

The Nodal Market & Other Challenges and Opportunities Facing the Texas Electric Market

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Public Utility Commission of Texas
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The Texas Electric Market

Where have we been,
where are we now, and
where are we going?



The ERCOT Market

- 85% of Texas load & 75% of land
- 22 million Texans served
- Market size: \$34 billion
- 39,000 MW generation added since 1996
- Installed capacity of 80,000 MWs



The ERCOT Market

- ◎ Over 40,000 miles of transmission
 - > Over 6500 miles of transmission improvements (\$4.4 billion) since 1999
 - > Approx. \$5 billion under development to support 18,000 MW of new wind (CREZ Project)
 - > \$3 billion under development

ERCOT's Role in the Market

Texas Legislature restructured electric market in 1999. Assigned ERCOT four primary responsibilities:

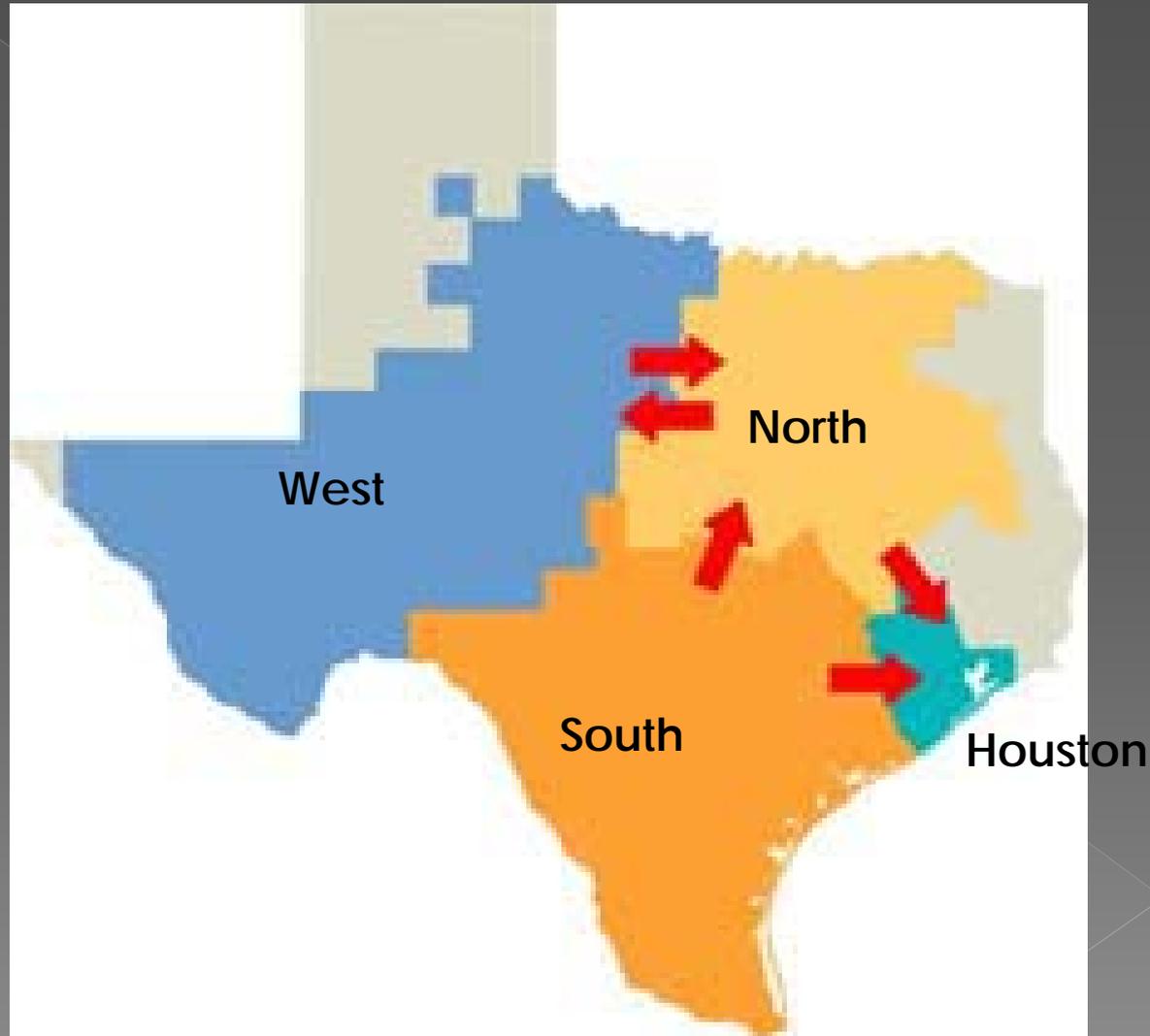
- ◉ System reliability – planning and operations
- ◉ Open access to transmission
- ◉ Retail switching process for customer choice
- ◉ Wholesale market settlement for electricity production and delivery.



Recent ERCOT Activity

- CREZ
- 2010 Budget Planning
- Congestion Management
- Transition to Nodal

Current Zonal Market



Current Zonal Market Design

- Four congestion management zones
- Four wholesale price points
- Five CSCs for inter-zonal congestion management



Inefficiencies in Zonal Market

- Congestion costs:
 - > Directly assigned for zonal congestion
 - > Uplifted for local congestion
- ERCOT provides portfolio level deployment instructions to QSEs
- Appropriate price signals are disguised in zones



History of Nodal in Texas

- ◉ September 2003, PUC approved transition to nodal wholesale market designed to:
 - > Reduce local transmission congestion costs
 - > Provide better price signals for locating generation and transmission
 - > Develop a day-ahead energy market
 - > Address other wholesale market concerns



Key Findings of CBA

- Overall system-wide benefit (including benefits from improved generation siting) = \$520 million.
- Savings to consumers = \$5.6 billion (NPV) over the first ten years of operation of the nodal market.

BREAKOUT OF ELECTRIC BILL

Applies to Competitive Choice Areas of ERCOT

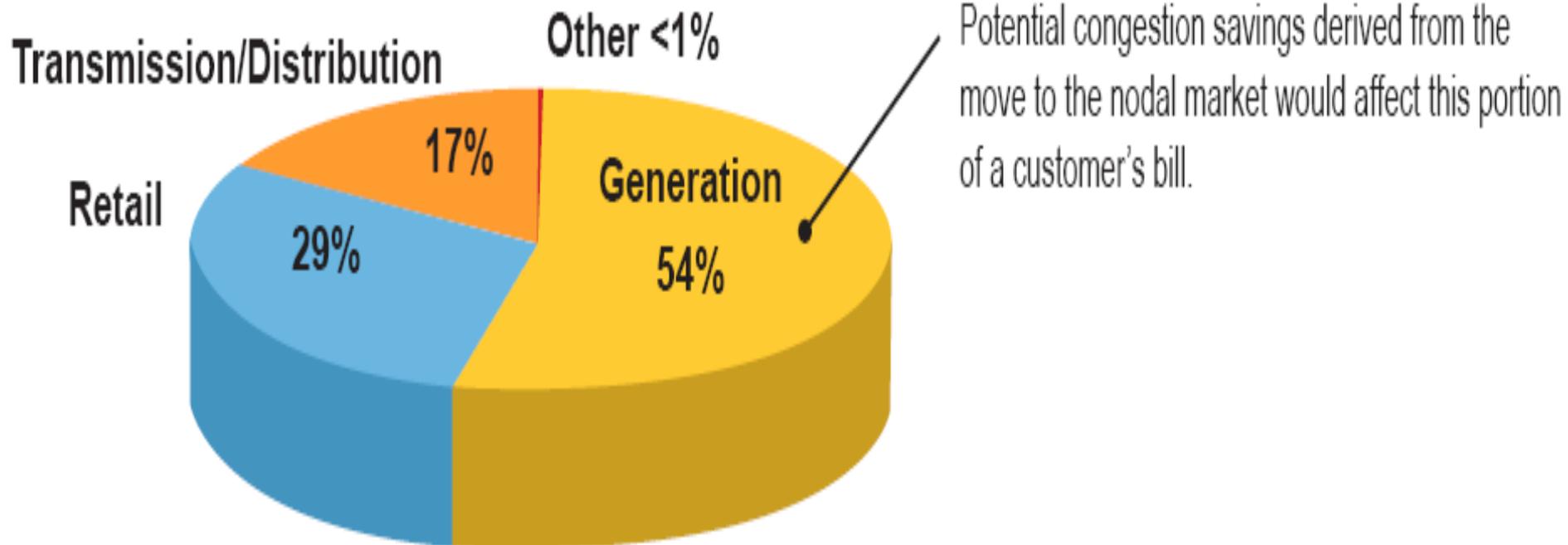
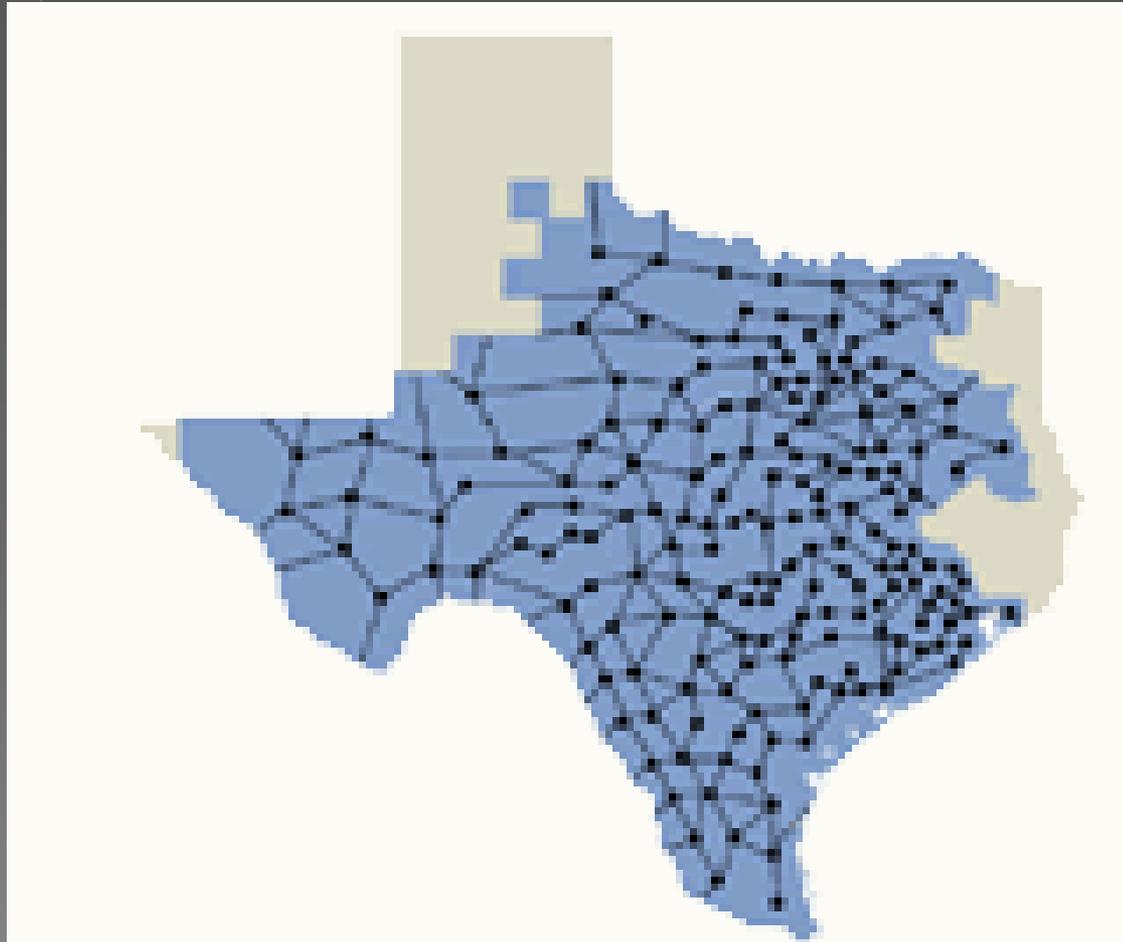


Chart based on retail data, market data, T&D charges and average retail margins for 2007-8. Does not include taxes.

IMM's 2008 State of the Market Report:

"The wholesale market should function more efficiently under the nodal market design by providing better incentives to market participants, facilitating more efficient commitment and dispatch of generation, and improving ERCOT's operational control of the system. "

What is Nodal?





What is Nodal?

- A system in which electric grid congestion and pricing information will be captured at more than 4,000 nodes
- This will improve market and operating efficiencies through more granular pricing and scheduling of energy services.



Efficiencies of a Nodal Market

- Improved price signals
- More efficient dispatch of electric generation
- Improved ability to anticipate system conditions to reduce local congestion
- Ability to assign local congestion to the resource causing the congestion

Figure 50: Pricing Contours of Unresolved Congestion in the Zonal Market

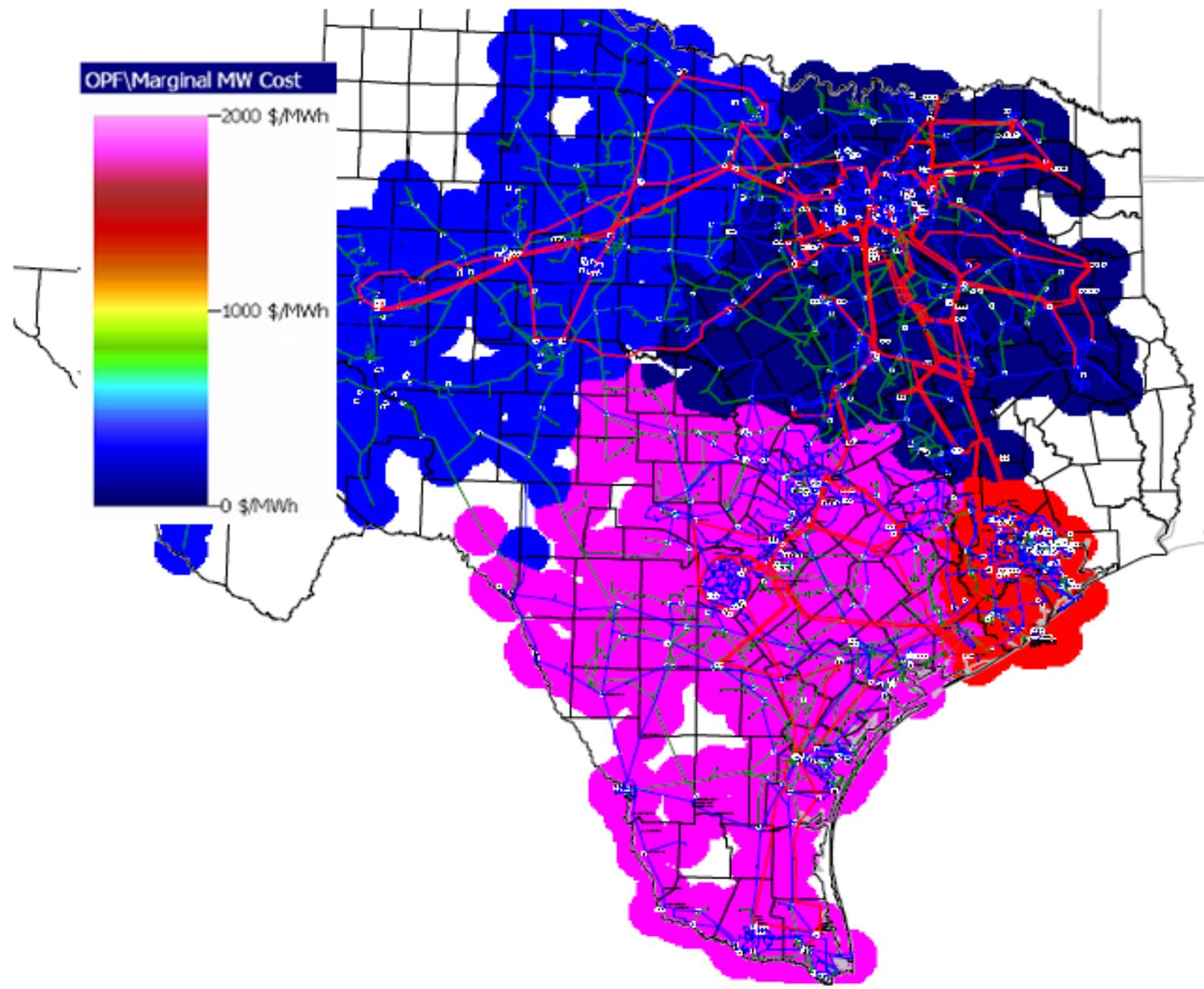
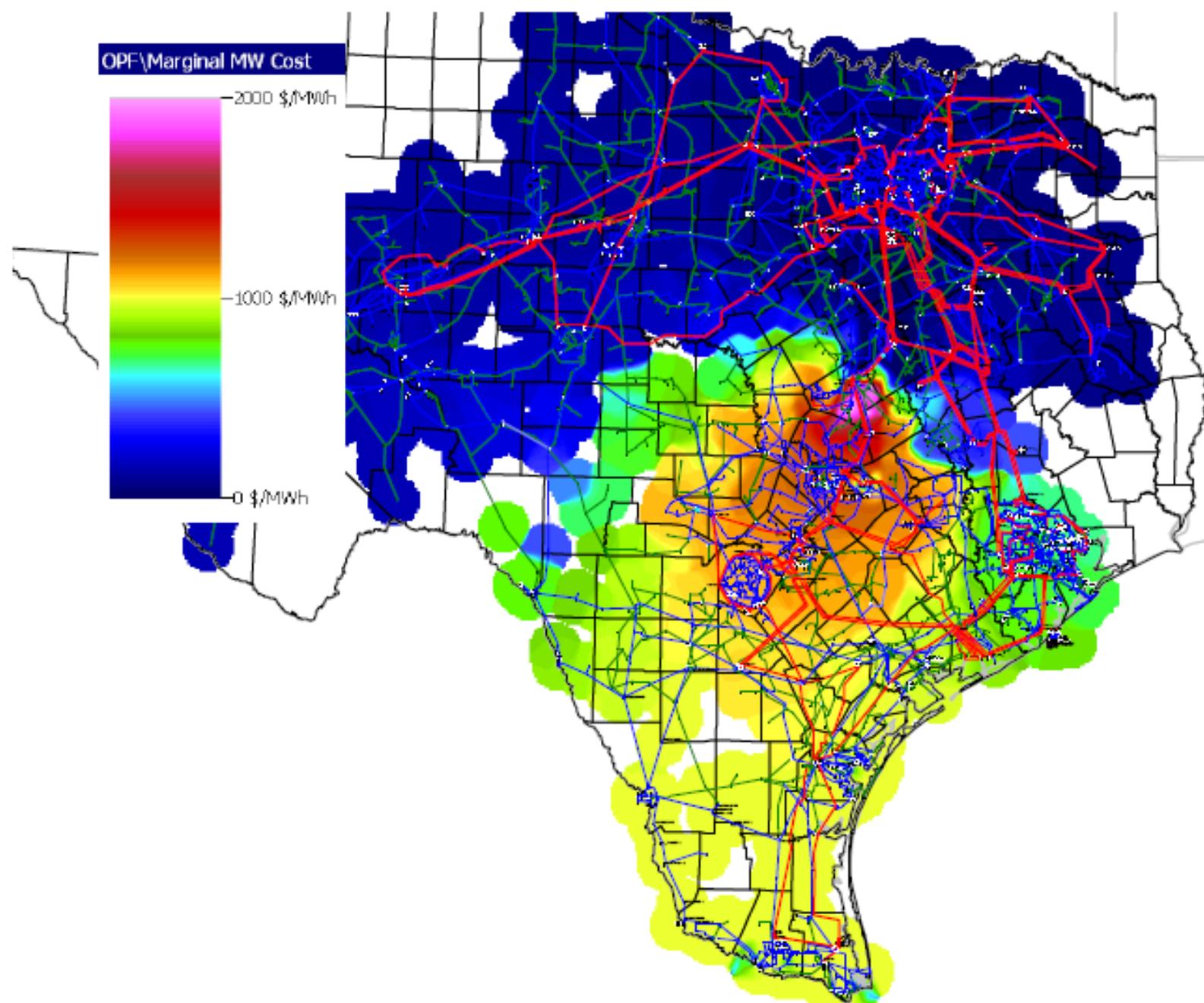


Figure 51: Pricing Contours of Unresolved Congestion in the Nodal Market





Day Ahead Market

- ◉ Arrange for energy and ancillary services for tomorrow
- ◉ Provide price discovery for tomorrow
- ◉ Provide price certainty for tomorrow

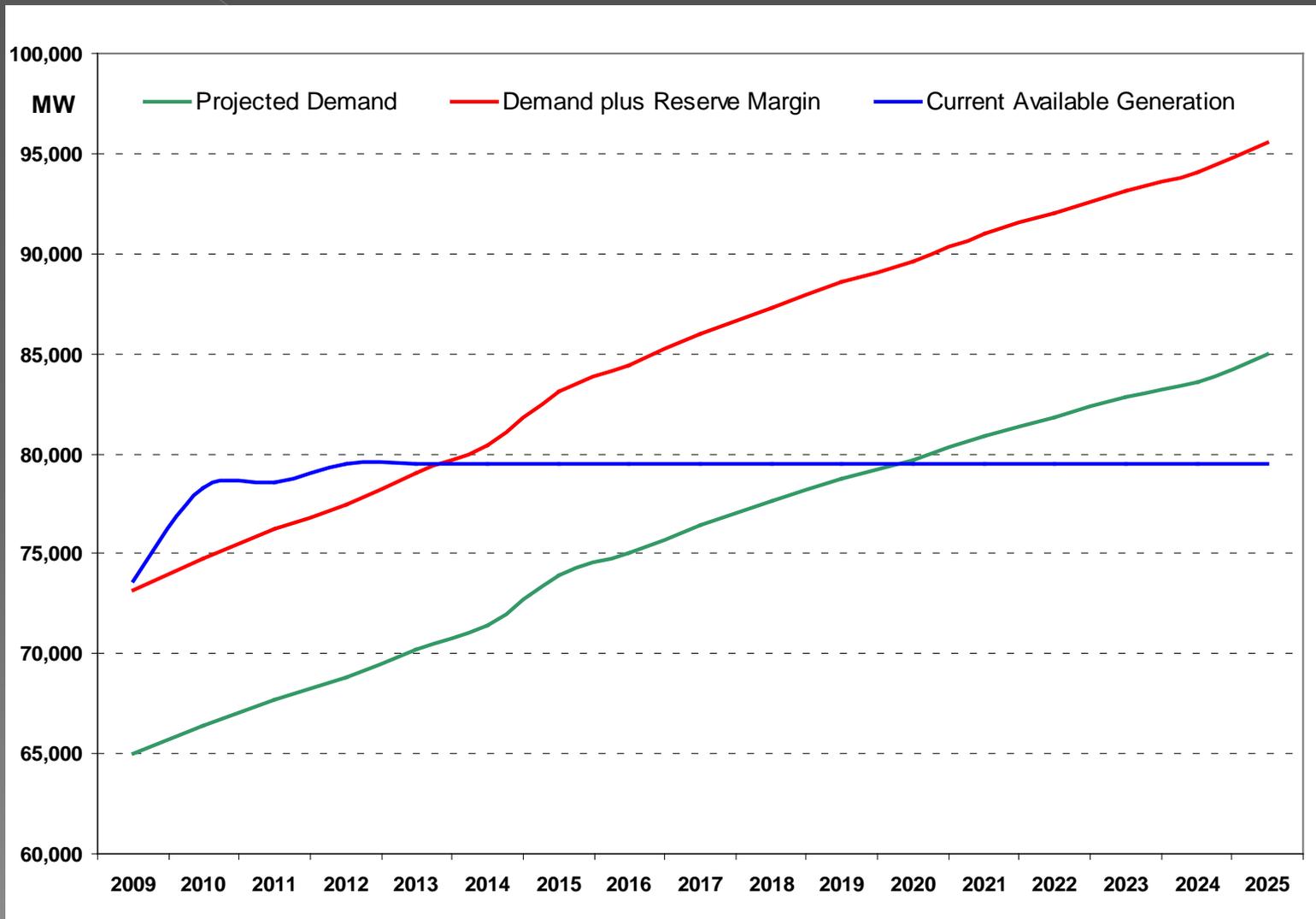
A Few of the Challenges

- ◉ Growth/Resource Adequacy
- ◉ Generation Mix and Diversity
 - > Heavy reliance on natural gas
 - > Integration issues: wind
- ◉ Delivery of Nodal

A Few of the Challenges

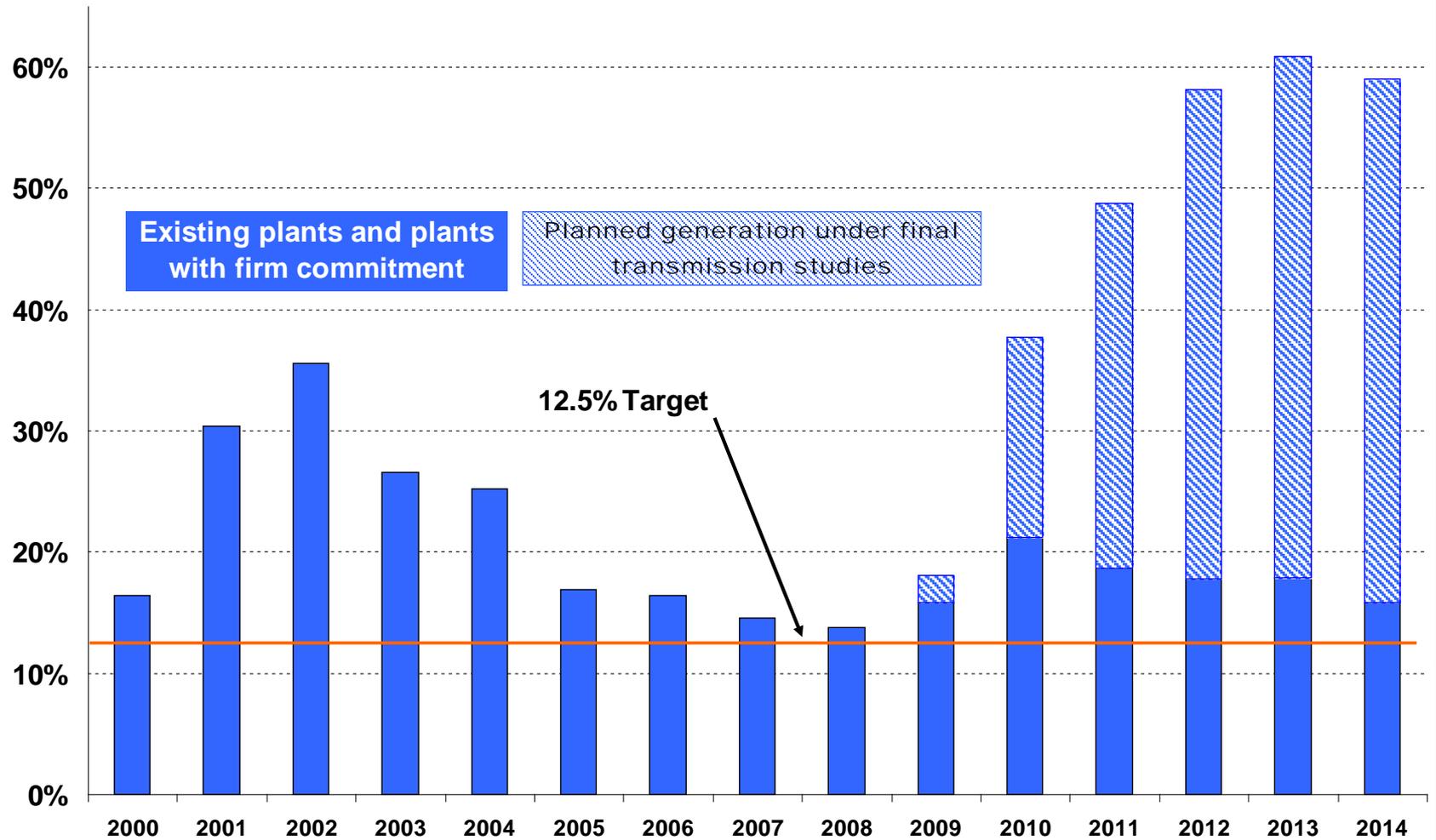
- Avoiding unnecessary increases in the cost of electricity
- Federal Carbon Legislation
- Public expectation
- The current financial situation

Demand Growth and Available Generation: 2009-2025



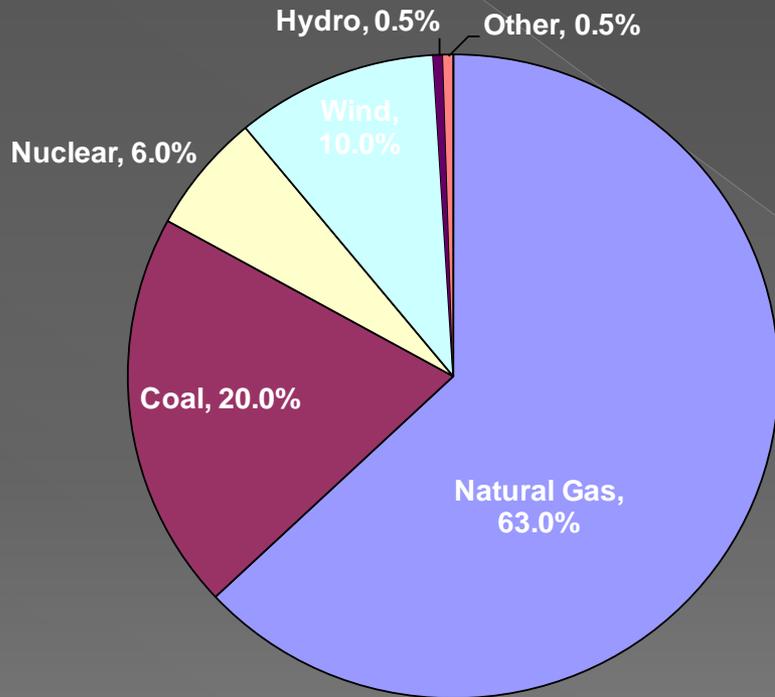
Resource Adequacy

RESERVE MARGINS 2000 - 2014

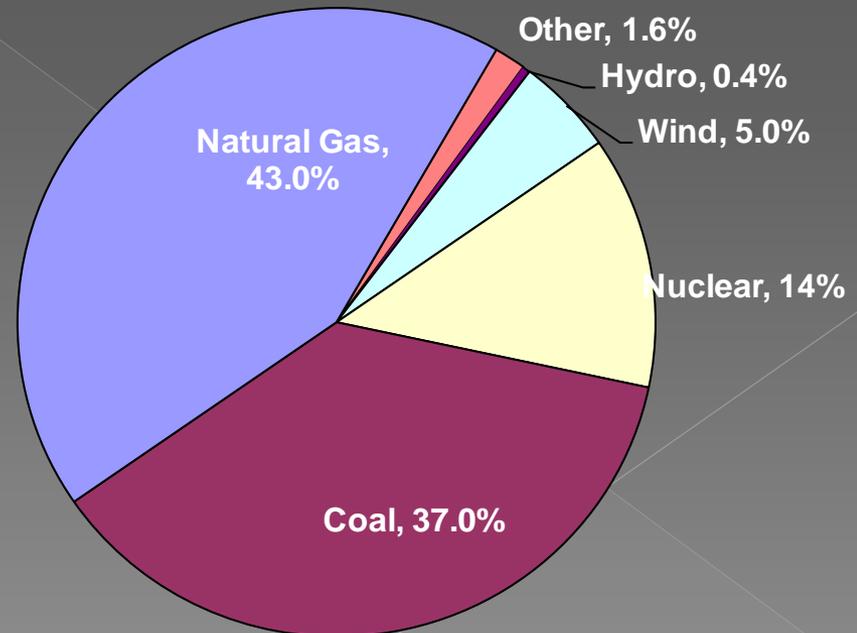


Generation Mix in Texas

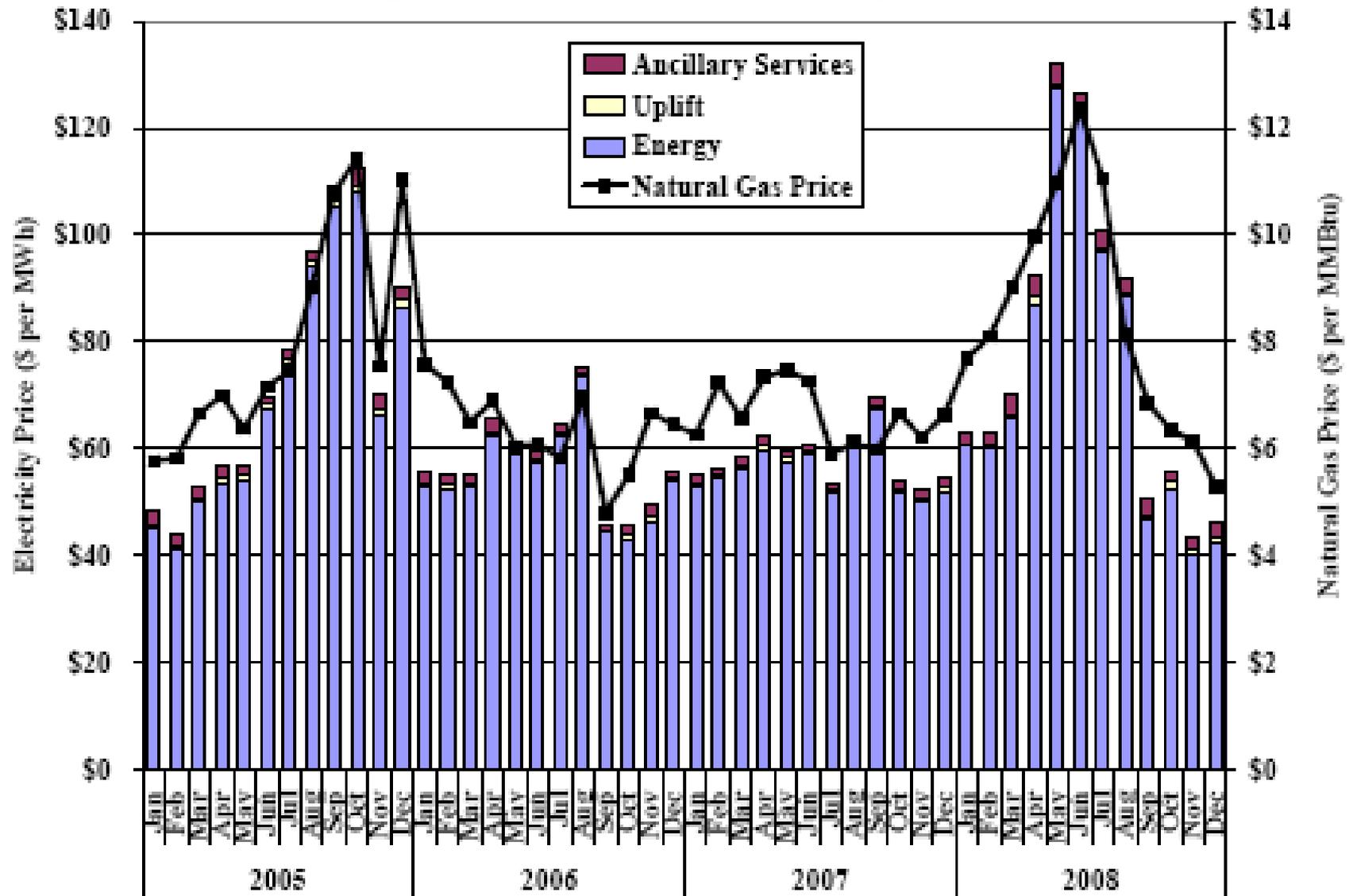
2008 ERCOT Generation Capacity by Fuel Type



2008 ERCOT Electric Generation by Fuel Type



Average All-in Price for Electricity in ERCOT





Federal Legislation

- ◉ Waxman-Markey Carbon Legislation
- ◉ Federal Renewable Portfolio Standard
- ◉ Nuclear Energy



What a difference
a year makes!



Lessons Learned

What have we learned
since SB 7?

Questions?