

“Resource Adequacy in ERCOT”

1

**COMMISSIONER KENNETH W. ANDERSON, JR.
PUBLIC UTILITY COMMISSION OF TEXAS**

**ANALYSIS OF ERCOT’S CAPACITY RESERVE MARGIN
BASED ON ERCOT’S CAPACITY, DEMAND AND
RESERVES REPORT, WINTER 2012**

Introduction

2

- 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.

Completed Resource Adequacy Initiatives

3

- **Before May 1, 2012 the Commission:**
 - Established price floors for certain ancillary services (operating and reliability reserves) that when deployed by ERCOT historically caused incorrect price reversals;
 - 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;
 - Established a process for the recall of mothballed generation; and
 - Increased responsive reserves by 500 MW (scarcity pricing should begin earlier and last longer).
- **Effective Aug. 1, 2012 the Commission:**
 - Raised the System-Wide Offer Cap (SWOC) to \$4,500.
- **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:
 - ✦ \$300,000 in 2012 -2013
 - ✦ 2014 and forward – three times the Cost of New Entry

Problems with a Mandatory Capacity Reserve Margin

- 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

5

- 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

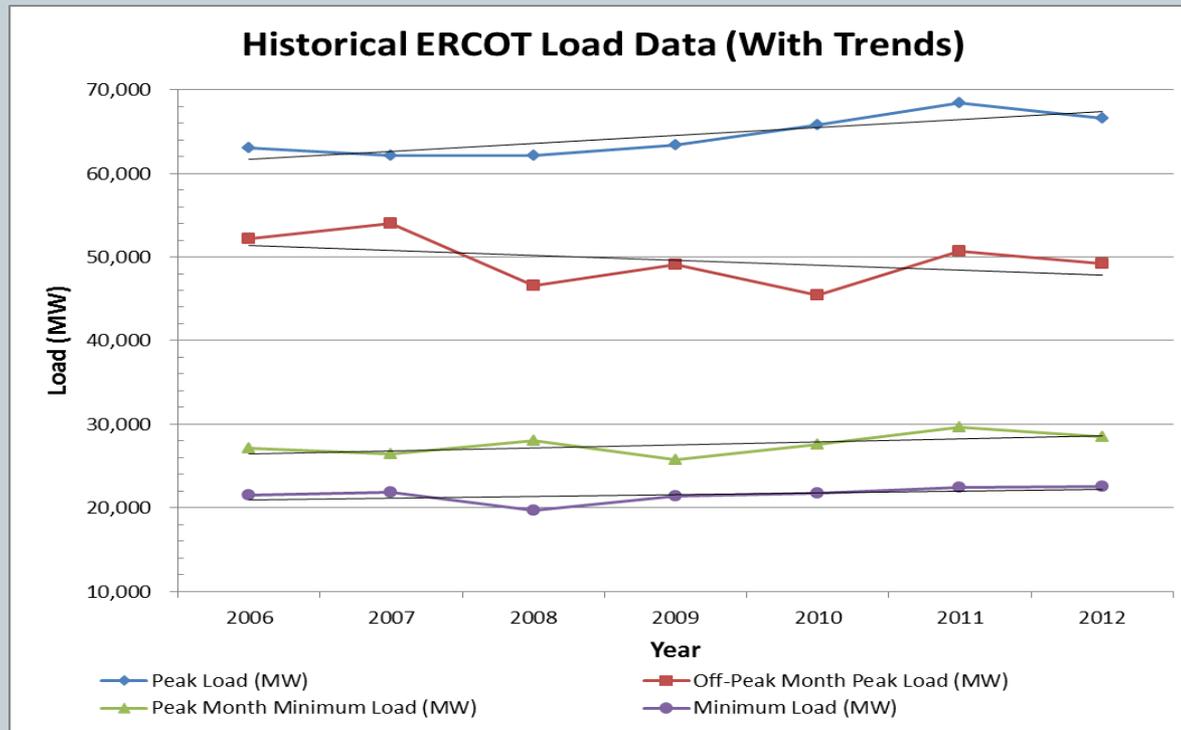
6

- 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.

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

7

- 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.

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.
- 5,031 MW of new generation has been announced, or announced obtaining financing or otherwise moving forward in the trade press.
 - ✦ 2,111 MW that is in the Dec. 2012 CDR, and has announced obtaining financing or begun construction,
 - ✦ 780 MW that is in the Dec. 2012 CDR, but has not announced obtaining financing and
 - ✦ 2,140 MW that is not in the Dec. 2012 CDR, but 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 (2,140 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 (2,140 MW), and
 - ✦ The incremental wind MWs associated with ERCOT Staff's recommended Effective Load Carrying Capacity (ELCC) of 32.9% and 14.2% for coastal wind and non-coastal wind, respectively, based on ERCOT's 2012 Loss of Load Probability Study. (Incremental from the current 8.7% ELCC for all wind resources).
- CONCLUSION: ERCOT does not dip below its 13.75% target reserve margin until after 2018. (See “Attachment A”).

Important Issues

10

- 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

11

- **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**

Contact Information

12

Kenneth W. Anderson, Jr.

512-936-7005

kenneth.anderson@puc.state.tx.us

**2012 Report on the Capacity, Demand, and Reserves in the ERCOT Region
December Update**

Load Forecast:	2013	2014	2015	2016	2017	2018
Firm Load Forecast, MW	65,952	67,592	69,679	71,613	72,637	73,214
Annual Load Growth	1,334	1,640	2,087	1,934	1,024	577
Annual % Demand Growth	2.1%	2.5%	3.1%	2.8%	1.4%	0.8%

Dec. 10, 2012 CDR

	2013	2014	2015	2016	2017	2018
Total Existing Resources	74,633	74,943	76,974	77,703	78,742	78,435
less Switchable Units Unavailable to ERCOT, MW	0	0	0	0	0	0
1 Calpine Unit expansions	0	520	520	520	520	520
2 CPS solar	25	43	95	148	200	200
3 Austin Energy Sand Hill Peakers	0	0	0	0	200	200
4 LCRA Ferguson Plant	0	0	0	0	0	0
5 Summit Power - Net to Grid	0	0	0	0	0	0
6 STEC Peakers	0	0	200	200	200	200
7 minus coletto creek	0	0	0	0	0	0
8 minus las brisas	0	0	0	0	0	0
9 GDF suez uprates	134	134	134	134	134	134
10 Sharyland DC Tie expansion	0	0	0	0	0	0
11 NRG Peaker	75	75	75	75	75	75
12 actual incremental Load Response seen in 2012	0	0	0	0	0	0
13 additional wind	0	0	0	0	0	0
14 Deeley Retirement by CPS Energy	0	0	0	0	0	0
15 Frontera TIAC uprate	45	45	45	45	45	45
16 NoTrees Battery Storage	0	0	0	0	0	0
17 RRE Solar delay	0	0	0	0	0	0
18 BPUB Tenaska Plant	0	0	0	800	800	800
19 Coastal wind at 32.9% ELCC net add'l MW *	408	496	496	496	496	496
20 Non-coastal wind at 14.2% ELCC net add'l MW *	512	541	582	602	602	602
subtotal	1,199	1,853	2,147	3,020	3,272	3,272
Total Resources	75,832	76,796	79,121	80,723	82,014	81,707
Reserve Margin (December 2012 Report)	13.2%	10.9%	10.5%	8.5%	8.4%	7.1%
Reserve Margin (with above new resources)	15.0%	13.6%	13.6%	12.7%	12.9%	11.6%
Remaining Mothballed Capacity with return of less than 6 mos	1,720	1,563	1,431	1,754	2,095	2,402
Reserve Margin (with above & mothballed with <6 mo return)	17.6%	15.9%	15.6%	15.2%	15.8%	14.9%

Accounted for in Dec. 2012 CDR (-317 MW)

Public announcement, not in Dec. 2012 CDR

Public announcement, not in Dec. 2012 CDR, assumed 50% Effective Load Carrying Capacity (ELCC)

Referenced in Austin rate review documents posted on City of Austin website, not in Dec. 2012 CDR

Included in Dec. 2012 CDR (116 MW)

Included in Dec. 2012 CDR (240 MW)

Referenced in Platts and other media, not in Dec. 2012 CDR

Accounted for in Dec. 2012 CDR (cancelled) (-660 MW)

Accounted for in Dec. 2012 CDR (air permit cancelled) (-1,240 MW)

Per recitation in Voluntary Mitigation Plan

Included in Dec. 2012 CDR (75 MW)

Public announcement, not in Dec. 2012 CDR (filed IA 12-12-12)

Included in Dec. 2012 CDR (300 MW)

Included in Dec. 2012 CDR (62 MW)

Accounted for in Dec. 2012 CDR, retiring after 2018 (-845 MW)

Public announcement - 10/4/2012

Included in Dec. 2012 CDR (36 MW)

Accounted for in Dec. 2012 CDR (cancelled) (-60 MW)

Public announcement, not in Dec. 2012 CDR

ERCOT Staff's recommended coastal wind ELCC based on ERCOT's 2012 Loss of Load Probability Study.

ERCOT Staff's recommended non-coastal wind ELCC based on ERCOT's 2012 Loss of Load Probability Study.

Available mothballed capacity not already included in Dec. 2012 CDR, by year

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

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

Does not include 652 MW of new generation from two compressed air energy storage (CAES) systems that have applied for EPA Green House Gas permits.

Does not include 80 MW 30-Minute ERS Pilot.

* Note: On January 18, 2013, ERCOT staff presented the results of the 2012 Loss of Load Study to the Generation Adequacy Task Force, and recommended a 14.2% ELCC for non-coastal wind resources and a 32.9% ELCC for coastal wind resources.

ATTACHMENT "A"

KWA REVISED PROJECTED DEC. 2012 CDR