

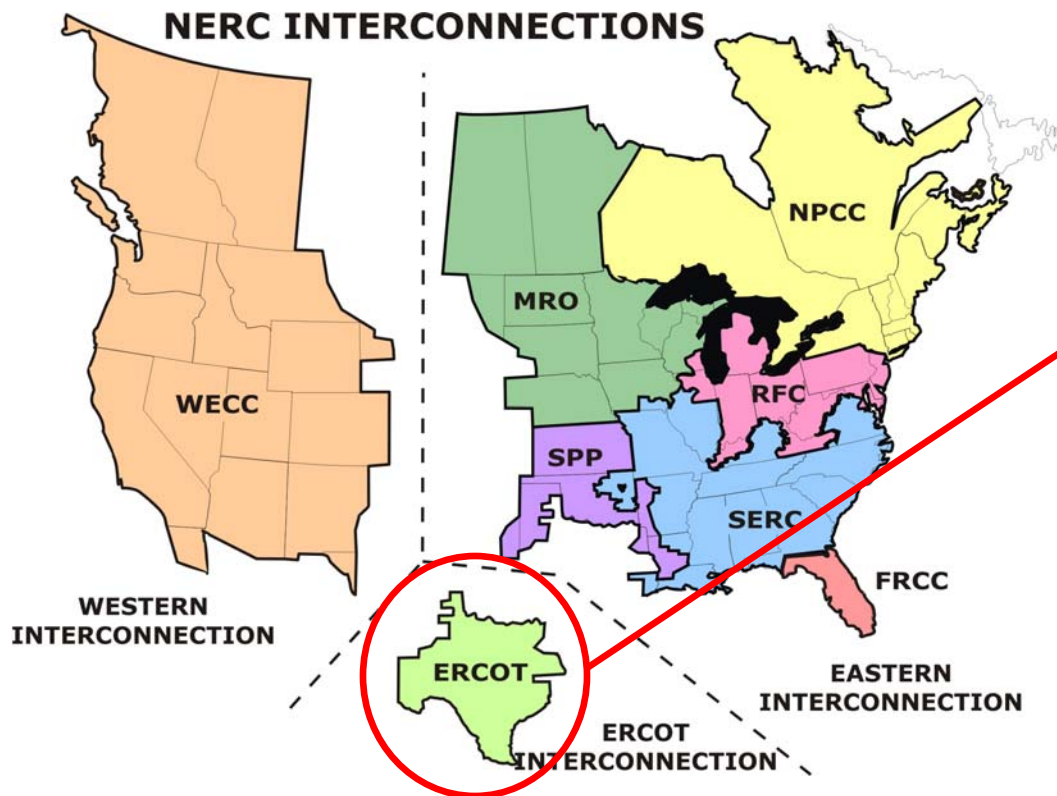


Electric Reliability and Resource Adequacy Update

Joint Hearing of the
Committee on Regulated Industries and
Committee on Energy Resources
Texas House of Representatives

Bill Bojorquez, Director of System Planning
Electric Reliability Council of Texas
Sept. 6, 2006

North American Interconnected Grids

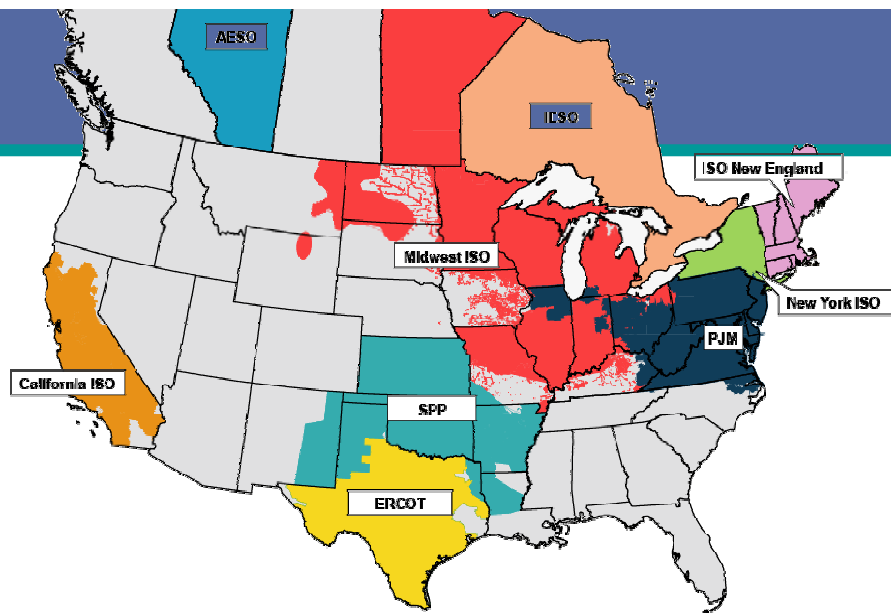


ERCOT connections to other grids are limited to direct current (DC) ties, which allow control over flow of electricity

• The ERCOT grid:

- Covers 75% of Texas land
- Serves 85% of Texas load
- 38,000 miles of transmission lines
- >550 generation units
- Physical assets are owned by transmission providers and generators, including municipal utilities and cooperatives
- 62,429 Megawatts peak demand (set 8/17/06)

Electric Grid Operations



- **Independent System Operator**

- ERCOT is one of 9 North American ISOs
 - ISOs serve 67% of U.S. population

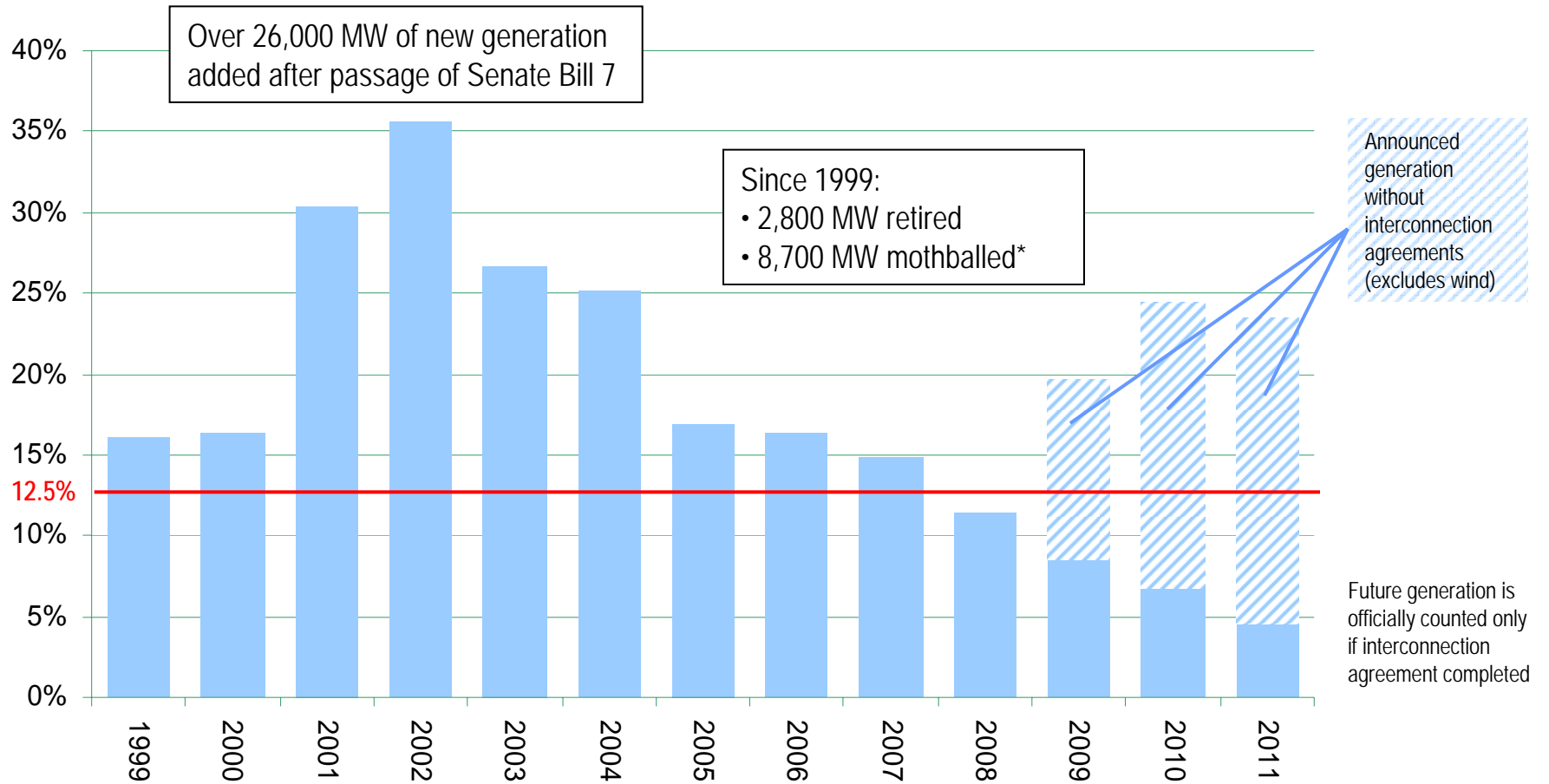
- **ERCOT ‘directs traffic’ on the grid to maintain reliability**

- ‘Air traffic controller’ of the electricity supply
 - Coordinates scheduling of power by market participants
 - Analyzes grid conditions continuously in real-time
 - Dispatches generation to ensure power production matches load at all times
 - *Electricity cannot be stored* --
 - Secures available generation capacity to meet reliability requirements
 - Coordinates planned outages of generators and transmission lines
 - Relieves transmission system congestion
 - Coordinates emergency actions & recovery
 - Operates markets to meet regional energy & capacity requirements not met thru bilateral arrangements

Reserve Margins: Projecting Adequacy of Supply

- **Reserve margin is a forecast, revised annually**
- **Minimum reserve margin target for the ERCOT Region is 12.5%**
- **Defined as:**
 - Percentage difference between available generating capacity and forecasted peak system load
- **Ensures (but does not guarantee) adequate electric supply will be available in case of contingency need**
 - Unexpected weather extremes or loss of major generation units
- **Available capacity includes:**
 - Available generation (wind is adjusted for availability during peaks)
 - Interruptible loads (typically large customers under contract to curtail if needed)
- **Load forecasting is based on an econometric model**
 - Long-term economic trends for Texas (income and population)
 - Highly weather-sensitive

Reserve Margins 1999-2011

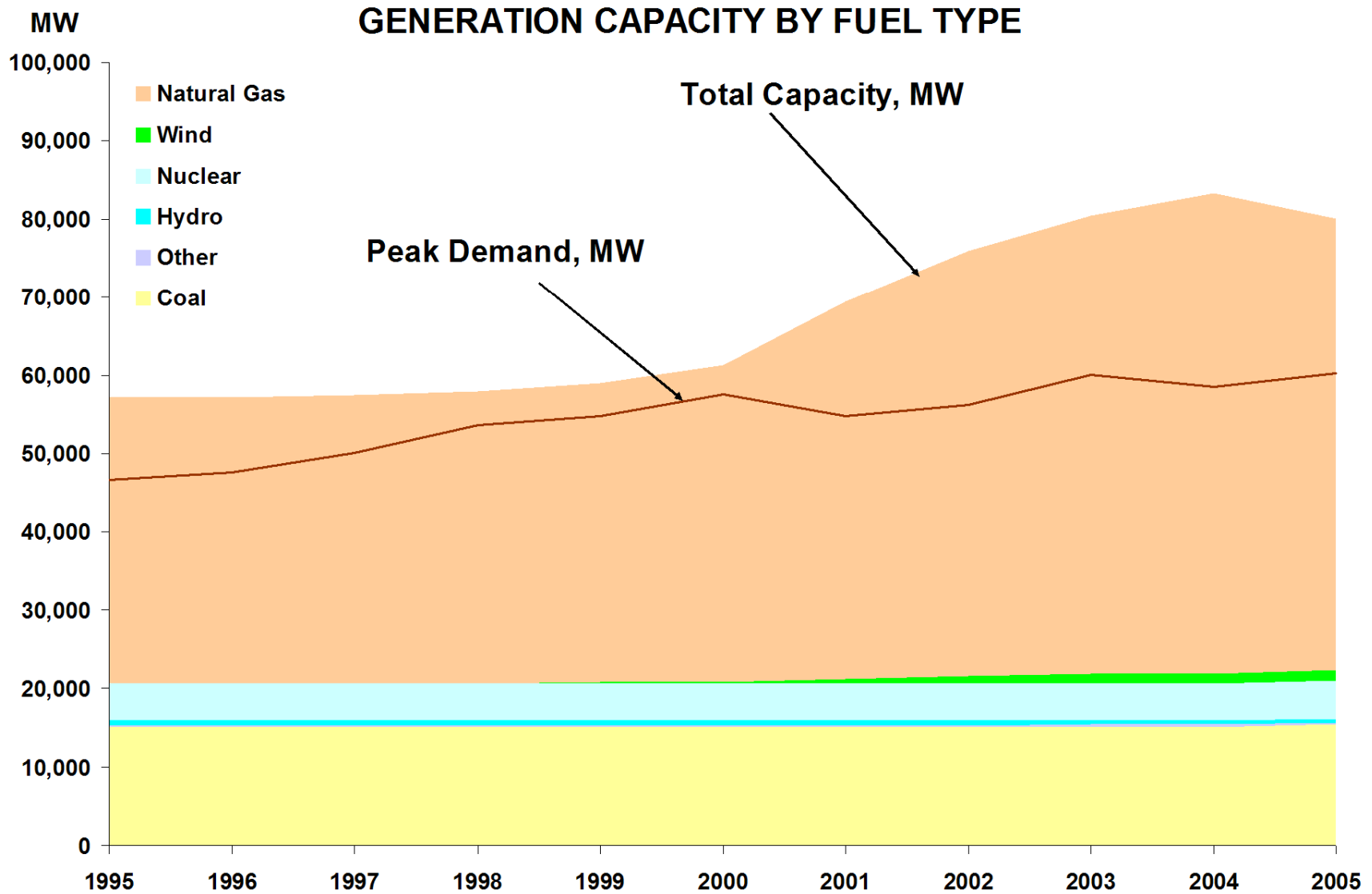


Percentage difference between projections for peak demand and available generation/resources

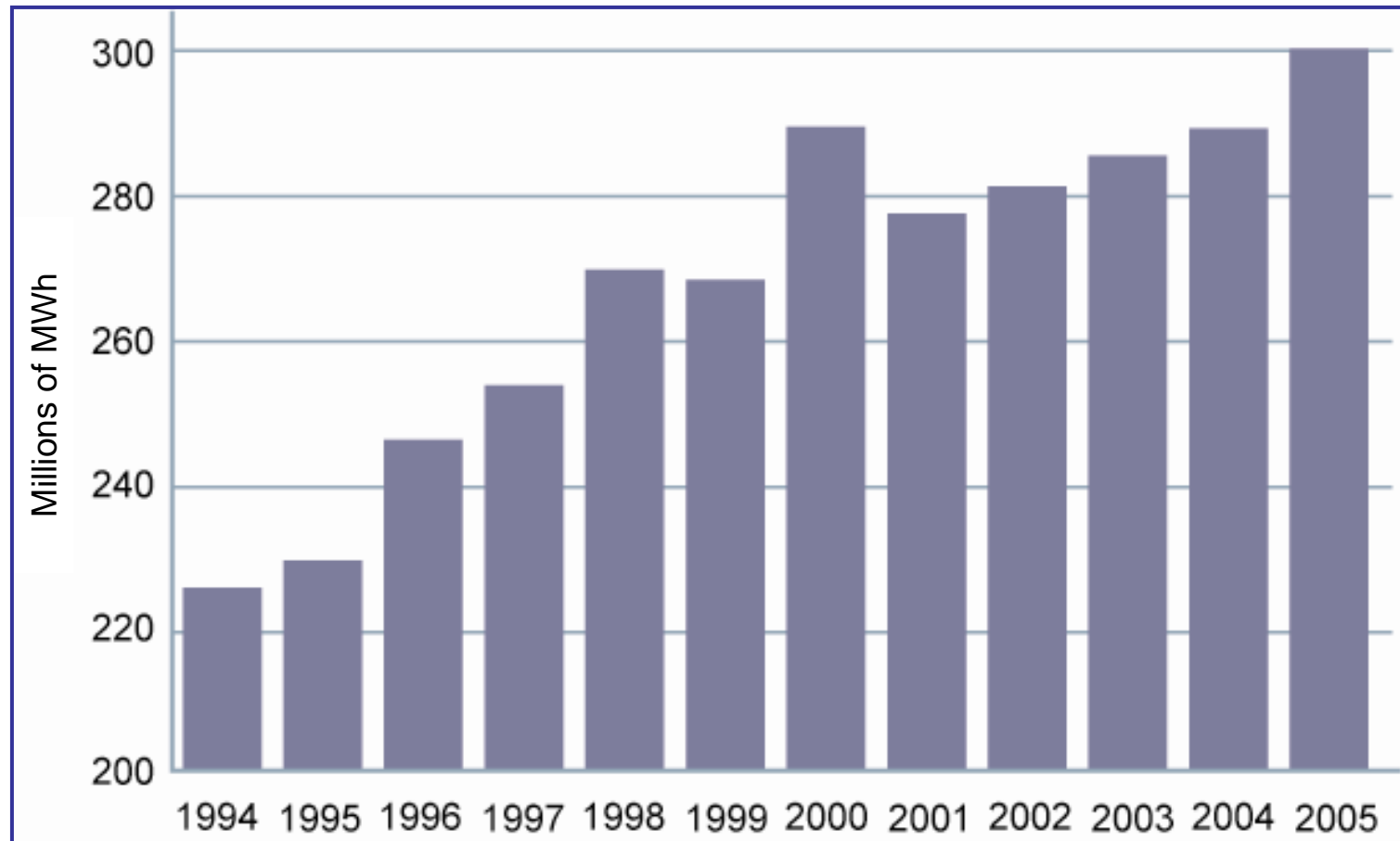
*1,100 MW of mothballed units have been returned to service

Note: Reserve margins are calculated using 2.6% of wind generation capacity, based on historical performance during peak hours and probability analysis.

Fuel Mix and Peak Demand in the ERCOT Region



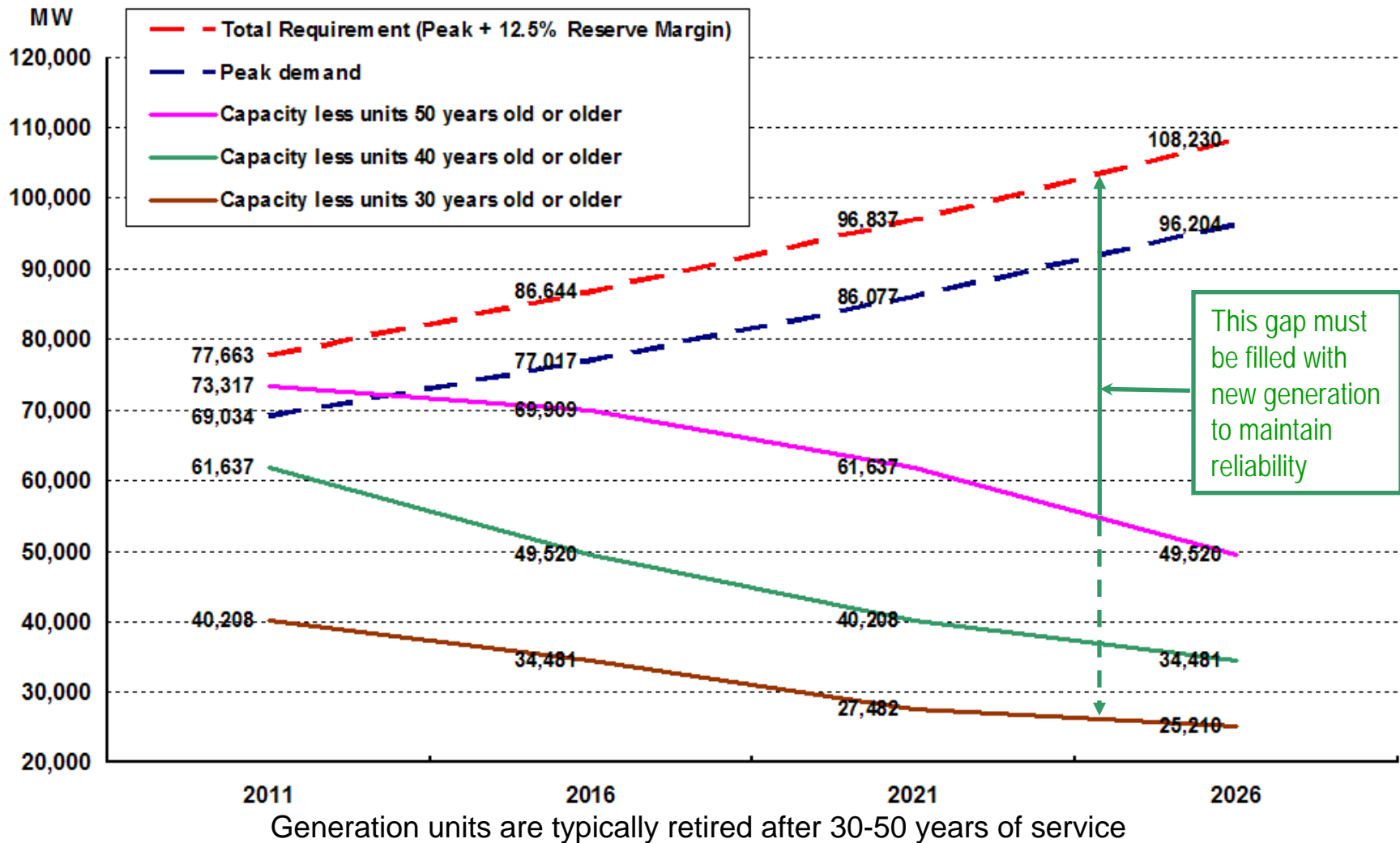
Regional Growth: Electric Energy Consumption



Electric Energy Consumption in the ERCOT Region
1994-2005 (Actual)

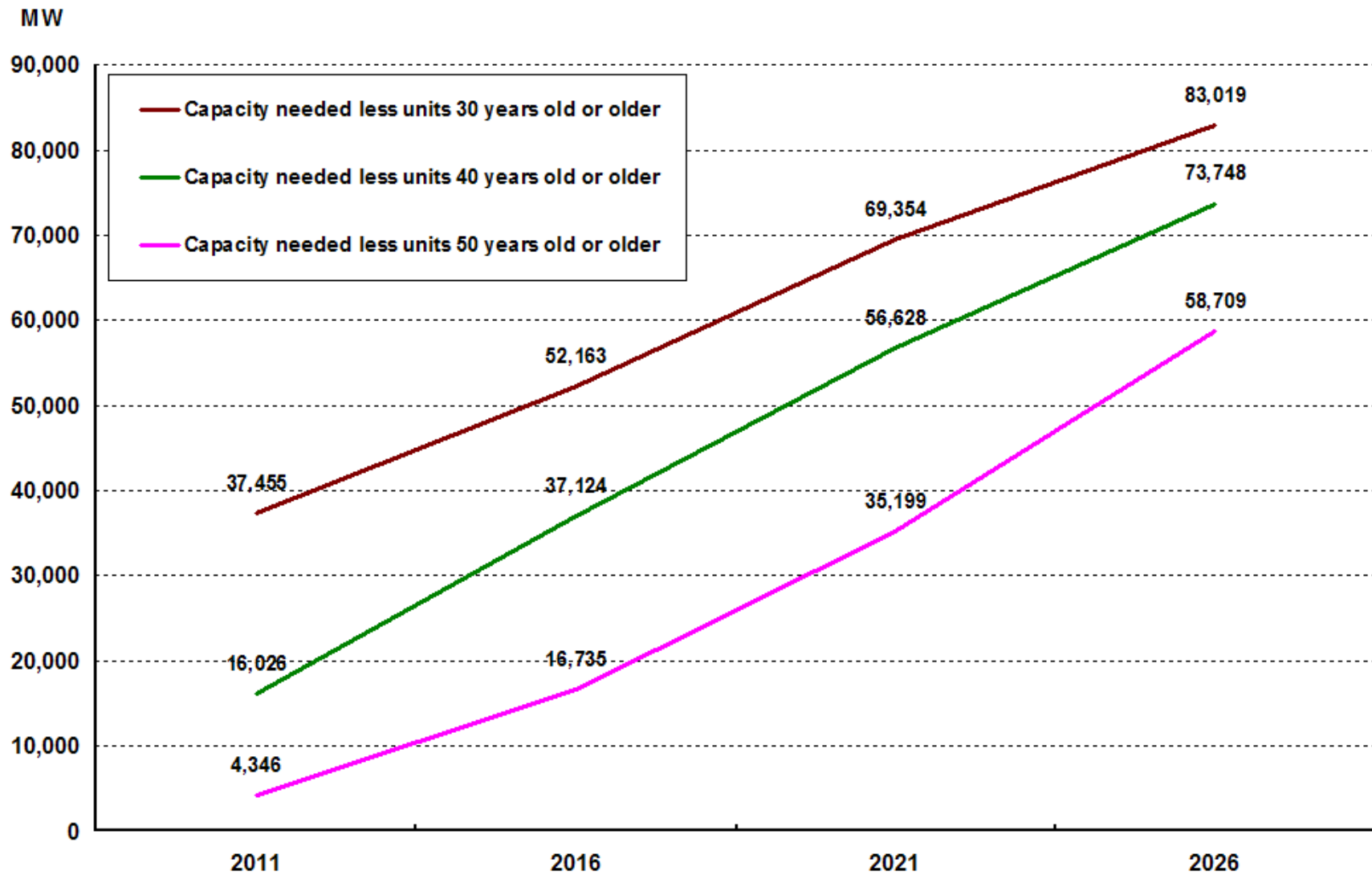
20-Year Load & Generation Maturity Scenarios

ERCOT GENERATION CAPACITY AND DEMAND PROJECTIONS



Future Generation Needs Based on Maturity Scenarios

POSSIBLE ERCOT GENERATION CAPACITY NEEDED



NEW Planned Generation in the ERCOT Region

2007-2011

Capacity in MW (data as of August, 2006)

Fuel Source	Under Development
Natural Gas	550
Coal	750
Wind	1,576
Other	0
TOTALS	2,876

COMMITTED

For these projects, signed interconnection agreements (contracts between generators and transmission owners) have been completed.

Publicly Announced	Not Publicly Announced	Total
2,300	4,445	6,745
11,709	4,652	16,361
2,944	13,578	16,523
12	1,112	1,124
16,965	23,788	40,753

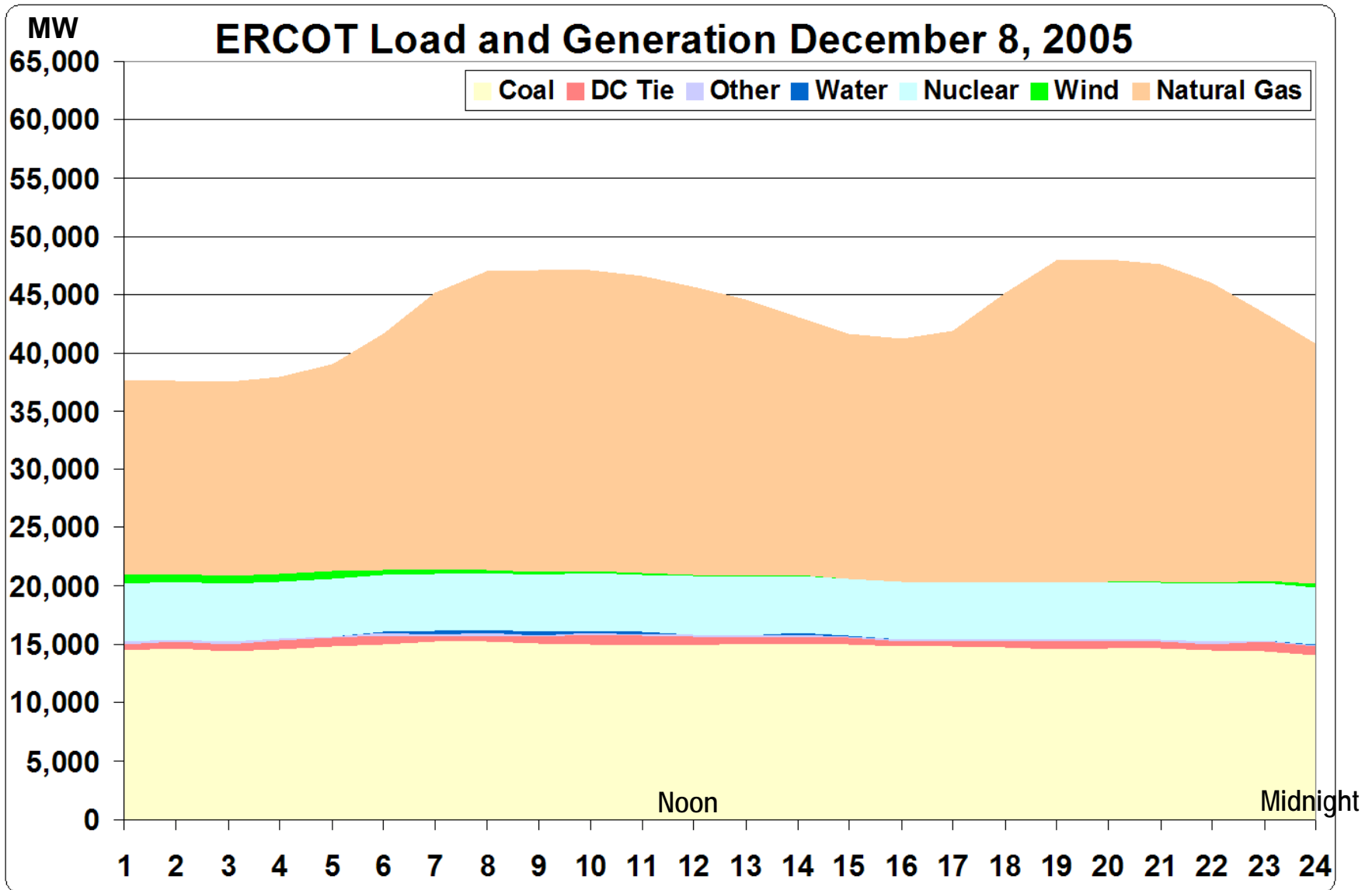
UNCOMMITTED

These are projects for which ERCOT has received transmission interconnection requests:

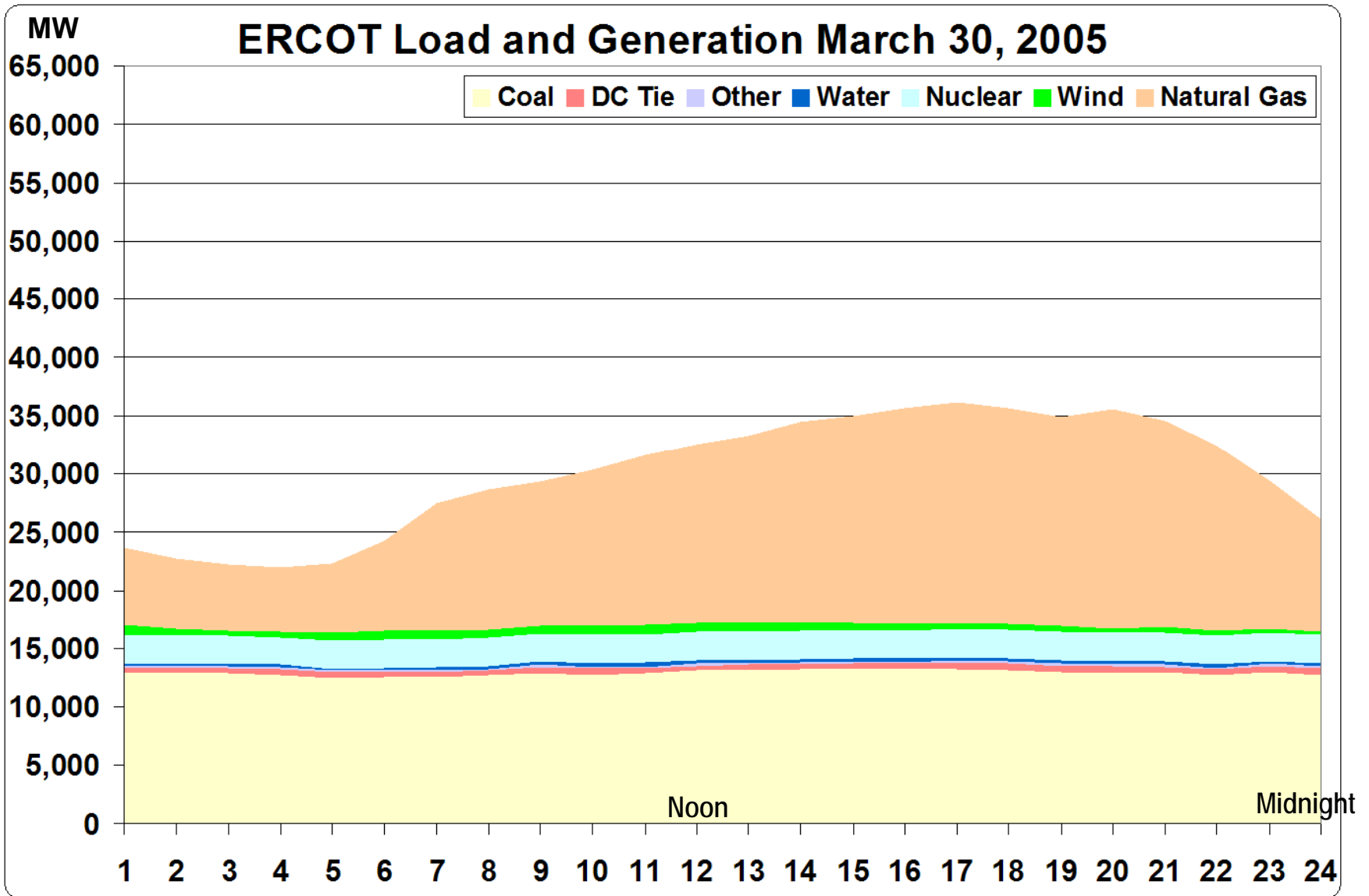
- *Projects are under consideration or in planning, and may or may not be built*
- *Excludes some announced projects, such as nuclear and offshore wind, which do not yet have interconnection requests on file*

Current resource availability in the ERCOT Region: 70,756 MW

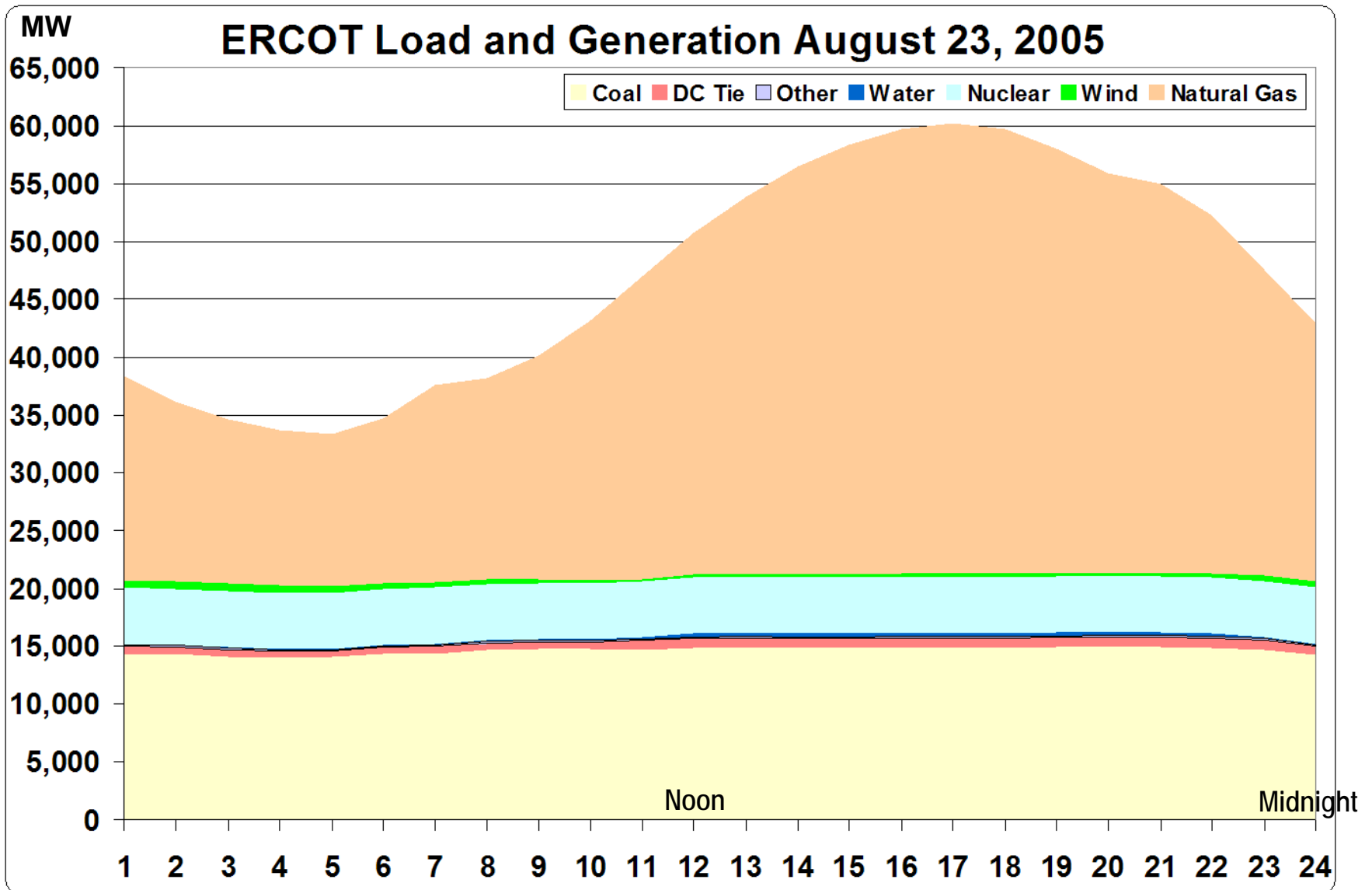
Winter Day Load Shape with Fuel Mix



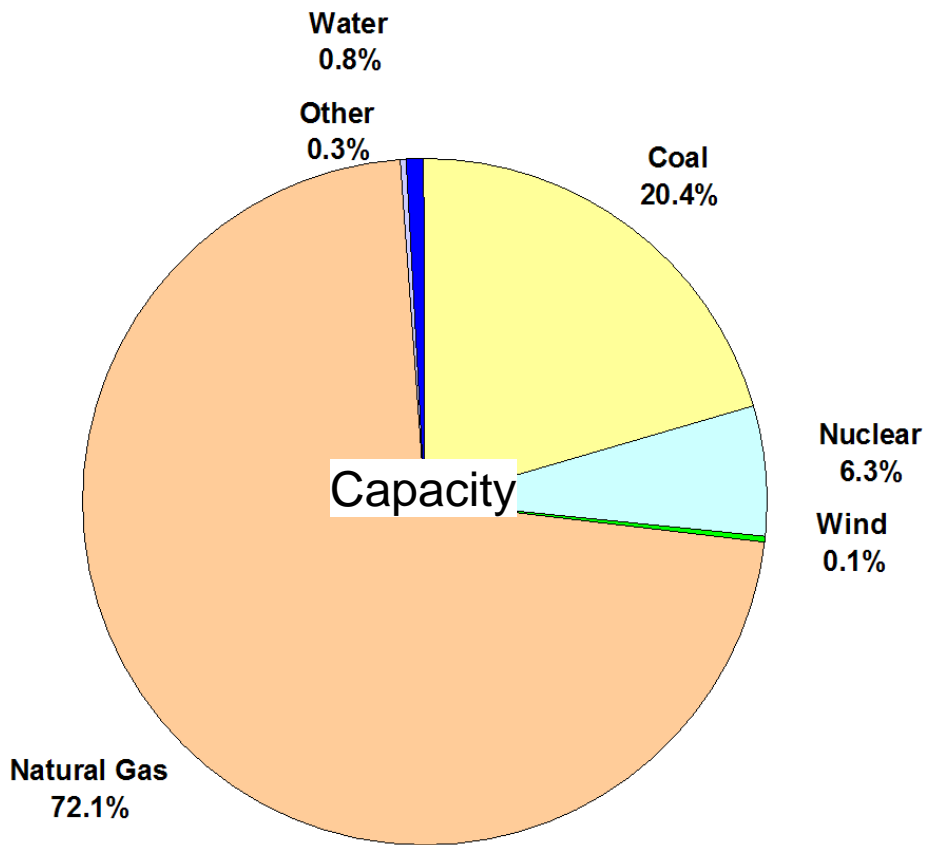
Spring Day Load Shape with Fuel Mix



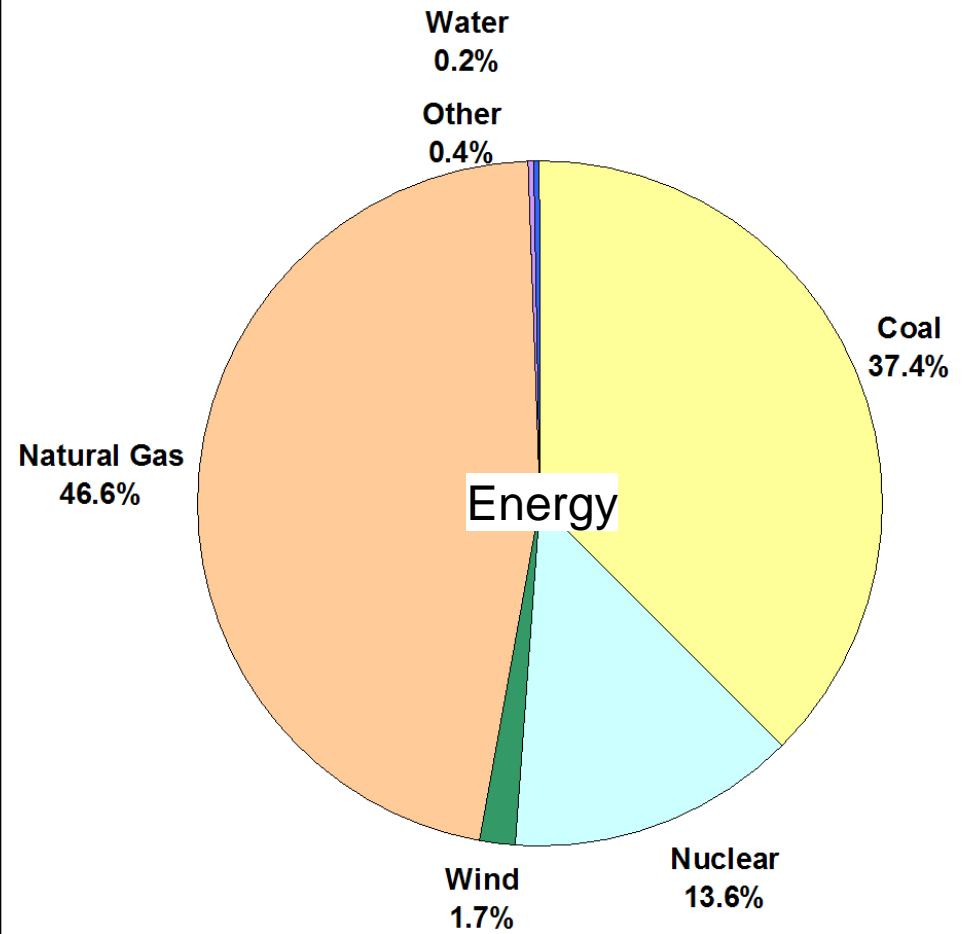
Summer Day Load Shape with Fuel Mix



Fuel Diversity: System Capacity vs. Energy Production



**Current ERCOT System
Net Dependable Generation Capacity**



**Actual Electric Energy Production
June 2005-May 2006**

Summary: Long-Term Reliability Outlook

- **ERCOT projects reserve margins to be near or below minimum levels beginning in 2007**
- **Significant additional generation has been publicly announced but not yet committed with interconnection agreements**
 - Available no earlier than 2009
- **New resources are essential to system reliability**
 - To accommodate load growth and offset probable retirements of older units
- **Region also needs additional fuel diversity**
 - To mitigate high dependence on single fuel type (natural gas)
 - Reduces vulnerability to supply disruption & volatile pricing
- **Also critical: additional load response (customers with ability and incentives to reduce load during peaks)**
 - ERCOT especially supports having additional voluntary load response tools available for emergency conditions

Questions?

