



ERCOT Long-Range Planning Overview

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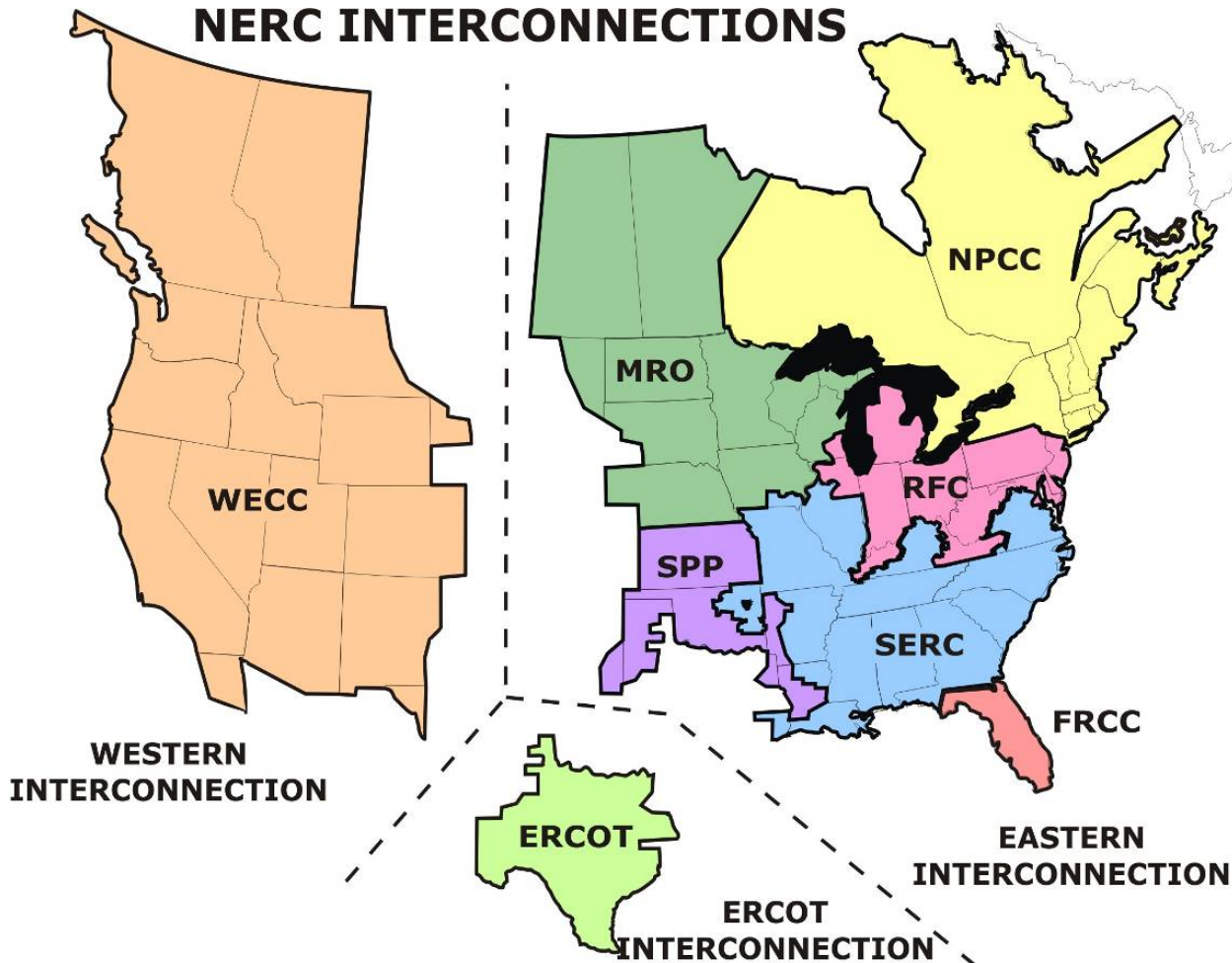
Director, System Planning

**Austin Generation Resource Planning
Task Force**

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The ERCOT Region



The ERCOT Region is one of 3 interconnections in North America.

The ERCOT grid:

- 75% of Texas land
- 85% of Texas load
- 38,000 miles of transmission lines
- 550+ generation units
- 68,305 MW peak demand (set 8/3/2011)

Regional Import Capacity: 1,106 MW of Asynchronous Tie Capacity (820 MW with Eastern Interconnection)

What Does ERCOT, Inc. DO?

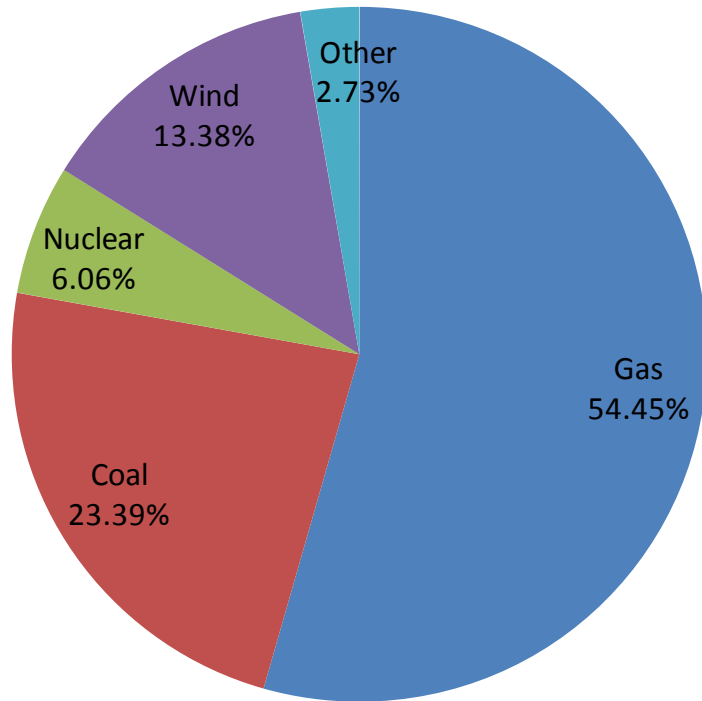
The Electric Reliability Council of Texas (ERCOT) manages the flow of electric power on the transmission system. We are responsible for the reliability and adequacy of the transmission grid.



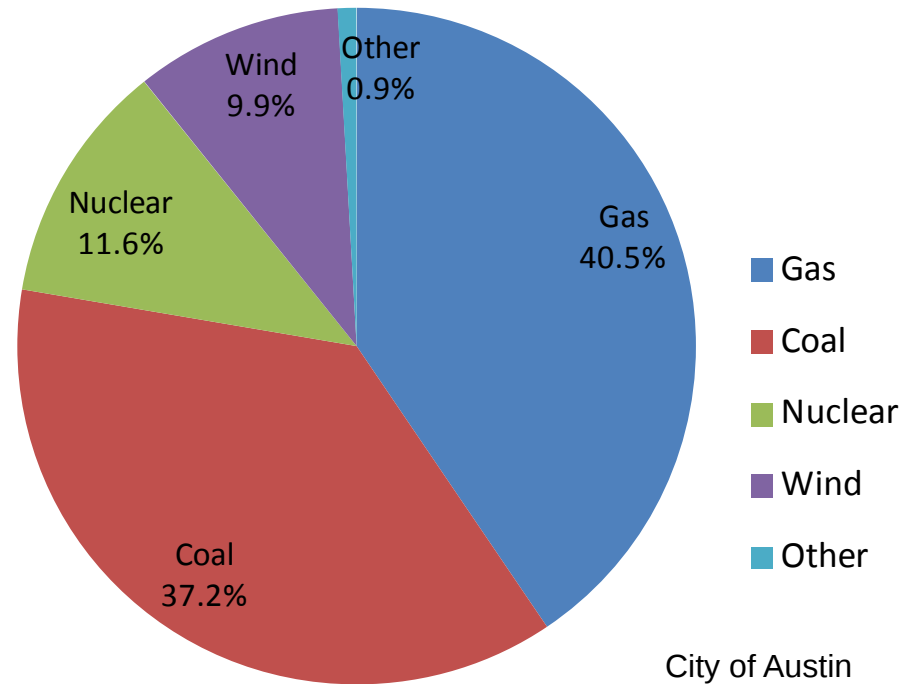
ERCOT also performs financial settlement for the competitive wholesale bulk-power market and administers retail switching for 6.6 million premises in competitive choice areas.

Energy Used in the ERCOT Region - 2013

ERCOT Generation Capacity by Fuel (% MW)

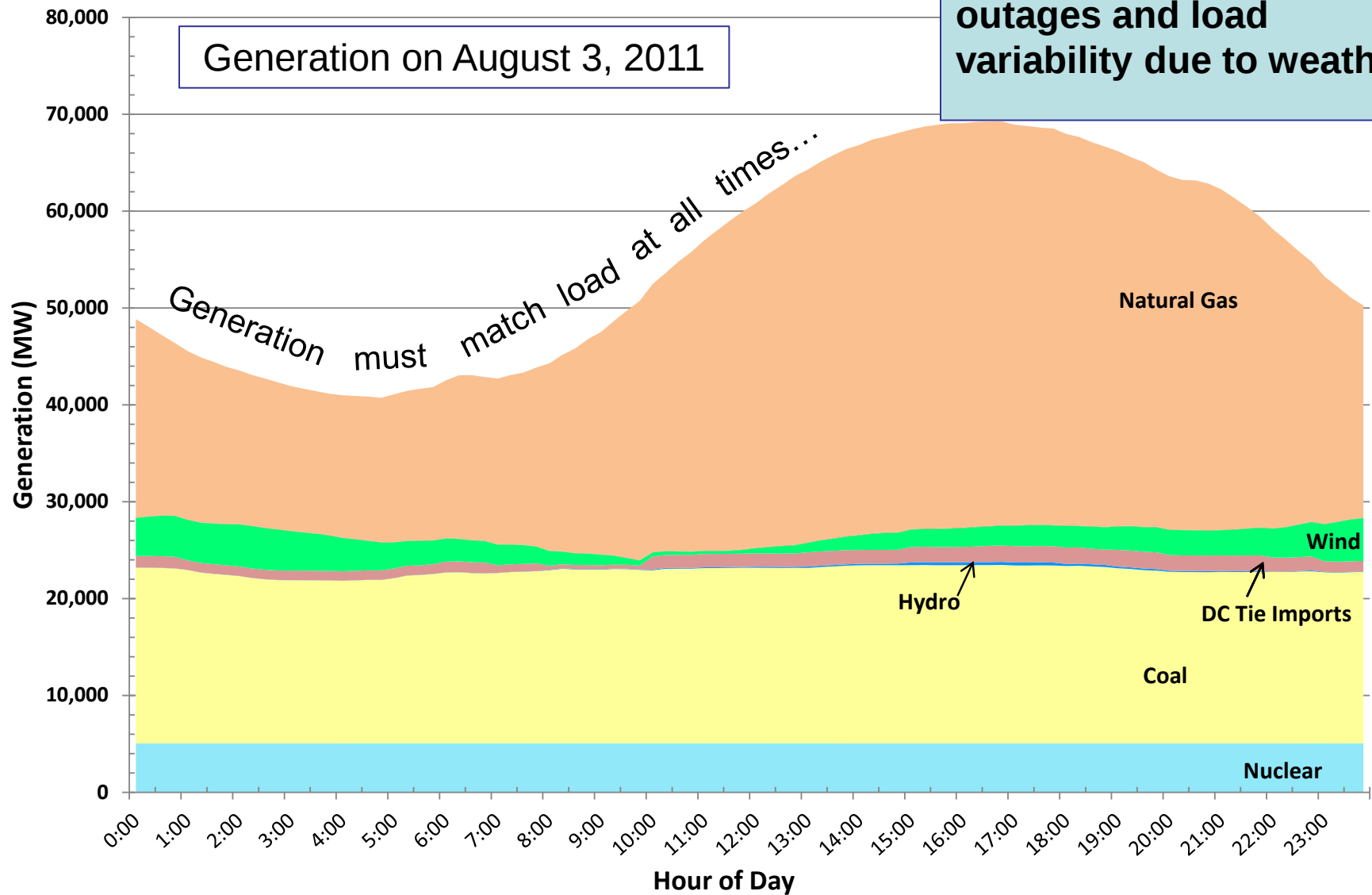


ERCOT Annual Generation by Fuel (% MWh)

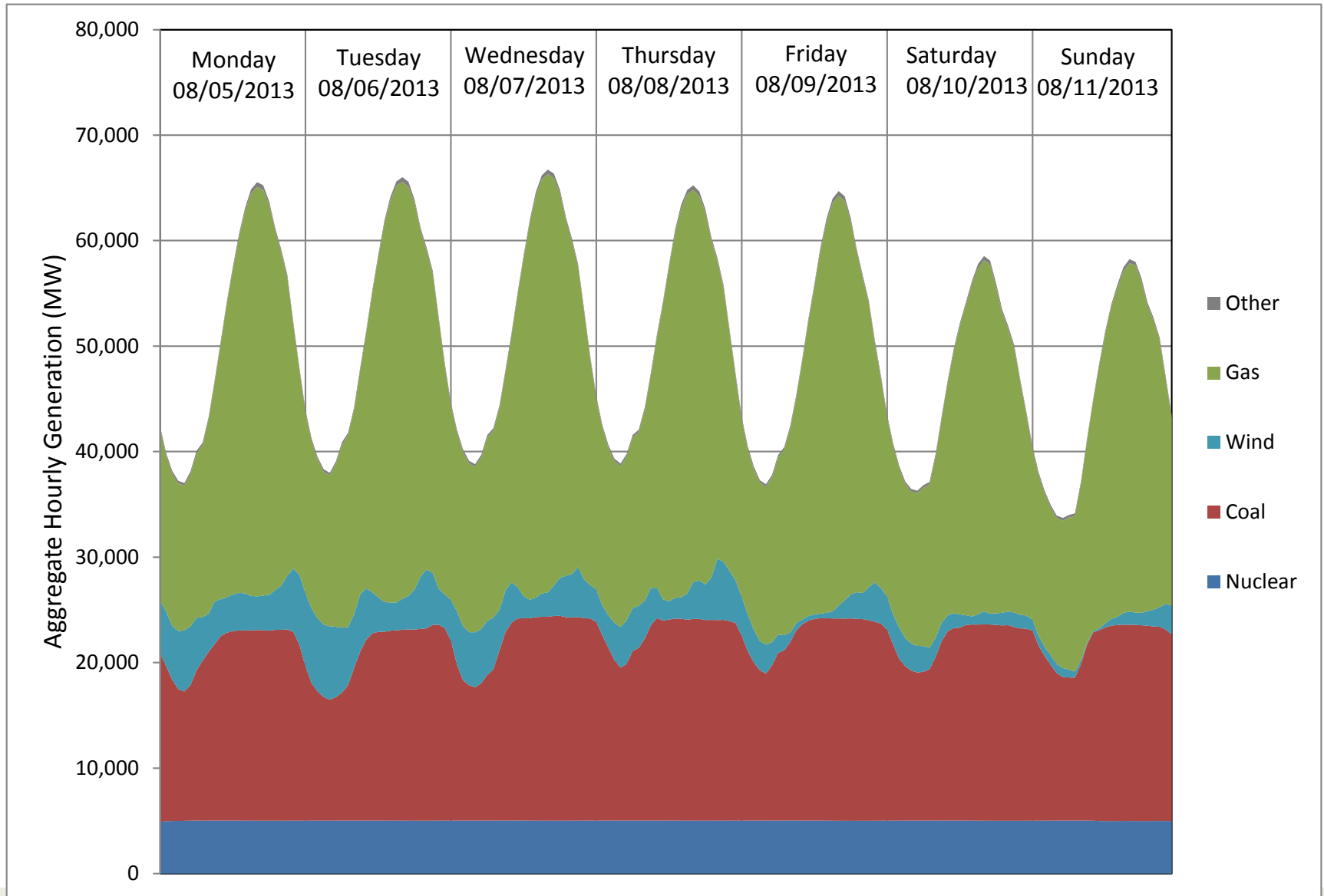


Peak Day Generation Output

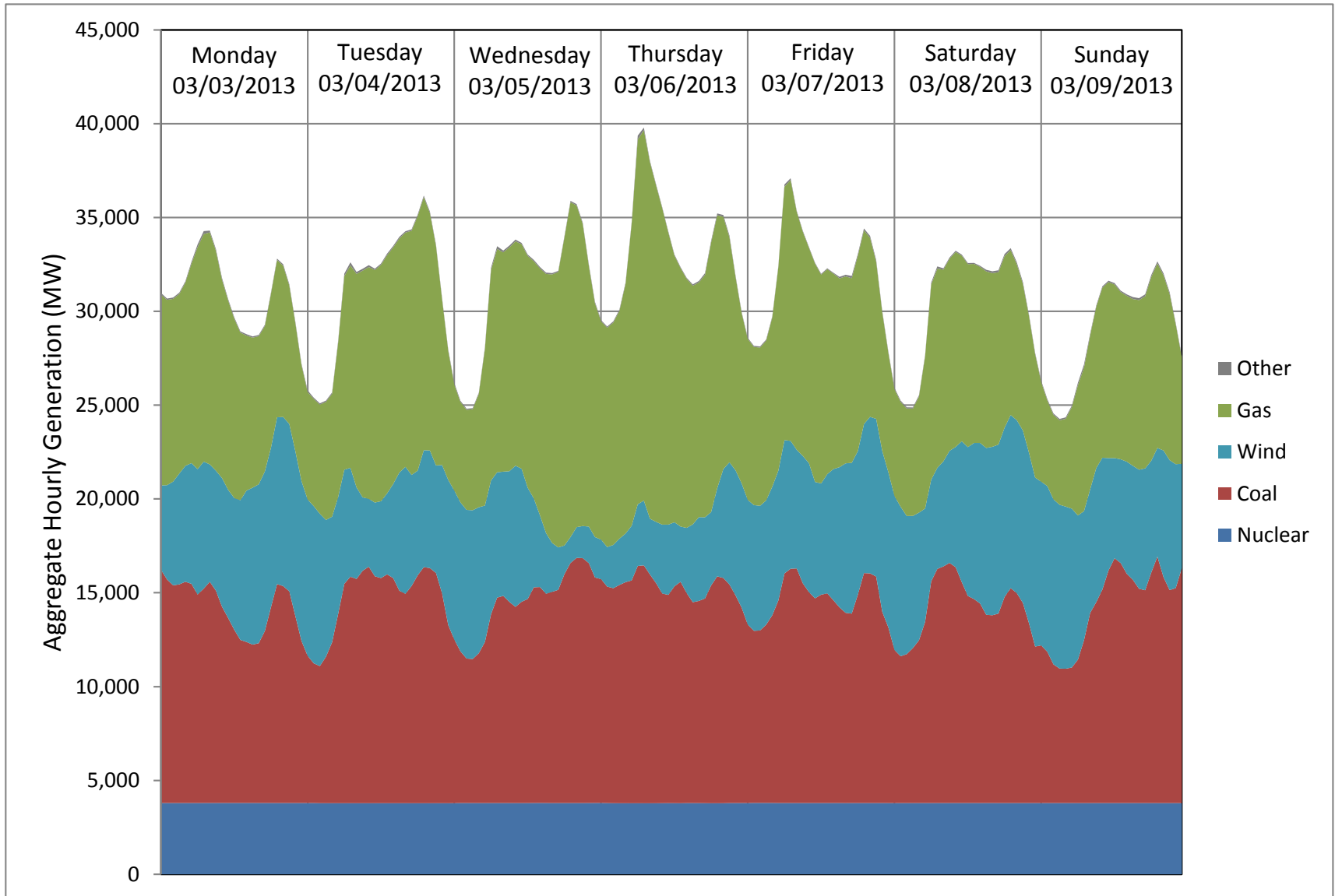
Generation reserves are necessary due to unit outages and load variability due to weather



Typical August Generation Output



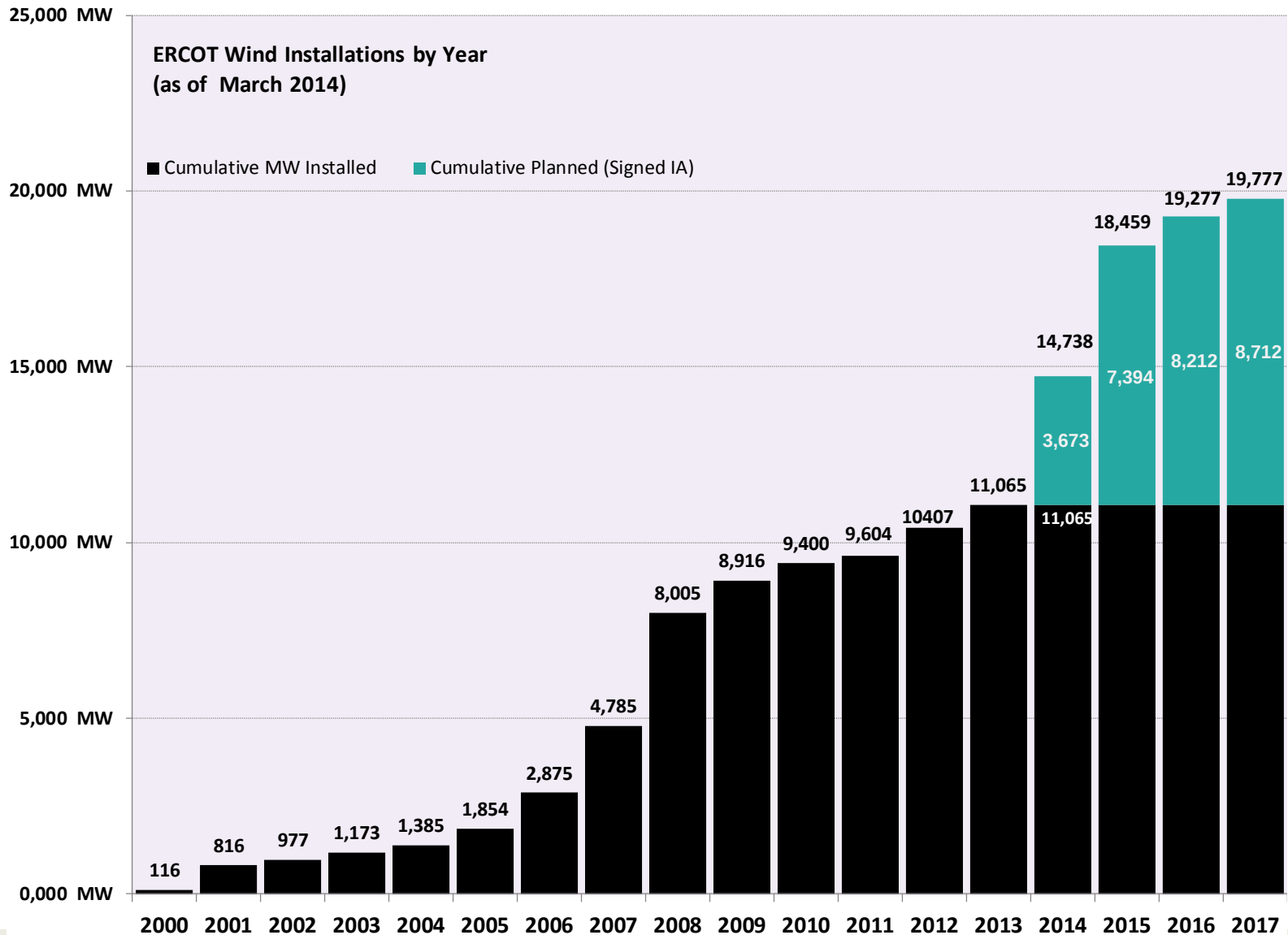
Typical March Generation Output



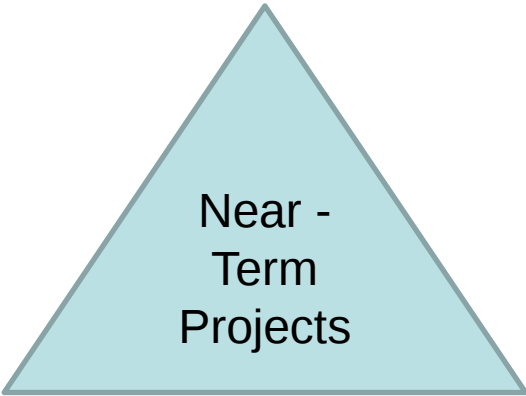
Generation Development in ERCOT

Fuel Type	Screening Study Projects (MW)	Projects Under Full Study (MW)	Completed Projects (MW)	Grand Total (MW)
Natural Gas	5,690	12,010	9,521	27,221
Nuclear	-	-	-	-
Coal	-	30	240	270
Wind	5,538	12,476	8,712	26,726
Solar	1,375	1,764	198	3,337
Biomass	-	-	-	-
Storage	-	594	-	594
Petroleum Coke	-	-	-	-
Grand Total	12,603	26,874	18,671	58,148

Wind Generation Development in ERCOT



Planning Studies in ERCOT



Near -
Term
Projects

Near-Term Planning
and Operations
Analysis

*CCN: Certificate of
Convenience and Necessity

Tier 1
(> \$50 M)
ERCOT independent review
and Board of Directors'
endorsement

Tier 2
(< \$50 M; requires CCN*)
ERCOT independent review

Tier 3
(Between \$15 M and \$50 M;
does not require CCN)
RPG stakeholder review

Tier 4
(< \$15 M; does not require
CCN; or load-serving)
Planned by TSP

Mid-Term Planning (1 – 6 Years)
(all planned projects included in the
annual Regional Transmission Plan)

Scenario 1:
Business As
Usual

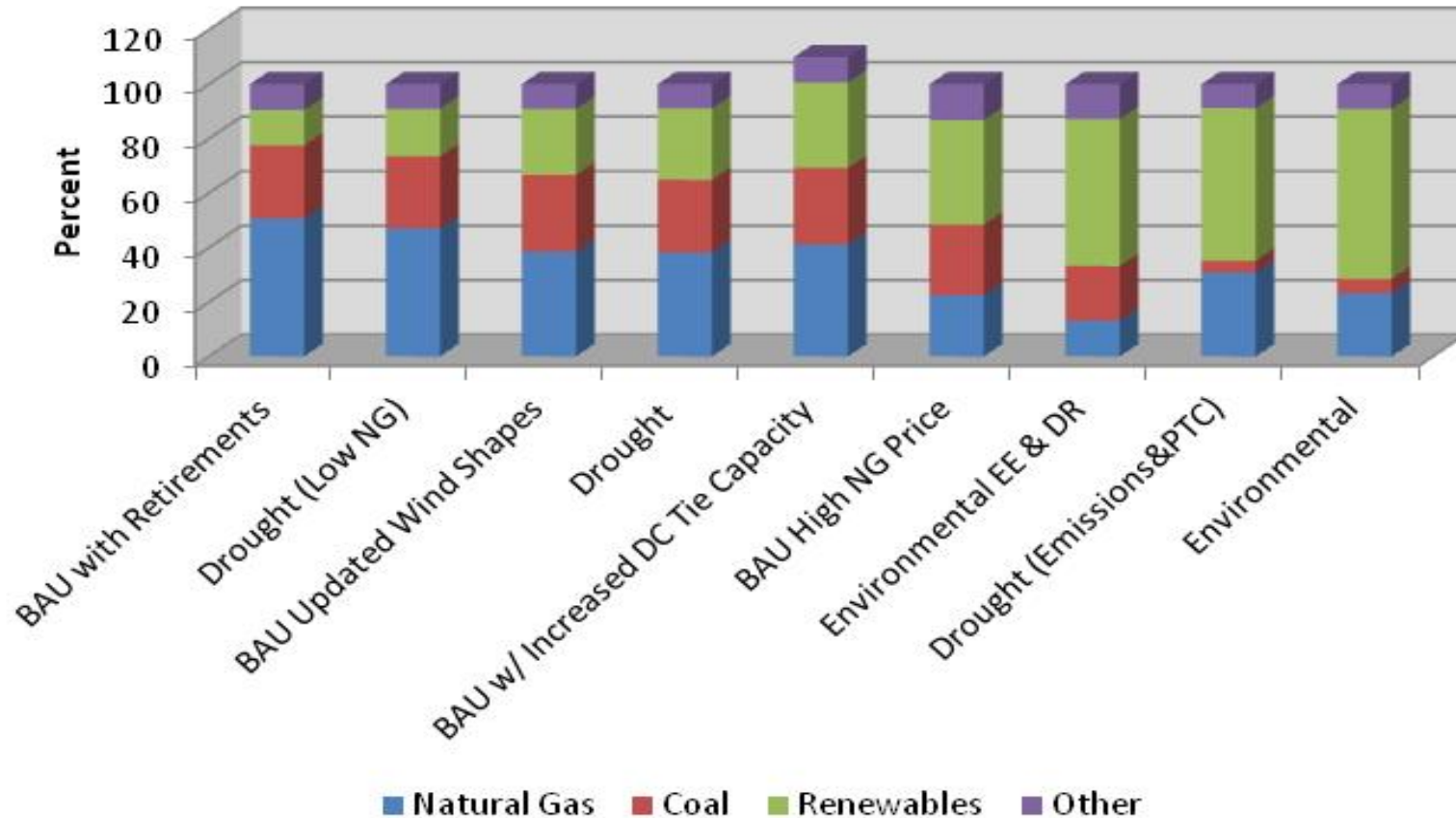
Scenario 2:
Increased
Environmental
Requirements

Scenario 3:
Extended
Drought

Scenario-based
Long-Term Planning
(10 – 15 years:
provides guidance
to project selection
in RTP)

Long-Term Study Scenario Summary

2032 Annual Generation Shares by Fuel (Existing and Expansion Capacity)



As increasing amounts of wind, solar and geothermal prove to be economical, the amount of energy provided by renewables increased from 13% in the BAU w/ Retirements scenario to 63% in the Environmental Scenario.

A Changing Industry

- **Society is becoming increasingly dependent on electricity, while reliability on the electric grid is being affected by new technologies and market design changes**
 - Old industry paradigm:
 - customer demand was not controlled, but was forecasted with acceptable accuracy; almost all generation sources were controlled
 - Utilities were vertically integrated (one company owned the generation sources, the transmission system, and interacted directly with the customer)
 - Everyone paid for a regulated level of reliability; cost of this reliability was difficult to quantify
 - New paradigm:
 - Customer demand is becoming increasingly difficult to forecast, due to distributed generation and market-based electric rates
 - Increasingly, grid resources are not “dispatchable”, but have to be forecasted based on weather conditions (wind and solar) or market conditions (price-responsive demand)
 - Cost of reliability is increasingly apparent, along with who pays

Future Drivers

- **Price of Natural Gas**
- **Capital Costs of New Technologies**
- **Customer Participation (Demand Response)**
- **Grid Reliability**



Questions?

