



# ERCOT Wind Experience

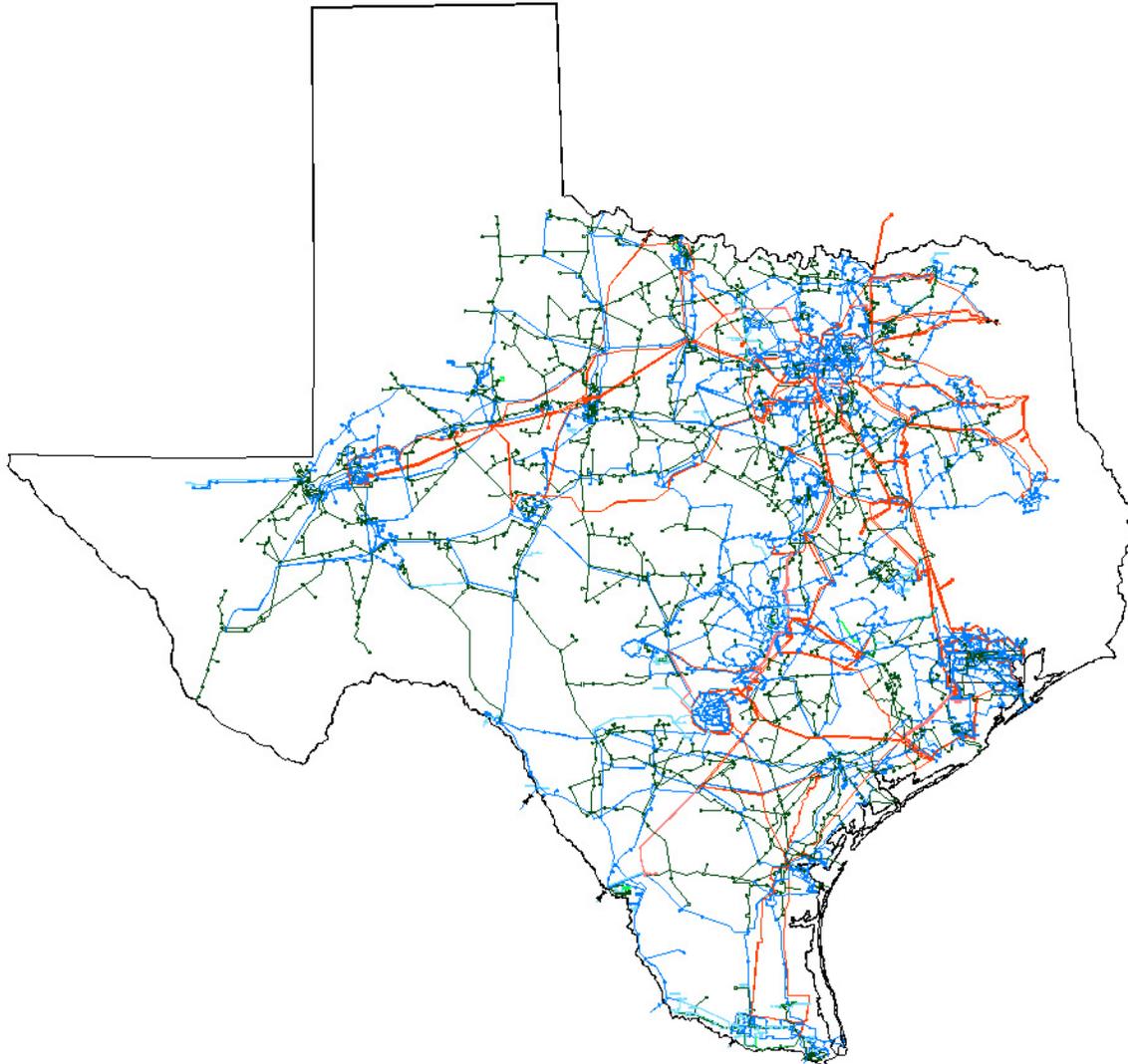
Michael G. Grable  
Vice President and General Counsel  
Electric Reliability Council of Texas, Inc.

FERC Technical Conference on Integrating  
Renewable Resources into the Wholesale Electric Grid

2 March 2009

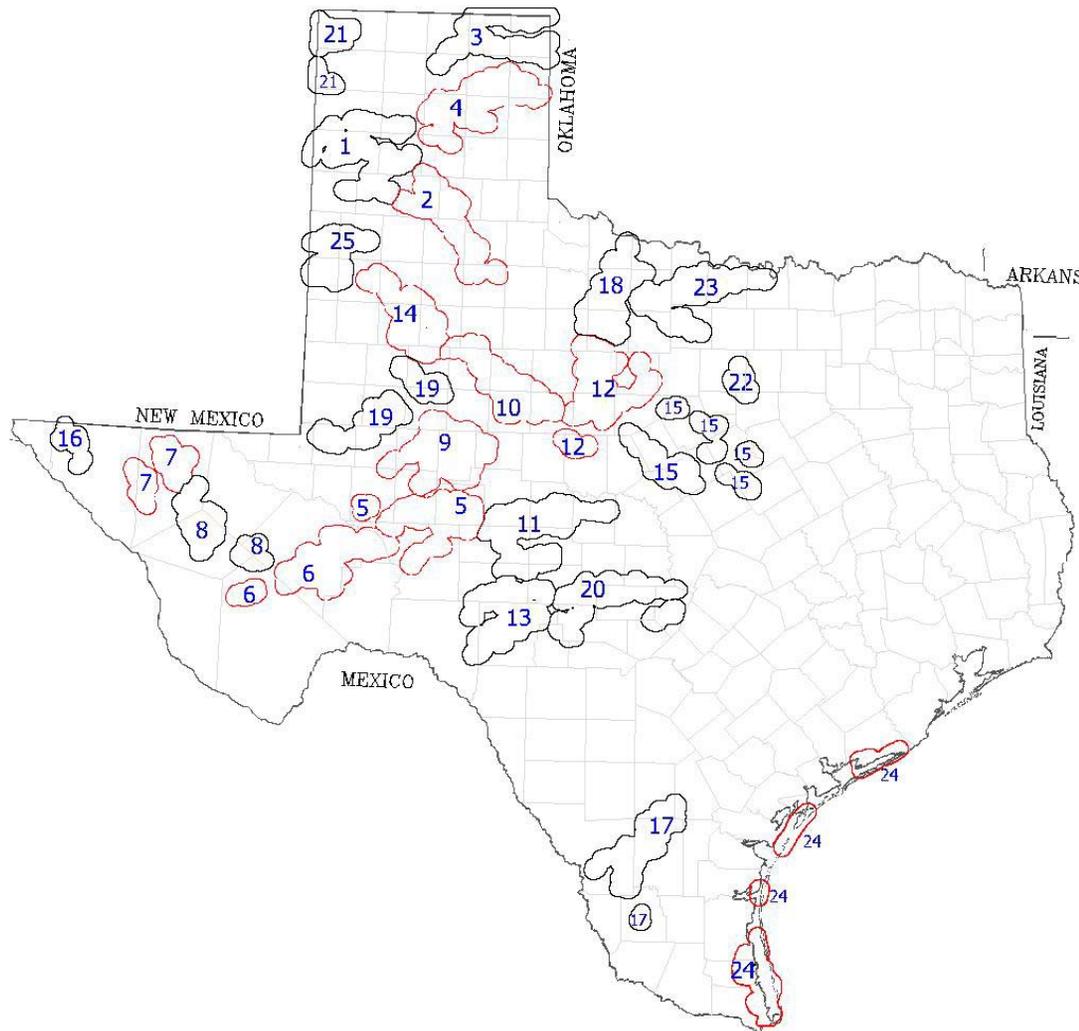
# The ERCOT Transmission Grid

**There are 38,000 miles of transmission lines in Texas...**



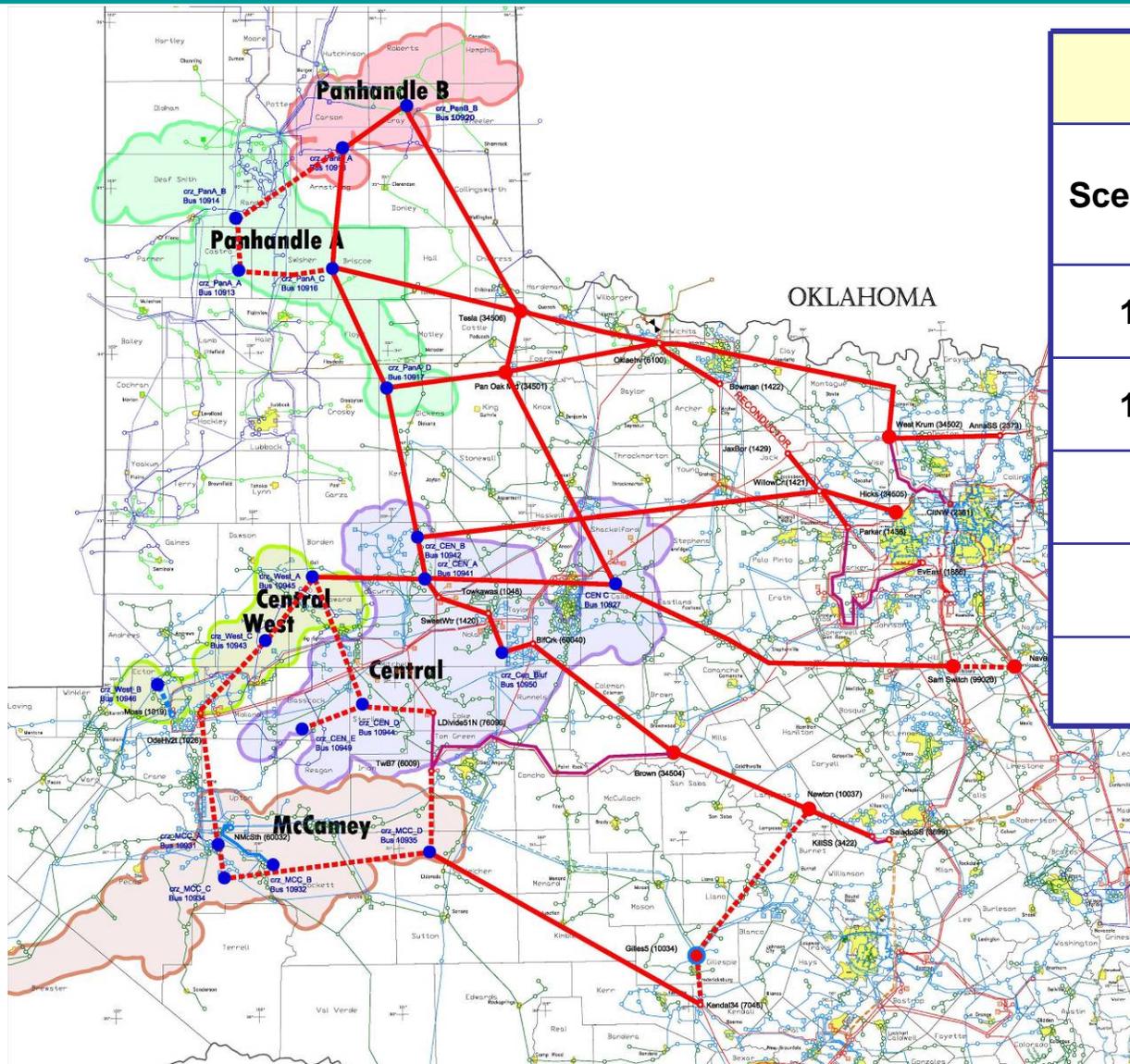
- 8,000 miles of 345 kV lines
- 16,000 miles of 138 kV lines
- 6,593 circuit miles of transmission built since 1999
- 2,888 circuit miles of transmission under study
- \$4.4 billion investment in transmission placed in service since 1999
- \$3 billion under development (independent of CREZ transmission)

# ERCOT CREZ Study



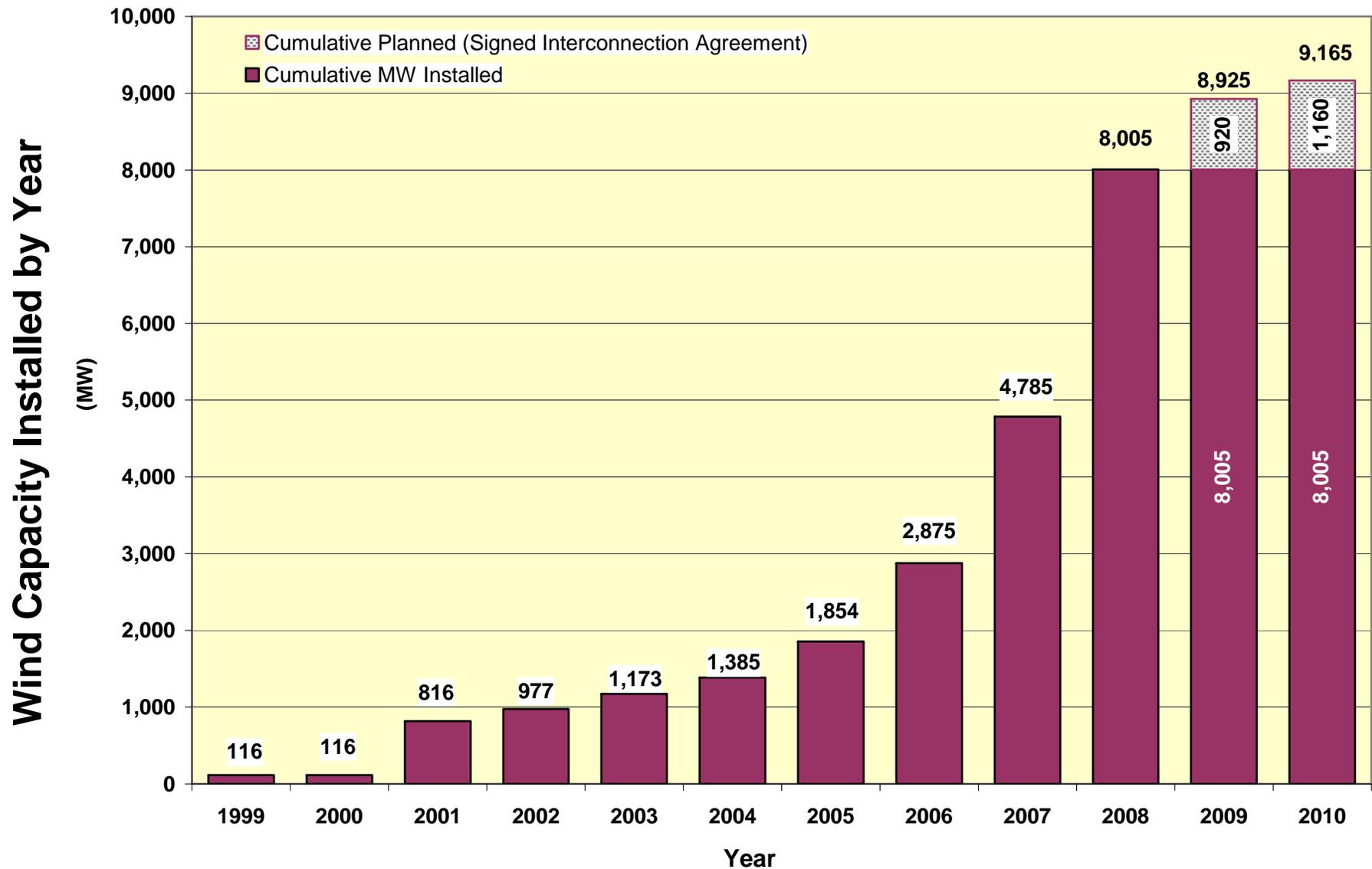
- **ERCOT led study during 2006 to support PUCT determination**
  - Hired AWS Truewind to identify best wind resource sites and provide expected characteristics of wind generation
  - Developed transmission plans through open stakeholder process to accommodate many of the potential zones in various combinations
  - Filed results with PUCT in December 2006

# CREZ Study Results

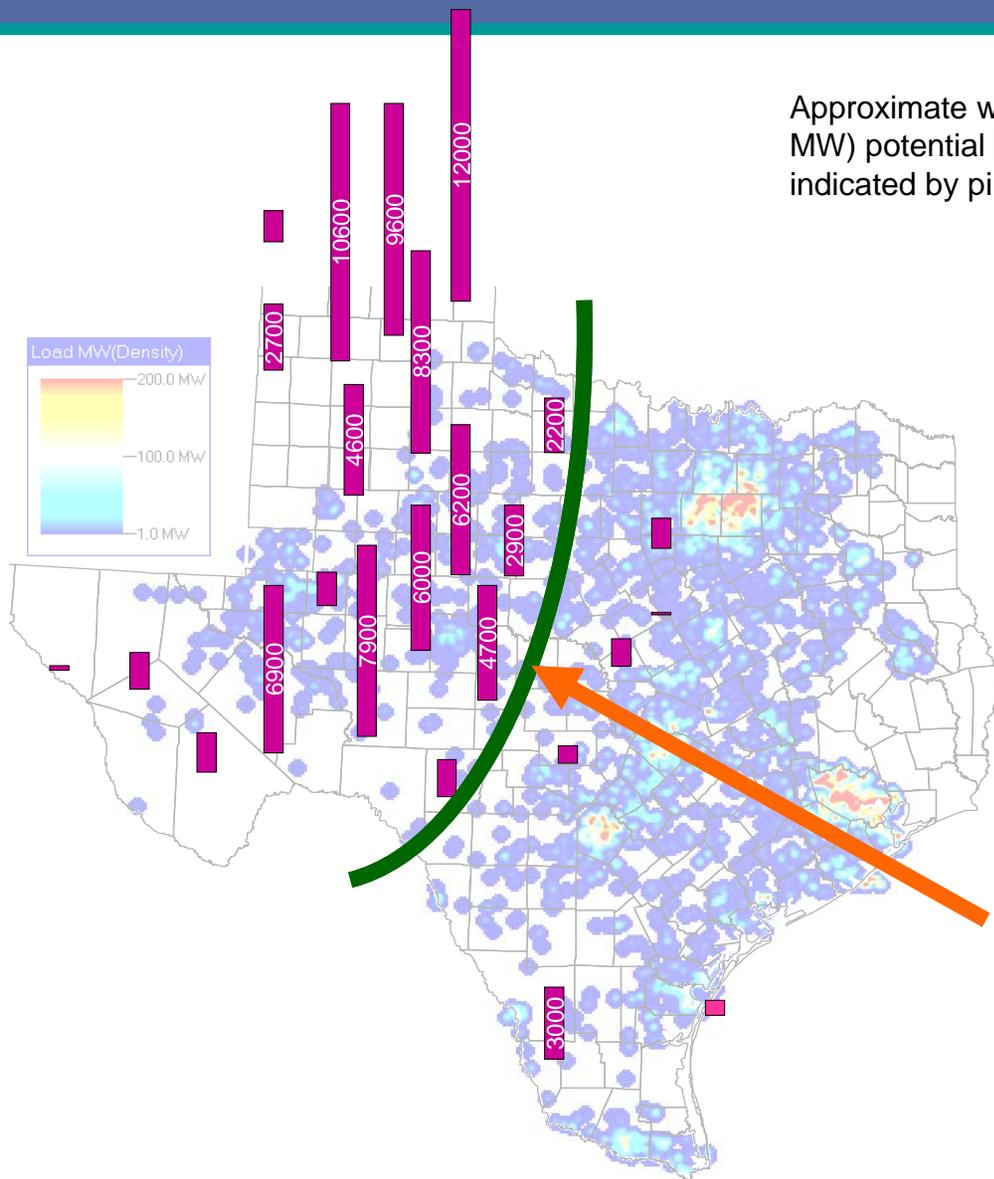


CREZ Plans		
Scenario	Cost (\$B)	Miles of New ROW
1A	2.95	1,638
1B	3.78	1,831
2	4.93	2,376
3	6.38	3,036
4	5.75	2,489

# ERCOT Wind Capacity



# Potential Wind Resource



Approximate wind capacity (in MW) potential in each area is indicated by pink bars

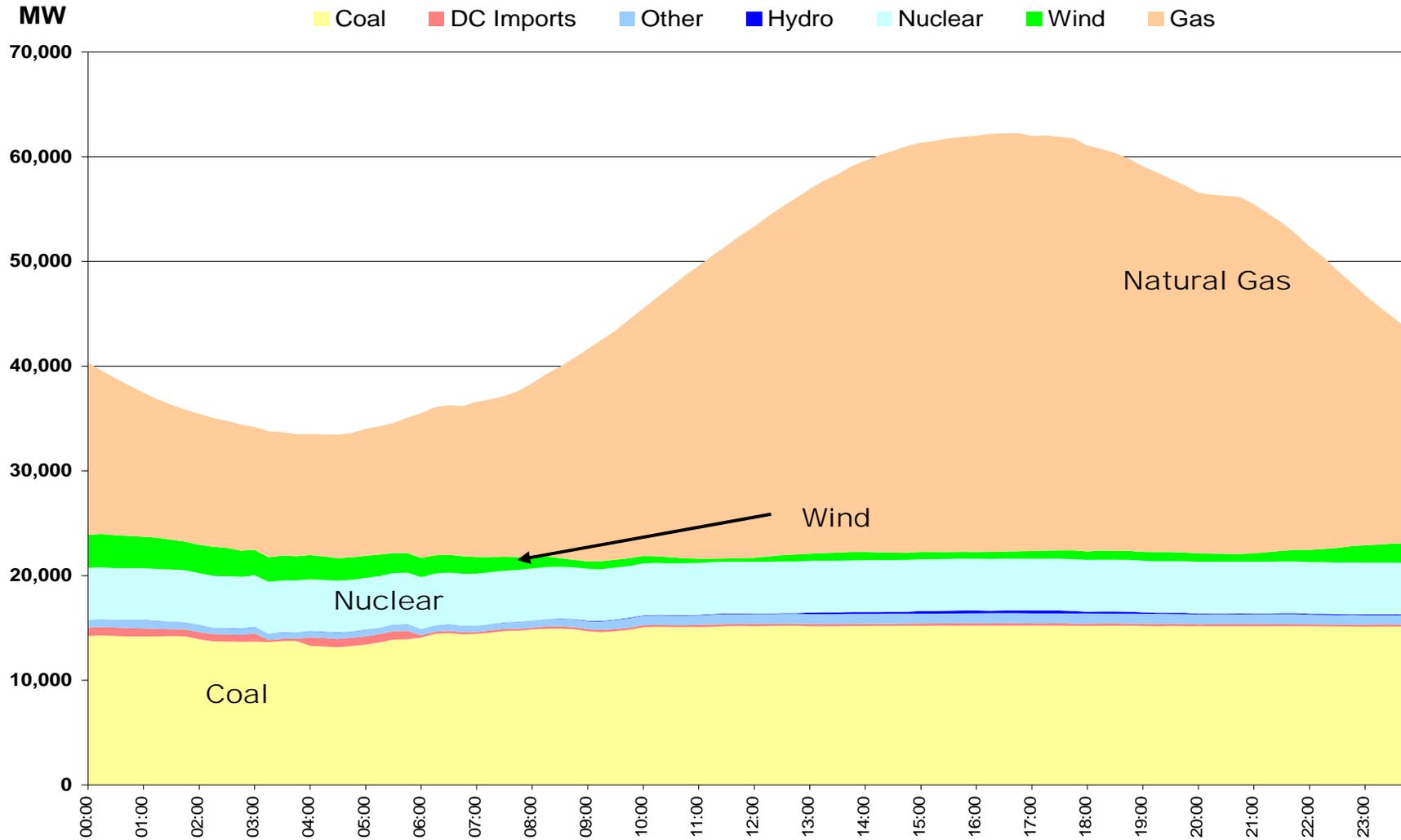
**Nearly 100,000 MW above 35% capacity factor**

**Concentrated in western half of state**

**Approximate west to east transfer capacity – 3200 MW**

# Summer Day Load Shape with Fuel Mix

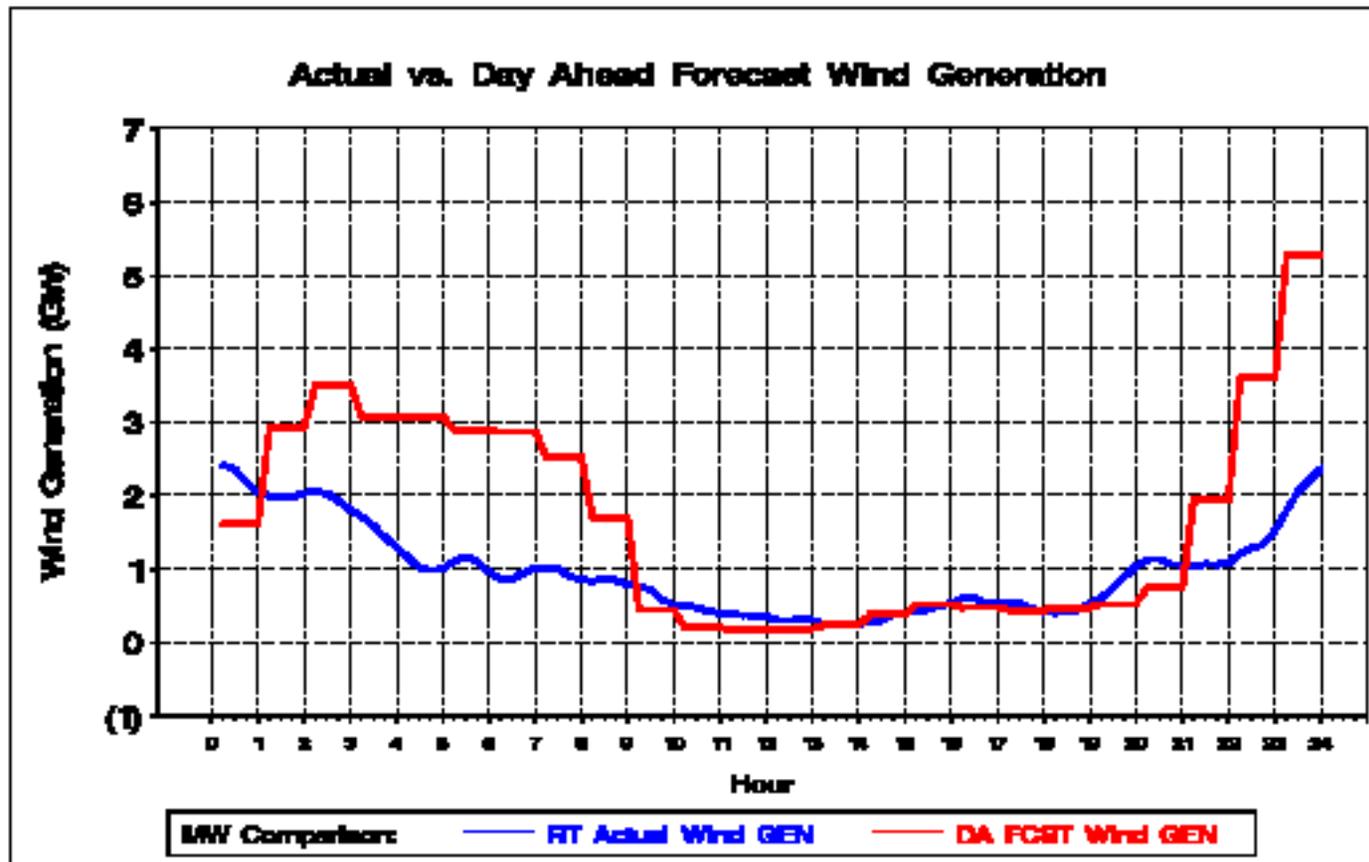
## Generation by Fuel - August 4, 2008



# Wind Snapshot – Day-ahead Forecast vs. Real-time Generation

## Daily Snapshot

ERCOT Wholesale Markets  
Operating Day: Wednesday, 2/25/2009



# Wind Power in Germany: Balancing and Reserve Power

