

Analysis of the e-POWER January to April 2023 auctions

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1 e-POWER Auction Analysis

1.1 Headlines

Across four monthly auctions between the months of January to April 2023, e-POWER sold PPAs for 55 projects with the total number of bids during this period reaching 673.

- These auctions saw three different PPA lengths and start dates, the majority of which were for 12 months (58% of all PPAs), six months (40% of all PPAs) or four months (2% of all PPAs). PPAs during the Q123 auction period were secured across a range of start dates, and therefore represent a range of forward wholesale prices at the times the PPAs were executed. Wholesale prices remain varied, but the reduced volatility in pricing could have supported greater levels of bidding activity.

Throughout 2023 to date, the wholesale cost of energy in GB has continued to fall, and thus the stabilisation of the market has brought with it a return to more ‘typical’ bidding behaviour.

- The average PPA price achieved by all sites in the auction was £181.52/MWh, compared with £173.50/MWh from the January 2022 annual auction analysis – representing a 4.6% uplift

A total of eight different technology types participated in the auction, across 55 individual projects. These technologies were Wind; Hydro; Landfill Gas; AD; Mixed Technologies; EfW ; Biomass; and Solar PV.

- Wind had the greatest number of assets in the auctions at 18 sites, representing 33% of all sites by count. Landfill Gas made up 18% of all sites (10 projects); Anaerobic Digestion made up 16% (9 projects); Solar PV made up 13% of all sites (7 projects); Hydro projects made up 11% (6 projects); Mixed Technologies made up 4% of projects (2 sites); EfW made up 4% of projects (2 sites) and there was 1 Biomass project (2%)
- By value retention, AD projects saw the greatest average value retention levels, at 95%. Mixed Technologies achieved an average of 94% value retention; EfW saw an average of 92%; Solar PV saw an average of 90% value retention; Landfill Gas projects averaged 89% value retention; Wind projects averaged 86% value retention; Hydro projects saw an average of 84%; and Biomass achieved 80% value retention

1.2 Cornwall Insight view

While the energy crisis is ongoing, the recent reduction and lessened volatility in wholesale power prices has aided competition levels in the PPA market. Somewhat reduced £/MWh values for renewable generators might appear less appealing, however greater confidence in pricing levels from offtakers has meant that bidding levels for PPAs has increased in recent months. Value retention levels in newly signed PPAs therefore remain at an elevated level compared to the same period of 2022.

Intermittent generation technologies continue to see mostly lower value retention compared to baseload generation technologies, as intermittent technologies are subject to greater volatility in output, and therefore increased volume, shaping and balancing risk within PPA deals. Nonetheless, the appetite from energy suppliers to source renewable electricity through PPAs continues to grow, as wider industry and consumer concerns regarding greenwashing and the perceived “greeness” of electricity supply has come to the fore. Here, intermittent technologies are often seen as preferred due to their perceived greater “greeness”.

Issues surrounding greenwashing mean that REGOs, at least for some, are considered a less attractive option for fuel mix disclosure purposes. Nevertheless, the ban of EU GoOs for fuel mix disclosure purposes in Great Britain has provided some support to REGO values. This has only strengthened the demand for PPAs, which are considered to be a better option for verifying the green credentials of an energy supply contract.

2 Methodology

This report analyses the results for contracts awarded in the January 2023 e-POWER auction, held on 25th January 2023, the February auction (23rd February 2023), March auction (22nd March 2023) and April auction (19th April 2023). It analyses the actual values achieved by generators and compares them against a maximum market benchmark value generators can potentially achieve if the full value of all revenue streams are realised. Achieved project and maximum benchmark values are presented as a £/MWh figure based on the sum of various revenues streams. These are assessed post-auction, where sources of value include:

- **Wholesale power price**
 - A variety of wholesale power price assumptions were used in this assessment for maximum benchmark values, based on PPA length and start dates. This auction saw three different PPA lengths (4 months, 6 months and 12 months), and six different start dates (1 April 2023, 1 May 2023, 1 June 2023, 1 October 2023, 1 April 2024, 1 October 2024). Benchmark values are summarised in Figure 1 overleaf
- **Green certificates**
 - Regarding Renewables Obligation Certificates (Rocs), a value of £54.00/Roc has been used by e-POWER. The buy-out price for CP21 was £52.88/Roc, and, dependent on RO banding, some assets saw values in excess of £54.00/Roc for their Rocs within the January to April auctions
 - Values for REGOs are not included in the maximum benchmark value assessment. However, it should be noted that suppliers may price in value for REGOs as part of their bids
- **Generation Distribution Use of System charges (GDUoS)**
 - These are paid by distribution network operators for localised generation and vary depending on the time of day. GDUoS is the most variable of the potential benefits, as it differs by region and connection voltage. GDUoS is always built into the contract price, whether it is a cost or a benefit
- **Transmission and distribution losses**
 - As embedded generators can help avoid the amount of thermal losses in the networks, distribution connected generators can avoid these extra costs and offer them as a benefit to suppliers
- Triad benefits are not included in this analysis as they are paid separately in the e-POWER contract

Typical maximum benchmark values used for this analysis are summarised in Figure 1. As previously mentioned, other wholesale power price assumptions are used where contracts dates differ from the front-season and front-annual prices.

Figure 1: Benchmark values (£/MWh) of e-POWER auction elements, showing select historic auctions

Auction date	Front Season Wholesale Baseload Power	Annual Wholesale Baseload Power	Rocs	Embedded Benefits
April 23	n/a	£137.25	n/a	+£2.75 to +£10.28
March 23	n/a	£131.00	n/a	+£2.75 to +£6.20
February 23	£135.53	£146.76	£60.00	+£2.75 to +£7.90
January 23	£141.50	£156.95	£54.00	+£2.75 to +£10.28
Jan-22	£189.39	£193.89	£51.00	-£1.63 to + £14.38
Jul-20	£47.79	£45.34	£50.05	£0.00 to £15.00
Jan-20	£36.63	£40.89	£50.00	£1.00 to £14.00
Jul-19	£56.39	£52.79	£48.78	£2.00 to £14.11
Jan-19	£55.83	£59.31	£48.50	£0.90 to 14.30
Jan-18	£43.63	£46.85	£47.22	£0.40 to £13.90
Jan-17	£46.10	£47.67	£45.00	-£0.60 to +£7.40
Jan-16	£31.60	£33.90	£45.00	£0.00 to £10.60
Jan-15	£41.60	N/A	£44.00	-£1.40 to +£7.30

Source: e-POWER

Figure 2: Count of PPAs secured by PPA start date and duration, all auctions

Start date	Duration		
	4 months	6 months	12 months
01-Apr-23	0	14	25
01-May-23	0	2	2
01-Jun-23	1	1	1
01-Oct-23	0	1	0
01-Apr-24	0	3	4
01-Oct-24	0	1	0

3 January to April 2023 analysis

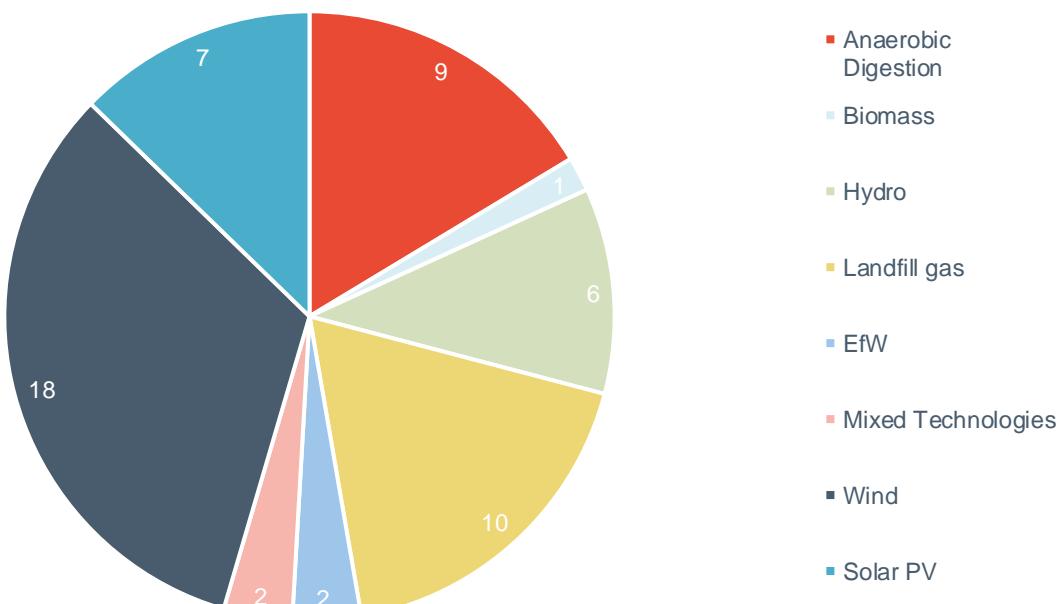
3.1 Auction summary and participation

Across four monthly auctions between the months of January to April 2023, e-POWER sold PPAs for 55 projects with the total number of bids during this period reaching 673.

A wide range of assets participated in the auctions, with eight different technology types across assets that are under both the RO and Feed-in Tariff (FiT) schemes, as well as assets that were selling power only (either subsidised or unsubsidised).

This auction saw three different PPA lengths and start dates, the majority of which were for 12 months (58% of all PPAs), six months (40% of all PPAs) or four months (2% of all PPAs). PPAs during the Q123 auction period were secured across a range of start dates, and therefore represent a range of forward wholesale prices at the times the PPAs were executed. Wholesale prices remain varied, but the reduced volatility in pricing could have supported greater levels of bidding activity.

Figure 3: Number of participating technologies in January to April 2023 auctions



Source: e-POWER, Cornwall Insight analysis

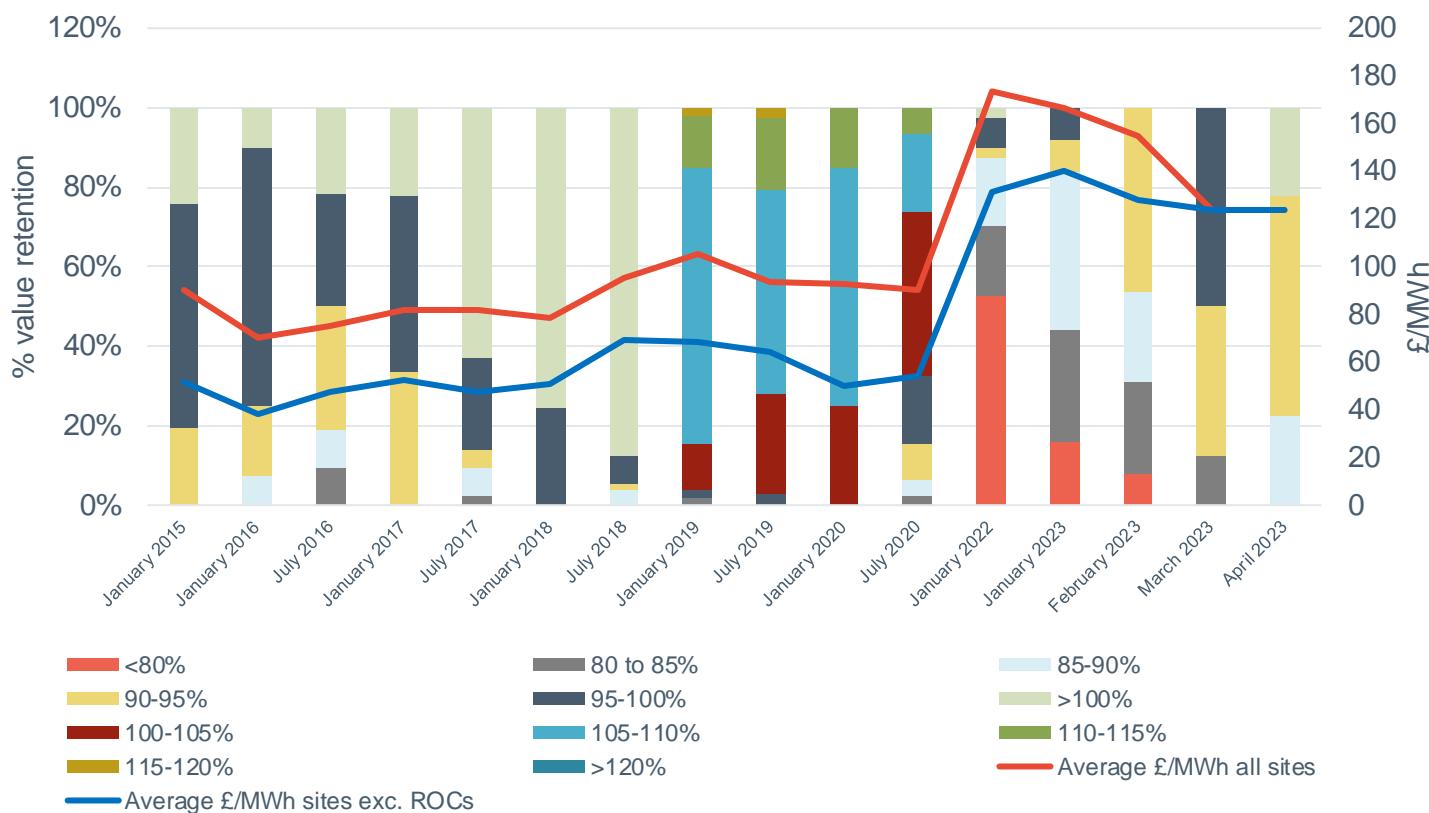
3.2 Values achieved & wider wholesale market impacts

The four auctions held across January to April saw increased levels of participation, particularly by comparison to the latter stages of 2022, amid periods of policy and regulatory ambiguity in the wake of the Russian invasion of Ukraine – bringing with it a level of uncertainty from both offtakers and generators and the appetite to commit to securing deals in a volatile market.

Throughout 2023 to date, the wholesale cost of energy in GB has continued to fall, and thus the stabilisation of the market has brought with it a return to more ‘typical’ bidding behaviour.

The average PPA price achieved by all sites in the auction was £181.52/MWh, compared with £173.50/MWh from the January 2022 annual auction analysis – representing a 4.6% uplift. The price achieved for sites where Rocs are not included was £128.43/MWh, compared with £131.31/MWh from the same auction analysis undertaken a year prior, representing 0.9% reduction.

Figure 4: Values achieved, distribution of values achieved compared to maximum benchmark values (i.e. value retention), and changes over time



Source: e-POWER, Cornwall Insight analysis

Despite the evident consecutive monthly drop-off in wholesale power prices in 2023, the pricing environment still remains well in excess of historic averages in GB; in particular by comparison to pre-COVID levels. This continues to support the underlying rise in average PPA achieved prices at auction, as the lessened volatility of wholesale prices over the first four months of 2023 has allowed value retention to rise in comparison to our previous analysis undertaken back in the beginning of 2022. Average % value retention across all sites in the auction was 89%, compared to 76% in January 2022.

The impacts of price cannibalisation continue to be factored into bids. Price cannibalisation is the depressive influence that high levels of correlated intermittent generators have on wholesale prices, which lowers the captured price of such technologies. This phenomenon was exacerbated amid low electricity demand caused by COVID-19, but has also been observed during the current energy crisis, as discounts for volume, shaping and balancing risk associated with these technologies are factored into PPA pricing levels.

Despite challenging market conditions for energy suppliers, competition between offtake parties bidding on assets remained healthy. The auctions delivered an average of ~12 bids per site, with one site receiving as many as 27 bids. The average number of bids was comparable with auction levels prior to the current energy crisis. It is understood from market analysis conducted by Cornwall Insight of the renewable PPA market, that now wholesale power prices have showed consistent levels of decline over Q422 and more recently the Q123 period, offtakers have noted that generators are becoming more comfortable with, and better aligned to their pricing expectations. Nevertheless, market participants highlighted that while the wholesale power price has reduced from the previous quarter again, securing PPA deals at the wholesale market rates seen in Q123 could still achieve good levels of value – particularly when compared against historical wholesale averages.

3.3 Broken down by technology

A total of eight different technology types participated in the auction, across 55 individual projects. These technologies were Wind; Hydro; Landfill Gas; AD; Mixed Technologies ; EfW ; Biomass; and Solar PV.

Wind had the greatest number of assets in the auctions at 18 sites, representing 33% of all sites by count. Landfill Gas made up 18% of all sites (10 projects); Anaerobic Digestion made up 16% (9 projects); Solar PV made up 13% of all sites (7 projects); Hydro projects made up 11% (6 projects); Mixed Technologies made up 4% of projects (2 sites); EfW made up 4% of projects (2 sites) and there was 1 Biomass project (2%)

By value retention, AD projects saw the greatest average value retention levels, at 95%. Mixed Technologies achieved an average of 94% value retention; EfW saw an average of 92%; Solar PV saw an average of 90% value retention; Landfill Gas projects averaged 89% value retention; Wind projects averaged 86% value retention; Hydro projects saw an average of 84%; and Biomass achieved 80% value retention.

The continuing trend of fuelled technologies achieving greater value retention compared to intermittent renewables has therefore again been observed in recent e-POWER auctions, with offtakers typically placing a premium on baseload generation. Intermittent generation comes with greater imbalance risk, shaping costs, and the associated impacts from price cannibalisation. These factors have been compounded with recently volatile wholesale power prices.

Across the January to April auctions, average value retention levels improved amid the stabilisation of wholesale power prices from more volatile levels witnessed over winter 22-23. Grouped by auction, all technologies in the January auction averaged 85% value retention; 88% in the February auction; 93% in the March auction; and 93% in the April auction.

- **EfW** saw the highest amount of capacity signing PPAs across January to April auctions, largely owing to a 43.2MW site in the March auction—the largest capacity project across all auction periods. Achieved values between both EfW sites ranged between £115.00/MWh and £136.50/MWh
- **Wind** projects saw the second highest amount of capacity signing PPAs across the January to April auctions, at 27.1MW (average site capacity of 1.5MW). Achieved values ranged between £106.60/MWh and £187.00/MWh
 - A total of 11 sites were sold with Rocs, achieving average value retention of 84%. Wind PPAs saw an average of 14 bids per project, the joint highest average across all technologies, with the highest average number of bids in the March auction at 23 bids
- **Solar PV** deals totalled 17.8MW (2.5MW asset average) across the four auctions. Average value retention stood at 83% in both January and February auctions, rising to 88% in March and latterly 92% in the April auction. Achieved values ranged between £115.00/MWh and £191.00/MWh
 - Solar PV sites saw an average of 12 bids per project, peaking at an average of 18 bids per project in the April auction. One site was sold with Rocs, achieving average value retention of 93%
- **Landfill Gas** capacity totalled 5.3MW (0.5MW asset average) across the four auctions, with average value retention in participating auctions at from 89% in the January auction, 87% in February, and 90% in the April auction. Achieved values ranged between £120.00/MWh and £198.00/MWh
 - An average of 11 bids per project was recorded for Landfill Gas projects, with the greatest average bid level seen in the April auction, at 13 bids. Two sites were sold with Rocs, at an average value retention level of 85%
- **Anaerobic Digestion** saw a total of 4.8MW being signed in PPA deals (average site capacity of 0.5MW). In the January auction, AD sites averaged 94% value retention, 90% value retention in the February auction, 97% in the March auction, and 101% in the April auction. Achieved values ranged between £112.80/MWh and £245.00/MWh

- Anaerobic Digestion also saw the joint highest average number of bids per project, at 14 bids. AD projects saw the greatest average bidding levels in the April auction, at 20 bids. 1 site was sold with Rocs, at 92% value retention
- **Biomass** sites totalled 3.6MW (3.6MW average) in the auctions. Only 1 Biomass site participated in the January auction, seeing value retention of 80%, at £190.00/MWh
- **Hydro** sites made up 2.6MW of participating capacity (0.4MW average). These sites saw average value retention across the January and February auctions rising from 82% to 91%, and achieved values ranging from £122.20/MWh to £190.00/MWh)
 - An average of 9 bids were made per Hydro project, with the greatest bidding levels seen in the January auction, averaging 10 bids per site
- **Mixed Technologies** sites made up a negligible proportion of signed PPA capacity across the four auction periods with <1MW

3.4 Summary by support scheme

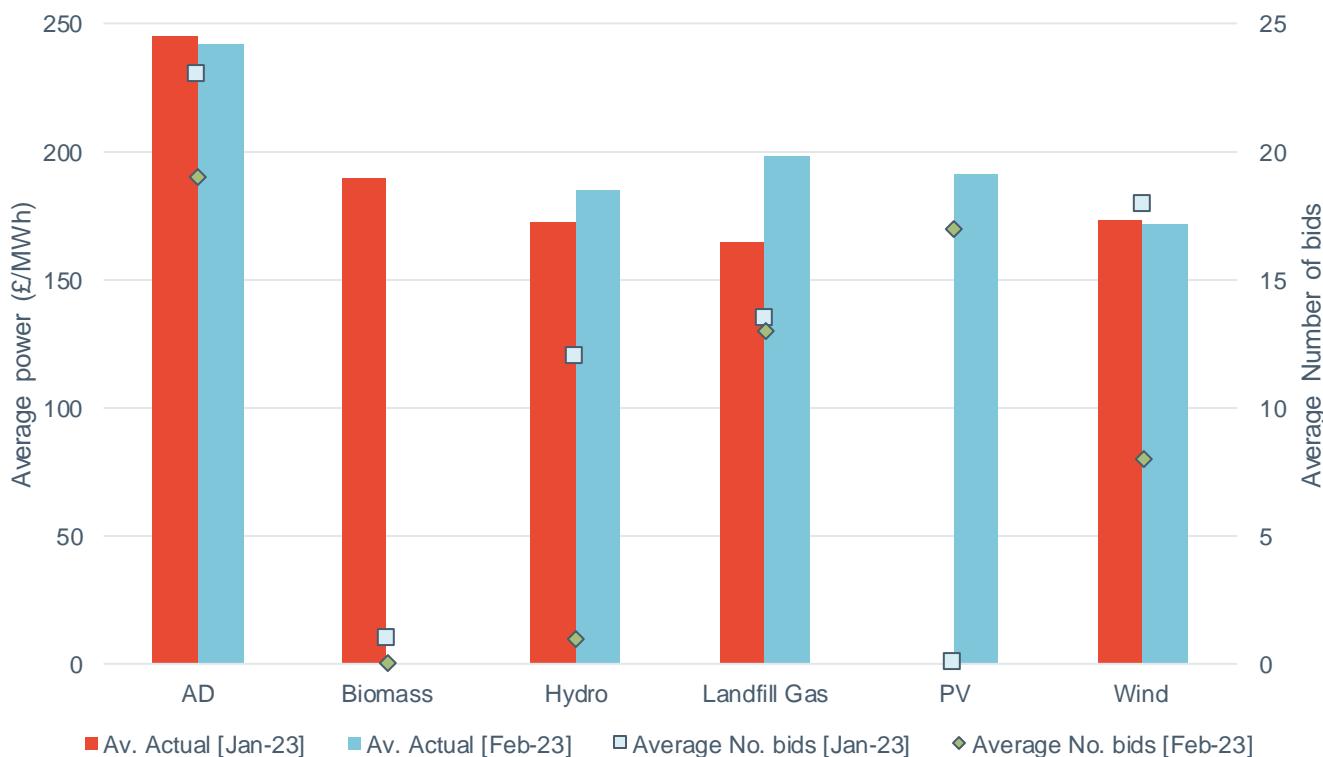
3.4.1 Roc Generators

Out of the four auctions, the January 2023 auction saw the highest participation level by RO accredited sites with a total of 18 participating – equivalent to 72% of total assets for that auction. Of these, wind farms made up the largest number of sites at 10, while 4 hydro sites; 2 Landfill gas sites; 1 Anaerobic Digestion (AD) site; and 1 Biomass site made up the remaining RO participants. No RO-accredited PV sites were active in this auction. Bids for power, Rocs, and embedded benefits for RO sites averaged £177.10/MWh and ranged between the lowest value of £152.50/MWh (wind) and £245.00/MWh (AD). When split by technology, biomass sites recorded the highest average £/MWh value at £157.10/MWh, while wind and hydro achieved the lowest at £149.20/MWh. Compared to the value of the Maximum Bid Price (MBP) – the maximum combined value of the individual sellable assets, like Rocs, embedded benefits, and power – all RO sites held average retention values above 80%. The lowest of these was biomass, which saw an average value retention level of 80.3%, while the highest was observed by the AD site at 91.5%; we note however that only one bid was tendered for both technologies.

In February's auction, 5 RO-accredited sites were active and accounted for 38.5% of units. Biomass was the only technology to not see any bids submitted by an RO generator, while each other technology saw a single site each. Falling value in the wholesale market led to tendered power prices falling from January's auction – averaging £142.60/MWh across RO sites, compared to £151.00/MWh in the January auction. Despite this, the average MBP value in February's auction rose by 3.6% from January's auction to £218.00/MWh. From a technology specific view, value retention rates of the actual sell price against their MBP remained above 80% for all technologies, with wind seeing the lowest at 81.3% and AD seeing the highest at 93.9%. AD saw the highest MBP value at £257.80/MWh while hydro saw the lowest at £203.70/MWh.

No RO-accredited sites were active in the March or April auctions.

Figure 5: Average £/MWh values, and average number of bids achieved by RO sites, by technology



Source: e-POWER, Cornwall Insight analysis

3.4.2 REGOs

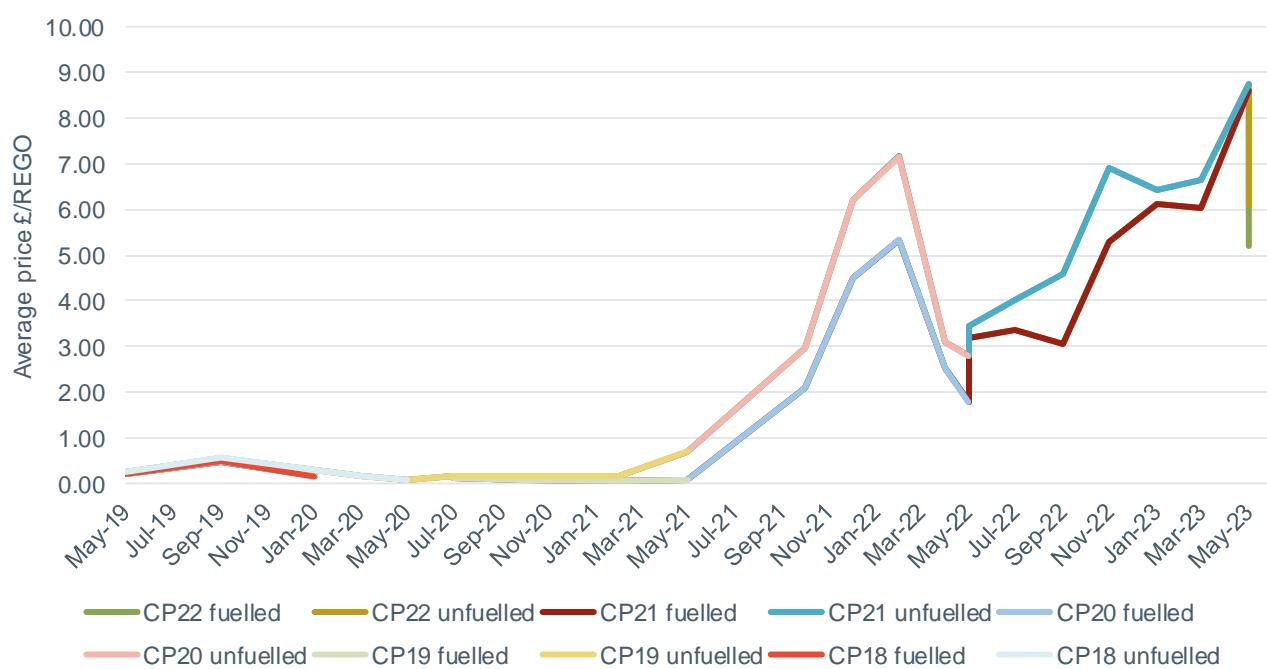
Since May 2022, e-POWER's e-REGO auctions have seen mostly consistent gains. At the time of writing, the most recent auction took place on 11 May and saw average spot REGO prices rise to their highest level ever recorded for both fuelled and unfuelled CP21 certificates. Please note, values for REGOs are not included in the maximum benchmark value assessment in e-POWER auctions, suppliers may price in value for REGOs as part of their bids.

After dropping off notably from CP20, Figure 6 shows that REGO prices rose steadily throughout the beginning of CP21. Uncertainty in future supply levels arose in the summer of 2022 after Ofgem announced it would no longer be accepting GoOs as proof of renewable electricity from the beginning of CP22 onwards. As such, uncertainty of supply caused prices to see strong gains across most areas of the market over this period.

The May 2022 auction saw prices fall compared to three prior auctions. For CP20 REGOs, wind certificates – the only unfuelled source involved in this auction – traded for £2.80/REGO, while fuelled REGOs captured an average price of £1.78/REGO. In comparison, May 2023's auction saw CP21 fuelled and unfuelled REGOs respectively rise 42.7% and 31.7% from the prior auction to £8.60/REGO and £8.75/REGO. This sharp growth is, in part, attributed to the end of the Fuel Mix Disclosure compliance period, however, demand will have been exacerbated by the lowest level of total wind generation in the past 3 compliance years at 63.9TWh – down from 87.7TWh in CP20.

The May auction saw CP22 prices begin the compliance year at average prices of £6.06/REGO for unfuelled technologies and £5.21/REGO for fuelled technologies. While down from the highs of their CP21 equivalent, they are notably higher than average spot REGO prices at the beginning of every other compliance year on record.

Figure 6: Average unfuelled and fuelled REGO prices from e-REGO auctions



Source: e-POWER, Cornwall Insight analysis

Trends from Cornwall Insight's April 2023 Green Certificates Survey show that average reported REGO prices over the past quarter have experienced losses across all FMD years from 22-23 to 26-27, despite the removal of GoOs in disclosure years going forward. Despite this, it was found that CP22 REGOs are typically trading in excess of £7.00/REGO.

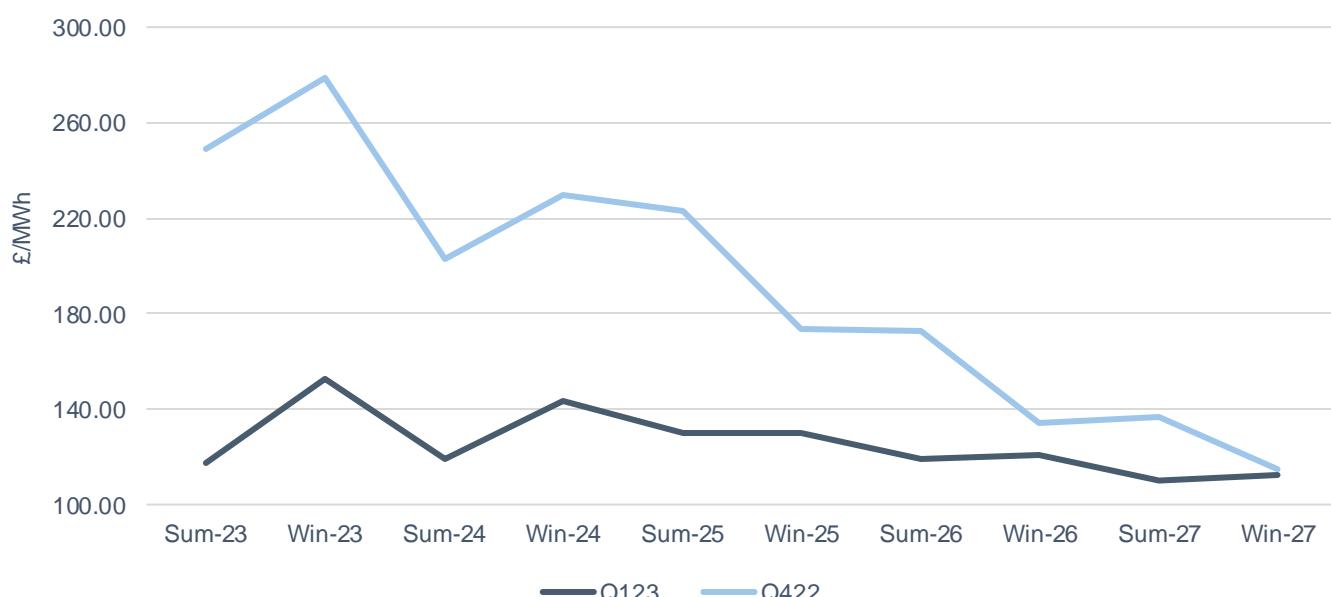
3.5 Wholesale price decline and wider PPA market trends

Throughout much of 2023 to date, we have observed the consistent decline in wholesale energy prices, both in the UK and also on the continent. Through a combination of well stocked European gas storage levels (in response to a mild winter 22), strong and consistent levels of gas supply reaching UK and European shores from LNG (liquefied natural gas) and risk premiums being eased to delivery of short and mid-term contracts we have observed marked decline in wholesale prices.

For Q123 more specifically, seasonal power contracts out to winter 27 fell 31% on average. The largest reductions occurred in the front-seasonal contracts (summer and winter 23) which fell 52.8% and 45.2% respectively. Q123 saw day-ahead baseload power prices in GB average £130.52/MWh, down ~28% quarter-on-quarter.

Much of the decline in wholesale power contracts in Q123 was attributed to the bearish sentiment showcased from NBP gas prices. Across Q123, the average day-ahead gas price stood at 131.2p/th, a 24.3% decrease when compared to Q422 – with longer-dated contracts mirroring the losses observed in their equivalent power contracts also.

Figure 7: Baseload power prices, end Q123 vs end Q422 (£/MWh)



Source: Cornwall Insight, Marex Spectron

As acknowledged in Section 3.2, the evident reduction in wholesale energy prices have not necessarily directly corresponded to lower PPA value retentions – recognising that the average PPA price across all technologies in the four e-POWER auctions this year were close to 5% higher than the January 2022 auction data. This is despite day-ahead baseload power prices being 33% lower on average in January 2023 compared to January 2022. Figure 8 represents the stark decline in wholesale prices over the last 12-months.

Figure 8: Seasonal baseload wholesale power price movements over ~12 month period



Source: Cornwall Insight

However, despite the apparent decreased levels of price and uplift in the volume of PPA transactions in Q123 – we recognise some wider challenges and trends in both the short and long term PPA market.

Executing certain PPA structures, such as fixed-prices remain challenging - most notably for wind projects, considering the associated risks surrounding volume, imbalance and hedging. Despite the return of increased levels of market competition to secure PPAs, other PPA structures such as flexible and partial fixed PPAs remain, in places, an attractive option.

Some of the wider market research and analysis undertaken by Cornwall Insight highlights that there is still a level of uncertainty surrounding how current wholesale prices will evolve further in 2023 and beyond which has meant that there is still some apprehension around transacting longer-term PPAs, even as some longer-term deals are signed.

Elsewhere, the level of activity in the corporate PPA (CPPA) market has also seen significant momentum in 2023. Amid the ongoing energy crisis, market participants noted increased interest in CPPAs, with interest in such structures being led, largely, from the corporate/public sector end-user. From a corporate perspective, CPPAs remain an attractive option for ‘greening’ their energy usage, and offering a long-term hedge against currently volatile wholesale power prices. The additionality of CPPAs, namely through the provision of ‘named’ REGOs was also noted as being desirable for corporate offtakers, in line with wider ESG targets. However, the CPPA market remains challenging, with significant complexity in meeting the expectations of corporate offtakers and generators.