewable generation is expected to be connected in West Texas

2020



# Delaware Basin Load



- The Delaware Basin is a sub-basin of the Permian Basin and comprises 8 out of the 22 Far West Weather Zone counties
- In 2019 ERCOT completed an assessment of the Delaware Basin and identified a 5-stage roadmap of transmission upgrades to serve continued oil and gas load growth in the area



**4,588**

Far West Peak Demand,  
Occurred July 15, 2020

**~1.5%**

ERCOT System-wide  
2010-2019 Annual Peak  
Load Growth Rate

**>10%**

Far West 2010-2019  
Annual Peak Load  
Growth Rate

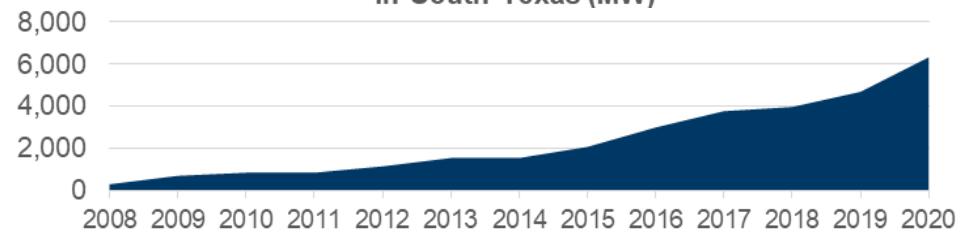


# South Texas Import and Export Constraints

- 5 of the existing 12 Generic Transmission Constraints (GTCs are used to manage stability limits in operations) are located in South Texas
- Proposed Liquefied Natural Gas facilities in the Valley could lead to up to \$1.2B in transmission improvements
- Additional generation development in the area may lead to further stability constraints



Cumulative Wind and Solar Generation Capacity in South Texas (MW)





## Houston/ Freeport Import

- The Houston Import Project went into service in 2018
- Freeport Import Project was approved in 2017 and will be complete in 2021
- The 2014 Houston Import Project study indicated additional upgrades would be needed by 2027 to continue to meet reliability criteria
- Recent planning studies indicate increasing amounts of congestion on the transmission lines importing power into the Houston and Freeport area in coming years.



# New Generation Challenges

**18-24  
Months**

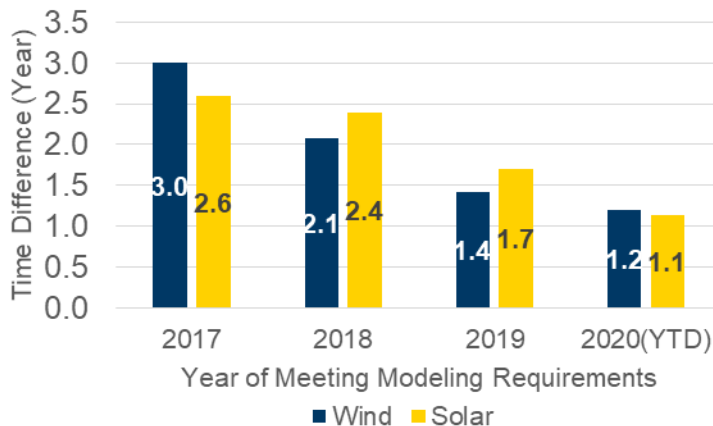
Typical time for IBRs from  
*initial* planning to physical  
interconnection

**0**

Number of IBRs  
currently planned  
beyond 2022

- The majority of new generation projects are inverter-based resources (IBRs), i.e., wind and solar
- Because of their short development timelines, IBRs are added to the planning models only six months to two years ahead of their commercial operation date, while transmission upgrades to resolve congestion can take up to six years to complete

Average duration of planned projects  
between meeting modeling requirements and  
projected commercial operation date



# Remedial Action Scheme (RAS) for New Generation

A RAS is a protection scheme that detects predetermined system conditions and automatically takes a corrective action. Corrective actions may include, but are not limited to:

- Transmission reconfiguration and load shedding for reliability
- Generation tripping used to allow Generation Resources to generate beyond local transmission constraints.
  - Increasing number of RASs are being requested for interconnecting new Generation Resources
  - August 21<sup>st</sup> Workshop will include a discussion of the reliability concerns associated with incorporating a large number of RASs into the grid.

# The Big Picture Recap

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# Questions?

