Planning for Texas' Energy Future

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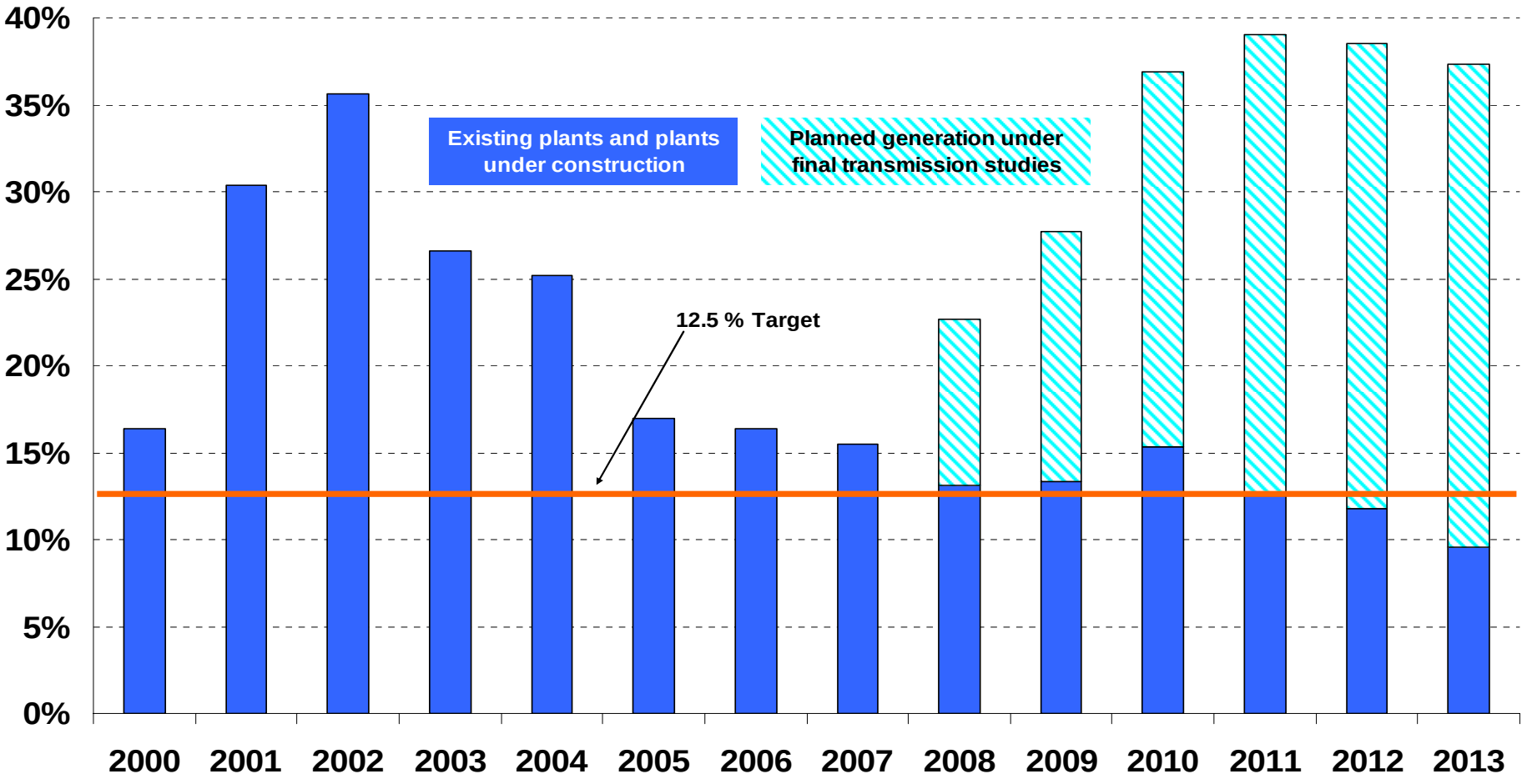
Reserve Margin Estimates

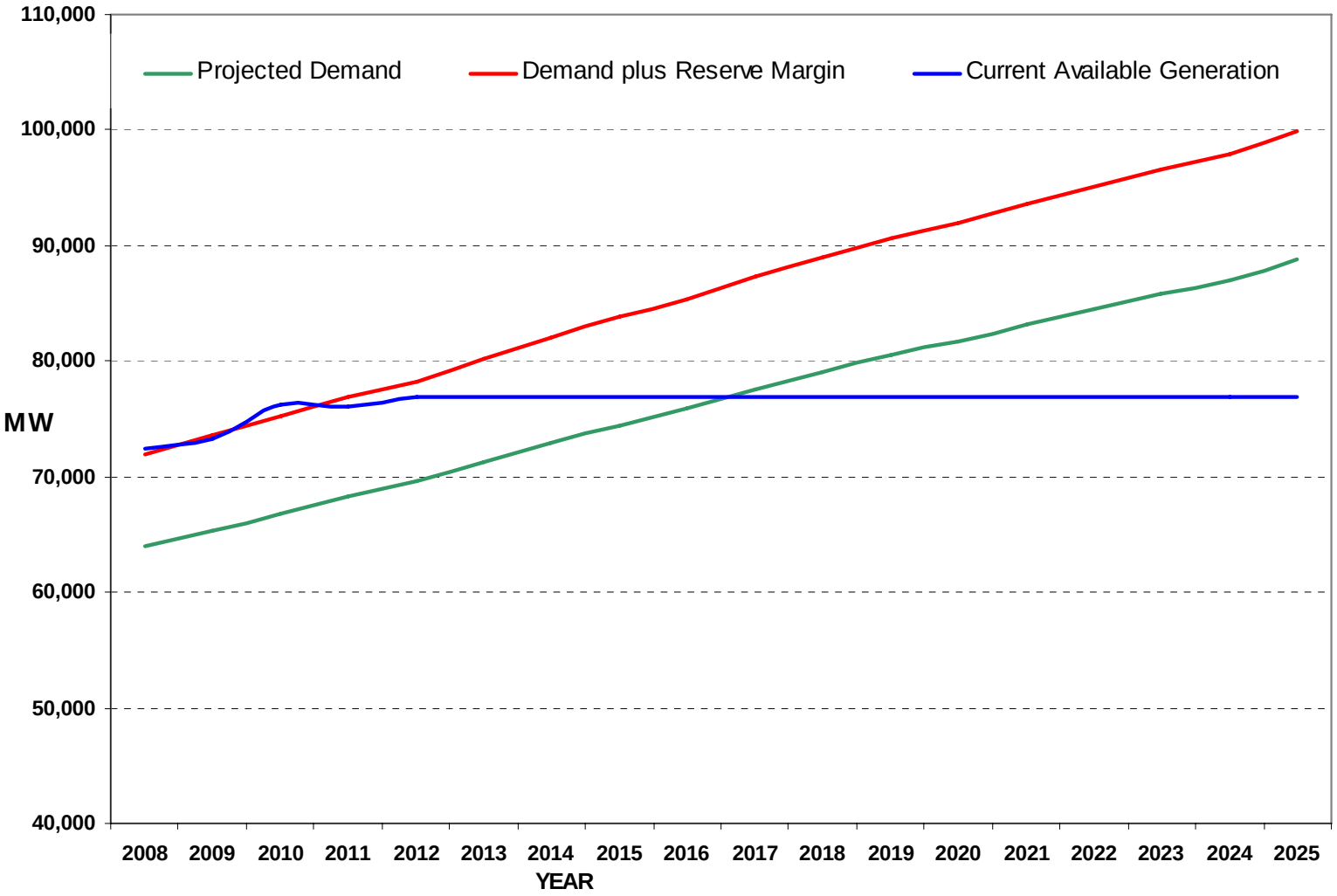
RESERVE MARGINS 2000 - 2013



"Available Capacity" Includes:

- **Gas, coal and nuclear fuel units accounted at their season operating limit level (unless scheduled to retire or mothball)**
- **Wind farms at their "high confidence summer peak" level (8.7%)**
- **Planned units with signed transmission interconnection agreements and approved air quality permits (if needed)**
- **Loads Acting as a Resource (LAAR) - large customers registered and bidding to provide capacity services in market-based load participation program**
- **DC Ties - capacity that can be imported through links to neighboring grids (factored at 50%)**

Projected Peak Demand: 2008-2025



Ensuring Generation Adequacy: So Far, ERCOT Has Met Demand

Since 2000, more than 24,000 MW of new gas fired generation and 5,000 MW of renewable generation have been added to the ERCOT grid

This generation has enabled ERCOT to meet its growth for the past six years

But new issues are emerging:

- Population Boom: 6 million new Texans by 2016
- New nuclear plants require significant lead time
- Natural gas prices will probably not return to 2002 levels

Future Generation

- **The Market is trying to provide new generation**
- **Many generation projects are in the permitting or study phase – unknown how many will be built**
- **Current permitting issues are a consideration**
- **Studies show a possible need for up to 70,000 MW of new generation by 2028 if all units over 40 years of age are retired**
- **Fuel diversity is a real issue in ERCOT – currently 70% of installed capacity is natural-gas fired**

Generation "in the queue"

ERCOT is currently tracking 219 active generation interconnection requests totaling over 100,000 MW.

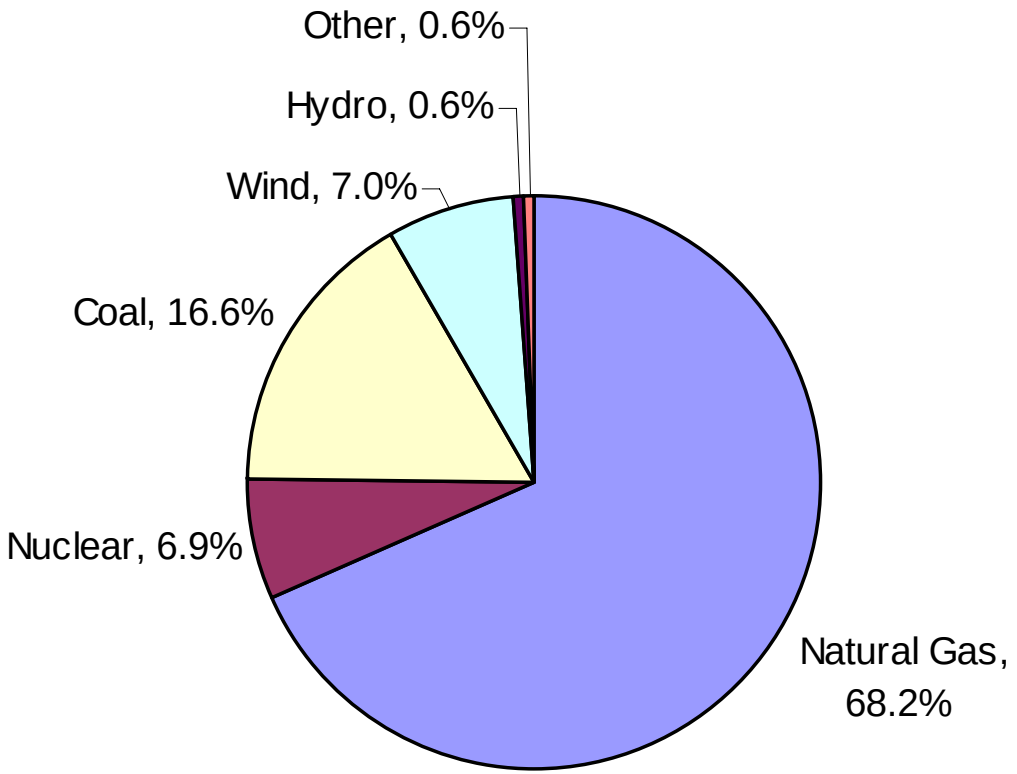
Fuel	Currently Installed (MW)	Under Review(MW)
Natural Gas	50,142	31,497
Nuclear	5,081	15,586
Coal	12,211	8,275
Wind	5,173	44,617
Hydro	442	0
Other	420	425
Totals	**73,469**	**100,400**

We Need Increased Fuel Diversity

Reduces vulnerability to supply disruption and volatile pricing

Also critical: Additional load response (customers with ability and incentives to reduce load during peaks)

Installed Capacity



Renewable Energy: Texas' Renewable Portfolio Standard (RPS)

- The Texas Legislature in Senate Bill (SB) 7 and in SB 20 have mandated steady increases in renewable power:
- Starting Line: 880 MW in 1999
- Old Goal 1: 2,880 MW by 2009 (Achieved by 2007)
- New Goal 1: 5,880 MW by 2015
- New Goal 2: 10,000 MW by 2025
- Target: 500 MW nonwind

Wind in ERCOT Today

- Current Installed Wind Capacity: ~ 5,043 MW
  - This makes Texas the largest wind power jurisdiction in North America (passed California during 2006)
- ~4,500 MW additional wind development with signed interconnection agreements
- ~44,600 MW additional wind development in interconnection study process

Additional bulk transmission lines are already needed in West Texas (independent of the CREZ case outcome)

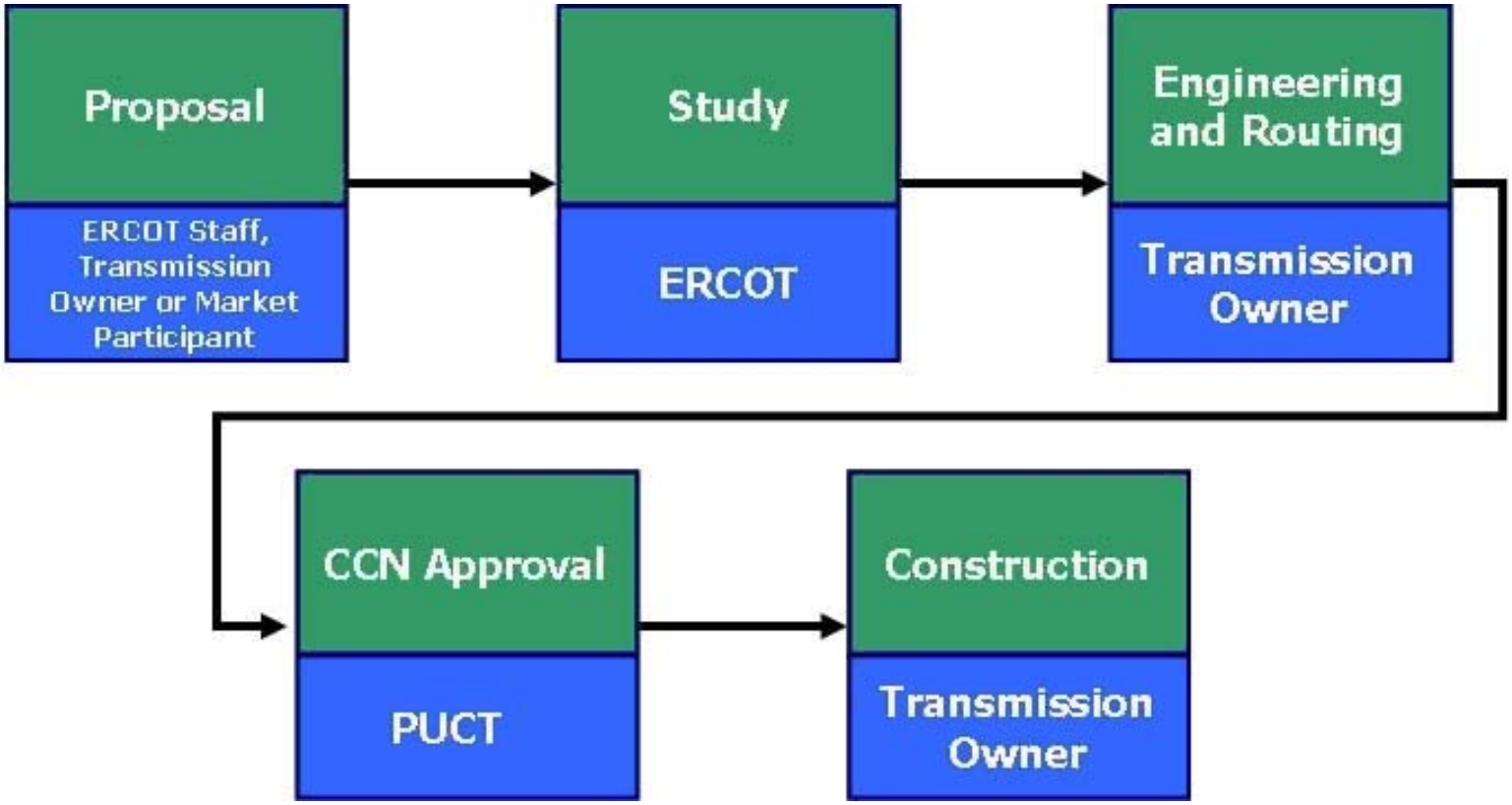
Some Issues Related to Increased Wind Resources in ERCOT

- **Wind is not as controllable or predictable as traditional generation**
  - Cannot be dispatched (with exceptions)
  - Highly dependent on weather conditions
- **Works best in conjunction with other generation in same area**
  - Conventional resources available to provide regulation & responsive reserve services
- **Creates new challenges in system design & operation**
  - Difficulty in coordination of transmission outages and construction, *i.e.,* system off peak = wind peak production
  - Requires some increases in ancillary services (regulation)

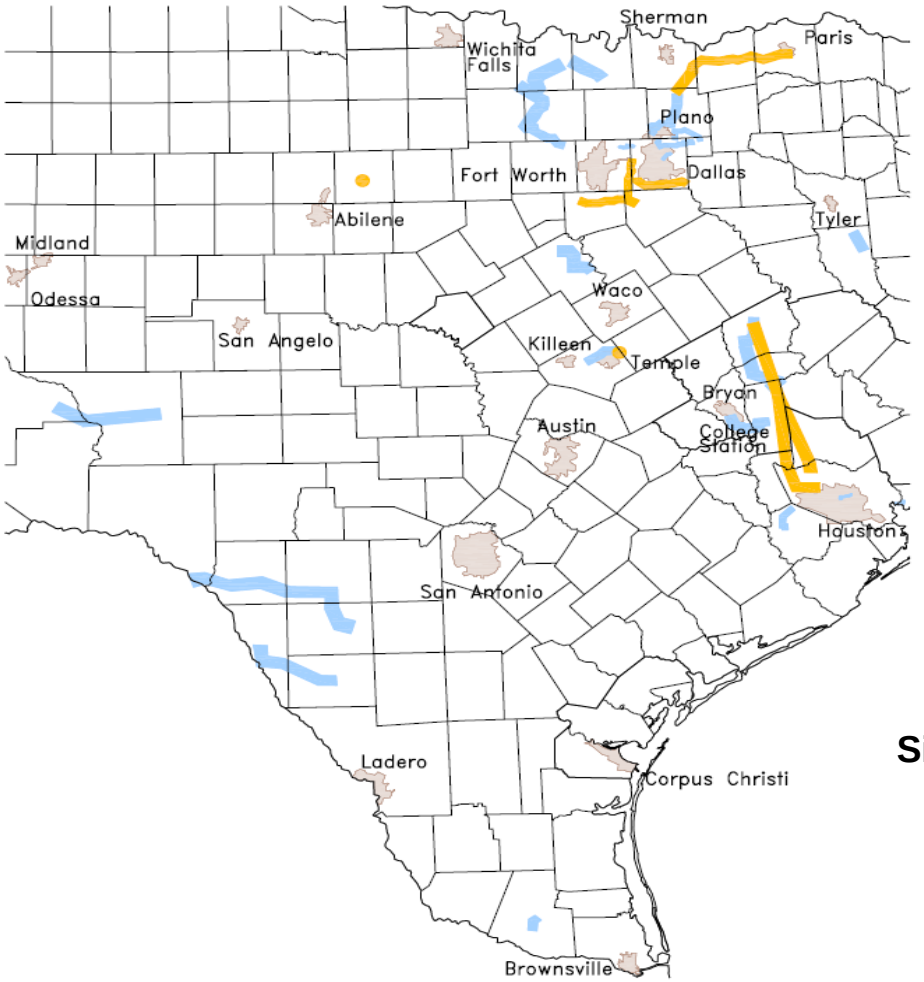
Summary of ERCOT's CREZ Transmission Optimization Study

Scenario	Wind Installed (GW)	Transmission Cost ($B)	Collection Cost ($B)	Total New ROW (Miles)	Regions
1 – Plan A	12.053	2.95	0.35 – 0.41	1,638	All 5
1 – Plan B	12.053	3.78	0.41 – 0.53	1,831	All 5
2	18.456	4.93	0.58 – 0.82	2,376	All 5
3	24.859	6.38	0.72 – 1.03	3,036	All 5
4	24.419	5.75	0.67 – 0.94	2,489	No Panhandle B

Transmission Planning in ERCOT



Transmission Achievements in ERCOT: Completed 138/345-kV Improvements 2005 - 2007



345 kV Projects

138 kV Projects

Since 2005, Transmission Improvements Include:

Over 2,500 circuit miles of transmission
Over 28,000 MVA of autotransformer capacity

Totaling more than $2.2 Billion

Future Transmission Improvements

The Regional Planning Group is currently reviewing proposed transmission improvements with an estimated total cost of $206.3 M.