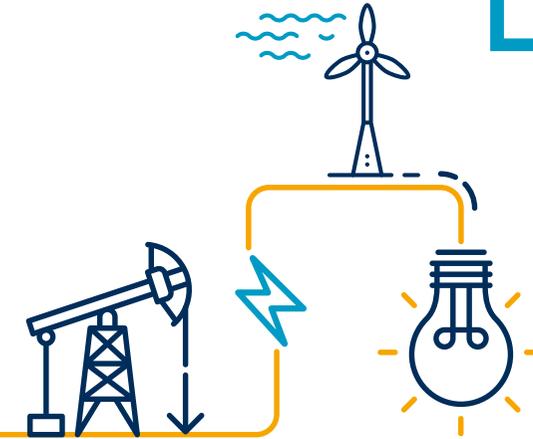


Review of the T-4 2019 capacity market auction

May 2020



The T-4 2019 Capacity Market (CM) auction for delivery in year 2023/24 (T-4 auction) concluded on 6 March 2020. In this bulletin, we provide our reflections on the auction results. We also draw comparisons to the T-3 auction for delivery in 2022/23 (T-3 auction) that was held in 2020 just over a month earlier following a one year delay.¹

Headlines

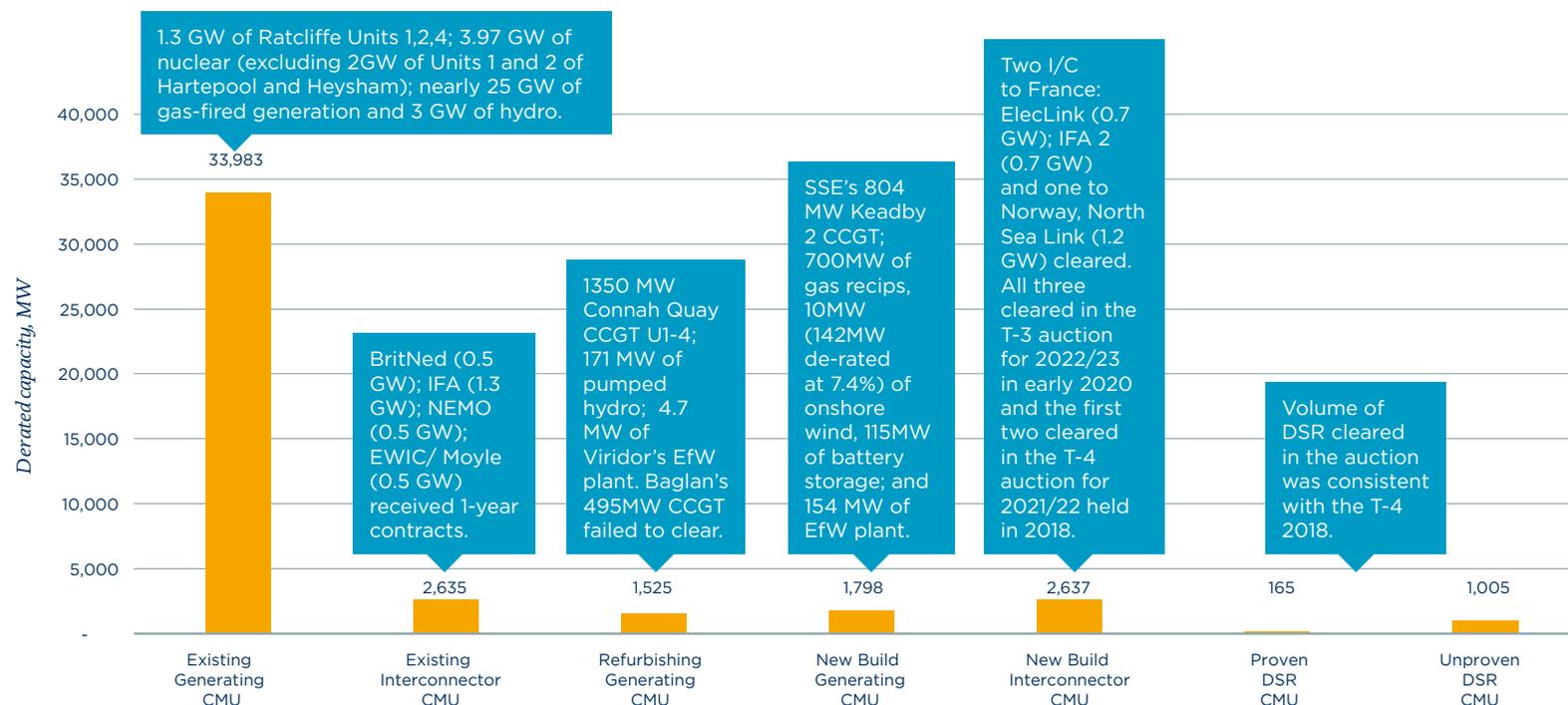
- The auction cleared at a price of £15.97 per kW per year, significantly above the clearing price of £6.44 per kW in the T-3 auction and the £8.40 per kW cleared in the T-4 auction for delivery year 2021/22 held in 2018 (previous T-4 auction).
- 43.7 GW of aggregate de-rated capacity² was procured in this auction. The target capacity for the two auctions held in 2020 was quite a bit lower compared to the capacity auctions held in previous years.
- Consistent with the T-3 auction, a limited amount of coal capacity cleared (comprising only of units from Uniper's Ratcliffe plant).
- Unlike previous auctions, several existing nuclear plant either opted out (861 MW Hinkley Point B) or failed to clear (996 MW of Hartlepool and 952 MW of Heysham 1).
- The three "new build" interconnectors clearing in the auction - ElecLink, IFA2, and North Sea Link - had cleared in previous auctions. All interconnection capacity participating in this auction was more heavily de-rated than in any previous auction.
- 1.8 GW of new-build capacity cleared in the auction. Nearly half of this was SSE's 804 MW Keadby 2 CCGT, which failed to clear in the previous T-4 auction held in 2018 but to which SSE had committed nonetheless.
- Compared to the T-3 auction when 15 MW onshore wind cleared in the CM auction for the first time, a smaller volume (10 MW of de-rated capacity across three units, which equates to 142MW of installed capacity) of onshore wind cleared.
- 1.2 GW of Demand Side Response (DSR) cleared in this auction, a similar volume to that seen in previous T-4 auctions but well above the 0.5 GW cleared in the T-3 auction.
- 1.5 GW of prequalified refurbishing capacity accepted 1 year contracts. The 495 MW Baglan Bay CCGT failed to clear as a refurbished unit.

¹ The delay was due to the suspension of the GB capacity market pursuant to a ruling of the General Court of the European Union in November 2018 annulling the approval granted to the GB CM by the European Commission in 2014. We reported on this suspension here: https://www.frontier-economics.com/media/2939/gb-capacity-suspension_v05.pdf

² All capacity referred to in this bulletin is on a de-rated basis unless specified otherwise.

Winners and losers

Developers would welcome the clearing price in the most recent T-4 auction returning to double digit figures after the T-3 auction held in early 2020 and the last T-4 auction held in 2018 both cleared at successively lower single digit levels (£6.44 per kW and £8.40 per kW, respectively). Of the 43.7 GW of de-rated capacity procured in the recent T-4 auction, more than 80% was existing generation or existing interconnection.



We comment below on how some of these technologies fared in the auction:

- Existing coal plant:** Of the 4 GW of existing coal capacity participating in the auction, only Uniper's Ratcliffe Units 1, 2 and 4 (1.3 GW) cleared. This was consistent with the T-3 auction where Ratcliffe was the only coal plant with clearing units, although, in that auction only two Ratcliffe units (2 and 3) cleared. It is now likely that Ratcliffe will be the only coal plant remaining on the system after October 2022, with Drax having recently announced it will stop burning coal in March 2021 and West Burton A having failed to secure CM contracts in either auction.

This was to be expected given that the economics of coal-fired generation have been deteriorating in recent years due to GB's carbon price support, significant increases in the price for EU ETS allowances and decreases in the price of natural gas relative to coal. The consequent coal-to-gas switching has been encouraging the retirement of GB's remaining coal fleet ahead of the government's deadline to have all coal capacity off the system by 2025.³

³ At present the government is consulting on whether any existing capacity that does not meet carbon emission limits proposed in the EU's Clean Energy for All Europeans package (coal plant do not) should be allowed to receive capacity payments starting either from 1 October 2024 or 1 July 2025. This means there is a possibility that coal plant may no longer be eligible for capacity payments starting in the T-4 auction held next year for the delivery year 2024/25 and may hence be planning to retire before hand.

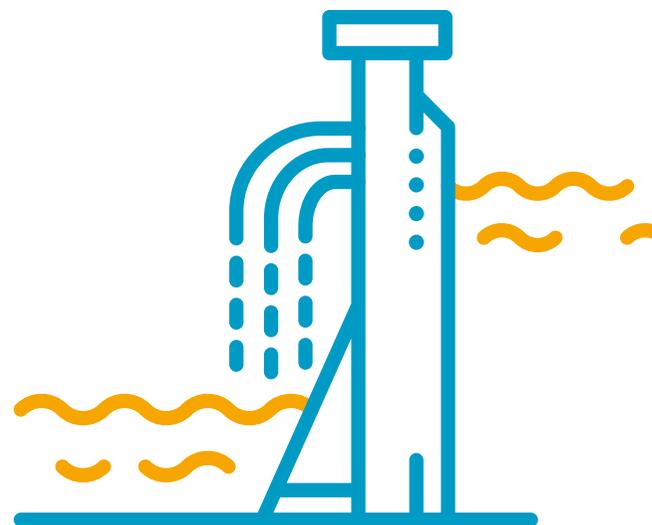
Winners and losers

Continued

- **Nuclear plant:** Unlike previous T-4 auctions, several existing nuclear plant either opted out or failed to clear this time around. 861 MW of Hinkley Point B units that were scheduled to retire in 2023 prequalified in the T-3 auction but then failed to clear. In the recent T-4 auction, Hinkley Point B did not prequalify and in addition, 996 MW of Hartlepool and 952 MW of Heysham 1 units that were expected to retire in 2024 prequalified but did not clear. In all these cases, it is likely that the plant owner did not consider the clearing price to be high enough to be worth keeping the plant open for January to September of the indicated year of retirement.
- **Interconnectors:** The three “new build” interconnectors clearing in the auction – ElecLink, IFA2, and North Sea Link⁴ – had previously cleared in the T-3 auction. Two of these, ElecLink and IFA2, had previously also cleared in the T-4 2018 auction for 2021/22. As such, there were no truly “new” interconnectors clearing in this auction.

The new and existing interconnection capacity participating in this T-4 was more heavily de-rated than in previous T-4 auctions. The difference was due to greater reliance on forward-looking modelling of expected interconnector flows taking into consideration new interconnectors coming online in the future and surplus capacity in the connected markets during times of stress in GB. For example, BritNed has a nameplate capacity of 1.4 GW and cleared 1 GW of de-rated capacity in the previous T-4 auction (in 2018) compared with only 475 MW in this auction. Changes in the forward-looking assumptions also led to a drop in de-rating factors between the T-3 and T-4 auctions, resulting in the contribution of interconnection decreasing by 0.6 GW (from 5.9 GW to 5.3 GW) despite the same set of interconnectors clearing.

- **DSR:** A significant volume of DSR (1.2 GW) cleared in the auction. This represents a similar level to that which cleared in previous T-4 auctions, and well above the level cleared in the T-3 auction (0.5 GW). The continued success of DSR in the CM is likely a welcome result for BEIS who were able to obtain the reinstatement of the CM in October 2019 by convincing the European Commission that the scheme does not disadvantage the participation of DSR.⁵
0.5 GW of (nearly all) unproven DSR capacity participating in this auction failed to clear despite the higher price. Given that DSR can only get one-year contracts, the capacity opting out may be counting on bidding again in the T-1 auction for the same delivery year when it would know its availability better than on a four-year-ahead basis.



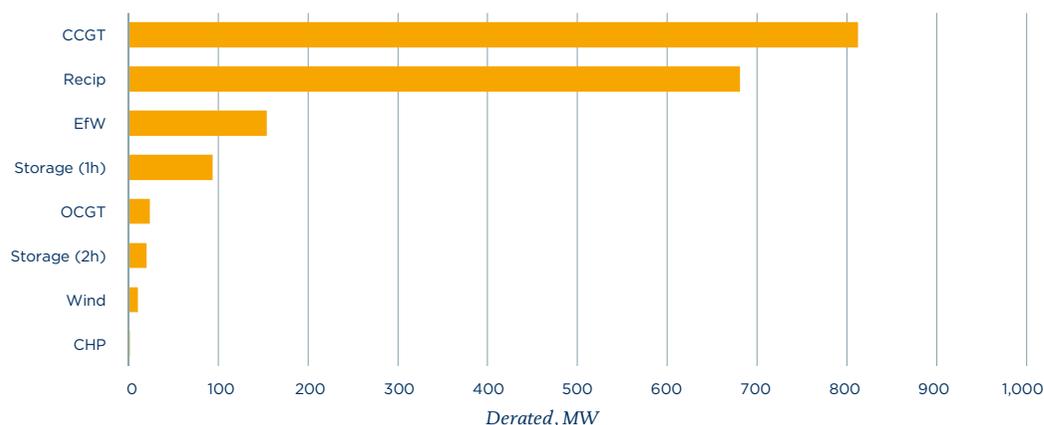
⁴ IFA2 and North Sea Link fall within Ofgem’s cap-and-floors regime, the primary scheme supporting new interconnection in GB. Eleclink is being built on a merchant basis.

⁵ “Notably, the Commission did not find any evidence that the scheme would put demand response operators or any other capacity providers at a disadvantage with respect to their participation in the scheme.” European Commission press release. State aid: Commission approves the British Capacity Market scheme. 24 October 2019. https://ec.europa.eu/commission/presscorner/detail/en/IP_19_6152

New Capacity

1.8 GW of new build capacity cleared in the auction, more than twice the 761 MW which cleared in the last T-4 and much more than the 319 MW of new capacity which cleared in the T-3 auction (principally as a result of lower clearing prices: £8.40 per kW and £6.44 per kW, respectively).

New generation capacity by technology type clearing in the T-4 auction



- **CCGT (804 MW):** SSE's Keadby 2 was the only CCGT to clear the auction (after failing to clear in the last T-4 auction in 2018 and in the T-3 auction). In contrast to other CCGT developers, SSE took the decision to proceed with Keadby 2 in 2018, potentially for a range of reasons including that:
 - the plant is being delivered in partnership with Siemens who are providing the “first of its kind” turbine in Europe along with a 15-year plant servicing contract;
 - it will be one of the most efficient (57% HHV) plant on the system and so will be counting on recovering significant profits from the energy market; and
 - the plant may benefit from lower costs as a result of existing CCGT infrastructure on the Keadby site (Keadby 1 failed to clear in both the T-3 and the T-4 auctions suggesting plans to close the existing unit).

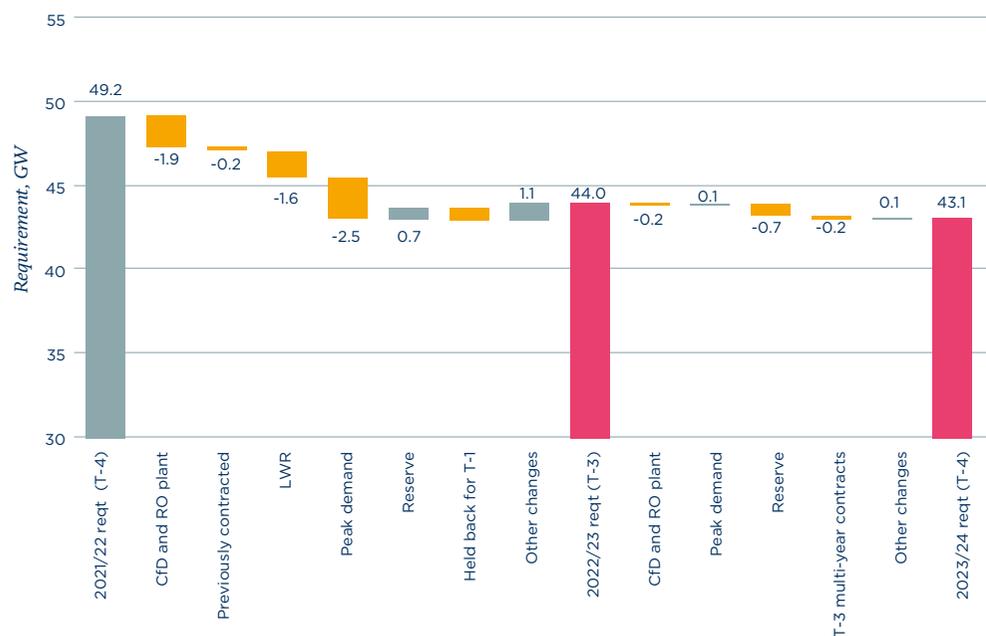
- **Gas reciprocating engines (715 MW):** This technology makes up the majority of the other new build capacity in this auction. These “embedded” gas engines are made up of small units typically 1 MW – 49 MW in size which are still proving to be cheaper to deploy than larger, more efficient CCGTs. Changes to policy and regulation (removal of embedded benefits) have made this technology less appealing over recent years, but developers appear to be still confident in making the economics work under current CM prices.
- **Batteries (115 MW):** 1 or 2 hour duration batteries cleared at volumes consistent with previous auctions despite shorter duration batteries being de-rated more heavily relative to previous years. The higher clearing price in this T-4 appears to have allowed a number of units to secure agreements which missed out in the T-3 auction.
- **Renewables (10 MW):** This year was the first time solar and wind were able to participate in the capacity auctions (from the T-3 auction in January 2020); although they are heavily de-rated (solar PV: 3.2%; onshore: 7.4% and offshore: 10.6%) because their contribution to reliability is limited by their intermittency and non-dispatchability. Onshore wind was the only renewable technology that prequalified for the two 2020 auctions as new build, and only a small volume of de-rated capacity (10MW) cleared the auction (albeit that this is equivalent to 142 MW of installed capacity).
- **Capacity failing to clear:** A significant amount of new capacity failed to clear in the T-4 auction. CCGTs made up the majority of this capacity with 6 GW failing to clear. The majority of these units require a higher clearing price as they appear to have dropped out of the auction in the £20-£25 per kW price range. Significantly, both 2020 auctions saw a substantial drop in the participation of new build CCGTs, with approximately 2 and 7 GW taking part in the T-3 and T-4 auction, respectively. This is well below the nearly 11 GW that took part in the previous T-4 auction in 2018 and the 14 GW of Transmission Entry Capacity (TEC) in the scoping and consents stages. This may reflect developers giving up on projects that have been in the pipeline for some time now and have failed to clear in previous CM auctions, potentially as a result of declining energy margins and expectation of increased competition in balancing and ancillary services provision (e.g as a result of changes to product definition and projects to widen market access).⁶

⁶ The requirements for Dynamic Containment (DC), which is set to replace Fast Frequency Response (FFR), is likely to favour faster response technologies (like batteries). The Distributed ReStart project is exploring how Distributed Energy Resources (DER) can be used to restore power in the unlikely event of a blackout. Project TERRE and wider access to the GB Balancing Market (BM) will introduce more competition from overseas generators taking place in TERRE auctions, as well as smaller providers and aggregators being able to increasingly participate in the BM.

Drivers of the clearing price

The clearing price was £7 per kW higher than the last T-4 auction. This is despite the fact that the capacity requirement was around 6 GW lower.⁷

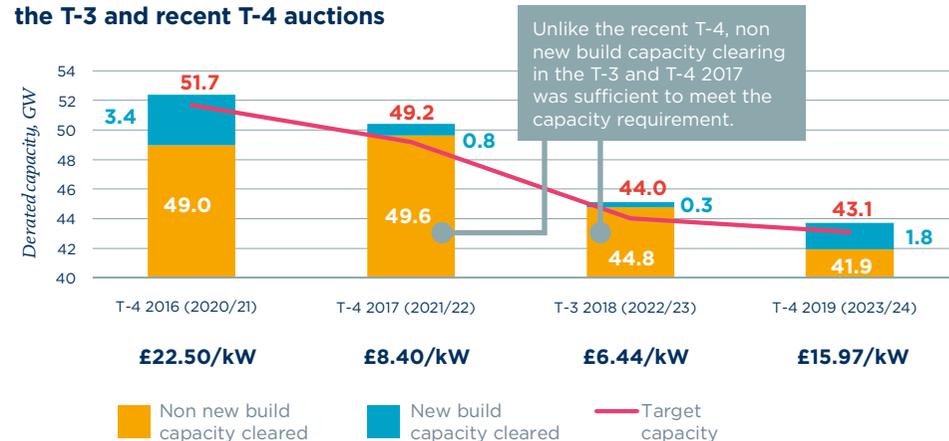
Capacity Requirement, change from 2021/22 to 2022/23 and 2023/24



The key to understanding the increase in price is on the supply side. Possible drivers include:

- non-new build capacity clearing in the auction was not sufficient to meet the auction's capacity requirement (unlike the T-3 and previous T-4 auction).⁸ The shortfall was filled by new build plant that typically require higher prices than existing plant to commit to deliver;
- a significant amount of the existing capacity competing in this auction (6 GW) had failed to secure an agreement in the T-3 auction, meaning it required a higher price in order to cover both the 2022/23 and 2023/24 delivery years, or retire before the start of the 2022/23 delivery year;
- combined with lower levels of prequalification of new plant (as noted above), the impact of existing plant retiring on the clearing price may have been greater than in previous auctions.

Comparison of capacity requirement and capacity clearing in the previous T-4, the T-3 and recent T-4 auctions



⁷ The reduction was driven by a range of factors including 1) an assumed decrease in peak demand (2.5 GW); 2) an increase in renewable capacity and consequent decrease in capacity requirement (1.9 GW); and 3) updates to National Grid's Least Worst Regrets modelling approach, i.e., the level of prudence relative to its base case

⁸ Non-new build capacity comprises of existing and refurbishing capacity, interconnectors and DSR. The shortfall arose due to two retiring nuclear plant (1.9 GW) dropping out (exiting the auction at prices above the clearing price), as well as the heavier de-rating of interconnectors (which meant that the total interconnection capacity across the same participating interconnectors was 0.6 GW lower than the T-3 auction)

Looking ahead

It is likely that future capacity auctions will be influenced by a number of demand and supply dynamics as well as changes to the CM mechanism itself.

The government has signalled fresh commitment to renewables beyond offshore wind (which was already set to reach 40 GW by 2030) with onshore wind and solar again able to participate in future CfD auction rounds. This increase in renewable capacity is reducing the capacity requirement in the CM and placing downward pressure on the clearing price, but will also reduce energy margins for conventional power plant, implying a need for higher capacity prices to make the economics work.

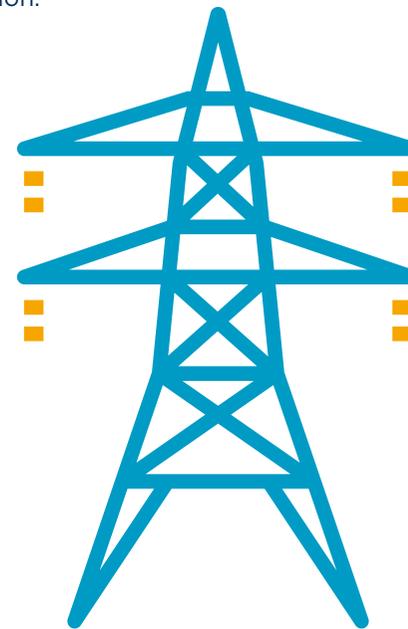
On the regulatory front, Ofgem has now made its final decision on the Targeted Charging Review (TCR), confirming its minded to position to remove a significant proportion of benefits secured by “behind the meter generators” (typically participating in the auction as DSR). Ofgem’s review of cost-reflective charging arrangements are ongoing and the Balancing Services Charges Taskforce is still due to take a decision on whether small distributed generation and behind the meter generation should be additionally liable to pay balancing services charges.

In terms of the design of the mechanism, cross-border participation is clearly important. To the extent the approach taken in the EU remains relevant in a post-Brexit world, ongoing change in this area may continue to have an important effect on the overall balance of supply and demand. As we note above, changes to the de-rating methodology for interconnectors were part of changes which had a significant effect on prices this time around. However, the new de-rating methodology may not be entirely consistent with that being developed for ENTSO-E. Moreover, ENTSO-E is designing arrangements for direct participation by cross-border providers (rather than interconnector participation). The proposals include both a different approach to determining how much interconnection can be counted upon to support security of supply, and also economic incentives which may limit the participation of cross-border capacity providers. If this latter feature means that the direct cross-border capacity

participating in the auction is lower than the de-rated interconnector capacity that would have otherwise participated, then this may lower supply and increase the clearing price in future auctions.

Several other areas of improvement to the CM are currently being consulted on.⁹ Some of these may be more important to future outcomes than others (as many are in a sense a formalisation of policies already in place rather than a change in existing policy). A general theme is the likelihood of increased competition on the supply side:

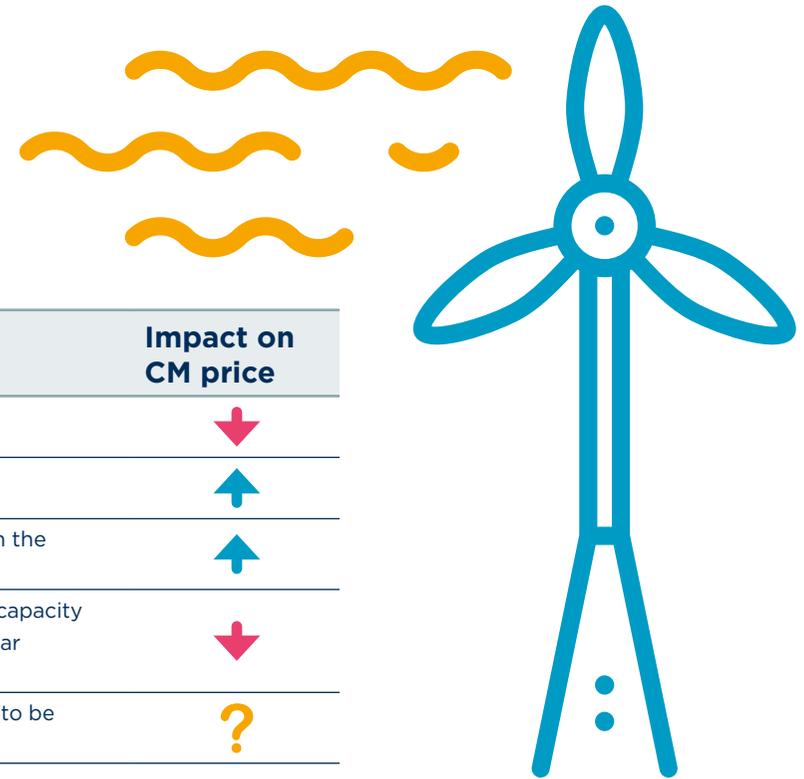
- a reduction in the participation threshold (from 2 MW to 1 MW) may encourage more direct access (rather than via aggregators);
- allowing all types of capacity (except interconnectors) meeting the capex threshold to obtain up to fifteen-year contracts may facilitate greater participation by certain types of DSR; and
- removing the exclusion of plants with long-term STOR contracts should increase participation.



⁹ BEIS. Capacity market consultation on future improvements. 2 March 2020. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/862674/capacity-market-consultation-future-improvements.pdf

Looking ahead

Continued



Driver	Implied change(s)	Impact on CM price
Increasing renewable capacity	Reduction in capacity requirement in future auctions	↓
	Reduction in energy margins of conventional generators	↑
Decision on Targeted Charging Review	Removal of a significant proportion of benefits secured by BTMG through the network charging regime	↑
Other changes to the CM mechanism	Reduction in the participation threshold (from 2 MW to 1 MW); all types of capacity (except interconnectors) meeting the capex threshold to obtain up to 15-year contracts; plant with LT STOR allowed to participate	↓
Decision of Balancing Services Charges Taskforce	Small distributed generators and BTMG to pay balancing services charges (to be decided)	?
Ofgem's ongoing reform of network access and forward looking charges	Changes to cost reflective network charges	?
Participation of cross-border capacity	Direct participation of foreign capacity instead of interconnector participation	?

The net effect of all of these changes is difficult to assess. However, as ever with the capacity auctions, it is clear that an understanding of the underlying demand and supply position is not enough to understand expected future prices. For some time to come, this will need to be combined with a view of policy and regulatory change to get the full picture.

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