

Analysis of the e-POWER July 2019 auction

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1 e-POWER Auction Analysis

1.1 Headlines

The July 2019 e-POWER auction sold PPAs for 39 projects totalling 94.1MW, and it was in the top five largest of all auctions to date. Overall e-POWER now has 151 generators with PPAs through the auction and an overall capacity of 536MW. The majority of contracts sold in the July auction were for power from 1 October 2019 for either six or 12 months; however, some contracts had alternative start dates and contract lengths of three months. Headlines from the July 2019 auction include:

- This auction achieved the highest value retention for all technologies to date, with 38 of the 39 sites achieving over 100%, with the overall average being 107.1% against assessed post-auction maximum energy benchmark values¹, higher than the previous auction by 0.2pp (at 106.9% average retention).
- Due to lower wholesale prices since our last analysis of e-POWER in January 2019, the auction saw a slight fall in the absolute value achieved by projects on a £/MWh basis. For sites selling both power and Rocs, values were £3.13/MWh lower on average, and for power only sites £4.39/MWh lower. This is because the majority of sites auctioned in January 2019 were for 6-month or 12-month contracts starting 1 April 2019, with wholesale power prices valued higher during January for those delivery periods than they were in July for delivery starting 1 October 2019
- Reasons behind the new record highs seen in value retention, with values >100%, include:
 - Strong levels of competition from offtakers in the short-term PPA market, with approximately 40-45 now active amid several new entrants gaining capacity. The auction saw an average of 22 bids per site, with nine sites receiving over 30 bids, one of which reached 55.
 - Forecasts of a short Roc market for 2019-20 has continued to support expected recycle values, and despite the market being less short than previously expected, Rocs have continued to trade at record high levels – recent monthly e-ROC auctions have seen Rocs trade at their highest ever price going back to 2002. Post auction maximum benchmark values are calculated using the buy-out price only, so any recycle values priced into bids acts to push value retention above 100%.
 - The 2018-19 and 2019-20 compliance years have also seen REGOs valued much higher, often between 30p -50p with some values exceeding 80p. Suppliers may have factored a value for REGOs into their bids, and this would act to push value retention for generators further above 100%.
 - Suppliers continued to place a higher premium on baseload technologies such as landfill gas, biomass, and anaerobic digestion (AD). These sites typically capture higher wholesale prices as well as earn higher embedded benefits revenues from TRIAD and GDUoS red rates.
- 14 FiT sites were auctioned, which saw an average contract price of £64.40/MWh. All FiT sites achieved a value above the 2019-20 administered FiT export tariff of £53.80/MWh.
- 24 Roc sites took part in the auction, 20 of which sold both power and Rocs while 4 sold power only. Sites which sold power and Rocs continued to see higher average value retention (at 108.4%²) compared to FiT sites, and achieved £121.84/MWh on average.

¹ The post auction maximum benchmark value for a project is calculated as the sum of the current wholesale power price, the site specific embedded benefit values and the value of the Roc buy-out price (if applicable).

² Please note that for the purpose of the analysis, post-auction maximum benchmark values uses the buy-out price only. Any recycle value factored into bids therefore pushes values further above 100%.

1.2 Commentary on implications

The July 2019 e-POWER auction once again saw new record highs for values retention, despite seeing a slight fall in the average £/MWh value achieved due to the fall in wholesale power prices. This has been driven by continued favourable conditions for renewable generators amid strong levels of competition in the offtake market, with several new entrants gaining capacity recently and up to 45 offtakers now active in seeking power from green generators.

This auction demonstrated high pass through rates of Rocs and wholesale power prices as seen in the wider PPA market. In short-term PPAs, Rocs are frequently passed through at 97% or more of the buy-out price, and 100% of the recycle value. Furthermore, wholesale power price discounts are being squeezed and are often at >97% pass through of day-ahead auction prices.

The REGO market has been an interesting development since previous auctions, with offtakers more frequently attributing value to the certificates. Typical prices that generators could get for a REGO in the 2018-19 compliance year was 30p – 50p; however, with the lack of a forward market it is unclear as to the direction of future price movements. The common market view is that REGO values are increasing, with reports from a recent Cornwall Insight survey suggesting that 2019-20 REGOs are trading at a 20p premium to those for 2018-19. This has stemmed from a rise in consumer demand for 100% renewables electricity tariffs, both at the domestic and larger I&C level.

Despite high pass through rates to green generators, the wholesale power market ultimately determined the £/MWh contract value achieved, and the relative value compared to previous auctions. A slight reduction in wholesale power prices outweighed the upwards driver of higher value retention, with the market largely taking direction from gas prices. With the wholesale power price usually set by a gas-fired generator, PPA values for green generators remain closely correlated to the price of gas. The gas supply outlook is one of health at present, which has driven prices downwards.

While not a prominent feature in this auction's analysis, the various embedded benefits reforms on the horizon will be one to consider in future auctions. The reduction in the Triad embedded benefit, which will continue to fall until 2020-21 where it will remain at a relatively steady but low rate, will act to reduce values for embedded generators. In the medium-term, the proposed BSUoS reforms could be implemented from April 2021 and cause an ~£5/MWh reduction in embedded benefits, depending on the option chosen by Ofgem, with impacts also varying by technology type. Under the Forwards Looking and Network Access Charging review, the GDUoS embedded benefit is also subject to change, but any changes are not expected before April 2022.

FiT sites have also seen a continued incentive to move away from the export tariff and instead engage in the PPA market. However, this incentive could decline in the years ahead due to backwardation in the wholesale market, meaning that wholesale power contracts further into the future are priced lower than those closer to delivery, and reforms to embedded benefits. It was encouraging to see smaller-scale sites (<250kW) in this auction achieve notably higher value retention, and perhaps represents an increased readiness and confidence for offtakers to contract with smaller sites.

2 Methodology

This report analyses the results for contracts awarded in the July 2019 e-POWER auction between the 9 and 11 July 2019. It compares the actual value that sites achieved in the auction against a maximum energy market benchmark value that sites can potentially achieve. Project values and maximum benchmark values are presented as a £/MWh figure based on different potential sources of value. These are assessed post-auction, where sources of value include:

- Wholesale power price
 - For the purposes of the benchmark prices, the winter 19 baseload power price has been taken for six-month contracts from October 2019 at £56.39/MWh, and the annual baseload price for 12-month contracts from October 2019 at £52.79/MWh.
 - The majority of contracts sold in the auction were for PPAs commencing from 1 October 2019 for six months, making up around two thirds of sites, with the remaining being 12-month contracts. Some contracts had alternative start dates and lengths; these included: two three-month contracts starting on 1 August 2019 with a benchmark wholesale value of £44.51/MWh; and, three 12-month contracts starting 1 September 2019 with a benchmark wholesale value of £52.37/MWh.
- Green certificates
 - Renewables Obligation Certificates (Rocs). The buy-out price for 2019-20 has been taken as the benchmark price for Rocs at £48.78.
- Generation Distribution Use of System charges (GDUoS)
 - These are paid by distribution network operators for localised generation and vary depending on time of day. GDUoS is the most variable of the potential benefits, as it differs by region, connection voltage, intermittency of technology. GDUoS is always built into the contract price, whether it is a cost or a benefit.
- Balancing Service Use of System charges (BSUoS) and transmission losses
 - As BSUoS and transmission losses are paid on volumes on the transmission system, distribution connected generators can avoid these charges 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 of the above elements for the period 1 October 2019 to 31 September 2020 (Winter 19) are summarised in Figure 1, as well as the front season power price which is applicable for 6-month PPA contracts.

Figure 1: Typical Maximum Benchmark Values (£/MWh) of e-Power Auction Elements (six-month season-ahead prices)

Auction date	Front Season Wholesale Baseload Power	Annual Wholesale Baseload Power	Rocs	Embedded Benefits
Jul-19	£56.39	£52.79	£48.78	£2.0 to £14.11
Jan-19	£55.83	£59.31	£48.50	£0.9 to 14.3
Jul-18	£62.36	£57.00	£47.22	£0 to £14.1
Jan-18	£43.63	£46.85	£47.22	£0.4 to £13.9
Jul-17	£46.10	£42.76	£45.00	-£2.0 to +£7.4
Jan-17	£46.10	£47.67	£45.00	-£0.6 to +£7.4
Jul-16	£46.60	£43.42	£45.00	-£0.6 to +£7.0
Jan-16	£31.60	£33.90	£45.00	£0 to £10.6
Jan-15	£41.60	N/A	£44.00	-£1.4 to +£7.3

Source: e-Power



3 January 2019 analysis

3.1 Auction Summary

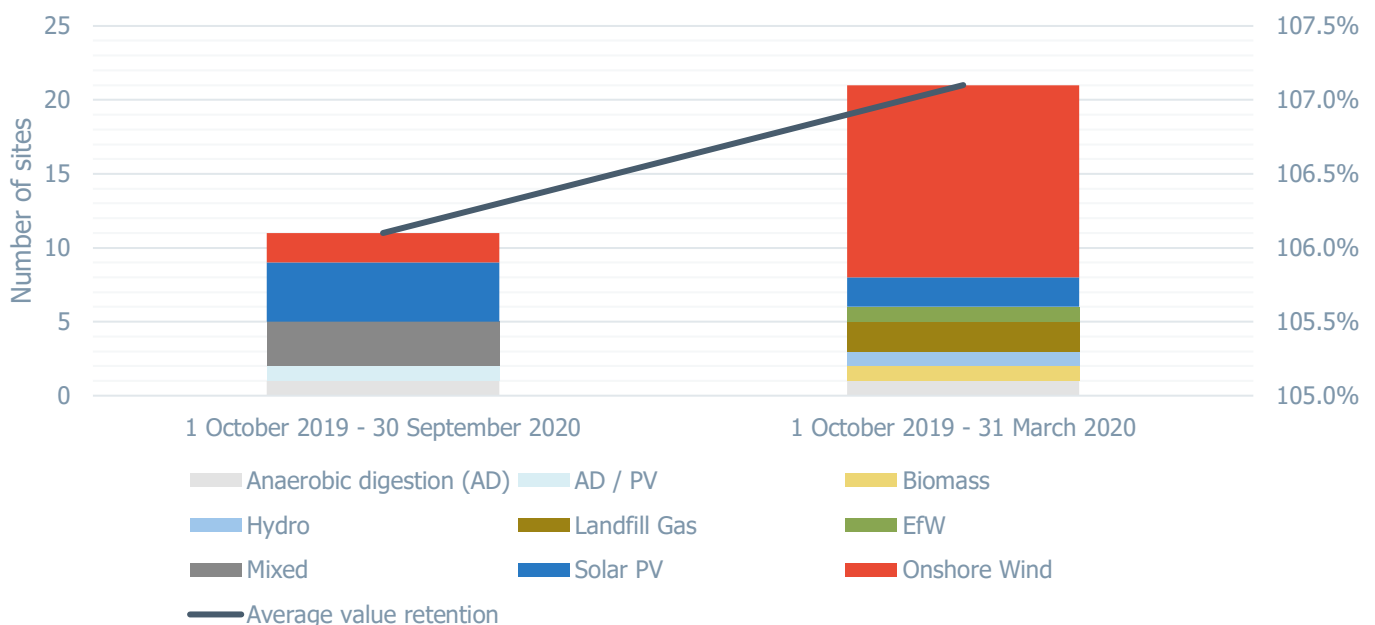
The July 2019 e-POWER auction sold PPAs for 39 projects totalling 94.1MW, and it was in the top five largest of all auctions to date. Overall e-POWER now has 151 generators with PPAs through the auction and an overall capacity of 536MW.

This auction achieved the highest value retention for all technologies to date. 38 of the 39 sites achieved over 100% retention, with the overall average being 107.1%, outachieving the last auction by 0.2pp (at 106.9% average retention). This was largely due to a higher proportion of Roc sites compared to FiT sites like the previous auction, which more frequently see retention values in excess of 100% with healthy Roc recycle values currently expected in the market. Increased value retention is also a consequence of rising levels of competition in the offtake market, with 40-45 now active in seeking power from green generators - the auction saw an average of 21 bids per site, with nine sites receiving over 30 bids and one project seeing 55 bids in total. Furthermore, offtakers are more frequently attributing value to REGOs, which could act to push value retention further above 100%.

However due to lower wholesale prices the auction saw a slight fall in the absolute value achieved by projects on a £/MWh basis. For sites selling both power and Rocs, values were £3.13/MWh lower on average, and for power only sites £4.39/MWh lower. This is because the majority of sites auctioned in January 2019 were for 6-month or 12-month contracts starting 1 April 2019, with wholesale power prices valued higher during January for those delivery periods than they were in July for delivery starting 1 October 2019.

Figure 2 below details average value retention for contracts auction from October 2019 for six or 12 months.

Figure 2: Contract length by technology and average value retention



3.2 Broken Down by Technology

Of the 39 sites awarded contracts in the auction, onshore wind had the largest presence by number with 15 projects, representing 38% of all sites. This is however down by nine on the January 2019 auction. Solar PV and hydro were joint second in terms of presence in the auction by number with six sites each; this was followed by AD and Mixed which both had three sites each.

Baseload technologies continued to sell at a premium to intermittent sites, with value retention averaging highest for biomass and LFG, while solar PV experienced the lowest value retention. However, overall average retention for all technology types breached 100%, with only one site below this threshold with 99% value retention.

Highlights for each technology are below, and comparisons with the previous auction made where possible³.

- **Onshore wind** had the most sites in the auction standing at 15 of 39. However, it had the third lowest average retention of all technologies at 106.7%. This reflects the additional discount off takers price in for intermittent technologies to account for higher imbalance risk and lower captured wholesale prices. However, wind was the most popular among bidders, with four of the top five sites in terms of number of bids being wind. One site was particularly popular and received 55 bids, achieving a value retention of 109.4%. The value of power for export only (i.e. without Rocs) for onshore wind sites on 12-month PPAs averaged £65.35/MWh with an average retention of 103.4%.
- **Solar PV** had the joint second largest presence in this auction with six sites in total awarded contracts, two below the number auctioned in the January 2019 auction. However, solar PV saw the lowest average value retention, reflective of the additional discount off takers price in for intermittent technologies as stated for wind, at 104.8%. This average retention is higher by 1.3pp for Solar PV than the January 2019 auction. Despite all solar PV sites being FiT accredited, they achieved higher value retention than the previous auction's FiT sites which average 97.4% retention. The value of 12-month power only PPAs averaged £62.38/MWh with a retention of 105.3%.
- **Hydro** also had the joint second largest presence in the auction with six sites, one less than the previous auction. It averaged a retention of 107.1% overall, in line with the premium that off takers place on more predictable technologies. In terms of absolute value achieved, the only hydro power site for export only was a six-month contract at £69.10/MWh, achieving a value retention of 108.2%.
- **AD** had the joint third largest presence in the auction, with three sites overall, and averaged a value retention of 109.8%. This is marginally higher than the January 2019 auction. As a baseload technology, higher retention values are expected due to a premium compared to intermittent technologies, with power from AD for export only on 12-month PPAs averaging £66.30/MWh, albeit for one site only.
- **Mixed** sites were also joint third in terms of number of sites auctioned. These sites achieved an average retention of 106.44%. The average price for 12-month power only PPAs was £61.20/MWh, which includes two with a slightly higher retention of 106.8%.
- **Landfill gas** saw two sites participate in the auction and achieved the second highest average value retention among all technology types at 110.3%, matching the previous auction. Again, this is likely due to the premium that off takers place on baseload technologies. In terms of absolute value achieved, the landfill gas site selling power and Rocs (1Roc/MWh) achieved £123.65/MWh, while the power only site achieved £62.60/MWh.
- **Biomass** had two sites represented in the auction and was the technology that achieved the highest overall value retention at 110.9%, at a price of £138.50/MWh for sites selling both power and Rocs.
- **Waste technologies** included one EfW site which achieved a retention value of 107.2%. The site was the largest in the auction at 42MW and the contract was for power only achieving a value of £62.60/MWh.
- **Other sites** included one AD/PV technology site which achieved a retention of 108.8%.

³ Direct £/MWh comparisons between contracts sold in this auction and contracts sold in previous auctions can be difficult, particularly for RO sites receiving different Roc awards. Therefore, where possible we have chosen to compare 12 month contracts for the sale of power only (i.e. including wholesale power and embedded benefits but excluding Rocs). While these sites will have different contract start dates, and therefore different benchmark wholesale power values and site specific embedded benefits, it allows for the best comparison.



Figure 3 shows the range of values achieved by different technologies against typical maximum benchmark values. The table highlights the general trend of baseload sites achieving higher values in the auction.

Figure 4 and Figure 5 detail the performance by technology in terms of value retention alongside the average number of bids accrued.

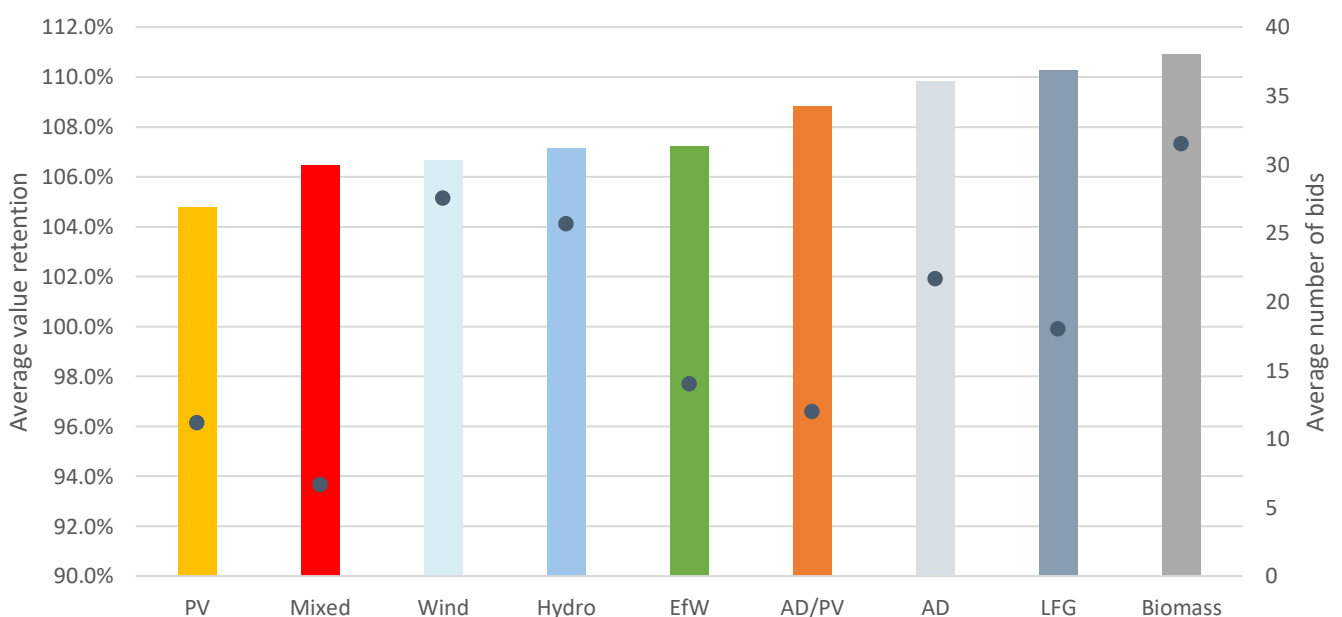
Figure 3: Number of sites achieving proportion of typical maximum benchmark value

Technology	<100%	100%-105%	105% - 110%	110% - 115%	>115%	Total
Anaerobic digestion (AD)	0	0	2	0	1	3
AD / PV	0	0	1	0	0	1
Biomass	0	0	0	2	0	2
Hydro	0	2	3	1	0	6
Landfill Gas	0	0	1	1	0	2
EfW	0	0	1	0	0	1
Mixed	0	0	3	0	0	3
Solar PV	0	4	2	0	0	6
Onshore Wind	1	4	7	3	0	15
Total	1	10	20	7	1	39
Percent	3%	26%	51%	18%	3%	100%

Figure 4: Average, minimum and maximum value retention by technology

Value retention	AD	AD/PV	Biomass	Energy from waste	Hydro	Landfill Gas	Mixed	PV	Wind
Average	109.84%	108.80%	110.92%	107.21%	107.13%	110.25%	106.44%	104.78%	106.66%
Maximum	116.02%	108.80%	111.41%	107.21%	110.40%	111.33%	108.28%	107.68%	111.32%
Minimum	106.33%	108.80%	110.42%	107.21%	103.85%	109.16%	105.24%	103.15%	99.33%

Figure 5: Average value retention and average number of bids by technology



3.3 Summary by Support Scheme

Value retention for sites varies by support scheme as well as technology. Roc sites have continued to see higher value retention and made up a greater proportion of sites auctioned at 24 compared to 14. However, FiT sites saw a relative increase in activity by proportion compared to the previous auction, and attained better value retention as well, though still less than Roc sites.

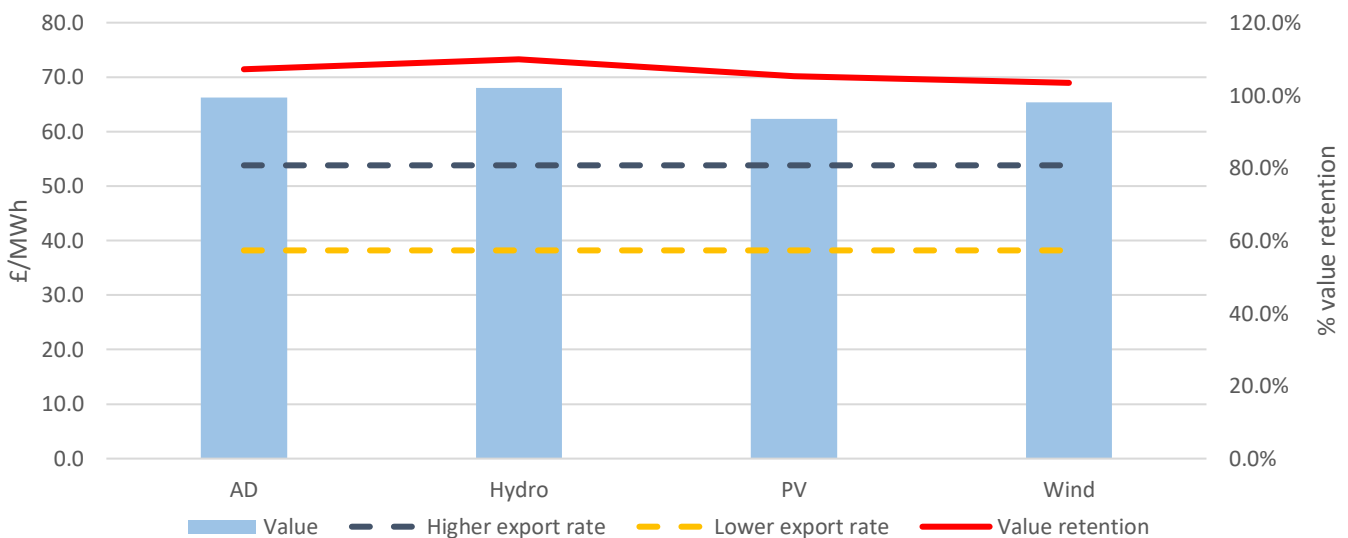
3.3.1 FiT Sites

14 FiT sites were auctioned, higher than the January 2019 auction by two. The increased number and relative proportion of FiT sites in the auction infers that these generators are seeking the higher PPA values relative to the administered export tariff, which is a trend that has persisted despite recent falls in wholesale prices. The annual October 19 wholesale price used for this auction assessment was £52.79/MWh, versus the 2019-20 higher export rate of £53.80/MWh and lower rate of £38.20/MWh. With the inclusion of embedded benefits, and potentially REGO values, PPAs are a more attractive route to market.

FiT sites saw an average value retention of 106%, with a price of £64.40/MWh, Intermittent technologies including wind and solar achieved lower values at 103.4% and 104.8% respectively compared to controllable technologies. These values are compared to 106.8% for AD and 109.4% for hydro installations. FiT generators have an annual choice to either take a PPA or the export tariff.

Figure 6 details the average value retention and price achieved by FiT sites versus the administered export rates.

Figure 6: Average value retention by technology



3.3.2 Roc Sites

24 Roc sites took part in the auction, 20 of which sold both power and Rocs while 4 sold power only. Sites which sold power and Rocs continued to see higher average value retention (at 108.4%⁴) compared to FiT sites, and achieved £121.84/MWh on average. This is slightly down on the January 2019 auction by £1.62/MWh, and is due to the underlying reduction in wholesale prices since the January auction, as well as

⁴ Please note that for the purpose of the analysis, post-auction maximum benchmark values uses the buy-out price only. Any recycle value factored into bids therefore pushes values further above 100%.



the varying levels of Roc awards that each site may receive – the higher the Roc award the higher the £/MWh value.

Forecasts of a short Roc market for 2019-20 has continued to support expected recycle values, and despite the market being less short than previously expected, Rocs have continued to trade at record high levels – recent monthly e-ROC auctions have seen Rocs trade at their highest ever price going back to 2002. Post auction maximum benchmark values are calculated using the buy-out price only, so any recycle values priced into bids acts to push value retention above 100%.

3.3.3 REGOs

Over the last 6-12 months the REGO market has developed significantly. Historically, REGOs have either been unpriced or priced relatively low (i.e. below 20p per REGO). However, the 2018-19 and 2019-20 compliance years have seen REGOs valued much higher, often between 30p – 50p with some values exceeding 80p in the wider PPA market.

This has stemmed from a rise in consumer demand for 100% renewables electricity tariffs, both at the domestic and larger I&C level. Consequently, generators are more frequently seeking the best value for their REGOs with more suppliers seeking to purchase them. In the latest e-POWER auction, suppliers may have factored a value for REGOs into their bids. This would act to push value retention for generators further above 100% as REGOs are not typically factored into reserve prices.

The value achieved by generators for REGOs also varies by technology type, with wind, solar and hydro technologies attracting higher values than fueled technologies.

3.4 Competition and auctioned contract numbers

39 projects totalling 94.1MW of capacity was sold in the auction. By number, it was within the top five largest auctions to date. In total, 151 generators with an overall capacity of 536MW have PPAs through the e-POWER auction Figure 7, 8 and 9 summarise the latest engagement from generators in terms of total number and the proportion of technologies.

Figure 7: Number of generators using e-POWER

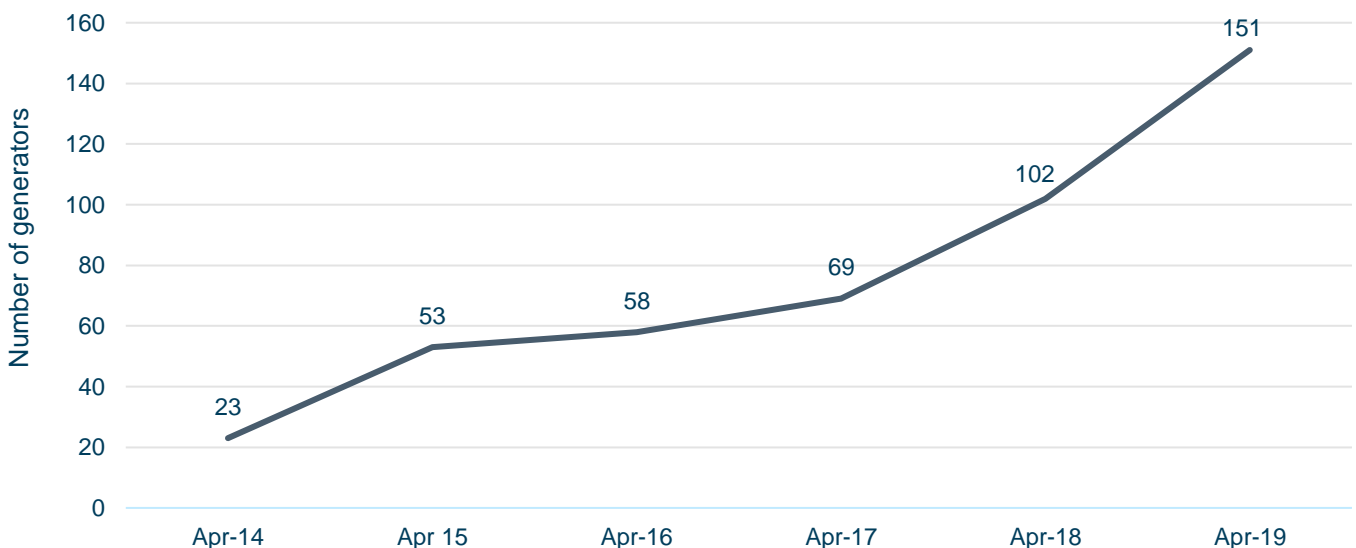
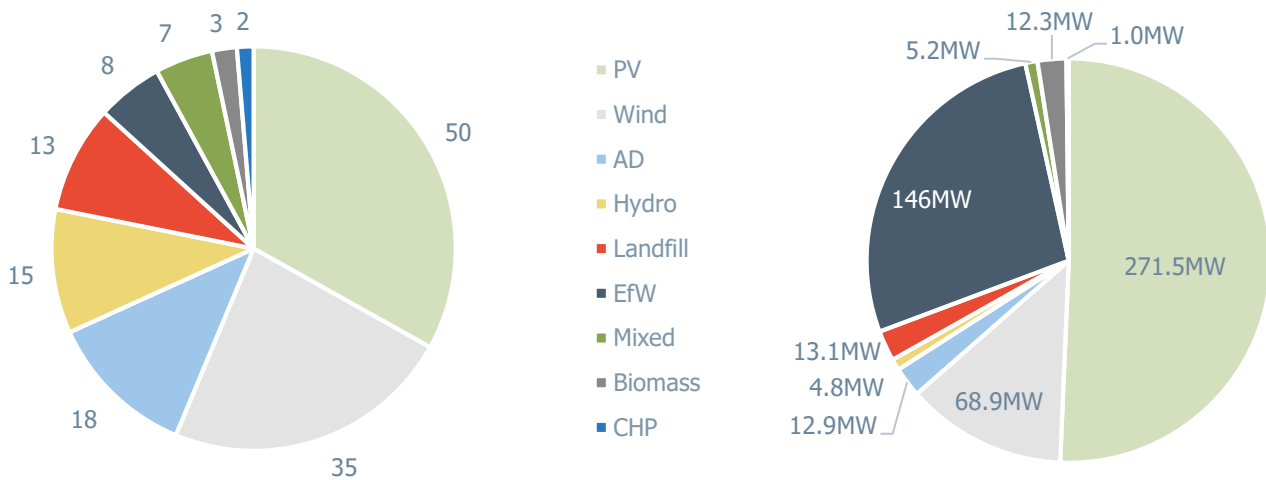


Figure 8 and 9: Number and capacity of technologies currently using e-POWER



Source: e-POWER

Participation in the auction remained high for several reasons, including:

- A continued drive towards short-term PPA contracts for some generators, with more regular retendering of projects.
- A high number of suppliers entering the e-POWER auctions as a route to market for green power. This has created strong levels of competition, bidding and liquidity, uplifting values for generators.

With a high number of offtakers in the short-term PPA market, now assessed as being between 40 and 45, high levels of competition have driven new records for value retention. The auction saw an average of 22 bids per site, with nine sites receiving over 30 bids, one of which reached 55.

3.5 Comparison with Previous Auctions

The July 2019 e-POWER auction saw a new record high for value retention compared to previous auctions. The average value share retained by generators was 107.2%, compared to 106.9% in January 2019, and 103.8% in July 2018.

However due to lower wholesale prices the auction saw a slight fall in the absolute value achieved by projects on a £/MWh basis. For sites selling both power and Rocs, values were £3.13/MWh lower on average, and for power only sites £4.39/MWh lower. This is because the majority of sites auctioned in January 2019 were for 6-month or 12-month contracts starting 1 April 2019, with wholesale power prices valued higher during January for those delivery periods than they were in July for delivery starting 1 October 2019.

Wholesale power prices experienced a fall since the previous auction – the annual baseload power price from October 2019 used for assessment was £52.79/MWh, 10.9 percentage points below the annual contract used at the time of the January 2019 auction which was £59.31/MWh. This has been due to an underlying decline in commodity prices, in particular gas contracts. The gas market has remained under pressure in 2019 from comfortable supplies, especially from an oversupplied global LNG market that has resulted in a surge of deliveries to GB. As gas-fired generation continues to make up ~45% of our generation mix, gas remains closely correlated to power prices. The impact of this has partially been offset by a rise in EU ETS carbon prices, which have risen to 13-year highs of >€29/t, and which are factored in to the wholesale power price.

Finally, higher values being attributed to REGOs as previously discussed will have aided in pushing value retention levels above those in the January 2019 auction.

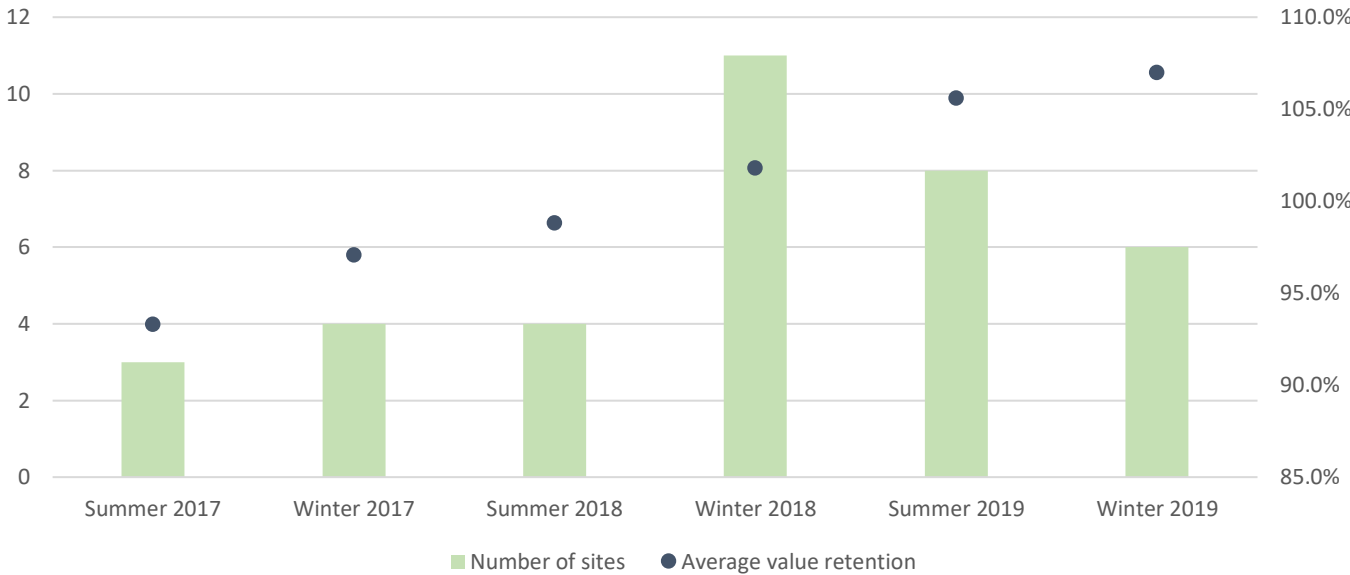


Figure 10: Wholesale Power Price Movements



This auction also continued a recent trend of increasing value for smaller scale entrants, especially those under 250kW in size. The number of entrants of this size has increased since previous auctions going back to 2017. These smaller-scale sites achieved value retention levels of above 100%, and the trend is clearly visible in Figure 11.

Figure 11: Number of under 250kW sites entering auctions and their average value retention through time



In terms of Roc values, the buy-out price used for the assessment has risen to £48.78 from £48.50, with the CP18 buy-out price having been confirmed by Ofgem in February.

Average embedded benefit values across all sites were £6.46/MWh, £0.71/MWh higher in this auction than in January. However, these can vary significantly by location and depends on site specific parameters with embedded benefits ranging from £2.00/MWh to £14.11/MWh across the 39 sites which gained contracts in the auction.



Figure 12 shows the distribution of values achieved in recent auctions against the post-auction maximum benchmark values. Projects have continued to cluster in the >100% segment, now containing approximately 97% of all sites entered into the auction.

Figure 12: Distribution of Values Achieved Compared to Maximum Benchmark Values and Changes Over Time

