“Resource Adequacy in ERCOT”

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PUBLIC UTILITY COMMISSION OF TEXAS

ANALYSIS OF ERCOT’S CAPACITY RESERVE MARGIN
BASED ON ERCOT’S CAPACITY, DEMAND AND RESERVES REPORT, WINTER 2012
Numerous resource adequacy initiatives have been completed since late 2011 to improve price signals and incent new generation. Capacity reserve margins can be a target or mandatory. ERCOT has historically had a target capacity reserve margin. My views regarding certain points that should be considered as the Commission evaluates its options going forward.
• Before May 1, 2012 the Commission:
  o Established price floors for certain ancillary services (operating and reliability reserves) that when deployed by ERCOT historically caused incorrect price reversals;
  o Incorporated online non-spin and quick start units into ERCOT’s Security Constrained Economic Dispatch (SCED) system so that these services can be dispatched properly;
  o Established a process for the recall of mothballed generation; and
  o Increased responsive reserves by 500 MW (scarcity pricing should begin earlier and last longer).

• Effective Aug. 1, 2012 the Commission:
  o Raised the System-Wide Offer Cap (SWOC) to $4,500.

• On Oct. 26, 2012 the Commission:
  o 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
  o Re-defined the Peaker Net Margin:
    ▸ $300,000 in 2012 -2013
    ▸ 2014 and forward – three times the Cost of New Entry

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Currently ERCOT has a 13.75% “target” capacity reserve margin.

Why is the nature of ERCOT’s capacity reserve margin important?

- If ERCOT retains a “target” capacity reserve margin it is of relatively lower importance because it only is a signal to generation investors of when to build.
  - 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.
A Mandatory Capacity Reserve Margin Likely Will 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%.
- 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 the reasonable planning criteria.
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.

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**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.

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Impact of Market Reforms Completed to Date

- Nearly 2,000 MW of mothballed generation voluntarily returned to service for the summer of 2012.

- The ERCOT market met all demand during the summer of 2012 without entering emergency operating conditions.

- 4,231 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 Dec. 2012 CDR, and has announced obtaining financing or begun construction and
  - 1,340 MW that is not in the Dec. 2012 CDR, has been announced.
Problems with ERCOT’s Capacity Reserve Margin Forecasts

- The Dec 2012 CDR shows ERCOT dropping below its 13.75% target reserve margin in **2013**.
- **BUT**, the Dec. 2012 CDR projected capacity reserve margins do not include:
  - All mothballed resources that can return to service in < 6 months, nor
  - All reliably anticipated new generation that has announced obtaining financing or otherwise moving forward in the trade press (1,340 MW).
- **IMPORTANT**: The load forecast for ERCOT’s CDR is highly dependent on economic forecasts. In previous CDRs, this led to a tendency to over forecast in near term years and under forecast in out years. This is important because a forecast that is too high goes right to the bottom line of the capacity reserve margin and impacts all subsequent years.
- “**Attachment A**” to this presentation is my analysis of ERCOT’s December 2012 CDR. My analysis **includes**:
  - All mothballed generation that can be returned to service in less than 6 months, and
  - All reliably anticipated new generation not included in the Dec. 2012 CDR (1,340 MW), and
  - The incremental 162 MW for coastal wind shown at a conservative 20% effective load carrying capacity (ELCC), as opposed to the 8.7% ELCC currently applied to all wind generation.
- **CONCLUSION**: ERCOT does not dip below its 13.75% target reserve margin until **2016**, (See “Attachment A”) and then only by 1.05%, or perhaps less if new generation comes online early.
In a September 27, 2012 memo filed in Docket No. 40000, I addressed resource adequacy steps that I believe need to be taken regardless of major changes to market design:

- **Increase Demand Response:**
  - I believe we need 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.

- **Address Potential Price Reversal Issues Related to the Deployment of Emergency Response Service (ERS) and TDU Load Management Programs:**
  - Increasingly important as:
    - ERCOT’s programs expand, and
    - If we grant waivers or otherwise encourage TDU Load Programs beyond 2011 levels.

- **Improve the Credit Implications of Clearing and Settlement:**
  - Reducing settlement timelines decreases credit and collateral risk for the ERCOT market.
  - I want to see the ERCOT market settle in a time frame that is similar to other financial markets.

- **Implementation of an Integrated Proxy Demand Curve for more efficient integration of operating reserves and Demand Response (DR):**
  - More efficient deployment of operating reserves and demand response, without price reversal,
  - Starts with prices above a certain point – say $500, $700, or $1,000 to the SWOC (eliminates price reversal),
  - Can be used in conjunction with the Power Balance Penalty Curve, and
  - Help to smooth out sharp price spikes of short duration (trading height of spikes for duration).
Ongoing Projects

- Project No. 40000 – the Commission’s omnibus Resource Adequacy project
  - ERCOT is conducting studies on:
    - Value of Lost Load Study (4-6 months to completion)
    - Loss of Load Probability.
    - Real-Time Market Co-optimization.
    - Appropriate quantity of operating reserves to procure.
    - Appropriate pricing for increased operating reserves.
  - ERCOT is working with IMM and Stakeholders to determine:
    - Market solutions to prevent price reversals due to deployment of existing load resources.
    - Administrative solutions to prevent price reversals due to deployment of existing load resources.
  - ERCOT, Stakeholders, the IMM and Staff are currently working with a nationally known academic to develop an operating reserve demand curve.

- 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

- Project No. 41060 – Proceeding to Examine the Inputs Included in the ERCOT Capacity, Demand and Reserves Report
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## Load Forecast:

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Dec. 10, 2012 CDR

## Annual Load Growth

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## Annual % Demand Growth

| Year | 2.1% | 2.5% | 3.1% | 2.8% | 1.4% | 0.8% |

## Total Existing Resources

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## Reserve Margin (December 2012 Report)

| Year | 13.2% | 10.9% | 10.5% | 8.5% | 8.4% | 7.1% |

## Reserve Margin (with above new resources)

| Year | 13.8% | 12.3% | 12.2% | 10.3% | 10.5% | 9.2% |

## Remaining Mothballed Capacity with return of less than 6 mos,

| Year | 1,720 | 1,563 | 1,431 | 1,754 | 2,095 | 2,402 |

## Reserve Margin (with above & mothballed with <6 mo return)

| Year | 16.4% | 14.6% | 14.3% | 12.7% | 13.4% | 12.5% |

## Does not include Sargas Texas 250 MW project announced October 25, 2012 - possible operational date of 2015

## Does not include 700 MW Brownsville power plant project in discussions for tax abatements

## Does not include 700 MW La Paloma power plant project in discussion for tax abatements.

## If ELCC for non-coastal wind were increased to 12.3%, incremental 310 MW.

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KWA REVISED PROJECTED DEC. 2012 CDR

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