



A GENERATION AHEAD,  
*today*

ERCOT CWG / MCWG

DAM Collateral

June 18, 2014

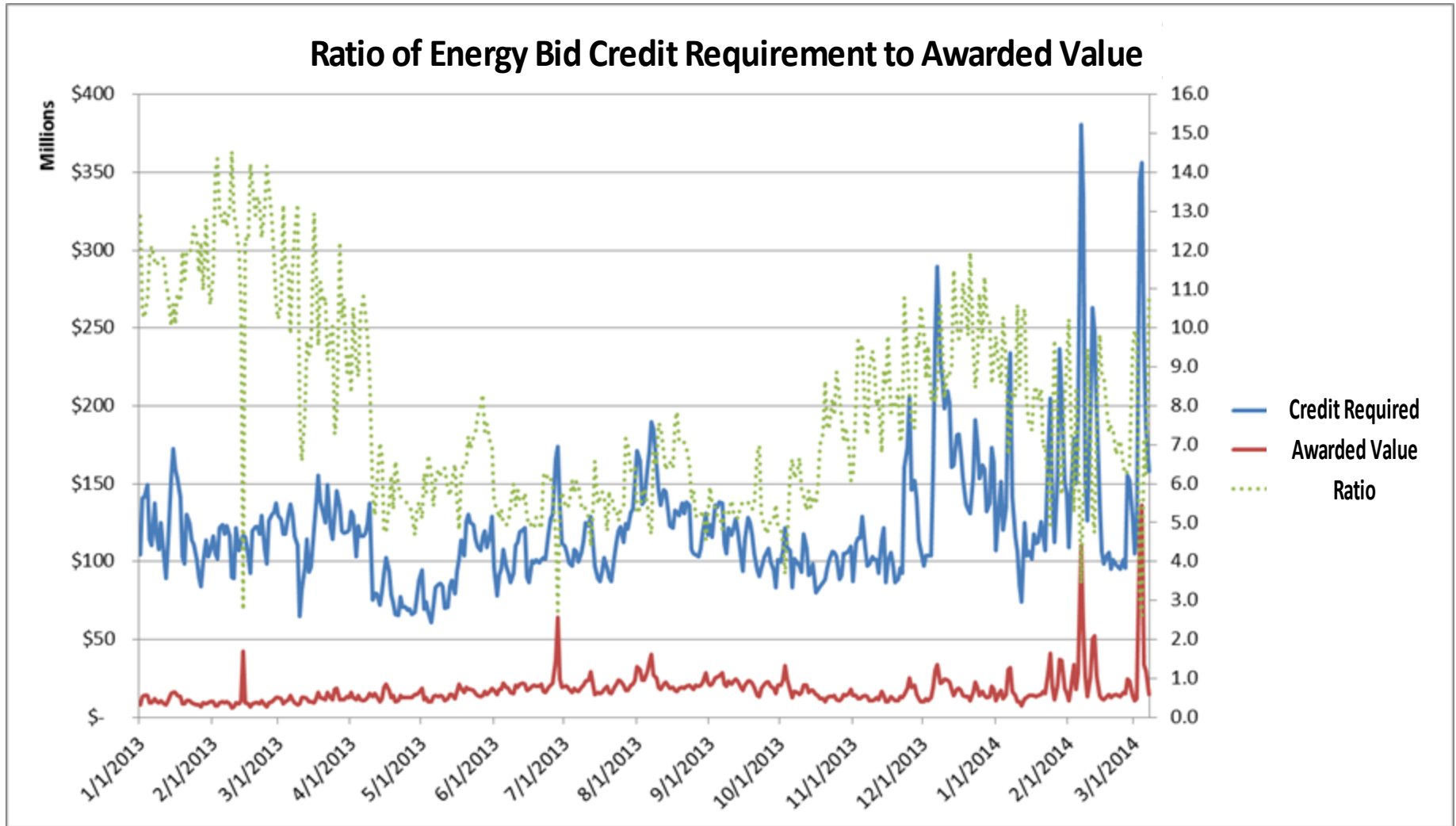


- Market Participants participate in the Day Ahead market to reduce volatility and risk
- The Day Ahead Market Credit Requirement is primarily driven by 2 components for generators and load:
  - Energy Bids
    - Generators participate in order to buy back existing hedges
    - Load participates to reduce their exposure to Real Time price spikes
  - Three Part Supply Offer - Sell Day Ahead Generation
- Under ERCOT DAM Protocols, Energy Bids require higher amounts of collateral than are received for a corresponding Three Part Offer due to price percentile disparity
  - Energy Bids - Percentile Calculation ( $D^{\text{th}}$ ) is 85<sup>th</sup>
  - Three Part Offer - Percentile Calculation ( $Z^{\text{th}}$ ) is 50<sup>th</sup>
- In addition to the 85<sup>th</sup> price percentile, Energy Bid Credit Requirements include “e” Factors
  - The amount of the difference in bid price and  $D^{\text{th}}$  percentile is multiplied by the “e” Factor
  - $e1 = 95^{\text{th}}$  percentile of Ratio1 over the last 30 days
  - Ratio1 is the percentage of the excess of cleared bids ( $P*Q$ ) over cleared TPO and EOO divided by total cleared bids ( $P*Q$ )

- Generators may hedge their fleet in the over-the-counter market prior to participating in the DAM. Over-the-counter bilaterals settle in the Real Time market.
- Generators often buy back (“Energy Bids”) hedges in the Day Ahead Market to mitigate Real Time/Day Ahead spread risk
  - Energy Bids are volumetrically offset by Three Part Offers
  - Generators are price takers when purchasing Energy Bids to ensure bids clear
- Generators who employ such practices enter the Day Ahead Market flat
  - However, it is possible not to exit the Day Ahead Market flat when not all Three Part offers clear
  - ERCOT addresses this exposure in the TPEA requirement via the “DALE”
- Generators have never defaulted resulting in a loss to ERCOT market participants

- DAM Price Percentile disparity
  - In an extreme price environment, (5 days of extreme prices within a 30 day period) collateral requirements increase exponentially due to the price percentile disparity despite entering the DAM flat (page 5)
- e1 Factor Calculation
  - Participants do not get a benefit for days where cleared TPO and EOO exceed cleared bids (zero credit for entering the market long)
  - Participants who clear the DAM long or flat on 28 of the previous 30 days will experience a significant rise in their “e” Factor with just 2 days of clearing the market short
  - Participants are penalized with higher e1 factors when Three Part Offers do not clear due to low prices
    - ERCOT’s credit exposure decreases in a low price environment
- Amount of DAM collateral required by current protocols is a significant multiple of the actual awarded value (slide 4)

# Collateral Required Significantly Exceeds Amount Cleared



Source: ERCOT

# Example - Collateral Required During Extreme Prices



Day Ahead Market Credit Requirements	
e1 =	0.03
Day Ahead Transaction	Credit Required
Energy Bids	\$ 50,904,000
Three-part Offers	\$ (2,400,000)
Base Collateral Requirement	<b>\$ 48,504,000</b>

DAM Energy Bid - Quantity		DAM Energy Bid - Dth Percentile	DAM Energy Bid - Bid Price	Bid Exposure Amount	Three Part Offer - Yth Percentile	Three Part Offer - Credit Amount
Hour	MWs	Price	Bid Price	Total	Price	Total
0	1,000	100	500	112,000	100	100,000
1	1,000	100	500	112,000	100	100,000
2	1,000	100	500	112,000	100	100,000
3	1,000	100	500	112,000	100	100,000
4	1,000	100	500	112,000	100	100,000
5	1,000	100	500	112,000	100	100,000
6	1,000	100	500	112,000	100	100,000
7	1,000	100	500	112,000	100	100,000
8	1,000	100	500	112,000	100	100,000
9	1,000	100	500	112,000	100	100,000
10	1,000	100	500	112,000	100	100,000
11	1,000	100	500	112,000	100	100,000
12	1,000	7,000	7,000	7,000,000	100	100,000
13	1,000	7,000	7,000	7,000,000	100	100,000
14	1,000	7,000	7,000	7,000,000	100	100,000
15	1,000	7,000	7,000	7,000,000	100	100,000
16	1,000	7,000	7,000	7,000,000	100	100,000
17	1,000	7,000	7,000	7,000,000	100	100,000
18	1,000	7,000	7,000	7,000,000	100	100,000
19	1,000	100	500	112,000	100	100,000
20	1,000	100	500	112,000	100	100,000
21	1,000	100	500	112,000	100	100,000
22	1,000	100	500	112,000	100	100,000
23	1,000	100	500	112,000	100	100,000
				<b>50,904,000</b>	<b>2,400,000</b>	

Day Ahead Market Credit Requirements	
<u>Day 4</u>	
	<u>Credit Required</u>
Energy Bids	\$ 4,053,000
Three-part Offers	\$ (2,400,000)
Base Collateral Requirement	<b>\$ 1,653,000</b>
<u>Day 5</u>	
	<u>Credit Required</u>
Energy Bids	\$ 34,506,150
Three-part Offers	\$ (2,400,000)
Base Collateral Requirement	<b>\$ 32,106,150</b>
<u>Day 6</u>	
	<u>Credit Required</u>
Energy Bids	\$ 50,904,000
Three-part Offers	\$ (2,400,000)
Base Collateral Requirement	<b>\$ 48,504,000</b>

# Percentile Example - 4 Days Until Collateral Jumps



- The below table is an example of the number of days within the previous 30 days before the discrepancy of percentiles impacts collateral during extreme price events

**\*\*During extreme disparity of prices you have 4 days until Collateral Requirements explode\*\***

Days	DASPP	Days	DASPP	Days	DASPP	
1	100	1	100	1	100	4:00 PM
2	100	2	100	2	100	4:00 PM
3	100	3	100	3	100	4:00 PM
4	100	4	100	4	100	4:00 PM
5	100	5	100	5	100	4:00 PM
6	100	6	100	6	100	4:00 PM
7	100	7	100	7	100	4:00 PM
8	100	8	100	8	100	4:00 PM
9	100	9	100	9	100	4:00 PM
10	100	10	100	10	100	4:00 PM
11	100	11	100	11	100	4:00 PM
12	100	12	100	12	100	4:00 PM
13	100	13	100	13	100	4:00 PM
14	100	14	100	14	100	4:00 PM
15	100	15	100	15	100	4:00 PM
16	100	16	100	16	100	4:00 PM
17	100	17	100	17	100	4:00 PM
18	100	18	100	18	100	4:00 PM
19	100	19	100	19	100	4:00 PM
20	100	20	100	20	100	4:00 PM
21	100	21	100	21	100	4:00 PM
22	100	22	100	22	100	4:00 PM
23	100	23	100	23	100	4:00 PM
24	100	24	100	24	100	4:00 PM
25	7000	25	100	25	100	4:00 PM
26	7000	26	7000	26	100	4:00 PM
27	7000	27	7000	27	7000	4:00 PM
28	7000	28	7000	28	7000	4:00 PM
29	7000	29	7000	29	7000	4:00 PM
30	7000	30	7000	30	7000	4:00 PM

0.85	7,000
0.50	100

Dth Percentile  
Zth Percentile

0.85	4,585
0.50	100

Dth Percentile  
Zth Percentile

0.85	100
0.50	100

- Closing the spread between Energy Bids and Three Part Offers by lowering the “D<sup>th</sup>” Percentile (from 85<sup>th</sup>)
- Changing the e1 Factor calculation to reflect overall participant behavior
- Provide different credit requirements based on participant’s scheduled volume
  - Net Long
  - Net Short
  - Flat