



GAS/ELECTRIC ISSUES IN ERCOT

2013 GAS/ELECTRIC PARTNERSHIP CONFERENCE

FEBRUARY 7, 2013

Kent Saathoff

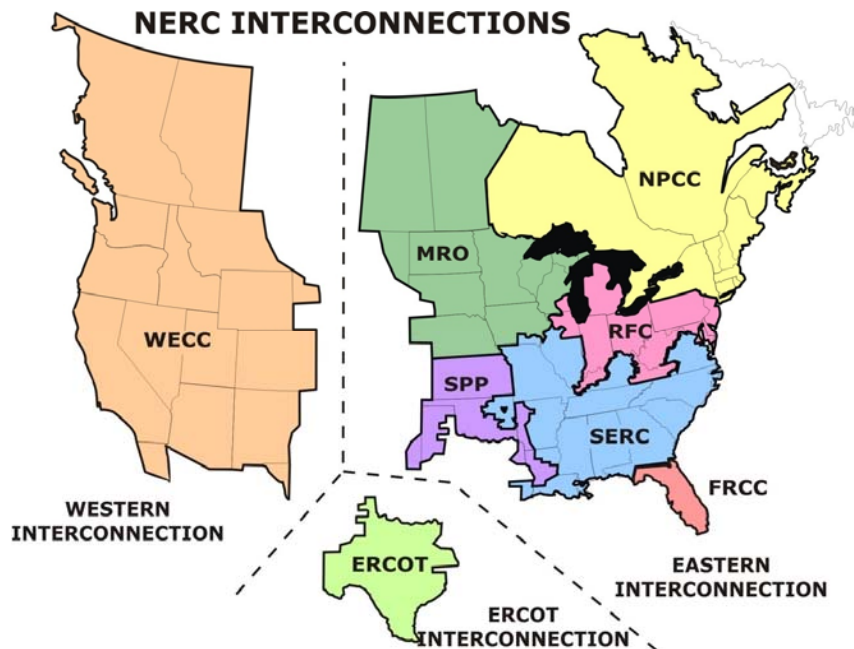
ERCOT

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The ERCOT Region:

The interconnected electrical system serving most of Texas, with limited external connections

- 75% of Texas land; 85% of Texas load
- More than 40,000 miles of transmission lines
- 550+ generation units
- 68,294 MW peak demand (set August 3, 2011)



ERCOT Inc.:

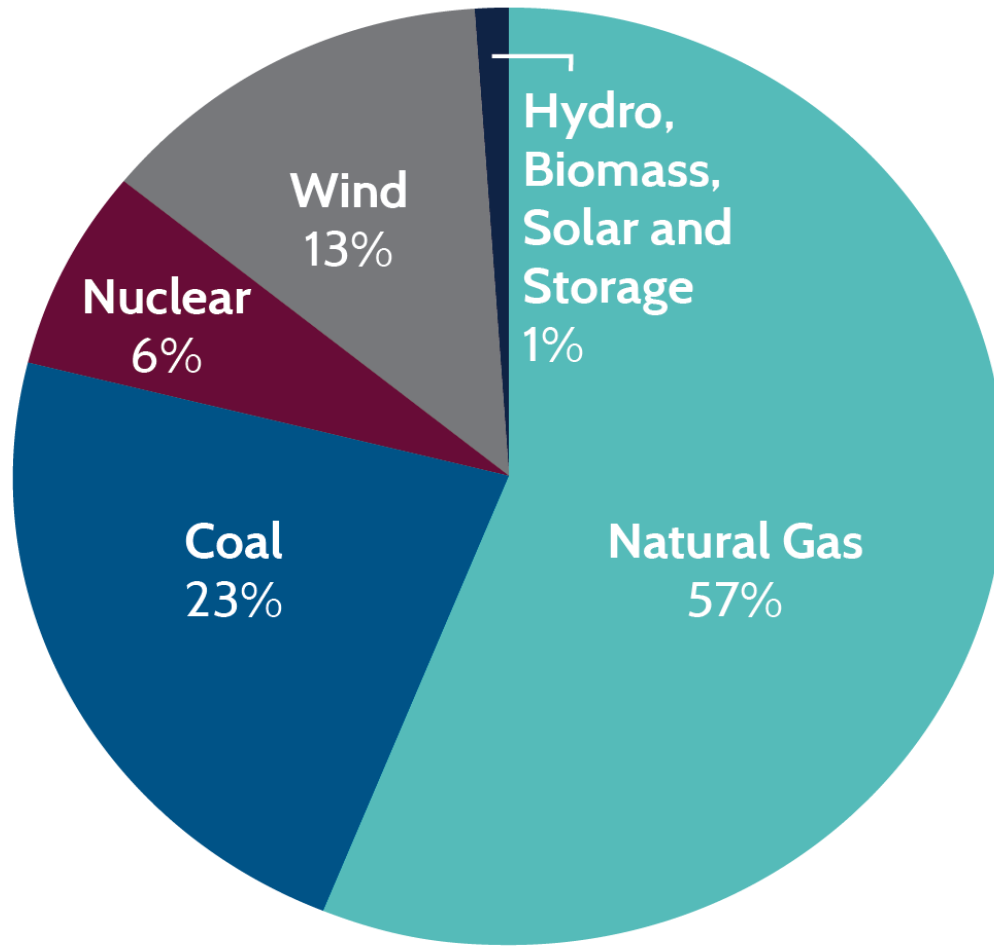
A non-profit corporation designated the “Independent Organization” under state law and assigned these responsibilities [Texas Public Utility Regulatory Act (PURA) 39.151]:

- Maintaining System Reliability
- Ensuring Open Access to Transmission
- Facilitating the Competitive Wholesale Market
- Facilitating the Competitive Retail Market

Regulatory Characteristics:

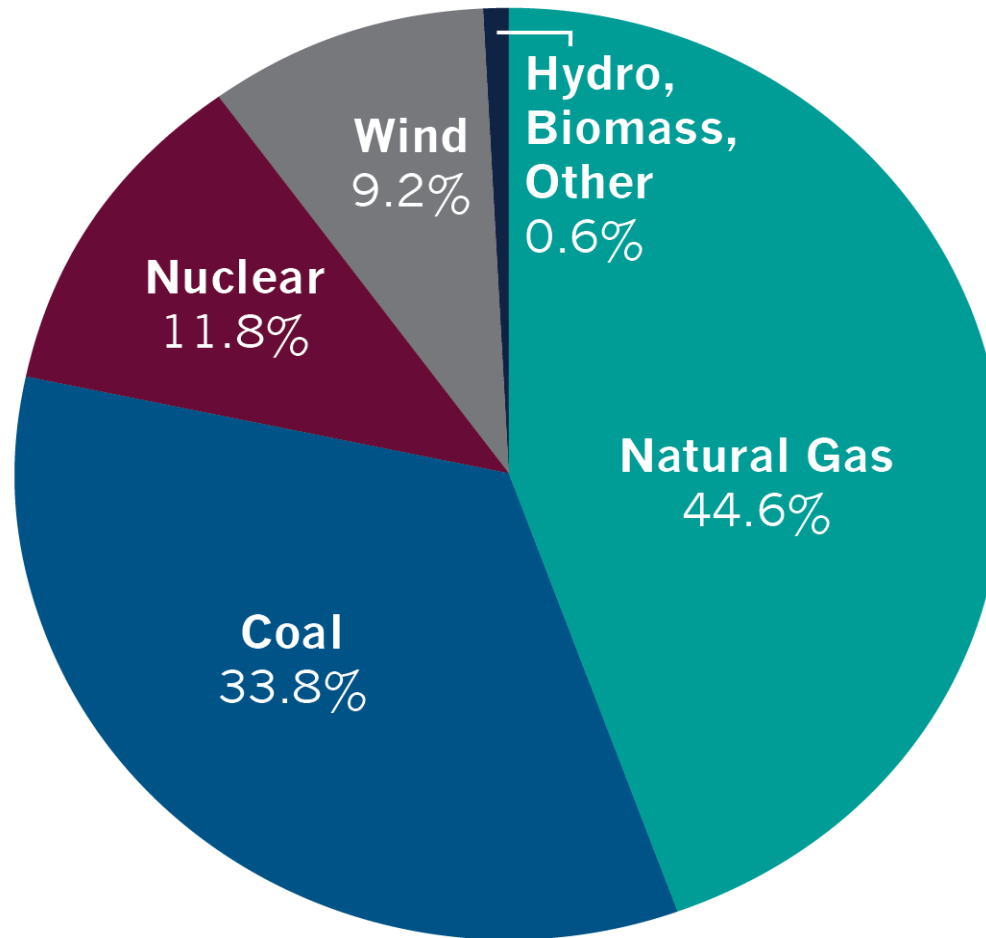
- ERCOT is regulated by the Texas Public Utility Commission with oversight by the Texas Legislature
- ERCOT is not a market participant and does not own generation or transmission/distribution wires

INSTALLED GENERATING CAPACITY BY FUEL TYPE



2012 Generation Capacity

2012 ENERGY PROVIDED BY FUEL TYPE



Energy Use 2012

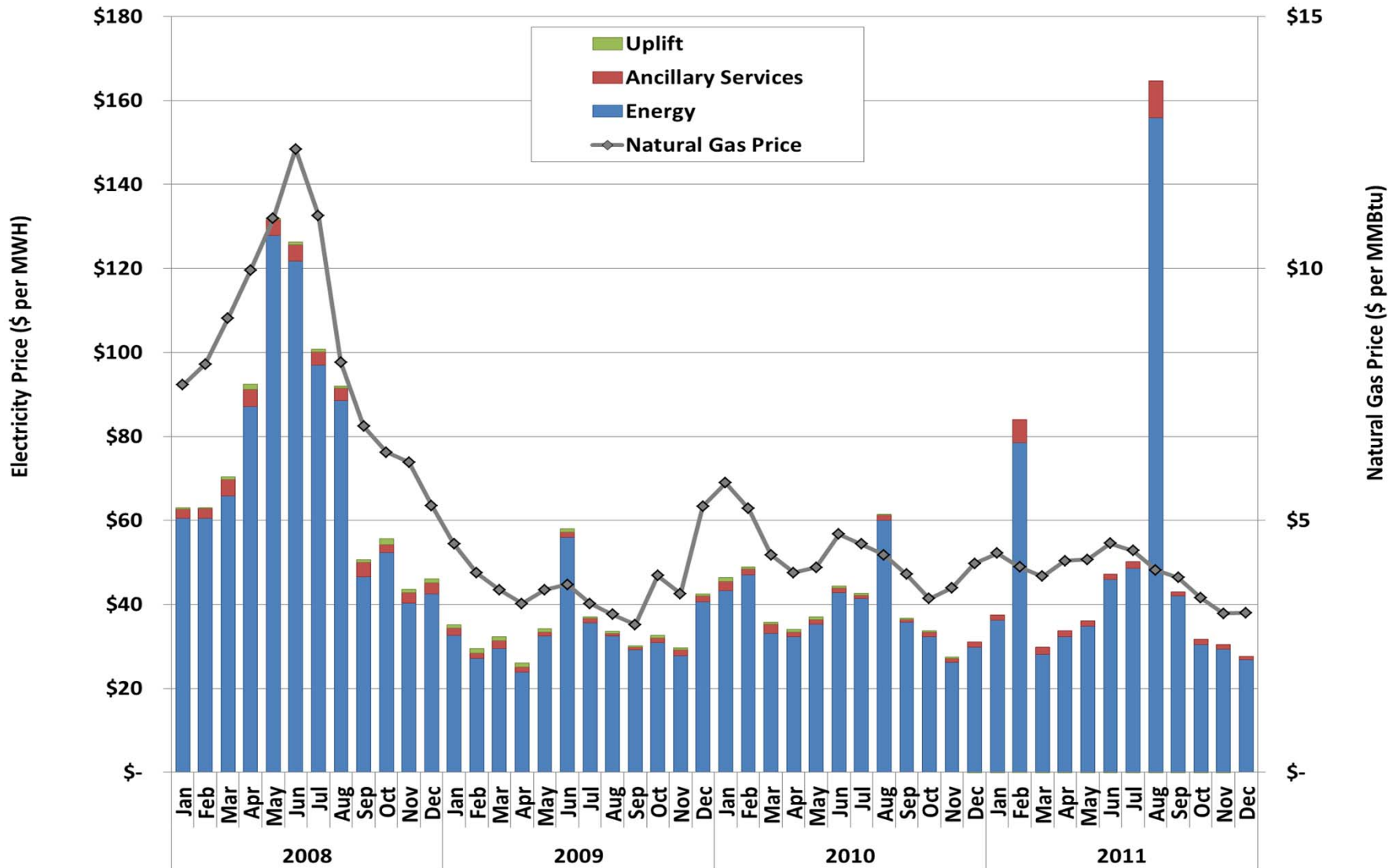
ELECTRICITY PRICES IN ERCOT

- **Under normal conditions, trend with natural gas prices since gas is the marginal fuel in ERCOT**
- **There is no “capacity market” for generators in ERCOT**
- **ERCOT is an “energy only” market. Prices can get very high during periods of scarcity. Current offer cap is \$4,000/ Mwh**

ERCOT AVERAGE REAL TIME ENERGY PRICES

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|----------------------|-------|-------|-------|-------|-------|
| Electricity (\$/Mwh) | 77.19 | 34.03 | 39.40 | 53.23 | 30.18 |
| Gas (\$/MMBTU) | 8.50 | 3.74 | 4.34 | 3.94 | 2.71 |

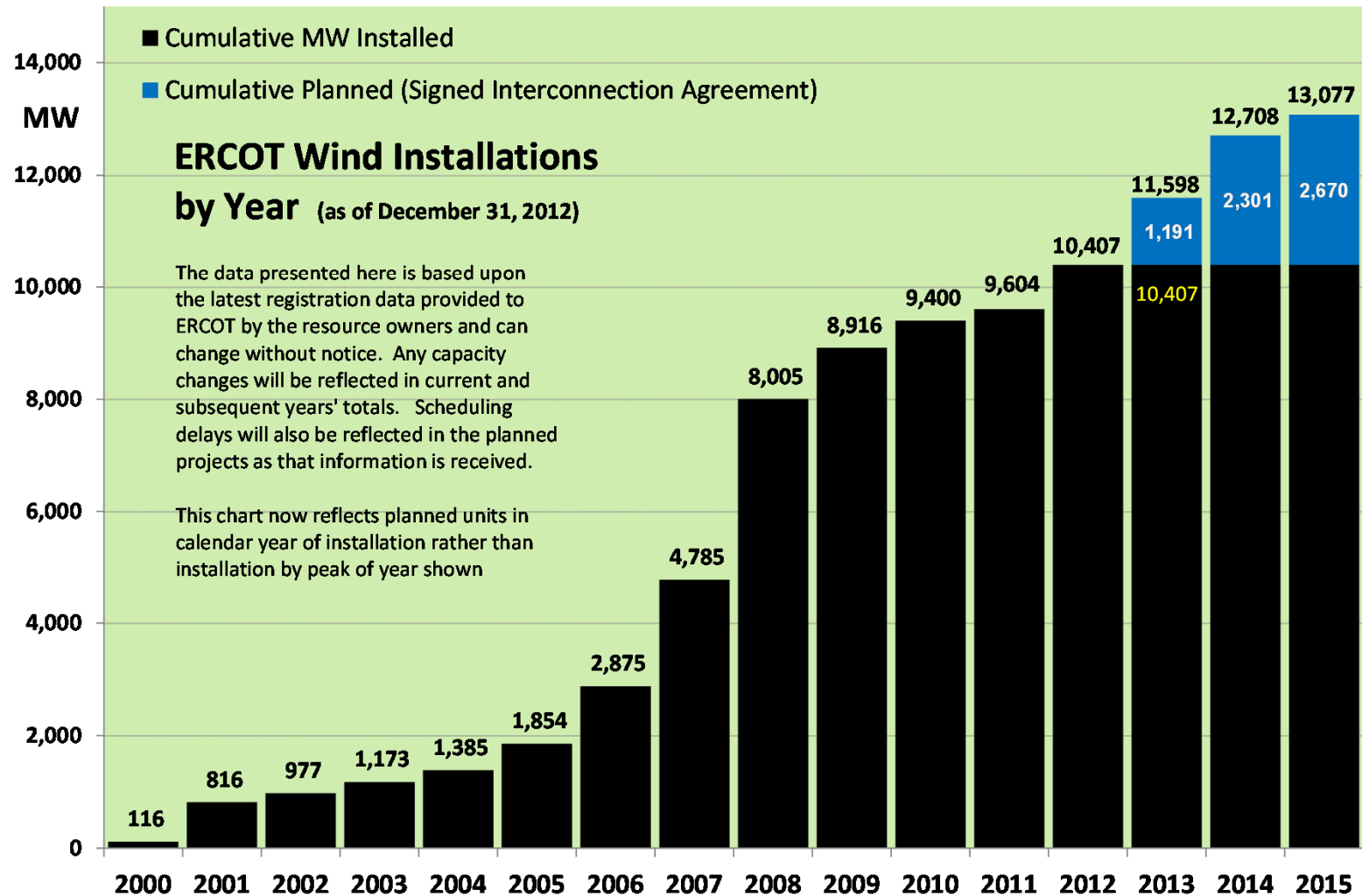
ERCOT AVERAGE WHOLESALE ELECTRICITY PRICES 2008-2011



WIND GENERATION ALSO KEEPS PRICES DOWN

- **Cost of fuel is zero**
- **Production Tax Credit means wind can generate at negative prices**
- **There have been a number of times when prices in the West load zone have been negative due to transmission limitations on exports from the West**
- **Approximately \$6 billion of transmission facilities being built to accommodate 18,000 MW of wind in the west**

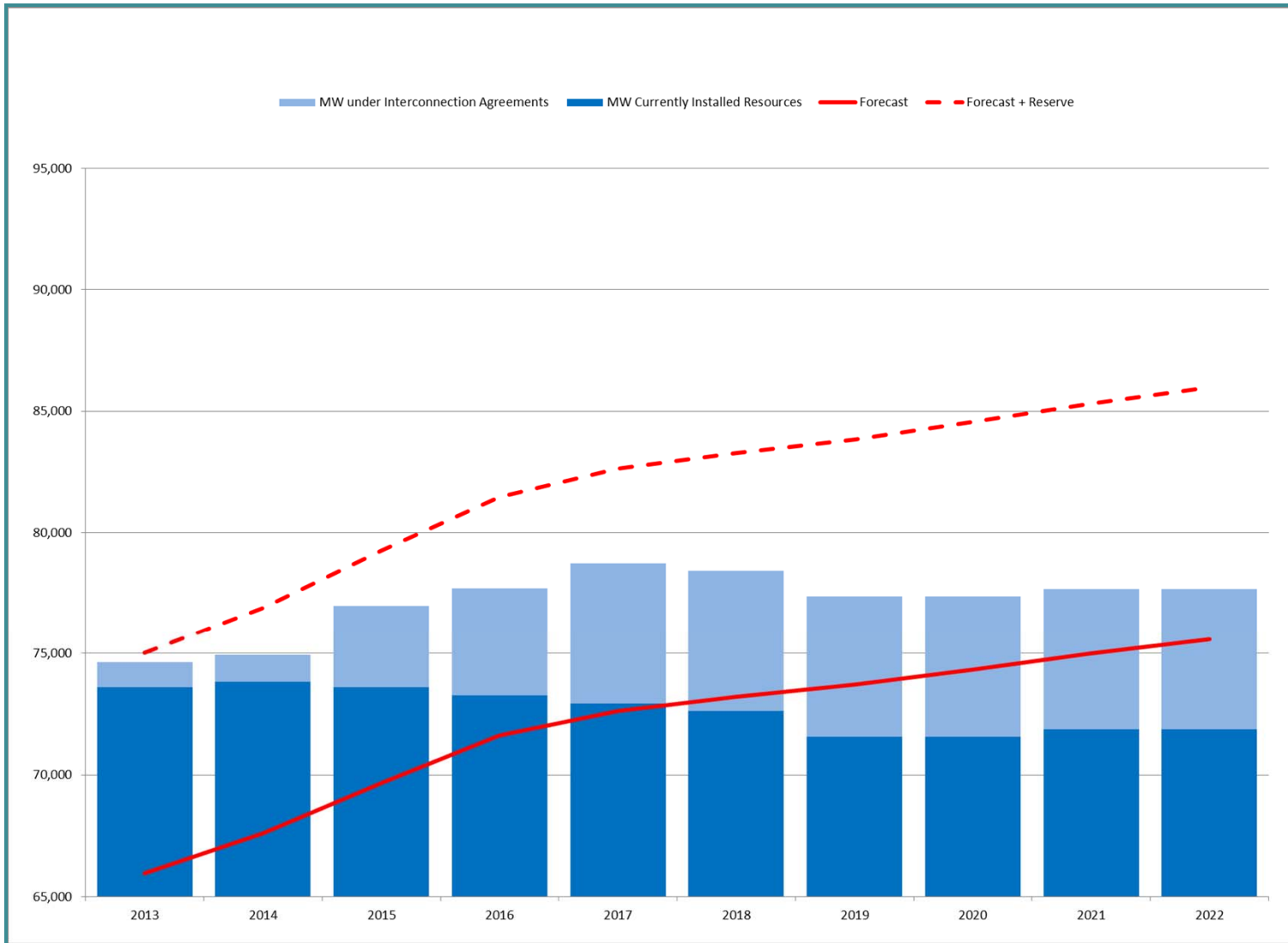
WIND GENERATION



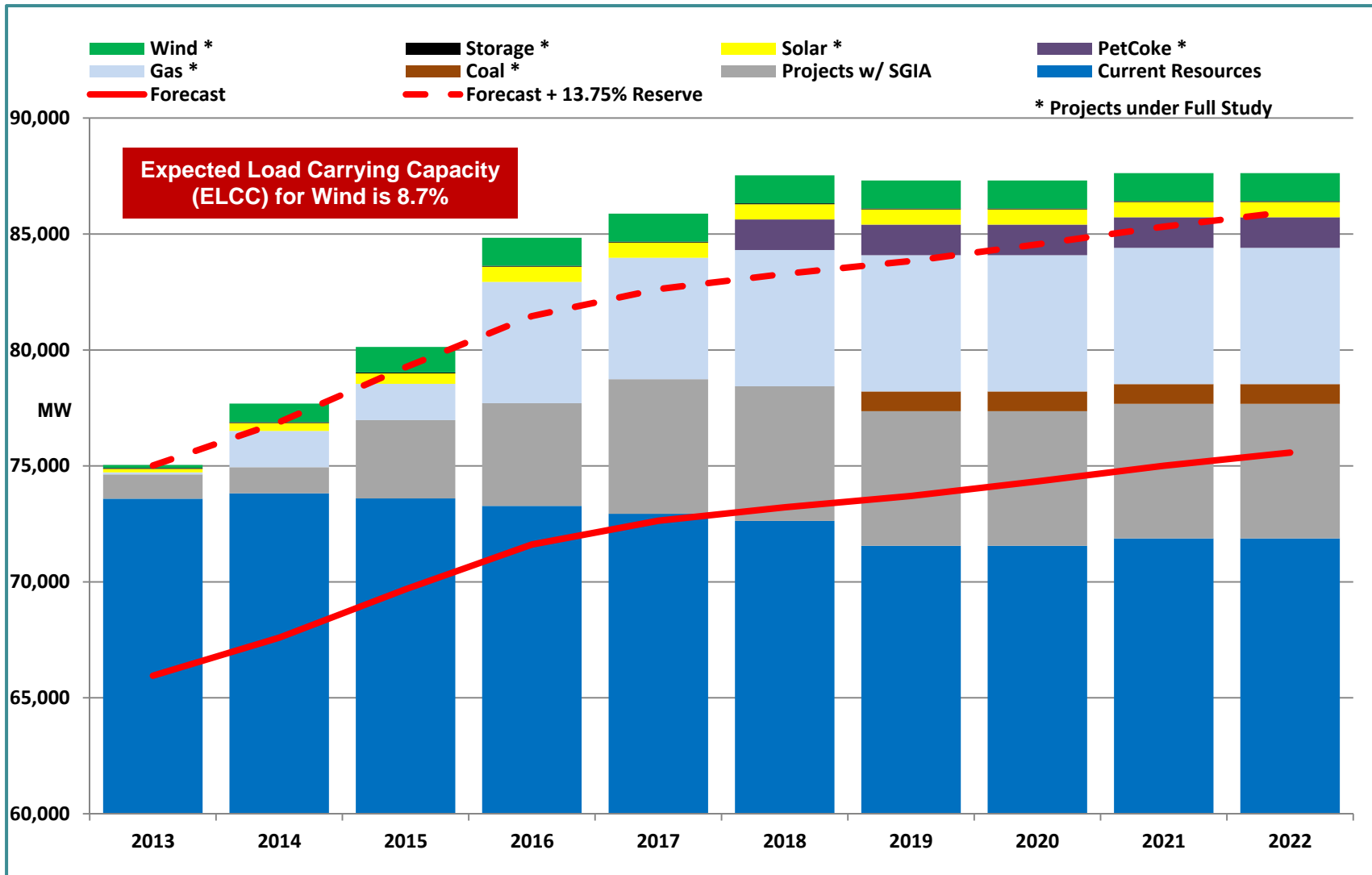
MAJOR ISSUE GOING FORWARD THAT WILL AFFECT PRICES

- **Resource Adequacy - Current prices in the energy only market are not sufficient to encourage the new generation needed to meet growing demand**
- **The PUCT and ERCOT have addressed this by:**
 - Raising the offer cap. Will be \$9,000/Mwh in 2015
 - Changing protocols so actions taken to maintain reliability in scarcity conditions do not depress prices
 - Developing and encouraging more demand response programs
 - Still considering need for a capacity market

DEC 2012 CAPACITY, DEMAND AND RESERVES REPORT (CDR)



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BLACK START CONCERNS

- **If there is an ERCOT system wide blackout**
 - Could take 2 days to 2 weeks to restore the system
 - Most of ERCOT's Black Start resources that can start themselves and next-start resources are gas fueled
 - Will gas be available to these resources if gas facilities have no electric service from the grid?
 - ERCOT is currently exploring this issue with gas pipelines, Railroad Commission and PUCT