A few slides that may be helpful

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San Antonio Environmental Challenges:
Opportunities in Resilience

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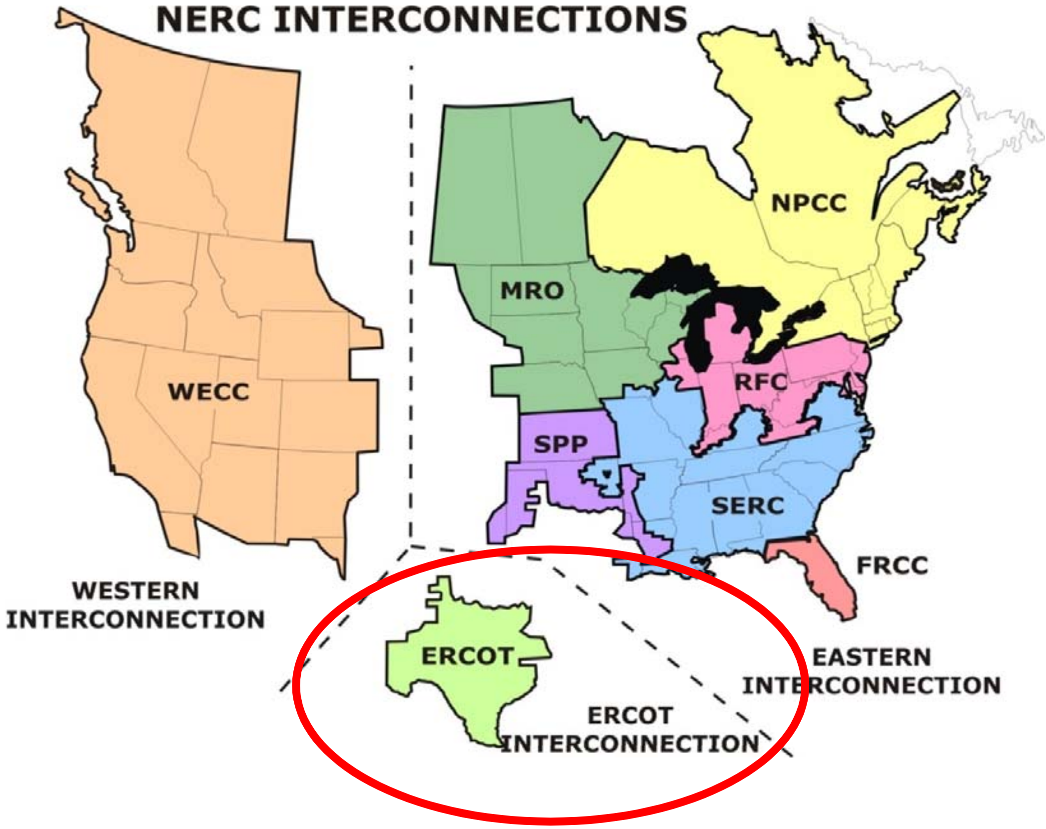
Bulk Power Grids in U.S./Canada

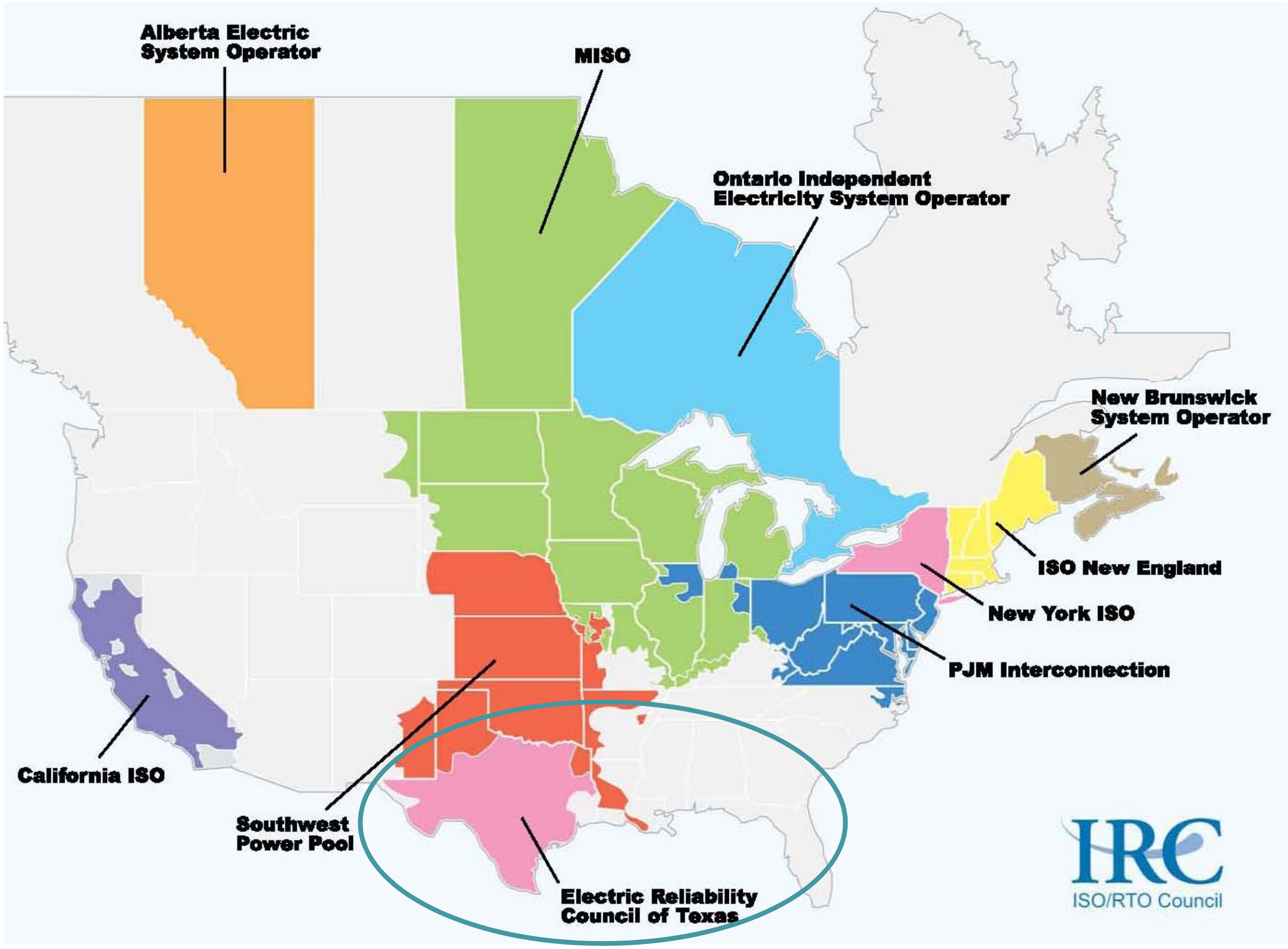


ERCOT connections to other grids are limited to direct current (DC) ties, which allow control over flow of electricity

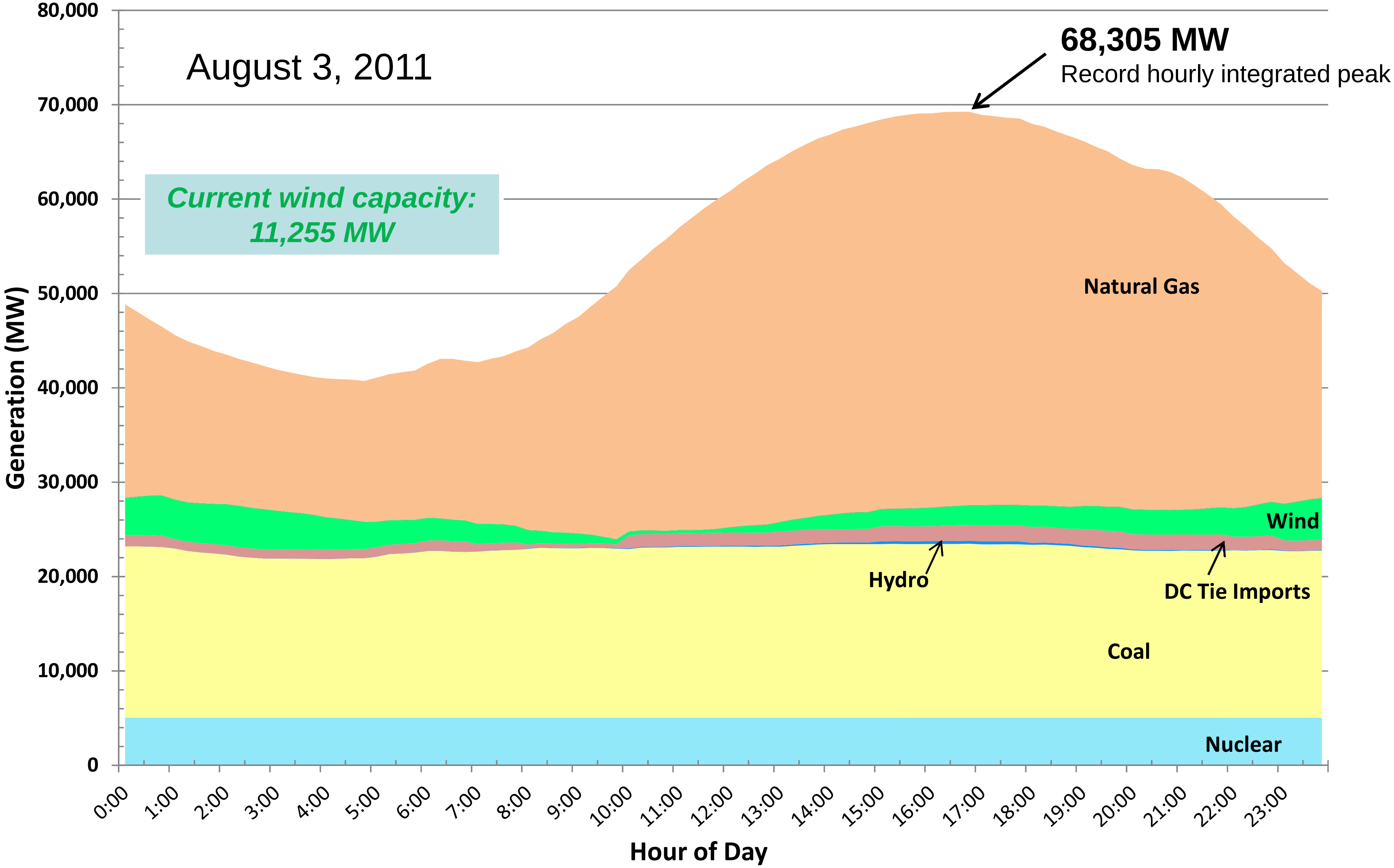
- The ERCOT Region is one of 3 grid interconnections in USA-Canada
- The ERCOT grid:
  - Covers 75% of Texas land
  - Serves 85% of Texas load
  - >41,500 miles of transmission lines
  - >550 generation units
  - Physical assets are owned by transmission providers and generators, including municipal utilities and cooperatives

U.S./Canada ISOs and RTOs

Independent System Operators and Regional Transmission Organizations are the 'air traffic controllers' of the bulk electric power grids



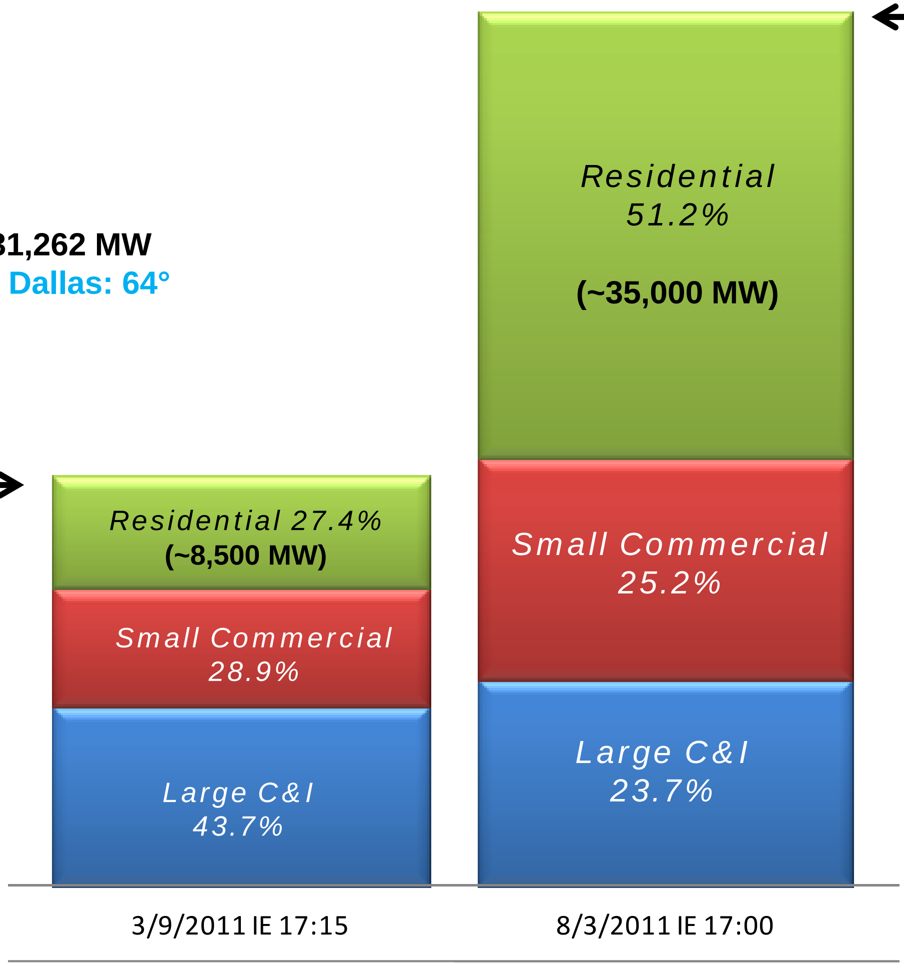
Peak Day Generation Fuel Mix



Weather impacts on load by customer type

Wed., Aug. 3, 2011
5:00 PM
ERCOT Load: 68,416 MW
Temperature in Dallas: 109°

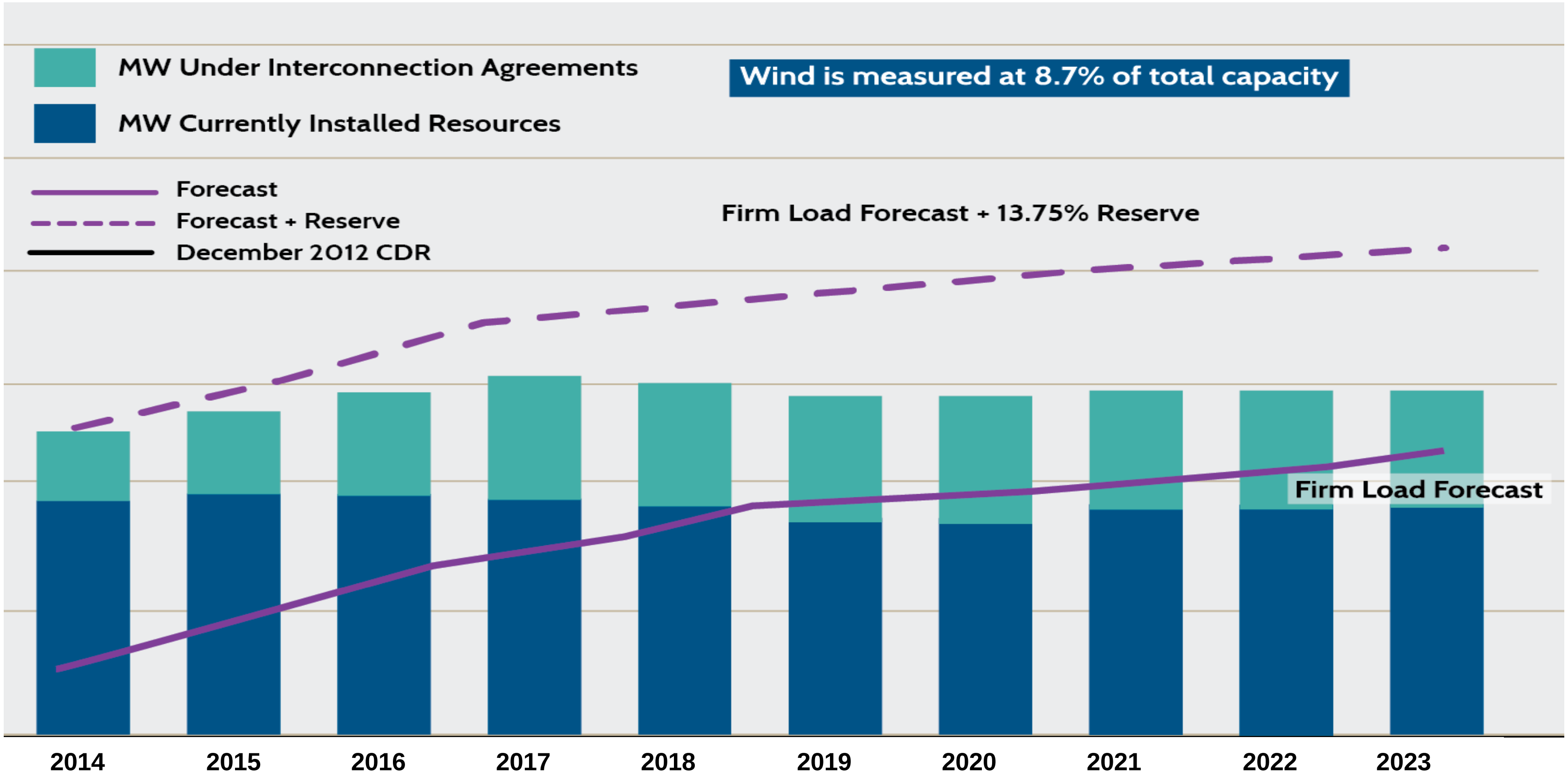
Wednesday
March 9, 2011
5:15 PM
ERCOT Load: 31,262 MW
Temperature in Dallas: 64°



37,000 MW of weather-sensitive load -- 54% of peak

- Customer class breakdown is for competitive choice areas; percentages are extrapolated for munis and co-ops to achieve region-wide estimate
- Large C&I are IDR Meter Required (>700kW)
- 15-minute settlement interval demand values

Capacity, Demand & Reserves (May 2013)



ERCOT staff has developed an updated load forecasting methodology, responding to changes in the relationship between economic indicators and energy demand in recent years. The new model uses growth trends in customer premises to project future growth in electric demand. ERCOT released a preliminary load forecast in January.

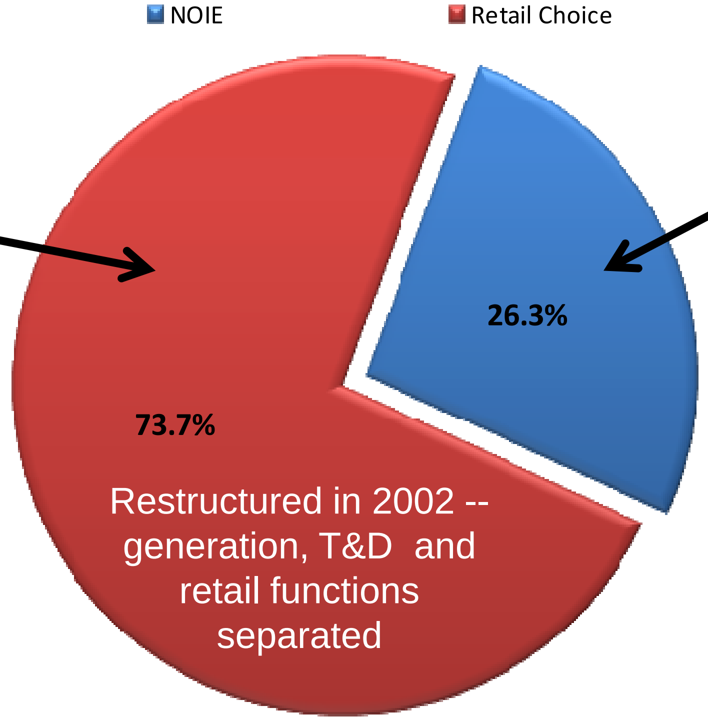
Retail Competitive Choice

'Utility' a mostly obsolete term

Dozens of REPs competing for residential and small commercial accounts

Mostly fixed-price offerings with 6-12 month terms; some pre-paid, renewable options

Near-universal AMI



MWh 12/1/10 thru 8/11/11

Municipals & Cooperatives

Muni's and co-ops are still vertically integrated

Many have existing and developing smart grid initiatives:
-- AMI
-- Smart thermostats
-- Other DLC

Possible triggers: Real-time prices, congestion management, 4CP response

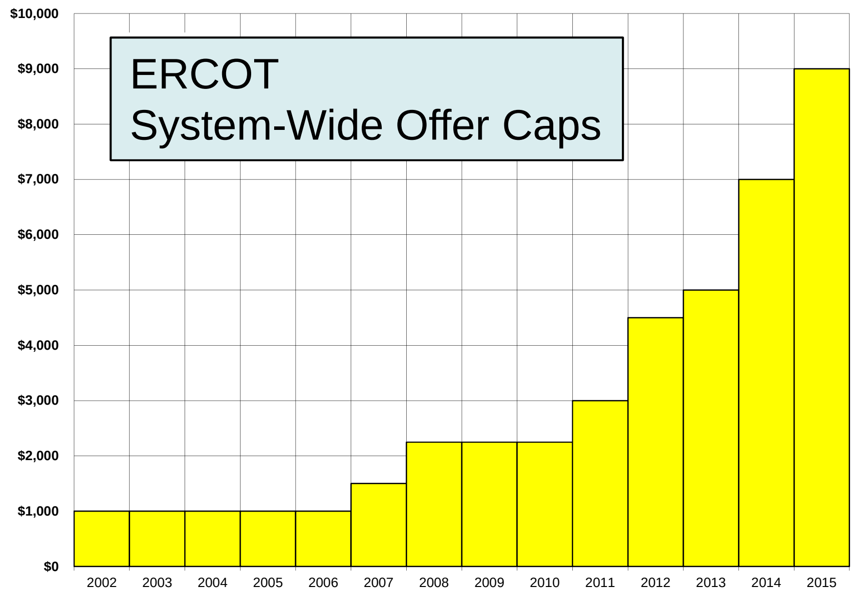
DR available for ERCOT dispatch (summer peaks 2013)

Service	MWs	Notes
Load Resources providing RRS	<1400	Capped at 1400 MW (half of total hourly RRS procurement of 2800 MW) Less than 1400 MW cleared most hours
ERS	~435	Includes 10-minute ERS + 30-minute pilot Procurement varies by Time Period; less than 400 MW available during summer peak 2012
TDSP Load Management Programs	~240	Summer peak hours only Dispatched concurrently with ERS through agreements between ERCOT and TDSPs

2,000 MW of dispatchable DR: < 3% of ERCOT summer peak

Wholesale market prices

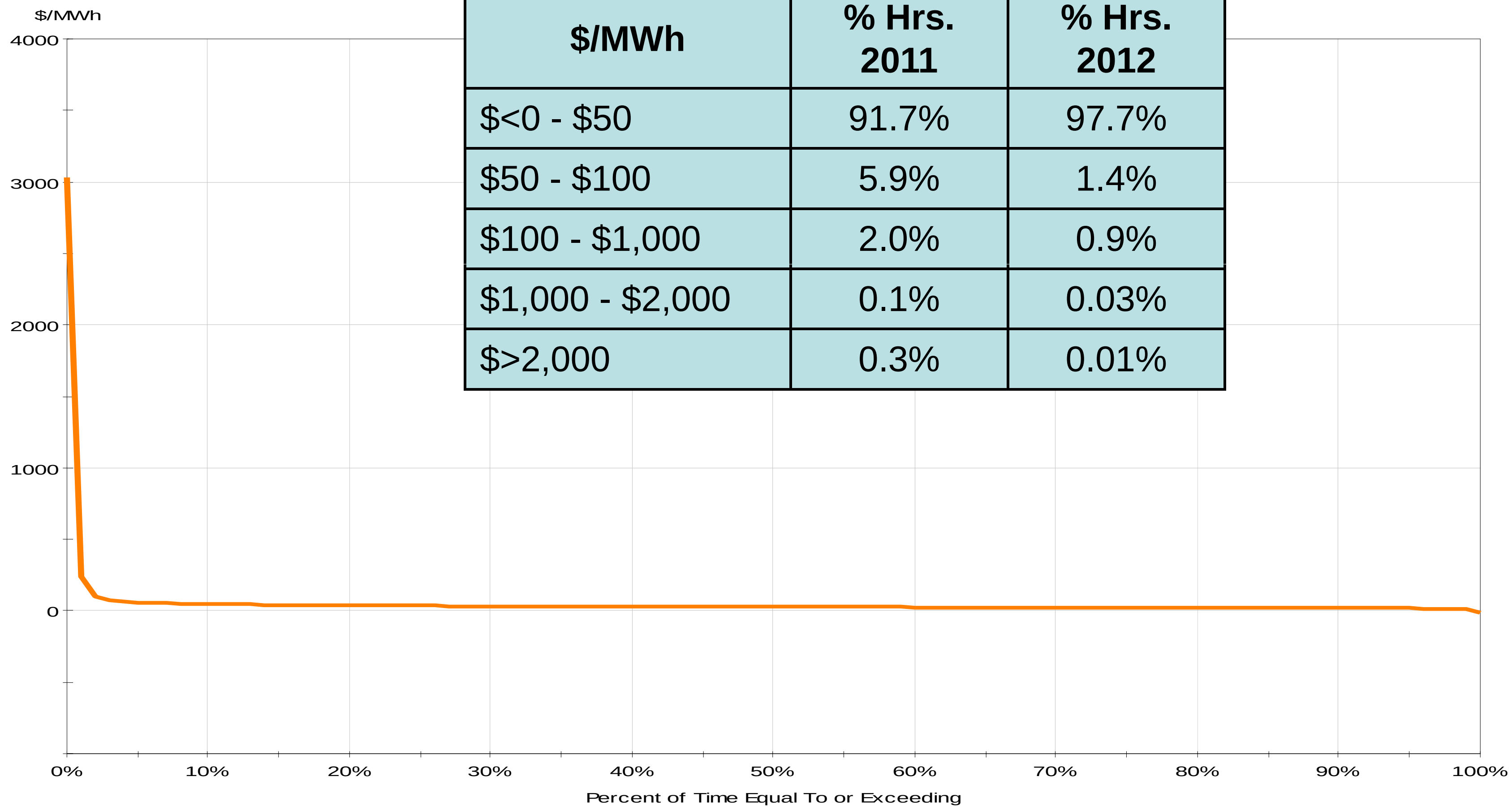
- **Escalating offer caps in the energy-only market**
  - 2002: $1,000
  - 2007 $1,500
  - 2008 $2,250
  - 2011: $3,000
  - 2012: $4,500
  - June 2013: $5,000
  - June 2014: $7,000
  - June 2015: $9,000



- **Applies to offers for energy (MWh) and Ancillary Services (MW)**
- **Possible role for DR as an insurance policy for both LSEs and Generators**

Price duration curve

SCARCITY PRICING INCIDENTS		
$/MWh	**% Hrs. 2011**	**% Hrs. 2012**
$<0 - $50	91.7%	97.7%
$50 - $100	5.9%	1.4%
$100 - $1,000	2.0%	0.9%
$1,000 - $2,000	0.1%	0.03%
$>2,000	0.3%	0.01%



Graph: North Load Zone Settlement Point Prices, 2011

Questions?