

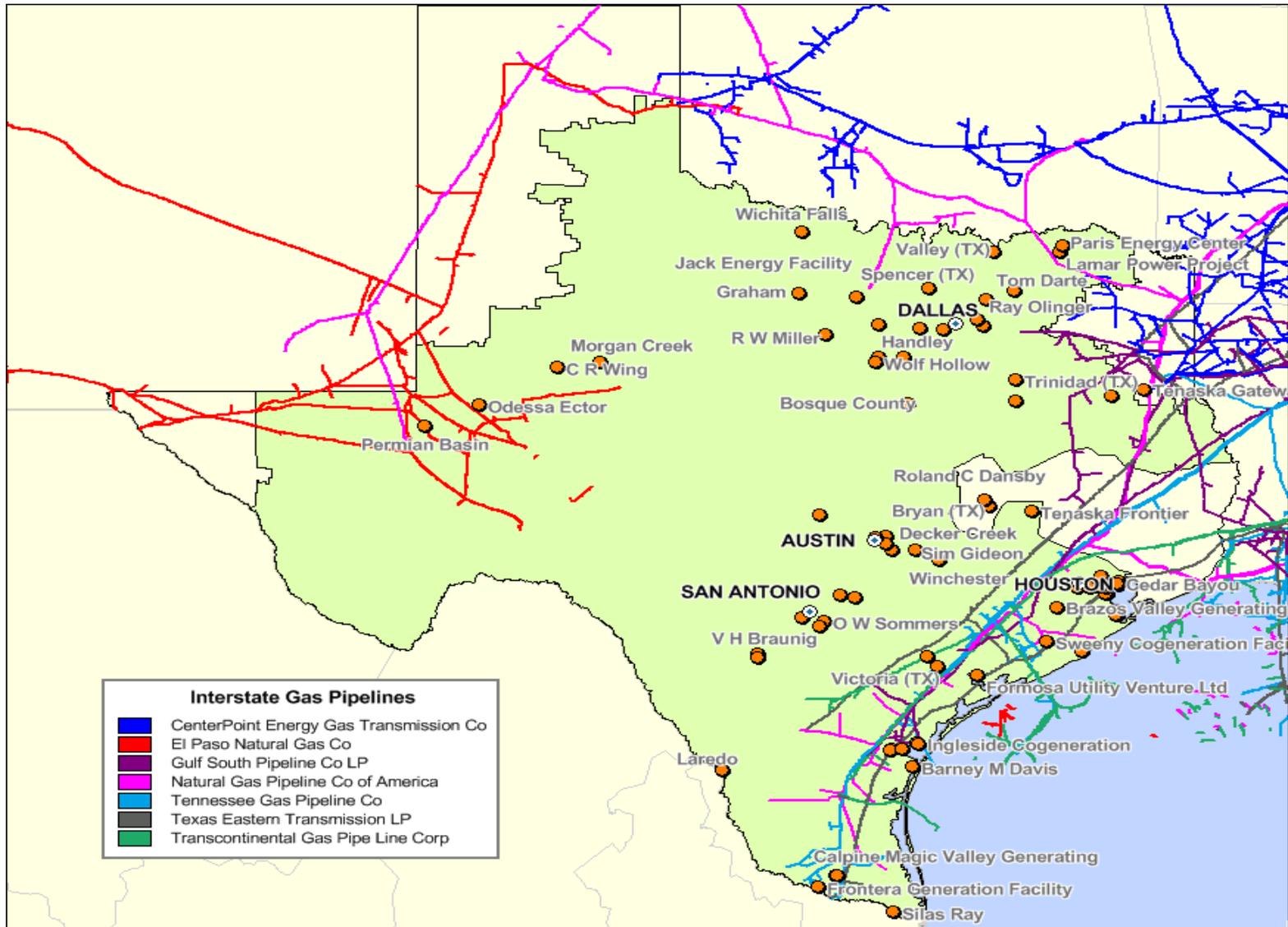


ERCOT  
Natural Gas/Electric Coordination

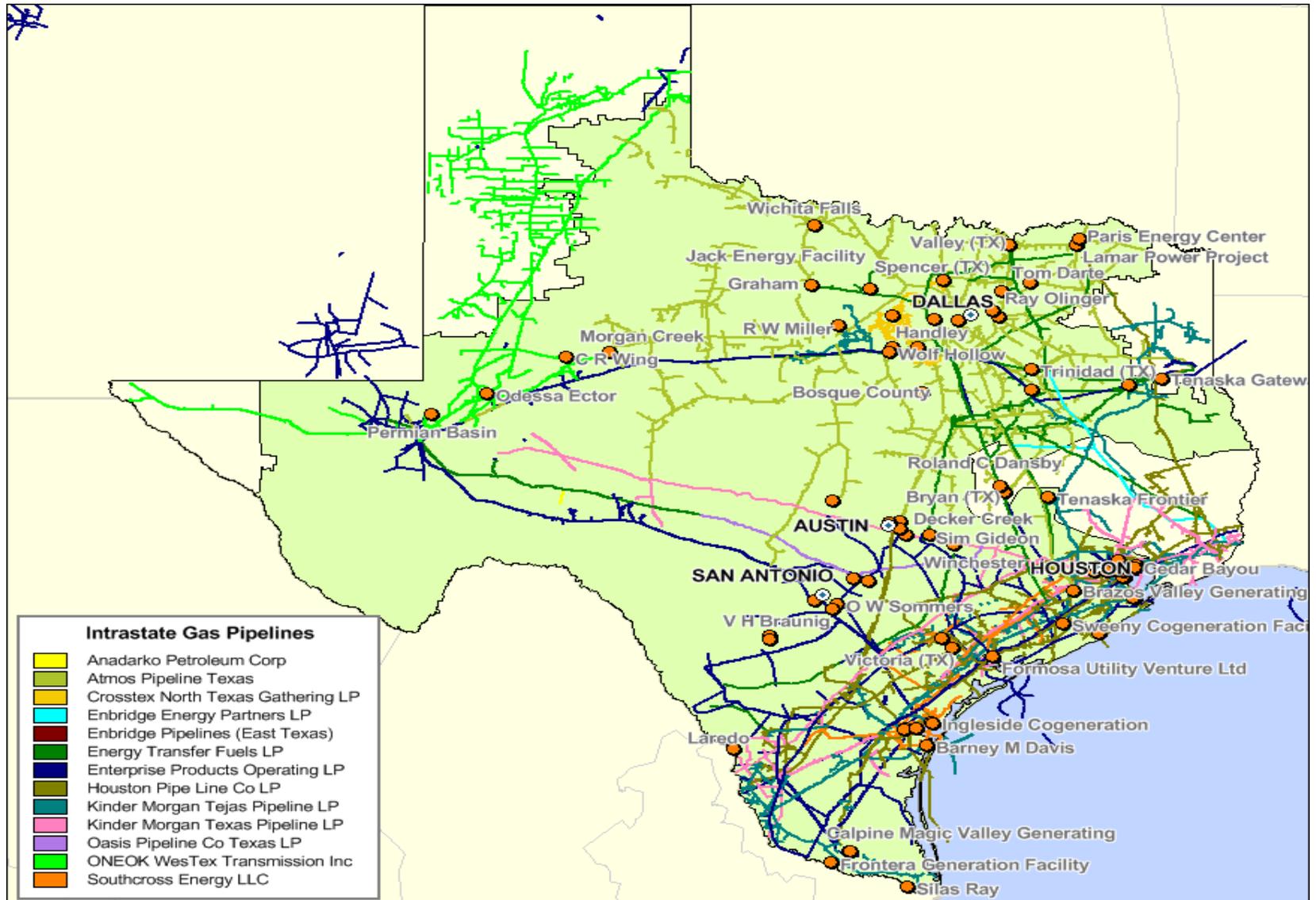
**FERC RTO/ISO Conference**  
**May 16, 2013**

Trip Doggett  
Chief Executive Officer

# Interstate Gas Pipelines Serving ERCOT Generators



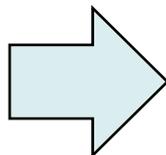
# Intrastate Gas Pipelines Serving ERCOT Generators



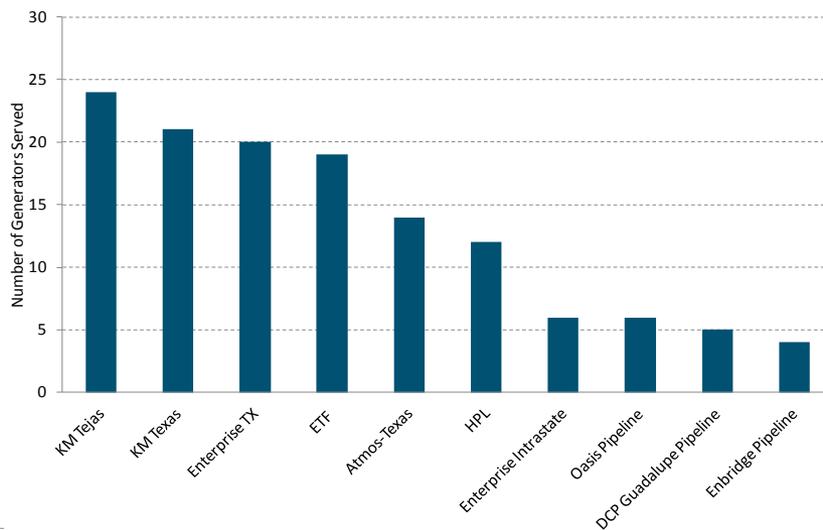
# Review of Natural Gas Infrastructure – Generators Demonstrate Redundancy Of Natural Gas Supply

Source: Gas Curtailment Risk Study prepared for ERCOT  
March 2012

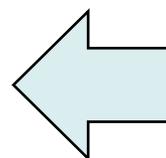
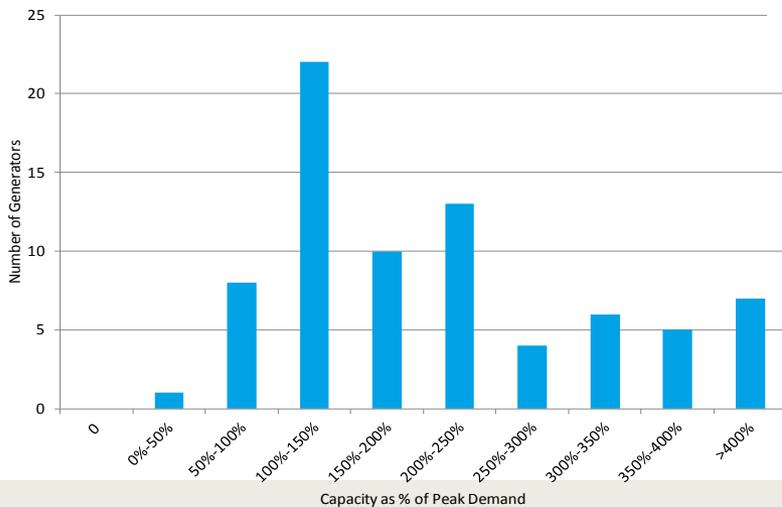
Intrastate Pipelines Dominate In Serving Electric Generators Within ERCOT  
(top ten pipelines shown)



Natural Gas Pipelines Serving ERCOT Electric Generators



Pipeline Capacity as % of Peak Needs for ERCOT Generators



Majority of ERCOT gas-fired generators have access to capacity in excess of their peak needs & multiple pipeline interconnects

# Potential Risks of Gas Supply to Electric Generation

- **Gas supply disruptions are most likely to occur during extended periods of cold weather. Much less likely due to hurricanes or pipeline infrastructure outages.**
- **The most severe disruption occurred in December of 1983 and required 1000 MW of rotating outages. The last widespread event occurred in February 2003, but required no rotating outages.**
- **The rotating outages in February 2011 in ERCOT were predominantly due to generating unit outages, not gas supply disruptions**
- **There has been extensive pipeline construction with the discovery of the Barnett and Eagle Ford shale plays in the last ten years**

# Coordination Between ERCOT and Gas Industry

- **Through the IRC, met jointly with INGAA members several times over the last two years, most recently in December 2012**
- **ERCOT is part of the Texas Energy Reliability Council , which consists of gas suppliers, pipelines, electric generators and large customers. Meet at least twice annually and by conference call whenever there is a potential for significant gas supply disruption.**
- **In 2012 ERCOT began working with the Texas Pipeline Association and Texas Railroad Commission to incorporate location of significant gas facilities into the ERCOT electric network model. This information will help ERCOT study the potential impact of electric outages on pipelines and pipeline outages on generators.**
- **Generators in ERCOT are required by Protocol to notify ERCOT any time they are made aware by their fuel supplier(s) of issues that might limit the operation of their generators.**

- **There were four minor reported gas supply or restriction events in December 2012 and January 2013**
  - December 11, 2012 – Pipeline equipment problems in the Rio Grande Valley caused a 500 MW class generator to be de-rated by 25 MW for approximately 3 hours
  - December 26, 2012 and January 14, 2013 – Below freezing weather caused a pipeline to implement gas restrictions to a 900 MW class generating plant in the Dallas area. Restrictions limited the plant to 400 MW operation without burning oil. Restrictions lasted for 100 hours and 60 hours respectively. Restrictions affecting this plant are expected whenever temperatures get below freezing.
  - January 30, 2013 - Pipeline equipment problems resulted in a 600 MW class plant in the Corpus Christi area remaining on line but unable to provide regulation service for approximately 30 minutes.
- **None of these events required ERCOT to take any extraordinary operational measures due to sufficient alternate generation.**