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

Q2 2023

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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Org. No 202 100-4284

Svenska kraftnät
Box 1200
172 24 Sundbyberg
Sturegatan 1

Phone: +46 10-475 80 00

Fax: +46 10-475 89 50

www.svk.se

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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. 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.

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.



During the pilot project, Svenska kraftnät has limited the volume of outstanding contracts to approximately 10 percent of the expected available physical capacity in the day-ahead market coupling for 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 are published quarterly in the form of short reports, of which this is the second one and refers to the second quarter of 2023.

Introduction

Electricity prices and bidding zones

The spot price of electricity varies between bidding zones, and price differences sometimes depends on the transmission capacity of the power grid. For example, the spot price is usually lower in Norrland (the northern part of Sweden, i.e. SE1 and SE2) due to relatively low demand while supply is high as most hydropower plants are located in the northern parts of Sweden. Most of Sweden's larger wind farms are also located in Norrland. In 2022, there were record high spot prices for electricity in Sweden. The first half of 2023 was partly characterized by continued comparatively high spot prices for electricity, especially in SE3 and SE4. For example, the spot price averaged SEK 0.92/kWh in SE4, compared to SEK 0.54/kWh in SE2. Also during the first months of the second half of 2023 the relatively large price differences between Sweden's four bidding zones has remained.

Price developments in the forward market provide an indication of how market participants view future price developments and future differences in electricity prices between bidding zones. At the same time, the forward market gives an indication of the market's expectations of the size of the future congestion income that arises from price differences between bidding zones and accrues to Svenska kraftnät.

Figure 17 on page 23 shows the expected annual average difference for next year (YR-24) between the Swedish area prices and the system price.

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

Hedging

So-called system price contracts enable hedging of large parts of the fundamental price risk that exists in the Nordic electricity market because of varying availability of, for example, hydro and nuclear power and variations in fuel prices. The system price serves as a broader reference price² for different types of contracts in the Nordic/Baltic market area.

The remaining price risk, i.e. the difference between the price in a specific bidding zone and the system price, indeed cannot be managed with system price contracts. EPAD contracts allow hedging against the base risk represented by the difference between a specific bidding zone's price and the system price.

By design, the combination of system price contracts and EPAD contracts provides effective hedging for the price risk that exists in the system as a whole and for the specific bidding zone against which the EPAD contract is settled.

Although an EPAD contract, by design, hedges the risk of deviations between a bidding zone's price and the system price, EPAD contracts can also be combined in pairs to hedge the price difference between two bidding zones or more. A combination of buying an EPAD in one bidding zone and selling in an adjacent bidding zone thus results in the system price disappearing from the equation and instead obtaining an instrument that corresponds to an area (price) hedge between two bidding zones. This is a type of hedging that for most market participants has limited uses, but the design can be used to manage the financial exposure that a transmission system operator (TSO) obtains when engaging in the financial market. This is because the contract combination acts as an effective hedge of congestion income.

² A virtual hub that pools all bids and offers on forward electricity contracts in the Nordics, boosting liquidity and creating a single reference price for several bidding zones.

Summary of auction results

In total, Svenska kraftnät has conducted auctions on six occasions during the second quarter of 2023 starting April 18, where monthly, quarterly and annual contracts have been auctioned in separate auctions. The sixth and last auction day of the quarter was June 27. The total number of participants per auction occasion averaged just over 19.

The participation rate has remained relatively constant, although with a slight increase during the last two auctions of the period. The number of individual transactions (deals) varied between 131 and 160 per auction and amounted to 146 on average. The total volume, here expressed in energy terms (GWh), has been evenly distributed between the auctions.

Table 1 summarizes the auctions in terms of participation, number of trades and volumes.

Table 1 Auction date, number of participants, number of trades and total volume (GWh).

Auction date	Number of participants	Number of trades	Total volume (GWh)
2023-04-18	19	159	1 201
2023-05-02	19	153	1 203
2023-05-16	18	160	1 203
2023-05-30	18	131	1 088
2023-06-13	21	135	1 251
2023-06-27	21	139	1 105

Total allocated volumes in the auctions

Table 2 below shows a summary of volumes for each contract in the auctions conducted during the period covered by this report.

Table 2 Allocated volumes in the auctions held between April 18 and June 27 2023.

Bidding Zone	Contract	Volume (MW)	Svk BUY	Svk SELL
SE2	May-23	50	BUY	
SE2	June-23	200	BUY	
SE2	July-23	199	BUY	
SE2	Aug-23	150	BUY	
SE2	Q3-23	180	BUY	
SE2	Q4-23	180	BUY	
SE2	YR-24	60	BUY	
SE3	May-23	50 + 50	BUY	SELL
SE3	June-23	200 + 200	BUY	SELL
SE3	July-23	200 + 199	BUY	SELL
SE3	Aug-23	150 + 150	BUY	SELL
SE3	Q3-23	180 + 180	BUY	SELL
SE3	Q4-23	180 + 180	BUY	SELL
SE3	YR-24	60 + 60	BUY	SELL
SE4	May-23	50		SELL
SE4	June-23	200		SELL
SE4	July-23	200		SELL
SE4	Aug-23	150		SELL
SE4	Q3-23	180		SELL
SE4	Q4-23	180		SELL
SE4	YR-24	60		SELL

How to interpret 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.³ 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 are 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.

³ Auction results are published on SKM's website, [Link to Auction Results](#)

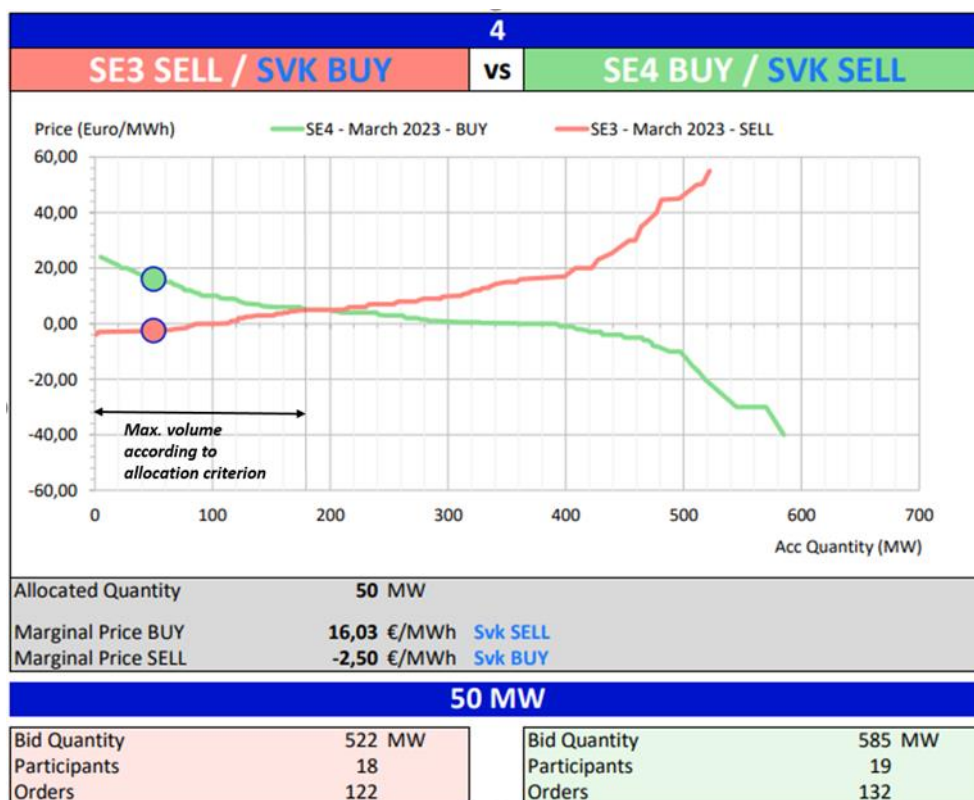


Figure 1. Example of auction result showing order curves, price for each contract, allocated volume, number of participants, number of orders and the total order quantity.

Table 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.

During quarter 2, the bid-to-cover ratio was highest for the annual contracts and amounted to approximately 6-7 times the volume offered. Demand has been stable over the period.

Figure 2 illustrates the bid-to-cover ratio for the offered annual contracts that link to the northern bidding zone border SE2–SE3. On average, the order volume has been more than six times greater than the volume offered by Svenska kraftnät.

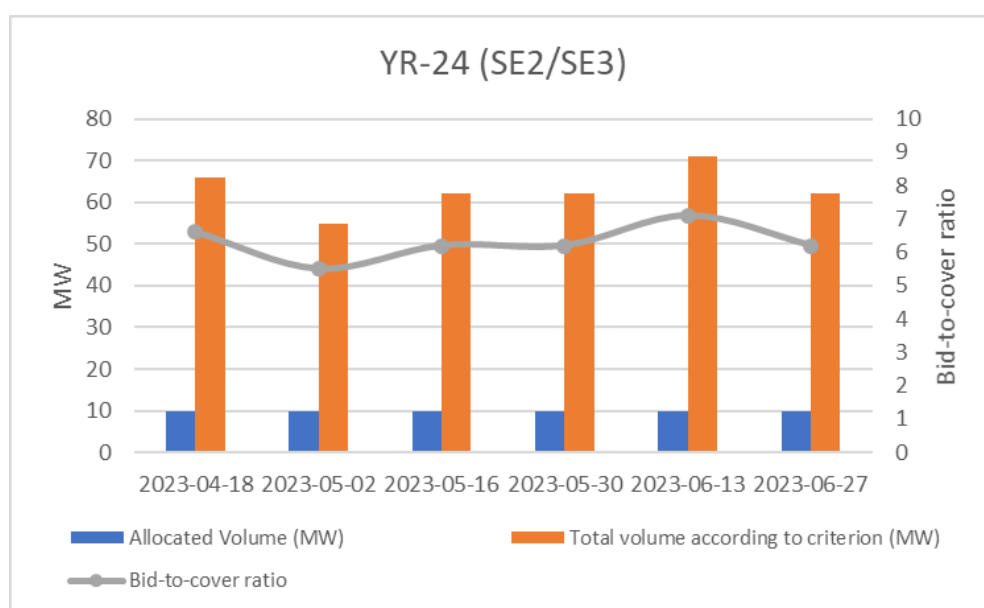


Figure 2. Volumes for SE2/SE3 yearly contracts, shown per auction day.

Figure 3 (below) shows the same relationship for the contracts in auctions for the southern bidding zone border between SE3 and SE4. On average, the total volume that met the criterion has been almost seven times greater than the volume offered.

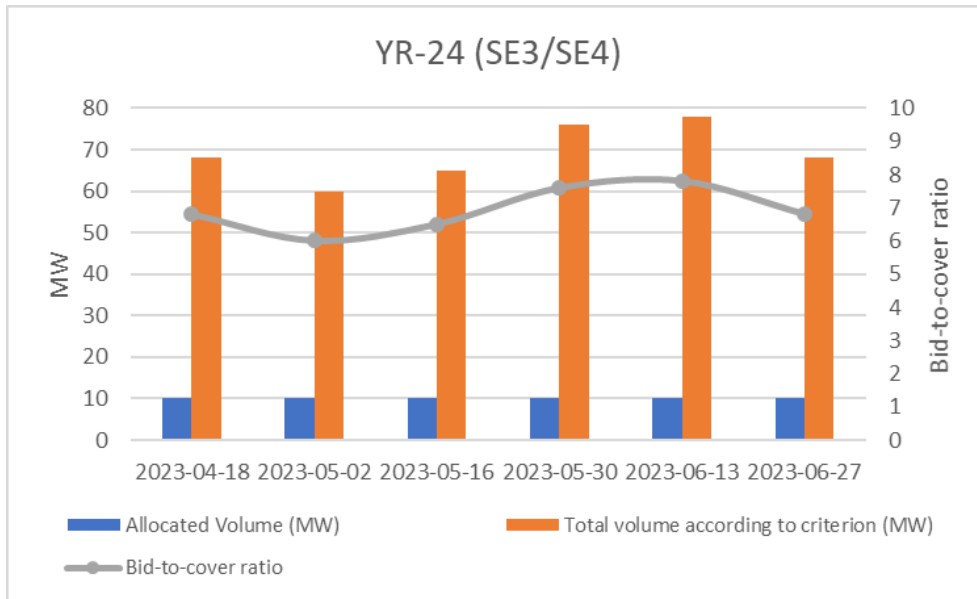


Figure 3 Volumes for SE3/SE4 yearly contracts, shown per auction day.

During the same period, quarterly contracts had a slightly lower bid-to-cover ratio. The picture below also shows that the southern border (SE3-SE4) attracted greater interest than the northern border (SE2-SE3). Note in particular that the Q3 contract for the southern border on average showed a demand that was twice as high as the northern border, the bid-to-cover ratio amounted to about 6.5 compared to the northern border's average bid-to-cover ratio of just over 3.

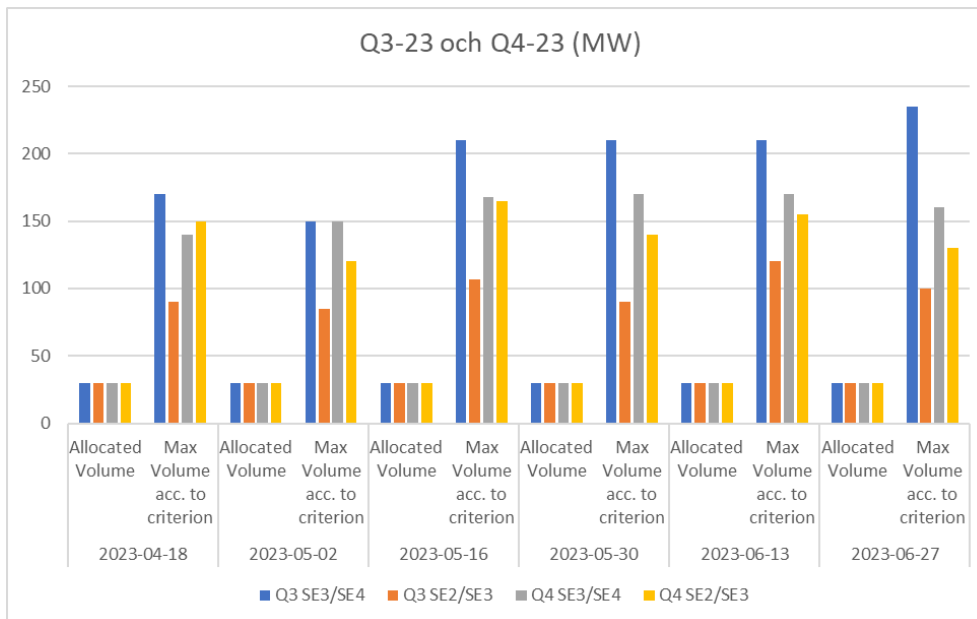


Figure 4. Volumes for quarterly contracts, shown per auction day.

As for the monthly contracts, these show the same pattern as the quarterly contracts, i.e. that the bid-to-cover ratio for the northern border is generally lower than for the southern border.

In general, monthly contracts have mostly shown a somewhat less stable price formation compared to contracts with longer durations. The reason behind this is currently not clear, but can possibly be attributed to a combination of the relatively high margin requirements for SE2, high volatility in short-term contracts and the proportion of speculative bids.

Against this background, it can be noted in particular that the auction of the July contract on 16 June for the SE2-SE3 bidding zone border was not fully subscribed. Svenska kraftnät offered 50 MW in this auction, but only 49 MW could be allocated, as it was at this volume that the allocation criterion for the auctions was met. Otherwise, all auctions during Q2 were fully subscribed. See **Figure 5**.

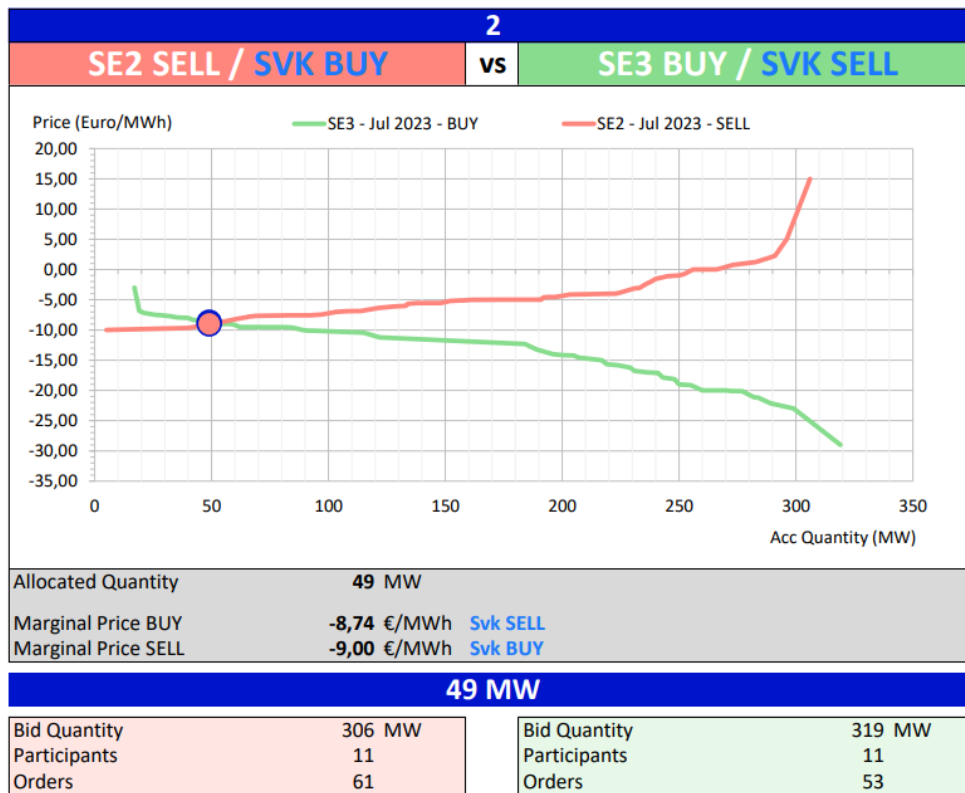


Figure 5. Auction result from June 16 2023 – July-23 contracts.

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.

During Q2, the average number of market participants has amounted to approximately 12 per individual auction. However, the total number of participants at each auction has been higher than that, 19 (since a participant does not have to bid for contracts in all bidding zones or on all bidding zone borders offered by Svenska kraftnät).

The illustration in **Figure 6** summarizes the highest, lowest and the average number of participants for the different auctions (presented per auction date).

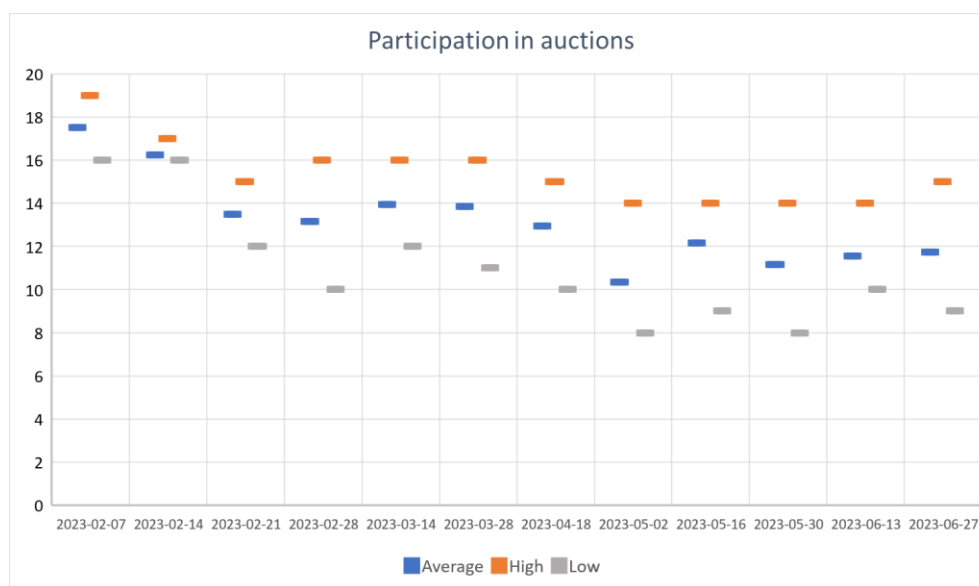


Figure 6. Average, high and low participation in auctions (per auction date)

From **Figure 7** below, which shows the auction participation during quarter 2 divided into monthly, quarterly and yearly contracts, it can be seen that the number of participants during the second quarter has been slightly lower in the auctions of yearly contracts compared to other contracts. Thus, note that the yearly contracts consistently showed the highest bid-to-cover ratio, but at the same time the lowest number of participants.

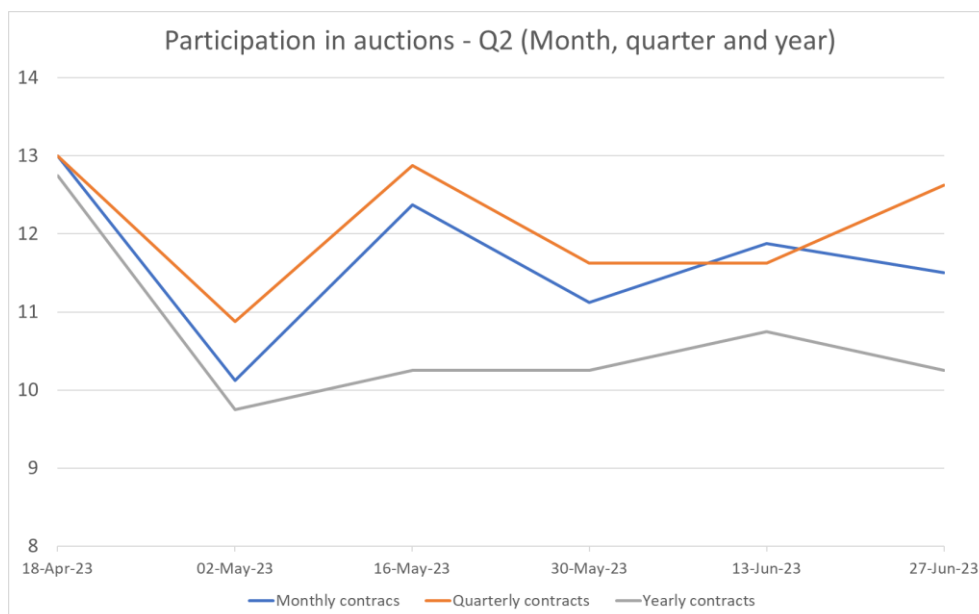


Figure 7 Average number of participants during quarter 2 per auction occasion split by maturity.

Price development in continuous market

In general, auction marginal prices have tended to end up relatively close to the previous trading day's closing prices and usually within the (unofficial) indicative price difference between the best buyer and the best seller (the so-called bid-ask spread).

During Q2, Svenska kraftnät conducted six auctions in bidding zone SE3 regarding YR contracts. In **Figure 8**, the auction dates have been plotted in relation to the historical price development during the first half of 2023. A slight downward trend was observed for this contract.

Furthermore, it can be noted that SE3 during the second quarter traded relatively stable and slightly below the system price (approximately -4 EUR/MWh). Svenska kraftnät both buys and sells SE3 contracts in the coupled auctions vis-à-vis SE4 and SE2 respectively and therefore normally obtains no net positions in SE3.

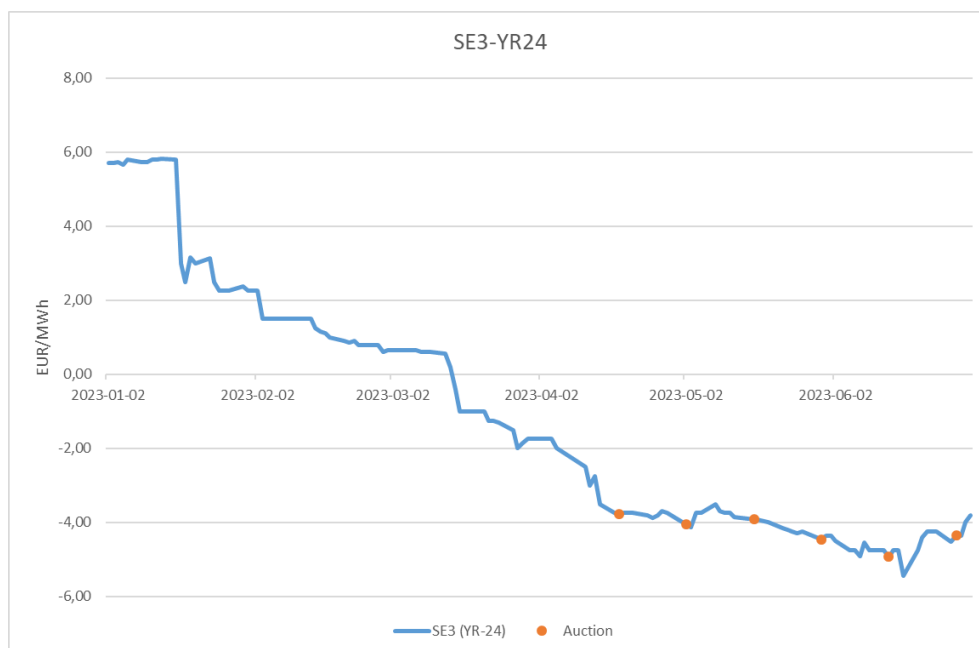


Figure 8. Closing prices for each day (first six months, 2023) in the continuous market plotted together with the auction days (April to June) for SE3 YR-24 contracts.

The corresponding contract for bidding zone SE4 shows a marked decline during the period and the expected price difference relative to the system price fell sharply during Q1. A sideways movement instead characterized quarter 2.

Svenska kraftnät conducted six auctions during the period and the marginal price in the auctions ended up in the range: from about 12 EUR/MWh to 15.5 EUR/MWh. See **Appendix I** for exact prices in the auctions, and **Figure 9** for closing prices in the continuous market plotted along with auction dates.

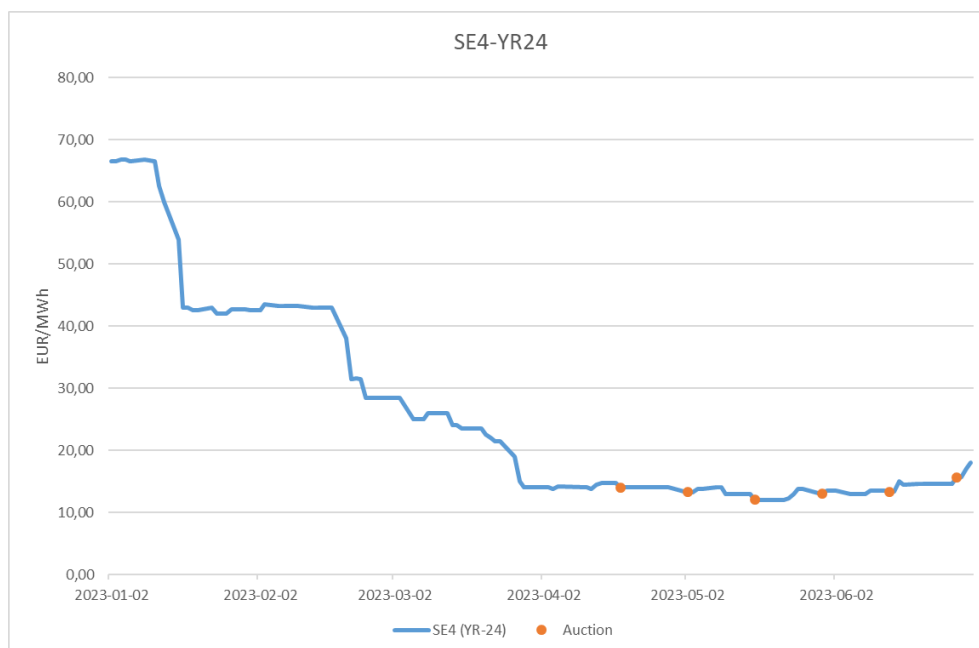


Figure 9. Closing prices for each day (first six months, 2023) in the continuous market plotted together with the auction days (April to June) for SE4 YR-24 contracts.

The price for the corresponding SE2 contract showed relatively high volatility during Q1, while Q2 was primarily characterized by a sideways market. The marginal price in the auctions ended up at EUR 30/MWh or just below it. See **Appendix I** for specific prices in each auction. Closing prices and auction dates are shown in **Figure 10**.

In general, the EPAD market has been characterized by relatively low liquidity over a long period. The low liquidity of EPAD contracts during the period means not only that turnover is low, but also that closing prices are also reasonably subject to some uncertainty as a reference price for auctions. However, in subsequent trading days following an auction, prices have been at or near the price levels set in the auctions. This suggests that auctions have fulfilled a price-forming function, i.e. facilitating price discovery.



Figure 10. Closing prices for each day (first six months, 2023) in the continuous market plotted together with the auction days (April to June) for SE3 YR-24 contracts.

Activity and trading in the continuous EPAD market

The model used by Svenska kraftnät in the pilot is primarily designed 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.

As mentioned earlier, continuous EPAD-trading has been rather limited for several years. These conditions were accentuated in 2022 (and applies to 2023) as increased margin requirements made it more capital-intensive to trade EPAD contracts than before. The margin requirements for positions in SE2 contracts during the period were significantly higher than for corresponding contracts in SE4.

In **Figure 11** below we present a summary of the total turnover of EPAD contracts for SE2 (northern Sweden) divided into auction volumes and continuous trading. The turnover measure used is the total amount of energy traded (GWh) and thus take into account both power and time. The look back period covers August 2022 through June 2023.

From picture below, it can be seen that the total turnover in SE2 has increased since the auctions started in February. However, turnover does not show a clear trend if auction volumes are excluded.

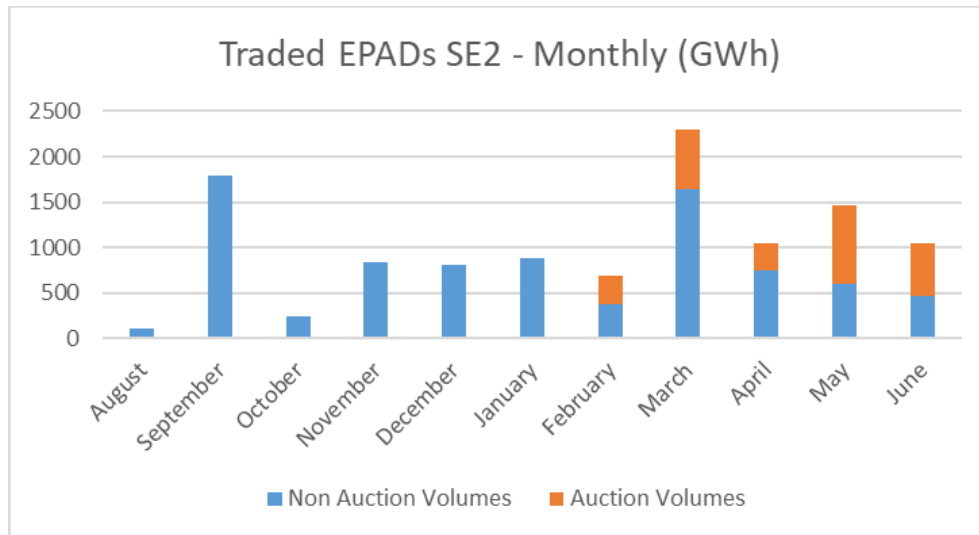


Figure 11. Turnover (GWh) of EPADs for SE2 per month 2022-2023.

In the case of SE3 (Central Sweden), which is the bidding zone that during the period showed the highest liquidity and the highest turnover in continuous trading, a slightly positive trend can be seen, even though auction volumes also accounted for a large proportion of the increase. (Note that the scale on the y-axis varies for the different bidding zones and that the turnover in SE3 was significantly higher than for SE2 and SE4.)

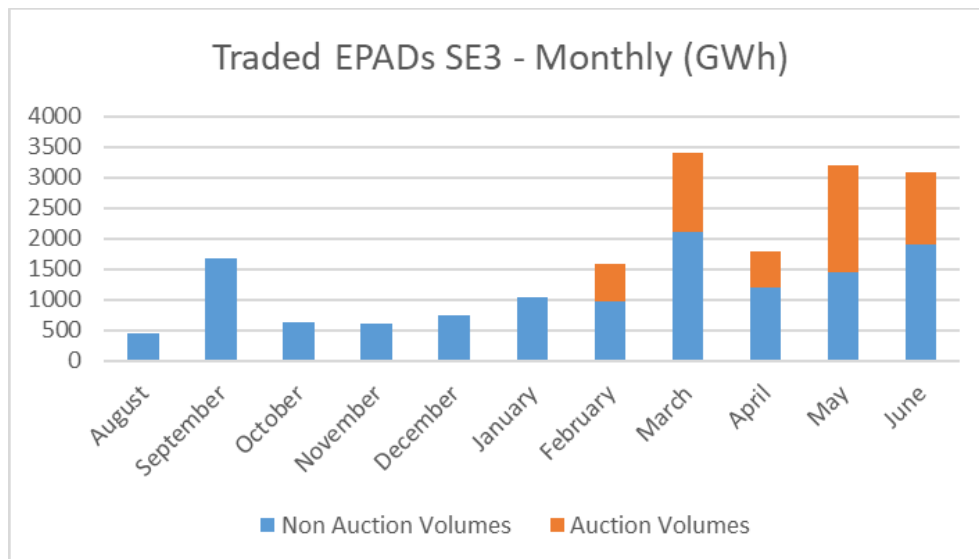


Figure 12. Turnover (GWh) of EPADs for SE3 per month 2022-2023.

Regarding SE4 (Southern Sweden), it can be noted that auction volumes account for the lion's share of the total increased trading volumes and that turnover in continuous trade has varied but remained at a low level, both in relative and absolute terms.

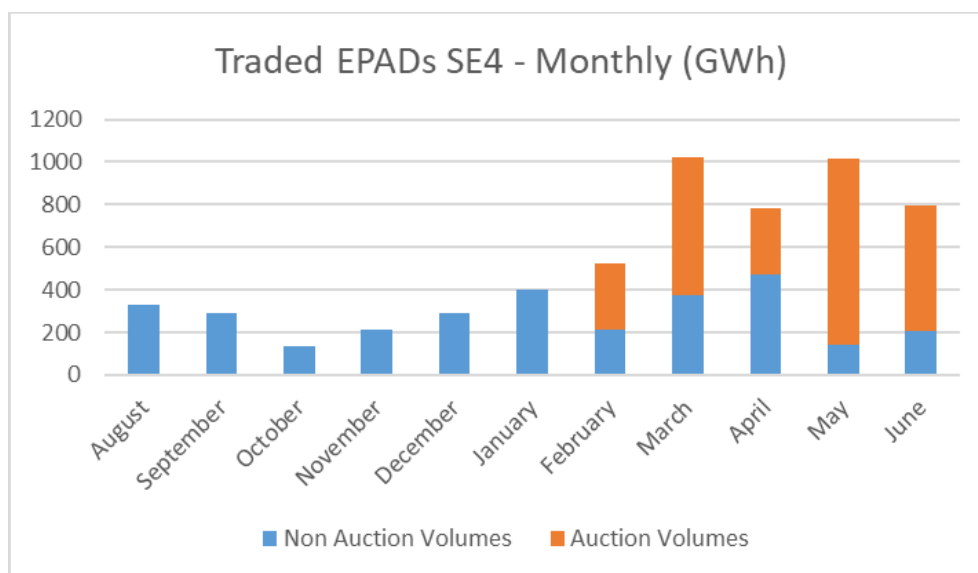


Figure 13. Turnover (GWh) of EPADs for SE4 per month 2022-2023.

Figure 14. Total trading for SE2, SE3 and SE4 compared to other EPAD contracts (July 2022-June 2023). a description of how the total turnover (TWh) in the contracts included in Svenska kraftnät's pilot (SE2, SE3 and SE4) has developed over the past year in relation to other EPAD contracts.

This comparison shows a marked increase in turnover, both in absolute and relative terms for the bidding zones where EPADs were auctioned, clearly illustrated via the blue bars. (Svenska kraftnät started auctioning monthly contracts for March on February 7, 2023.)

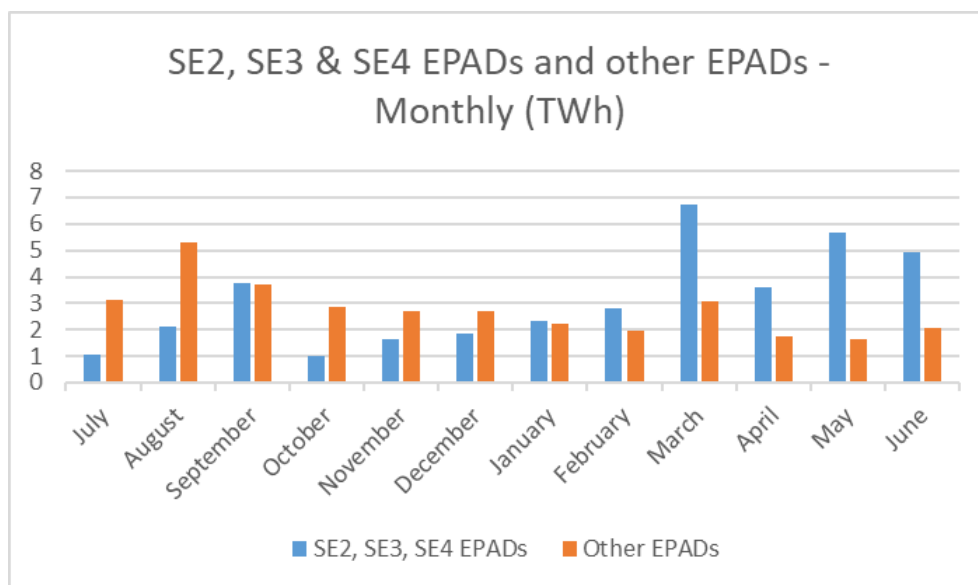


Figure 14. Total trading for SE2, SE3 and SE4 compared to other EPAD contracts (July 2022-June 2023).

In **Figure 15**, the total turnover of the contracts [TWh] included in the pilot instead is split into continuous trade and auction volumes. The figure illustrates that the auction volumes' share of total turnover has been high. (Note that continuous trading was lower than auction volumes in May 2023.)

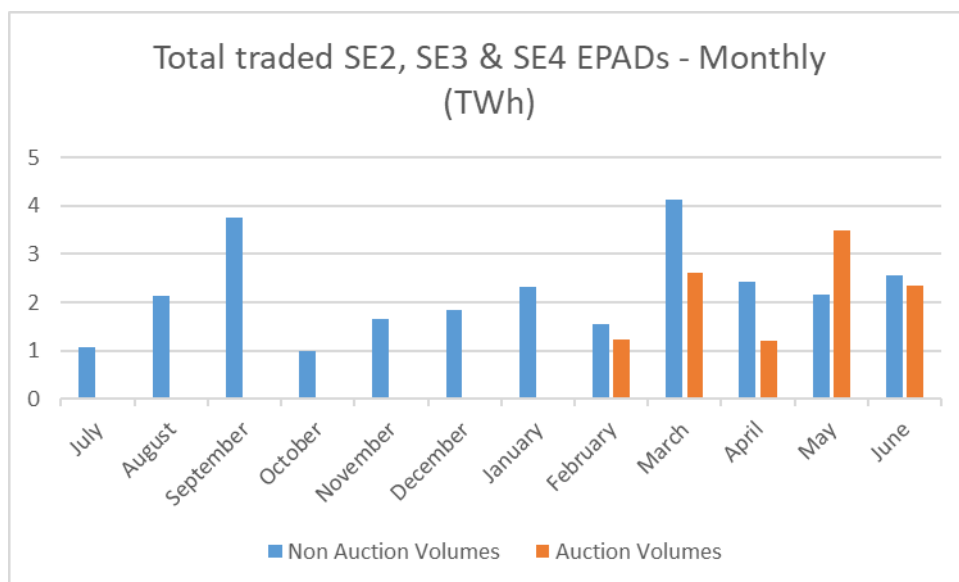


Figure 15. Total trading for SE2, SE3 and SE4 split into non auction volumes and auction volumes (July 2022-June 2023).

Open Interest

Open interest is often used as an indicator of liquidity and market activity in continuous trading. Open interest is the total number of derivative contracts (e.g. EPAD-futures) 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 thus 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 16 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 figure shows that open positions have increased cautiously throughout the period, but at a decelerating pace during the second quarter. 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.

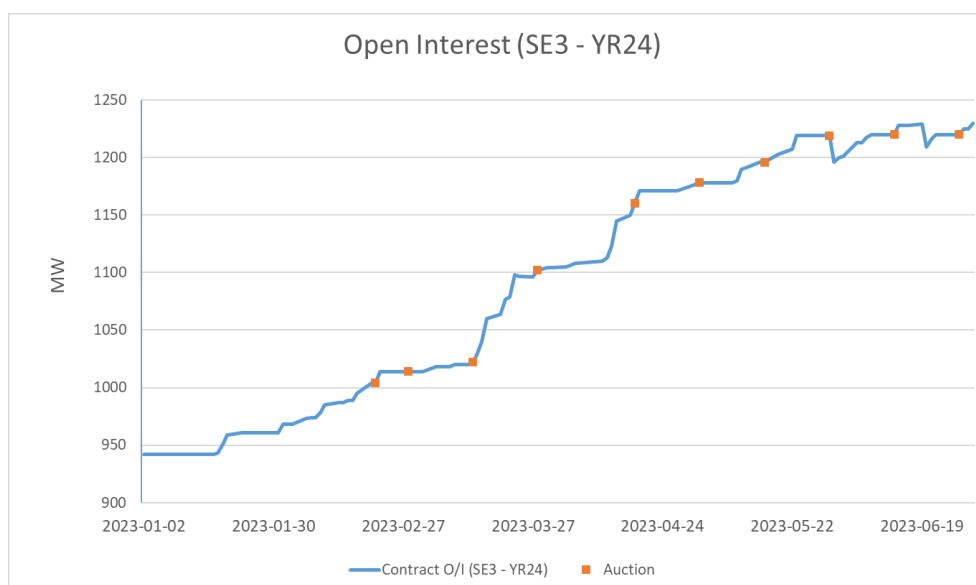


Figure 16. Open interest in SE3 YR-24 EPAD contract (January – June, 2023).

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 and the strength of this measure is that we can follow the development in volumes that have actually been hedged. 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 90 MW plus sales of 90 MW) in bidding zone SE3.

In-depth section

Svenska kraftnät's own role and exposure

From **Figure 17** below, which covers the entire pilot period, it can be seen that the first quarter was characterized by decreased future bidding zone differences, primarily manifested through gradually decreasing prices for the SE4 contract. The second quarter was instead characterized by an expectation of relatively stable future differences.

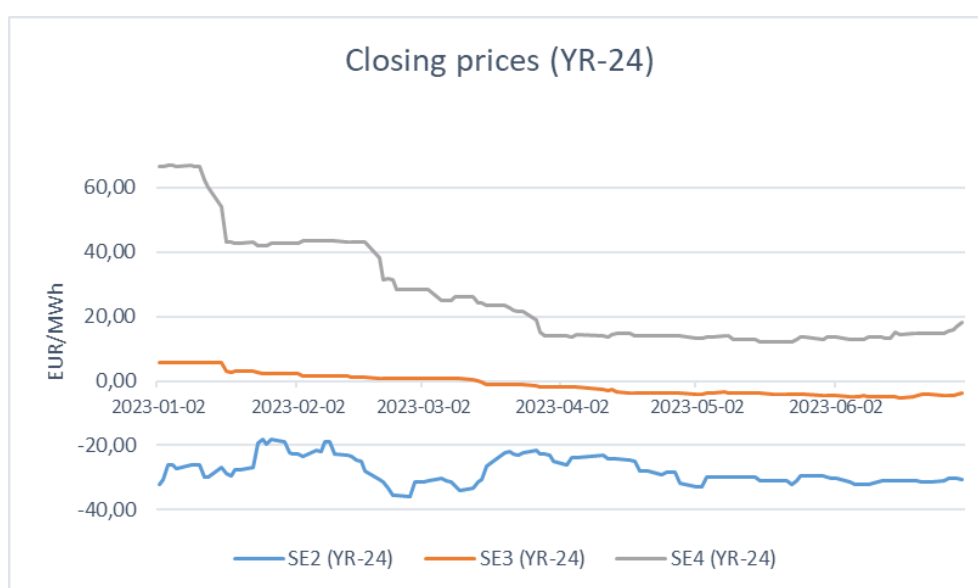


Figure 17. Closing prices YR-24 contracts (January – June, 2023).

Svenska kraftnät has the opportunity to offer market participants these trading opportunities via auctions, since congestion income attributable to each bidding zone border constitutes an inherent financial exposure.

Conceptually, the auctions can therefore also be described as Svenska kraftnät partially hedging expected future congestion income generated through price differences between different bidding zones in the day-ahead market.

Normally, Svenska kraftnät buys EPADs in the surplus area SE2 and sells EPADs in the deficit area SE4. Svenska kraftnät's net position after auctions thus means that we obtain a long SE2 position (a neutral SE3 position) and a short SE4 position.

The price difference between SE2 and SE4 is shown in **Figure 18** below, this "spread" gives an indication of the level of hedged congestion income. From the picture below, it can thus be seen that the locked margin for annual contracts on average during the second quarter was slightly lower than in the first quarter and that it averaged just over 43 EUR/MWh.

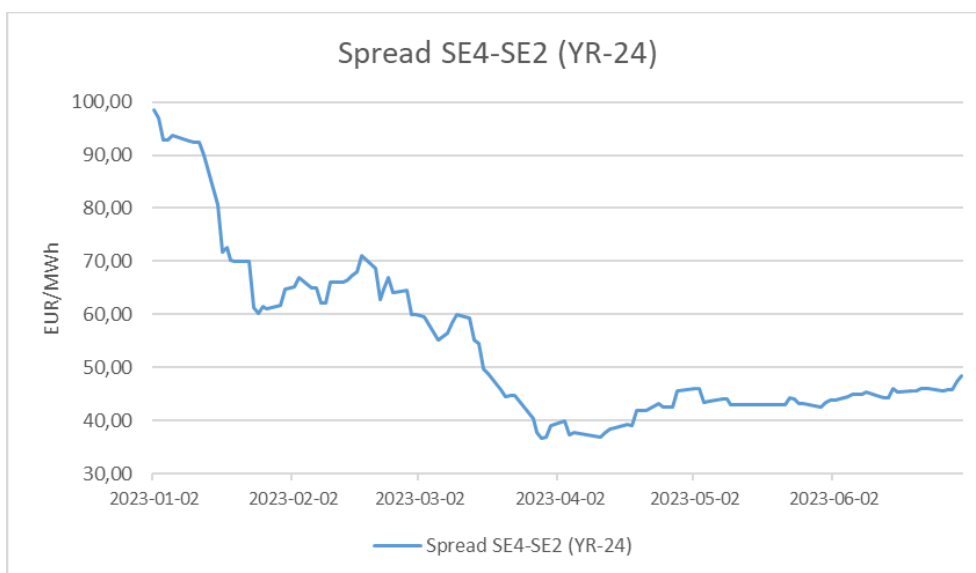


Figure 18. Price difference between SE2 and SE4 for YR-24 contracts (January – June, 2023).

Conclusions

The aim of the EPAD pilot is to support market participants by providing cross-zonal transmission capacity in the forward market, which will partly compensate for an underlying market asymmetry and at the same time add new trading volumes with the aim of contributing to higher liquidity in continuous trading in the long-term perspective.

This report covers only the first five months of the pilot. Although interesting developments can be observed, we still consider it too early to draw firm conclusions about the effects of the auctions. This report primarily aims to continue to identify various initial indications, which in the future can be analyzed more thoroughly.

One observation is that the second quarter of 2023 has been characterized by a market that has continued to recover and stabilized after a period characterized by the energy crisis, high electricity prices and high volatility. We also note that the auctions have continued to work well and that the high bid-to-cover ratio clearly indicates a great interest from market participants.

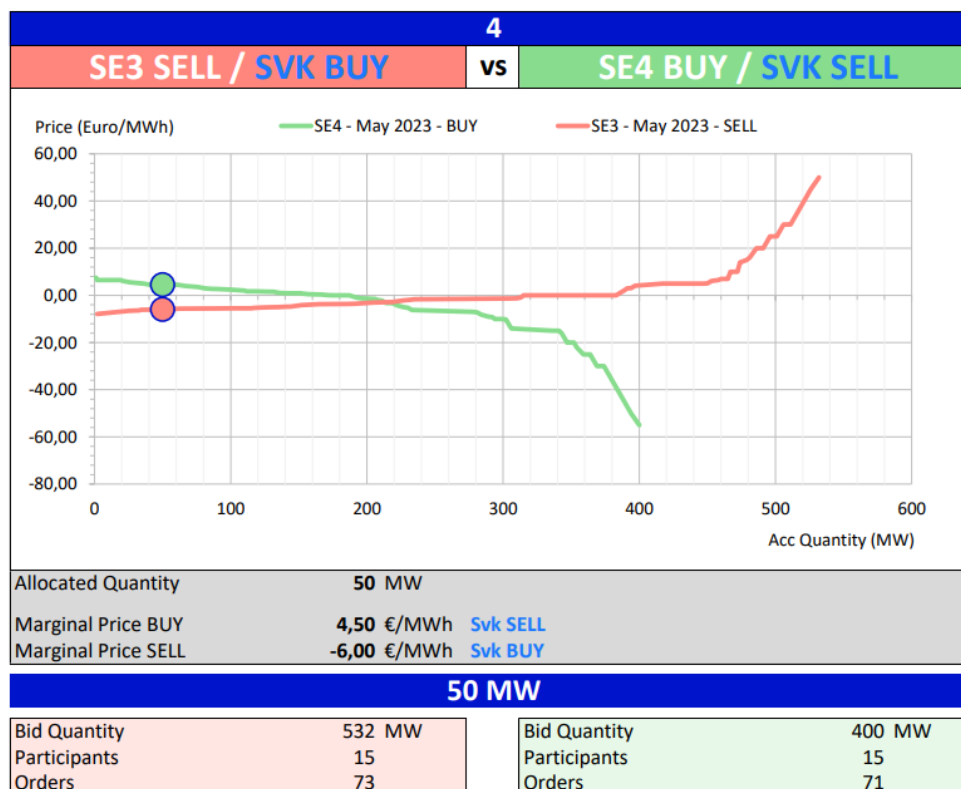
As mentioned earlier, the auctions are expected to support increased transparency and better price formation (i.e. price discovery) in the EPAD market. Svenska kraftnät's role as a "natural" buyer and seller in the deficit- and surplus areas SE2 and SE4 is also assessed, at least preliminarily, to contribute to offering some compensation for the above-mentioned structural market asymmetry. The auctions' relatively large share of total turnover in Q2 supports this assessment.

In order to be able to evaluate the effectiveness of the pilot from a socio-economic perspective in the long term, the most important benefit would be lower costs for hedging via EPAD contracts. This benefit is often approximated as the difference between the best bid-ask spread for individual contracts. Whether the auction volumes have positively contributed to higher liquidity in continuous trading is currently difficult to assess. However, the unequivocal verbal positive feedback that Svenska kraftnät has received from market participants cannot be unambiguously observed in continuous trading.

Appendix I

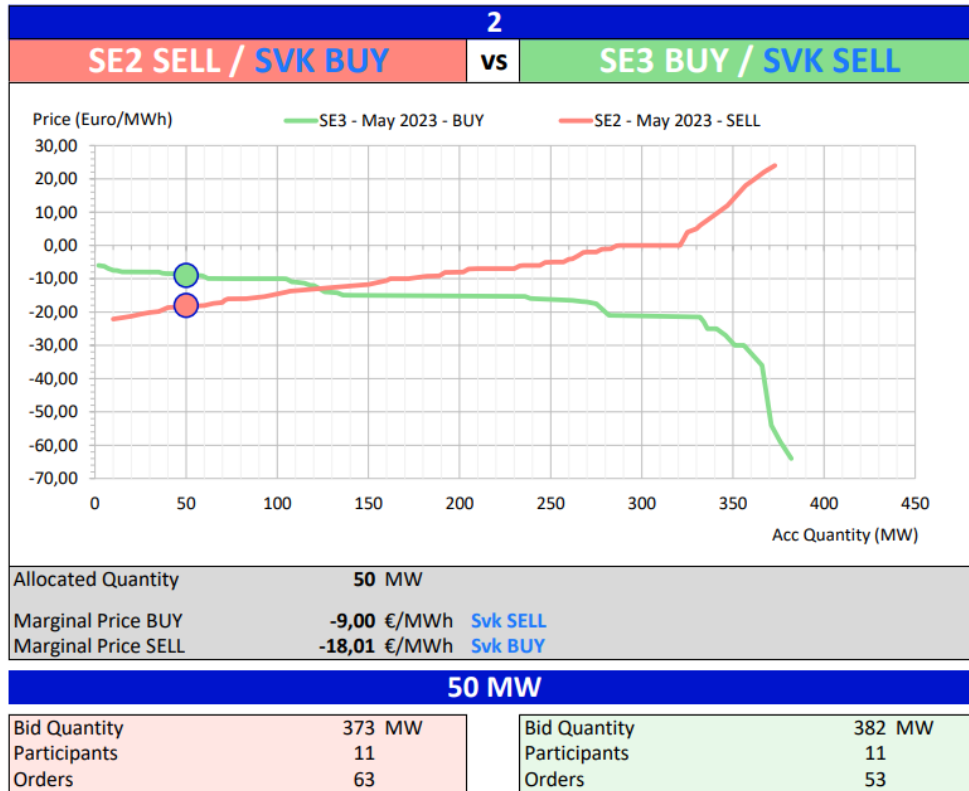
This appendix provides the complete compilation of reports that have been published by SKM in conjunction with each performed auction during Q2 2023⁴.

18 Apr 2023, MAY-23 (SE3-SE4)

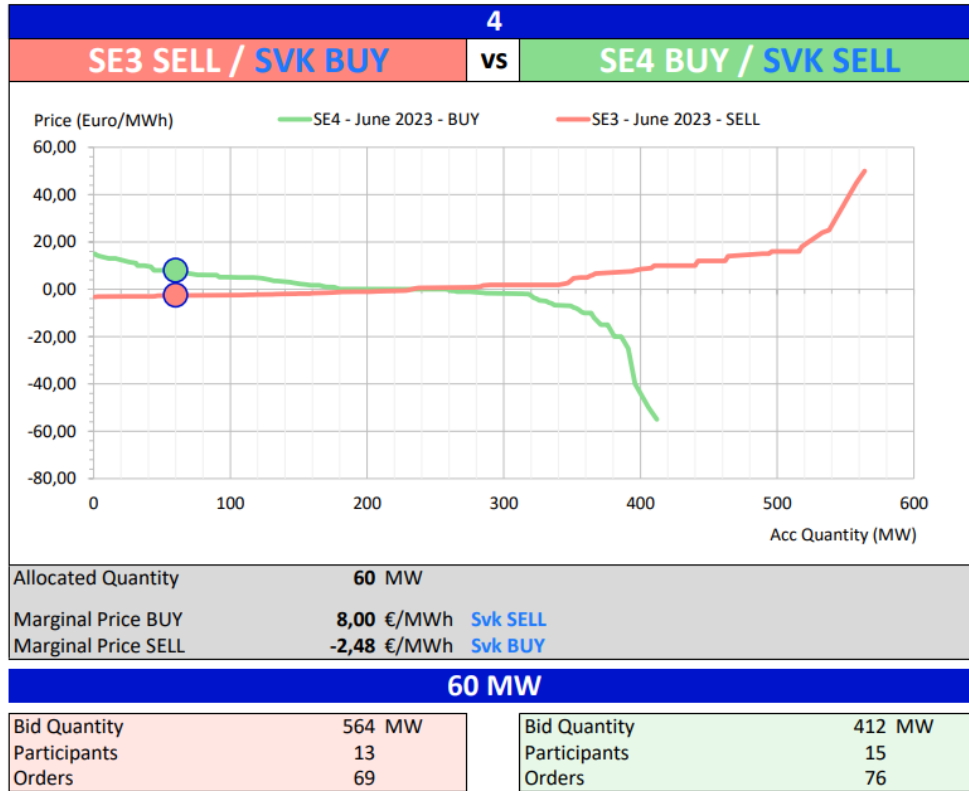


⁴ These reports are continuously published at www.skm.se

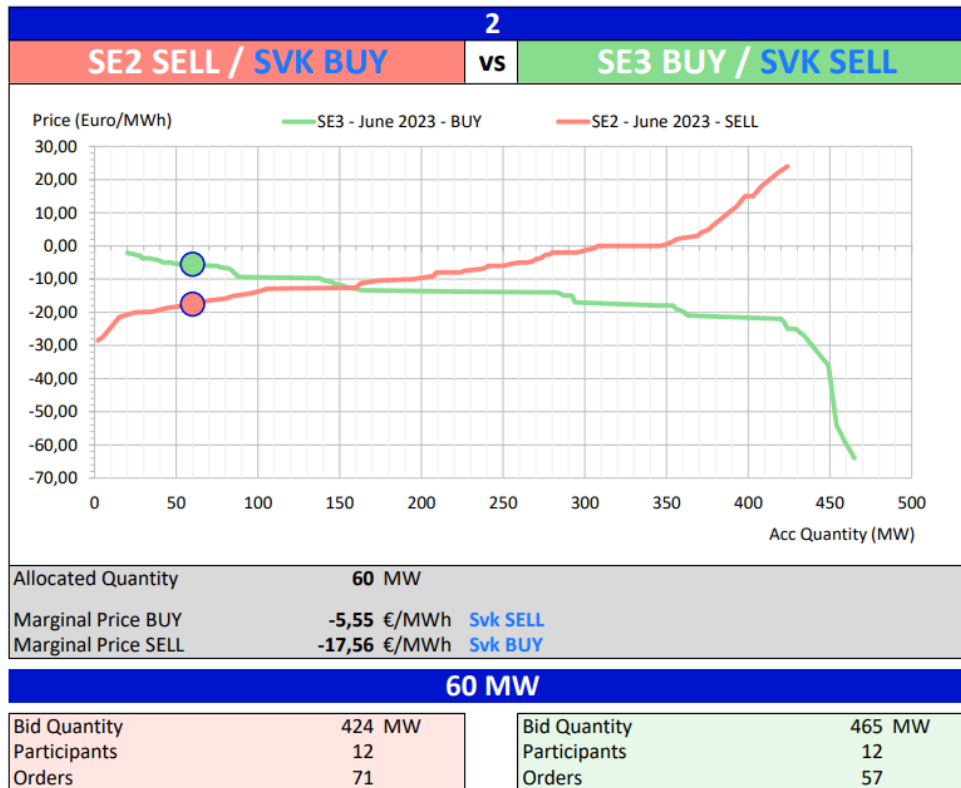
18 Apr 2023, MAY-23 (SE2-SE3)



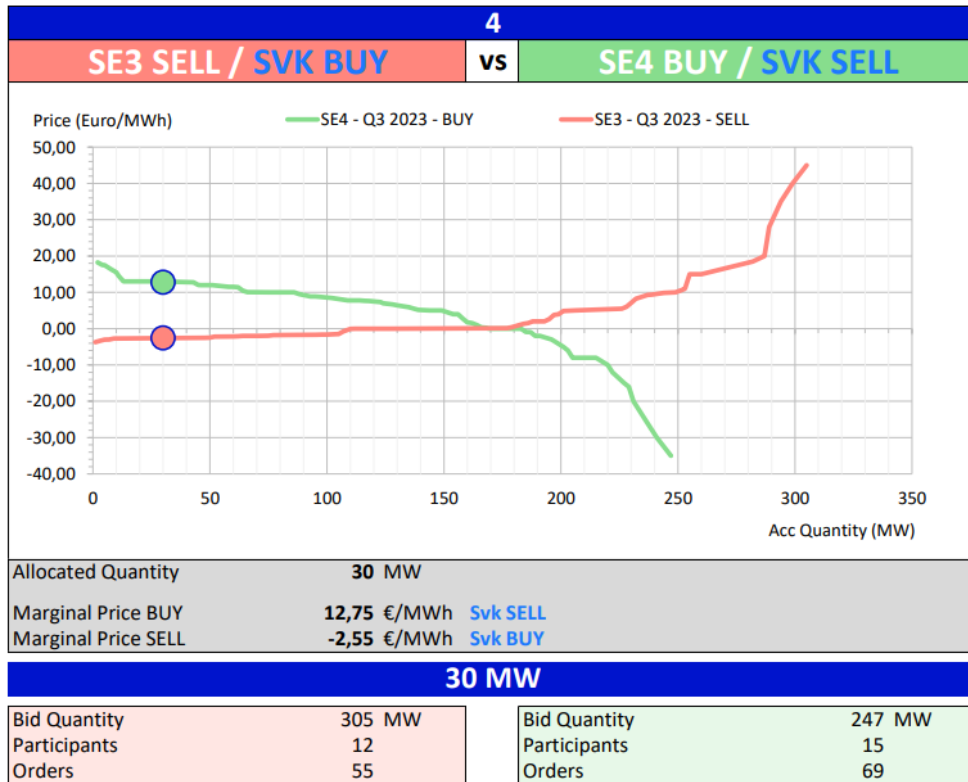
18 Apr 2023, JUN-23 (SE3-SE4)



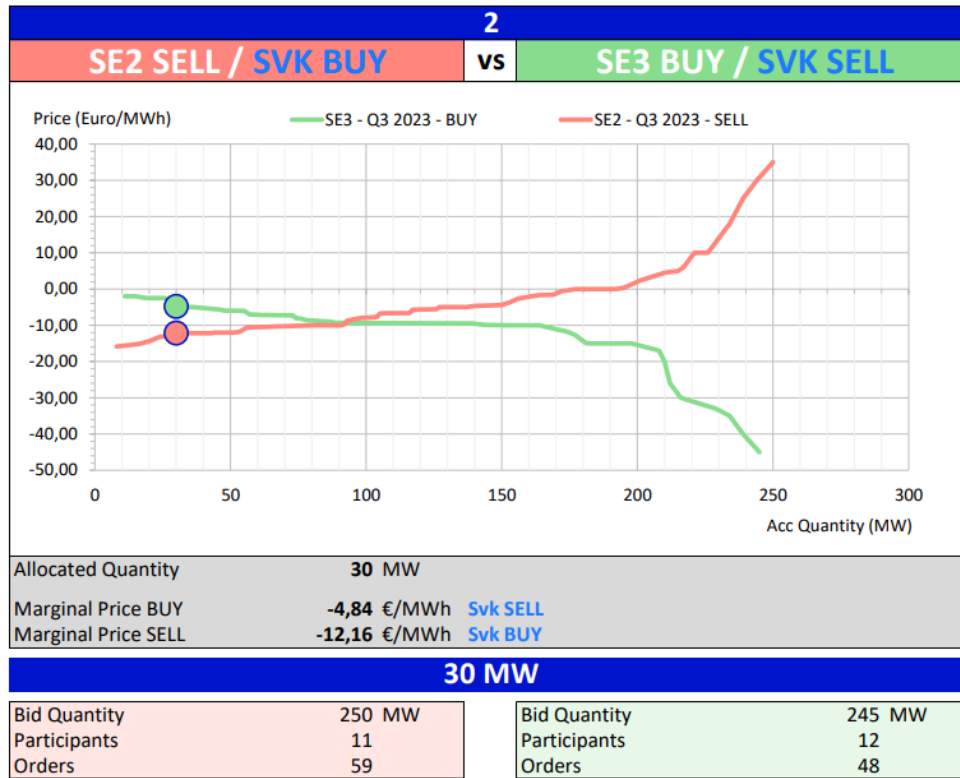
18 Apr 2023, JUN-23 (SE2-SE3)



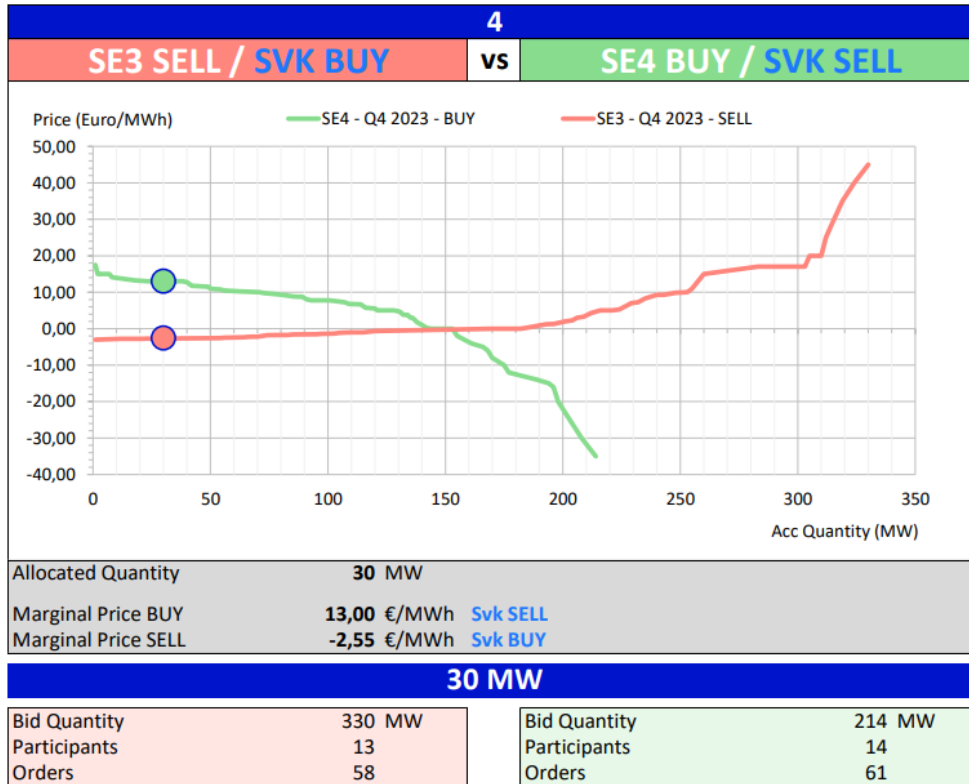
18 Apr 2023, Q3-23 (SE3-SE4)



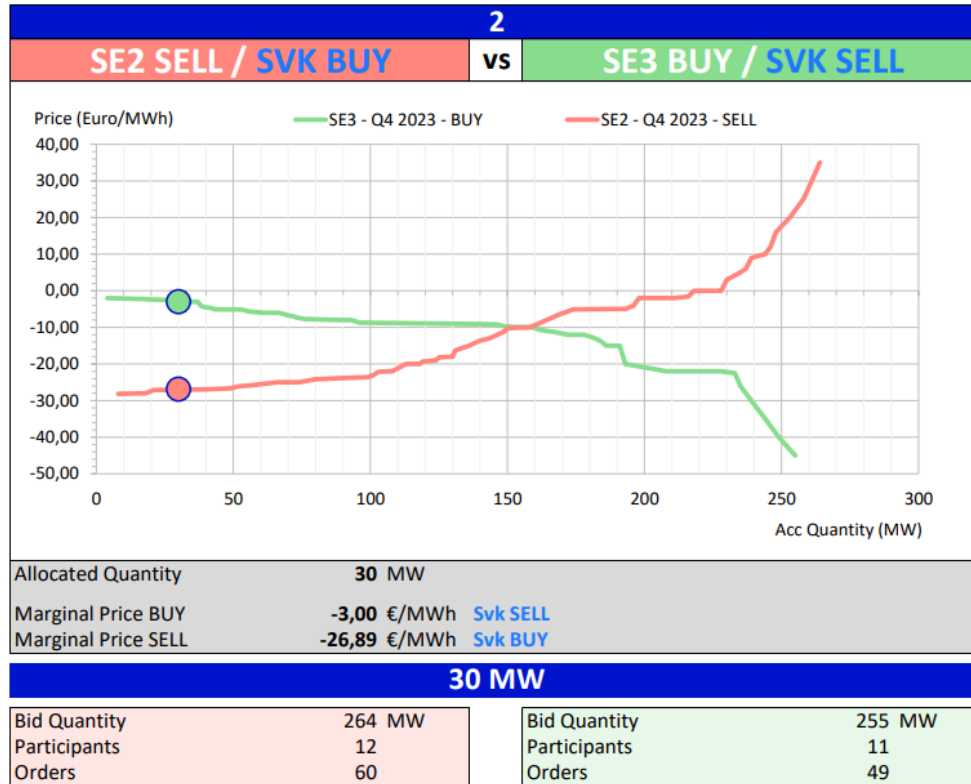
18 Apr 2023, Q3-23 (SE2-SE3)



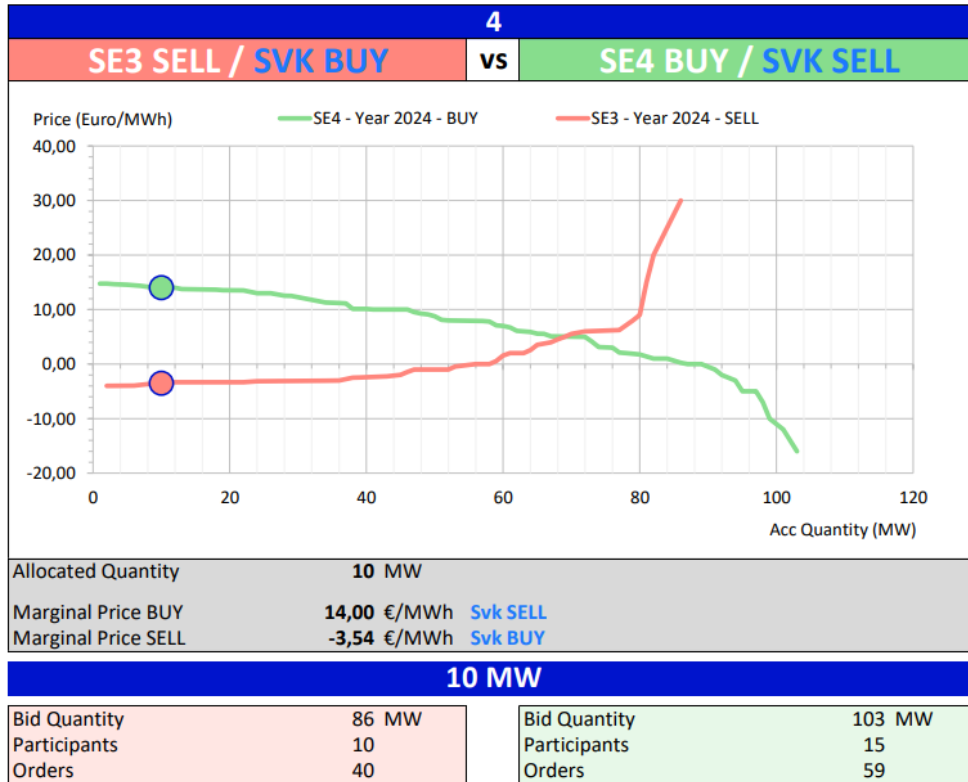
18 Apr 2023, Q4-23 (SE3-SE4)



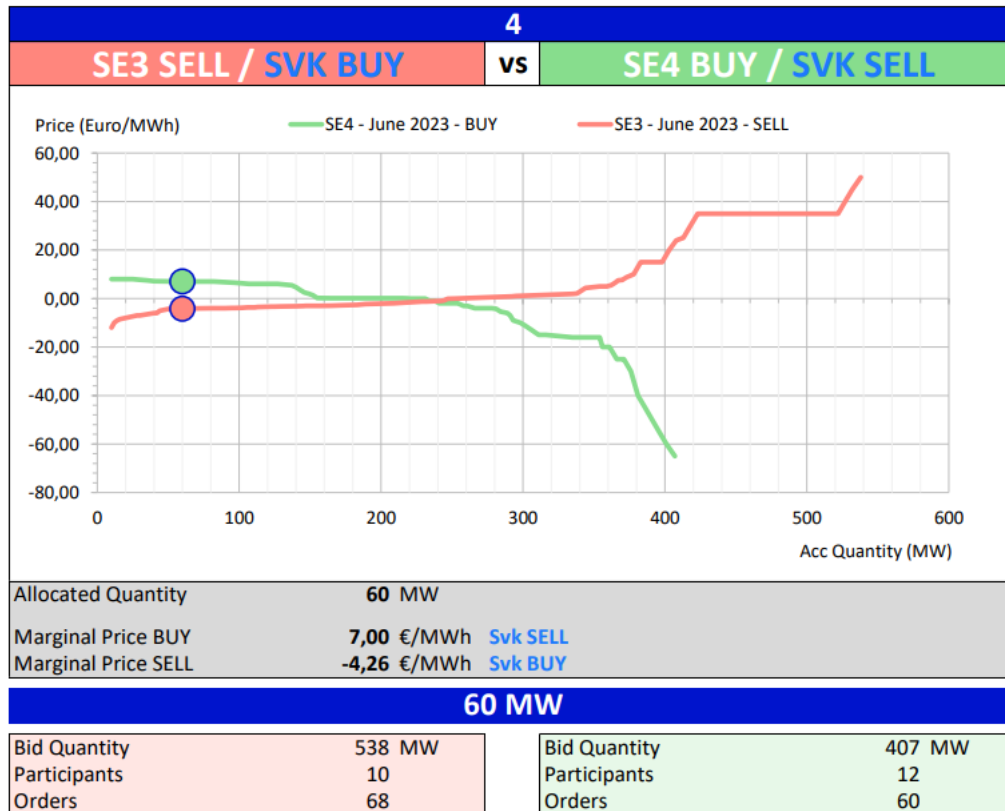
18 Apr 2023, Q4-23 (SE2-SE3)



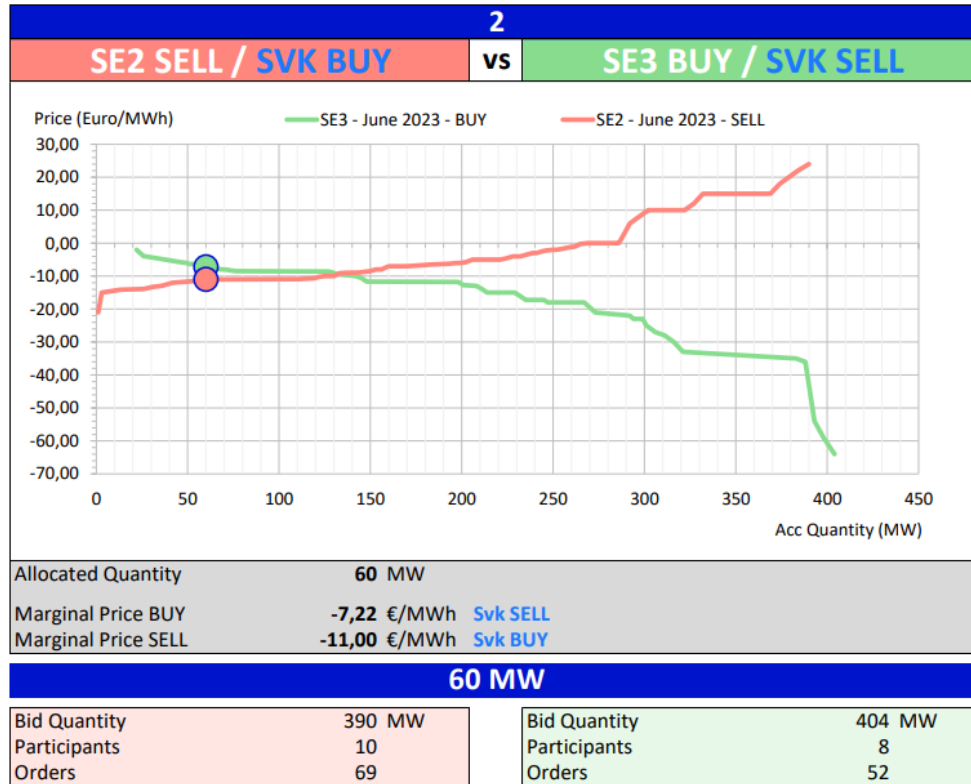
18 Apr 2023, YR-24 (SE3-SE4)



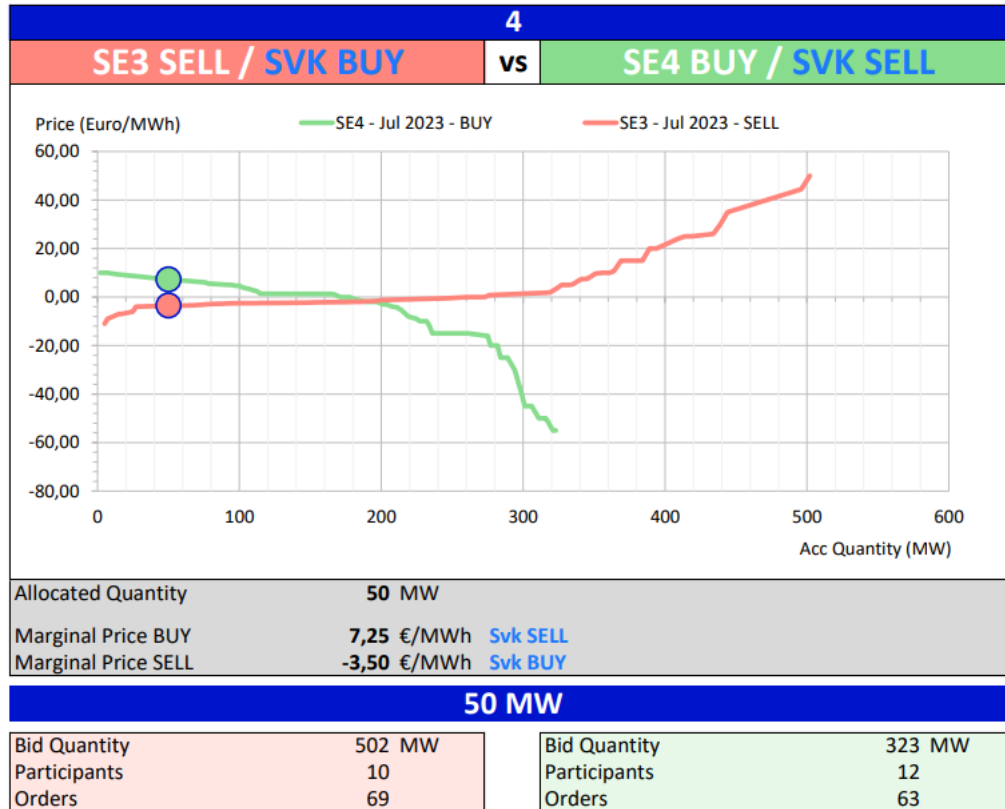
2 Maj 2023, JUN-23 (SE3-SE4)



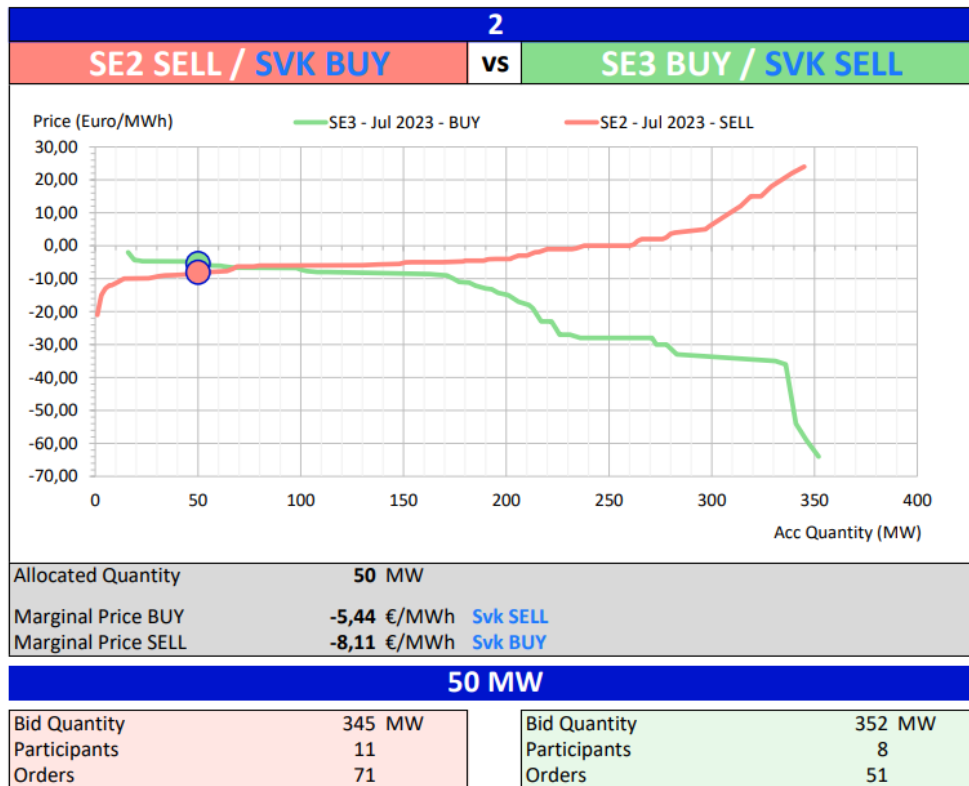
2 Maj 2023, JUN-23 (SE2-SE3)



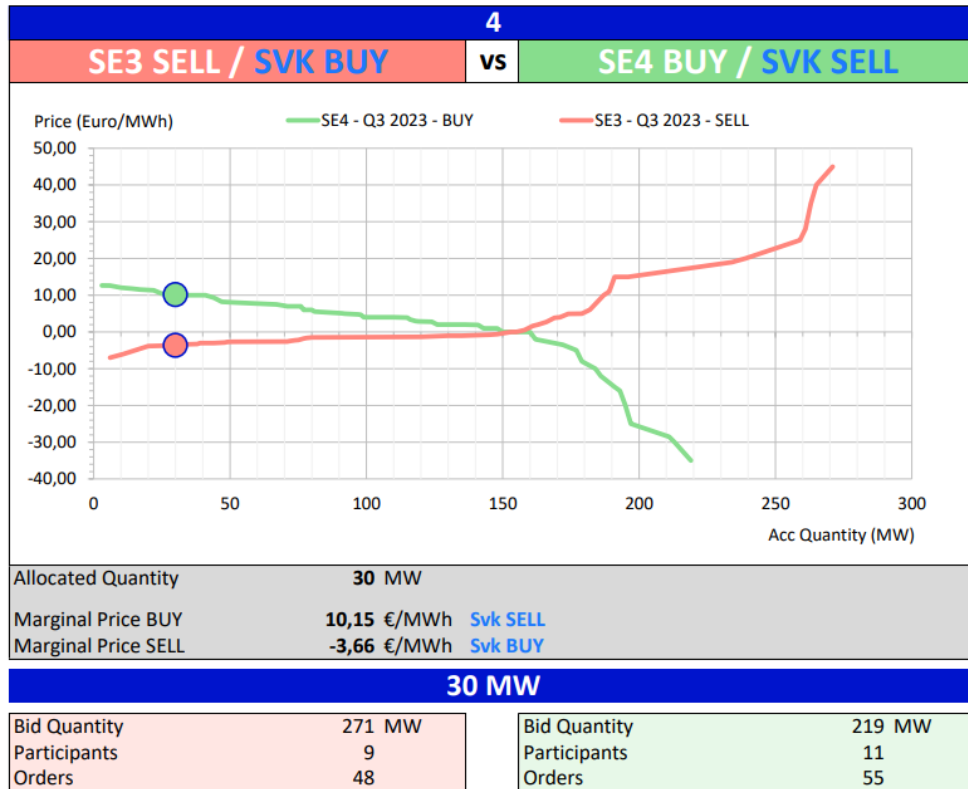
2 Maj 2023, Jul-23 (SE3-SE4)



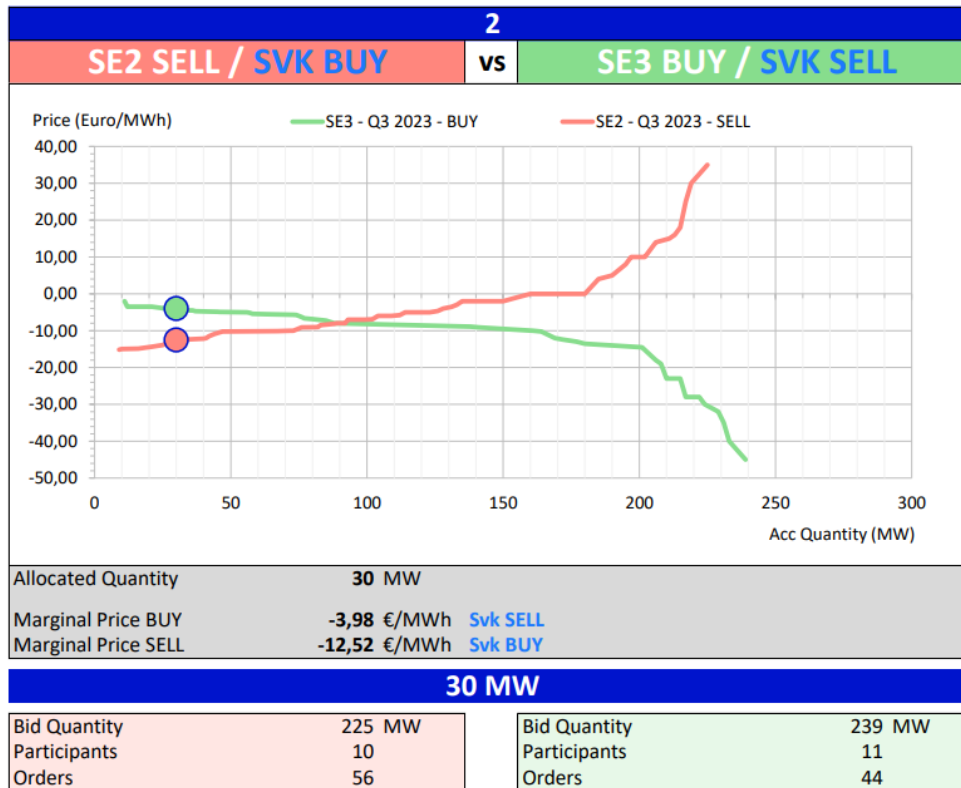
2 Maj 2023, Jul-23 (SE2-SE3)



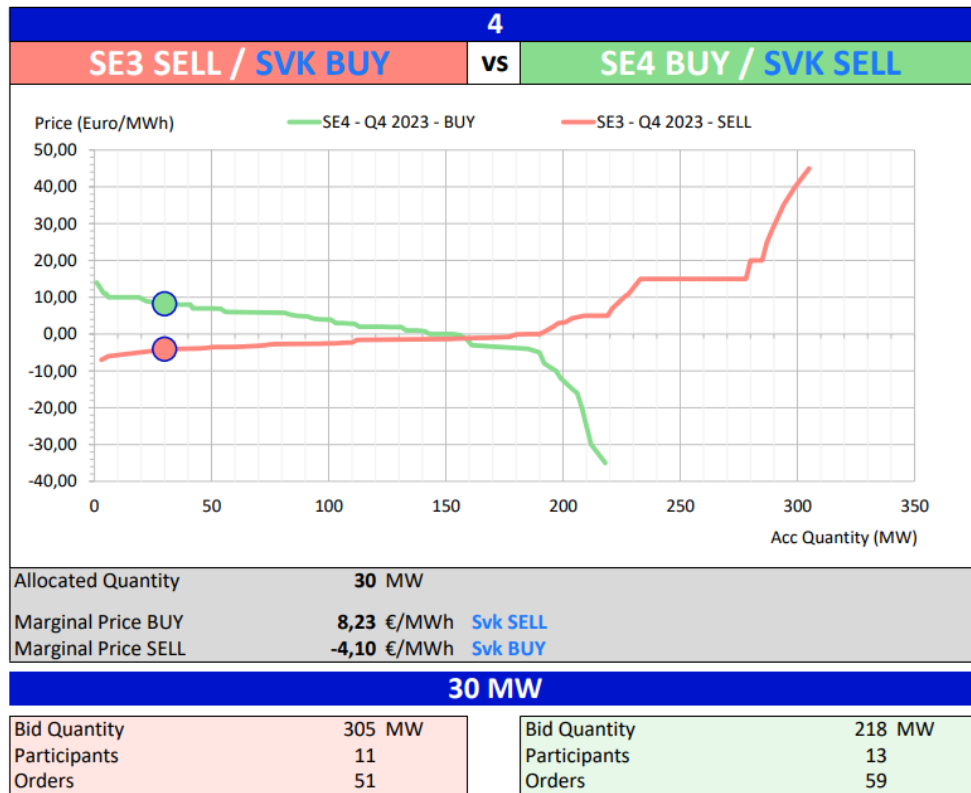
2 Maj 2023, Q3-23 (SE3-SE4)



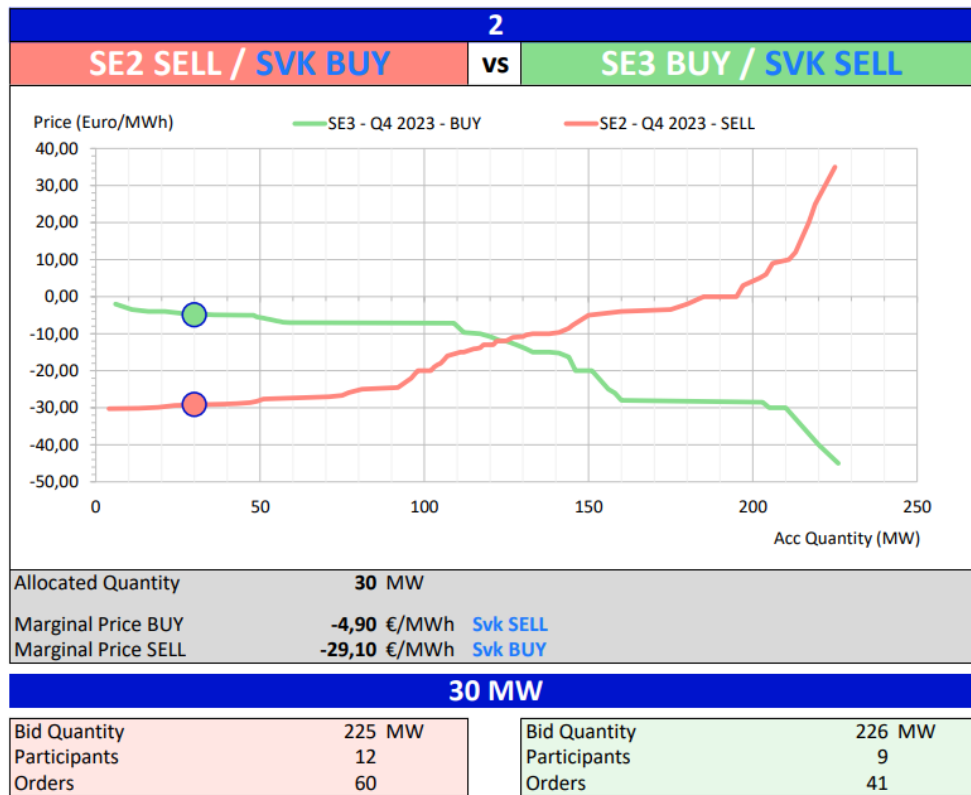
2 Maj 2023, Q3-23 (SE2-SE3)



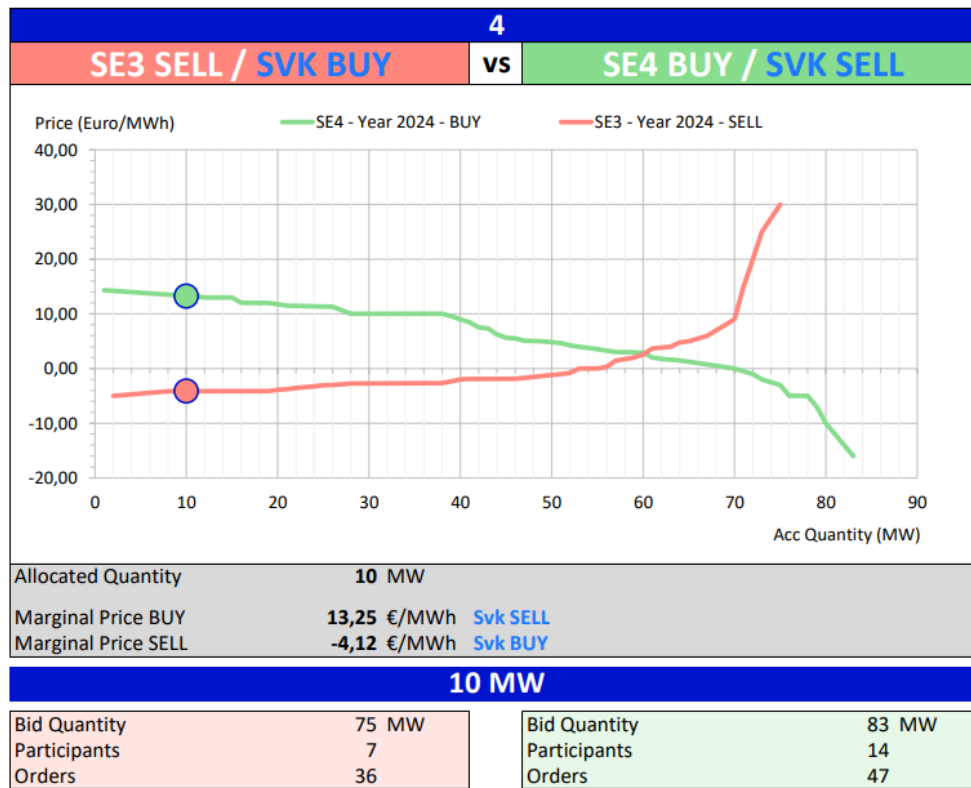
2 Maj 2023, Q4-23 (SE3-SE4)



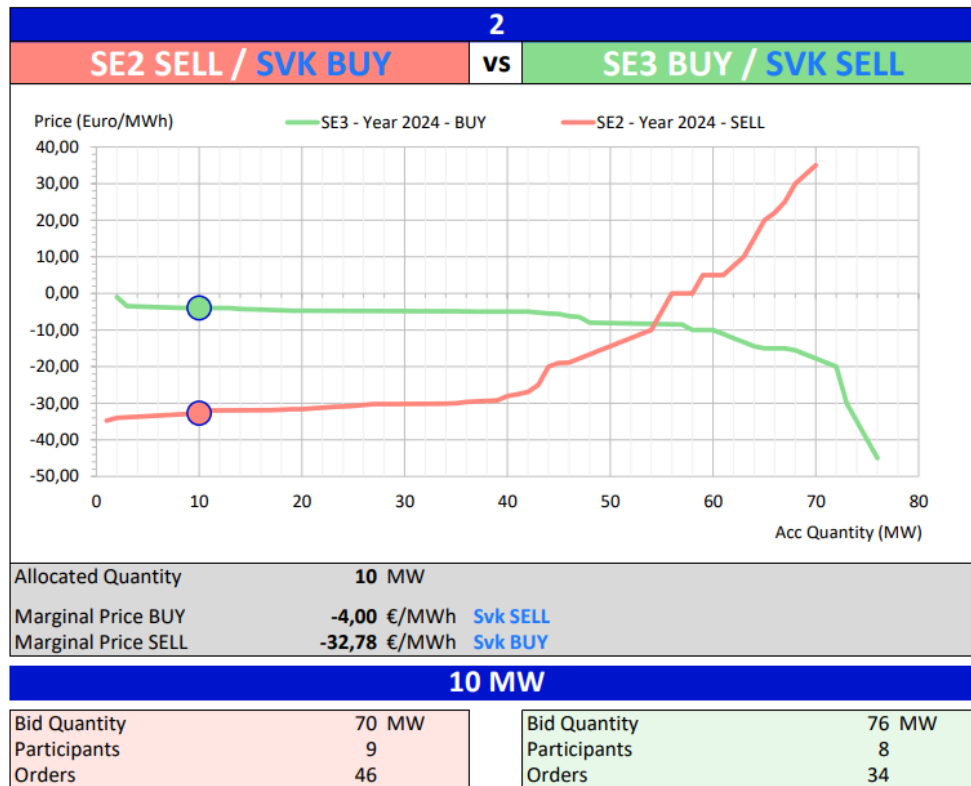
2 Maj 2023, Q4-23 (SE2-SE3)



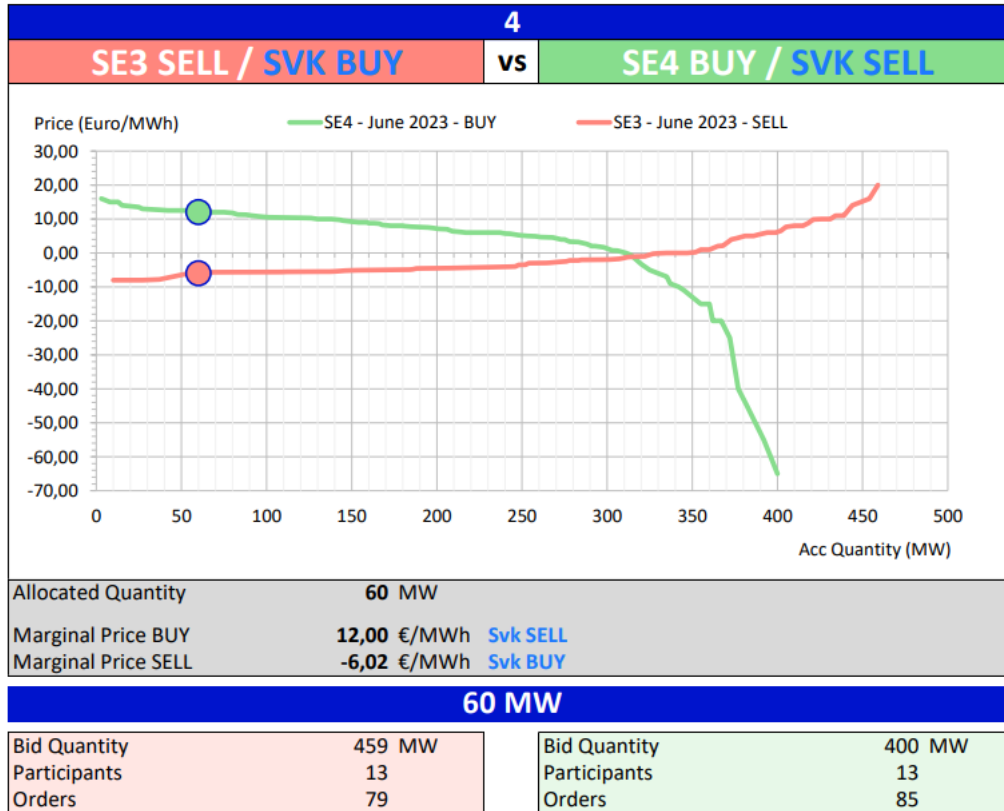
2 Maj 2023, YR-24 (SE3-SE4)



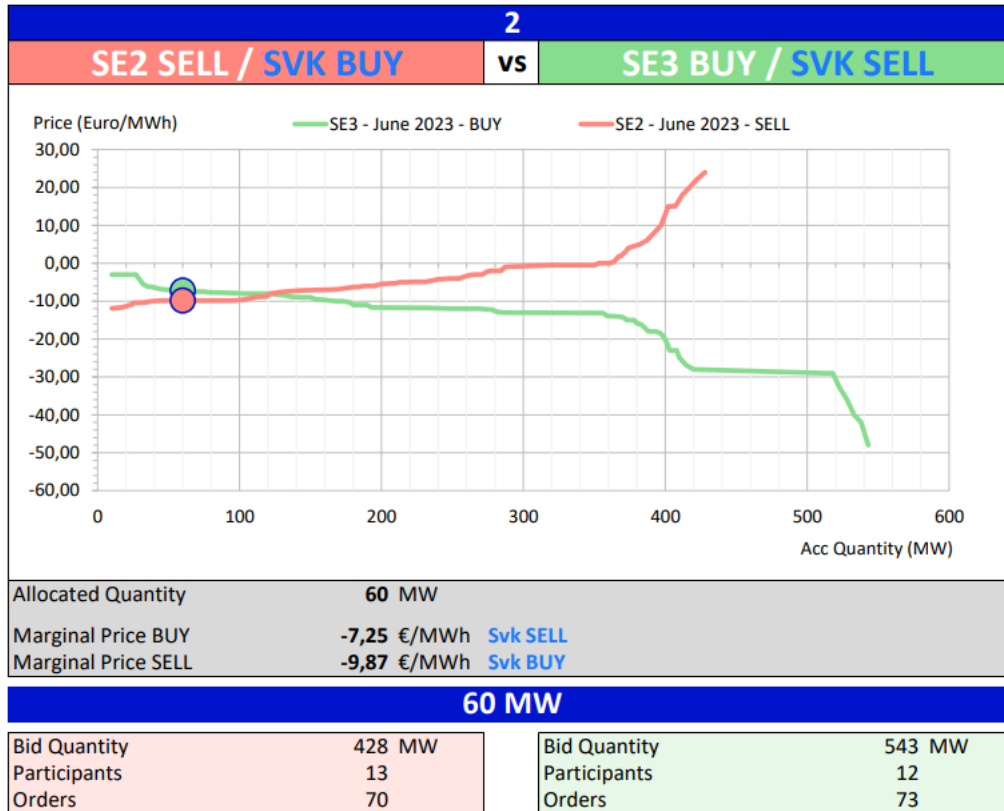
2 Maj 2023, YR-24 (SE2-SE3)



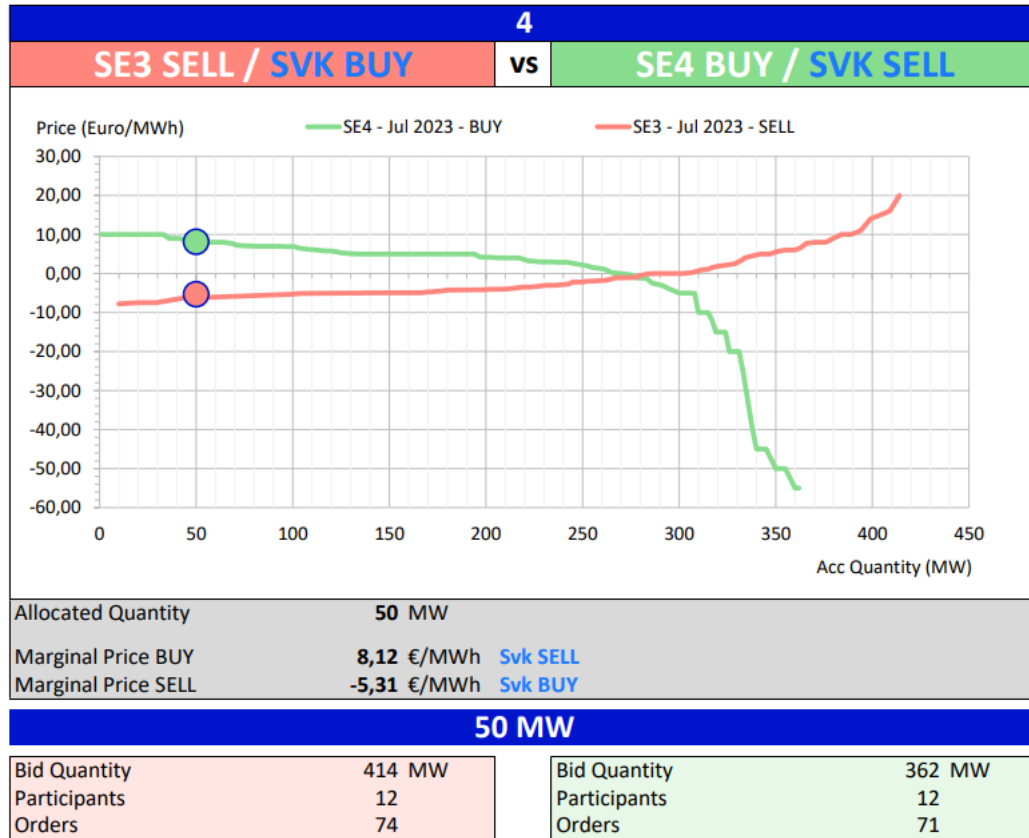
16 Maj 2023, JUN-23 (SE3-SE4)



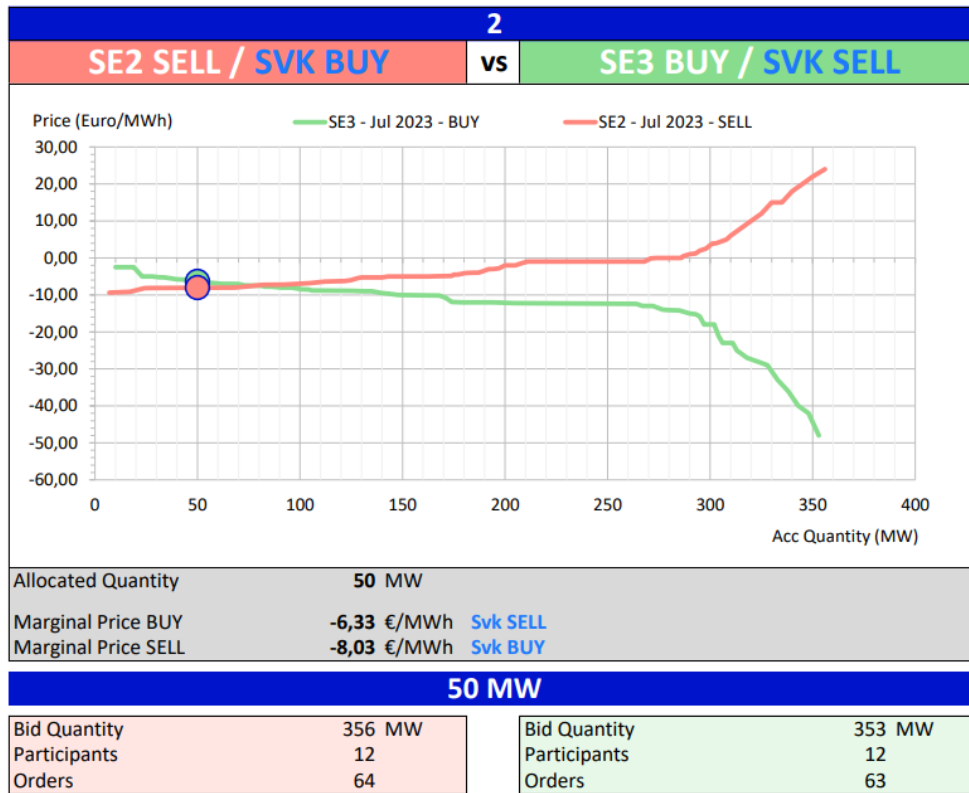
16 Maj 2023, JUN-23 (SE2-SE3)



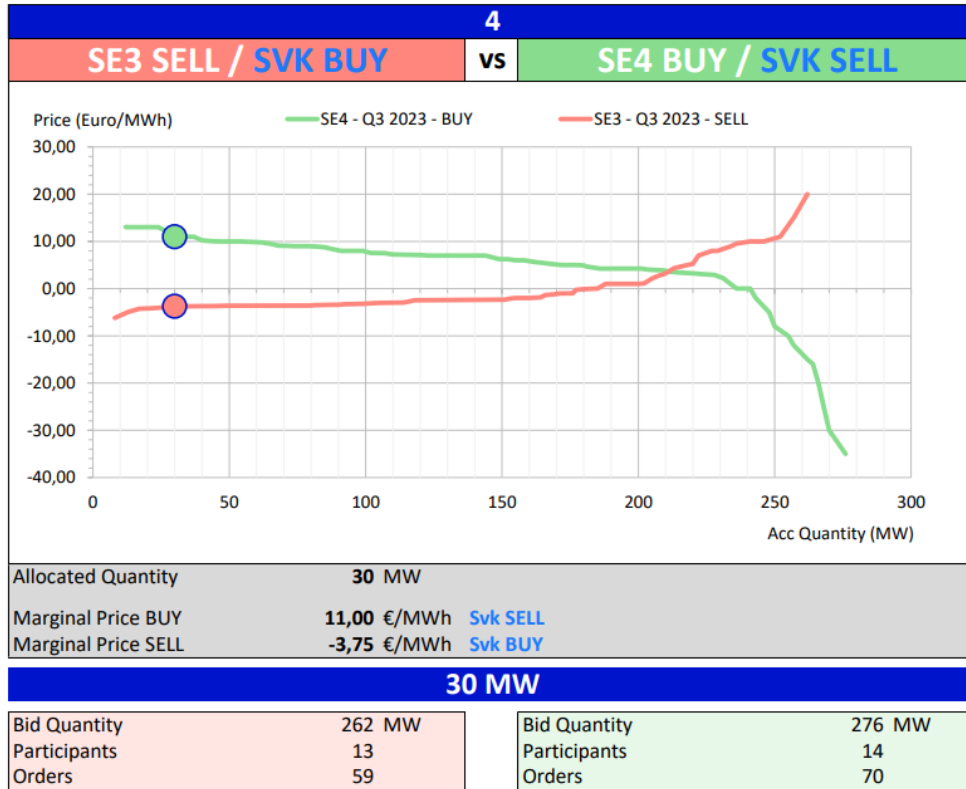
16 Maj 2023, JUL-23 (SE3-SE4)



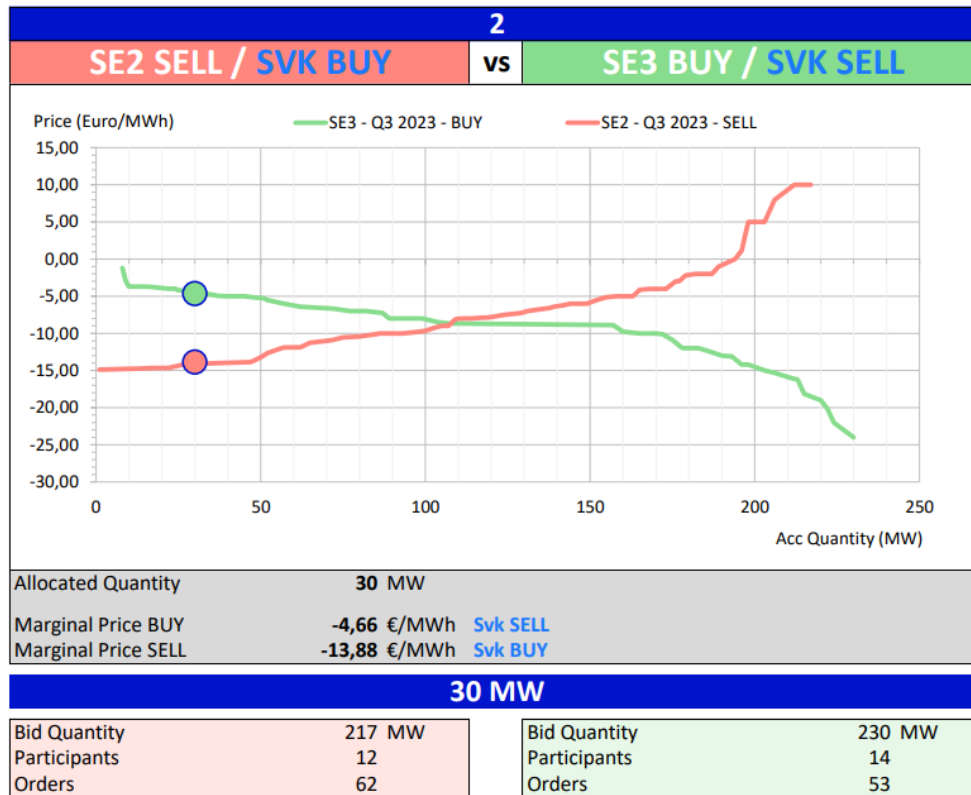
16 Maj 2023, JUL-23 (SE2-SE3)



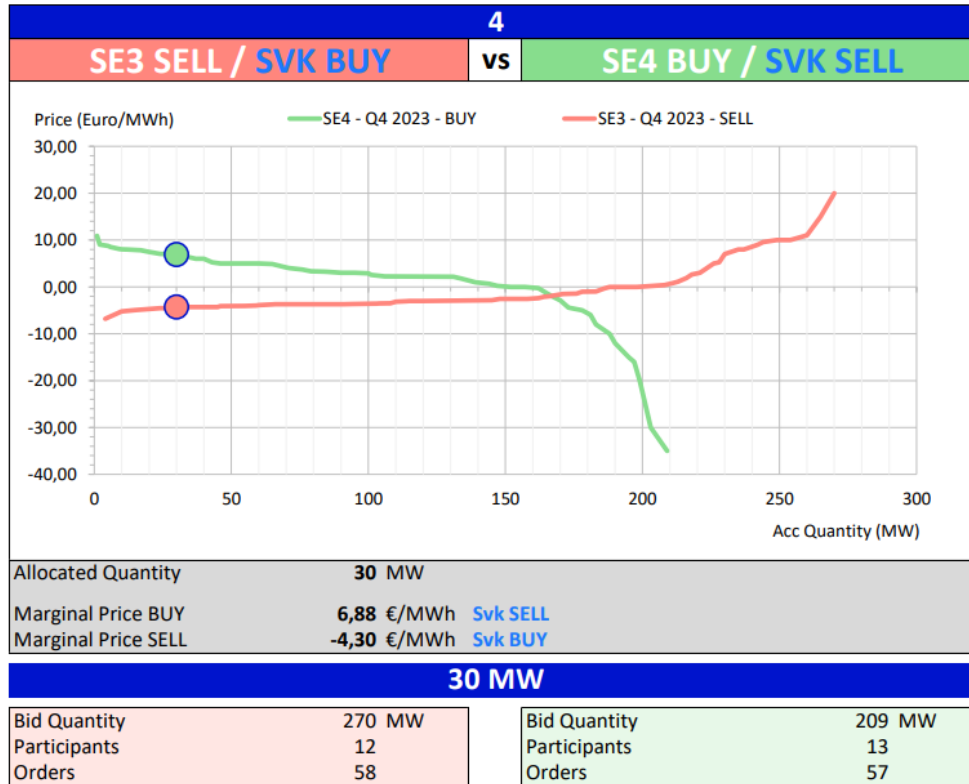
16 Maj 2023, Q3-23 (SE3-SE4)



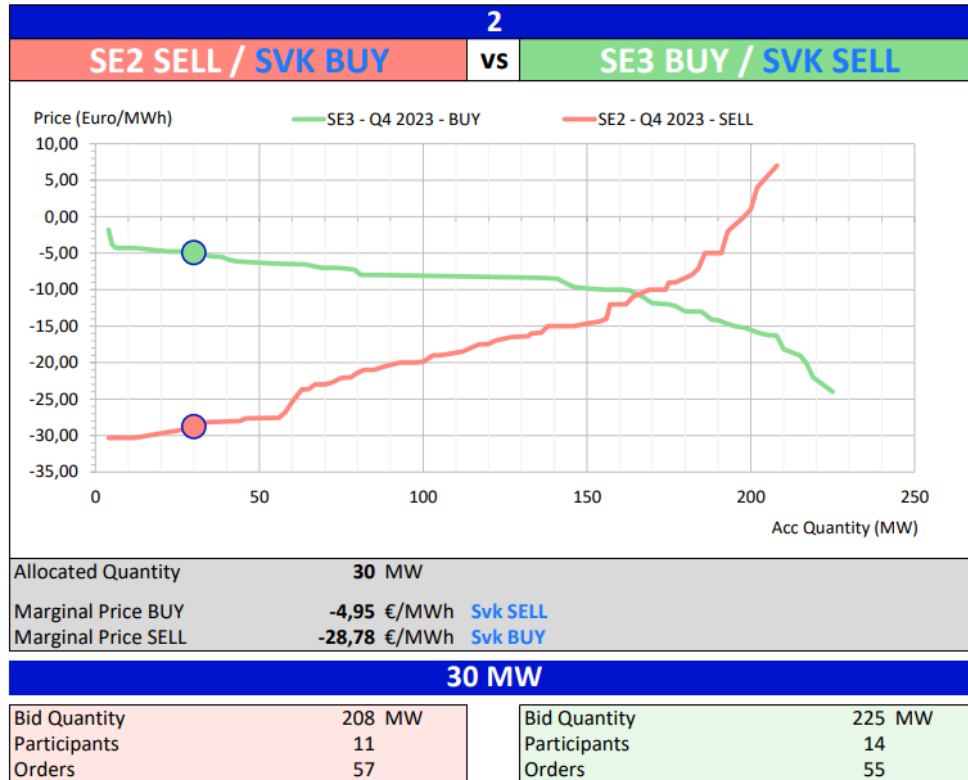
16 Maj 2023, Q3-23 (SE2-SE3)



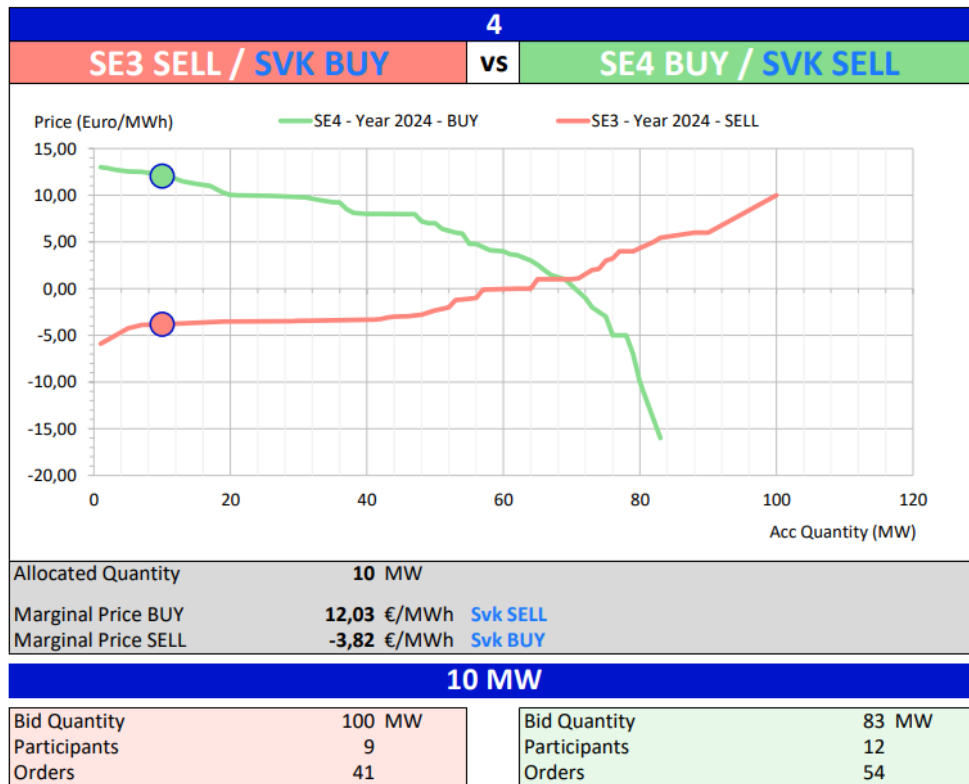
16 Maj 2023, Q4-23 (SE3-SE4)



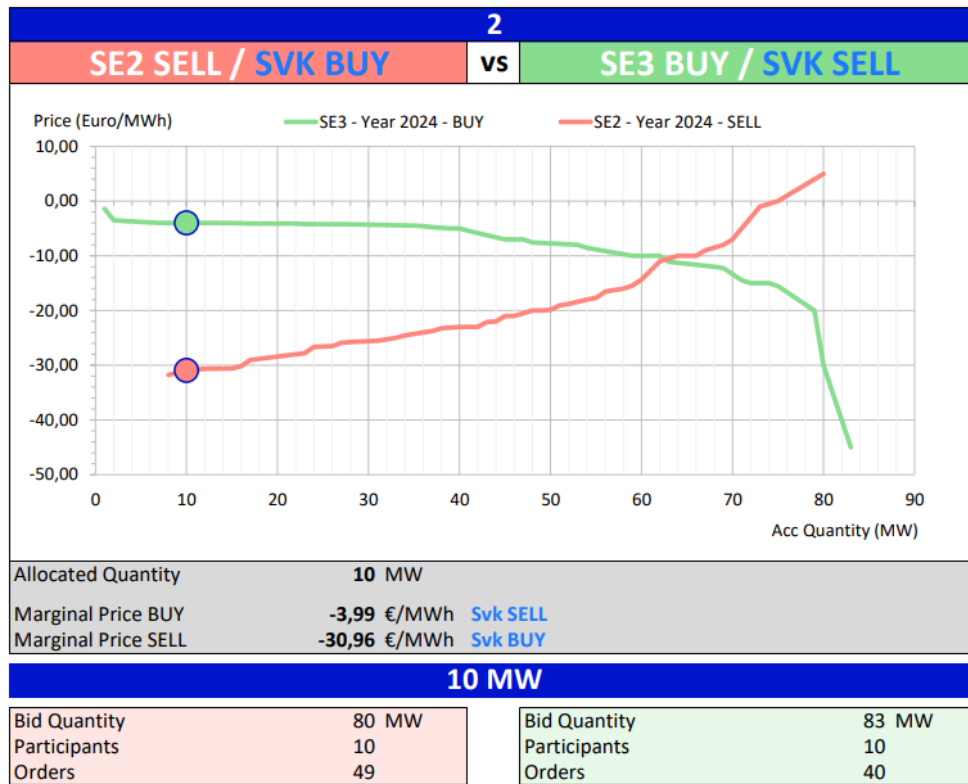
16 Maj 2023, Q4-23 (SE2-SE3)



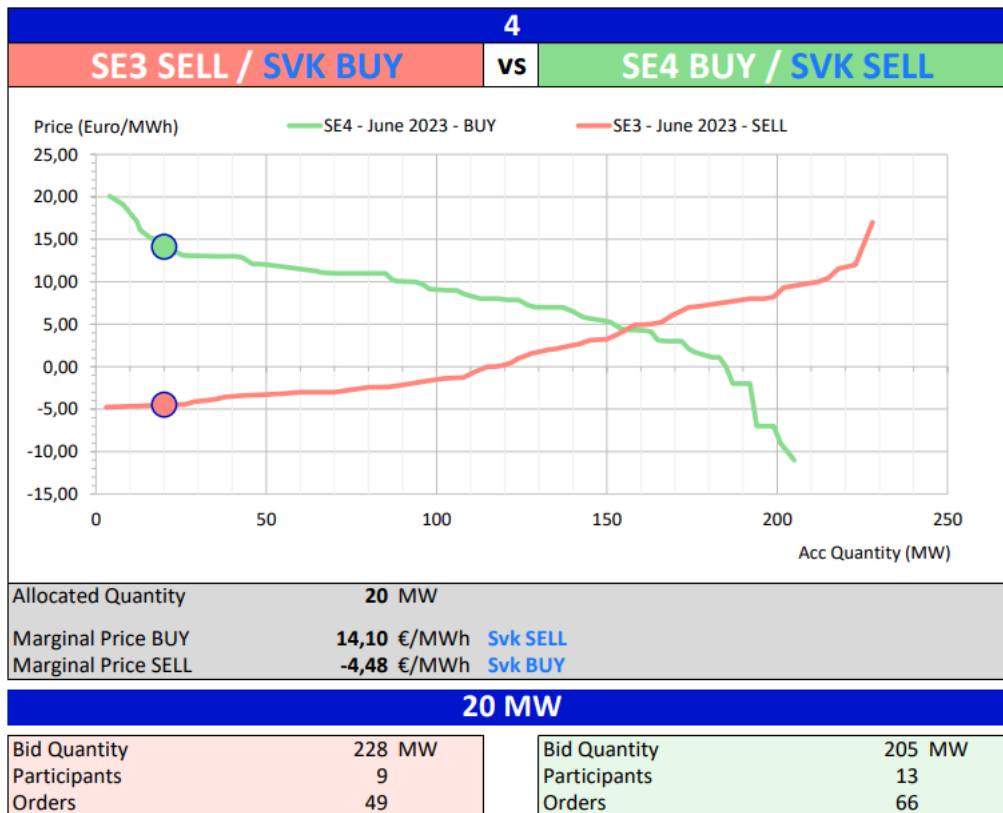
16 Maj 2023, YR-24 (SE3-SE4)



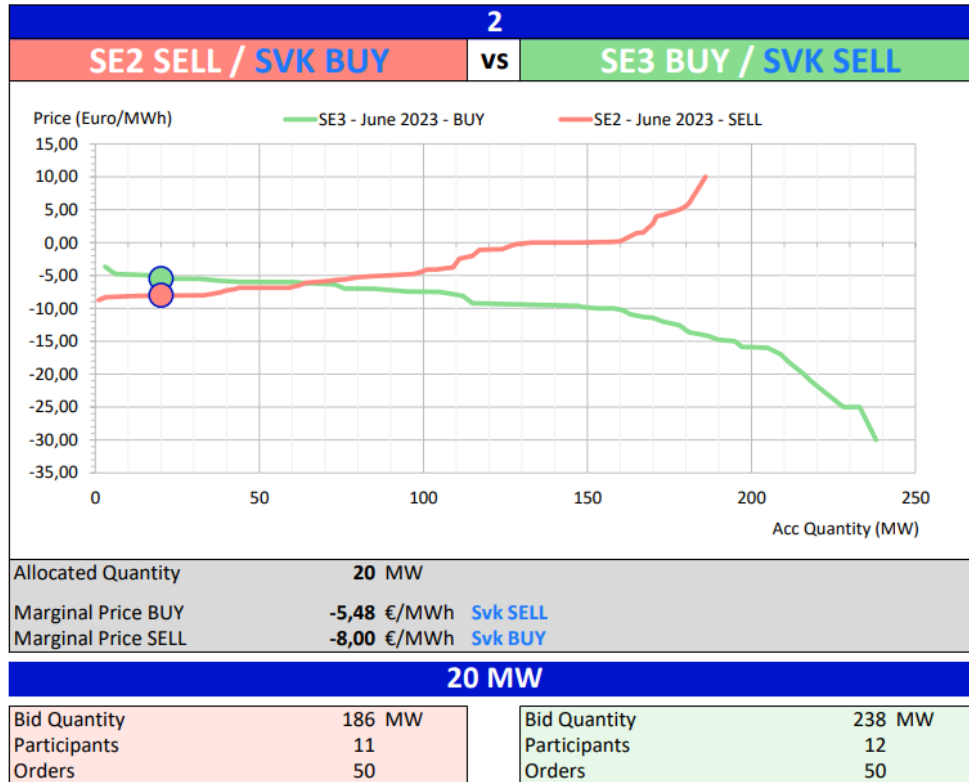
16 Maj 2023, YR-24 (SE2-SE3)



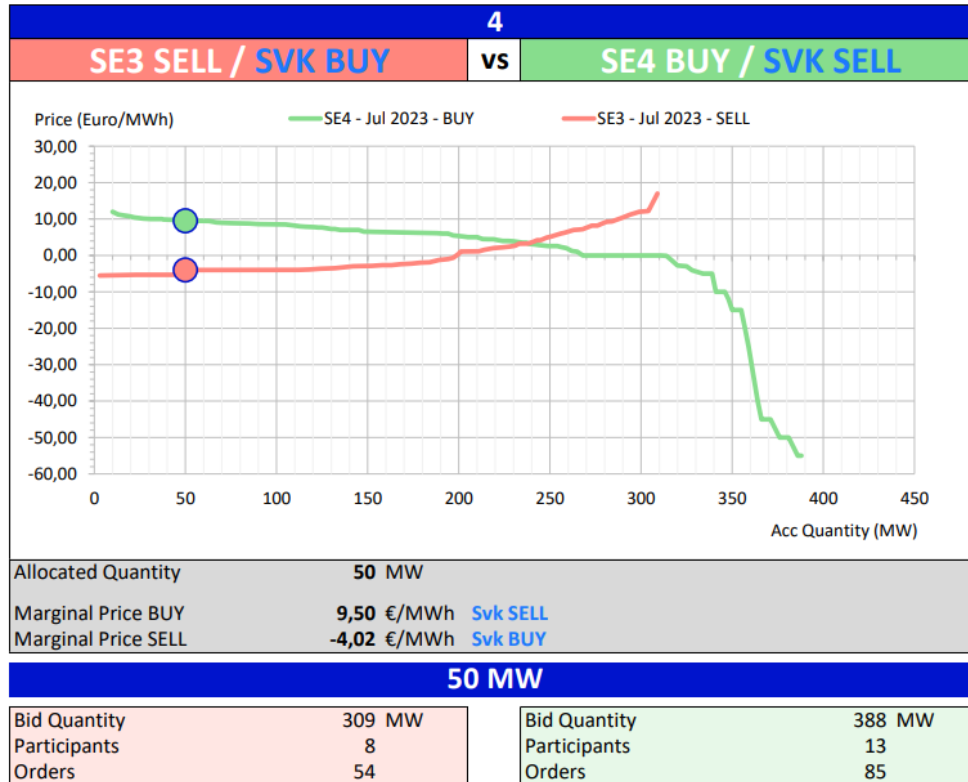
30 Maj 2023, JUN-23 (SE3-SE4)



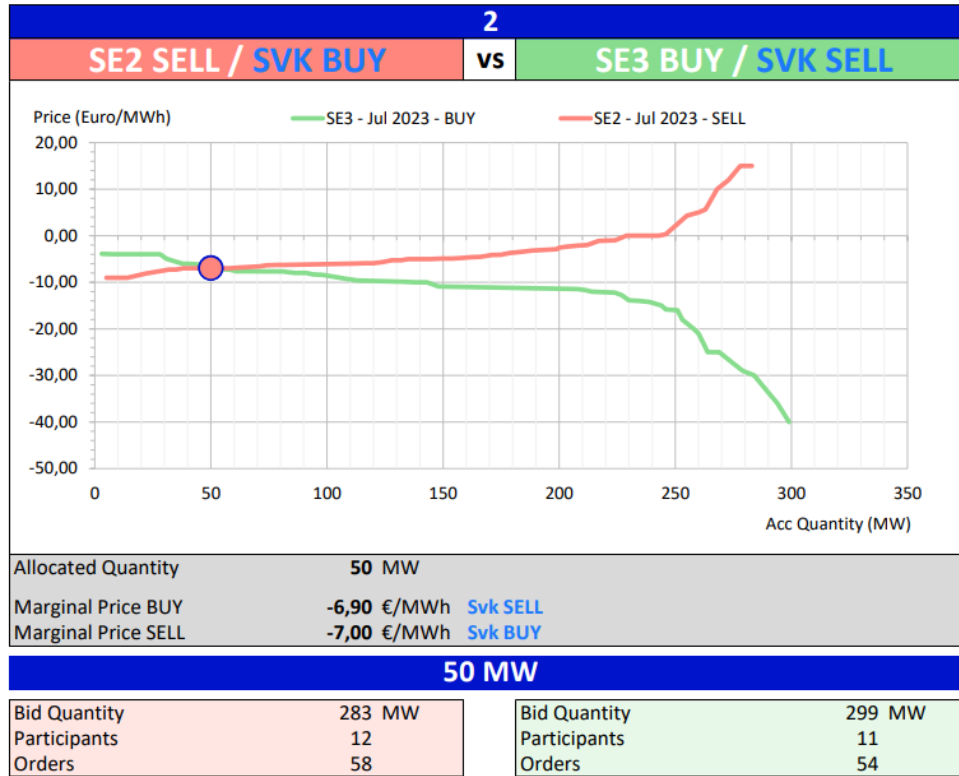
30 Maj 2023, JUN-23 (SE2-SE3)



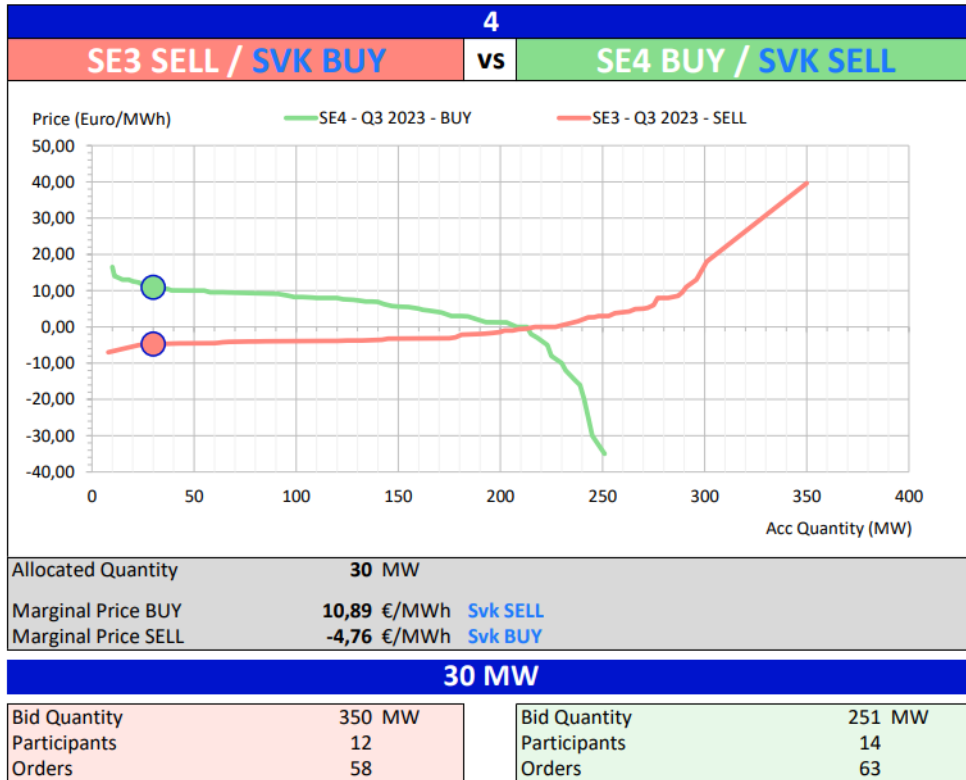
30 Maj 2023, JUL-23 (SE3-SE4)



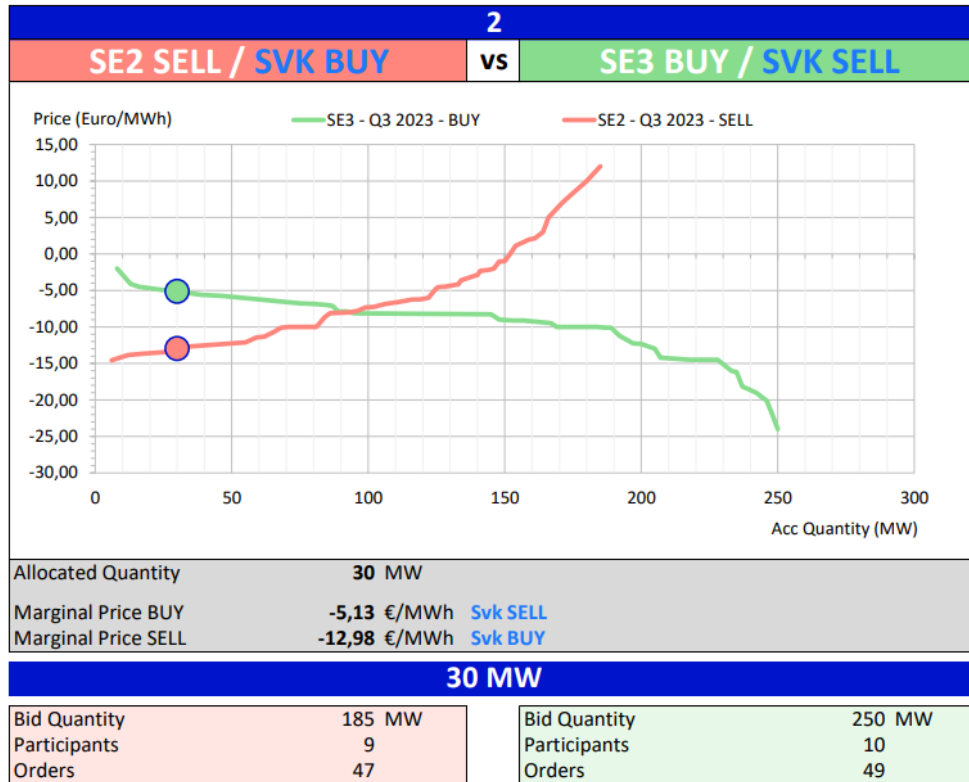
30 Maj 2023, JUL-23 (SE2-SE3)



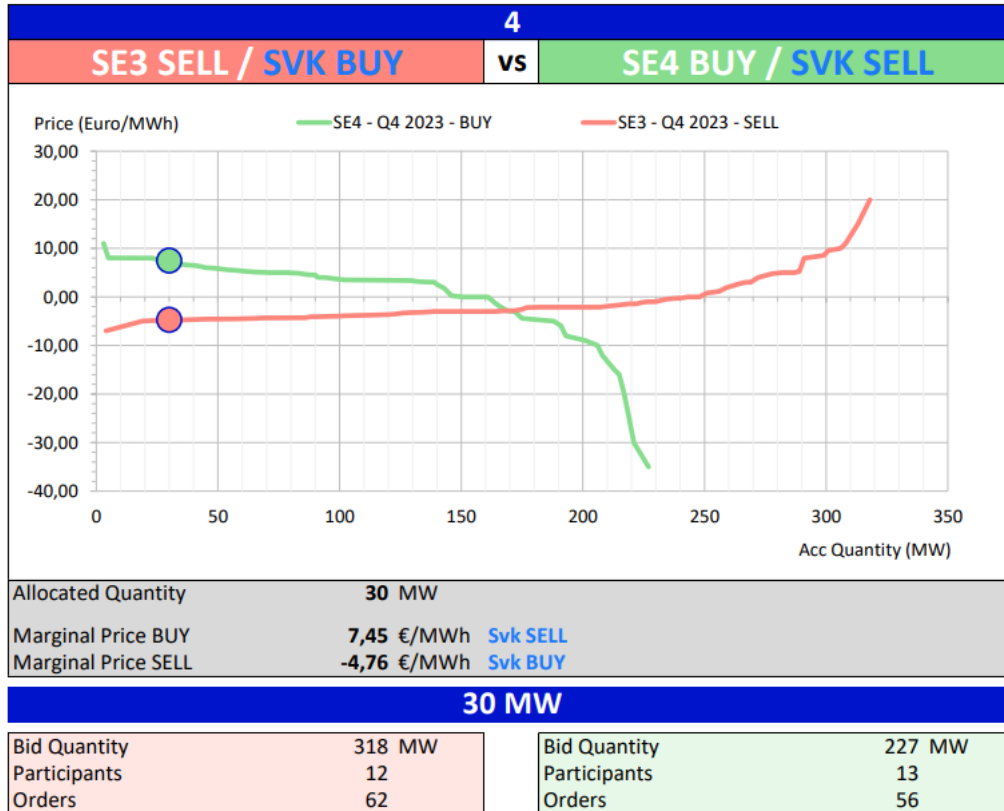
30 Maj 2023, Q3-23 (SE3-SE4)



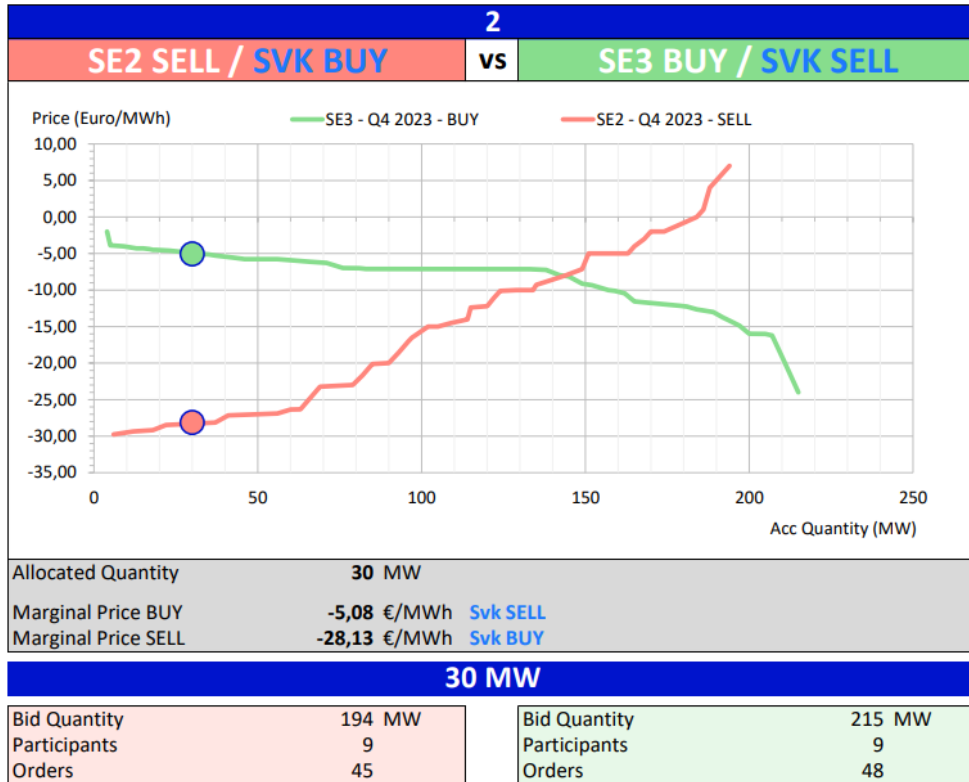
30 Maj 2023, Q3-23 (SE2-SE3)



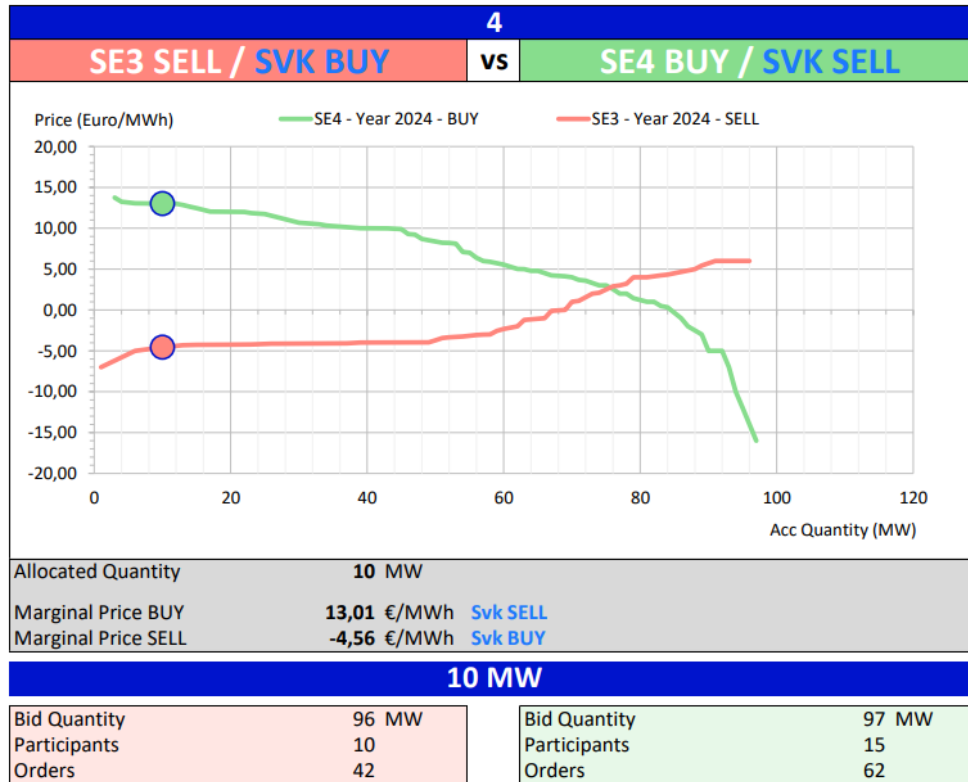
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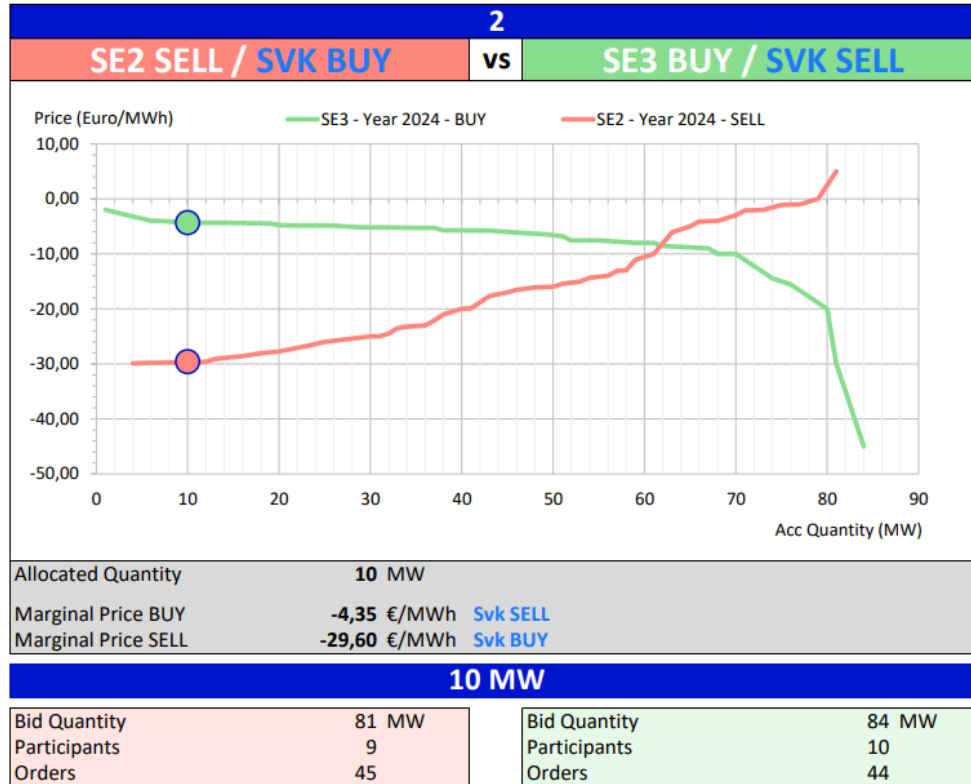
30 Maj 2023, Q4-23 (SE2-SE3)



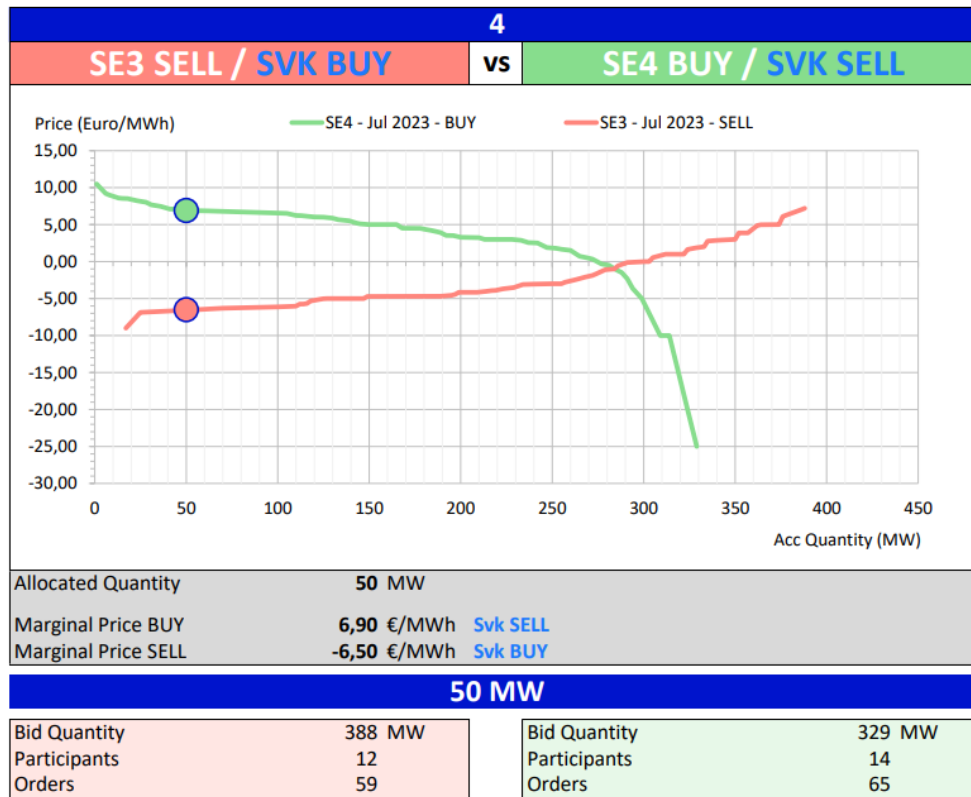
30 Maj 2023, YR-24 (SE3-SE4)



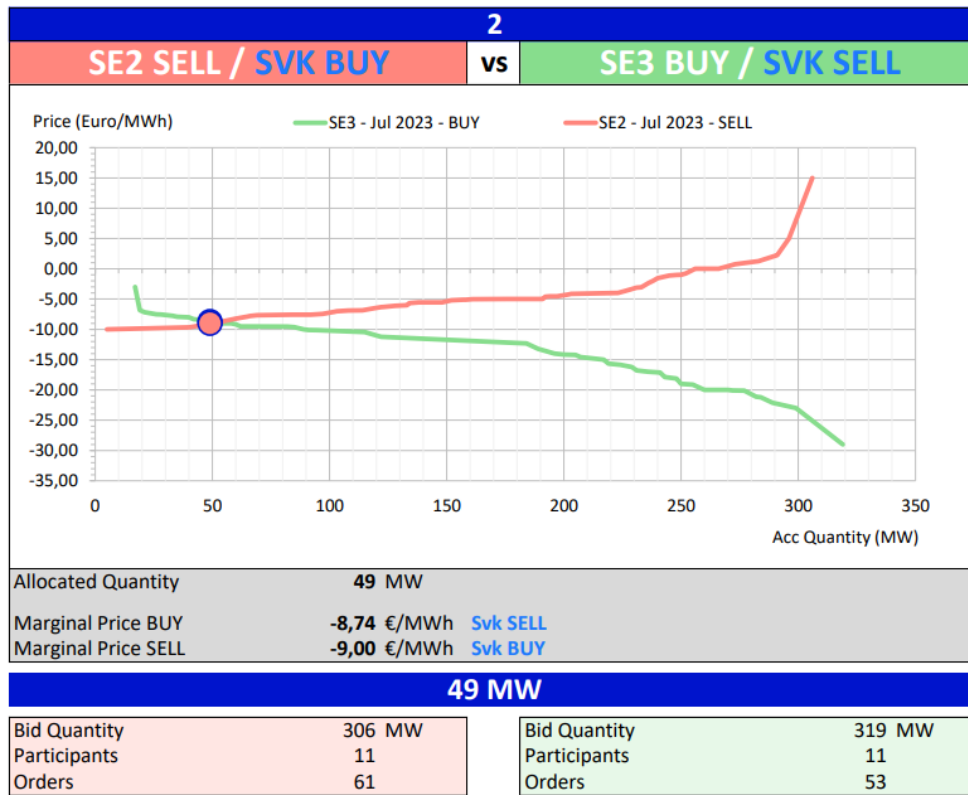
30 Maj 2023, YR-24 (SE2-SE3)



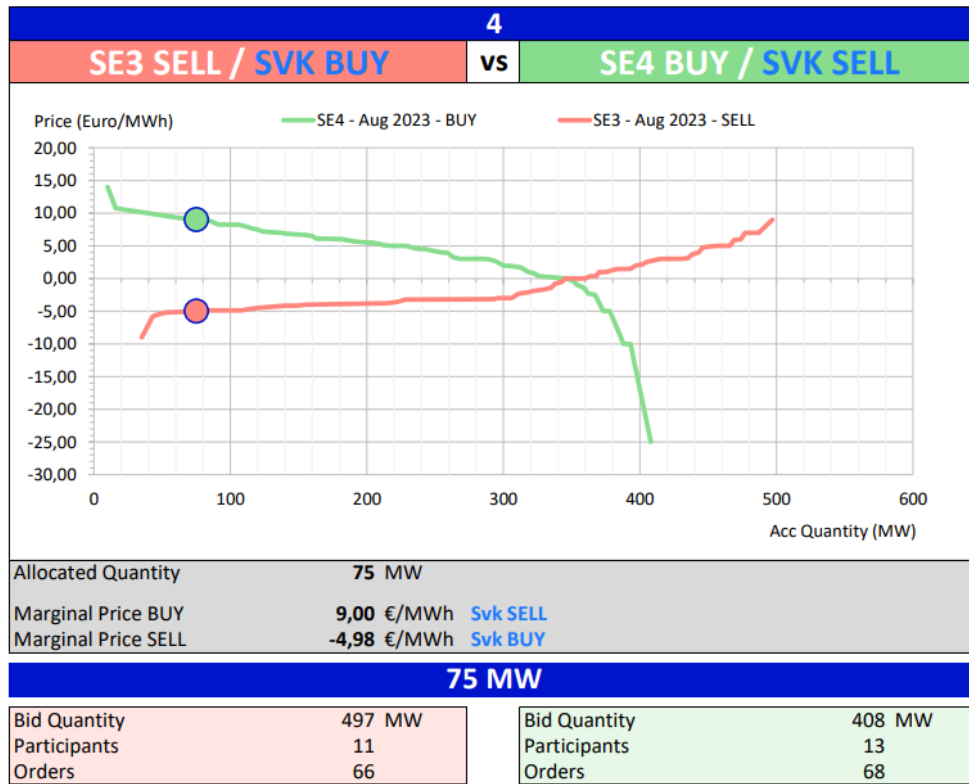
13 Jun 2023, JUL-23 (SE3-SE4)



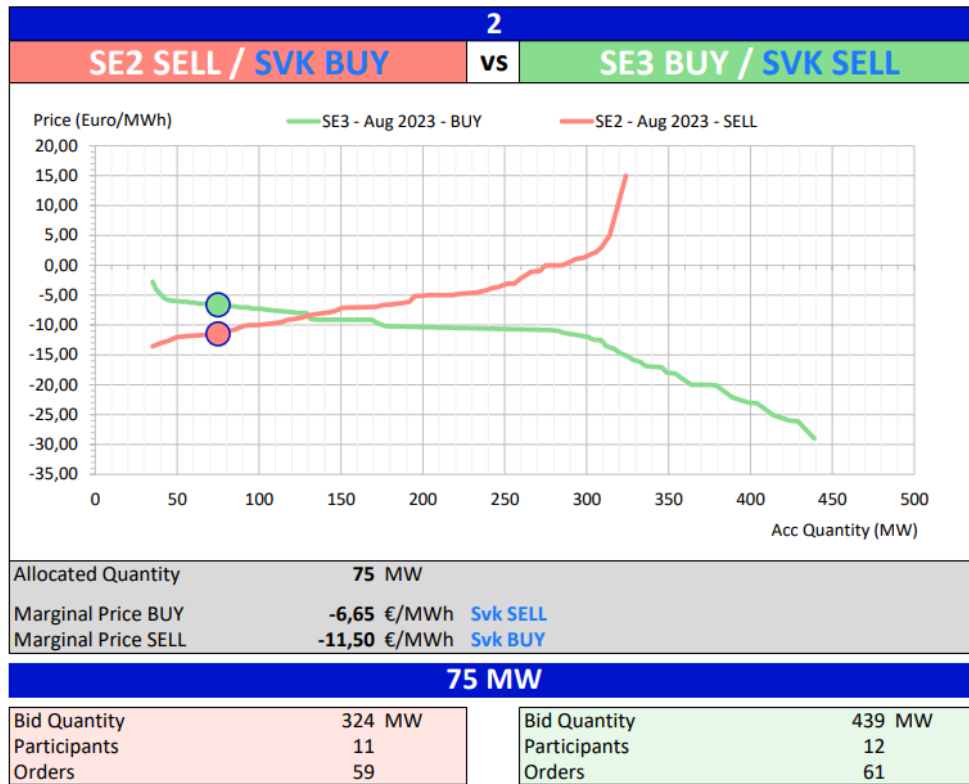
13 Jun 2023, JUL-23 (SE2-SE3)



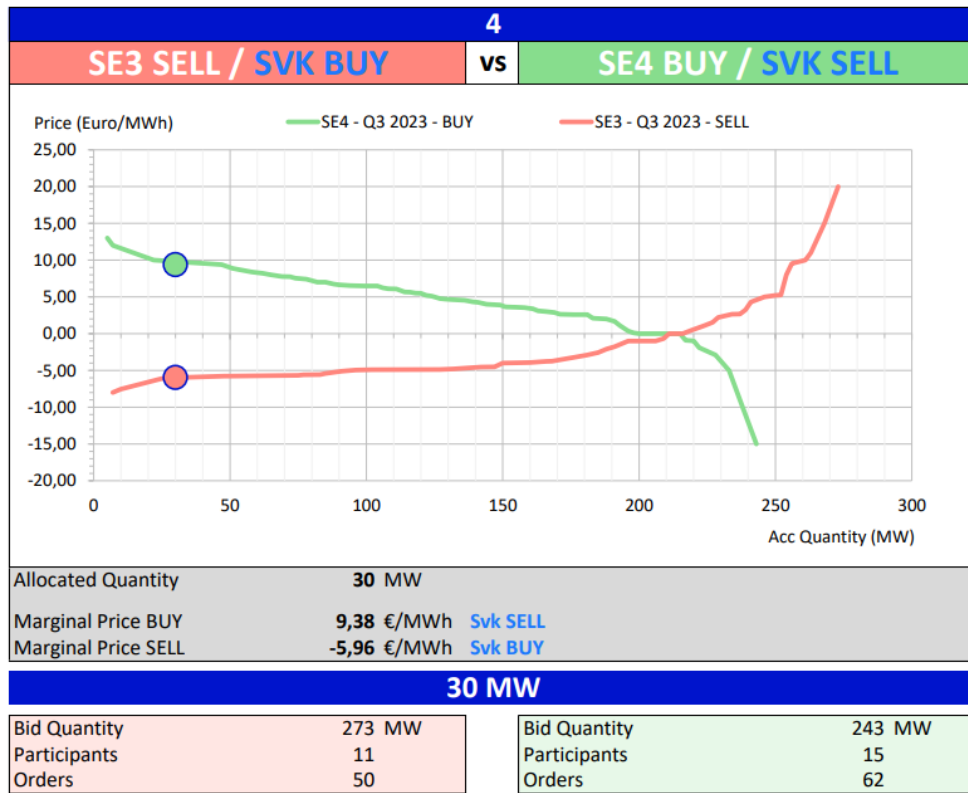
13 Jun 2023, AUG-23 (SE3-SE4)



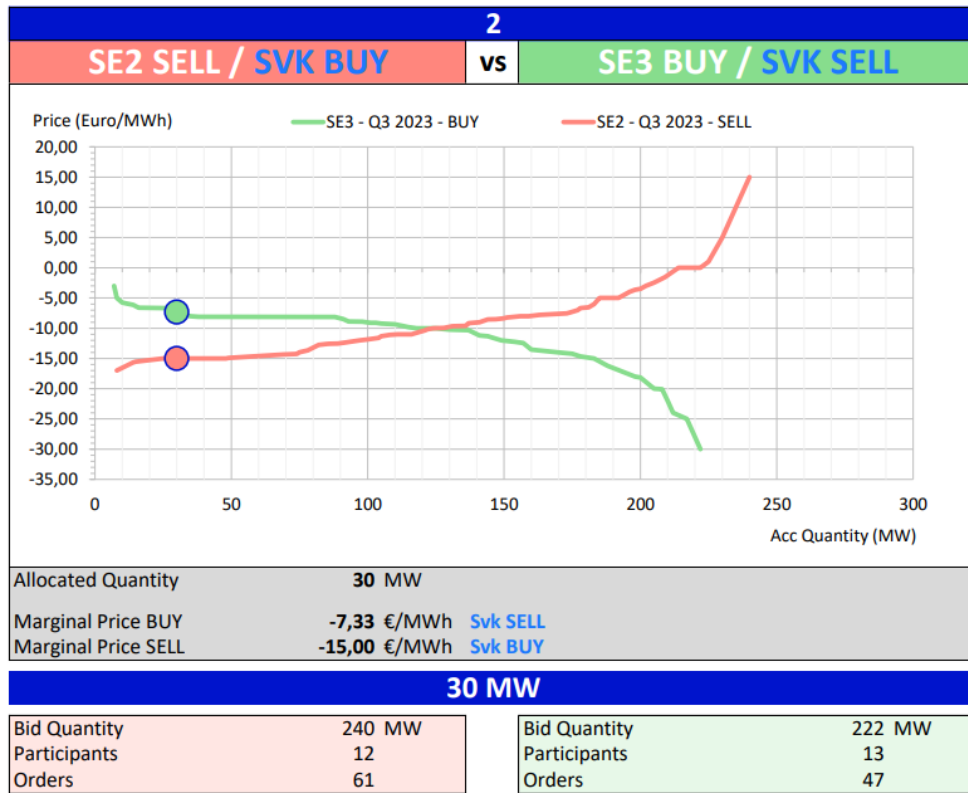
13 Jun 2023, AUG-23 (SE2-SE3)



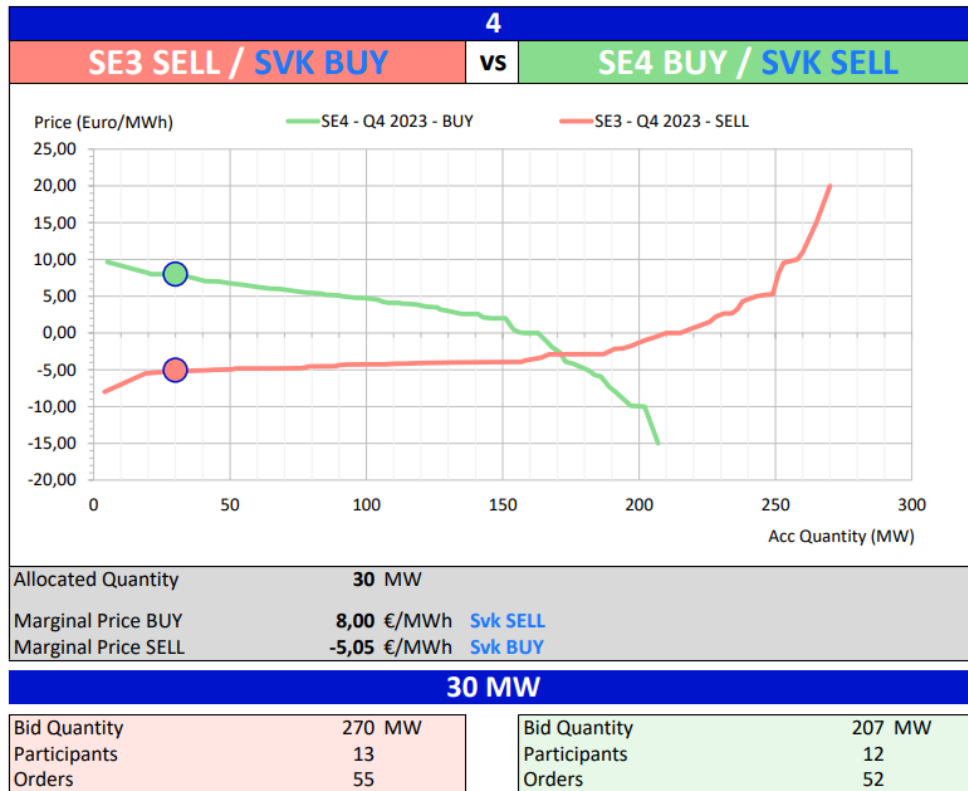
13 Jun 2023, Q3-23 (SE3-SE4)



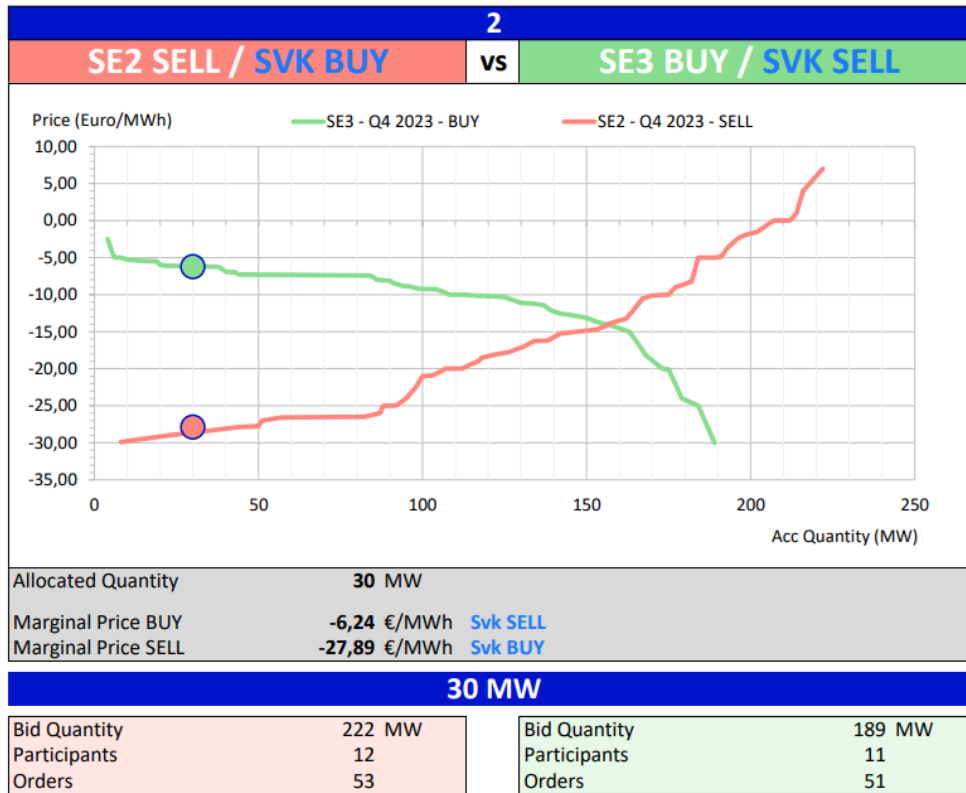
13 Jun 2023, Q3-23 (SE2-SE3)



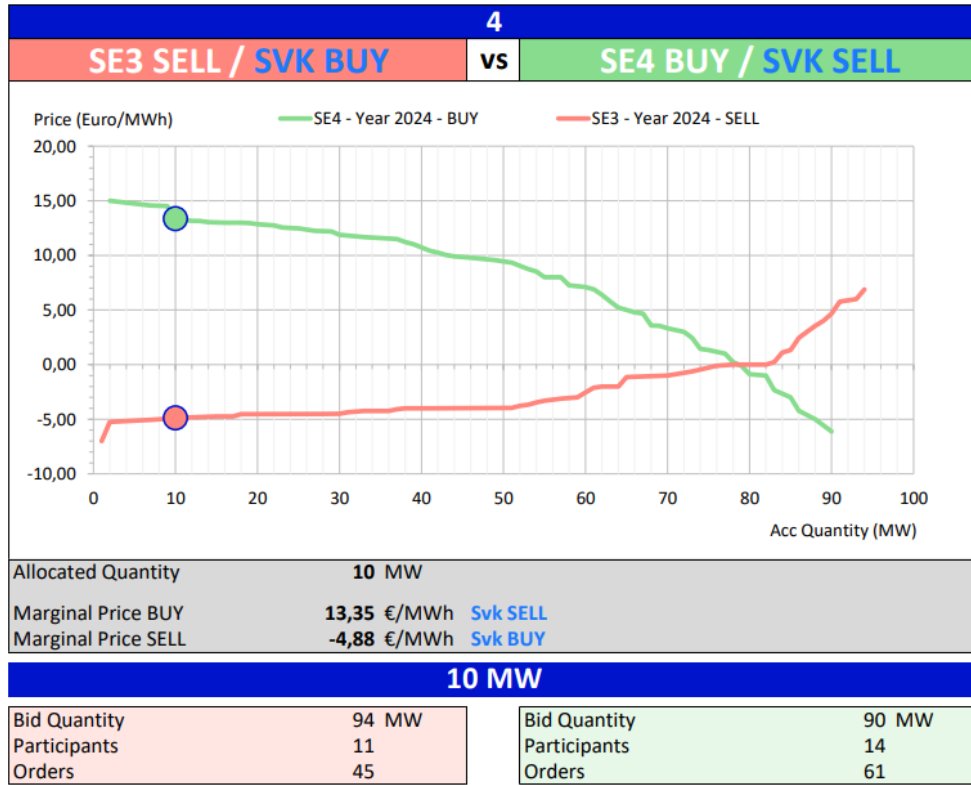
13 Jun 2023, Q4-23 (SE3-SE4)



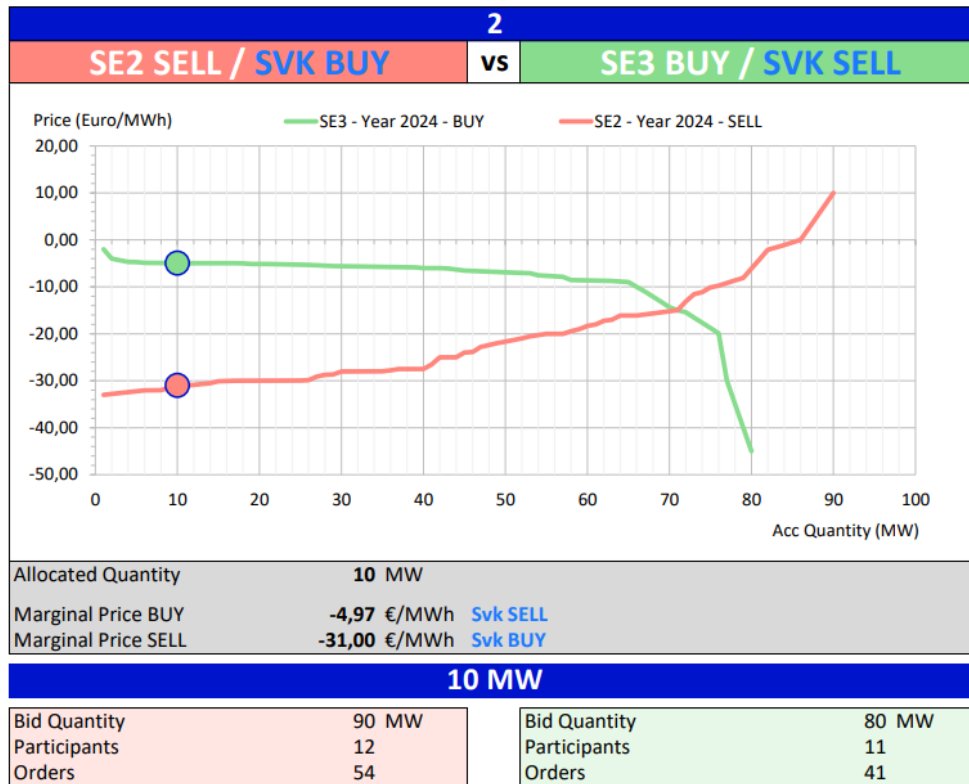
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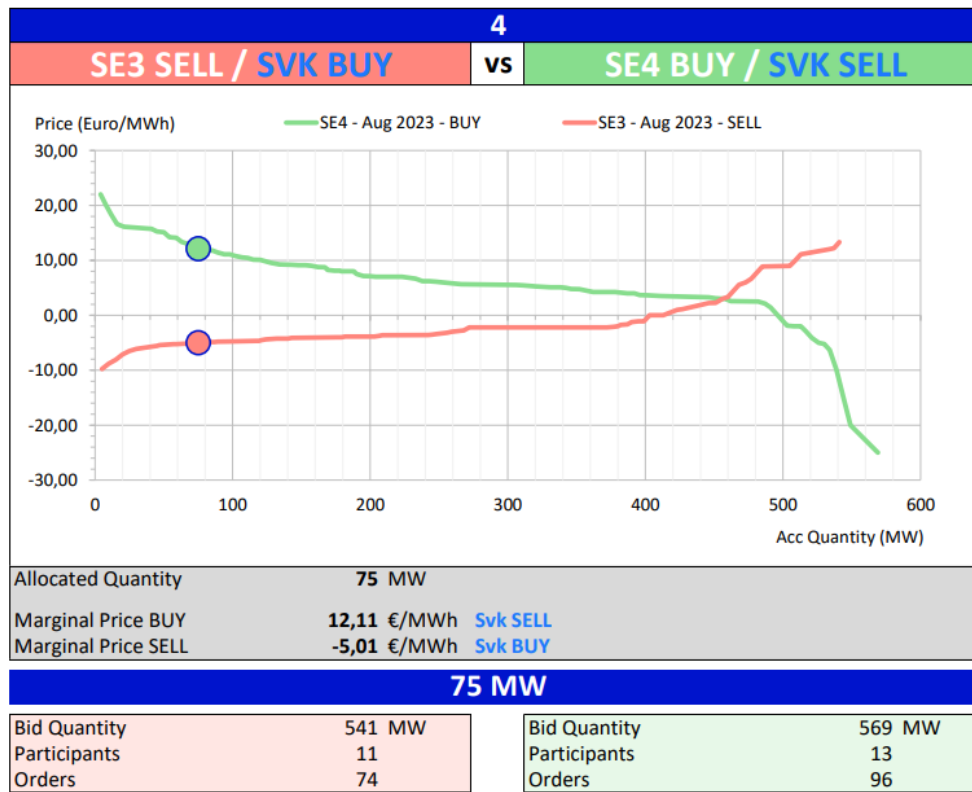
13 Jun 2023, YR-24 (SE3-SE4)



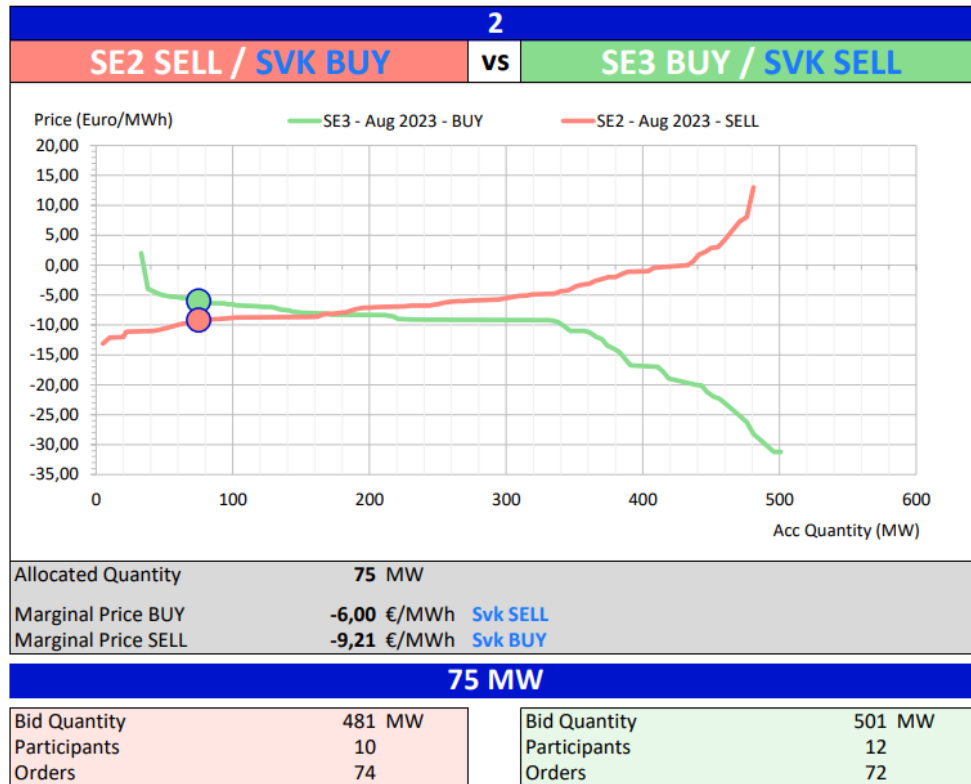
13 Jun 2023, YR-24 (SE2-SE3)



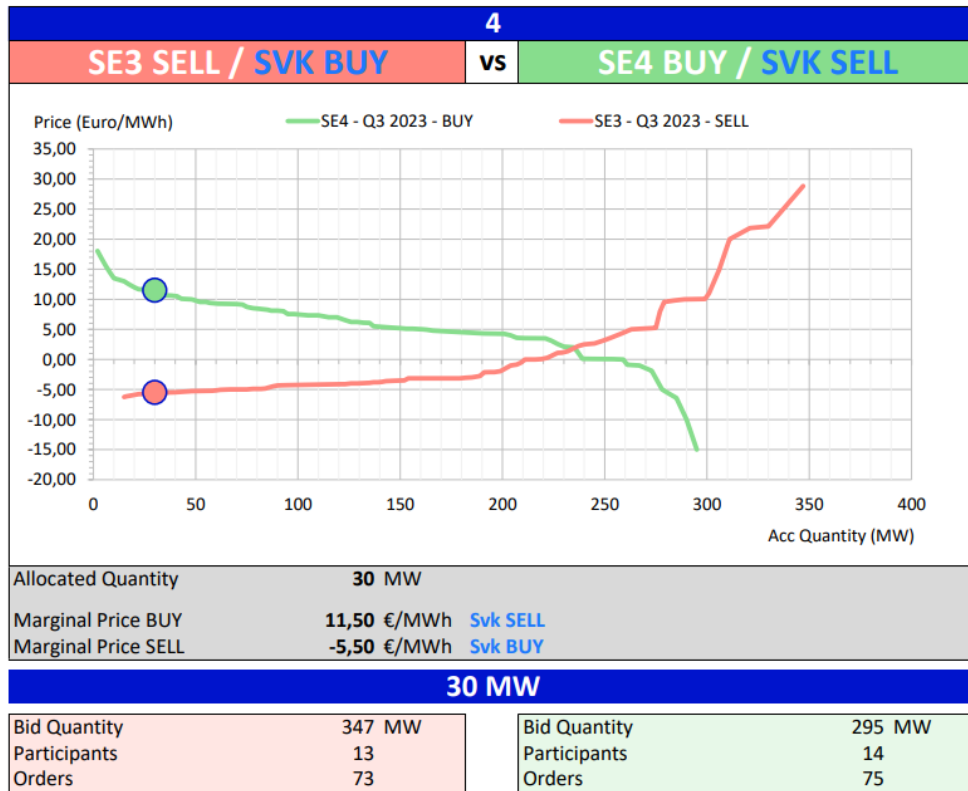
27 Jun 2023, AUG-23 (SE3-SE4)



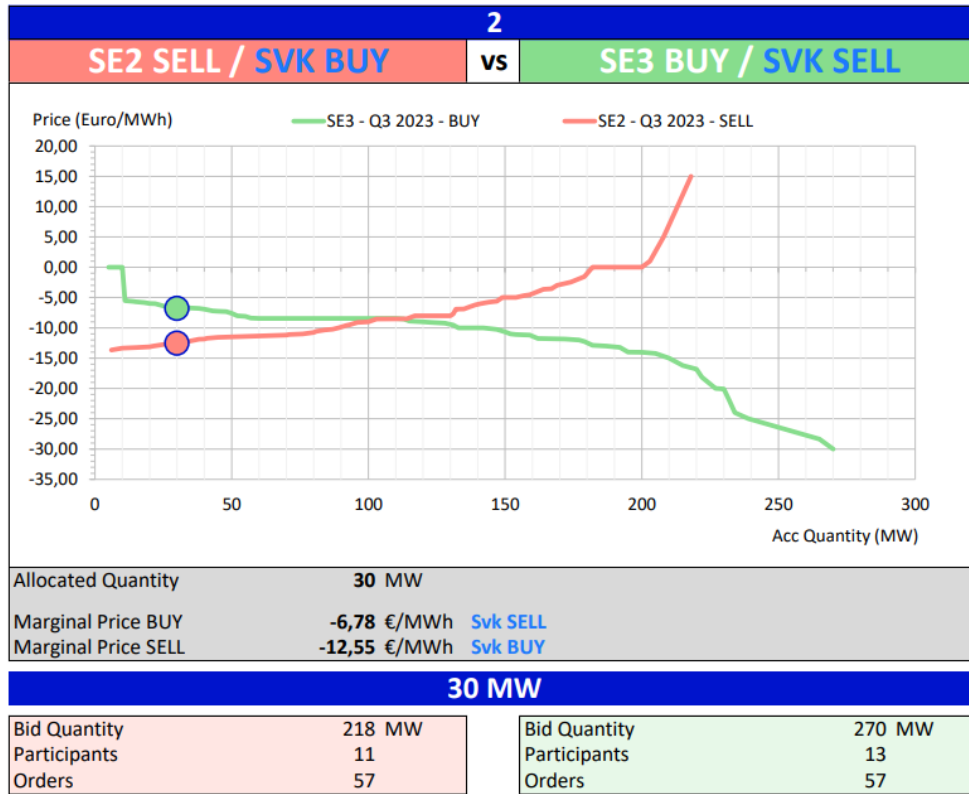
27 Jun 2023, AUG-23 (SE2-SE3)



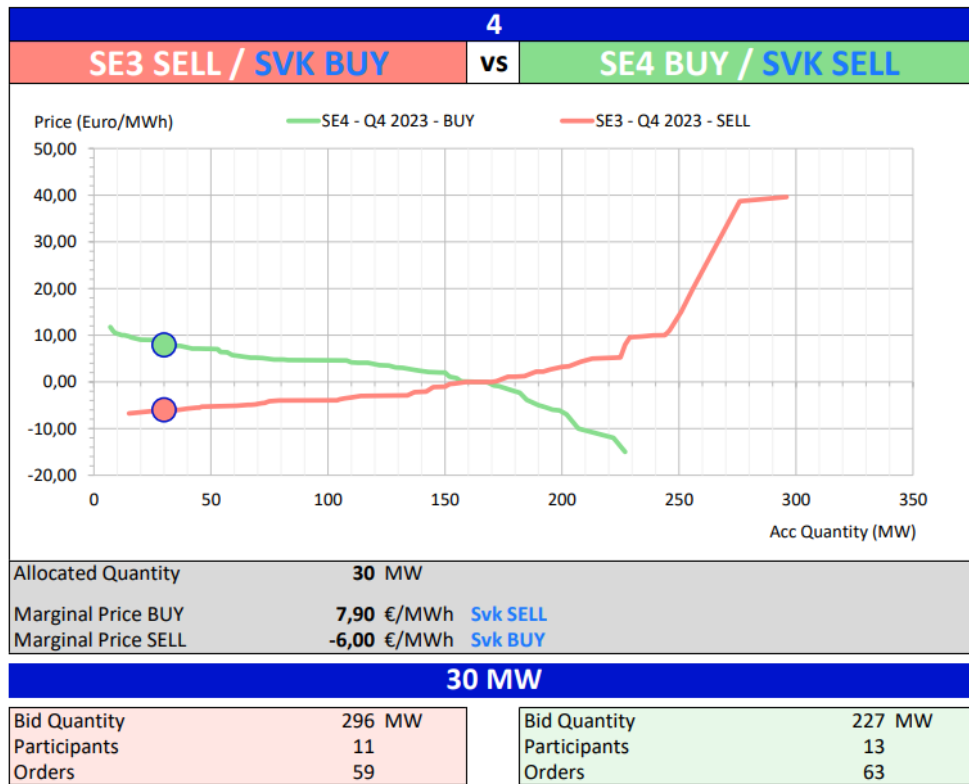
27 Jun 2023, Q3-23 (SE3-SE4)



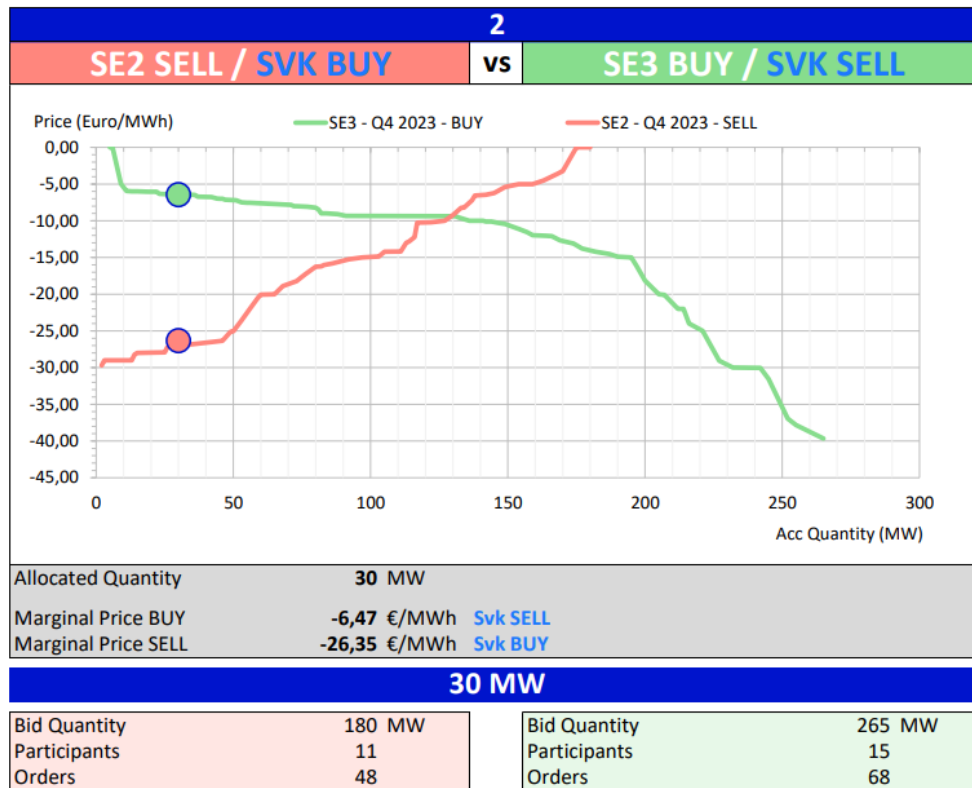
27 Jun 2023, Q3-23 (SE2-SE3)



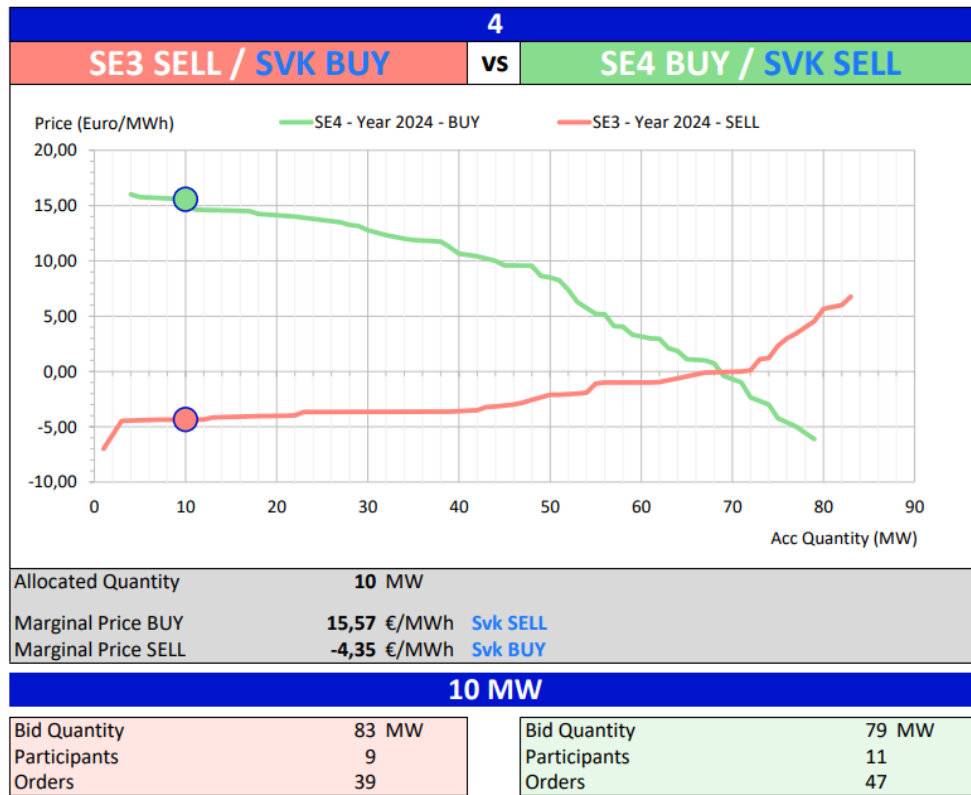
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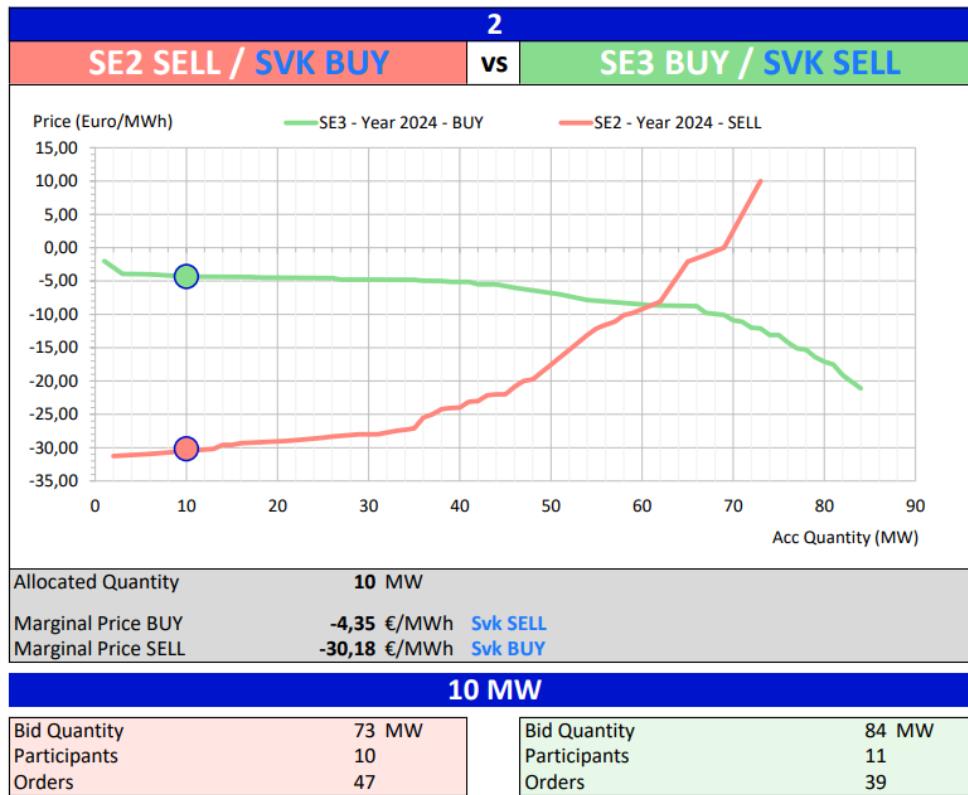
27 Jun 2023, Q4-23 (SE2-SE3)



27 Jun 2023, YR-24 (SE3-SE4)



27 Jun 2023, YR-24 (SE2-SE3)



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.

Svenska kraftnät
Box 1200
172 24 Sundbyberg
Sturegatan 1

Phone: 010-475 80 00
Fax: 010-475 89 50
www.svk.se

