Southeast Energy Exchange Market: Auditor Report

Presented to:

SEEM Board Meeting

Potomac Economics

May 25, 2023

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Introduction

- SEEM Auditing Process is based on SEEM Market Rules Section VI.D.

- These duties are in four main categories.

  - ✓ Ensure SEEM input, constraints, and matching are in accordance with the SEEM Rules;

  - ✓ Ensure participants have access to SEEM data;

  - ✓ Report to the Membership Board regarding (1) the reliability and accuracy of the SEEM System, and (2) any complaints received from a Participant; and

  - ✓ Respond to written questions from Participants, and applicable regulators.

Introduction and Summary

- Our main daily duties involve monitoring the data and output of the SEEM processes to ensure they operate properly.

  - ✓ We have established automated data downloads, screens, and notifications to satisfy this objective.

- Our reports to the board on a monthly basis summarize the outcomes of the SEEM market and results of this daily monitoring, showing:

  - ✓ Only isolated and minor instances of operating issues, mainly due to software updates addressed by Hartigen.

  - ✓ Offer, Bid, and trade volumes have increased since the market start.

  - ✓ Cleared trades are small relative to bids and offer quantities.

  - ✓ Transmission is generally available to facilitate SEEM trades.

  - ✓ Transmission costs (i.e., cost of losses) have a modest effect on trading.

Summary of SEEM Outcomes

- The following figure the monthly market activity since November.

  ✓ The bars shows bid MWs above the axis and offer MWs below the axis.

  ✓ The dark green segment of the bar shows cleared MW.

  ✓ The red segment shows trades that could have been matched with contemporaneous offers but did not clear because of:

    – Transmission losses – accounts for 60% of this area, but over 70% in recent months.

    – Unavailable transmission capability or counterparty constraints.

  ✓ The light green bars show bids and offers that were not cleared but were within the cleared bid-offer spread.

    – These did not clear because of a lack of economic bids or offers on the other side of the transaction.

  ✓ The light blue bars show bids/offer within $10 of the overlap range.

  ✓ The dark blue bars show bids/offer greater than $10 of the overlap range – participants likely do not expect these to clear.

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Summary of SEEM Outcomes

- The figure reveals some key findings regarding SEEM transactions:
  - ✓ Bids and offers volumes have increased steadily, and indicate growing liquidity, even though the cleared volumes have not risen significantly.
  - ✓ Most bids and offers do not clear in each month – only 7 percent clear.
  - ✓ 13% of the remaining uncleared bids (25% of offers) are within the price range where transactions are matched (the "overlap" range), but the quantity of counterparty bids and offers are insufficient to match them.
    - The shrinking overlap range is also consistent with increasing market liquidity.
  - ✓ 62% of the uncleared bids and 46% of offers are within $10 of the overlap range.
  - ✓ Importantly, a very small portion (5% percent) of uncleared bids and offers were economic to match, but were not cleared because of transmission constraints, losses, or counterparty constraints.
- In addition, prices have declined as natural gas prices and load has fallen.

SEEM Outcomes: Bids and Offers
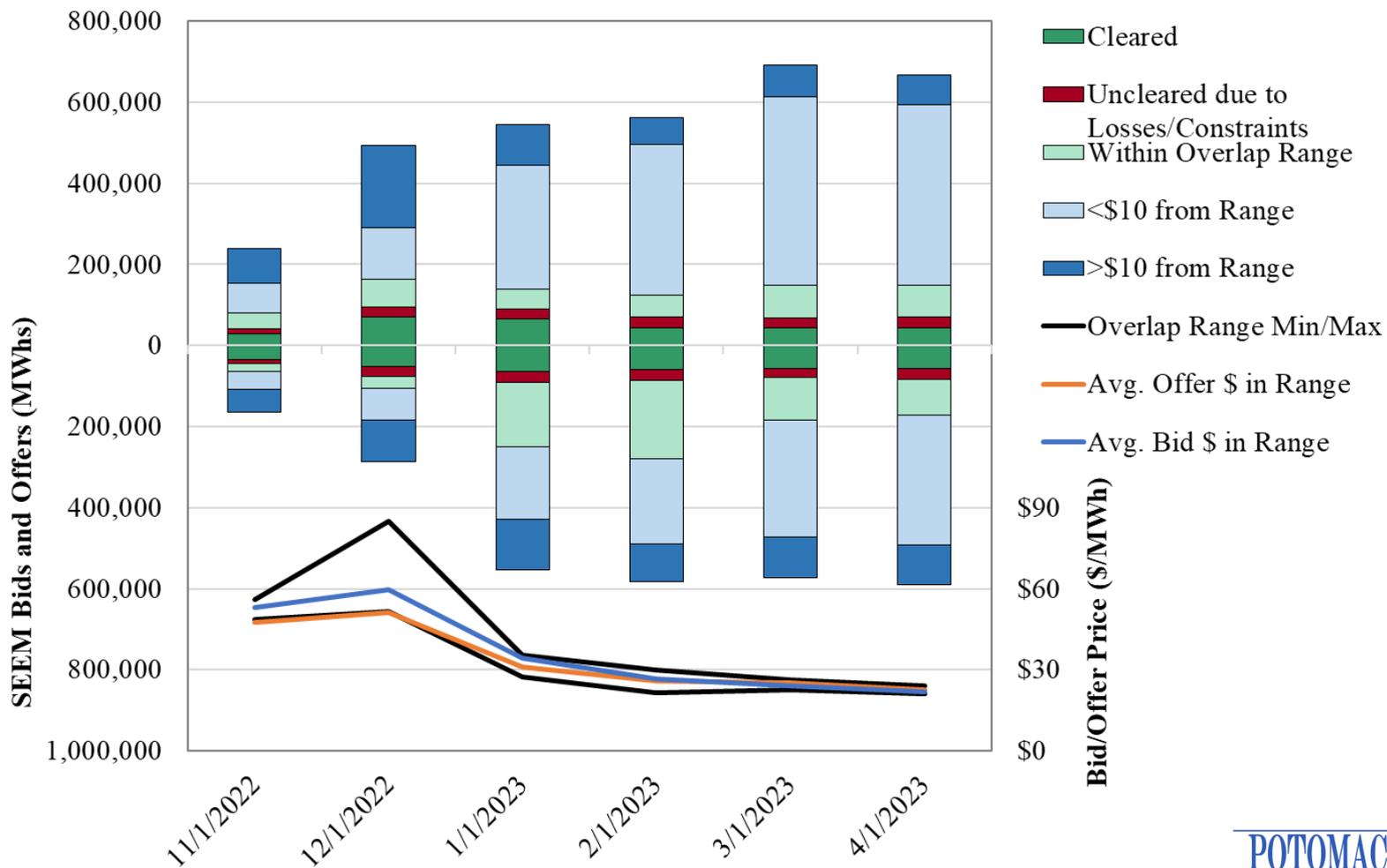
SEEM Prices

- The next figure summarizes the SEEM clearing prices, showing:

    ✓ The average price for each month in peak and off-peak hours;

    ✓ The average daily minimum and maximum prices in peak and off-peak hours during the month

    ✓ The average natural gas price at the Henry Hub in each month;

- These results show that prices have been well-correlated with natural gas – falling as gas prices have fallen since last fall.

    ✓ This correlation is expected in a competitive market.

- The spread in prices has also fallen as liquidity has increased somewhat from last fall.

SEEM Outcomes:
Peak and Off-Peak Clearing Prices
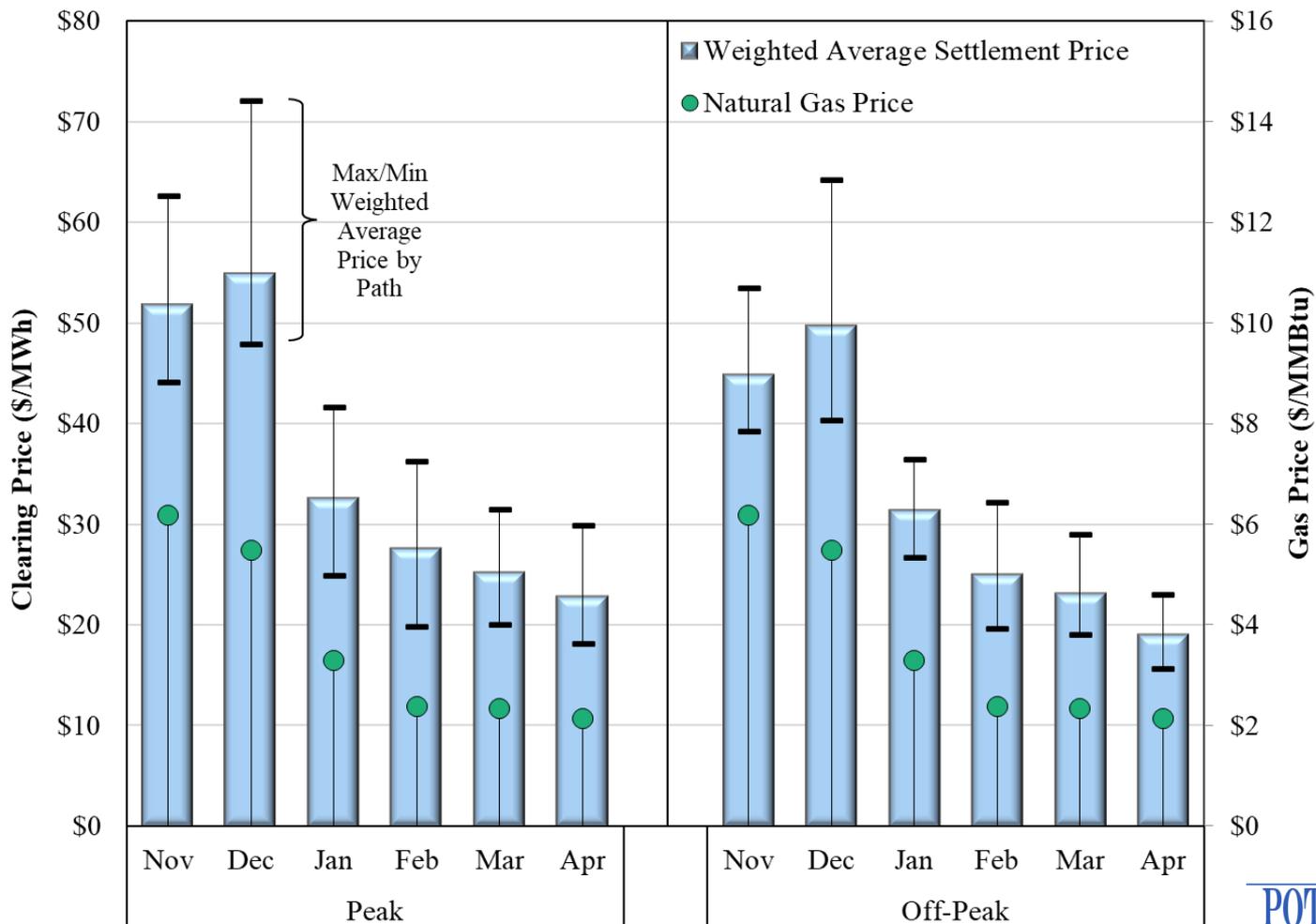
Utilization of Transmission Segments

- The table below shows the utilization of the top 20 paths by the SEEM market, as well as for the 10 least available paths.

- This analysis shows that none of these paths are highly utilized – all have loading factors less than 1 percent.

- The table also shows that:

  ✓ All of the paths are fully or partially used in a very small share of intervals.

  ✓ Even the paths that are frequently unavailable (ATC=0) are rarely utilized in those intervals when they are available.

- Overall, this shows that available transmission capability has not been an impediment to trading through the SEEM process.

	Cleared Transactions		As a Percentage of Segment-Intervals			
Segments	MWhs	Loading factor	Partially Unsed	Fully Used	Unavailable	Uncleared
Top 10 Segments by Volume	52,152	0.47%	8%	0%	1%	91%
Next 10 Segments by Volume	16,249	0.33%	4%	0%	1%	95%
10 Least Available Segments	2,845	0.81%	0%	1%	34%	65%

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SEEM Outcomes: Transmission Availability

- We evaluated the transmission system usage. The table in Appendix A shows the most utilized SEEM transmission segments

  - ✓ It shows the 23 SEEM segments with trades > 1000 MWh in April

    - – There are 180 segments in SEEM

  - ✓ The table shows that the uncleared category is by far the most common;

    - – This is true in other months and across the universe of all segments;

    - – This suggests ATC is widely available for trading

- The table in Appendix B shows the segments most often with ATC=0, although this still tends to be much less than half of the time.

  - ✓ If transmission constraints were preventing matches, we would observe a large amount of uncleared bid/offers that were economic to match.

    - – For April, accounting for average losses ($2/MWh) we found that one percent of the uncleared offers could be economically matched.

  - ✓ This indicates that transmission constraints or transmission costs are not the chief determinant of non-cleared activity

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Conclusions

- The SEEM technical operation has been excellent. There have been only rare and immaterial operating issues.

- Only a small portion of bids and offers clear. We attribute this to the following factors:

  ✓ The cost of transmission losses prevents some transactions from clearing;

    – SEEM losses average about 10% per trade;

    – Three percent losses in line with typical industry experience would increase trading volumes;

  ✓ The market is not highly liquid:

    – SEEM receives a substantial volume of uneconomic bids and offers that are unlikely to clear.

    – There are limited quantities of bids and offers in the range that would potentially clear.

    – This will likely improve as participants gain experience.

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Appendix A -- Most utilized SEEM Transmission Segments

Segment	ATC				Loading Factor	Partially Used		Fully Used		Unavailable		Uncleared	
	Min	Median	Max	MWhs		Intervals	%	Intervals	%	Intervals	%	Intervals	%
S/CPL/CPLE-DUK//	1,178	5,577	7,677	8,337	0.22%	353	12%	0	0%	0	0%	2527	88%
SS/SOCO/TVA-SOCO//	626	944	1,247	7,312	1.05%	274	10%	0	0%	0	0%	2606	90%
S/TVA/TVA-SOCO//	0	2,744	3,000	6,675	0.38%	211	7%	0	0%	301	10%	2368	82%
S/CPL/CPLE-SC//	914	3,015	4,319	5,705	0.26%	358	12%	0	0%	0	0%	2522	88%
SS/SOCO/DUK-SOCO//	0	878	1,086	5,237	0.86%	197	7%	4	0%	27	1%	2652	92%
S/SC/CPLE-SC//	0	1,862	2,474	5,152	0.38%	319	11%	0	0%	6	0%	2555	89%
S/DUK/CPLE-SOCO//	442	2,041	2,335	4,927	0.34%	209	7%	0	0%	0	0%	2671	93%
S/SC/SOCO-SC//	0	1,014	1,974	3,229	0.44%	203	7%	0	0%	20	1%	2657	92%
SS/SOCO/SOCO-SOCO//	43,253	43,556	43,556	2,880	0.01%	129	4%	0	0%	0	0%	2751	96%
S/DUK/CPLE-TVA//	0	692	692	2,698	0.55%	98	3%	3	0%	1	0%	2778	96%
SS/SOCO/SOCO-SC//	34	480	622	2,693	0.86%	142	5%	1	0%	0	0%	2737	95%
S/DUK/DUK-SOCO//	182	1,897	2,335	2,062	0.16%	118	4%	0	0%	0	0%	2762	96%
P/LGEE/TVA-LGEE//	0	1,413	1,424	1,974	0.20%	91	3%	0	0%	3	0%	2786	97%
S/TVA/DUK-TVA//	0	355	355	1,723	0.68%	58	2%	0	0%	12	0%	2810	98%
S/DUK/SOCO-DUK//	0	1,524	2,220	1,660	0.17%	212	7%	0	0%	253	9%	2415	84%
SS/GTC/GTC-SOCO//	19,669	20,000	20,000	1,409	0.01%	47	2%	0	0%	0	0%	2833	98%
SS/GTC/SOCO-GTC//	12,769	13,321	15,259	1,277	0.01%	72	3%	0	0%	0	0%	2808	98%
SS/SOCO/SOCO-DUK//	155	601	1,054	1,252	0.28%	171	6%	0	0%	0	0%	2709	94%
S/SC/DUK-SC//	0	1,742	2,464	1,128	0.09%	159	6%	0	0%	8	0%	2713	94%
S/SCEG/CPLE-SCEG//	75	475	600	1,071	0.32%	139	5%	0	0%	0	0%	2741	95%
S/TVA/DUK-LGEE//	0	355	355	1,066	0.56%	50	2%	0	0%	626	22%	2204	77%
S/CPL/CPLE-SCEG//	0	412	631	1,059	0.50%	127	4%	10	0%	576	20%	2167	75%
SS/GTC/DUK-GTC//	0	499	682	1,011	0.32%	52	2%	10	0%	136	5%	2682	93%

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Appendix B -- Most Constrained SEEM Transmission Segments

Segment	ATC				Loading	Partially Used		Fully Used		Unavailable		Uncleared	
	Min	Median	Max	MWhs	Factor	Intervals	%	Intervals	%	Intervals	%	Intervals	%
S/AECI/TVA-AECI//	0	0	731	120	0.18%	8	0%	0	0%	2,376	83%	496	17%
S/TVA/AECI-LGEE//	0	9	409	0	0.00%	0	0%	0	0%	1,178	41%	1702	59%
S/CPL/CPLW-TVA//	0	178	276	0	0.00%	0	0%	0	0%	952	33%	1928	67%
S/TVA/AECI-DUK//	0	9	355	256	0.88%	12	0%	45	2%	814	28%	2009	70%
S/TVA/AECI-CPLW//	0	9	276	10	0.03%	1	0%	0	0%	813	28%	2066	72%
S/TVA/AECI-SOCO//	0	9	409	660	2.25%	26	1%	94	3%	789	27%	1971	68%
S/CPL/CPLW-DUK//	0	271	1,318	0	0.00%	0	0%	0	0%	779	27%	2101	73%
S/TVA/TVA-LGEE//	0	1,004	2,828	641	0.08%	27	1%	3	0%	714	25%	2136	74%
S/TVA/TVA-DUK//	0	355	355	963	0.51%	35	1%	1	0%	706	25%	2138	74%
S/TVA/TVA-CPLW//	0	276	276	195	0.14%	5	0%	1	0%	694	24%	2180	76%
S/TVA/SOCO-LGEE//	0	1,102	2,828	99	0.01%	6	0%	0	0%	682	24%	2192	76%
S/TVA/CPLW-LGEE//	0	276	276	168	0.11%	10	0%	0	0%	654	23%	2216	77%

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