Case no: Svk 2023/1497 **Date:** 2023-05-03

Quarterly summary of Svenska kraftnät's auctioning of EPAD contracts to improve hedging opportunities

Q1 2023

SVENSKA KRAFTNÄT

Svenska kraftnät

Svenska kraftnät is a state owned enterprise with the task of maintaining Sweden's electricity transmission grid, which consists of about 16,000 kilometres of 400 kV and 220 kV transmission lines with substations and interconnectors. Svenska kraftnät is also the system operator for electricity in Sweden.

Svenska kraftnät is developing the transmission grid and the electricity market to meet society's need for a secure, sustainable and cost-effective supply of electricity. In this, Svenska kraftnät plays an important role in implementing national climate policies.

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Content

Background

The FCA Guideline (EU) 2016/1719 establishing a guideline on forward capacity allocation, aims to improve and ensure sufficient hedging possibilities in the forward markets. The regulatory framework mainly concerns transmission system operators (TSOs), regulatory authorities, Member States and market participants. The long-term hedging (forward) market shall ensure that it is possible to mitigate risks related to the price volatility in the Day-Ahead market in bidding zones across the EU. TSOs are identified as one party that can be legally obliged to support the functioning of the market. Until now, the most common way of providing support has been for the TSOs to offer Long Term Transmission Rights. Svenska kraftnät's pilot project with auctioning of the financial contracts used for hedging specific bidding zone price risk in the Nordic market, Electricity Price Area Differentials (EPADs), aims to empirically test an optional way for the TSO to increase liquidity in the forward market. If proven successful, this model could potentially serve as an example of alternatives to the measures currently described in the FCA GL.

In the pilot's auctions, Svenska kraftnät offers to both buy and sell EPADs in the bidding zones SE2, SE3 and SE4. For the implementation of the auctions, Svenska kraftnät has procured Svensk kraftmäkling AB (SKM), which arranges the auctions. All transactions are cleared with Nasdaq Clearing. The auctions on either side of a bidding zone border (buy on one side and sell on the other) are matched with each other and the transactions only go through if Svenska kraftnät's buy transaction is made at the same or a lower price than Svenska kraftnät's sell transaction in the adjacent bidding zone. This linkage reflects market participants' collective expectation of future price differences and the anticipated flow direction in the Day-Ahead market across the bidding zone borders. During the pilot project, Svenska kraftnät has limited the volume of outstanding contracts to approximately 10 percent of the expected available physical capacity on each bidding zone border.[1]

In order to simplify follow-up and analysis of the pilot project, Svenska kraftnät compiles the results of the auctions and presents a number of metrics that also illustrate the development of the continuous market for EPADs in the affected bidding zones. The summaries will be published quarterly in the form of short reports, of which this is the first one.

[1] For more detailed information on how the auctions are set up and concluded, please refer to www.svk.se and www.skm.se.

Summary of auction results

A total of six auctions have been conducted during Q1 2023, starting February 7. The sixth and final auction of the quarter was conducted on March 28.

Total allocated volumes in the auctions

The table below shows a summary of volumes for each contract in the auctions conducted during the period covered by this report.

Table 1, Volumes in each contract in the auctions held between February 7 and March 28 2023.

Bidding zone	Contract	Volume (MW)	Svk BUY	Svk SELL
SE2	March-23	90	BUY	
SE2	April-23	100	BUY	
SE2	May-23	100	BUY	
SE2	Q2-23	160	BUY	
SE2	Q3-23	60	BUY	
SE2	YR-24	30	BUY	
SE3	March-23	90 + 90	BUY	SELL
SE3	April-23	100 + 100	BUY	SELL
SE3	May-23	100 + 100	BUY	SELL
SE3	Q2-23	160 + 160	BUY	SELL
SE3	Q3-23	60 + 60	BUY	SELL
SE3	YR-24	30 + 30	BUY	SELL
SE4	March-23	90		SELL
SE4	April-23	100		SELL
SE4	May-23	100		SELL
SE4	Q2-23	160		SELL
SE4	Q3-23	60		SELL
SE4	YR-24	30		SELL

How to interpret the auction results

When allocating the coupled EPADs the symmetrical volume offered by Svenska kraftnät for purchase and sale is distributed to market participants based on the marginal price for their bids and offers for the individual EPAD contract, i.e. market participants submit orders for discrete products for each side of the bidding zone border. Where Svenska kraftnät offer to purchase EPADs, the offers from sellers will be accepted beginning with the lowest price and increasing to the price level of the offer that fulfils Svenska kraftnät's volume to purchase (marginal price).

Where Svenska kraftnät offer to sell EPADs, the bids from buyers will be accepted beginning with the highest price and decreasing to the price level of the bid that fulfils Svenska kraftnät's volume to sell (marginal price).

The results of each auction opportunity are published just after 13:00 CET on the day of the auction.[2] The auction results are presented in the form of bid curves.

Figure 1 shows the first auction conducted on February 7, this is one example of how to illustrate price formation with the bid curves. The green bid curve illustrates the prices at which market participants are prepared to buy the March contract in the SE4 bidding zone, these are ranked from highest to lowest bid. The red curve illustrates the prices at which market participants are prepared to sell corresponding contracts in the SE3 bidding zone. The points on each bid curve represent the marginal price at which the transactions were concluded. On the x-axis, these are placed at the offered volume (50 MW) and the marginal prices (16,03 EUR/MWh and -2,5 EUR/MWh, respectively) can be read off the y-axis.

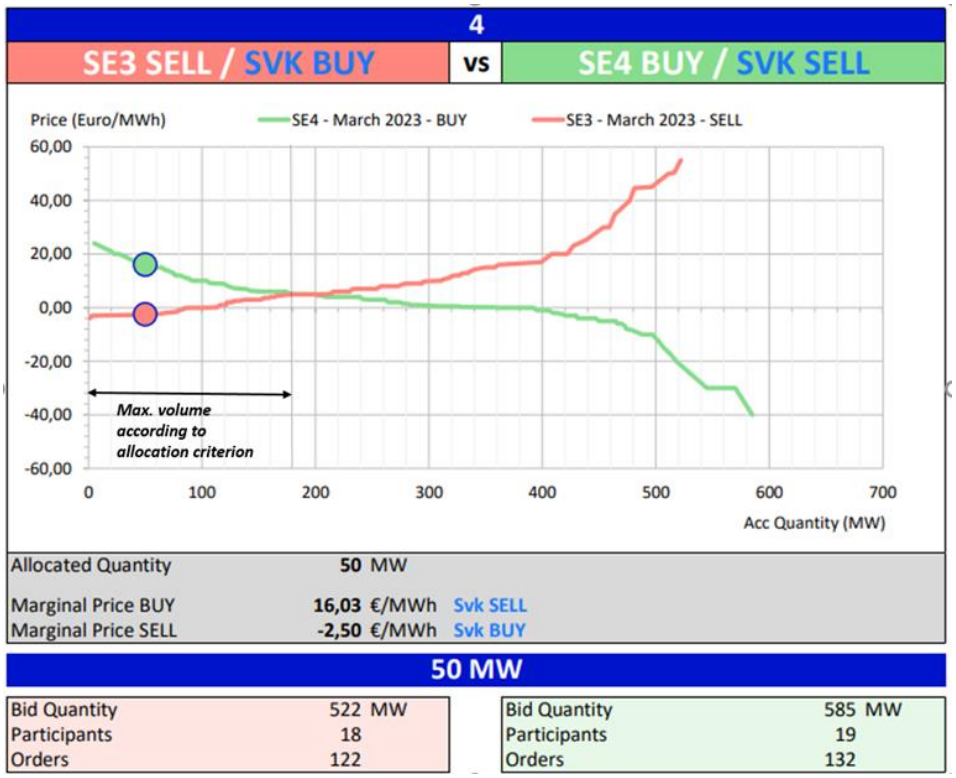


Figure 1, Example of auction result showing order curves, price for each contract, allocated volume, number of participants, number of orders and the total order quantity.

[2] Auction results are published on SKM's website, Link to Auction Results

Figure 1 also illustrates the distance that corresponds to the volume that could have been allocated given Svenska kraftnät's allocation criteria. (The price which Svenska kraftnät purchase for must always be lower than or equal to the price at which Svenska kraftnät sell for in each coupled transaction.) In the figure just above, this corresponds to a volume of 188 MW, i.e. where the two curves intersect. The total bid volume, number of participants and total number of orders can be found in the information boxes at the bottom.

Bid–to–cover ratio

The bid–to–cover ratio is the quantity of orders (buy or sell) for an EPAD-contract divided by the quantity accepted by Svenska kraftnät. A high bid–to–cover ratio indicates a strong demand for the contracts.

As mentioned earlier, the price at which Svenska kraftnät purchase must always be lower than or equal to the price at which Svenska kraftnät sell in each coupled transaction. The bid–to–cover ratio presented below is adjusted to reflect this condition, i.e. calculated as the volume accepted by Svenska kraftnät divided by the total volume of orders where the respective purchase and sales price would meet the above criterion. Note that the bid–to–cover ratio is not calculated and based on the total (gross) volume of orders.

Figure 2 illustrates the bid–to–cover ratio for the offered quarterly contracts that connects the SE2–SE3 bidding zone border. On average, the order volume has been more than four times greater than the volume offered by Svenska kraftnät. **Figure 3** shows the volumes for contracts connected to the SE3-SE4 border. On average the total volume according to the criterion has been nearly five times larger than the offered volume.

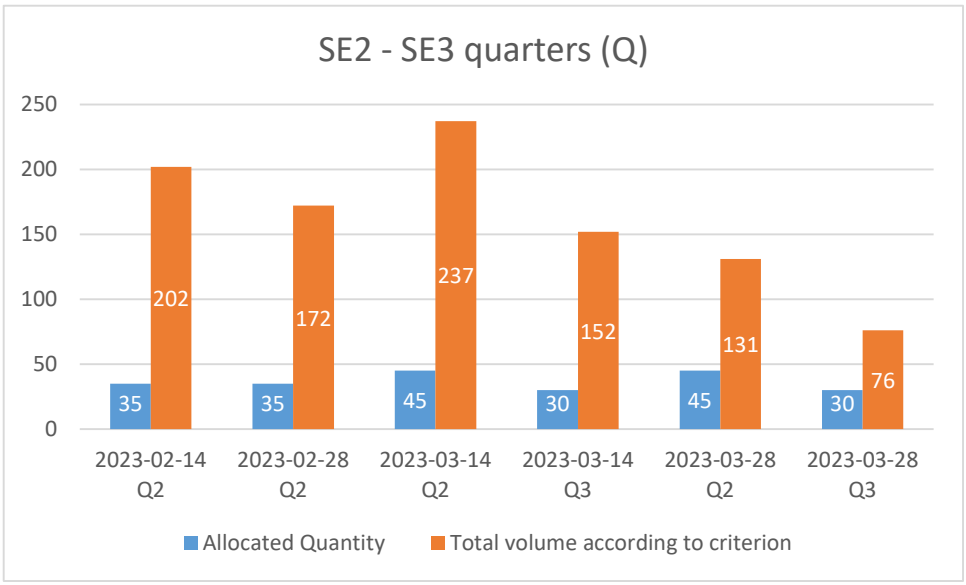


Figure 2, Volumes for SE2 and SE3 quarterly contracts, shown per auction day

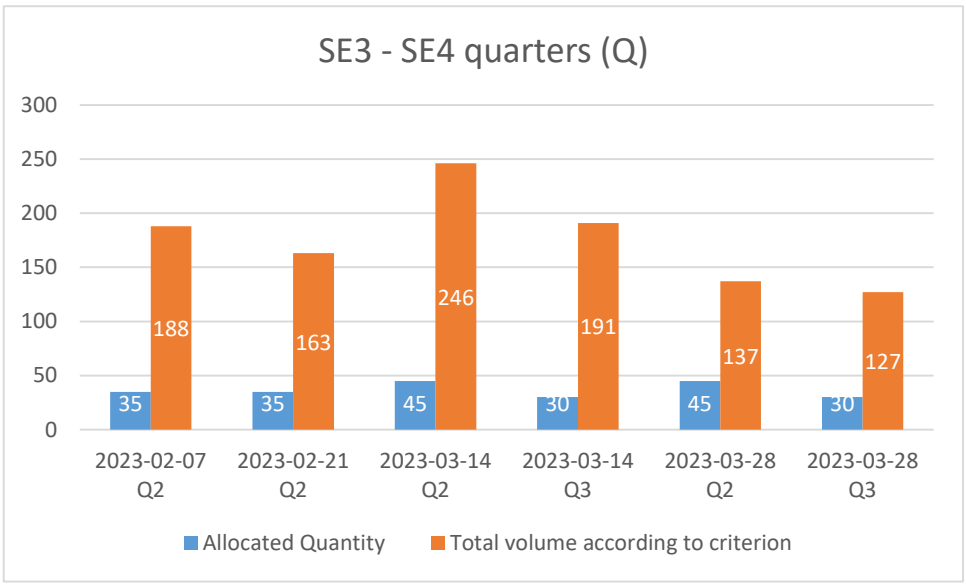


Figure 3, Volumes for SE3 and SE4 quarter contracts shown per auction day

Participation in auctions

The participation has been relatively stable over the period. It should be noted that the first four auctions in February involved only two bidding zones at a time, and that only two auctions (in March) involved all three bidding zones. Starting with caution - only one bidding zone border at a time - was a conscious choice made by

Svenska kraftnät and may partly explain the slightly higher initial participation. The average number of market participants has amounted to approximately 15 per auction. The total number of participants may have been higher than this, since a participant does not need to submit orders for contracts in all bidding zones or on all bidding zone borders offered by Svenska kraftnät.

The illustration in **Figure 4** summarizes the highest, lowest and the average number of participants for the different auctions (presented per auction date).

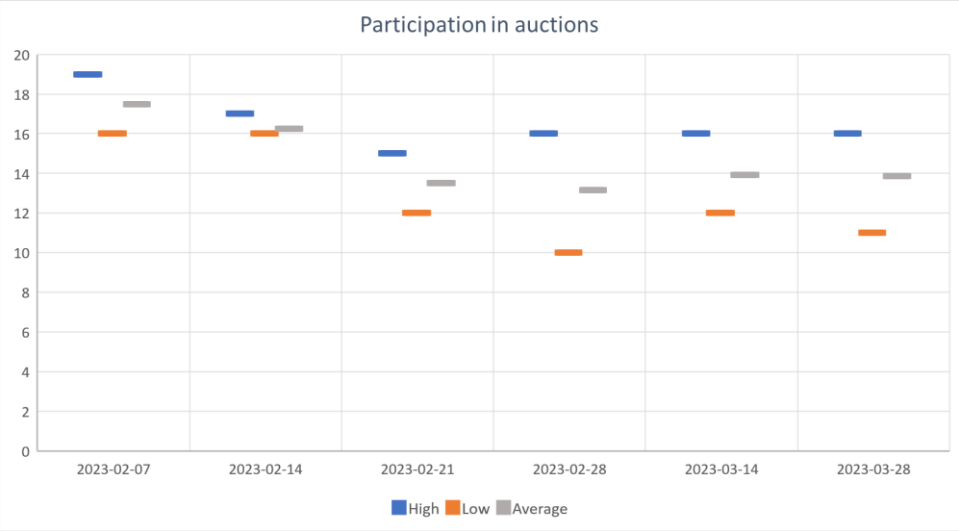


Figure 4, Highest, lowest and average participation in the auctions for each auction day.

It can be noted that the number of participants has been slightly lower in the auctions of yearly contracts compared to the monthly and quarterly contracts. When it comes to the individual bidding zones, SE2 and SE4 show essentially the same interest and SE3 has a slightly higher participation in the auctions.

Looking at total order volume compared to total offered volume by Svenska kraftnät per bidding zone, some differences can also be noted. Measured as total amount of energy (all contracts), the picture below (**Figure 5**) illustrates that the surplus area SE2 shows a slightly lower ratio than the deficit area SE4 while the largest trading interest has been shown in SE3.

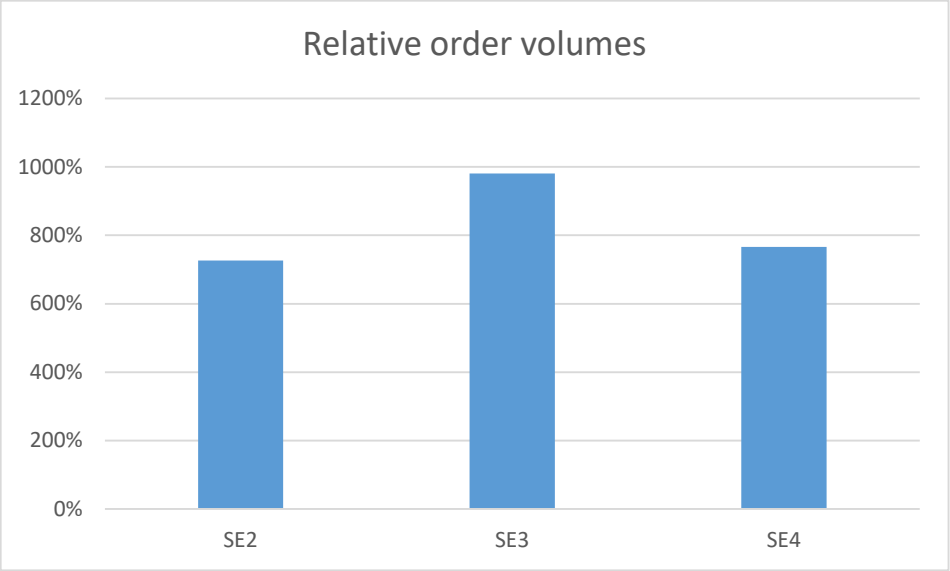


Figure 5, Relative order volumes; total order volume divided by the total offered volume, [%].

Price development in continuous market

In general, the auction marginal prices have tended to end up relatively close to the previous trading day's closing price and typically within the indicative spread between best buyer and best seller (the so-called Bid/Ask spread).

During the period, Svenska kraftnät conducted six auctions in the SE3 bidding area as regards Q2-contracts. In **Figure 6**, the auctions are plotted in relation to the historical price development during Q1 2023. A clear downward trend can be observed in this contract. Furthermore, it can be noted that the SE3 bidding zone at the end of the period was trading below the system price (negative price for the contract). Svenska kraftnät both buys and sells SE3 contracts in the coupled auctions to SE4 and SE2 respectively, and therefore obtains no net positions in the SE3 bidding zone.

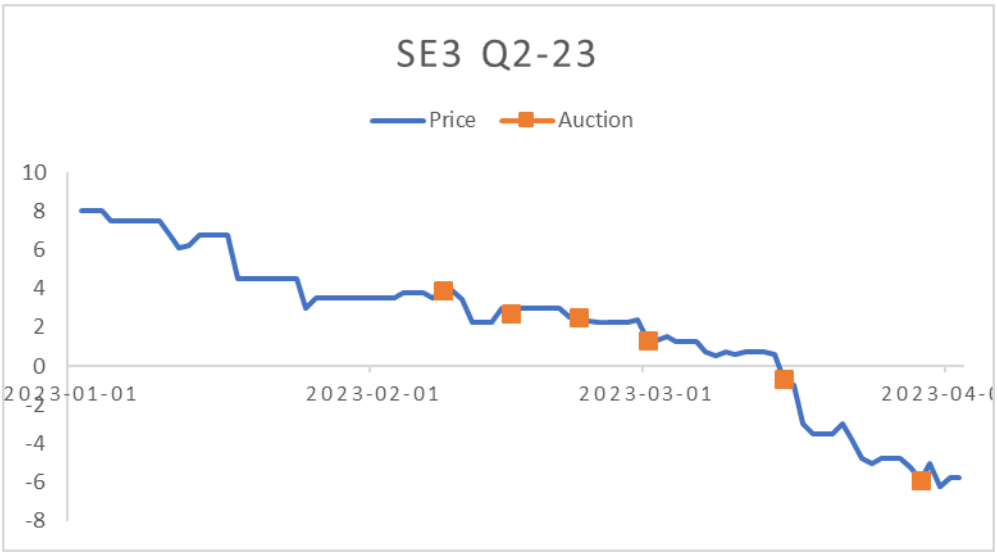


Figure 6, Closing prices for each day in the continuous market plotted together with the auction days, for SE3 Q2-23 contracts, January to March 2023.

The corresponding contracts in bidding zone SE4 show a marked decline during the period while the expected difference compared to the system price tightened. Svenska kraftnät conducted four auctions for contracts in SE4 during the period, see **Appendix I** for prices in each auction, and **Figure 7** for prices in the continuous market plotted together with the auction days.

In general, the EPAD market has over a longer period been characterized by a relatively low liquidity. This fact is clearly illustrated in the below picture, from which it can be seen that the Q2 contract makes almost discrete jumps on several occasions in conjunction with the auctions. However, in the trading sessions following an auction, prices have remained at or close to the levels set in the auctions. This indicates that the auctions at least partly have fulfilled a price-forming function in the market. The margin prices in the auctions were outside the previous trading day's bid-ask spread on several occasions.

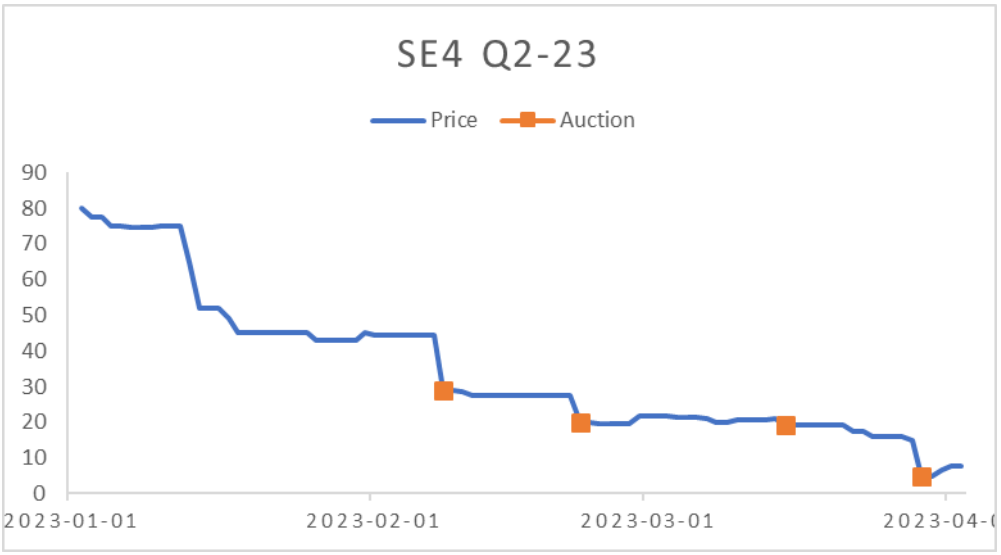


Figure 7, Closing prices for each day in the continuous market plotted together with the auction days, for SE4 Q2-23 contracts from January to March 2023.

The SE2 bidding zone price (**Figure 8**) showed a fairly high volatility in the Q2-23 contract, but a less pronounced trend than what can be seen in the SE4 contract. The price of the contract rose in the continuous market during the period from February to March 2023. See Appendix I for prices in each auction.

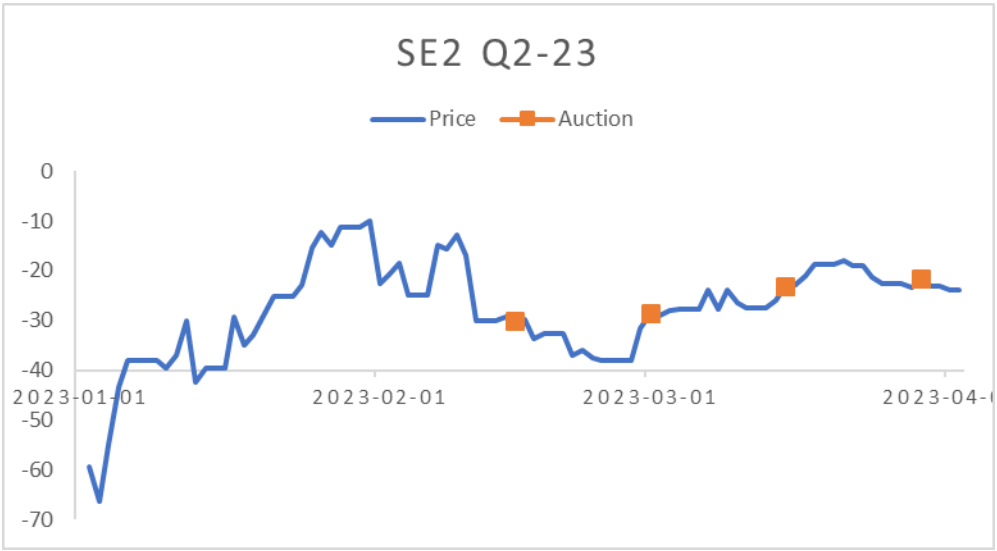


Figure 8, Closing prices for each day in the continuous market plotted together with the auction days, for SE2 Q2-23 contracts from January to March 2023.

Activity and trading in the continuous EPAD market

The model used by Svenska kraftnät in the pilot is designed primarily to add liquidity to the existing market, not to establish a parallel market or trading venue to the existing. Therefore, one of the most important long term effects of the pilot to study and evaluate will be its' impact on the continuous market.

In **Figure 9** below, we present a summary of the total trade in the EPAD contracts for SE2, SE3 and SE4 from January 2023 to the end of March 2023 that Svenska kraftnät has offered in the auctions. Trading in EPADs is generally quite limited on a day-to-day basis. This characteristic has been emphasized during 2022 and 2023 when collateral requirements have made it more expensive to trade in EPAD contracts than before. The figure illustrates the overall limited activity in the continuous market with marked added activity when auctions are performed. The 5-day moving average, which is only based on trading volumes in the continuous market, indicates an increase during March.

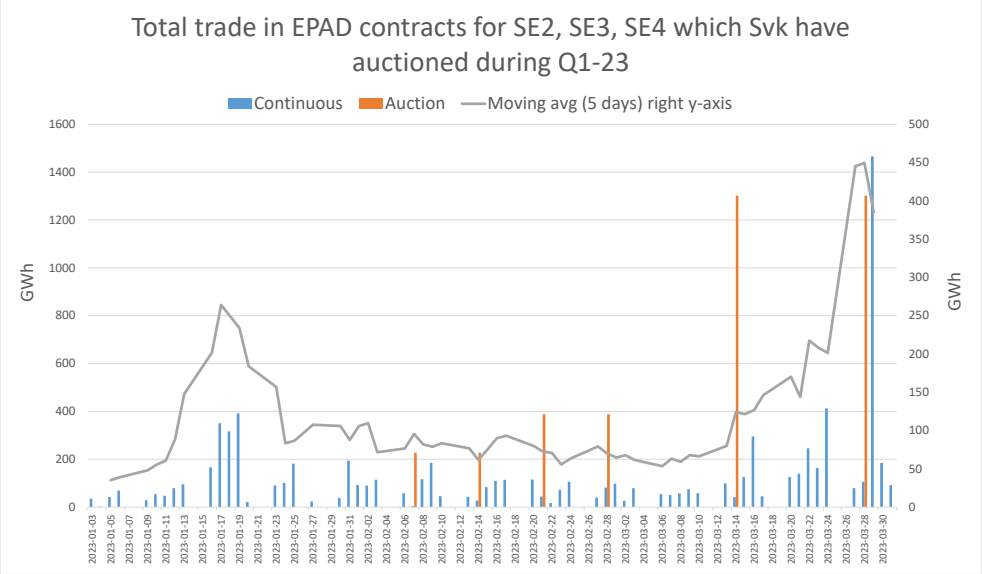


Figure 9, Total trade in EPAD contracts for SE2, SE3, and SE4 from January 2023 to the end of March 2023.

Open Interest

Open interest is the total number of (e.g. EPAD-futures) contracts held by market participants at the end of the trading day. Open interest is calculated by adding all the contracts from opened trades and subtracting the contracts when a trade is closed by a market participant. Open interest is not the same as traded volume, as traded volume increases by both entries and exits while open interest increases by entries and decreases by exits.

Figure 10 shows the development in the continuous market of the SE3 yearly contract (YR-24). The figure indicates that open interest has risen during the period. The line in the graph shows the open interest for SE3 YR24 contracts, and the auction dates are shown with orange marks in the graph.

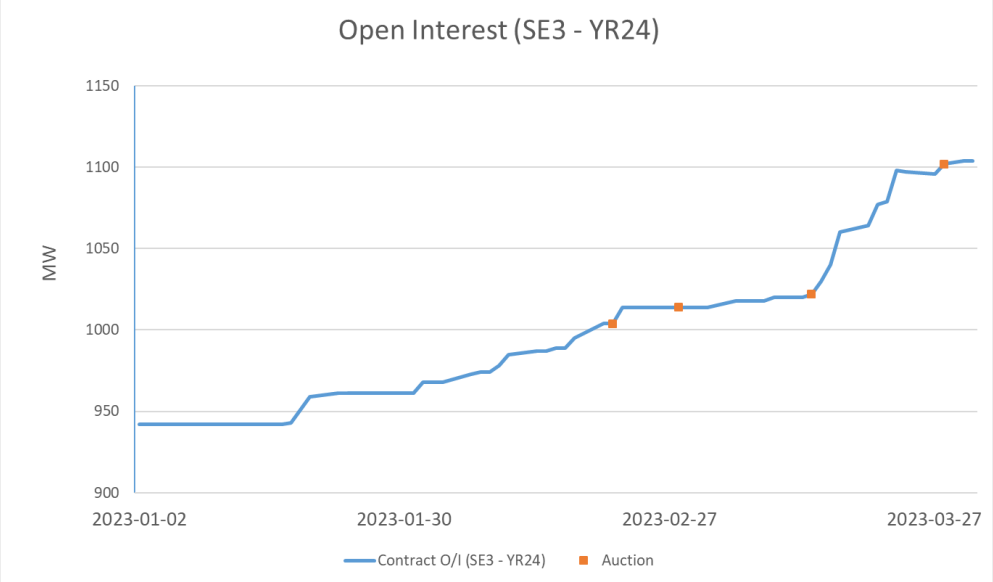


Figure 10, Open interest in SE3 YR24 EPAD contract.

Causality, implying a form of necessity in the relationship between EPAD-auctions and rising open interest cannot be demonstrated, but overall, the open interest is commonly used as an indicator of liquidity and market activity. As mentioned above, Svenska kraftnät does not have any open positions in SE3. In addition, Svenska kraftnät has only auctioned a limited volume in yearly (YR-24) contracts during this period (purchase of 30 MW plus sales of 30 MW) in bidding zone SE3.

Conclusions

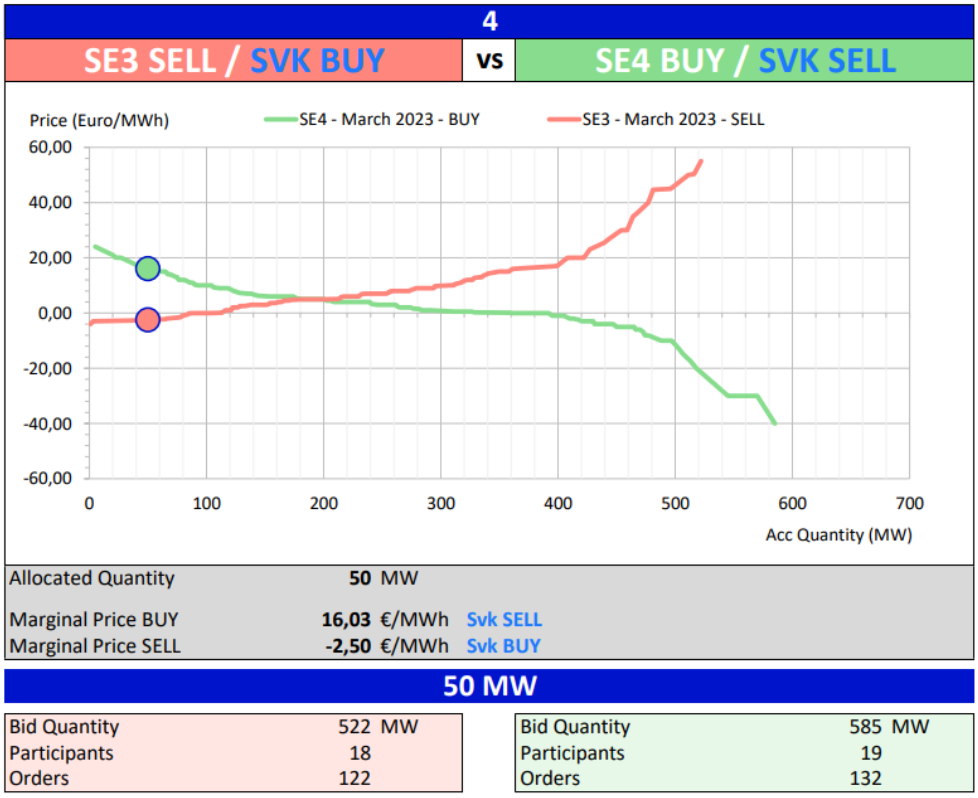
This report covers only the first two months of the EPAD auctioning pilot. Although interesting developments can already be observed, it is still considered too early to draw any firm conclusions on the EPAD auctions' effects on the market. This report serves primarily to identify some early indications, which can be more thoroughly analyzed in subsequent reports.

An important observation is that the first quarter of 2023 is characterized by a market slowly adjusting from 12-15 months of severe disruption and turbulence. Some of the positive developments during these three months can therefore likely be attributed to a general improvement in overall market conditions.

Appendix I

This appendix provides the complete compilation of reports that have been published by SKM in conjunction with each performed auction during Q1 2023[3].

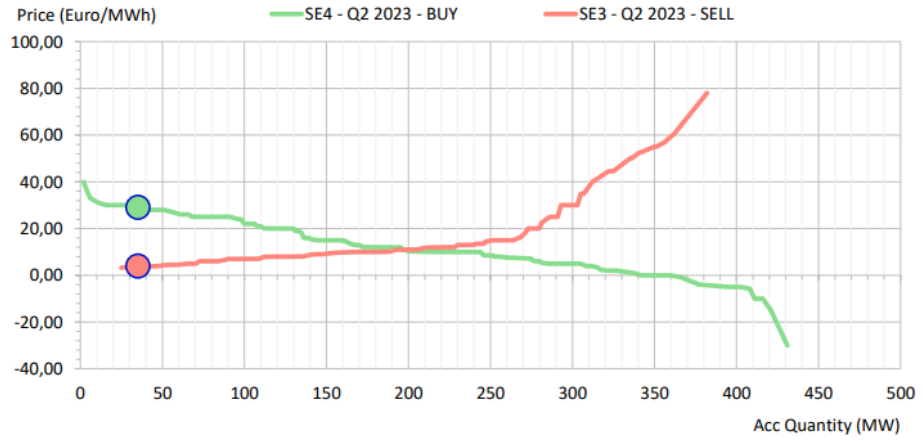
07 Feb 2023, MAR-23 (SE3-SE4)



[3] These reports are continuously published at www.skm.se

07 Feb 2023, Q2-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



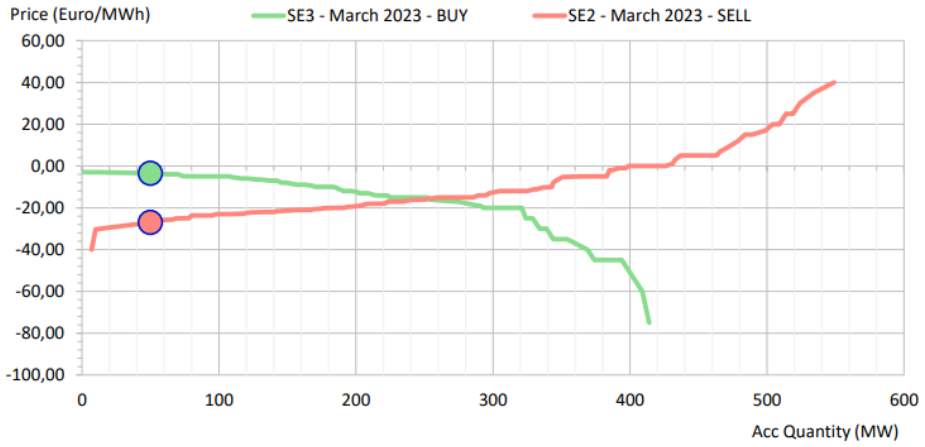
Allocated Quantity	**35**	MW	
Marginal Price BUY	**29,03**	€/MWh	Svk SELL
Marginal Price SELL	**3,89**	€/MWh	Svk BUY

35 MW

Bid Quantity	382	MW	Bid Quantity	431	MW
Participants	18		Participants	20	
Orders	100		Orders	134	

14 Feb 2023, MAR-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



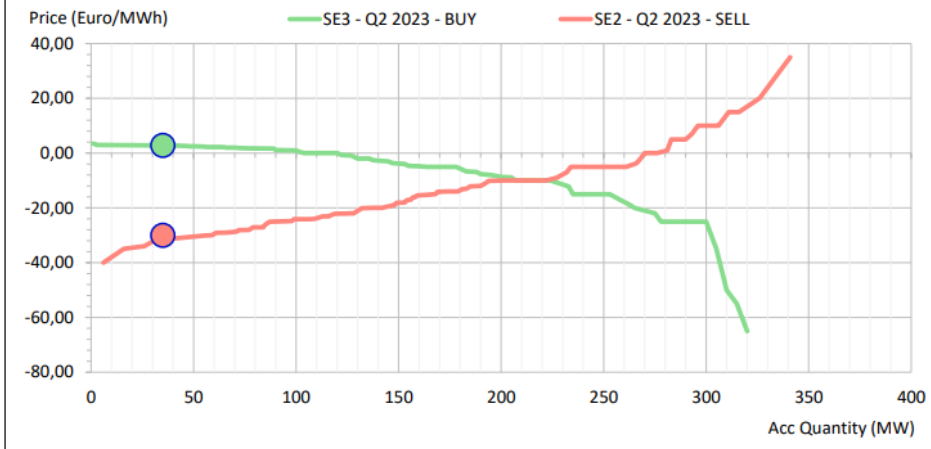
Allocated Quantity	**50** MW	
Marginal Price BUY	**-3,50** €/MWh	Svk SELL
Marginal Price SELL	**-27,06** €/MWh	Svk BUY

50 MW

Bid Quantity	549	MW	Bid Quantity	414	MW
Participants	17		Participants	14	
Orders	104		Orders	80	

14 Feb 2023, Q2-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



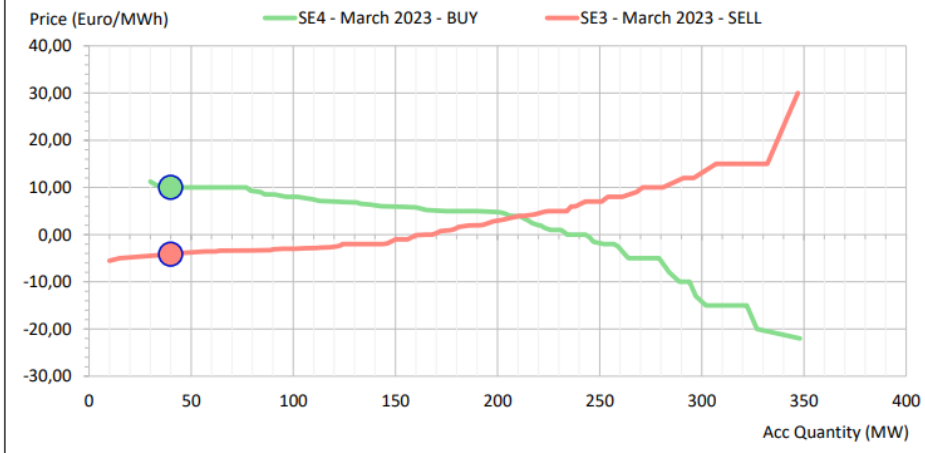
Allocated Quantity	**35**	MW	
Marginal Price BUY	**2,75**	€/MWh	Svk SELL
Marginal Price SELL	**-30,08**	€/MWh	Svk BUY

35 MW

Bid Quantity	341	MW	Bid Quantity	320	MW
Participants	16		Participants	16	
Orders	85		Orders	78	

21 Feb 2023, MAR-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



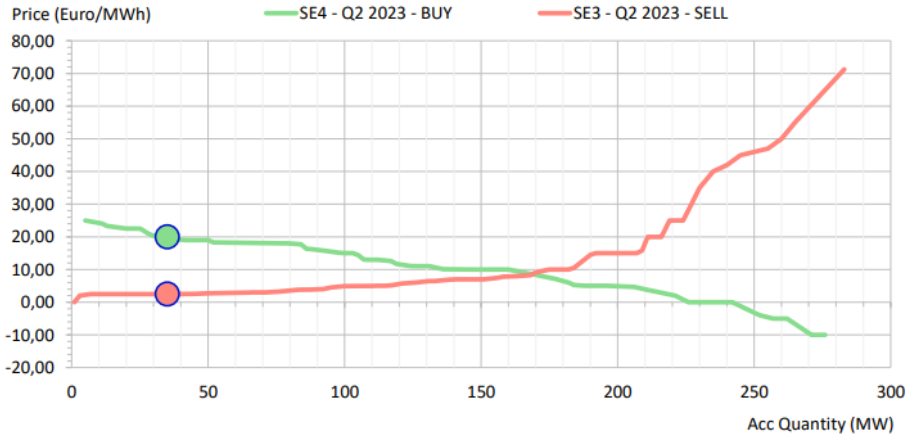
Allocated Quantity	**40**	MW	
Marginal Price BUY	**10,00**	€/MWh	Svk SELL
Marginal Price SELL	**-4,15**	€/MWh	Svk BUY

40 MW

Bid Quantity	347	MW	Bid Quantity	348	MW
Participants	13		Participants	11	
Orders	71		Orders	65	

21 Feb 2023, Q2-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



Allocated Quantity	**35** MW	
Marginal Price BUY	**20,00** €/MWh	Svk SELL
Marginal Price SELL	**2,49** €/MWh	Svk BUY

35 MW

Bid Quantity	283 MW		Bid Quantity	276 MW
Participants	12		Participants	13
Orders	59		Orders	64

21 Feb 2023, YR-24 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL

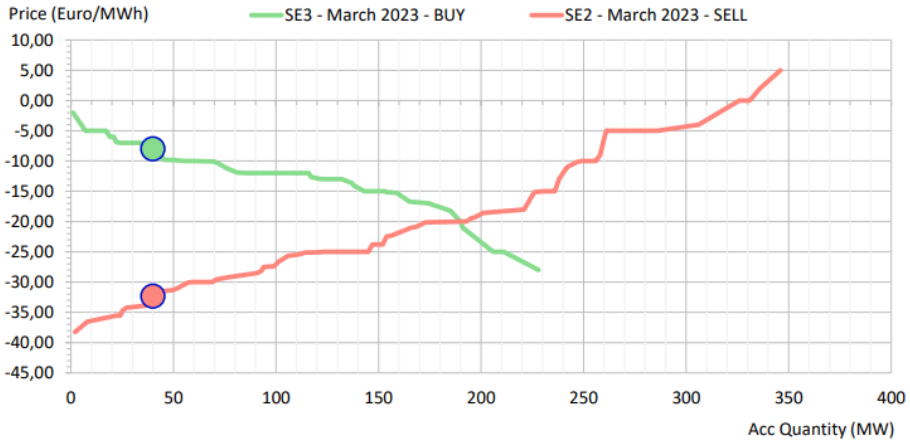
Allocated Quantity	**10**	MW	
Marginal Price BUY	**31,50**	€/MWh	Svk SELL
Marginal Price SELL	**0,85**	€/MWh	Svk BUY

10 MW

Bid Quantity	97	MW	Bid Quantity	80	MW
Participants	13		Participants	14	
Orders	46		Orders	43	

28 Feb 2023, MAR-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL

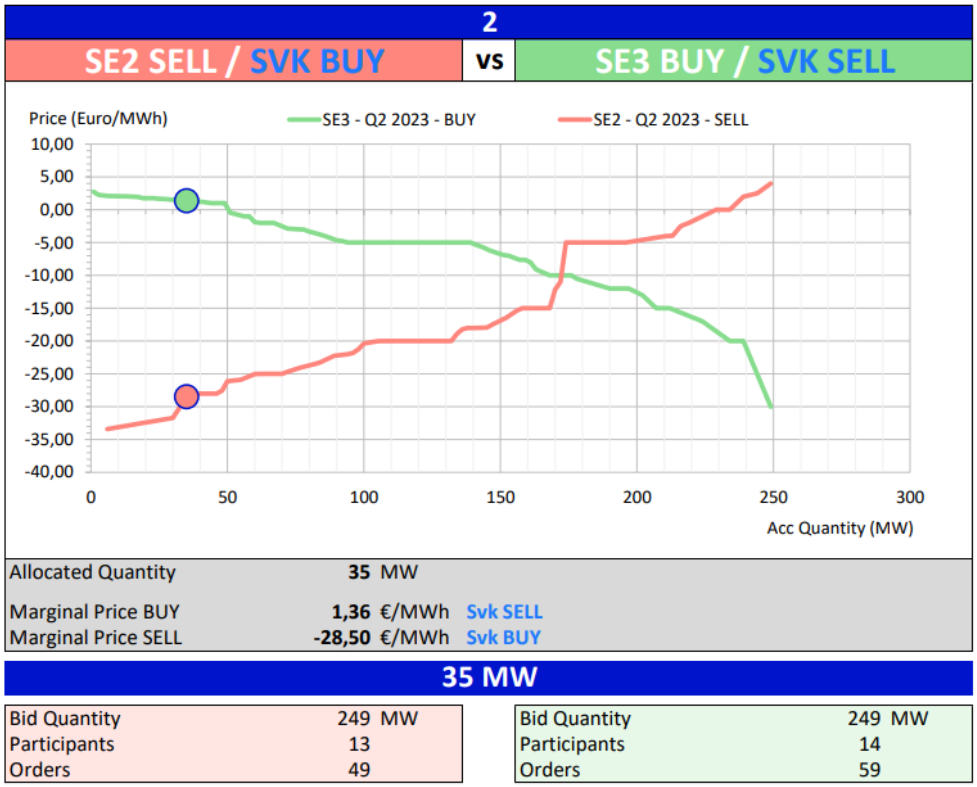


Allocated Quantity	**40**	MW	
Marginal Price BUY	**-8,00**	€/MWh	Svk SELL
Marginal Price SELL	**-32,33**	€/MWh	Svk BUY

40 MW

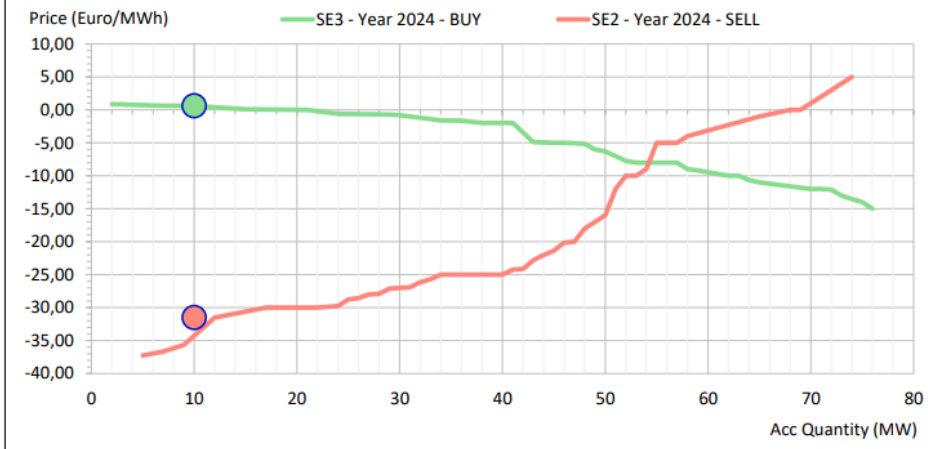
Bid Quantity	346	MW	Bid Quantity	228	MW
Participants	16		Participants	10	
Orders	67		Orders	47	

28 Feb 2023, Q2-23 (SE2-SE3)



28 Feb 2023,YR-24 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



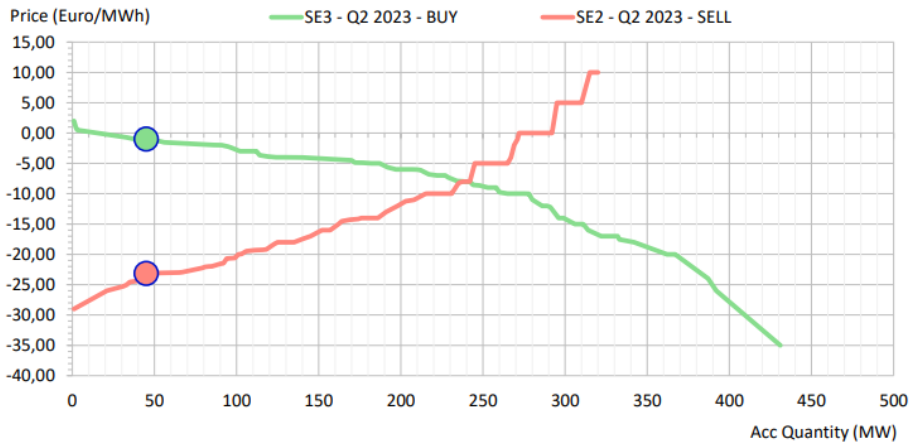
Allocated Quantity	**10** MW	
Marginal Price BUY	**0,61** €/MWh	Svk SELL
Marginal Price SELL	**-31,50** €/MWh	Svk BUY

10 MW

Bid Quantity	74 MW		Bid Quantity	76 MW
Participants	10		Participants	12
Orders	40		Orders	47

14 Mar 2023, Q2-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



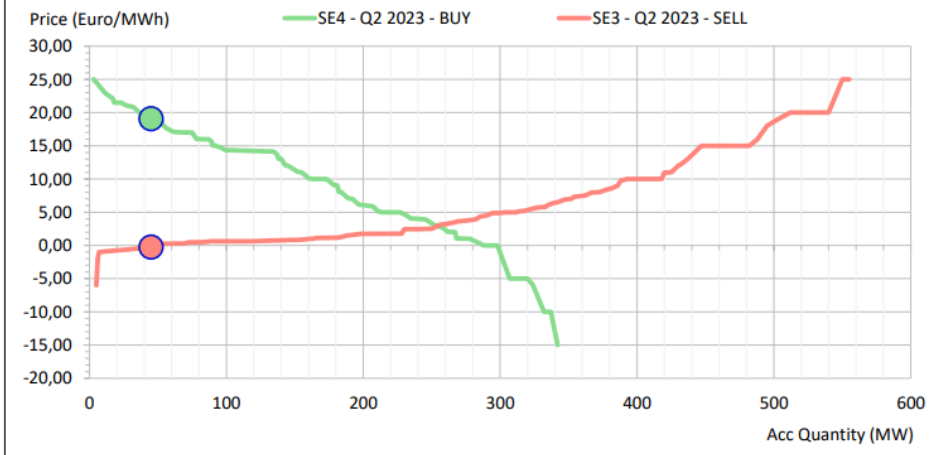
Allocated Quantity	**45**	MW	
Marginal Price BUY	**-1,00**	€/MWh	Svk SELL
Marginal Price SELL	**-23,15**	€/MWh	Svk BUY

45 MW

Bid Quantity	320	MW	Bid Quantity	431	MW
Participants	13		Participants	14	
Orders	73		Orders	67	

14 Mar 2023, Q2-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



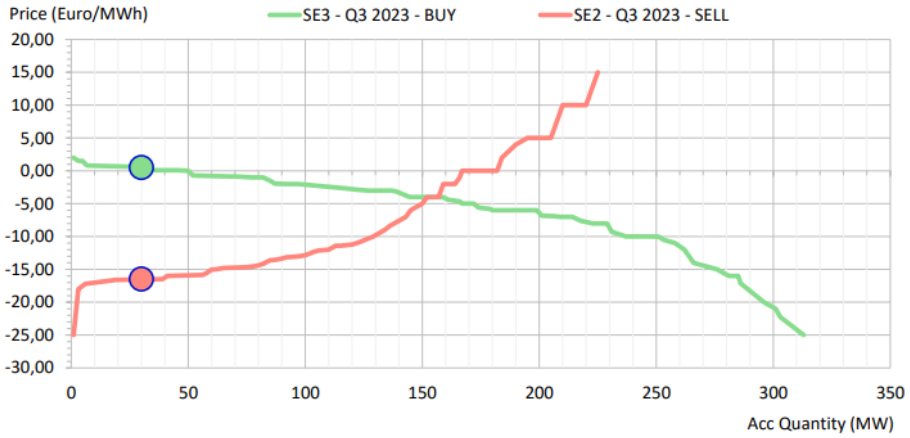
Allocated Quantity	**45**	MW	
Marginal Price BUY	**19,06**	€/MWh	Svk SELL
Marginal Price SELL	**-0,26**	€/MWh	Svk BUY

45 MW

Bid Quantity	555	MW	Bid Quantity	342	MW
Participants	15		Participants	13	
Orders	91		Orders	90	

14 Mar 2023, Q3-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



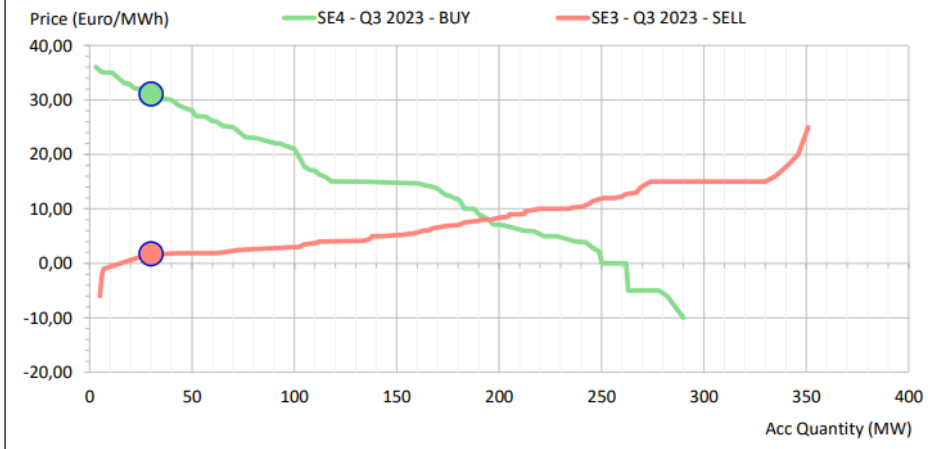
Allocated Quantity	**30** MW	
Marginal Price BUY	**0,50** €/MWh	Svk SELL
Marginal Price SELL	**-16,50** €/MWh	Svk BUY

30 MW

Bid Quantity	225 MW		Bid Quantity	313 MW
Participants	11		Participants	16
Orders	61		Orders	65

14 Mar 2023, Q3-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



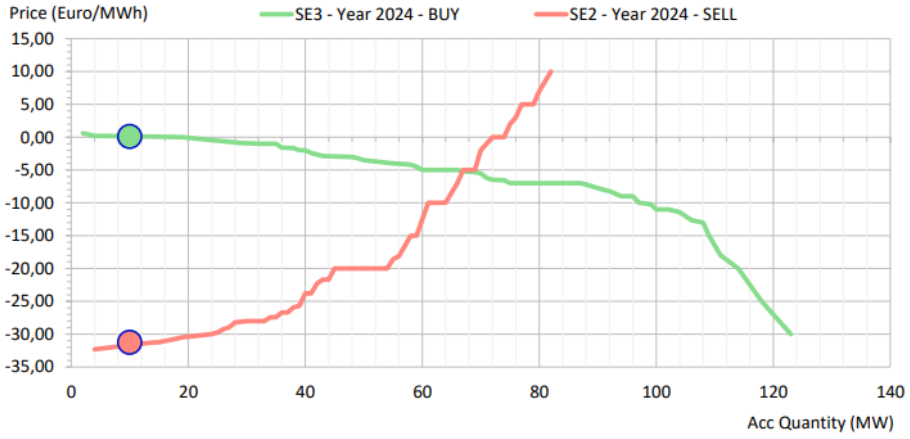
Allocated Quantity	**30**	MW	
Marginal Price BUY	**31,06**	€/MWh	Svk SELL
Marginal Price SELL	**1,73**	€/MWh	Svk BUY

30 MW

Bid Quantity	351	MW	Bid Quantity	290	MW
Participants	12		Participants	15	
Orders	65		Orders	77	

14 Mar 2023, YR-24 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



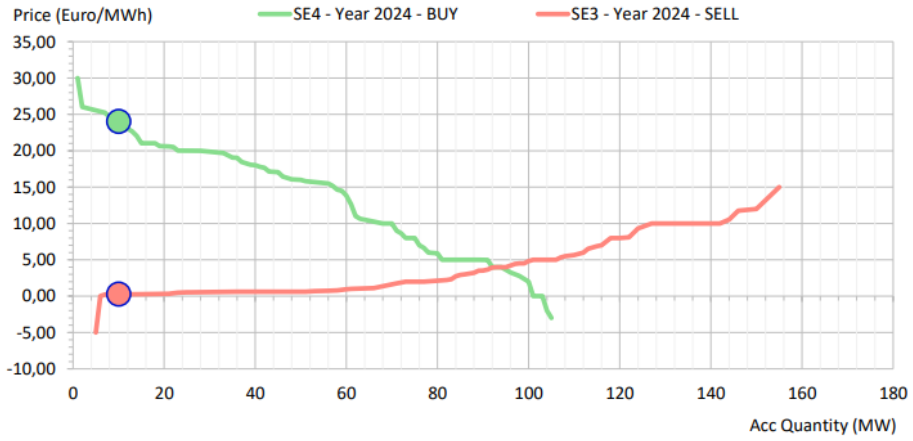
Allocated Quantity	**10** MW	
Marginal Price BUY	**0,10** €/MWh	Svk SELL
Marginal Price SELL	**-31,25** €/MWh	Svk BUY

10 MW

Bid Quantity	82 MW		Bid Quantity	123 MW
Participants	10		Participants	13
Orders	48		Orders	50

14 Mar 2023, YR-24 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



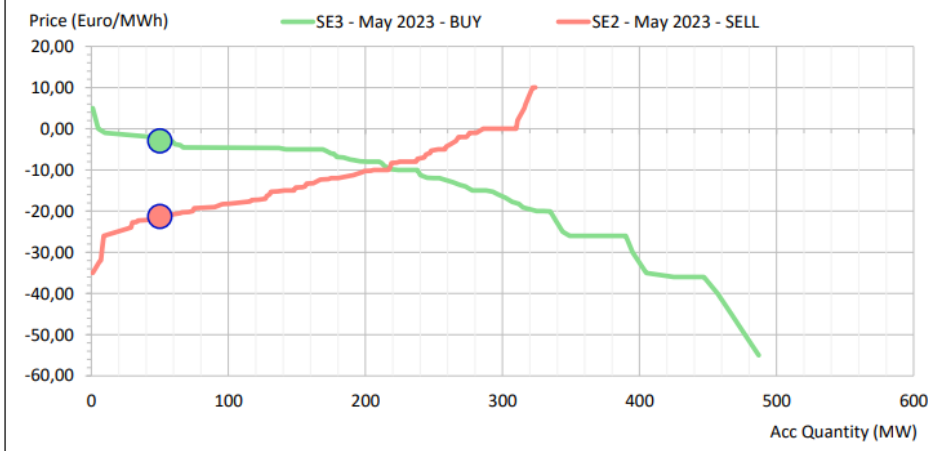
Allocated Quantity	**10** MW	
Marginal Price BUY	**24,02** €/MWh	Svk SELL
Marginal Price SELL	**0,28** €/MWh	Svk BUY

10 MW

Bid Quantity	155 MW		Bid Quantity	105 MW
Participants	14		Participants	15
Orders	57		Orders	63

14 Mar 2023, MAY-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



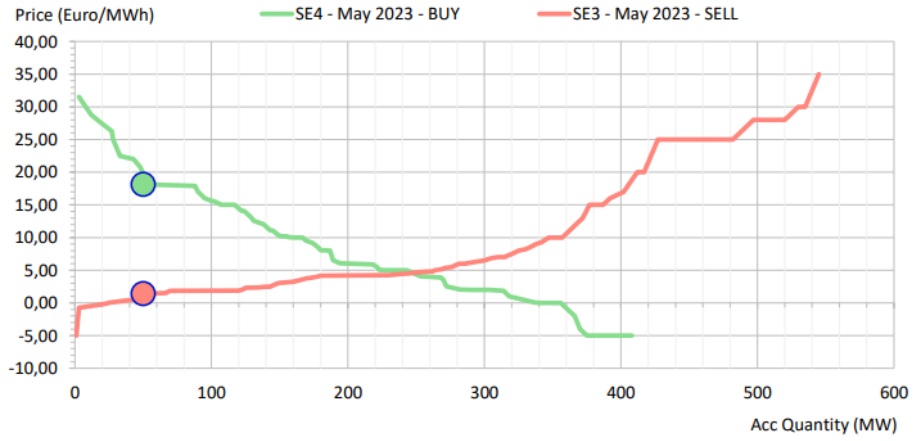
Allocated Quantity	**50** MW	
Marginal Price BUY	**-3,00** €/MWh	Svk SELL
Marginal Price SELL	**-21,30** €/MWh	Svk BUY

50 MW

Bid Quantity	324 MW		Bid Quantity	487 MW
Participants	13		Participants	13
Orders	83		Orders	68

14 Mar 2023, MAY-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



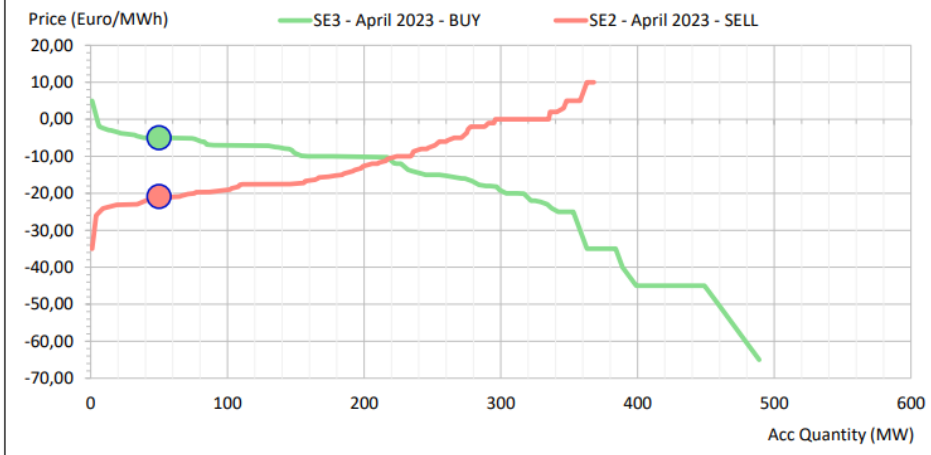
Allocated Quantity	**50**	MW	
Marginal Price BUY	**18,12**	€/MWh	Svk SELL
Marginal Price SELL	**1,43**	€/MWh	Svk BUY

50 MW

Bid Quantity	545	MW	Bid Quantity	408	MW
Participants	11		Participants	14	
Orders	79		Orders	71	

14 Mar 2023, APR-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL

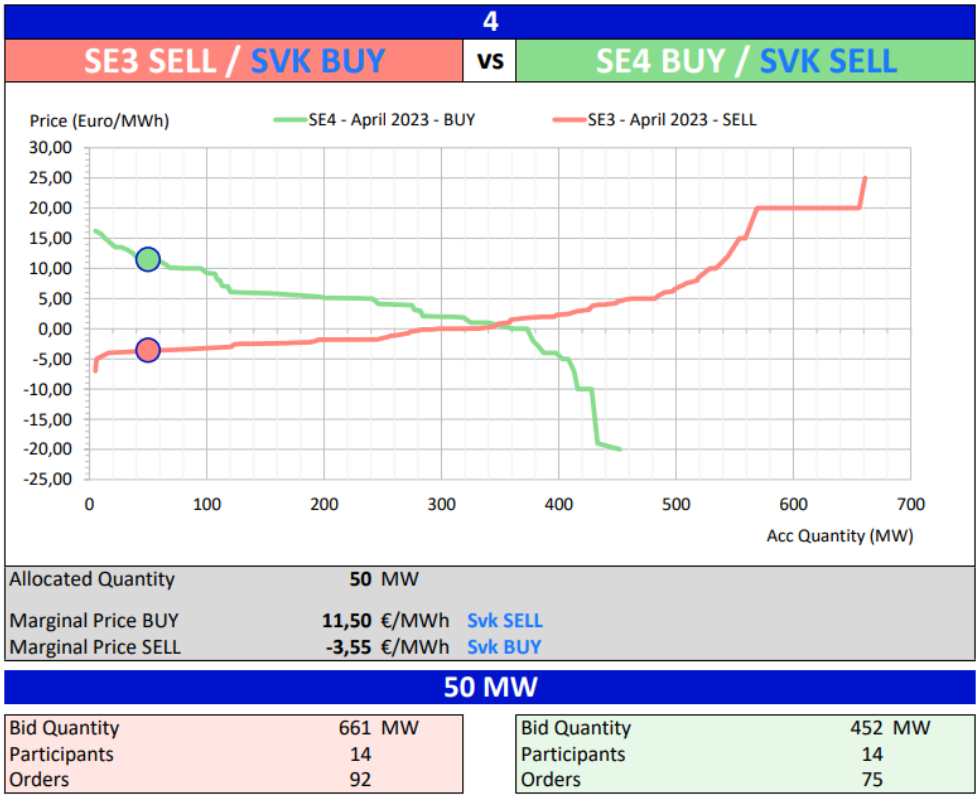


Allocated Quantity	**50**	MW	
Marginal Price BUY	**-5,00**	€/MWh	Svk SELL
Marginal Price SELL	**-20,88**	€/MWh	Svk BUY

50 MW

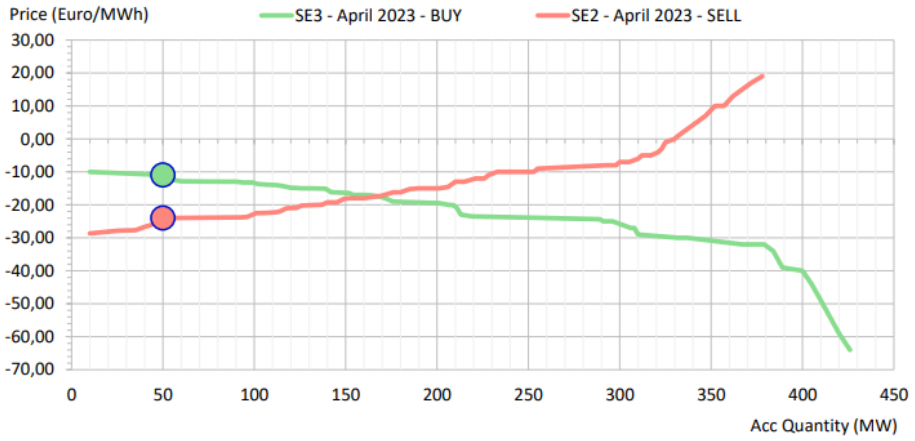
Bid Quantity	368	MW	Bid Quantity	489	MW
Participants	12		Participants	13	
Orders	83		Orders	73	

14 Mar 2023, APR-23 (SE3-SE4)



28 Mar 2023, APR-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



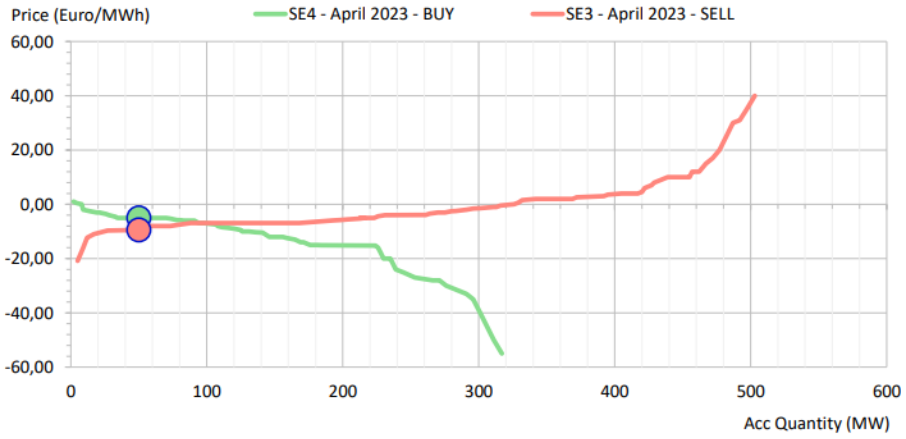
Allocated Quantity	**50** MW	
Marginal Price BUY	**-10,95** €/MWh	Svk SELL
Marginal Price SELL	**-24,02** €/MWh	Svk BUY

50 MW

Bid Quantity	378 MW		Bid Quantity	426 MW
Participants	13		Participants	12
Orders	69		Orders	56

28 Mar 2023, APR-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



Allocated Quantity	**50** MW	
Marginal Price BUY	**-5,00** €/MWh	Svk SELL
Marginal Price SELL	**-9,50** €/MWh	Svk BUY

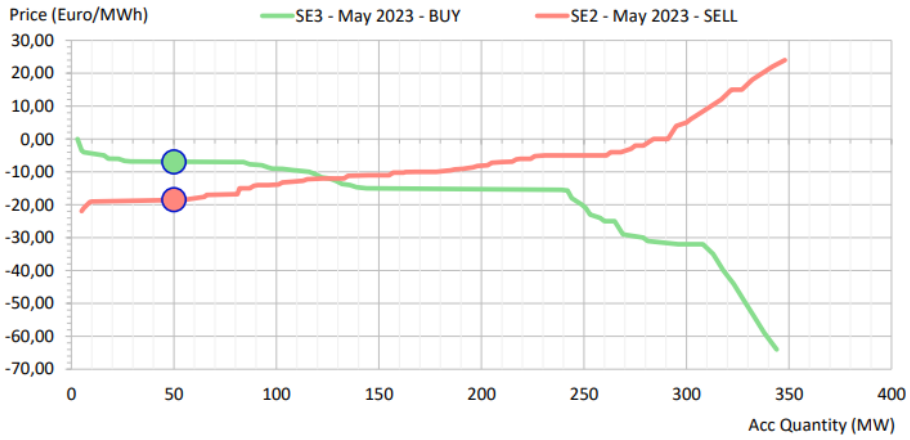
50 MW

Bid Quantity	503 MW
Participants	11
Orders	66

Bid Quantity	317 MW
Participants	12
Orders	64

28 Mar 2023, MAY-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



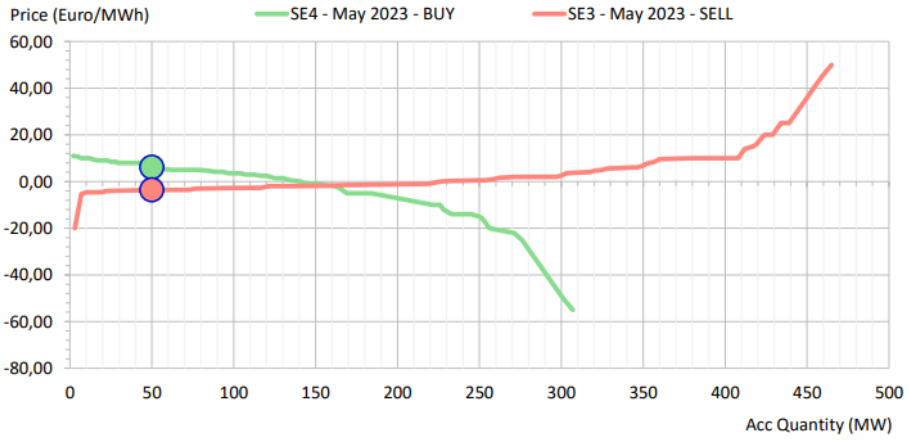
Allocated Quantity	**50**	MW	
Marginal Price BUY	**-6,99**	€/MWh	Svk SELL
Marginal Price SELL	**-18,48**	€/MWh	Svk BUY

50 MW

Bid Quantity	348	MW	Bid Quantity	344	MW
Participants	12		Participants	13	
Orders	68		Orders	50	

28 Mar 2023, MAY-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



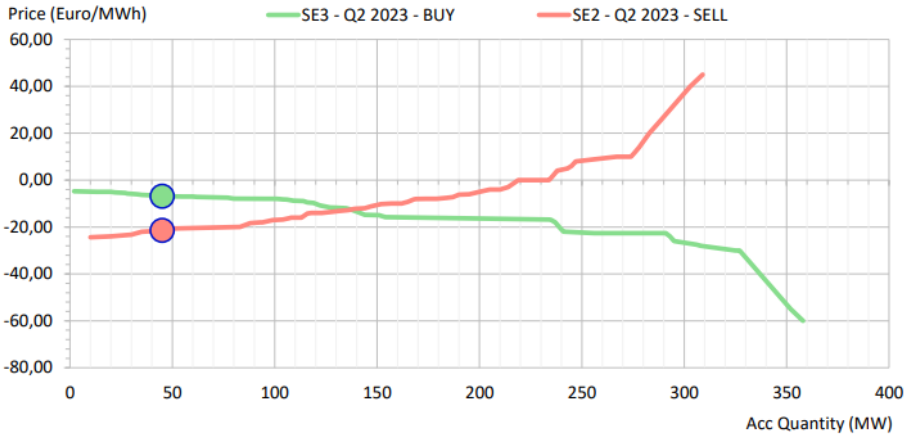
Allocated Quantity	**50** MW	
Marginal Price BUY	**6,15** €/MWh	Svk SELL
Marginal Price SELL	**-3,56** €/MWh	Svk BUY

50 MW

Bid Quantity	465 MW		Bid Quantity	307 MW
Participants	11		Participants	11
Orders	62		Orders	65

28 Mar 2023, Q2-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



Allocated Quantity	**45**	MW	
Marginal Price BUY	**-6,95**	€/MWh	Svk SELL
Marginal Price SELL	**-21,46**	€/MWh	Svk BUY

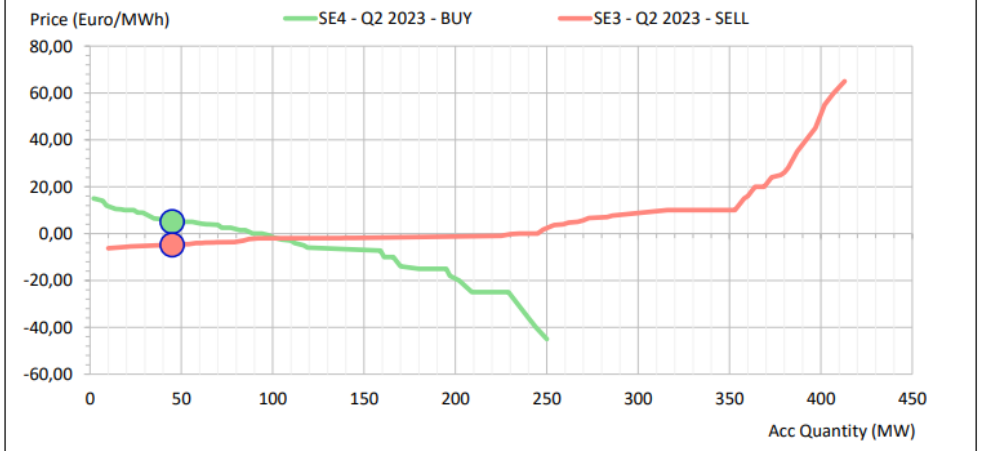
45 MW

Bid Quantity	309	MW
Participants	13	
Orders	61	

Bid Quantity	358	MW
Participants	12	
Orders	51	

28 Mar 2023, Q2-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



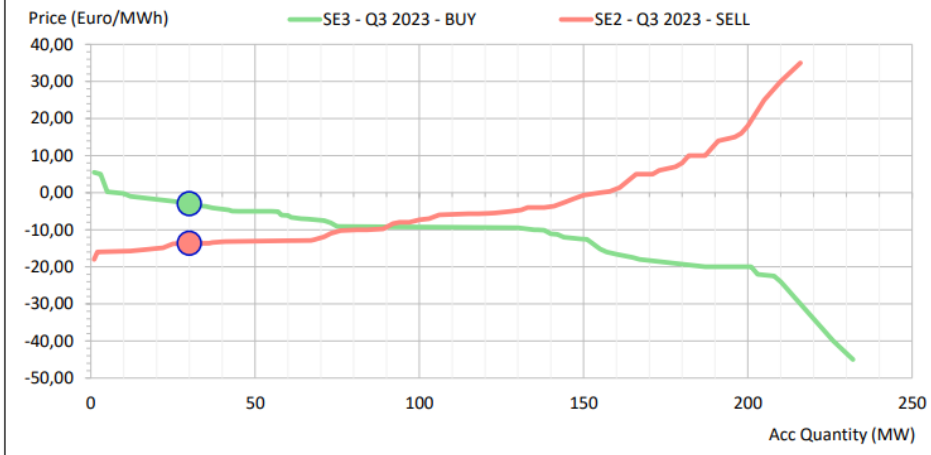
Allocated Quantity	**45** MW	
Marginal Price BUY	**5,00** €/MWh	Svk SELL
Marginal Price SELL	**-4,86** €/MWh	Svk BUY

45 MW

Bid Quantity	413 MW		Bid Quantity	250 MW
Participants	12		Participants	12
Orders	55		Orders	53

28 Mar 2023, Q3-23 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



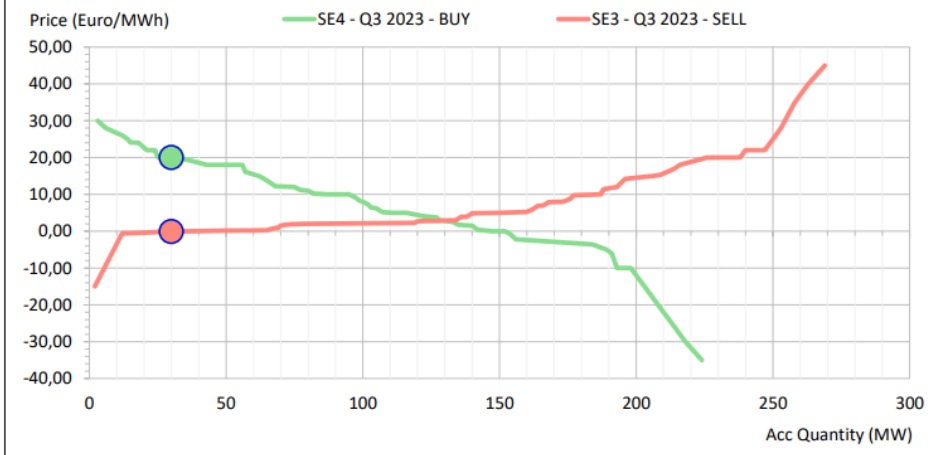
Allocated Quantity	**30**	MW	
Marginal Price BUY	**-3,00**	€/MWh	Svk SELL
Marginal Price SELL	**-13,67**	€/MWh	Svk BUY

30 MW

Bid Quantity	216	MW	Bid Quantity	232	MW
Participants	12		Participants	13	
Orders	60		Orders	52	

28 Mar 2023, Q3-23 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



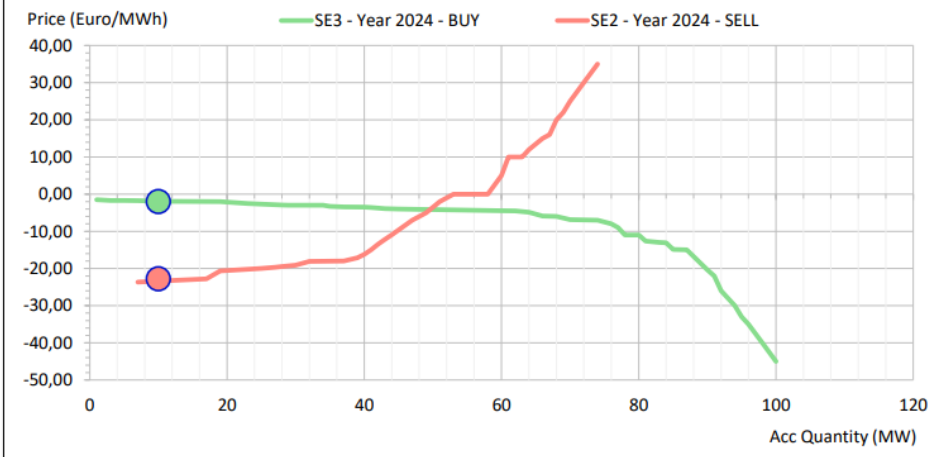
Allocated Quantity	**30**	MW	
Marginal Price BUY	**20,00**	€/MWh	Svk SELL
Marginal Price SELL	**-0,10**	€/MWh	Svk BUY

30 MW

Bid Quantity	269	MW	Bid Quantity	224	MW
Participants	12		Participants	14	
Orders	56		Orders	66	

28 Mar 2023, YR-24 (SE2-SE3)

2		
SE2 SELL / SVK BUY	vs	SE3 BUY / SVK SELL



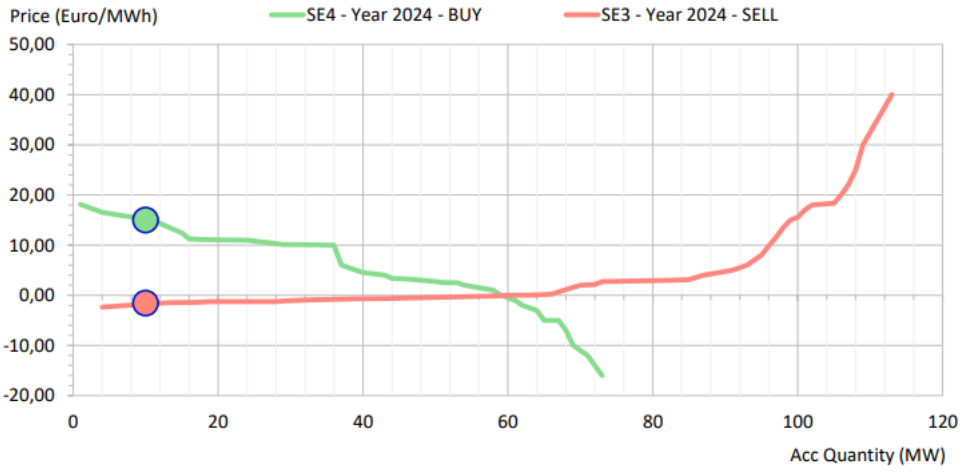
Allocated Quantity	**10**	MW	
Marginal Price BUY	**-1,99**	€/MWh	Svk SELL
Marginal Price SELL	**-22,78**	€/MWh	Svk BUY

10 MW

Bid Quantity	74	MW	Bid Quantity	100	MW
Participants	8		Participants	13	
Orders	33		Orders	46	

28 Mar 2023, YR-24 (SE3-SE4)

4		
SE3 SELL / SVK BUY	vs	SE4 BUY / SVK SELL



Allocated Quantity	**10**	MW	
Marginal Price BUY	**15,00**	€/MWh	Svk SELL
Marginal Price SELL	**-1,56**	€/MWh	Svk BUY

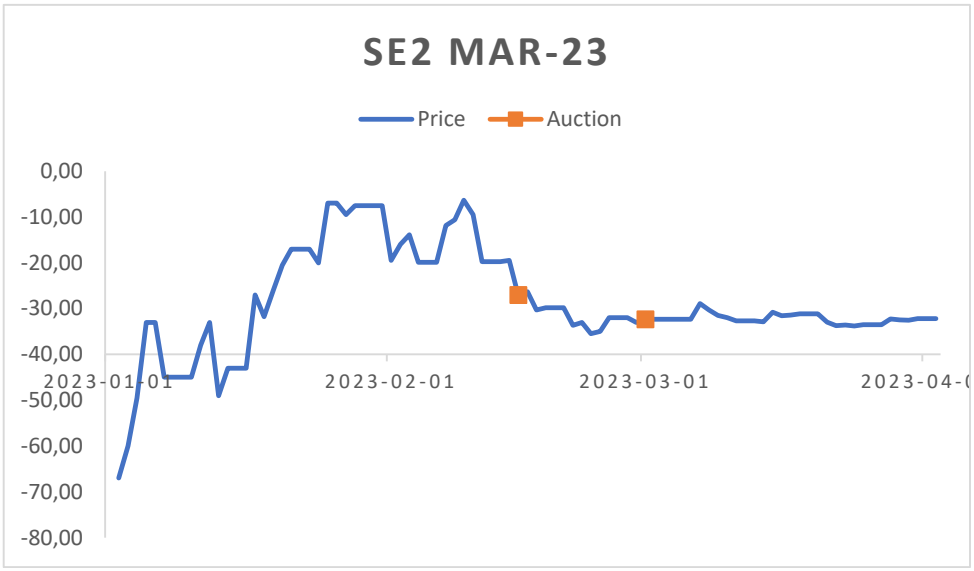
10 MW

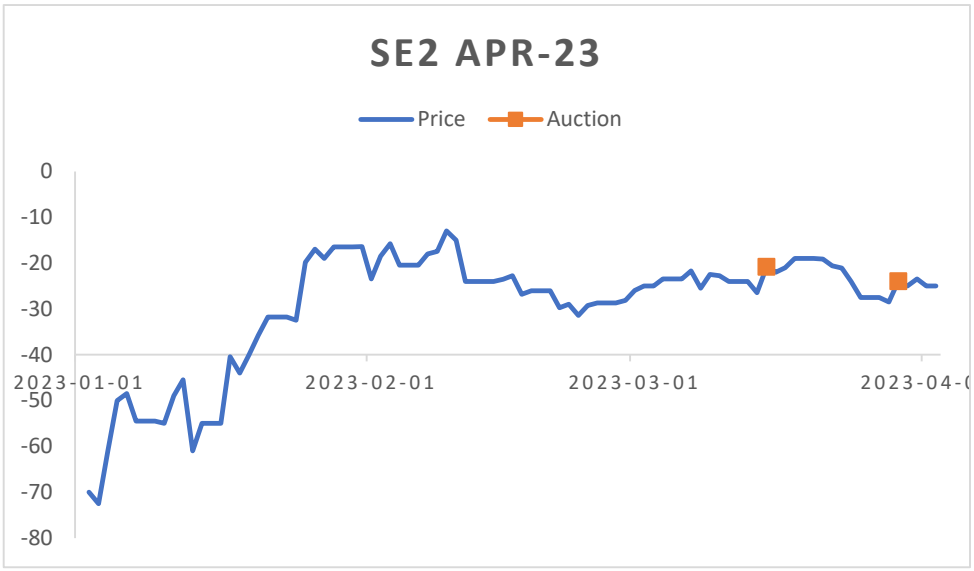
Bid Quantity	113	MW	Bid Quantity	73	MW
Participants	13		Participants	10	
Orders	46		Orders	36	

Appendix II

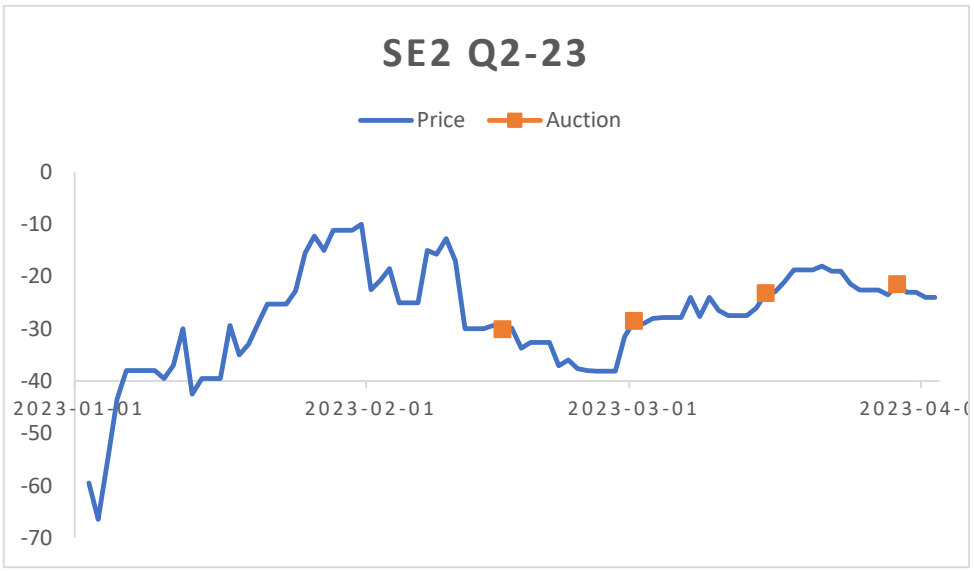
This appendix provides graphs that illustrate the daily closing prices of the continuous EPAD market and the points in time when auctions have been performed.

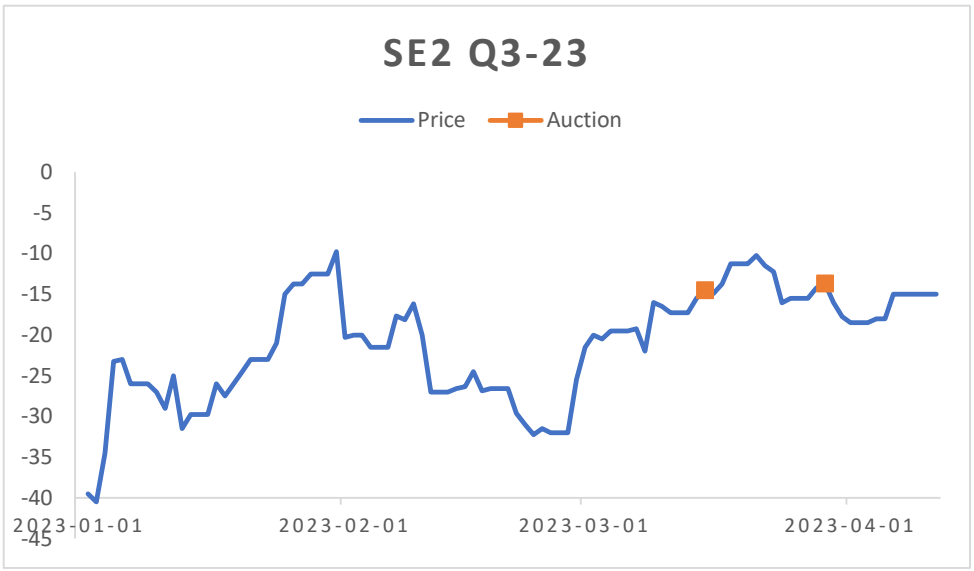
Auctions performed for EPAD contracts relating to SE2

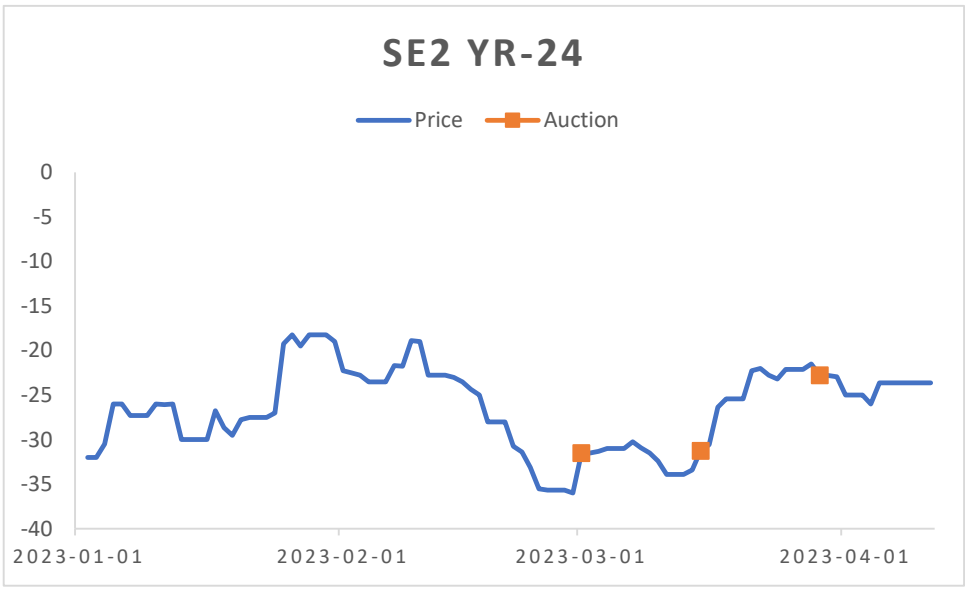




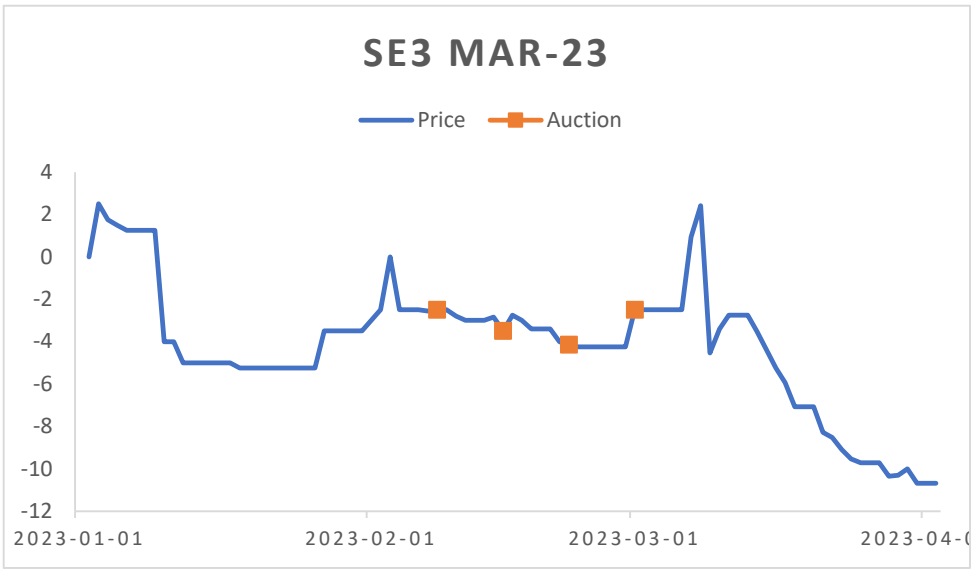

SE2 MAY-23
Price
Auction
0
-10
-20
-30
-40
-50
-60
-70
2023-01-01
2023-02-01
2023-03-01
2023-04-

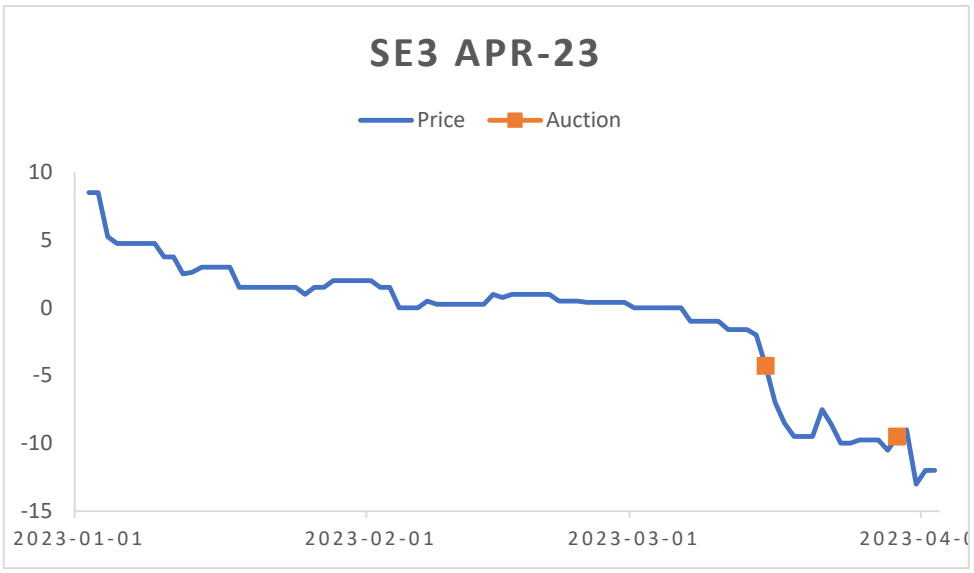

SE2 Q2-23
Price
Auction
0
-10
-20
-30
-40
-50
-60
-70
2023-01-01
2023-02-01
2023-03-01
2023-04-

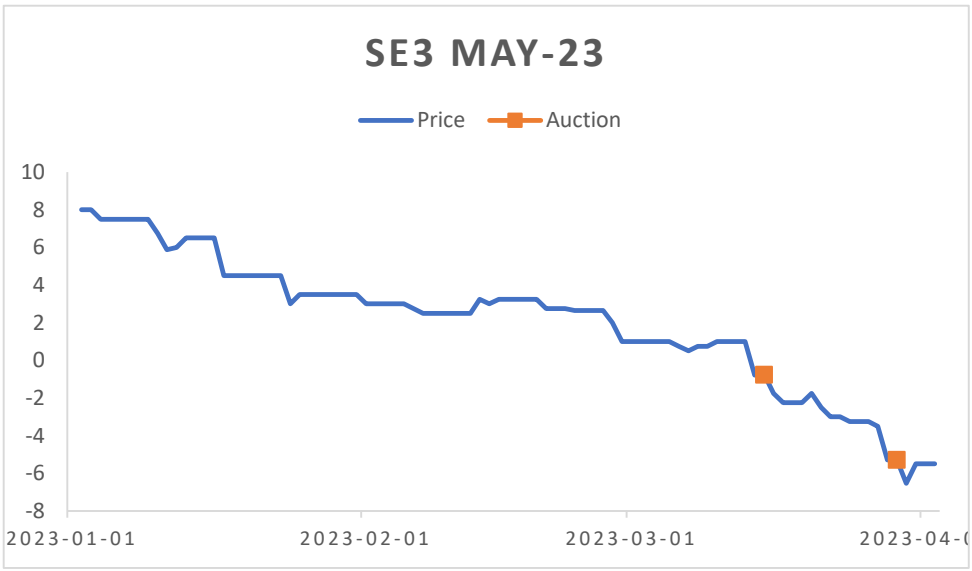

SE2 Q3-23
Price
Auction
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
2023-01-01
2023-02-01
2023-03-01
2023-04-01

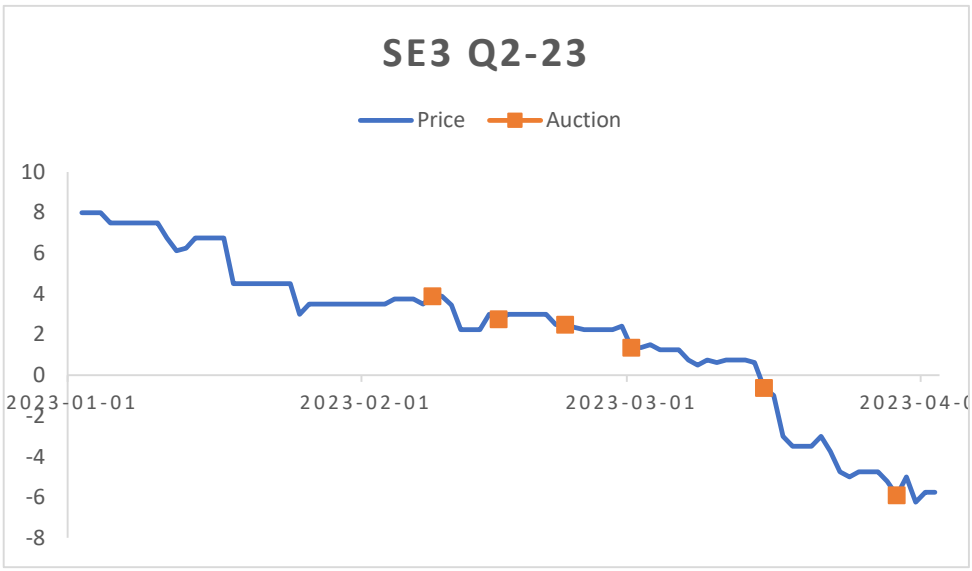

SE2 YR-24
Price
Auction
0
-5
-10
-15
-20
-25
-30
-35
-40
2023-01-01
2023-02-01
2023-03-01
2023-04-01

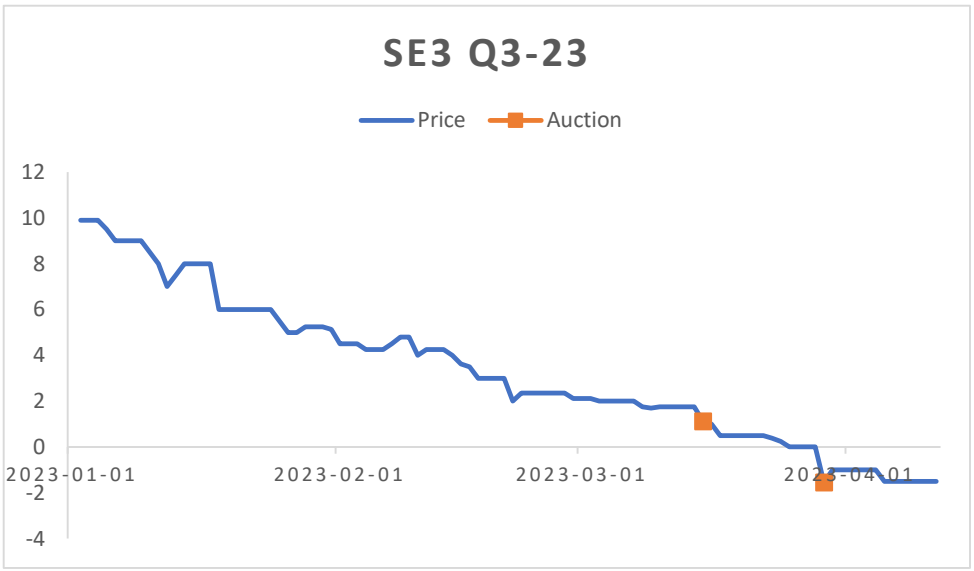
Auctions performed for EPAD contracts relating to SE3

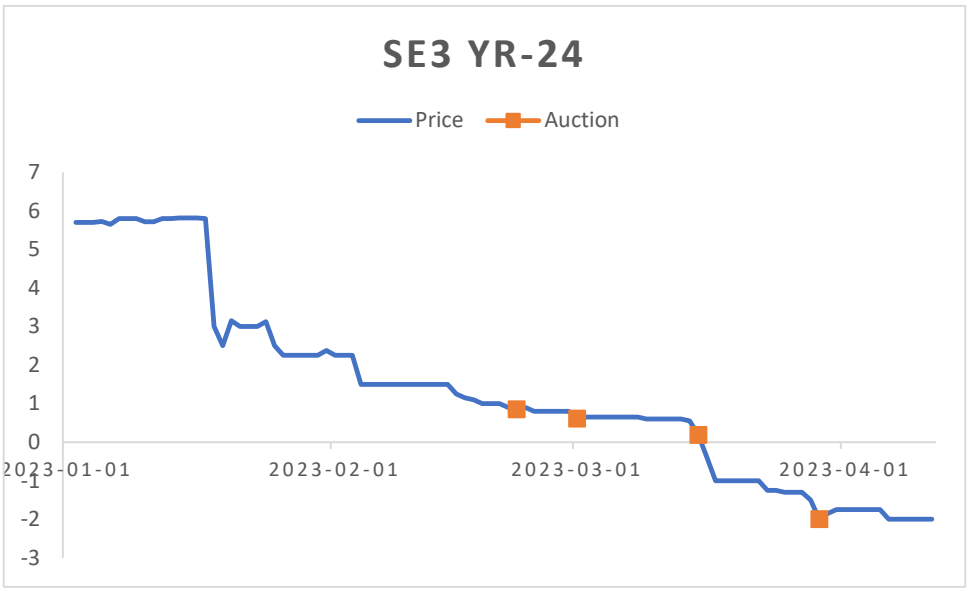




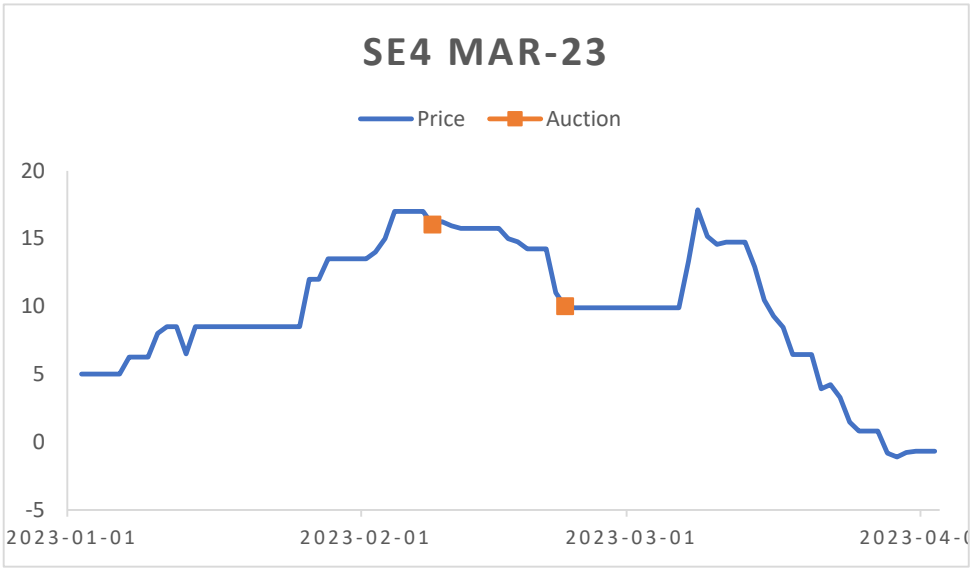

SE3 MAY-23
Price
Auction
10
8
6
4
2
0
-2
-4
-6
-8
2023-01-01
2023-02-01
2023-03-01
2023-04-

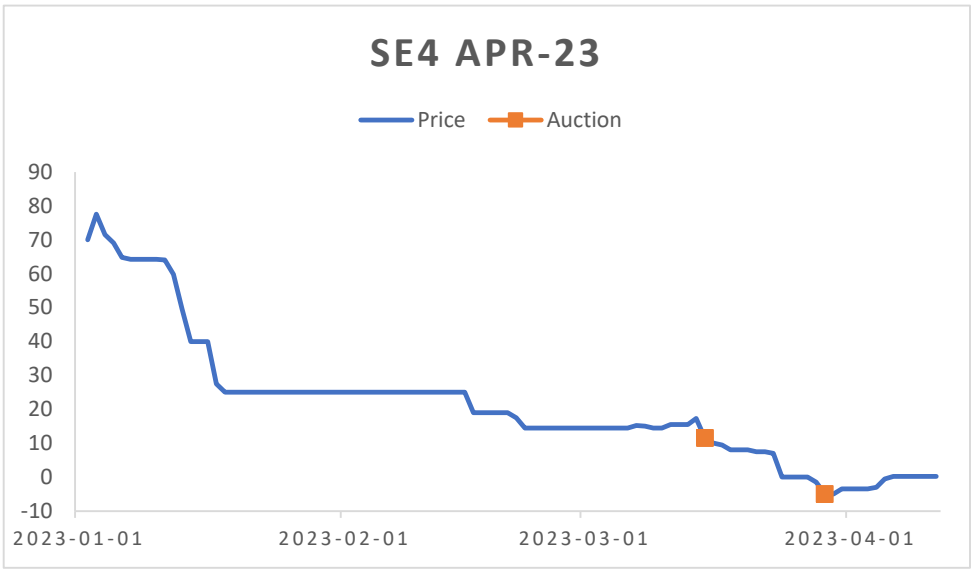

SE3 Q2-23
Price
Auction
10
8
6
4
2
0
-2
-4
-6
-8
2023-01-01
2023-02-01
2023-03-01
2023-04-

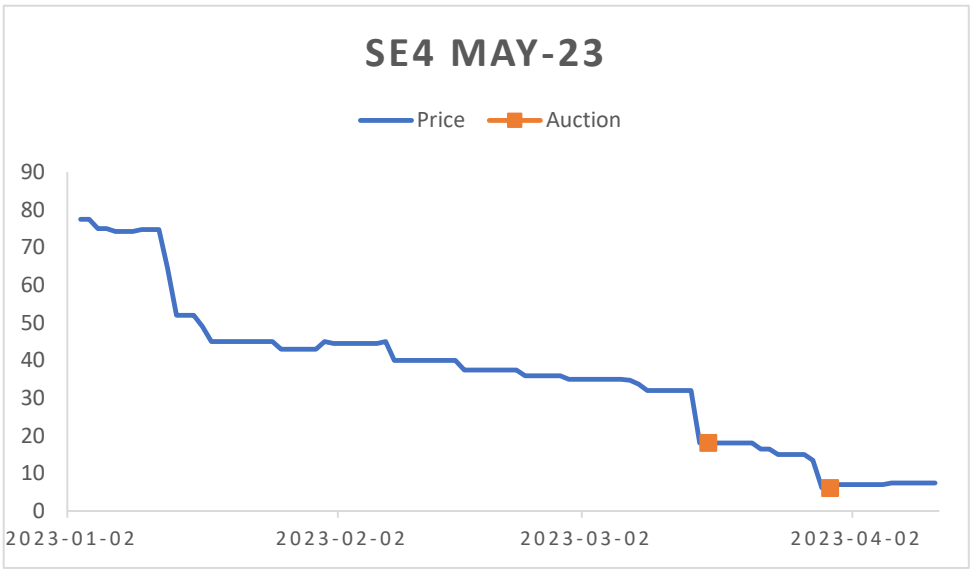

SE3 Q3-23
Price
Auction
12
10
8
6
4
2
0
-2
-4
2023-01-01
2023-02-01
2023-03-01
2023-04-01

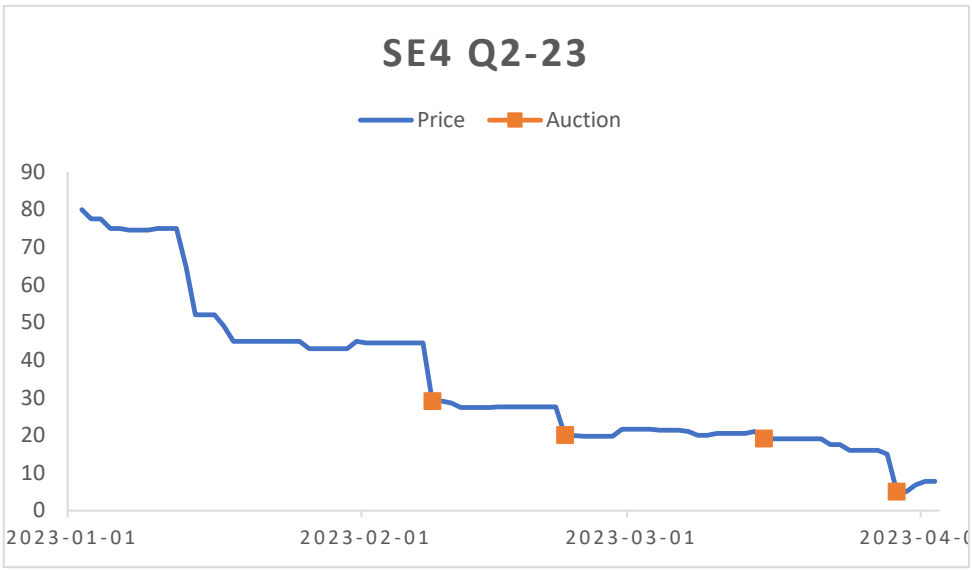

SE3 YR-24
Price
Auction
7
6
5
4
3
2
1
0
-1
-2
-3
2023-01-01
2023-02-01
2023-03-01
2023-04-01

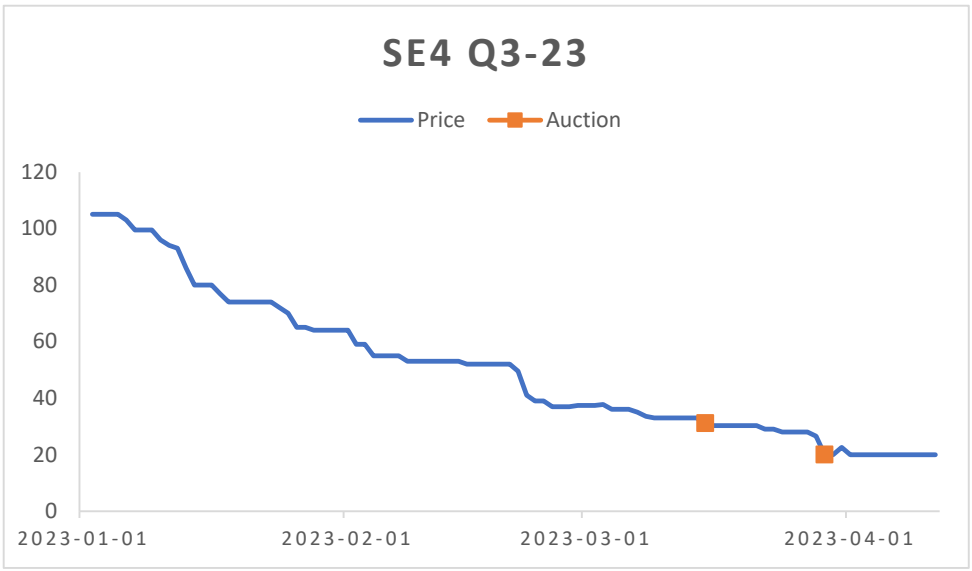
Auctions performed for EPAD contracts relating to SE4

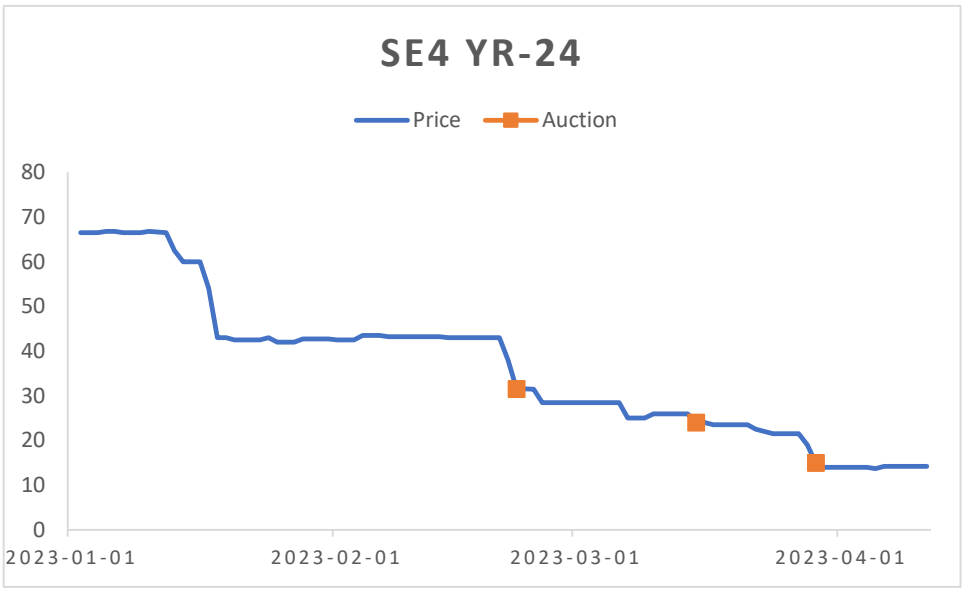





SE4 MAY-23
Price
Auction
90
80
70
60
50
40
30
20
10
0
2023-01-02
2023-02-02
2023-03-02
2023-04-02


SE4 Q2-23
Price
Auction
90
80
70
60
50
40
30
20
10
0
2023-01-01
2023-02-01
2023-03-01


SE4 Q3-23
Price
Auction
120
100
80
60
40
20
0
2023-01-01
2023-02-01
2023-03-01
2023-04-01


SE4 YR-24
Price
Auction
80
70
60
50
40
30
20
10
0
2023-01-01
2023-02-01
2023-03-01
2023-04-01

Svenska kraftnät is a state owned enterprise with the task of maintaining Sweden's electricity transmission grid, which consists of about 16,000 kilometres of 400 kV and 220 kV transmission lines with substations and interconnectors. Svenska kraftnät is also the system operator for electricity in Sweden. Svenska kraftnät is developing the transmission grid and the electricity market to meet society's need for a secure, sustainable and cost-effective supply of electricity. In this, Svenska kraftnät plays an important role in implementing national climate policies.

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