

Annual Report on the Operation of the Capacity Market in 2016/2017

Report

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Overview:

The Electricity Capacity Regulations 2014 require us to provide the Secretary of State with an annual report on the operation of the Capacity Market.

This is the third of these annual reports, following the third round of Capacity Market auctions in December 2016, January 2017 and March 2017.

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Executive Summary

This is our third annual report on the operation of the Capacity Market (CM). There have been three Capacity Market auctions since our last report: the 2016 T-4 Auction securing capacity for delivery in 2020/21, the 2017 Early Capacity Auction for delivery in 2017/18 and the 2017 DSR Transitional Auction (TA), securing capacity for 2017/18. This report describes the outcomes from these auctions, including the prequalification processes, along with some observations from our analysis of the auction results.

Key findings

Prequalification

As in previous years, a large number of CMUs failed prequalification initially but succeeded in prequalifying after submitting new information during the first round of appeals, suggesting that applicants still struggle with the process. The Delivery Body will be taking further steps to reduce this number in the next round - our Delivery Body Performance Report, published alongside this report contains more information.

2016 T-4 Capacity Auction

The third T-4 capacity auction cleared at a price of £22.50/kW, which was slightly higher than the previous two auctions. Those winning agreements included one new CCGT and one new OCGT, although both were on existing generating sites.

Early Capacity Auction

The first and only Early Capacity Auction was run following the decision to bring forward the first delivery year of the capacity market. The clearing price of £6.95/kW was the lowest yet reached in a CM auction, which is likely to reflect that many bidders had obligations for later years and would have faced termination fees if they had closed.

DSR Transitional Auction

The second and final TA was run for delivery in 2017/18 and cleared at £45/kW. Only turn-down DSR was allowed to participate, which reduced the total capacity entering the auction compared to the first TA. The auction was not liquid, as the maximum capacity demanded by the demand curve was greater than the total capacity entering. This meant the TA was unable to clear below £33/kW.

1. Background

Purpose of this report

- 1.1. Regulation 83 of the Electricity Capacity Regulations 2014¹ requires Ofgem to provide the Secretary of State for the Department for Business, Energy and Industrial Strategy (BEIS)² with an annual report on:
- The operation of the Capacity Market (CM) (this report); and
 - National Grid's (the Delivery Body) performance of its functions in relation to the CM.³

Scope of this report

- 1.2. The annual report covers the operation of the CM since our last report published in June 2016, including a factual presentation of the prequalification process and the auction outcomes of three auctions⁴:
- 2016 four year ahead auction, with capacity to be delivered in 2020/21 (2016 T-4 Auction);
 - 2017 Early Capacity Auction (ECA) for delivery in 2017/18; and
 - 2017 DSR Transitional Auction (TA) for delivery in 2017/18⁵.
- 1.3. It also includes DSR participation and analysis of bidding behaviour in the 2016 T-4 Auction and ECA, and an update of delivery against milestones of Capacity Agreements won in earlier auctions.
- 1.4. The Secretary of State may instruct us to report on any particular matter as part of this report. No such instruction was received this year.

¹ [The Electricity Capacity Regulations 2014](#).

² Formerly Department of Energy and Climate Change, DECC.

³ <https://www.ofgem.gov.uk/electricity/wholesale-market/market-efficiency-review-and-reform/electricity-market-reform-emr>.

⁴ The timings for these auctions is available at <https://www.emrdeliverybody.com/Lists/Latest%20News/Attachments/35/Capacity%20Market%20Operational%20Plan%202016%20v%203.pdf>.

⁵ National Grid has published final auction results for the [2016 T-4 Auction](#), the [2017 Early Capacity Auction](#) and [2017 DSR Transitional Auction](#). See www.emrdeliverybody.com.

Background to the Capacity Market

Overview of Capacity Market

- 1.5. The CM is one of the key policies introduced under the government's Electricity Market Reform programme⁶. It aims to maintain sufficient levels of capacity to ensure security of electricity supply.
- 1.6. The CM provides revenue in the form of capacity payments to potential capacity providers. In return, participants must commit to delivering electricity at times of system stress and face penalties if they fail to do so.
- 1.7. Capacity payments are determined via competitive auctions, held four years (T-4 Auction) and one year (T-1 Auction) before each delivery period. Prospective capacity providers must meet certain eligibility requirements and prequalify before they can participate in the CM auctions.
- 1.8. CM auctions are technology neutral, and generation, demand side response and interconnectors may all participate⁷. However, any capacity receiving renewable subsidies, eg Contracts for Difference, is not eligible.

Overview of the prequalification process

A high level summary of the prequalification process

- 1.9. In order to participate in a Capacity Market (CM) auction, a Capacity Market Unit (CMU) must prequalify by meeting the requirements set out in the Capacity Market Rules (the "Rules") and Regulations⁸. The prequalification process is run by National Grid Electricity Transmission (NGET), the Delivery Body, who review applications submitted by CMUs and determine whether they are eligible.
- 1.10. Applicants can ask the Delivery Body to review its initial decision (a 'Tier 1 appeal'). Following an unsuccessful Tier 1 appeal an applicant may submit an appeal to the Authority (a 'Tier 2 appeal').

⁶ See <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>.

⁷ Except for the TAs which are only for DSR Capacity Market Units.

⁸ [The Electricity Capacity Regulations 2014](#) and [the Capacity Market Rules](#).

Classification of CMUs

- 1.11. CMUs are classified as follows: generators and interconnectors that are currently operational ('Existing'), generators investing in an existing asset ('Refurbishing') and new generators and interconnectors ('New Build'). Demand side response⁹ (DSR) may also participate. They may have completed a DSR Test ('Proven DSR') or not ('Unproven DSR').
- 1.12. Existing CMUs and all DSR CMUs are eligible for agreements that last for one year. Refurbishing and New Build CMUs are eligible to receive agreements up to 3 and 15 years respectively.
- 1.13. Existing CMUs are by default 'Price Takers', which means they can only place bids below a certain threshold (£25/kW/year in the 2016 T-4 Auction, 2017 ECA and 2017 TA). In order to bid above this threshold, they must become 'Price Makers' by submitting a Price Maker Memorandum, outlining why they may need to bid above the threshold. All other CMUs are Price Makers and can bid up to the Auction Price Cap (£75kW/year in the 2016 T-4 auction, 2017 ECA and 2017 TA).

Overview of the auction process

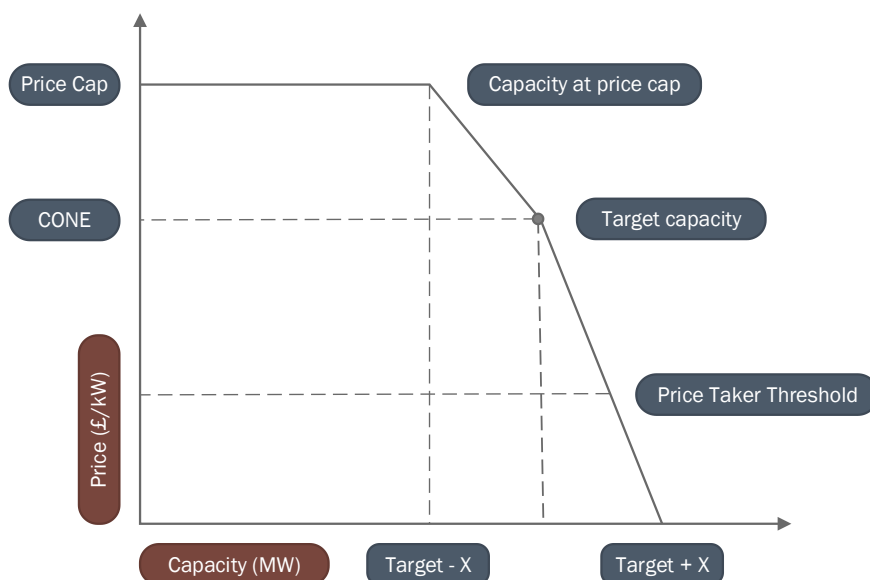
Overarching design

- 1.14. The CM auctions have a descending clock format, with bidders exiting the auction when the price drops below the level at which they are willing to take on a capacity obligation. There are multiple 'rounds', starting at a price cap and reducing incrementally.
- 1.15. As well as placing bids to exit the auction, Refurbishing and New Build CMUs may place a bid at the price at which they would like to switch from a three year or 15 year agreement to a one year agreement. Refurbishing CMUs can also specify a price at which they would like to switch to a 'Pre-refurbishing' state, where they would instead receive an Existing CMU contract for one year, with no obligation to invest in the asset.
- 1.16. The auction continues on this basis until the total capacity offered by remaining participants falls below the demanded capacity at that price (the 'clearing round'). CMUs still in the auction will receive a capacity agreement at this price.

⁹ Demand Side Response is provided by customers who lower or shift their electricity use at peak times, which may be done by those customers utilising backup generation.

- 1.17. The demand curve for the auction, as shown in Figure 3, slopes downwards, reflecting the benefit in securing more capacity when the price is low. A variability from the target ("X") defines the slope of the curve.

Figure 1 – 2016 T-4 Auction demand curve



Recent policy developments

Diesel emissions and embedded benefits

- 1.18. In 2016, the government made a number of policy decisions which affected particular fuel and technology types' participation in the CM.
- 1.19. The Department for Environment, Food and Rural Affairs' (Defra) Medium Combustion Plant Directive places emissions limits on plants that are less than 50MW.¹⁰ This primarily affects diesel generators but also older and more polluting gas turbines who, unlike large scale generators, are not currently subject to emissions limits. The Directive is aimed at addressing emissions of high levels of noxious air pollutants. Emissions limits will apply and permits will be required for new plants from December 2018. Existing plants will be affected from January 2024.
- 1.20. In July 2016, Ofgem published an open letter for charging arrangements for embedded generators.¹¹ It referred to concerns that charging arrangements

¹⁰https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/504217/March_2016_Consultation_Document.pdf.

¹¹https://www.ofgem.gov.uk/system/files/docs/2016/07/open_letter_-_charging_arrangements_for_embedded_generation.pdf.

for embedded generators may over-reward embedded generation ('embedded benefits'), which could potentially be distorting investment decisions and leading to inefficient outcomes in the CM. In December 2016, Ofgem published an updated letter to clarify key developments for those bidding into the forthcoming 2016 T-4 Auction. It stated that it would be prudent for participants in the CM auction to assume that by no later than 2020, transmission network use of system demand residual payments to embedded generation could be as low as the most significant reduction proposed in the code modifications and Workgroup Alternatives that were under review.

Participation in TA limited to turn-down DSR

- 1.21. The government announced in 2016 that all generation assets would be excluded from the second TA in March 2017.¹² It stated that generation-derived DSR, which is typically small-scale distributed generation and back-up generation, is mature enough to participate in the main CM auctions and does not need ring-fenced support through the TA, unlike 'turn-down' or load reduction DSR which is still a nascent sector that requires targeted support.
- 1.22. The government also reduced the threshold for eligibility to 500kW to enable a wider range of load reduction DSR resources to enter the 2017 TA.

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/521301/Govt_response_to_March_2016_consultation_FINAL.pdf

2. Prequalification process for the 2016/17 Auctions

Prequalification process review

Prequalification results

- 2.1. Many CMUs required the appeals process to prequalify. National Grid received 386 Tier 1 appeals for the 2016 T-4 Auction, 313 for the 2017 Early Capacity Auction and 16 for the 2017 TA.
- 2.2. The five most common reasons for failure at prequalification were:
 - Company documents were either invalid or missing
 - The Ordinance Survey Grid Reference was invalid
 - Capital expenditure had already been used for a prior capacity, as prohibited under Rule 3.7.2(c)
 - Failure to submit the appropriate exhibits for Joint Owners or Despatch Controllers
 - Missing CMU Component Information
- 2.3. Following the Tier 1 dispute process, 96% of the 386 appeals were successful in becoming prequalified or conditionally prequalified. Of the 313 Early Capacity Auction Tier 1 appeals, 94% of the applicants succeeded in becoming prequalified or conditionally prequalified. All of the 16 rejected Tier 1 applicants for the TA went on to prequalify.
- 2.4. Ofgem received Tier 2 disputes from 52 CMUs from applicants who disagreed with the prequalification decision or the parameters of their prequalification¹³. The breakdown of the reasons and numbers for each auction are in Table 1 below.

¹³ Ofgem's determinations on Tier 2 CM disputes are available at www.ofgem.gov.uk.

Table 1 – Number of CMUs involved in Tier 2 disputes and the subject of those disputes

| | 2016 T-4 Auction | 2017 ECA | 2017 TA |
|---|------------------|-----------|-----------|
| Accompanying letter missing from prequalification application | 1 | 1 | - |
| Appeal on the length of the Capacity Agreement | 3 | - | - |
| Administrative error by the applicant | 2 | - | 1 |
| Procedural fairness | - | - | 8 |
| Rule 3.2.6 and 3.2.7 | 15 | 15 | - |
| Validity of connection agreements | - | 2 | - |
| Value of connection capacity | - | 2 | - |
| Rule 11.3.2(b) | - | - | 2 |
| Total | 21 | 20 | 11 |

2.5. Of the 52 Tier 2 disputes received, ten decisions were overturned. Two CMUs in the 2017 Early Capacity Auction did not have their disputes overturned but the parameters of their prequalification were changed.

3. 2016 T-4 Auction

- 3.1. This section covers the prequalification and auction outcomes of the 2016 T-4 Auction, for delivery of capacity in 2020/21.
- 3.2. In the 2016 T-4 Auction the price cap was £75/kW/year¹⁴. The price decrement per round was £5/kW/year, resulting in a maximum of 15 rounds over four consecutive days. The final target volume of capacity was 52,000MW.

Prequalification and participation outcomes for the 2016 T-4 Auction

Prequalification applications for the T-4 Auction

- 3.3. 990 Capacity Market Unit (CMU) applications were made during the Prequalification Window, totalling 74.9 GW of de-rated capacity¹⁵. The final number of prequalified CMUs for the T-4 Auction was 645, totalling 70GW of de-rated capacity.
- 3.4. Eleven CMUs, totalling 5.9GW of anticipated de-rated capacity, opted out. Of these, nine were going to be closed down, decommissioned or otherwise non-operational by the start of the Delivery Year. Their decision to opt out could imply that these CMUs needed a price above the cap to participate, or it could reflect pre-existing plans to close down. The other two opted-out despite their intention to remain operational throughout the Delivery Year.

CMUs that entered the T-4 Auction

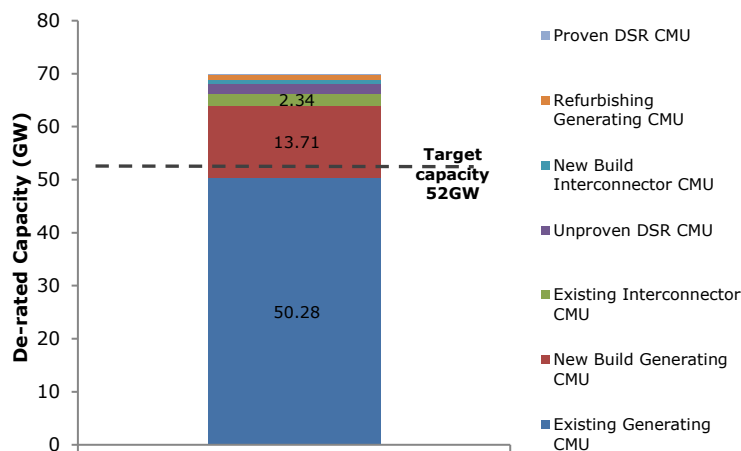
- 3.5. A total of 629 CMUs entered the auction¹⁶, totalling 69.8GW of de-rated capacity. This compares with the target capacity of 52GW, implying there was considerable competition and liquidity going into the auction (Figure 2).

¹⁴ Auction parameters are expressed in 2015/16 prices.

¹⁵ De-rated capacity includes the bidding capacity for DSR CMUs and the post-refurbishing de-rated capacity for Refurbishing CMUs.

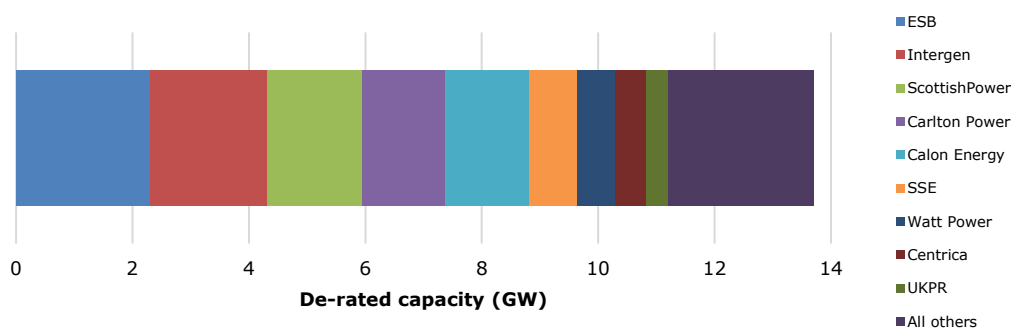
¹⁶ 645 CMUs prequalified for the auction but only 629 entered the auction. The 16 CMUs that prequalified but did not enter the auction were New Build and Unproven DSR CMUS which did not confirm entry into the auction. It is a requirement for New Build and Unproven DSR CMUS to confirm entry into the auction in order to participate (Rule 5.5.14).

Figure 2 – Participating capacity by CMU Category



3.6. Approximately 93 different companies¹⁷ entered at least one CMU in the 2016 T-4 Auction. Figure 3 shows prequalified New Build capacity by company. A number of companies participated with new large scale CCGT projects.

Figure 3 – Volume of prequalified New Build Generating CMU capacity by company



3.7. Four companies made up the total participating Refurbishing capacity, totalling around 879MW. Calon Energy’s CCGT power station was the largest single asset to prequalify as a refurbishing asset (around 495MW).

CMUs that didn’t prequalify for the T-4 Auction

3.8. A total of 345 CMUs failed to prequalify for the T-4 Auction, totalling around 5.8GW of anticipated de-rated capacity¹⁸. As in the 2014 and 2015 T-4

¹⁷ We have aggregated results for applicant companies on the Capacity Market Register by their parent company where appropriate.

¹⁸ These are CMUs that didn’t prequalify for auction following the Prequalification window and

auctions, the majority of these CMUs were small, distribution-connected New Build units.

- 3.9. 286 of the unsuccessful CMUs were initially granted a conditional prequalification status following the Prequalification Results Day, but later failed to provide sufficient satisfactory information before the auction to become fully prequalified.

2016 T-4 Auction outcomes

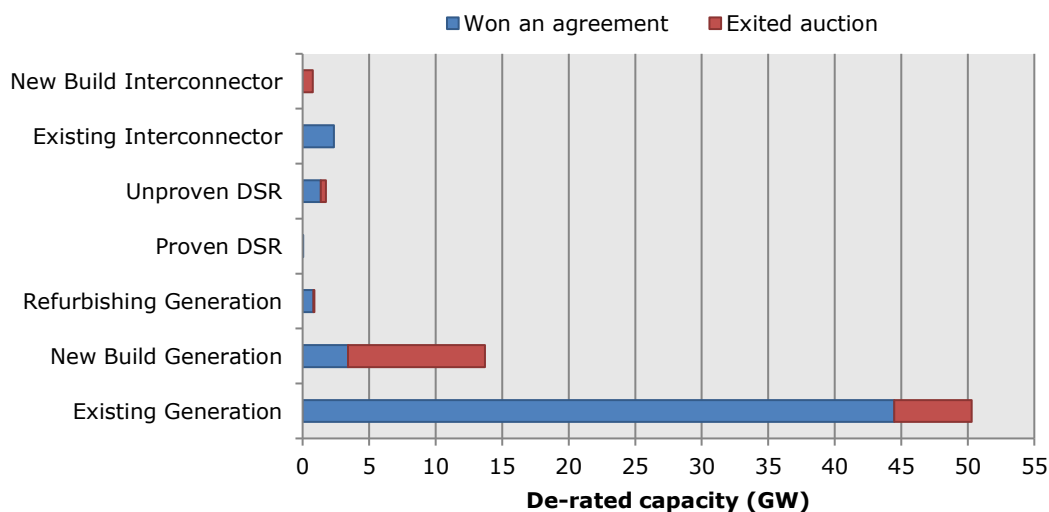
Clearing price and volume

- 3.10. A total of 52.4GW of capacity was awarded a Capacity Agreement in the T-4 Auction at a clearing price of £22.50/kW/year. We believe this price was on a par with what forecasters expected.¹⁹ Due to the slope of the demand curve this resulted in 425MW of extra capacity being awarded over the target level.

Results by CMU Category

- 3.11. The vast majority of cleared or successful capacity was Existing Generation (85%), as demonstrated in Figure 4. The next largest share was New Build Generation, making up only 7% of cleared capacity.

Figure 4 – Volume of cleared and exited capacity by CMU Category



are assets that were given either a 'Rejected' status, or units that failed to provide sufficient evidence to consolidate their conditional status into prequalified.

¹⁹ Lazarus reported in December 2016 before the start of the auction that it would clear at a higher price than the first two auctions. JP Morgan forecasted that the auction would settle on a range of £20-30/kW. Barclays estimated £25-30/kW.

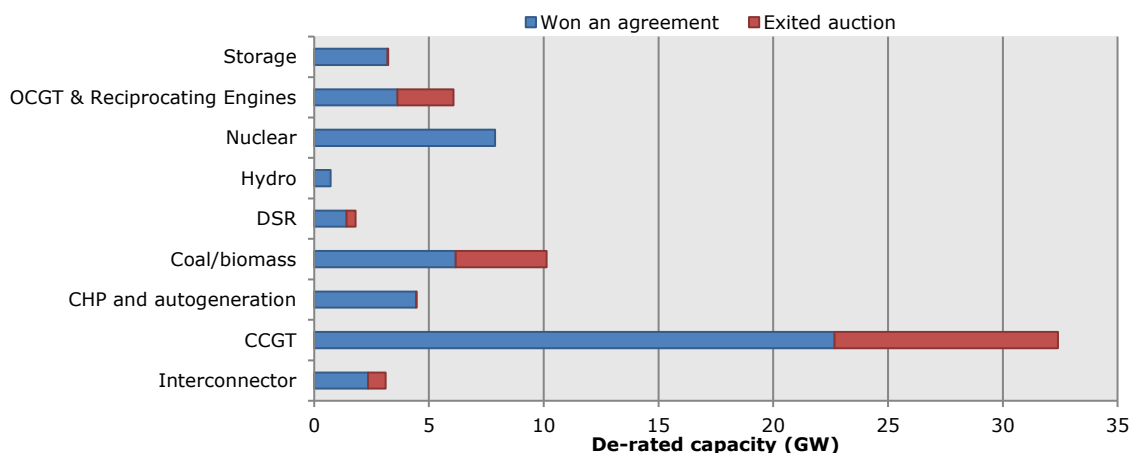
3.12. Over 3.4GW of New Build Generating CMU capacity won capacity agreements. This includes Carrington, the transmission connected 819MW CCGT project which had not yet been commissioned during prequalification. The auction also procured one other new CCGT - Centrica's Kings Lynn project (333MW) – and one large OCGT project – Intergen's expansion at Spalding (298MW). Both projects are on existing sites. The majority of the remaining 1.96GW of new capacity was comprised of distribution connected OCGT and reciprocating engines. In addition, battery storage was successful for the first time, and accounted for around 15% of New Build capacity.

Results by technology and fuel type

3.13. Almost half (43%) of the acquired capacity obligations by volume was provided by CCGTs, 15% by Nuclear, and 9% by generators using coal or biomass as a fuel (Figure 5).

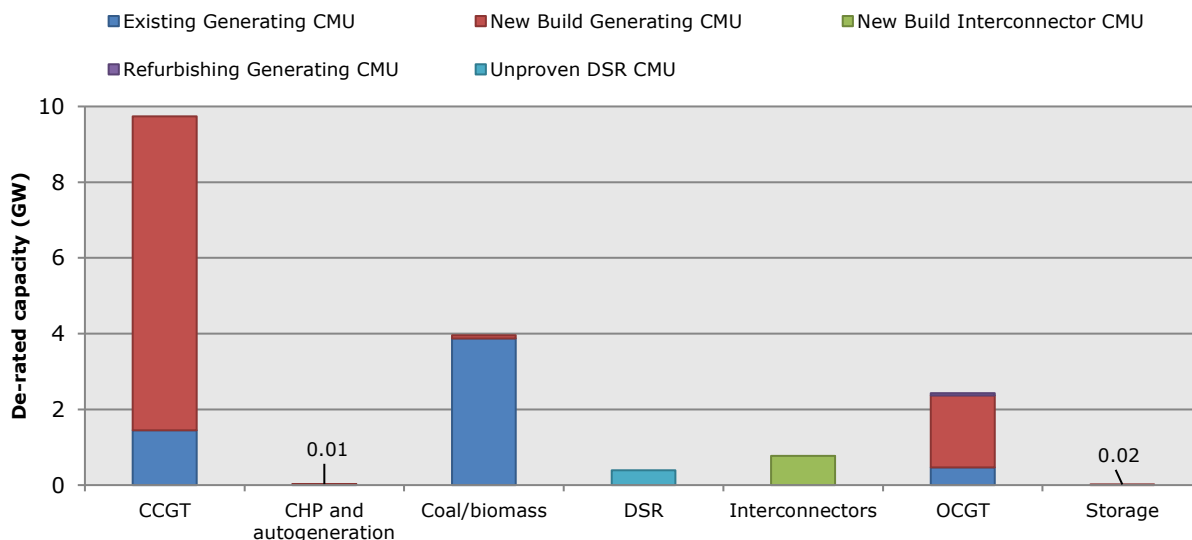
3.14. Around 1.3GW of new distributed generators, including small OCGT and gas and diesel reciprocating engines won agreements, despite announcements before the auction on the removal of 'embedded benefits' and tightening of local air quality regulations. CHP and autogeneration, storage and nuclear capacity had success rates of 96%, 98% and 100% respectively.

Figure 5 – Cleared and exited capacity by technology and fuel type (GW)



3.15. As in the 2015 T-4 Auction, New Build capacity accounted for most of exited CCGT and OCGT capacity. In comparison, most of the coal/biomass capacity that failed to win an agreement was existing (Figure 6). Just over half of the existing coal plants in GB cleared the auction: Ratcliffe, West Burton, Aberthaw and Drax.

Figure 6 – Exited capacity by technology type (GW)



3.16. Out of the five prequalifying interconnector CMUs, the four Existing Interconnector CMUs received an agreement. The New Build Interconnector CMU, NEMO Link, due to begin commercial operation in 2019²⁰, did not gain an agreement.

Length of agreements

3.17. As in the 2014 and 2015 Capacity Market auctions, the majority (95%) of capacity in the 2016 T-4 Auction won one year agreements, equivalent to 49.8GW of capacity. Approximately 2.6GW were awarded 15 year agreements.

3.18. Just over 2.6GW of capacity was awarded agreements of more than one year in the 2016 T-4 auction, more than double the amount awarded in the 2015 T-4 Auction.

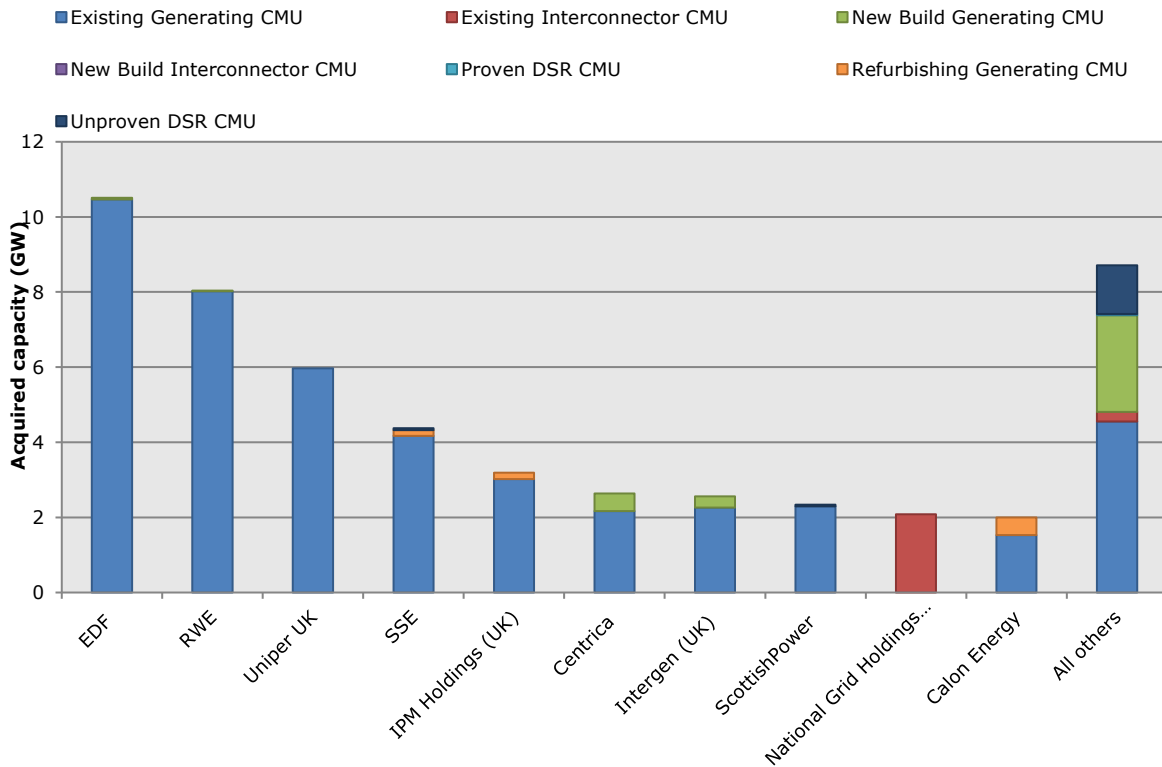
Results by company

3.19. Over 87% of the companies that entered the auction won agreements for at least one CMU. The acquired capacity through the 2016 T-4 auction closely reflects the current market structure in power generation. In volume terms,

²⁰ <http://www.nemo-link.com/timeline/>

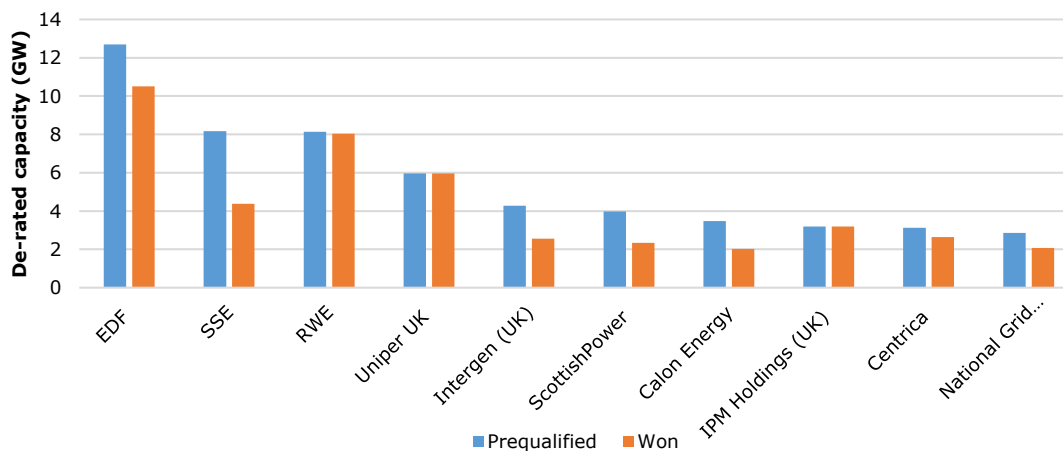
EDF, RWE and Uniper secured the most auction acquired capacity, close to 50% between them (Figure 7).

Figure 7 – Volume of cleared capacity by company



3.20. Figure 8 demonstrates the success rates in the 2016 T-4 auction for the ten companies securing the highest volumes of capacity in the auction. All but one of the ten largest auction participants by secured de-rated capacity had a success rate of over 50%. In comparison, all of the ten most successful companies in the 2015 T-4 Auction had a success rate of over 80%. This suggests that market power was less concentrated in the 2016 T-4 auction.

Figure 8 –Top 10 companies by prequalified and successful capacity



Further observations

Clearing price higher than in the 2015 T-4 auction

- 3.21. The auction cleared at a higher price than in the 2014 and 2015 T-4 auctions. The final price was £22.50/kW/year, compared to £18.00/kW/year in 2015 and £19.40/kW/year in 2014.
- 3.22. A total of 17.35GW of de-rated capacity in the 2016 T-4 auction failed to clear. This was a higher proportion of the total capacity that entered the auction (25%) compared to that in the 2015 T-4 auction (20%). This is despite the 2016 auction targeting a higher volume of capacity and clearing at a higher price than the 2015 auction. One reason for this is that a larger amount of new build capacity bid into the 2016 auction.

Battery storage won agreements for the first time

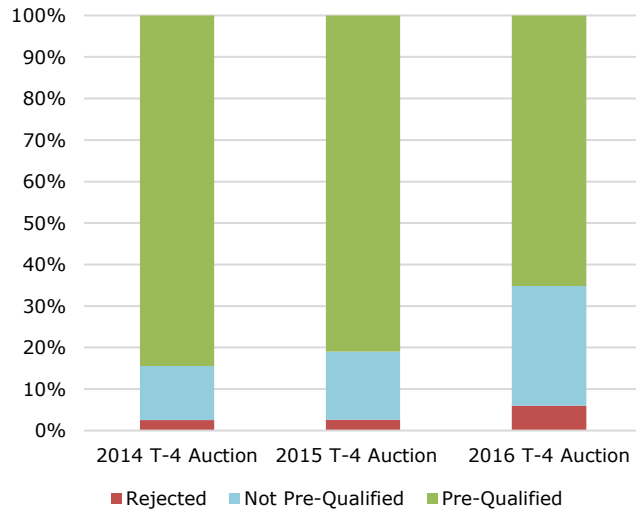
- 3.23. The 2016 T-4 Auction was the first auction that battery storage won agreements in. Of the 3.2GW of storage capacity that entered the auction, only 18MW exited. While the majority of the successful capacity (2.5GW) was existing transmission-connected storage, 454MW of New Build distribution connected storage also won agreements. Storage comprised just over 6% of total awarded capacity.

Comparison with earlier T-4 auctions

- 3.24. Figure 9 below suggests that while the breakdown of Pre-Qualification Decisions (ie determining whether a CMU is Prequalified, Not Prequalified or Rejected) in the 2014 and 2015 T-4 auctions were quite similar, a markedly smaller proportion pre-qualified in the 2016 T-4 Auction. This can be partly explained by the prequalification behaviour of some companies, who conditionally prequalified multiple CMUs for the same site, for example with

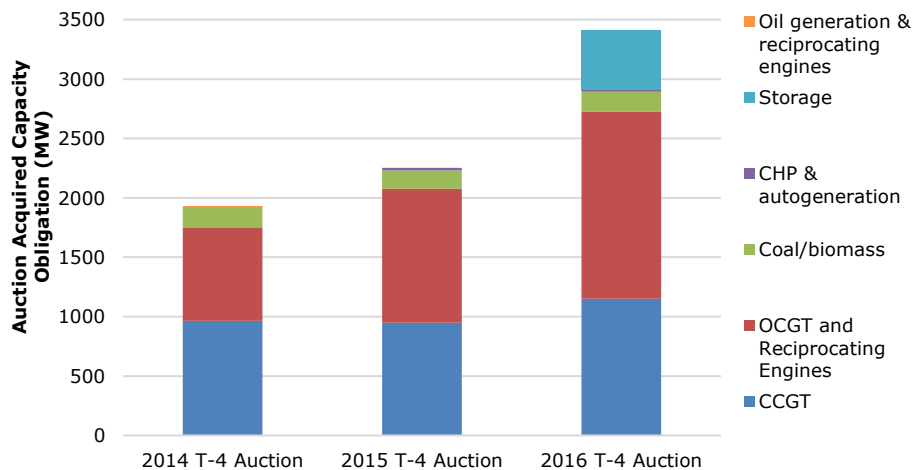
different capacity volumes, but then only took one option forward, with the other CMUs becoming not prequalified.

Figure 9 – Breakdown by Pre-Qualification Decision in the T-4 auctions (number of CMUs)



3.25. Figure 10 below shows the breakdown by fuel and technology type of the New Build capacity that won agreements in the 2014, 2015 and 2016 T-4 auctions. It should be noted that the CCGT figures include the 1.66GW Trafford plant which won an agreement in 2014 but has now been terminated and Carrington which is classified as new in both the 2015 (805MW) and 2016 (819MW) T-4 auctions. The chart shows that the total volume of new build capacity has increased over time, although this may partly be explained by the increasing volume of capacity being procured. The high success rate of battery storage also helped to increase the volume of new build capacity.

Figure 10 – Successful New Build capacity by fuel and technology type in the T-4 auctions



4. 2017 Early Capacity Auction

- 4.1. This section covers the prequalification and auction outcomes for the 2017 Early Capacity Auction, for delivery of capacity in 2017/18.
- 4.2. In the Early Capacity Auction, the price cap was £75/kW/year. The price decrement per round was £5/kW/year, resulting in a maximum of 15 rounds over four consecutive days. The final target volume of capacity was 53.8GW

Prequalification and participation outcomes for the 2017 Early Capacity Auction

- 4.3. A total of 755 Capacity Market Unit (CMU) applications were made during the prequalification window, an equivalent of 62GW of de-rated capacity²¹. A total of 595 CMUs, equivalent to 60GW of de-rated capacity, prequalified for the 2017 Early Capacity Auction.
- 4.4. Eight CMUs, totalling 3.7GW of anticipated de-rated capacity, opted out. Of these eight CMUs, six were going to be closed down, decommissioned or otherwise non-operational by the start of the Delivery Year. The two remaining CMUs (33MW) opted out due to being temporarily non-operational for the winter of 2017/18 but operational thereafter.

CMUs that entered the Early Capacity Auction

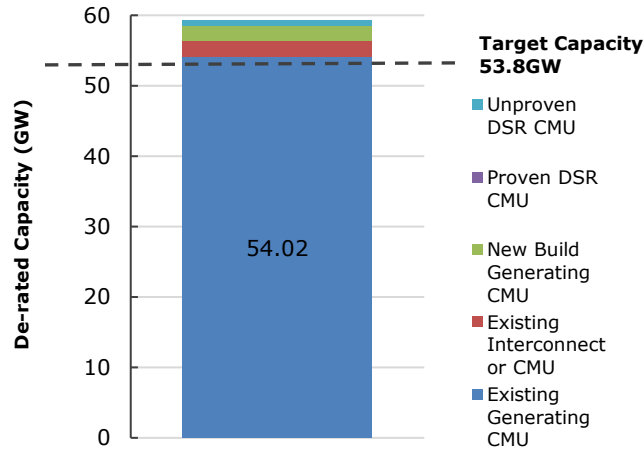
- 4.5. A total of 507²² CMUs entered or participated in the auction, the equivalent of 59.3GW of de-rated capacity. This compares with the target capacity of

²¹ De-rated capacity includes the bidding capacity for DSR CMUs and the post-refurbishing de-rated capacity for Refurbishing CMUs.

²² A total of 595 CMUs prequalified for the auction but only 507 entered the auction. The 88 CMUs that prequalified but did not enter the auction were New Build and Unproven DSR CMUS that did not confirm entry into the auction. It is a requirement for New Build and Unproven DSR CMUS to confirm entry into the auction in order to participate (Rule 5.5.14).

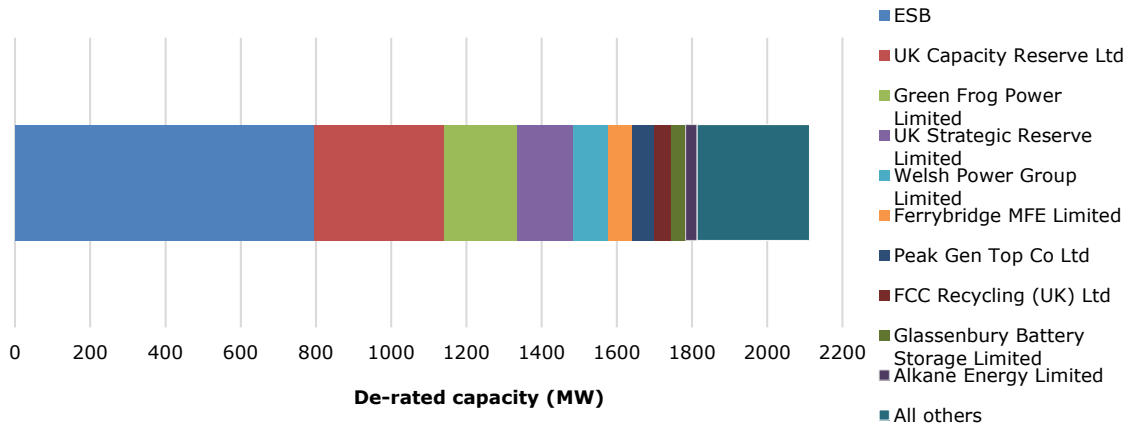
53.8GW, implying there was considerable competition and liquidity going into the auction (Figure 211).

Figure 11 – Participating capacity by CMU Category



- 4.6. Approximately 85 different companies²³ entered at least one CMU for the 2017 Early Capacity Auction.
- 4.7. Figure 12 shows prequalified New Build capacity by company. No Refurbishing Generating CMUs applied for the Early Capacity Auction, likely due to the short lead time between the auction and the Delivery Year.

Figure 12 – Volume of prequalified New Build Generating CMU capacity by company



²³ We have aggregated results for applicant companies on the Capacity Market Register by their parent company where appropriate.

CMUs that didn't prequalify for the Early Capacity Auction

- 4.8. A total of 160 CMUs failed to qualify for the Early Capacity Auction, totalling around of 2.1GW of anticipated de-rated capacity²⁴.
- 4.9. 119 of the unsuccessful CMUs were initially granted a conditional prequalification status following the Prequalification Results Day, but later failed to provide sufficient satisfactory information before the auction to meet the conditions imposed. Two CMUs that were initially rejected went on to gain prequalification status after appealing to Ofgem as part of the dispute resolution process.

2017 Early Capacity Auction outcomes

Clearing price and volume

- 4.10. A total of 54.4GW of capacity was awarded in the 2017 Early Capacity Auction at a clearing price of £6.95/kW/year. We believe this price was significantly below forecasters' expectations²⁵. This resulted in around 634W of extra capacity being awarded over the target level due to the slope of the demand curve.

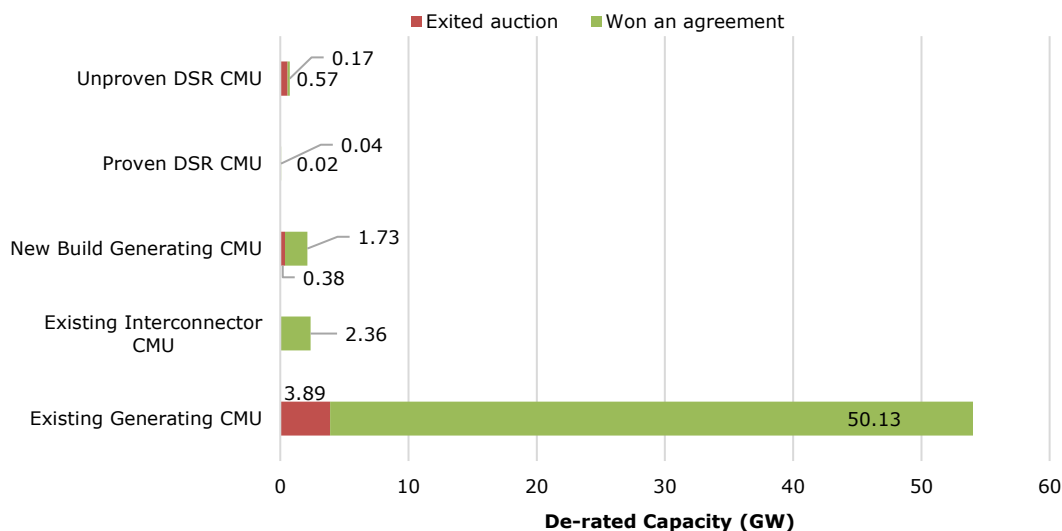
Results by CMU Category

- 4.11. The majority of cleared, or successful, capacity was Existing Generating capacity (50.1GW), as demonstrated in Figure 13, making up over 92% of successful capacity. This is likely to be in part due to the short time between the end of the auction and the start of the delivery year.

²⁴ These are CMUs that didn't prequalify for auction following the Prequalification window and are assets that were given either a 'Rejected' status, or units that failed to provide sufficient evidence to consolidate their conditional status into prequalified.

²⁵ Market analysts, such as RBC Capital Markets which forecasted a clearing price in the £15-17.5/kW/year range, generally expected a higher clearing price.

Figure 13 – Cleared and exited capacity by CMU Category (GW)



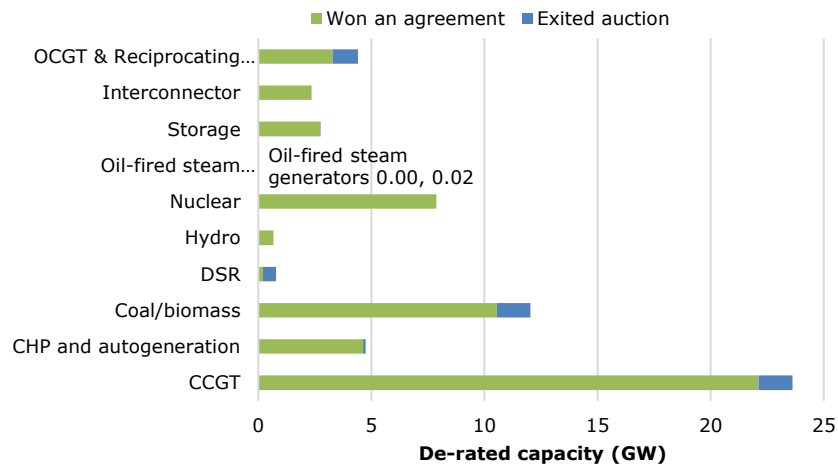
4.12. Around 1.7GW of New Build capacity won Capacity Agreements. This includes Carrington, the transmission connected 797MW CCGT project which had not yet been commissioned during prequalification.²⁶ The majority of the remaining 937MW of capacity was distribution connected, comprising mainly of gas OCGT and reciprocating engines. These could be units with agreements from the first auctions for which development is being accelerated in time for the 2017/18 delivery year.

Results by technology and fuel type

4.13. Around 41% of the successful capacity was provided by CCGTs, 19% by generators using coal or biomass as a fuel and 14% by nuclear (Figure 14).

²⁶ The de-rating factor for CCGT was 87.6% for Delivery Year 2017/18, and 90% for Delivery Year 2020/21 which is why the capacity of CMUs may change between auctions.

Figure 14 – Cleared and exited capacity by technology and fuel type (GW)



4.14. Nuclear, interconnectors, hydro and oil-fired steam generators all had success rates of 100%. Storage, CHP and autogeneration and CCGT had success rates of 98%, 98% and 94% respectively.

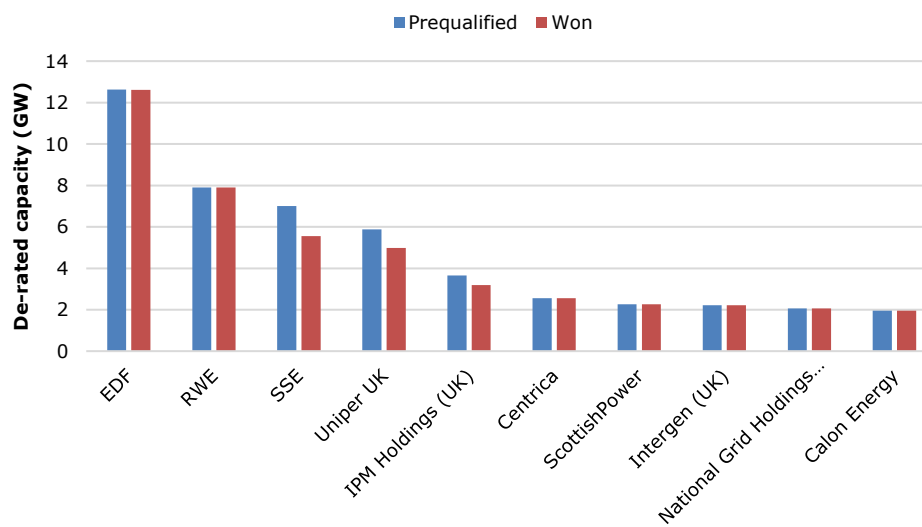
Length of agreements

4.15. Only one year agreements were available in the Early Capacity Auction, as the Delivery Year starts on 1 October 2017, one year ahead of the delivery year targeted in the 2014 T-4 auction.

Results by company

4.16. Around 84% of the companies that entered the auction won agreements for at least one CMU. Figure 15 demonstrates the success rates in the Early Capacity Auction for the ten companies securing the highest volumes of capacity in the auction. All of the ten largest auction participants by secured de-rated capacity had a success rate of over 79%, with four having success rates of 100%.

Figure 15 – Top 10 companies by prequalified and successful capacity



Further observations

Low clearing price

- 4.17. The clearing price of £6.95/kW/year is the lowest ever reached in a Capacity Market Auction. As this is a market wide 'T-1 Auction', and therefore unique, it is not possible to draw definitive conclusions from this.
- 4.18. One possible explanation for the low clearing price could be that many of the CMUs that had been successful in the Early Capacity Auction had won agreements in auctions for future delivery years (90% of the capacity that won a Capacity Agreement in the 2016 T-4 Auction also won an agreement in the 2017 Early Capacity Auction). The termination fees they would have to pay for renegeing on these later agreements provide an incentive not to close, pushing down the price at which bidders would be willing to accept an agreement.
- 4.19. Another possibility is that the CMUs that won agreements in the Early Capacity Auction already have agreements from earlier T-4 auctions and have been able to accelerate their delivery, allowing them to bid competitively.
- 4.20. Bidders with cleared capacity in the Early Capacity Auction may also have been confident that electricity prices would be high during the delivery year, allowing them to earn higher wholesale market revenues and therefore accept a lower price for guaranteeing capacity.

5. 2017 DSR Transitional Auction

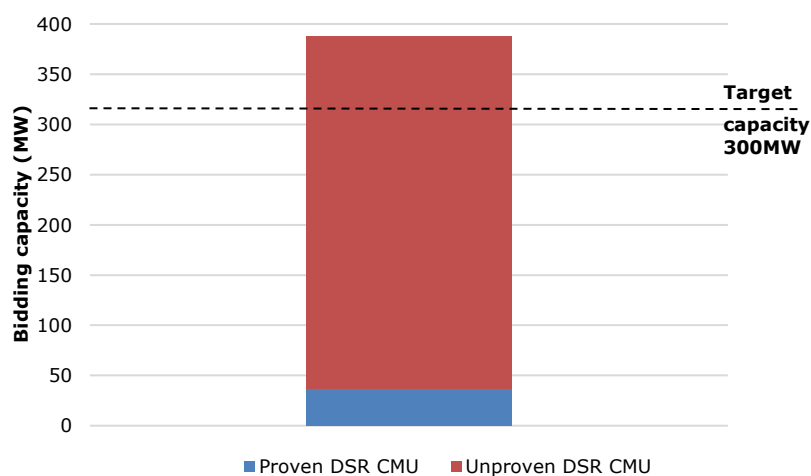
- 5.1. This section covers the prequalification and auction outcomes for the 2017 DSR Transitional Auction (TA) for delivery of capacity in 2017/18.
- 5.2. In the TA the price cap was £75/kW/year. The price decrement per round was £5/kW/year, resulting in a maximum of 15 rounds over two consecutive days. The final target volume of capacity was 300MW.
- 5.3. Only turn-down DSR, ie where electricity consumers are paid to turn-down demand in response to tight supply/demand balances, was allowed to participate in the 2017 TA. Behind-the-meter generation was excluded from the auction.

Prequalification outcomes for DSR Transitional Auction

Prequalification applications and prequalified CMUs for the DSR Transitional Auction

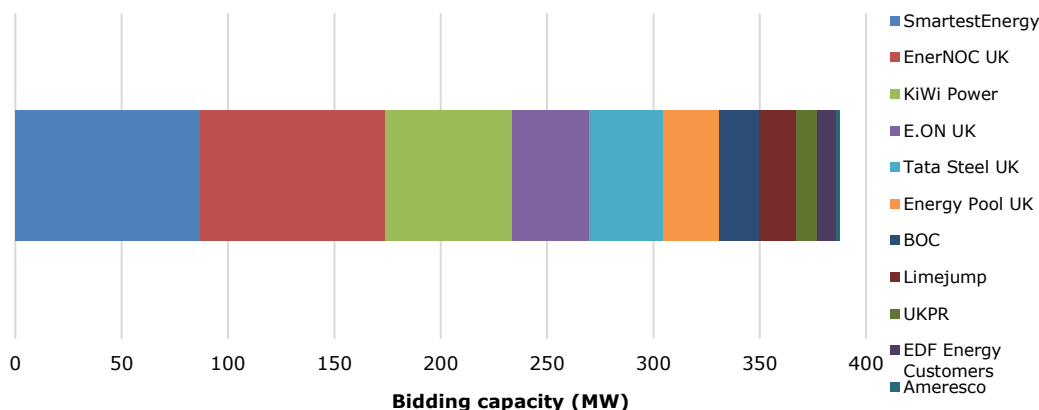
- 5.4. There were 47 prequalification applications. A total of 41 CMUs prequalified totalling 388MW of bidding capacity, however only 35 CMUs totalling 373MW entered the auction. The maximum capacity to be acquired was 400MW, meaning the auction was illiquid. Due to the slope of the demand curve the price could not have fallen below £33/kW without the auction clearing.

Figure 16 – Prequalified capacity by CMU Category (MW)



- 5.5. Unproven DSR capacity accounted for around 90% of the total prequalified capacity, and Proven DSR accounted for 10% of capacity (Figure 16). The average bidding capacity size of a prequalified CMU was 9.4MW.

Figure 17 – Volume of prequalified DSR capacity by company (MW)



- 5.6. A total of 11 companies prequalified CMUs for the auction (Figure 17). No company had more than 22% of the total capacity. However two companies had more capacity than the excess capacity in the first round of the auction.

CMUs that didn't prequalify for the DSR Transitional Auction

- 5.7. 114MW of de-rated capacity failed to prequalify, the majority of which was Unproven DSR (89.5MW).
- 5.8. Nine applications were initially rejected, but eight were later overturned and prequalified. One CMU was rejected as it was an Existing Generating CMU, and therefore not allowed to participate in this TA. Two CMUs were removed from the auction as they had become ineligible since prequalifying. Twenty applications were initially conditionally prequalified, of which 17 went on to prequalify.

2017 DSR Transitional Auction

- 5.9. A total of 373MW of capacity entered the auction, of which over 83% secured a Capacity Agreement for delivery in 2017/18, all with a contract duration of one year. Longer agreements were not available in the TA.
- 5.10. The auction system included two CMUs totalling 40MW which were not eligible to participate in the 2017 TA. In accordance with the Rules, as it was too late to remove the CMUs prior to the start of the auction, NGET submitted bids at the Bidding Round Price Cap in the first round for both CMUs.

Clearing price and volume

- 5.11. A total of 312.171MW of capacity was awarded an agreement at a clearing price of £45/kW/year.
- 5.12. The clearing price is approximately 64% higher than the £27.5/kW/year achieved in the first TA last year. One likely reason is that behind-the-meter generation was able to participate in the first TA but excluded from the second TA, and this technology may have been able to bid at a lower price than turn down DSR. Another reason is likely to be the low liquidity in the second TA which limited how low the clearing price could be.

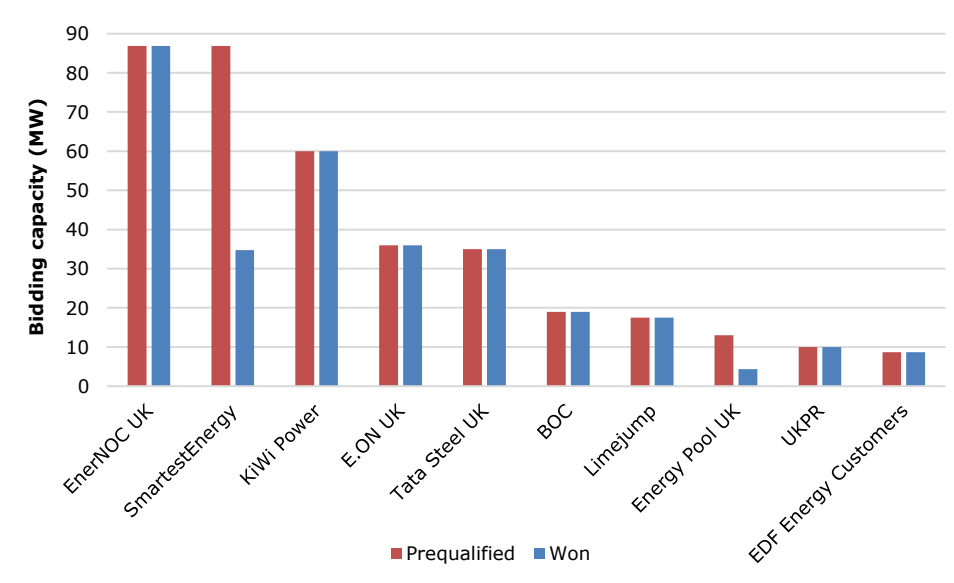
Results by CMU Category

- 5.13. A total of 32 out of 35 participating CMUs were successful in securing a Capacity Agreement through the TA (the average size of a successful CMU was 9.8MW).
- 5.14. The majority of successful bidding capacity securing an agreement in the TA was Unproven DSR (88%).

Results by company

- 5.15. All of the ten companies that entered the auction won agreements for at least one CMU (Figure 18).

Figure 48 – All participating companies by prequalified and successful capacity



Further observations

No further TAs planned

- 5.16. The 2017 TA is the last TA, subject to any further policy decisions from BEIS. In future, all DSR capacity will participate as normal alongside other capacity in the regular T-4 and T-1 auctions.
- 5.17. While the clearing price of the TA is higher than the T-4 auction, it could be partially explained by the commercial barriers that turn-down DSR faces and the low liquidity in the auction. We have seen successful DSR in the 2016 T-4 Auction clearing at a lower price (1.4GW at £22.50) than the 2017 TA, which implies that some DSR, particularly behind the meter generation DSR, is able to compete in the market-wide auctions.

6. DSR participation

- 6.1. This section covers Demand Side Response (DSR) participation in the 2016 T-4 Auction and 2017 Early Capacity Auction, and some historical analysis.

Background

- 6.2. The original design of the Capacity Market, included a number of arrangements to encourage DSR participation, including two Transitional Auctions for DSR and small scale generation for delivery in the years ahead of the Capacity Market fully coming into effect. The first of the TAs took place in 2016, for delivery in 2016/17. The second took place in 2017, for delivery in 2017/18.

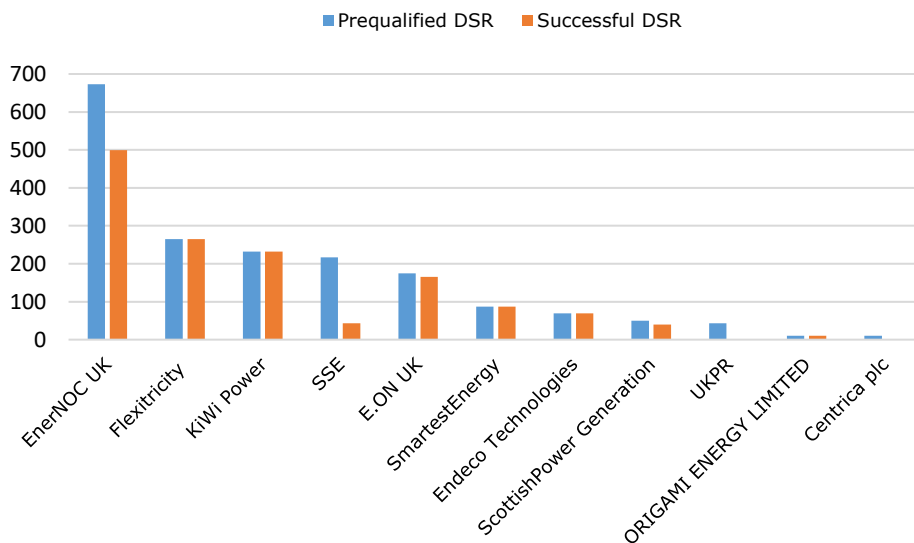
DSR prequalification and auction outcomes

2016 T-4 Auction

- 6.3. A total of 1.4GW of DSR capacity secured an agreement out of the 1.8GW that entered the auction. This accounted for 2.7% of total secured capacity.
- 6.4. The DSR that prequalified for the 2016 T-4 Auction had a success rate of 78.5%, which is almost on par with the success rates of the other technology types (78.6%). As these DSR components will have to undergo testing before the beginning of the Delivery Year in September 2020, the volume of DSR could decline.
- 6.5. As Figure 9 demonstrates, independent aggregators secured more capacity (76%) than supplier-aggregators (24%). Additionally, independent aggregators had a higher success rate (83%) than supplier-aggregators (62%).²⁷

²⁷ This represents a simple average by CMUs and not a weighted average by capacity.

Figure 19 – Prequalified and successful DSR capacity by company in the 2016 T-4 Auction



2017 Early Capacity Auction

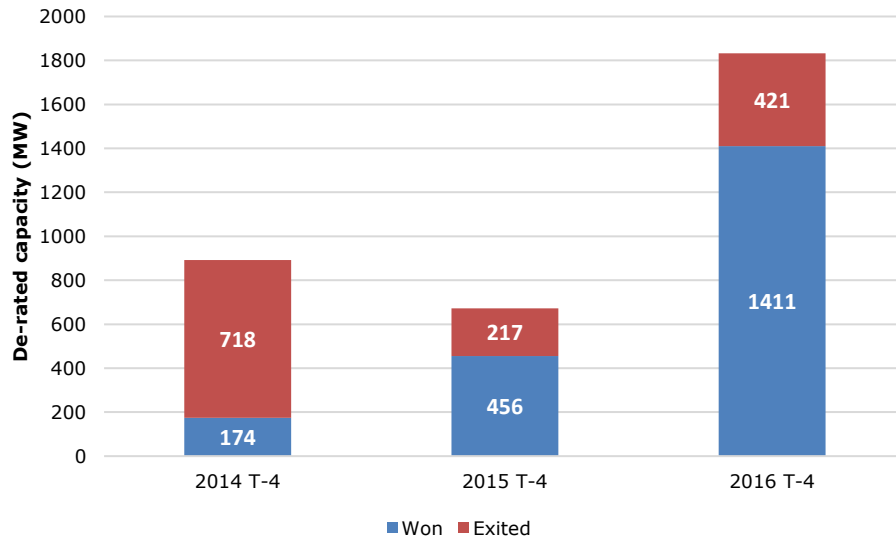
- 6.6. A total of 68 DSR CMUs entered the Early Capacity Auction, with a total bidding capacity of 792MW. This accounted for around 1% of capacity that entered the auction.
- 6.7. Out of the total participating Early Capacity Auction capacity, 30 DSR CMUs secured an agreement, totalling around 209MW of capacity and accounting for just 0.4% of all successful capacity and a success rate of 26% – much lower than the average success rate of other technology types (88%). The successful DSR CMUs will have to undergo testing before the beginning of the Delivery Year September 2017 and the volume of DSR could decline.
- 6.8. The relatively low success rate of DSR may partly be explained by the low clearing price, and also the short time between the auction and the delivery year. This nine month period may not have been adequate for recruiting DSR customers.

Historical analysis of DSR participation in T-4 auctions

- 6.9. The amount of successful DSR shows a steady increase over the three T-4 auctions to date (Figure 20). Only 174MW, equivalent to 0.4%, of the capacity procured in the 2014 T-4 Auction belonged to DSR CMUs. In the 2015 T-4 auction this rose to 456MW, while in the 2016 T-4 auction this figure almost tripled to 1411MW.
- 6.10. Unlocking the full potential of DSR capacity could help drive down the cost of delivering secure electricity supplies. However, we also recognise that there are incentives for generation to locate on customer sites in order to reduce their network charges and this may have increased the amount of DSR we

saw coming forward in the 2016 T-4 auction. We have consulted on launching a Targeted Charging Review to look into these issues.

Figure 20 – DSR participation and success in T-4 auctions



7. Bidding behaviour

Background

7.1. This section provides an overview of the bidding approaches of participants in the 2016 T-4 and 2017 Early Capacity auctions.

Bidding options in 2016 T-4 Auction and 2017 Early Capacity Auction

7.2. In each round, the following actions are available to auction participants:

- **Exit Bid** – all Capacity Market Units (CMUs) can specify the price at which they exit the auction
- **Duration Bid Amendment (DBA)** – New Build and Refurbishing CMUs that qualify for longer agreements can specify the price at which they want to reduce the length of their agreement
- **Continue as Pre-refurbishing** – Refurbishing CMUs can specify a price to switch to an Existing contract (and as a result only receive a one-year agreement)

7.3. In each round, bidders also have the option of placing 'Proxy Bids' for any of the above actions. These are bids which take effect in a later round.

7.4. CMUs that qualified as Price Makers could place Exit Bids up to the auction cap of £75/kW/year. This included all New Build, Refurbishing and DSR CMUs, and Existing CMUs that submitted Price Maker Memorandums. Price Takers could only place bids at less than or equal to £25/kW/year.

7.5. Auction participants in the ECA and 2017 DSR Transitional Auction (TA) were only able to make Exit Bids.

Our monitoring

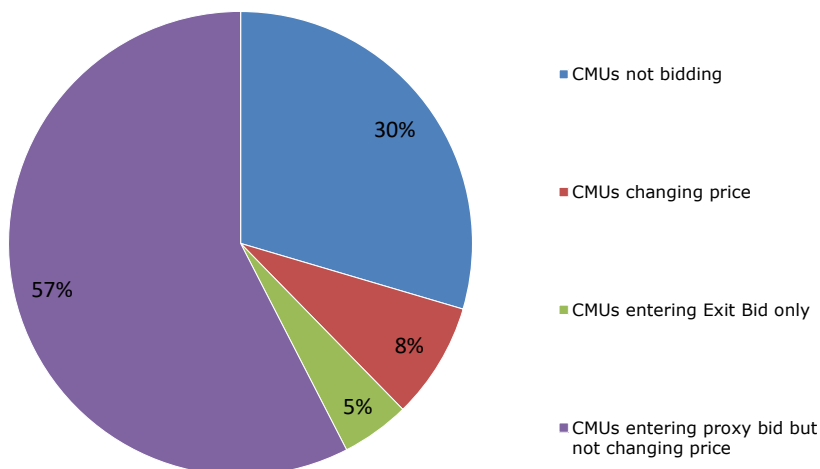
7.6. We monitor bidding patterns and behaviour following the CM auctions for several reasons, including our role as a Competition Authority and a National Regulatory Authority and to monitor compliance with the CM Rules. We also monitor to inform decisions on whether to make changes to the CM Rules.

7.7. Some of the key themes and trends from the 2016/17 CM auctions are summarised below.

Summary of bidding behaviour in the 2016 T-4 Auction

7.8. Looking at the 2016 T-4 Auction data (Figure 21), around 8% of CMUs changed their bidding price during the auction. This was lower than in the 2015 T-4 Auction (16%). The majority of the changes in price were decreases, which could reflect the competitive nature of the auction.

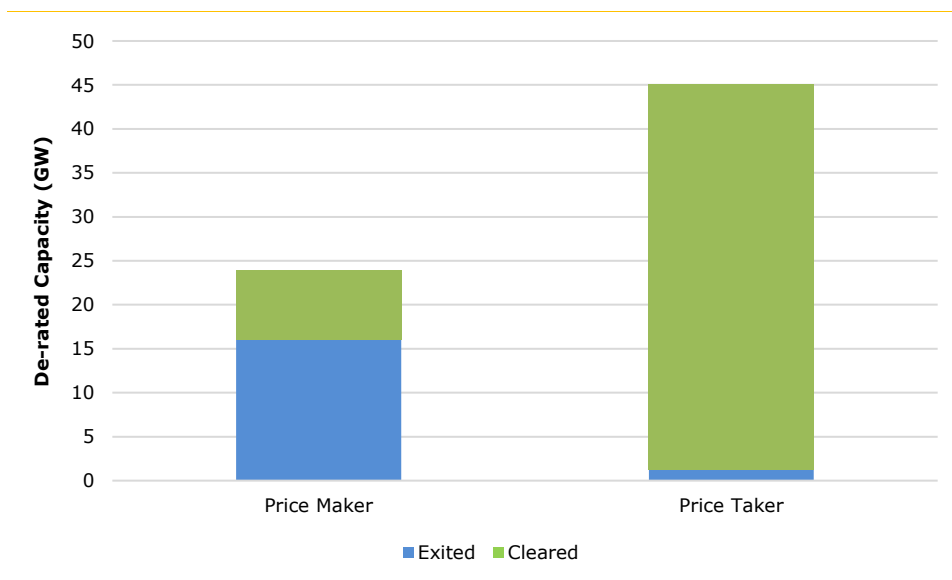
Figure 21 – Bidding approaches for CMUs in the 2016 T-4 Auction



Price Makers and Takers

7.9. Looking at all Price Maker CMUs participating in the 2016 T-4 Auction, the majority of Price Maker capacity (approximately 67%) exited the auction without an agreement (Figure 22). Around 21% of the Existing Generating capacity that had signed a Price Maker Memorandum (enabling them to bid above £25/kW) cleared the auction.

Figure 22 – Cleared and exited capacity by Existing Price Makers and Price Takers in the 2016 T-4 Capacity Market Auction

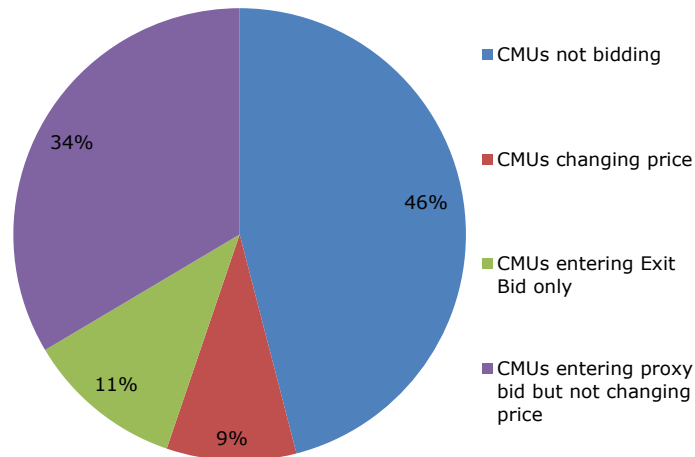


7.10. Overall, the bidding behaviour in the 2016 T-4 Capacity Market Auction did not significantly differ from the 2015 T-4 Auction. The majority of price makers that entered the auction failed to secure an agreement, whilst most price takers secured an agreement.

Summary of bidding behaviour in the 2017 Early Capacity Auction

7.11. Looking at the 2017 Early Capacity Auction data, 46% of CMUs did not place any bids during the auction (Figure 23). This is lower than the 2016 T-4 auction. One reason could be that the clearing price in the ECA was lower, and therefore there were more rounds of the auction in which Exit Bids could be made.

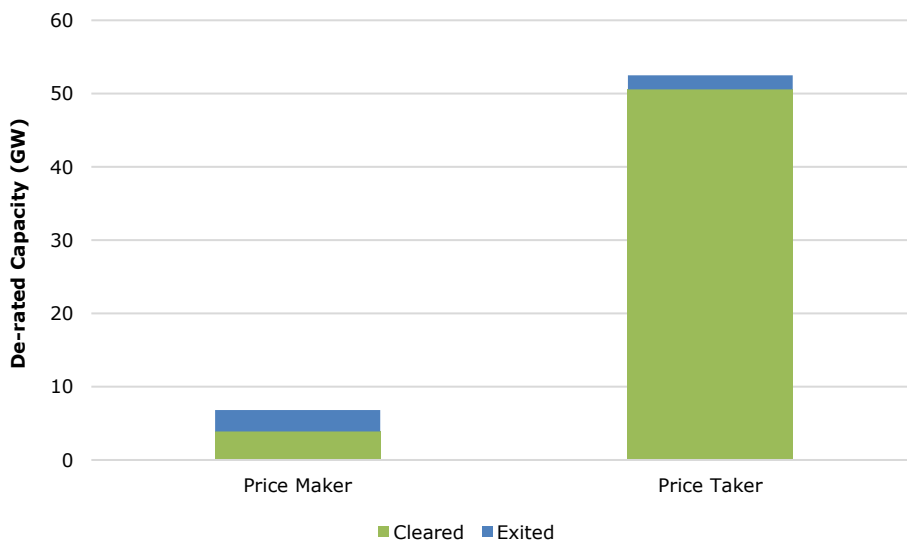
Figure 23 – Bidding approaches for CMUs in the 2017 Early Capacity Auction



Price Makers and Takers

7.12. Looking at all Price Maker CMUs participating in the 2017 Early Capacity Auction, the majority of capacity (approximately 57%) cleared the auction with an agreement (Figure 24). Around 50% of the Existing Generating capacity that had signed a Price Maker Memorandum (enabling them to bid above £25/kW) cleared the auction.

Figure 24 – Cleared and exited capacity by Existing Price Makers and Price Takers in the 2017 Early Capacity Auction



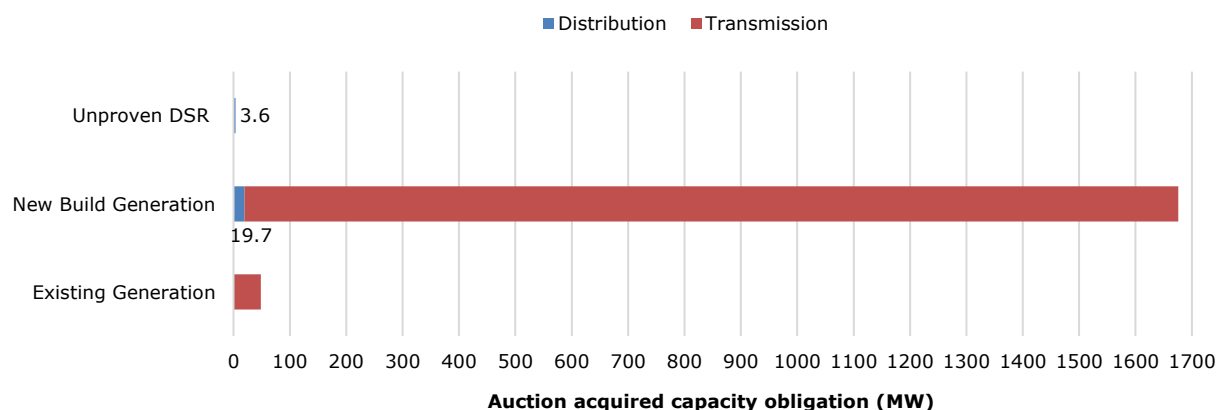
8. Delivery milestones for earlier auctions

The 2016/17 auctions is the third round of the Capacity Market (CM) auctions. There have been three earlier auctions in 2014 and 2015. Successful new build Capacity Market Units (CMUs) in these auctions must meet a number of pre-delivery year milestones. CMUs which fail to meet certain milestones may have their agreements terminated. Further detail on the success rates and reasons for failure of these CMUs is provided below.

2014 T-4 Auction

- 8.1. A total of 49.3GW of capacity was procured in the auction at a clearing price of £19.40/kW/year, which included over 2.6GW of new generating capacity.
- 8.2. Six Capacity Agreements totalling 1,728MW of acquired capacity obligation were terminated between June 2015 and December 2016 for failing to meet pre-delivery year milestones (Figure 25). A further CMU was issued a termination notice but then had this withdrawn. Ofgem opened one investigation into a company for an alleged breach of the CM Rules but closed this investigation without terminating any capacity agreements.

Figure 25 – Terminated capacity by CMU category and connection type



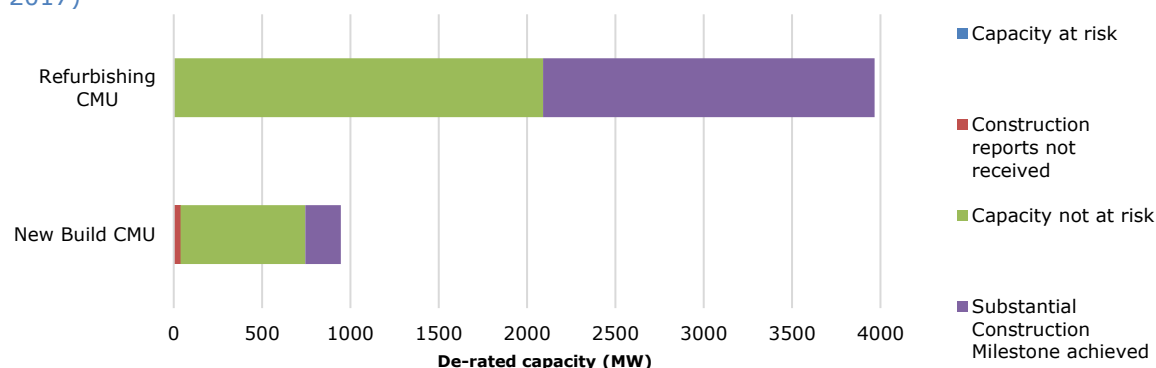
- 8.3. Around 96% of the total terminated capacity from the 2014 T-4 Auction is the Trafford power station, which failed to reach its financial commitment milestone in December 2016 after receiving a three-month extension.
- 8.4. Of the 77 new build generating units that won Capacity Agreements, three have so far been terminated. However, these three agreements represent 64% of the successful new build capacity from the 2014 T-4 auction.

- 8.5. Another 47MW of transmission connected existing generation was also terminated after a steel plant went into liquidation in 2015. The remaining 23MW was made up of distribution connected new build and unproven demand side response (DSR).

Construction milestone progress for Prospective CMUs

- 8.6. New Build Generating, Refurbishing and New Build Interconnector CMUs (ie Prospective CMUs) must meet financial commitment milestones and milestones to completion. The Delivery Body may terminate a Capacity Agreement if a CMU fails to comply after the prescribed notice period.²⁸
- 8.7. There are a total of 85 Prospective CMUs from the 2014 T-4 Auction, none of which are at high risk of not meeting their construction milestones. Forty-two percent have already met their Substantial Completion Milestone²⁹ and only 0.8% of capacity is either at risk of not meeting their construction milestones or has not submitted construction reports (Figure 26). Over 80% of the Prospective CMU capacity is Refurbishing CMU capacity.

Figure 26 – Construction milestone progress by CMU category for 2014 T-4 Auction (at March 2017)



2015 T-4 Auction

- 8.8. None of the Capacity Agreements awarded in the 2015 T-4 Auction have thus far been terminated. CMUs which won a Capacity Agreement must reach the financial commitment milestone by 22 June 2017.

Construction milestone progress for Prospective CMUs

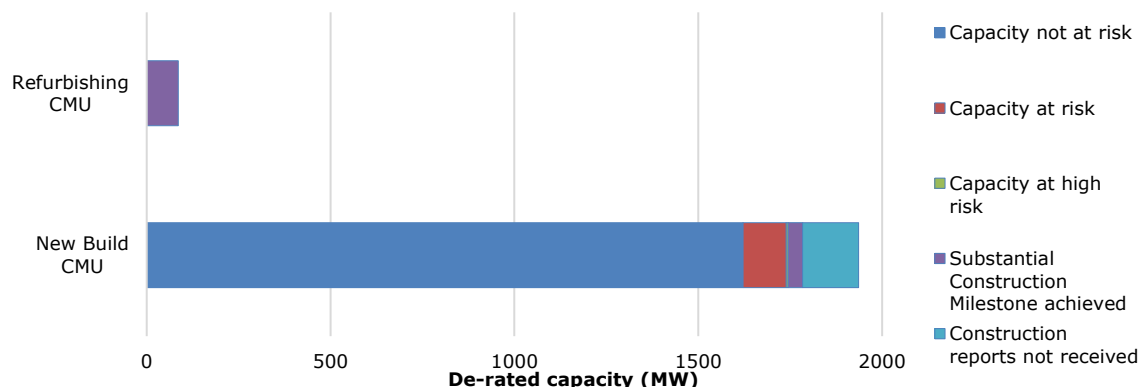
- 8.9. There are a total of 75 Prospective CMUs from the 2015 T-4 Auction, of which 0.3% of capacity is at high risk of not meeting their construction milestones

²⁸ See Rule 6.8.2.

²⁹ Has the meaning given in Rule 6.7.26.7.2 or Rule 6.7.3, as applicable.

and around 13% is at risk or has not submitted their construction reports. Six percent have already met their Substantial Completion Milestone and 80% of capacity is on track to meet their milestones (Figure 27).

Figure 27 – Construction milestone progress by CMU category for 2015 T-4 Auction (at March 2017)



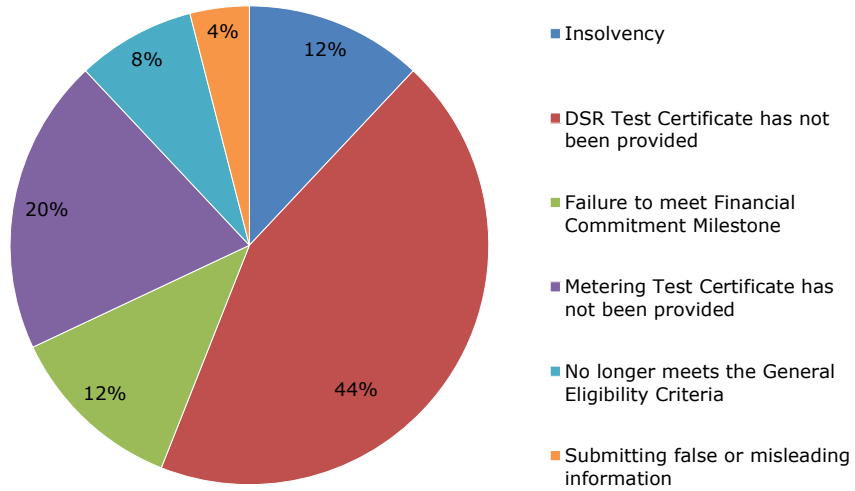
2015 DSR Transitional Auction

- 8.10. A total of 802.7MW of capacity was procured in the first DSR Transitional Auction (TA) that was held in 2015 at a clearing price of £27.50/kW/year.
- 8.11. Eleven capacity agreements totalling 86.7MW of acquired capacity obligation were terminated in November 2016 for failing to meet pre-delivery year milestones. This is equivalent to almost 9% of the total acquired capacity obligation for the 2016 TA. A further seven CMUs were issued a termination notice but then had these withdrawn once the issue was rectified.
- 8.12. There were only two successful New Build CMUs in the 2016 TA, and both have already met their substantial construction milestones.

Capacity Agreement terminations

- 8.13. In total, there have been 25 Capacity Agreement terminations since the start of the Capacity Market in 2014. Eight of these have been withdrawn after compliance with the relevant rule within the requisite cure plan time period.
- 8.14. As Figure 28 shows, almost half of the total 25 Capacity Agreement terminations have been due to failure to provide a DSR Test Certificate.

Figure 28 – Reasons for Capacity Agreement terminations



9. Next Steps

- 9.1. The government is expected to announce the Capacity Market (CM) auction parameters for the next round of auctions (2017/18) in summer 2017.
- 9.2. Ofgem will continue to play a key role in the CM, including:
 - Responsibility for the CM Rules
 - Oversight of NGET's functions as the Delivery Body under EMR, including setting incentives and reporting on their performance
 - Determining disputes where participants disagree with a decision made by NGET
 - Monitoring of the CM
 - Ensuring compliance with the Rules and Regulations and taking enforcement action where necessary
 - Reporting annually on the operation of the CM and on NGET's performance
 - Reporting at least every five years on whether the CM rules are meeting their objectives
- 9.3. Ofgem will publish its decisions on the 2017 CM Rule change process later this year.³⁰ These decisions will inform prequalification for the next round of auctions.

³⁰ For more information see: <https://www.ofgem.gov.uk/electricity/wholesale-market/market-efficiency-review-and-reform/electricity-market-reform/capacity-market-cm-rules>.