2023 ANNUAL AUDIT REPORT ON THE SOUTHEAST ENERGY EXCHANGE MARKET

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I. OVERVIEW

This is the Annual Auditor report for 2023 on the Southeast Energy Exchange Market (SEEM). This report covers activity in 2023 and also includes observations on the first quarter of 2024. SEEM is a regional energy market that centrally clears bilateral trades every 15 minutes using a transmission service designed for SEEM called Non-Firm Energy Exchange Transmission Service (NFEETS). It began operating in November 2022 and currently has 24 members.[1]

Trading volumes increased throughout 2023, in part due to the Florida participants joining in July.

- The monthly average cleared trades for 2023 was 58,000 MWh.
- The July-December average was 74,000 MWh cleared, illustrating the impact of new participants.
- It is noteworthy that the first three months of 2024 had a monthly average of 98,000 MWh, although this high volume cooled in April.

About 15,000 MWh – 20,000 MWh of potential economic exchanges are left uncleared each month. These are likely due mainly to costs of transmission losses and, to a lesser extent, participant-specific constraints or transmission constraints. Our evaluation of transmission availability supports the conclusion that transmission constraints have not significantly affected SEEM trading. Considering all intervals and segments, less than seven percent of the interval-segments showed zero availability. Market share concentration among individual sellers and buyers declined with the addition of the Florida participants and increases in liquidity.

According to the Auditing Process under the SEEM Market Rules (Section VI.D) our auditing duties fall into two general areas:

(1) analyzing SEEM inputs, constraints, and matching results; and

(2) responding to certain inquiries and reporting on the SEEM operation and outcomes.

Our annual Report reviews the results of our auditing activity from 2023, including some results from the first quarter of 2024. In section II, we review our findings with regard to auditing inputs, constraints and transactions. Our screening involves daily data transfer and storage architecture that receives SEEM data to support a range of screens. During 2023, we applied the screens daily

[1] The initial 18 members are: Alabama Power Company; Georgia Power Company; Mississippi Power Company; Associated Electric Cooperative, Inc.; Dalton Utilities; Dominion Energy South Carolina, Inc.; Duke Energy Carolinas, LLC; Duke Energy Progress, LLC; Louisville Gas & Electric Company and Kentucky Utilities Company; North Carolina Municipal Power Agency Number 1; PowerSouth Energy Cooperative; North Carolina Electric Membership Corporation; Tennessee Valley Authority; Georgia System Operations Corporation; Georgia Transmission Corporation; Municipal Electric Authority of Georgia; Oglethorpe Power Corporation; and South Carolina Public Service Authority. The Florida member joining in June 2023 are: Seminole Electric Cooperative; Tampa Electric Company; Duke Energy Florida; Florida Power Corporation; TEA Gainesville Regional Utilities; and TEA JEA.

and found that in all intervals the screens have indicated that the SEEM requirements have been satisfied.

In section III, we review the SEEM outcomes from an overall market perspective, evaluating both trends in trading and use of transmission service. SEEM activity has increased as measured by the volume of cleared trades. Aside from adding members from Florida in July, the volume has increased in recent months. Increased participation has also decreased the concentration of trading.

In Section IV, we present our conclusions and recommendations. We discuss improvements that we recommend SEEM consider for both the near-term improvement of the current market, as well as potential long-term expansions of the SEEM market.

II. MARKET OPERATION SCREENS

We audit SEEM by calculating screens, metrics, and other analyses on a daily basis using market data and other data to verify bids and offers, evaluate matches, and verify SEEM constraints. These screens are based on specific requirements in the Auditing Process in the SEEM Market Rules. These are in three categories and are as follows:

Daily Screens

The following screens audit the information provided in participant bids and offers.

- Offers (bids) from a participant must have Participant-Specific Constraints identifying at least three other non-affiliated Participants that can be matched as counterparties;
- All offers and bids properly must include a source or sink;
- Each offer and bid must have a delivery interval;
- Bids and offers must be 4 MW increments;
- "All or Nothing Selection" must be indicated; and
- The Network Map must be accurate (monthly).

Matching

The following screens are used to audit the SEEM matches:

- Match price must not exceed the bid price and must be greater than the offer price;
- Buyer and seller must be distinct participants;
- Matches must not violate any participant-specific constraints;
- SEEM benefit calculation must be verified;
- Any maximum offer price declared must bind the transaction; and
- Each match must have a NERC Tag.

Constraints

The following screens audit the SEEM constraints.

- Transaction volume must not exceed offer or bid volume;
- The SEEM algorithm must only make energy exchanges that yield positive benefits to both buyer and seller; and
- Transaction volume over each segment must not exceed the segment ATC.

Most of these screens are evaluated daily on an automated basis. In 2023, these screens successfully evaluated the various data elements and calculations and revealed no issues with the operation of SEEM.

The network map audit screen is evaluated monthly. We used this monthly screen to detect any changes during the month. Except for the addition of Florida participants in July, the map did not change over the course of 2023. This map was created through a lengthy technical process used by SEEM and the SEEM members at the outset of the SEEM deployment and when the Florida participants were added. This has not changed from the original technical processes, and so we conclude the network map is accurate for the current sources and sinks participating in SEEM.

We also evaluate changes to participant-specific constraints. We check for any changes in excluded sellers or buyers, any max price constraints, and identify any constraints that changed during the month. From month to month in 2023, there were minor changes to these participant-specific constraints to manage trading partners.

Overall, our screens and other monitoring of the SEEM market indicate that the SEEM market operated as expected, in compliance with the SEEM rules and tariff provisions.

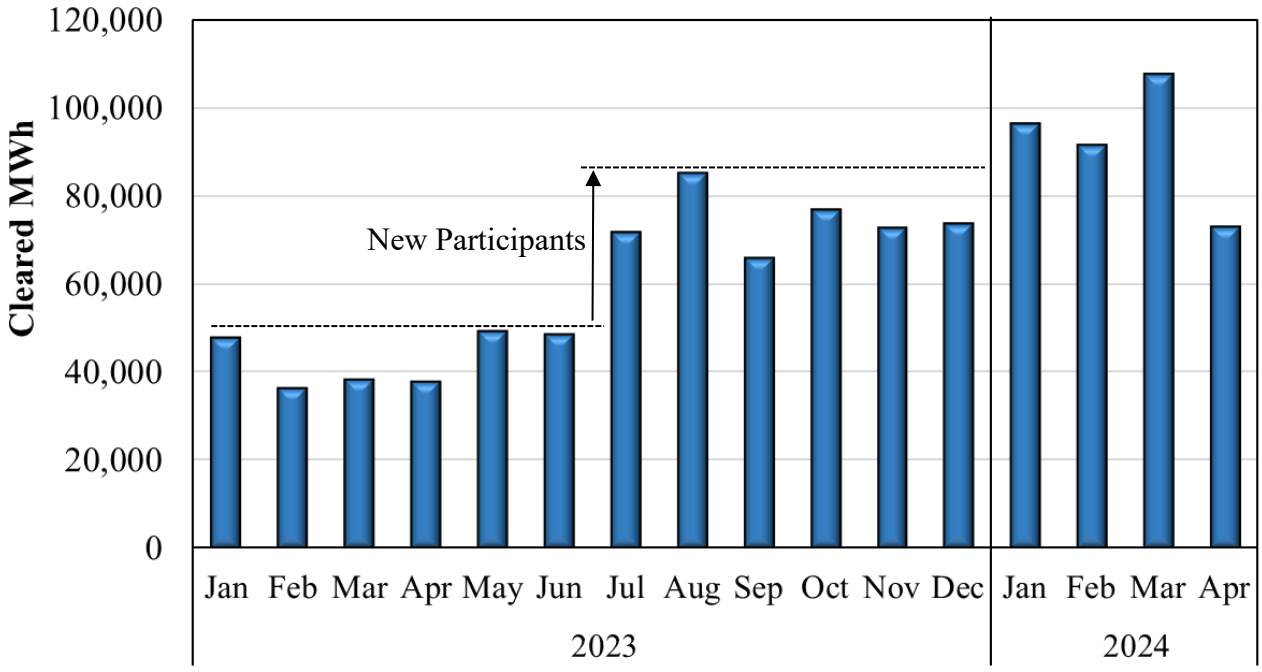
III. MARKET ACTIVITY

In this section, we review SEEM operations and outcomes in 2023 to discuss potential operating or market issues. This includes an overall review of the market trading, including volumes, prices, and characteristics of participation and an evaluation of network usage, focusing on the key transmission paths and constraints.

A. Trading and Liquidity

SEEM cleared 704,000 MWh of energy in 2023. Figure 1 shows the monthly volumes of cleared trades from January 2023 to April 2024. The figure shows a general increase in cleared volumes. The obvious increase came in July during the Florida participants' first full month of trading. We include the first four months of 2024 to show that volumes continue to increase. This is a favorable development that indicates increased interest and confidence in the market.

Figure 1: Volume of Cleared Trades
January 2023 -April 2024



In Figure 2, we show the monthly total activity in the SEEM market, including both cleared and uncleared bids and offers. The purpose is to summarize the trends in market liquidity. The dark green bars are the cleared bids and offers. The rest of the bar segments are various categories of uncleared bids and offers:

- The red segment shows uncleared economic bids and offers. These transactions appear to be profitable, but do not clear because of the cost of losses or a constraint.
- The light green bars show bids and offers that were not cleared but were within the indicated cleared bid-offer spread – i.e., from the lowest cleared offer to the highest

cleared bid. Bids and offers in this group do not clear because there are not sufficient counterparties to clear all of them – i.e., the counterparty bids/offers that could be economic have already been matched to another bid/offer with greater savings.

- The light blue bars show bids/offers within $10 of the overlap range ($10 or less outside the cleared bid-offer range).
- The dark blue bars show bids/offers greater than $10 of the overlap range – i.e., offers to sell that are >$10 higher than this highest bid or offers to buy energy <$10 less than the lowest supply offer. Participants likely do not expect these to clear.

Because the uncleared bids and offers in the blue bars are unlikely to clear, a movement of these quantities closer to the expected clearing range signals an improvement in market liquidity.

Figure 2: Bid and Offer Evaluation

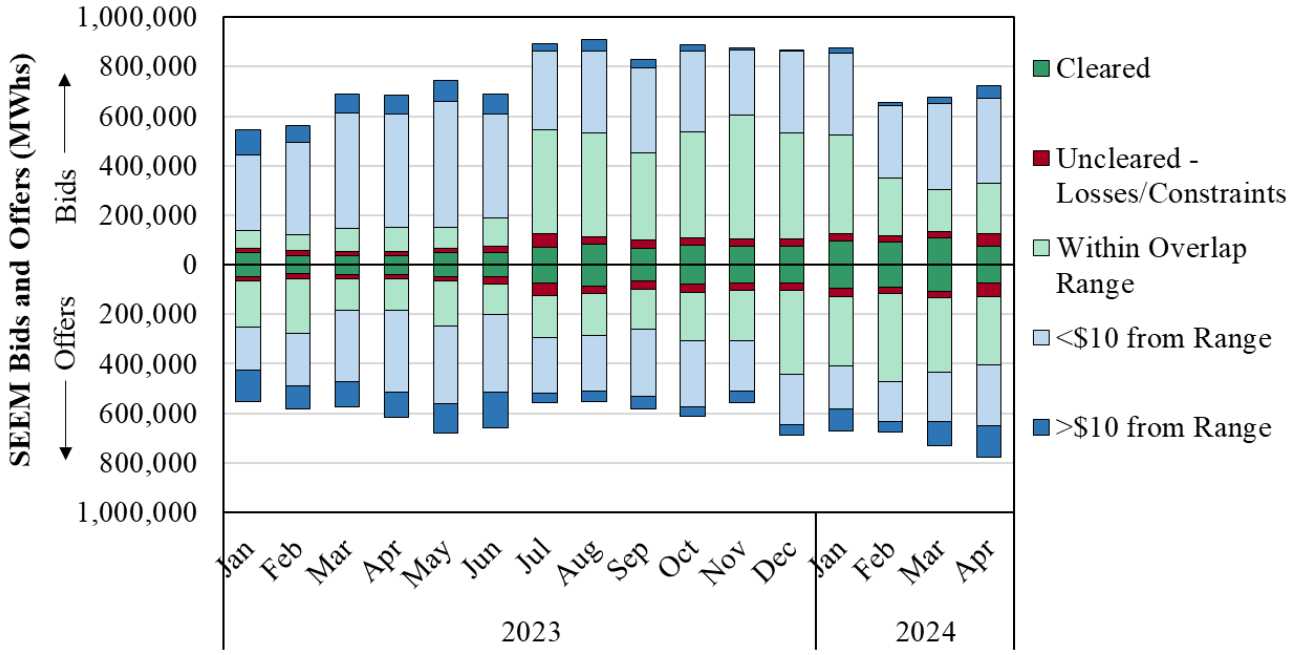
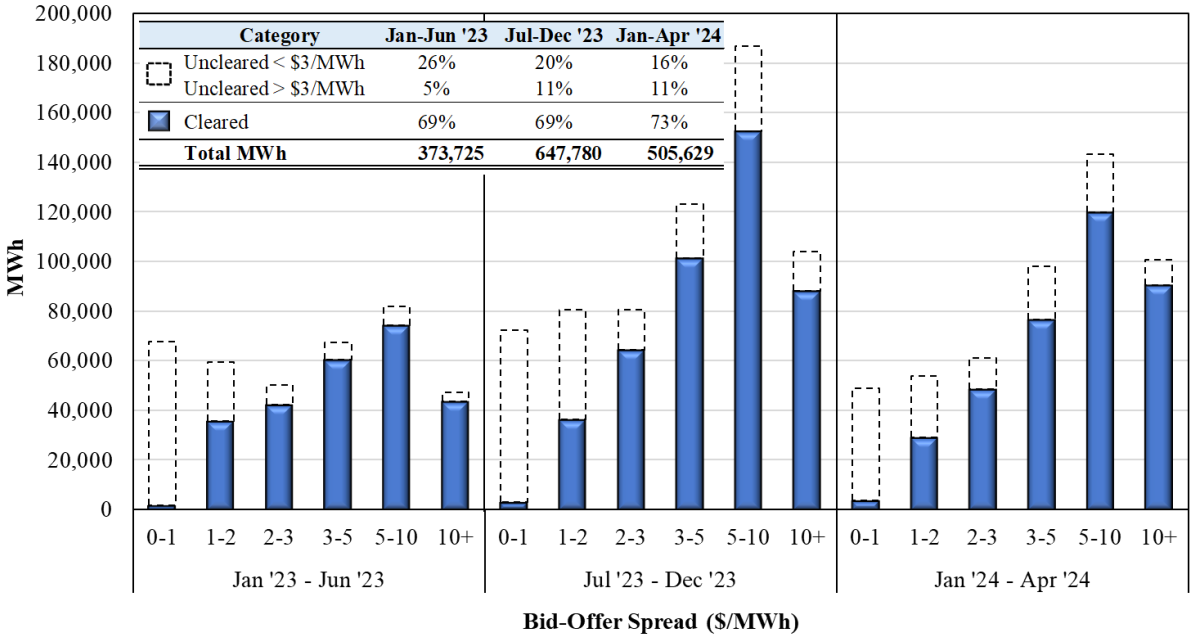


Figure 2 shows that liquidity increased gradually from the beginning of the year as the market matured from its launch in November 2022. Not surprisingly, bid and offer volume increased substantially when Florida participants joined fully in July. Since the end of 2023, liquidity declined slightly, even though cleared matches increased. Overall, these trends are positive.

Finally, to provide additional insight on the extent to which losses and constraints have prevented economic transactions from clearing, Figure 3 shows the disposition of all economic bids and offers (i.e., those for which an economic counterparty was available). The blue bars show the economic bids and offers that were matched and cleared, while the transparent bars show those that did not clear because of the costs of losses, transmission constraints or other constraints. The figure shows bid-offer pairs in tranches by the price spread, which is important because it allows us to infer why transactions likely did not clear since the output of the clearing software provides no information on the reasons why transactions did not clear.

Figure 3: Cleared and Uncleared Economic Bids and Offers
January 2023 – April 2024



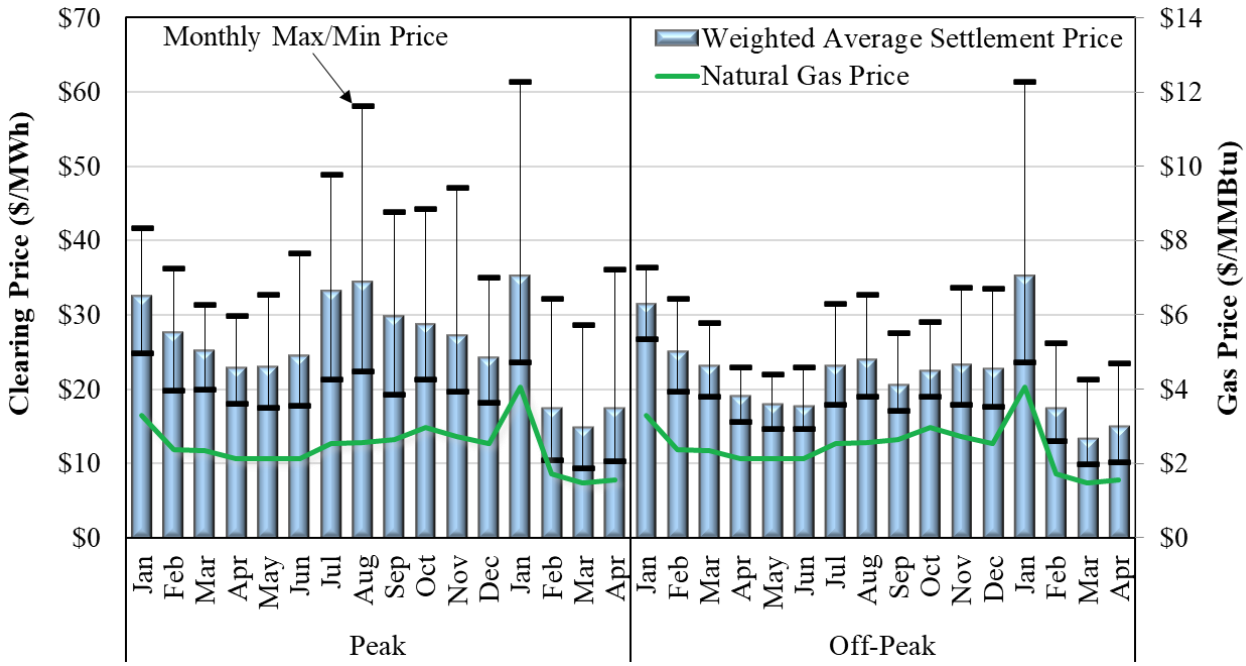
To understand why economic bids and offers may not have cleared, it is useful to examine the bid-offer spread. Average loss charges are roughly $2 per MWh, although some potential economic matches would incur higher loss costs. Therefore, in the inset table, we divide totals between bid-offer spreads above and below $3 per MWh. Those below $3 are very likely to have not cleared because of the costs of losses, well most of those that did not clear at spreads above $3 likely did not clear because of transmission constraints or participant constraints.

Figure 3 shows that over the entire period, roughly 70 percent of the economic transactions cleared. It also shows that the costs of transmission losses were likely the most significant factor that prevented transactions from clearing, because in each of the periods most of the uncleared economic transactions were those with spreads less than $3 per MWh. However, this share fell from 26 percent in the first period to 16 percent in the last period while uncleared economic transactions with larger price spreads rose from 5 percent of all economic transactions to 11 percent. This trend indicates that transmission constraints have likely begun to play a slightly larger role in preventing economic transactions from clearing as market activity increases. This is consistent with expectations since higher activity will generate more network flows and associated transmission congestion. It raises no significant concerns as transmission capability has generally been available to SEEM participants, as we discuss in Subsection C below.

B. SEEM Prices

In this subsection, we report on pricing in the SEEM market. Figure 4 shows monthly SEEM clearing prices, natural gas costs, and average daily minimum and maximum prices in peak and off-peak hours during the month.

Figure 4: Monthly Clearing Prices and Natural Gas Costs



The figure shows that prices are correlated with natural gas costs, which is the marginal fuel in most hours. This supports the conclusion that the SEEM market has generally performed competitively since generators in a competitive market will face incentives to offer power at their marginal costs of producing it.

The superimposed "whisker lines" over the bars show the range of daily average prices in each month. The top of the lines is the highest daily average price during the month. The variation in prices throughout SEEM, which influences the variation in daily prices, is strongly influenced by the locational value of available resources.

Indeed, we calculated the weighted average price on all segments used in SEEM and we found a wide variance in the prices for transactions clearing over different segments. Ignoring segments that had no trades, the average price was about $30/MWh for all segments. However, the average prices by segment ranged from $10/MWh and $80/MWh. This shows that the value of transactions can vary significantly by path, mainly because transmission constraints can contribute to higher prices at different locations. If a constraint prevents higher total flows (economic trades) between two areas, the average price will be higher than if sufficient transmission capability was available to allow all economic trades to clear between the areas.

C. Network Usage

In this subsection, we report on the usage of the SEEM transmission network. We evaluate SEEM transactions by segment to illuminate the system usage and availability. Segments are used by themselves or combined with connecting segments to form larger paths for trading. Most

segments have an Available Transmission Capability ("ATC") value that determines how much power can be transferred over the segment. We gathered ATC and trading statistics for all SEEM segments available to the model. There are 240 unique segments used in SEEM that have ATC values. There are 69 segments used in 2023 that did not have ATC values, meaning they were available on an unlimited basis.[2] There were 41 segments that were not used at all.

Table 1 shows the top 25 segments scheduled during the period January 2023-April 2024, including the median, maximum, and minimum ATC values over all intervals, as well as the total MWh that cleared over each segment. Segments without ATC include only cleared MWh. For segments with ATC, we calculate a "loading factor" based on the scheduled transactions and ATC on the segment during each 15-minute interval. It is the portion of the path used in that interval relative to the maximum amount that could have been used based on the ATC. We also calculate how each segment was utilized by interval during the period, *to wit*, the interval was either:[3]

(1) Partially used (MWs cleared were less than ATC or there was no ATC);

(2) Fully Used, ATC was used up for the interval;

(3) Unavailable, no ATC; and

(4) Uncleared (no schedules on the segment).

Table 1: Statistics for Most Utilized SEEM Segments
January 2023 to April 2024

Rank	Segment	ATC				Loading	Partially Used		Fully Used		Unavailable		Uncleared	
		Min	Median	Max	MWhs	Factor	Intervals	%	Intervals	%	Intervals	%	Intervals	%
1	F/TEC/TEC-FPC//	0	1,815	3,437	185,509	1.42%	15,872	*34%*	4	*0%*	108	*0%*	13724	*29%*
2	F/FPC/FPC-SOCO//	0	128	370	155,657	15.81%	6,764	*14%*	713	*2%*	11,713	*25%*	10523	*23%*
3	SS/SOCO/TVA-SOCO//	0	1,177	1,571	125,803	0.93%	4,013	*9%*	0	*0%*	4	*0%*	42626	*91%*
4	S/CPL/CPLE-DUK//	0	5,208	20,655	115,574	0.20%	4,787	*10%*	5	*0%*	140	*0%*	41711	*89%*
5	S/TVA/TVA-SOCO//	0	2,905	3,000	112,458	0.36%	3,415	*7%*	6	*0%*	2,014	*4%*	41208	*88%*
6	F/FPC/TEC-SOCO//	0	128	370	107,528	10.92%	9,236	*20%*	471	*1%*	11,693	*25%*	8313	*18%*
7	SS/SOCO/FL-SOCO//	-81	556	1,369	100,390	2.02%	7,773	*17%*	4	*0%*	493	*1%*	23258	*50%*
8	S/SC/SOCO-SC//	0	1,333	2,460	87,041	0.62%	7,038	*15%*	71	*0%*	3,873	*8%*	35661	*76%*
9	S/DUK/CPLE-SOCO//	0	2,063	2,335	85,636	0.40%	4,012	*9%*	3	*0%*	2,352	*5%*	40276	*86%*
10	F/FPC/TEC-FPC//	0	1,866	3,486	77,981	0.58%	10,290	*22%*	0	*0%*	84	*0%*	19339	*41%*
11	F/JEA/SOCO-JEA//	0	542	869	74,642	1.92%	9,983	*21%*	31	*0%*	1,271	*3%*	18318	*39%*
12	S/TVA/TVA-DUK//	0	355	430	69,914	1.79%	2,155	*5%*	23	*0%*	3,635	*8%*	40830	*88%*
13	SS/SOCO/DUK-SOCO//	-62	833	1,141	65,613	0.70%	2,341	*5%*	81	*0%*	118	*0%*	44103	*95%*
14	S/CPL/DUK-CPLE//	0	3,367	8,120	57,018	0.14%	3,683	*8%*	1	*0%*	286	*1%*	42673	*91%*
15	S/DUK/TVA-DUK//	0	692	692	53,757	0.78%	1,632	*3%*	128	*0%*	1,493	*3%*	43390	*93%*
16	S/CPL/CPLE-SC//	0	2,580	4,428	52,571	0.17%	3,512	*8%*	10	*0%*	855	*2%*	42266	*91%*
17	P/LGEE/TVA-LGEE//	0	1,421	4,624	49,764	0.28%	1,854	*4%*	1	*0%*	1,368	*3%*	43420	*93%*
18	S/TVA/SOCO-TVA//	0	2,376	3,000	46,426	0.17%	1,829	*4%*	6	*0%*	964	*2%*	43844	*94%*
19	S/SC/CPLE-SC//	0	1,641	3,423	46,415	0.26%	3,239	*7%*	15	*0%*	3,418	*7%*	39971	*86%*
20	S/DUK/SOCO-DUK//	0	1,720	2,264	42,839	0.24%	2,597	*6%*	10	*0%*	2,817	*6%*	41219	*88%*
21	SS/SOCO/FL-TVA/MULTIPATHALIAS/	-81	556	1,369	40,608	0.82%	1,893	*4%*	0	*0%*	493	*1%*	29142	*62%*
22	SS/SOCO/SOCO-SOCO//	39,640	43,556	44,230	38,563	0.01%	2,222	*5%*	0	*0%*	0	*0%*	44421	*95%*
23	SS/SOCO/FL-SC/MULTIPATHALIAS/	-200	193	768	37,778	2.33%	3,223	*7%*	386	*1%*	1,818	*4%*	26101	*56%*
24	SS/SOCO/SOCO-SC//	-617	222	876	35,738	1.24%	2,730	*6%*	282	*1%*	1,990	*4%*	41641	*89%*
25	P/LGEE/LGEE-TVA//	0	1,623	4,036	34,040	0.19%	1,860	*4%*	9	*0%*	1,009	*2%*	43765	*94%*

2 It is not unusual for transmission paths to have no ATC value posted, and not just for the SEEM transmission service (NFEETS).

3 We use a threshold of < 4 MW to identify segments fully used or unavailable for the values below.

It is notable that the top two segments facilitate trades from Florida to the legacy SEEM members, even though Florida members were full participants in only 9 of the 16 months in the table. These statistics also indicate that among these most utilized segments, ATC remains available for SEEM trades. For example, many of the top paths have over 90 percent of their intervals uncleared. Nonetheless, there are many instances when segments are constrained. A constrained segment is one where either (1) the segment is completely used by SEEM ("Fully Used" column in the table) or (2) ATC is insufficient (less than 4 MW) prior to SEEM matching (the "Unavailable" column in the table).

It is difficult to draw overall conclusions regarding transmission availability from segment-level information. Therefore, we summarize the usage for all segments in Table 2. During the period, total segment intervals is the product of all 309 segments and the number of intervals, which yields over 10 million segment intervals.

Table 2: Summary of All Segments
January 2023– April 2024

	Cases	Intervals	%
1	Partially Used	206,882	2.0%
2	Fully Used	5,711	0.1%
3	Unavailable	698,030	6.7%
4	Uncleared	9,482,307	91.2%

The results in Table 2 show:

- The two circumstances when a segment is constrained (Cases (2) and (3)) occurred in roughly 700,000 segment-intervals, or almost 7 percent of all segment intervals.
- The constraint segments were almost always because the ATC was insufficient to schedule (i.e., ATC < 4 MW) rather than because it was fully used by SEEM matches.
- The most common outcome (more than 91 percent of all segment intervals) was that they were "Uncleared" (Case 4), where ATC was available, but the segment was not used because no economic transactions were cleared by the SEEM model over that segment.
- The third most common outcome were segments that were "Partially Used" (Case 1), where the segment was partially used by the SEEM market.

Overall, these results indicate that transmission was generally available to facilitate economic transactions in the SEEM region. As we discussed above, transmission loss costs were a larger factor in preventing economic trades from being consummated than transmission constraints.

Further insight on constrained segments can be gained from Table 3. It shows the 25 segments most often unavailable to SEEM. Even though these are the most unavailable segments, they are still available most of the time. Overall, the evaluation of individual segments indicates the system is largely unconstrainted for SEEM activity.

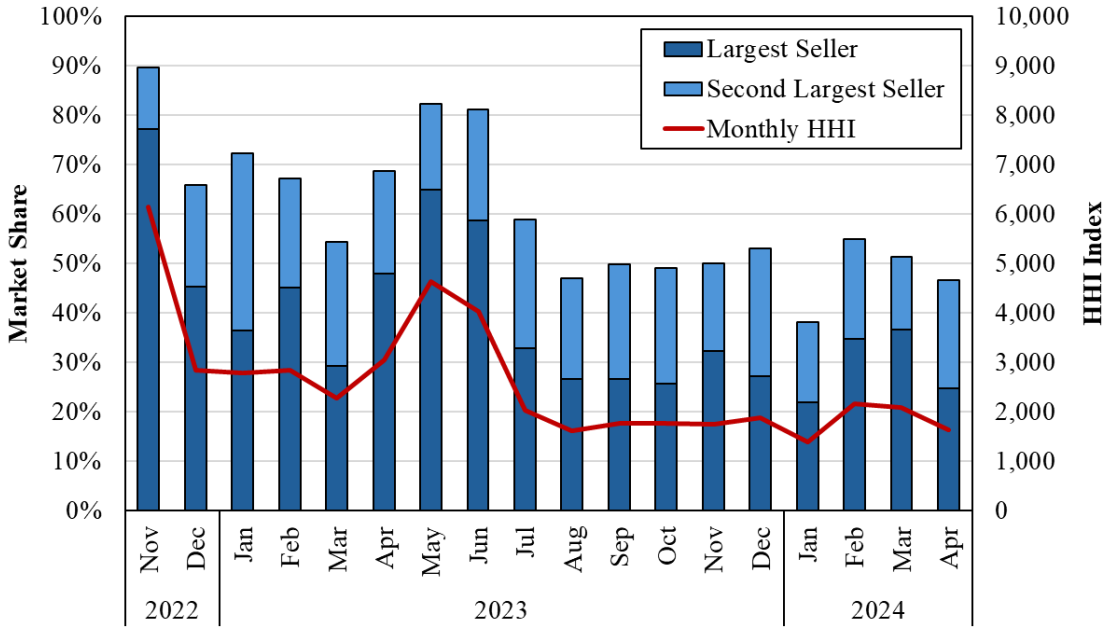
Table 3: Most Constrained SEEM Segments
January 2023 – April 2024

Rank	Segment	ATC				Loading	Partially Used		Fully Used		Unavailable		Uncleared	
		Min	Median	Max	MWhs	Factor	Intervals	%	Intervals	%	Intervals	%	Intervals	%
1	F/JEA/SEC-JEA/SSN-JEA/	0	0	589	0	0.00%	0	0%	0	0%	25,027	54%	4576	10%
2	S/TVA/AECI-CPLW//	0	2	308	275	0.03%	32	0%	7	0%	23,549	50%	23055	49%
3	S/AECI/TVA-AECI//	0	61	1,112	10,068	0.28%	562	1%	81	0%	21,969	47%	24031	52%
4	S/TVA/CPLW-LGEE//	0	276	308	2,763	0.14%	132	0%	1	0%	19,114	41%	27396	59%
5	S/TVA/TVA-CPLW//	0	276	308	10,385	0.49%	417	1%	2	0%	17,053	37%	29171	63%
6	S/CPL/CPLW-TVA//	0	261	308	0	0.00%	0	0%	0	0%	16,530	35%	30113	65%
7	S/TVA/SOCO-CPLW//	0	276	308	43	0.00%	11	0%	0	0%	16,273	35%	30359	65%
8	S/TVA/LGEE-CPLW//	0	276	308	2,577	0.12%	197	0%	2	0%	15,969	34%	30475	65%
9	S/TVA/CPLW-AECI//	0	276	308	1,052	0.05%	72	0%	0	0%	15,917	34%	30654	66%
10	S/CPL/TVA-DUK//	0	276	7,928	13,280	0.60%	573	1%	60	0%	15,566	33%	30444	65%
11	S/TVA/DUK-CPLW//	0	276	308	0	0.00%	0	0%	0	0%	15,504	33%	31139	67%
12	S/CPL/DUK-TVA//	0	276	3,482	6,562	0.29%	339	1%	15	0%	15,501	33%	30788	66%
13	S/CPL/TVA-CPLW//	0	276	789	0	0.00%	0	0%	0	0%	15,489	33%	31154	67%
14	S/TVA/CPLW-DUK//	0	276	308	0	0.00%	0	0%	0	0%	15,028	32%	31615	68%
15	S/TVA/CPLW-SOCO//	0	276	308	395	0.02%	40	0%	0	0%	14,847	32%	31756	68%
16	S/TVA/CPLW-TVA//	0	276	308	2,352	0.10%	121	0%	0	0%	14,843	32%	31679	68%
17	S/TVA/AECI-LGEE//	0	77	473	217	0.01%	10	0%	11	0%	14,048	30%	32574	70%
18	S/SCEG/SOCO-SCEG//	0	737	99,999	14,699	0.15%	1,585	3%	26	0%	12,389	27%	32643	70%
19	F/FPC/SEC-SOCO/SSO-SOCO/	0	104	370	0	0.00%	0	0%	0	0%	12,153	26%	17560	38%
20	F/FPC/FPC-SOCO//	0	128	370	155,657	15.81%	6,764	14%	713	2%	11,713	25%	10523	23%
21	F/FPC/TEC-SOCO//	0	128	370	107,528	10.92%	9,236	20%	471	1%	11,693	25%	8313	18%
22	F/FPC/SEC-SOCO/SSN-SOCO/	0	116	370	0	0.00%	0	0%	0	0%	11,597	25%	18116	39%
23	F/FPC/GVL-SOCO//	0	131	370	0	0.00%	0	0%	0	0%	11,581	25%	18132	39%
24	S/TVA/AECI-DUK//	0	103	430	2,484	0.15%	221	0%	138	0%	10,887	23%	35397	76%
25	S/TVA/AECI-SOCO//	0	116	473	12,828	0.72%	750	2%	351	1%	10,330	22%	35212	75%

D. Market Concentration

Economists measure market shares to get a general view of the competitiveness of a market. It is not determinative of the existence of market power, but it is useful for an overall view. Figure 5 shows the monthly share of matched transaction of the largest two sellers along with the Herfindahl Hirschmann Index (HHI), defined below. The bars in this figure stack the two top sellers during the month.

Figure 5: Seller Market Share Statistics
November 2022 – April 2024

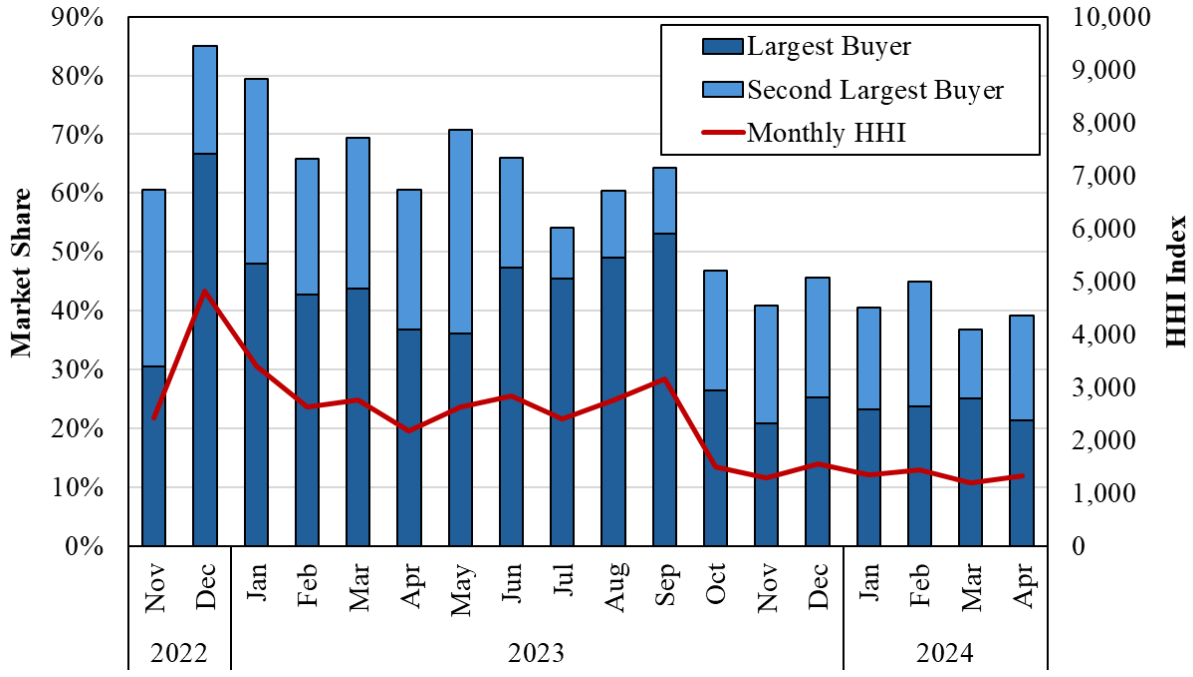


Not surprisingly, the share of the top seller, as well as the share of the top two, declined once the Florida participants full joined in July 2023. The chart also shows the HHI has declined. The HHI is a measure of market concentration and is used to determine market competitiveness, often on a relative basis over time or as a result of structural changes like a merger or divestiture. It is calculated by squaring the market share of each firm competing in a market and then summing the resulting numbers. It can range from close to 0 to 10,000, with lower values indicating a less concentrated market. A single-seller monopoly market would have an HHI of 10,000 = 100 x 100. A perfectly competitive market where no firm has an appreciable market share, the HHI is close to 0. The US antitrust agencies (FTC and DOJ) consider markets with:

- HHI greater than 1800 to be highly concentrated;
- one with an HHI between 1000 and 1800 to be moderately concentrated; and
- one with an HHI less than 1000 to be unconcentrated.

The HHI indicates that the SEEM market has highly-concentrated in most months. However, the HHI has come down since July and has remained close to 1800. Although this is close to the highly-concentrated range, it has been falling and the correlation of prices with fuel prices indicates that the market has performed competitively. Figure 6 shows the buyer concentration.

Figure 6: Buyer Market Share Statistics
November 2022 – April 2024



The statistics show a trend similar to the seller market shares. The entry of Florida participants coincided with a decline in buyer concentration, although there was a two-month lag in the decline in the share of the largest buyers. These declines, together with the uptrend in matched trades are indicative of a market evolving to greater liquidity and competitiveness.

IV. Conclusions and Recommendations

Our evaluation of SEEM operations since November 2022 has shown implementation and operation of the SEEM platform has been successful. In 2023, the Florida participants were successfully integrated, and liquidity has continued to improve as a result. This has also contributed to the competitive performance of the market.

In the course of our auditing, we have had occasion to be contacted by or we contacted traders to address various issues that arise. We have also solicited impressions of the SEEM market from four traders for this report. Each gave us a positive review of their experiences with SEEM. They reported the system is creating value for their operations and they expressed optimism that the system will continue to expand opportunities.

Near-Term Improvement

In evaluating the performance of the SEEM market over the past year, we consider the effectiveness of the price discovery provided by the market. SEEM publishes the daily average price for transactions after the day. This limits real-time price discovery. In order to improve real-time price discovery, we recommend that SEEM:

Publish interval average prices in real time

Publishing hourly prices in real time would allow participants to be aware of the prevailing clearing prices in the intervals over the most recent hour or two. This could produce significant benefits because it would inform:

- More competitive and efficient bids and offers; and
- Other real-time decisions by participants (e.g., starting a fast start unit).

Long-Term Improvements

Given the solid performance of the SEEM platform system, it holds promise to expand the system to include longer timeframes. The current SEEM market facilitates very short, near-term exchanges of economic energy. Additional benefits and efficiency could be achieved by transacting further ahead and for longer periods, potentially including:

- Hourly or multi-hour real-time transactions facilitated during the operating day.
- A day-ahead clearing of bids and offers to facilitate hourly trades for the following day.

In either case, the main difference between these timeframes and the current market is that holders of transmission reservations would have to release the transmission. The current SEEM market uses unscheduled available transmission capability after the hourly schedules are processed. Hence, the transmission is released and made available at no cost. This would not be possible for

longer lead-time transactions because the transmission reservations could potentially still have significant value in these timeframes. Therefore, implementing hourly real-time or day-ahead transactions would require:

- Offers by the holders of transmission reservations to make them available at a submitted cost (does not exist in the current market); and
- Bids by buyers and offers by sellers that are comparable to the current market.

We recommend that SEEM consider:

E*xpanding its market to include intra-day real-time trades and day-ahead hourly trades.*

Both expansions would facilitate fuller utilization of the transmission system. However, an hourly day-ahead market would likely be the most beneficial because it could lead to changes in resource commitments that would lower the costs of service load in the region.