Major Issues Before the Public Utility Commission of Texas Relating to the ERCOT Market

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TEXAS SOCIETY OF CERTIFIED PUBLIC ACCOUNTANTS
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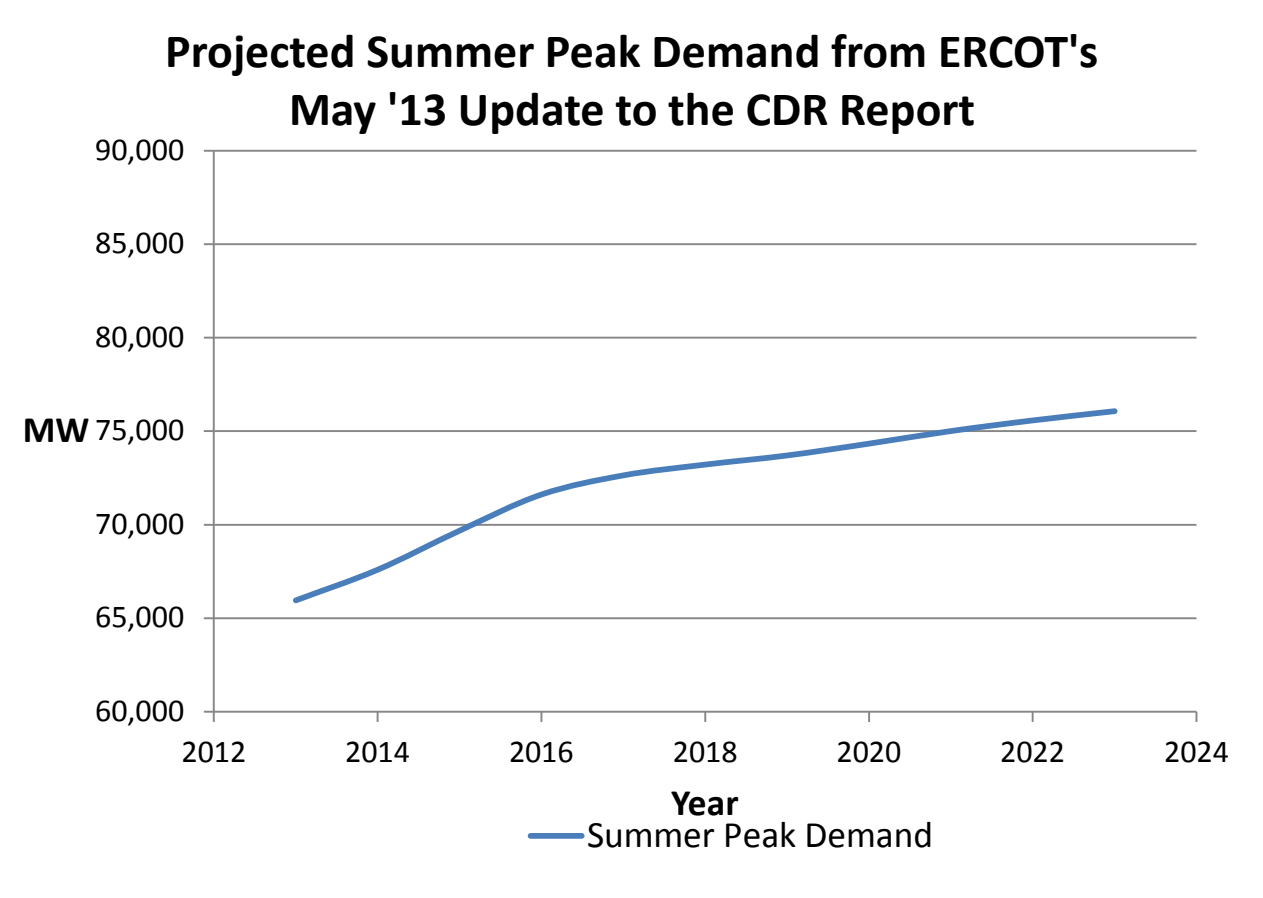
Introduction

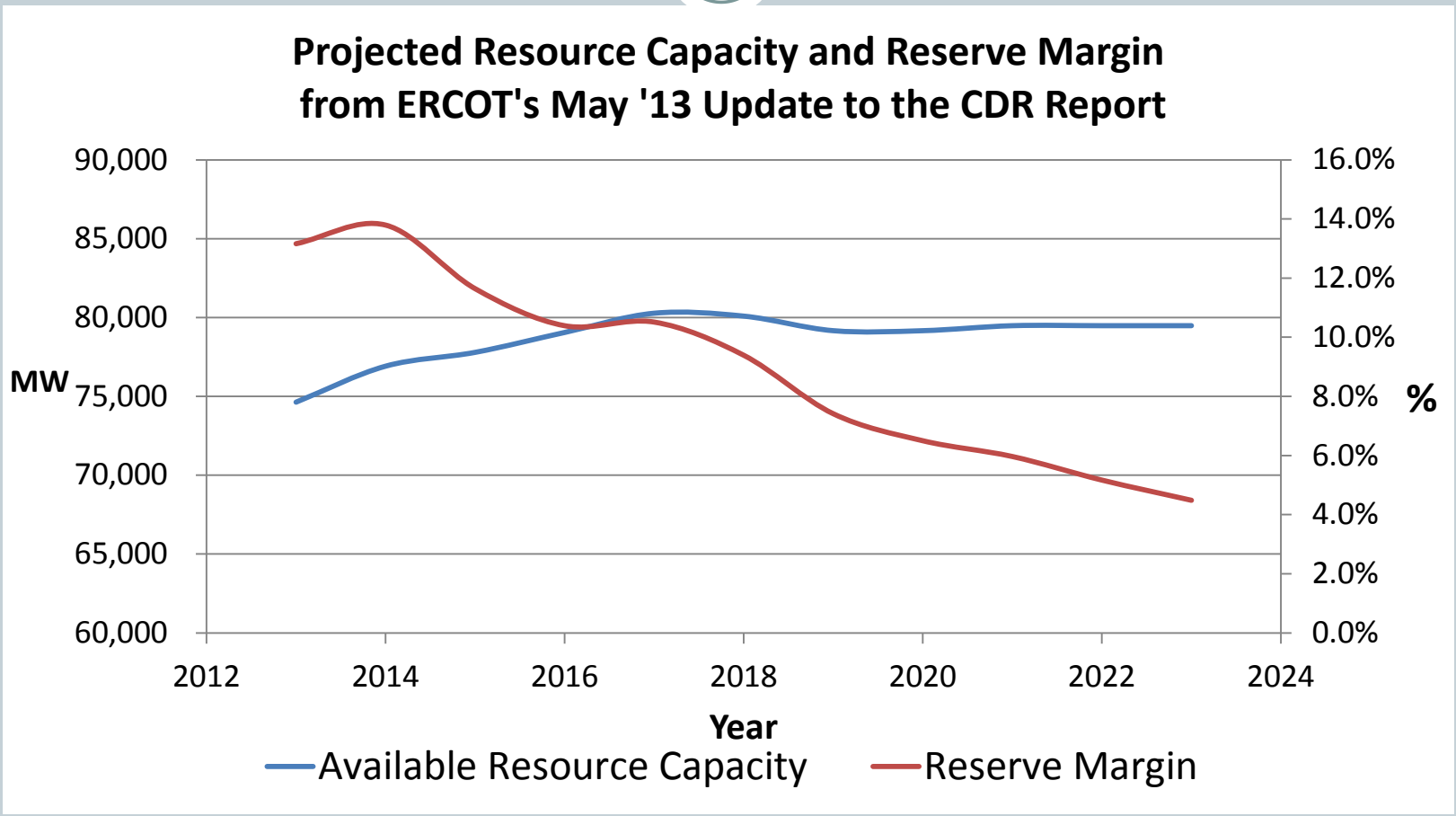
- My topic for today: Two important issues before the Public Utility Commission of Texas (PUCT or Commission) relating to the ERCOT market.
  - Resource Adequacy
    - Scope of problem facing ERCOT.
    - Reserve Margins.
    - Operating Reserve Demand Curve (ORDC).
    - Demand Response.
  - Smart Meters
- I'm going to:
  - Describe actions taken by the Commission affecting Resource Adequacy.
    - Describe the Commission's most recent activities and decisions over the last year in this area.
    - Talk about what I believe remains to be done.
    - Lastly, give you my views regarding certain points that should be considered as we evaluate our options.
  - Briefly describe the status of the advanced meter deployment and related issues currently pending before the PUCT.

Projected Load



- Overall demand for electricity in ERCOT has been growing by an average of about 2% a year for the last decade

ERCOT Reserve Margin Projections



- Only units with signed interconnection agreements and air permits are included in the projected values

But… 2011 Was a Year of Records

- But how accurate are ERCOT forecasts?
- Weather Records set in 2011.
  - February 2, 2011 was coldest day in 22 years.
  - 2011 was the hottest year in 110 years
    - New Monthly Heat Records in May, June, July, August and September.
  - Driest 7 –month span on record.
- Record peak demand of 68,379 MW on August 3, 2011.
  - Nearly 2,500 MW higher than actual 2010 peak demand.
- Wind generation record of 7,400 MW on October 8, 2011, 15% of total load.
- *Wind continues to set records:*
  - 9,481 MW on February 13, 2013, 28% of total load.

ERCOT Market Design

- ERCOT has an “Energy-only Market” wholesale market design. Owners of generation are only paid for the electricity they actually put out on the grid, unlike the other restructured markets in the United States.
- The only exception to this rule are the capacity payments that are part of the daily bids to provide ancillary services, reliability and operational resources that ERCOT uses to maintain grid stability.
- More about that later…..

ERCOT Market Design cont'd

- ERCOT relies upon prices in the market to signal the need for new generation.
- When there is a scarcity of energy, prices must reflect that because it encourages generators to bring more supply, and motivates demand reduction.
- Investment in new generation will only be made when owners and developers see demand and believe that there is a reasonable opportunity to recover investments at a market return.

Reserve Margins

- Why is ERCOT's reserve margin important?
  - Currently ERCOT has a 13.75% "target" capacity reserve margin.
  - If ERCOT remains an Energy-Only market, its reserve margin variations and uncertainty are less important because the result is only a target and signal to generation owners, operators and investors of when to build.
  - If ERCOT adopts a "mandatory" minimum reserve margin, it becomes very important because it drives the amount of generation procured either in forward capacity auctions or some other process and translates into dollars imposed on consumers in addition to actual wholesale energy prices.

Problems with a Mandatory Capacity Reserve Margin

- It is important to note: For reliability purposes, ERCOT procures three types of operating reserves on a daily basis:
  - 2,800 MW of responsive reserves or spinning reserves (up to half can be provided by loads),
  - Between 500 – 1,500 MW of non-spinning reserves (mostly quick start), and
  - Between 250 - 900 MW of regulation-up.
  - In 2012, ERCOT's daily operating reserve procurements represented approximately 4.7%– 6.9% of ERCOT's total installed capacity.
  - If ERCOT adopts a "*mandatory*" minimum capacity reserve margin, it becomes very important because it drives the amount of generation procured either in forward capacity auctions or some other process and translates into dollars imposed on consumers.
- A mandatory capacity reserve margin will result in billions of unnecessary, unavoidable and largely un-hedgeable costs to customers, without guaranteeing rolling blackouts will not occur.

Problems with a Mandatory Capacity Reserve Margin: Likely to Lead to Unrealistic Expectations

- ERCOT has NEVER experienced a grid collapse, unlike many other parts of the country.
- There have been two ERCOT involuntary rotating load-shed events to avoid grid collapse:
  - April 2006:
    - Had a 16.4% capacity reserve margin;
    - A heat related event;
    - A large number of generation units were down for planned maintenance; and
    - Wind dropped off unexpectedly.
  - Feb. 2011:
    - Had between 15.9% and 17.5% capacity reserve margin;
    - A cold weather event.
- And, in the **winter of 1989**, before ERCOT was the balancing authority, and local vertically integrated electric utilities were their own balancing authority Houston Power and Light had to initiate rolling blackouts to maintain their system because of weather related gas curtailments and generation outages, even though they had a capacity reserve margin of over 30%.

ERCOT Has Seen Tight Capacity Reserve Margins Before

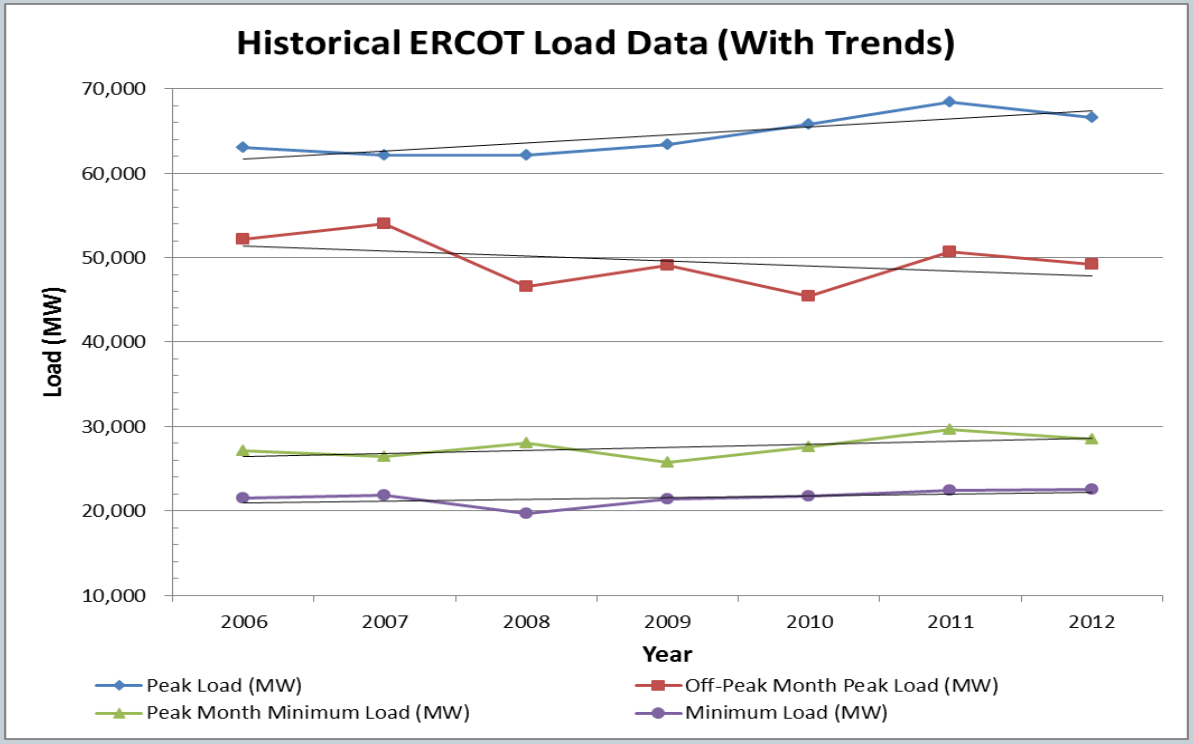
- Summer of 1998. Very hot, tight summer. Severe concerns about reserves.
- June 2005 Report on Capacity, Demand and Reserves in the ERCOT Region (CDR) showed inadequate reserves by 2010.
- June 2006 CDR showed inadequate reserves by 2008.
- May 2008 CDR showed inadequate reserves by 2013.
- May 2009 and 2010 CDRs showed adequate reserves through at least 2014.
- An efficient energy-only market with growing consumption should always show a capacity reserve margin shortfall 4-5 years out.

Points to Consider

- Tight reserve Margins are to be expected in an efficient Energy-Only market that exists in a state or region that is experiencing continued economic growth and increased electricity consumption.
- It is VERY important to remember that normal system planning and the resulting installed capacity reserve margins do not avoid the risk of rolling blackouts from 'black swan' events – events that occur outside of reasonable planning criteria.
- If we adopt a mandatory reserve margin there the danger of creating unrealistic expectations; particularly if we were to go to a centralized forward capacity market (CFCM) construct.

The REAL Scope of the Problem: ERCOT *does not* need more Base Load Generation

- ERCOT's high low load trend is relatively flat, so ERCOT has sufficient base load generation.



- ERCOT's Resource Adequacy "problem" actually is only an issue of 160 hours during the summer, out of 8760 total hours per year. (< 2% of the time)
  - 4 hours per day x 5 days per week x 8 weeks per year.
  - And this is probably an inflated number, the real problem likely is less than 80 hours a year.

Objectives and How Do We Reach Them

- We have time to evaluate ERCOT market design issues.
  - Realistically, by my revised analysis, which includes generation assets not counted by the planning process, ERCOT's target reserve margin doesn't fall below 13.75% until after 2018.
  - Rather than rush and fundamentally change the highly successful ERCOT market design, I would focus on solutions that are less costly, less complex, can be implemented more quickly and that provide real reliability.
- I believe ERCOT needs more flexible and peaking units.
  - ERCOT has sufficient base load.
  - ERCOT was only in very tight conditions 1/3 of 1% of the time in 2011, an extraordinary weather stressed year.
  - If ERCOT needed to procure additional backstop generation, I estimate that it could be had for a one-time payment at a substantially lower cost than any annual CFCM auction.
- If avoiding rolling blackouts is the primary objective, then our focus should be on options that provide actual improvements to reliability, such as:
  - Implementing an Operating Reserve Demand Curve.
  - ERCOT procuring additional reserves on a daily basis.
  - Expansion of demand response that helps set prices.

Actions taken by PUCT to improve Resource Adequacy

- Since the second half of 2011, the Commission, working with ERCOT and Stakeholders, has completed a number of initiatives that have helped encourage increased generation capacity.
- Before May 1, 2012 the Commission:
  - Under took initiatives and implemented reforms to ensure ERCOT market was sending correct price signals.
  - These reforms were specifically designed such that when deployed the reliability and operability tools did not result in inappropriate price reversals.
- Effective Aug. 1, 2012 the Commission:
  - Raised the System-Wide Offer Cap (SWOC) to $4,500.

Additional Action taken after Summer 2012

- On Oct. 26, 2012 the Commission:
  - Raised the SWOC:
    - Beginning June 1, 2013, the SWOC will be $5,000.
    - Beginning June 1, 2014, the SWOC will be $7,500.
    - Beginning June 1, 2015, the SWOC will be $9,000.
  - Re-defined the Peaker Net Margin:
    - Originally set at $175,000, it was a trigger that if it was reached it would have reduced the SWOC to $500.
    - This level was NOT even reached in 2011.
    - $300,000 in 2012 -2013.
    - 2014 and forward – three times the Cost of New Entry.

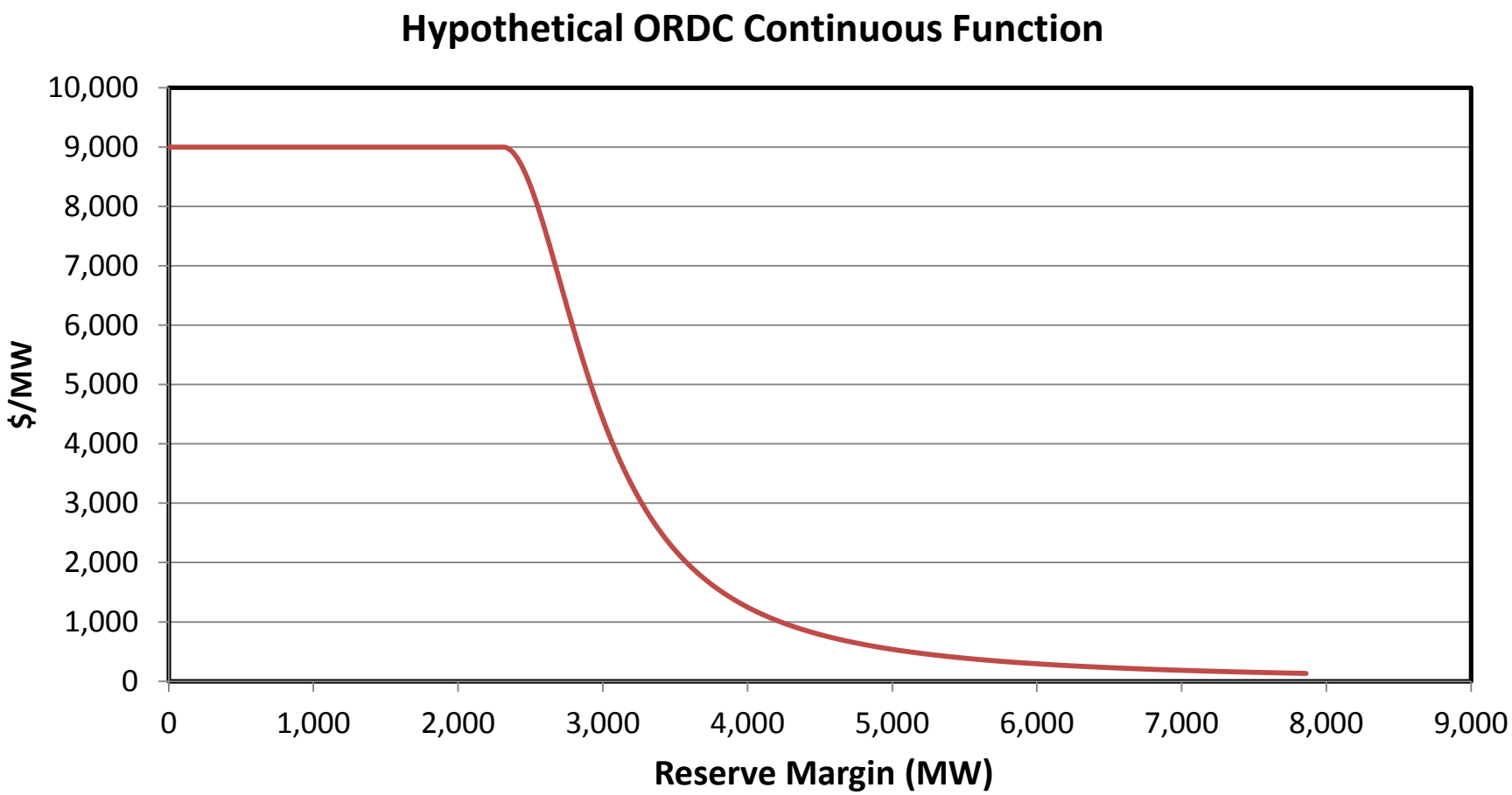
Impact of Market Reforms on Generation Status

- 903 MW of mothballed generation voluntarily returned to service for the summer of 2013.
- 5,731 MW of new generation has been announced, or announced obtaining financing or otherwise moving forward in the trade press.
  - 2,891 MW that is in the May 2013 CDR, and has announced obtaining financing or begun construction, and
  - 2,840 MW that is *not* in the May CDR, but has been announced.
- If it all is built, ERCOT should be all right.

Continued PUCT Efforts to improve Resource Adequacy

- Operating Reserve Demand Curve
  - ORDC is a mechanism to value and compensate operating reserves on the system during a set time period.
  - The shape of the curve is dictated by the probability of loss of load (LOLP) during a given period in light of system conditions at that period, and the compensation paid to eligible market participants is determined by the product of the value of lost load per MW (VOLL) and LOLP.
  - Eligible market participants would include all generation on the system or that can be on the system within 30 minutes and loads that can curtail within the same period.
  - Once the minimum contingency reserve requirement is reached, prices become equal to the system wide offer cap.
  - It is important to note that ORDC does NOT replace ERCOT's procurement of ancillary services.

Operating Reserve Demand Curve Continuous function example



* Assumes a minimum contingency of 2300 MW and the $9,000 VOLL

Predicted ORDC Effect on Real Time Co-Optimization of Energy and Ancillary Services (2011 & 2012)

Change in Net (Energy + AS) Charge to Resources for Different VOLLs and Minimum Contingency Levels (X)

VOLL	Change in Net (Energy + AS) Charge to Resources with X at 1375 MW			Change in Net (Energy + AS) Charge to Resources with X at 1750 MW			Change in Net (Energy + AS) Charge to Resources with X at 2300 MW		
	2011	2011 w/o Feb & Aug	2012	2011	2011 w/o Feb & Aug	2012	2011	2011 w/o Feb & Aug	2012
$5000/MWh	-$2.26B	-$500M	-$349M	-$3.91B	-$1,05B	-$778M	-$11.0B	-$3.22B	-$2.86B
$7000/MWh	-$3.64B	-$711M	-$504M	-$6.18B	-$1.49B	-$1.12B	-$16.9B	-$4.58B	-$3.42B
$9000/MWh	-$5.01B	-$923M	-$659M	-$8.44B	-$1.93B	-$1.46B	-$22.9B	-$5.93B	-$4.46B

According to an ERCOT backcast analysis, had ORDC been in place in 2011 & 2012, the above revenues would have been realized for the given values of lost load.

Predicted ORDC Effect on Peaker Net Margin (PNM) (2011 & 2012)

VOLL	Total Additional PNM under Interim Solution B+ with X at 1375 MW ($/MW)		Total Additional PNM under Interim Solution B+ with X at 1750 MW ($/MW)		Total Additional PNM under Interim Solution B+ with X at 2300 MW ($/MW)	
	2011	2012	2011	2012	2011	2012
$5000/MWh	$38,544	$7,740	$67,892	$17,267	$192,728	$53,194
$7000/MWh	$62,141	$11,189	$107,327	$24,809	$296,489	$76,367
$9000/MWh	$85,773	$14,643	$146,795	$32,362	$400,361	$99,568

The numbers in this table are in addition to the realized PNM in 2011 & 2012:
2011 - $125,000
2012 - $33,950

Current Discussions/Initiatives - Demand Response

- Other Areas I Believe Will Improve Resource Adequacy:
  - Increase Demand Response:
    - The commission has opened a project to consider fully all aspects of the steps necessary to further encourage the development of price responsive loads that operate to assist with price formation, not price suppression.
      - Project No. 41061 – Rulemaking Regarding Demand Response in the ERCOT Market.
        - Role of "passive" DR.
        - Participation of loads in real-time market.
        - Incentives necessary to encourage DR participation.
        - Ensure market-based solutions to DR participation that aid in price formation.

Currently: Two Types of Demand Response

- **Current demand response employed in the ERCOT region.**

1. Load Resources (LR) providing Responsive Reserve Service (RRS) some of which are automatically interrupted by under-frequency relays when system frequency decreases to 59.7 Hz or below. These resources can also be manually deployed within ten (10) minutes by ERCOT in response to energy emergencies. The total amount of LRs is limited to 50 percent of the total ERCOT RRS requirement, or a maximum of 1400 MW, for any given hour.

2. Emergency Response Service (ERS), formerly called Emergency Interruptible Load Service (EILS), is a service designed to be deployed by ERCOT as an operational tool under an Energy Emergency Alert (EEA). ERS is designed to decrease the likelihood of ERCOT operating reserve depletion and the need for ERCOT to direct firm Load shedding. ERCOT may deploy ERS following an EEA Level 2 instruction. ERCOT may also deploy ERS Resources immediately following an EEA Level 3 instruction if ERCOT System conditions do not allow time for ERCOT to deploy ERS prior to firm Load shedding. Generally this service has a 10 minute response time, although ERCOT has a pilot program examining the benefits of a 30 minute program.

Smart Meters: Deployment

- Centerpoint Energy in Houston with approximately 2.2 million smart meters deployed.
- Oncor Electric Delivery, based in Dallas, Texas, is currently deploying smart meters to more than three million customers in North Texas. Oncor's full deployment was completed by the end of 2012.
- Austin Energy, the nation's ninth largest community-owned electric utility, with nearly 400,000 electricity customers in and around Austin, Texas has completed deployment.
- San Antonio, Texas-based CPS Energy has launched a pilot program with 40,000 smart meters deployed as of the summer of 2011. CPS plans to complete installation of smart meters (electricity and gas) for all customers by the end of 2016.
- AEP is in the process of deploying their smart meters.
- Several large Co-ops have also deployed advanced meters.

Smart Meters: Benefits

- Reliability. The smart meter allows the utility to know instantly when and exactly where power is out enabling much more rapid restoration.
- Facilitates Market Settlement. As of the end of March 2013, 96.3% of ERCOT load settled with 15 minute interval data, made possible in part because of 6.2 million that are part of the system.
- Facilitates voluntary demand response and distributed generation.
- Smart meters are a key component of the smart grid. They enable two-way, real-time communication that gives consumers the information they need to cut energy use and electricity costs. These devices help ensure that every day energy users reap the many benefits of the evolving smart grid.

Smart Meters-PUCT Rulemaking to Consider Customer Opt Out

- Opt out provisions – considered in PUC rulemaking
  - Information recorded by utility cannot be shared without consent of the customer.
  - A fee imposed for the resulting extra costs incurred by utility (and therefore other customers) associated with reading the meter and recording the data.
    - Cost of labor for meter read.
    - Fuel and equipment expenses associated with the need to read the meter and process the data.
    - The re-imposition of optional/discretionary service charges for out-of-cycle meter reads.
      - Out of cycle meter reads for immediate switch to a new retail electric provider.
      - Expedited move in/move out.
      - Disconnect/reconnect.

❖ The hidden cost to the customer: They will be at the bottom of any restoration effort as they must call in to report an outage since the utility will not have their information in real time.

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