Review of the T-4 2024/25 GB capacity market auction

May 2021

The T-4 Capacity Auction for delivery in 2024/25 ("T-4 2020 auction") concluded on 10th March 2021. In this bulletin, we provide our reflections on the auction results.

Headlines

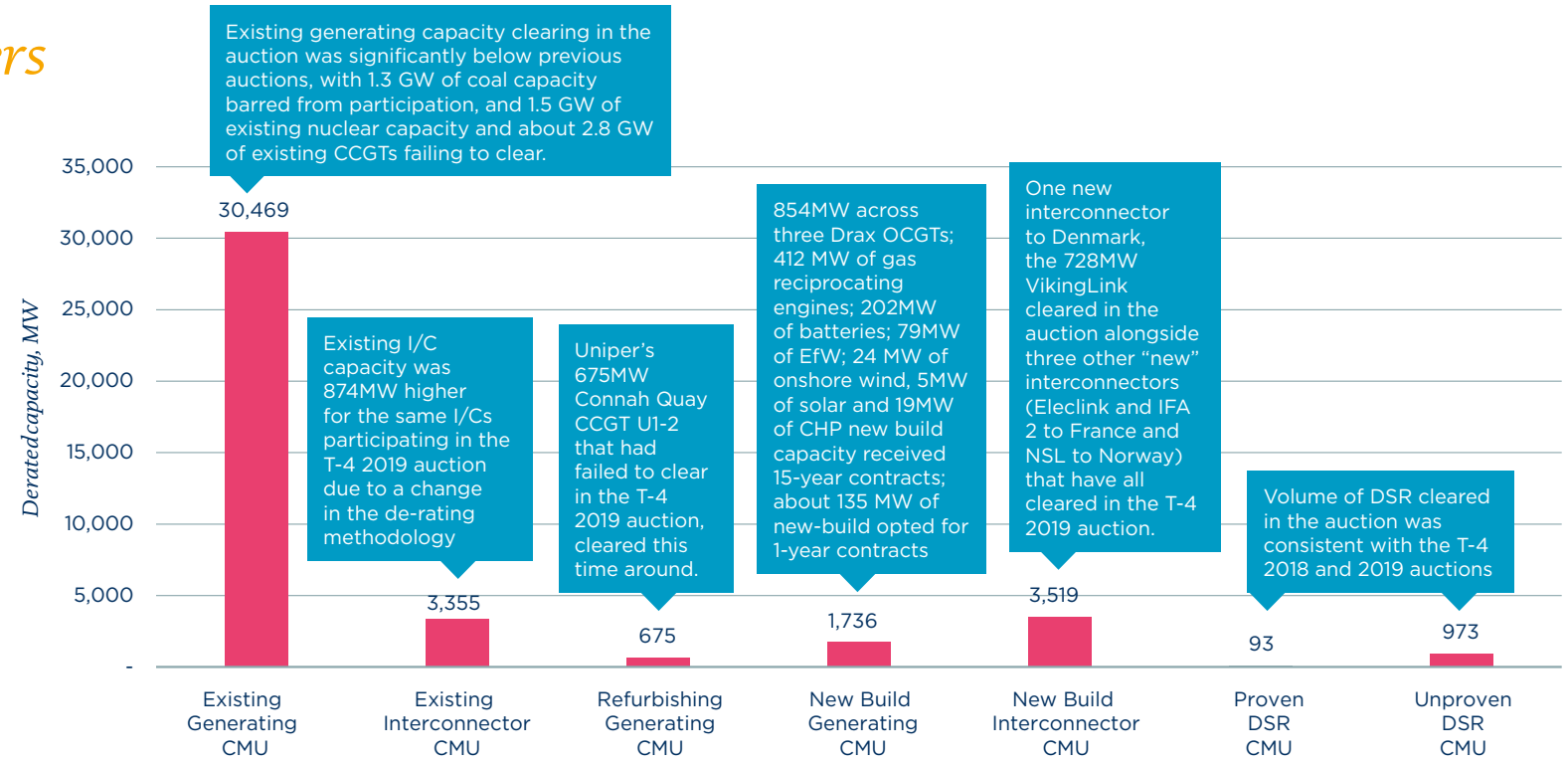
- The auction cleared at a price of £18.00 per kW per year, above the clearing price of £15.97 per kW in the T-4 auction for delivery year 2023/24 held in 2020 ("T-4 2019").
- 40.8GW of aggregate de-rated capacity was procured in this auction, a little bit above the 40.1GW target (that was itself quite a bit lower compared to auctions held in previous years).
- Similar to the T-4 2019 auction, the non-new-build capacity clearing in the auction was 1GW short of the target capacity, making way for new build to clear the auction at a higher clearing price.
- One reason for the shortfall of existing capacity was, as expected, 1.3GW of coal capacity that cleared in the previous auction not being allowed to participate as new emission limits on existing plant participating in the GB Capacity Market (CM) were applied.
- In addition, about 2.8GW of existing CCGT capacity[2] that had participated in previous CM auctions failed to either prequalify or clear in this auction, and 1.5GW of EDF's existing nuclear capacity failed to clear despite being scheduled to retire a few years after the 2024/25 delivery year for this auction.
- Offsetting these reductions, the 728MW VikingLink interconnector was awarded a 1-year contract for the first time. In addition, as a result of changes to de-rating, there was a material increase in awarded capacity for all other interconnectors relative to the T-4 2019 auction.
- Three new gas fired OCGTs being developed by Drax were awarded 15-year contracts for 854MW of capacity. New gas reciprocating engine capacity was quite a bit lower than in previous auctions, at 460MW (de-rated). Higher prices for this capacity may reflect the impact of reduced revenues from network charging following the implementation of Ofgem's Targeted Charging Review.
- Awarded new build battery storage capacity more than doubled to 252MW facilitated by favourable commercial factors and recent policy decisions.
- Awarded renewable capacity (onshore wind and solar) quadrupled since last year, despite these technologies being eligible for more lucrative Contracts for Difference (CfD). However, this capacity only amounted to 40MW.
- There was no meaningful change in Demand Side Response (DSR) capacity clearing in this auction, despite this being the first year that DSR meeting the relevant capital expenditure thresholds could bid for 15-year contracts.

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

2 Comprised of Intergen's 747MW Rocksavage CCGT that failed to clear after clearing in the T-4 2019 auction and Calon Energy's 764 MW Severn, 765MW Sutton Bridge and 495 MW Baglan Bay CCGTs that failed to prequalify in this auction.

Winners and losers

A significant decline in the existing generation capacity participating and clearing in this auction helped pave the way for new build capacity clearing the auction at a higher price than that observed in the T-4 2019 auction (£15.97 per kW) and significantly above the T-3 auction held in early 2020 and the T-4 auction held in 2018 that both cleared at single digit levels (£6.44 per kW and £8.40 per kW, respectively).



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

- **Existing coal plant:** Last year the government decided that existing capacity not meeting carbon emission limits proposed in the EU's Clean Energy for All Europeans package (effectively any coal plant) would not be allowed to receive capacity payments starting from 1 October 2024[3]. This meant that this was the first T-4 auction where existing coal plant that might have still been operational for the 2024/25 delivery year (i.e., 1.3GW of Uniper's Ratcliffe Units 1, 2 and 4, which was the only coal plant that cleared in the T-4 2019 auction) was not eligible to participate and did not pre-qualify. It is worth noting in a post-Brexit world that this outcome is likely to have occurred regardless of the European legislation given the UK policy to remove coal from the system by 2025.
- **Existing CCGTs:** Intergen's 747MW Rocksavage CCGT joined SSE's 716MW Keadby and 662MW Medway in not clearing the auction, indicating decisions to retire ahead of the 2024/25 delivery year. The latter two plants did not clear in the T-4 2019 auction either. In addition, Calon Energy's 764MW Severn, 765MW Sutton Bridge and 495MW Baglan Bay CCGTs that had participated in previous CM auctions, failed to prequalify for this auction. Severn and Sutton Bridge were put into "a dormant state of managed preservation" in August 2020 to allow creditors more time to recover costs after Calon Energy went into administration in June 2020.[4] The two units were subsequently returned to the company directors in late March 2021.[5]

3 BEIS. Capacity market: Government response to consultations on future improvements, emission limits and coronavirus measures. May 2020. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886147/Future_improvements__emission_limits_and_coronavirus_easements_-_government_response_to_consultations.pdf

4 https://www.bbc.co.uk/news/uk-wales-53895806

5 Bloomberg. Administrators return two UK Gas Stations to Calon Energy. March 30, 2021. Available at: https://news.bloomberglaw.com/bankruptcy-law/administrators-return-two-u-k-gas-stations-to-calon-energy

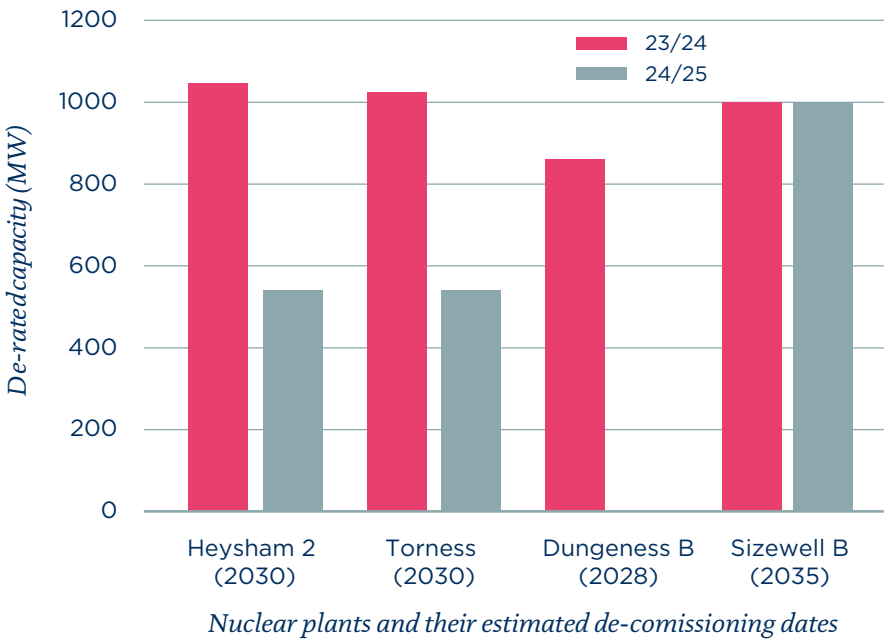
Winners and losers

Continued

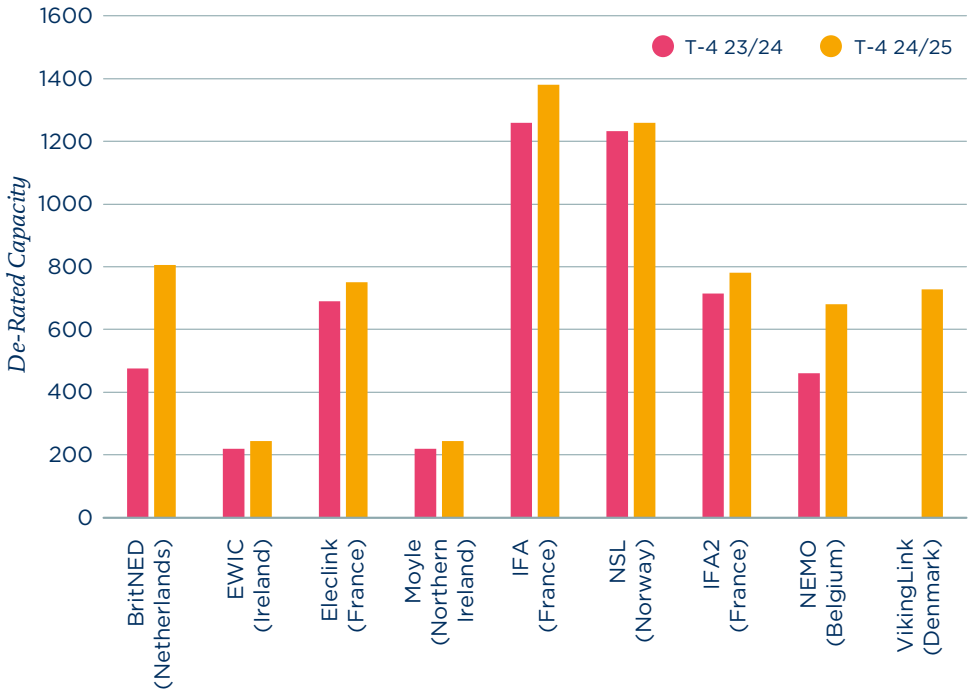
- **Nuclear plant:** EDF's 449MW Dungeness B Unit 22 was unable to pre-qualify for the auction as it did not meet the requirement of having generated within the previous 2-year window. This may explain why the 440MW Dungeness B Unit 21 that did prequalify failed to clear. Somewhat more surprisingly, 1GW of other existing nuclear capacity (comprising of half the units at EDF's Heysham 2 and Torness plants) failed to clear. We discuss this in more detail below.

- **Interconnectors:** A new interconnector, Viking Link connecting to Denmark, received a contract for 728MW of de-rated capacity. In addition, across all other interconnectors there was an 874MW increase in awarded capacity relative to the T-4 2019 auction resulting from a change in de-rating factors. We discuss this in more detail below.

Awarded Nuclear Capacity



Awarded Interconnector Capacity



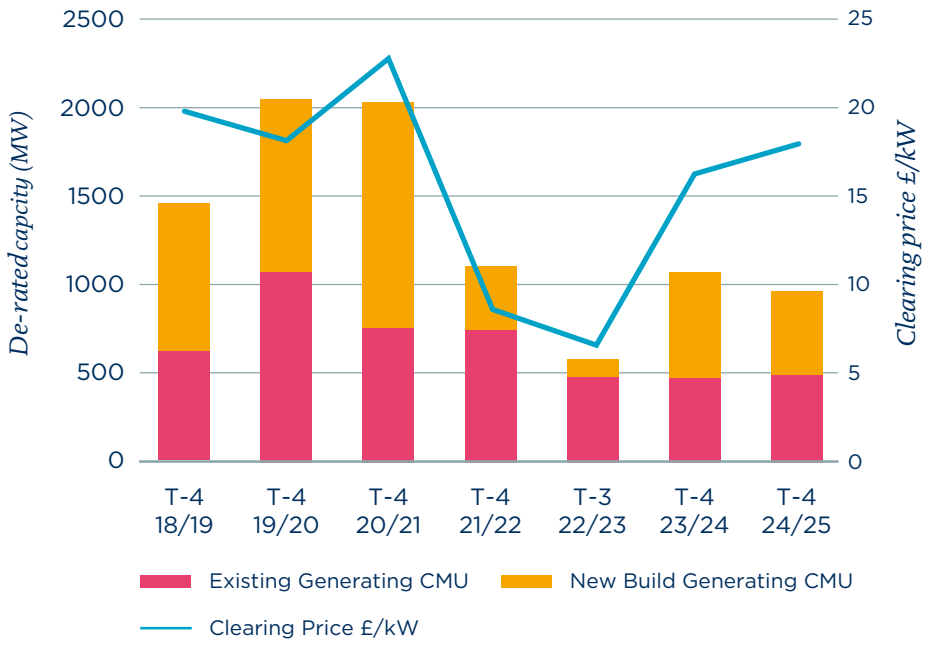
Winners and losers

Continued

- **OCGTs and reciprocating engines:** Of the 1.7GW of new build capacity clearing in the auction, more than three quarters was comprised of flexible, gas-fired capacity. This included three OCGTs being developed by Drax that received 15-year agreements for 854MW capacity in total, and 460MW across 44 new gas reciprocating engines.

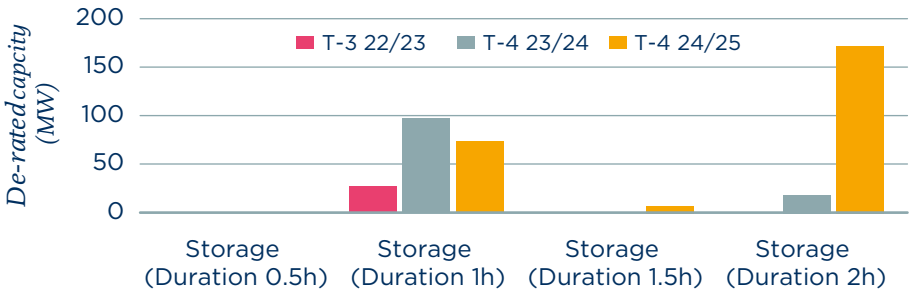
  Compared to previous auctions that cleared at a higher price, considerably fewer new build reciprocating engines cleared, potentially reflecting the impact of reduced revenues from network charging arrangements following the implementation of Ofgem's Targeted Charging Review. Compared to the T-4 auction for delivery in 2019/20 (which also cleared at £18 per kW), in this auction only half as much new build reciprocating engine capacity cleared.

Recips Awarded Capacity vs Clearing Price



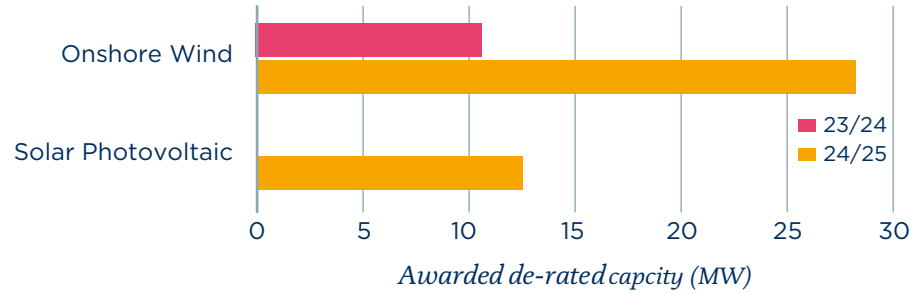
- **Battery storage:** Awarded battery storage capacity more than doubled from 118MW in the T-4 2019 auction to 252MW, likely facilitated by recent policy decisions and other factors improving the commercial environment for battery storage. There has been an increase in the amount of battery storage with longer durations clearing over the last few auctions, partly due to longer duration storage having a higher de-rating factor. We discuss this in more detail below.

Awarded Battery Storage Capacity



- **Renewables:** Awarded renewable capacity quadrupled since last year from 10MW to 40MW. 28MW of onshore wind plant was awarded agreements, of which 24MW was new build plant receiving 15-year contracts. Solar plant featured for the first time in a T-4 auction, winning 12MW of capacity in total, of which the 5MW Bilton Farm received a 15-year contract as a new build plant.

Renewable Awarded Capacity



Winners and losers

Continued

As the table below shows, these renewable generators have opted to enter into agreements that imply a very low level of £/kW payments based on non-de-rated capacity. Compared to a CfD contract, the equivalent annual £/MWh support for these generators is close to zero (and the plant bear merchant energy price risk), which may mean these generators are expecting future CfD auctions for onshore wind and solar to clear at a low premium in the future.

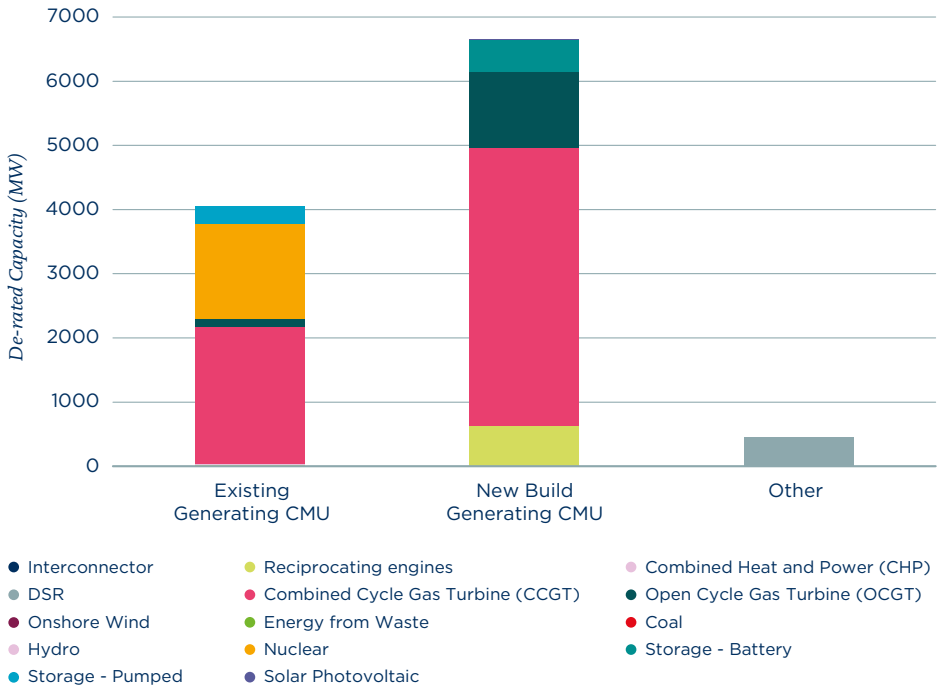
	Awarded De-Rated Capacity (MW)	Equivalent Installed Capacity (MW)	Agreed £/KW of De-Rated Capacity (MW)	Agreed £/KW of Installed Capacity (MW)	Equivalent Annual £/MWh of Installed Capacity (MW)
Solar PV	12.5	535	18	0.4	0.4
Onshore Wind	27.9	358	18	1.4	0.6

Note: Equivalent Annual £/MWh of Installed Capacity is calculated by assuming load factors of 11% for Solar PV and 27% for Onshore Wind

- **Demand Side Response:** There was no meaningful change in DSR capacity clearing in this auction despite this being the first year in which DSR was allowed to bid for 15-year contracts. The inability of DSR to obtain longer-term capacity contracts was a key point of contention in Tempus Energy's appeal against the European Commission's approval of the GB CM that resulted in the suspension of the market over the course of November 2018 to October 2019.[6] As part of the reinstatement of the CM, BEIS committed to allow all types of capacity (except interconnectors) meeting the capex threshold to obtain up to fifteen-year contracts.[7] Only one aggregator, Zenobe Energy, sought a 15 year contract for a group of coach/bus chargers, but did not clear in the auction.

- **Capacity failing to clear:** As in previous auctions, CCGTs comprised the largest proportion of new build capacity failing to clear. Participating CCGT capacity was quite a bit lower, reflecting developers giving up on projects that have been in the pipeline for some time now and have failed to clear in previous CM auctions where prices have failed to reach the £25/kW-year-plus range that a CCGT is likely to require.

Losing Capacity by CMU and Technology type



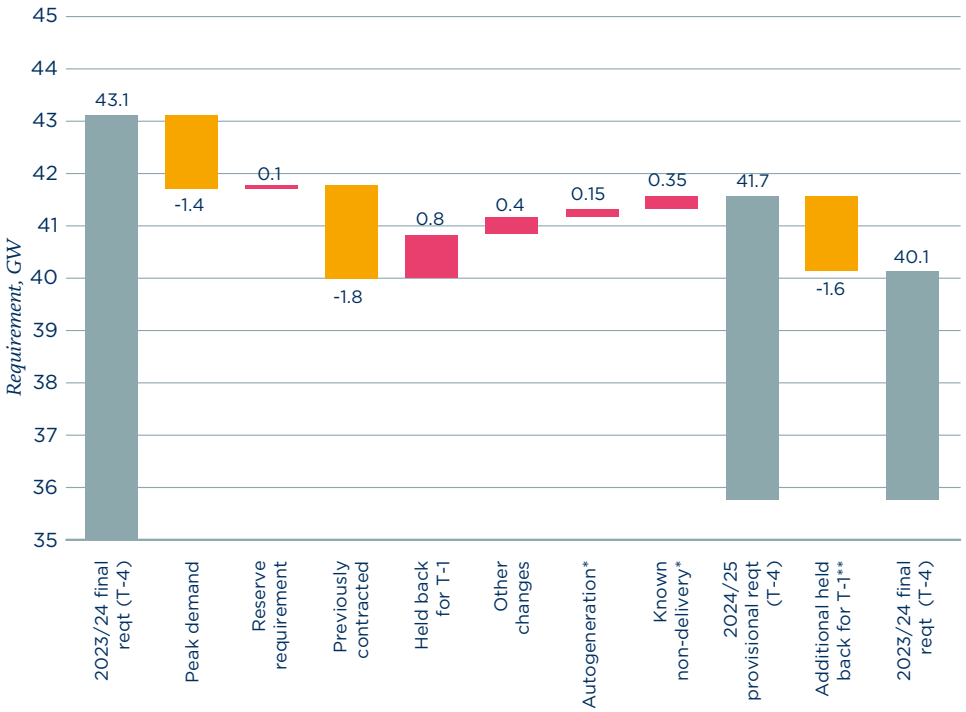
6 Frontier and LCP reported on the suspension of the GB capacity market that can be found here: https://www.frontier-economics.com/media/2939/gb-capacity-suspension_v05.pdf

7 BEIS. Capacity market: Government response to consultation on future improvements, emission limits and coronavirus easements. May 2020. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886147/Future_improvements__emission_limits_and_coronavirus_easements_-_government_response_to_consultations.pdf

Drivers of the clearing price

We previously commented[8] on the reduction in National Grid's target capacity for T-4 auctions in recent years, due in large part to growth in renewable generation. Relative to the T-4 2019 auction, target capacity declined again this year by 1.4GW to 41.7GW. This was a result of a drop in peak demand forecast of 1.4GW and a reduction due to previously contracted capacity (1.8GW), offset by increases due to the amount held back for the T-1 auction and the known non-deliveries.

Drivers impacting the target capacity



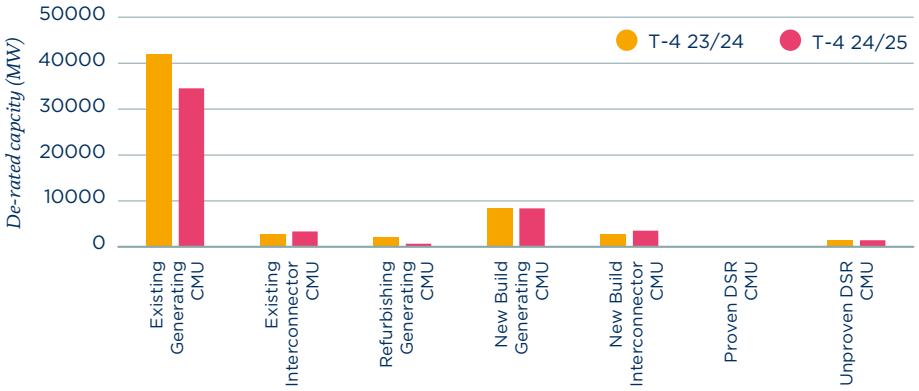
* January 2021 adjustment

** February 2021 Secretary of State decision

8 Frontier and LCP. Review of the T-4 2019 capacity market auction. May 2020. Available at: https://www.frontier-economics.com/media/3916/cm-2020-briefing_v23-002.pdf

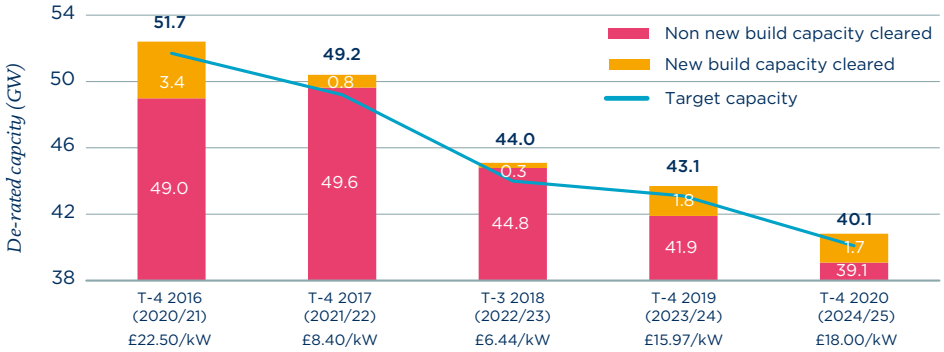
Looking at the supply in this auction, the prequalifying capacity was also low compared to the T-4 2019 auction.

Total Pre-Qualified Capacity



The net effect was that non-new build capacity clearing in the auction was once again not sufficient to meet the auction's target capacity, as was the case in 2016 and 2019. This resulted in a higher price – in contrast to years in which existing capacity was sufficient (2017 and 2018), when the clearing price was significantly lower.

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



Deep dive on key technologies

In this section we look more closely at a how a few key technologies fared in this auction.

Nuclear

As discussed above, only half of the prequalified capacity at EDF's Heysham 2 and Torness plant cleared in the auction. More specifically, Heysham 2 Unit 8 and Torness Unit 2 cleared the auction, but Heysham 2 Unit 7 and Torness Unit 1 failed to clear. Since there are often categories of fixed cost shared across pairs of units, this may have been an unexpected outcome likely driven by a couple of factors (which are not mutually exclusive):

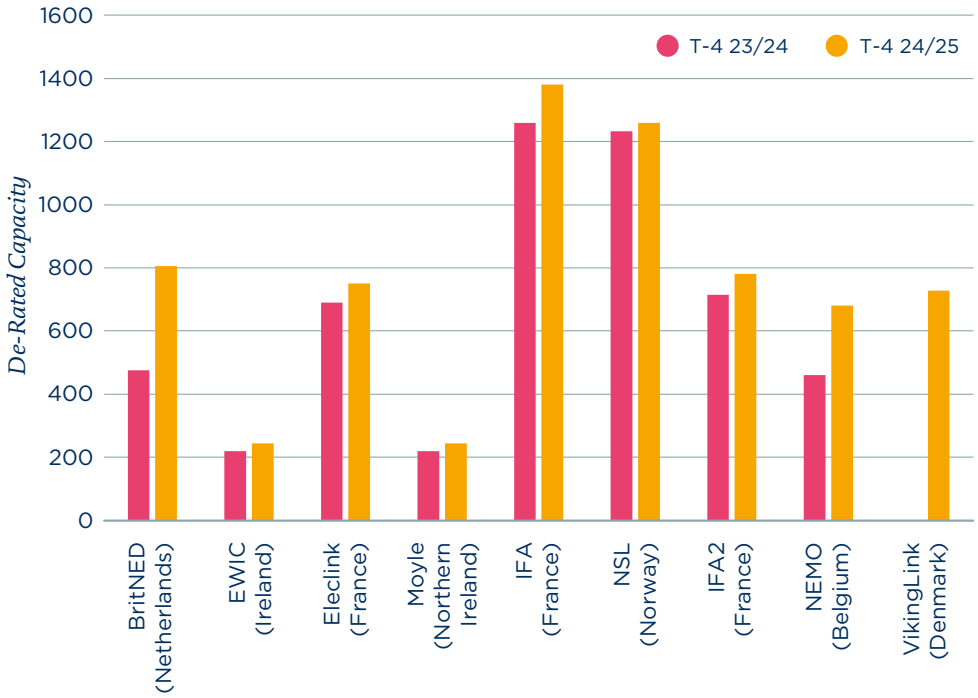
- to reduce risk of non-delivery: both Heysham 2 and Torness plant commenced operation in the late 1980s and are well into their useful lives. The operating lives for both Advanced Gas-cooled Reactors were extended by EDF from 2023 to 2030.[9] Accepting a contract for only one unit in each pair would provide EDF with a contingency against non-delivery if one or more units needed to close for maintenance over parts of the 2024/25 delivery year.
- to allow them to bid in T-1 for 2024/25: EDF may be looking to enter the units that failed to clear in this auction into future T-1 auction for the same delivery year. This decision could have in part been motivated by the clearing price in this year's T-1 auction (for delivery in 2021/22) clearing at £45/kW, the highest price ever observed in a GB CM auction.[10]

Of course, in withdrawing the capacity, EDF (and other generators) will have benefited from higher capacity prices than would otherwise have been the case. At a price of £18/kW on 3.3GW of capacity, EDF's fleet capacity revenues will amount to £59.1 million. On their full pre-qualified capacity of 4.8GW, the price would have had to have been below £13/kW for revenues to be lower.

Interconnectors

Cleared interconnector capacity was 1.6GW higher than in the T-4 2019. This was partly due to a new interconnector with Denmark, VikingLink, receiving a contract for 728MW of de-rated capacity.

Awarded Interconnector Capacity



9 EDF Energy. Available at: https://www.edfenergy.com/energy/nuclear-lifetime-management

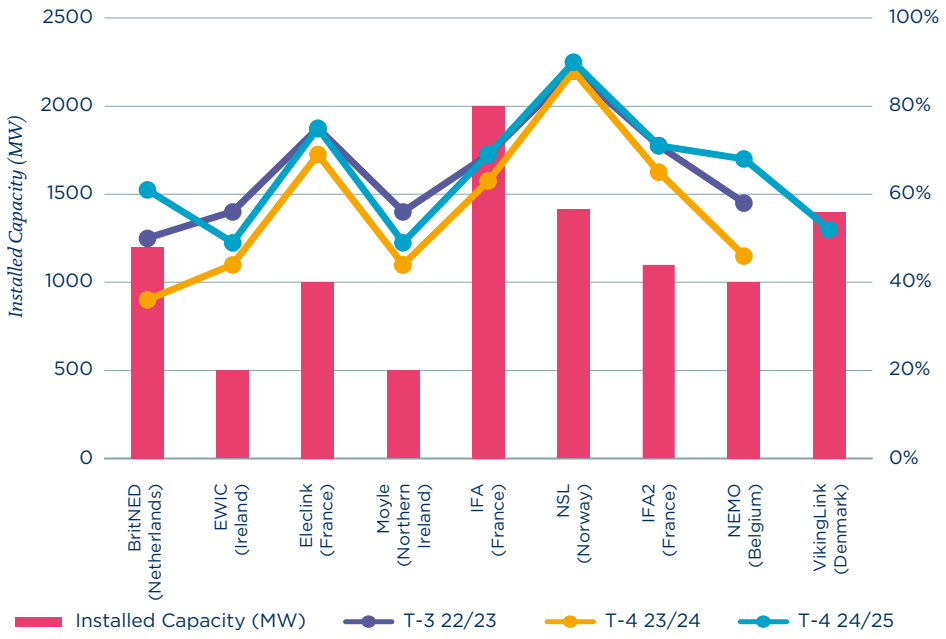
10 The high price was driven by an increase in the target capacity from 0.4GW to 2.4GW in January. Despite a decrease in the expected ACS Peak Demand (-1,700MW), large adjustments to the target for known non-delivery (+1,850MW) and capacity at risk of not being operational or being unavailable (+3,900MW and +1,700MW) led to an overall increase. With the higher target in place, the auction cleared at £45/kW after the West Burton A coal units exited in the £45/kW to £50/kW round. In addition, the auction's "descending clock" round structure played a potentially significant role in setting the high clearing price. It is possible that the next bid was significantly lower than £45/kW (if bids had been sealed), but the £5/kW round structure forced a clearing price of £45/kW once sufficient capacity had exited in the round. If the next bid down was, for example, £15/kW, then the round structure meant an additional £67m in cost to consumers.

Deep dive on key technologies

Continued

The remaining 874MW increase in cleared interconnector capacity was due to higher de-rating factors. This comes after National Grid had previously significantly lower de-rating factors from the 2022/23 T-3 auction to the 2023/24 T-4 auction. For example, BritNed was awarded 69% more de-rated capacity for the 2024/25 delivery year relative to 2023/24, its de-rating factor increasing from 36% to 61%.

Installed Interconnector Capacity and De-Rating %



The de-rating factors are determined through forward-looking modelling of expected interconnector flows taking into consideration new interconnectors coming online in the future and surplus capacity in the connected market during times of stress in GB. The changes in de-rating factors are therefore a result of changes in the assumptions and scenarios used in this forward-looking modelling. As more interconnectors are developed, these (sometimes subjective) inputs will matter more and more. The changes in de-rating factors compared to the last auction are equivalent to the addition of a material new power station to the system. As such, if the de-rating factors continue to be volatile, they will represent a significant source of uncertainty for bidders.

National Grid ESO has recently indicated they will update their methodology for calculating interconnector de-rating factors in ECR 2021 to align more closely with ENTSO-E's proposals for allowing foreign participation in the CM. In particular, the forward-looking modelling will now scale the capacity in each foreign market to meet the market's assumed security standard, rather than running sensitivities using a single scaling factor across all markets. LCP and Frontier looked at ENTSO-E's proposals in detail for the Independent Generator's Group (IGG) last year, and found that this relatively technical change – if it is employed as the base case recommendation – could result in materially lower Interconnector de-rating factors. This would clearly be a positive factor for future prices.

The de-rating methodology is meant to be an indication of the degree to which the interconnectors can be relied upon to provide security of supply. Interconnectors have recently been affected by the "de-coupling" of GB and European power markets following the UK's exit from the EU, which has immediate implications for the day-ahead market[11], but also reduces the prospect of continuous intraday market coupling being implemented any time soon. This intraday coupling is arguably more important in terms of ensuring the interconnectors can react quickly to an emerging stress situation. It is not clear if or how this should be taken into account in de-rating factors.

11 Frontier and LCP recently explored this issue and estimated that inefficient Interconnector flows are resulting in lost trade of £45m per annum. Available at: https://www.frontier-economics.com/uk/en/news-and-articles/articles/article-i8192-brexit-and-interconnectors-a-45m-problem/

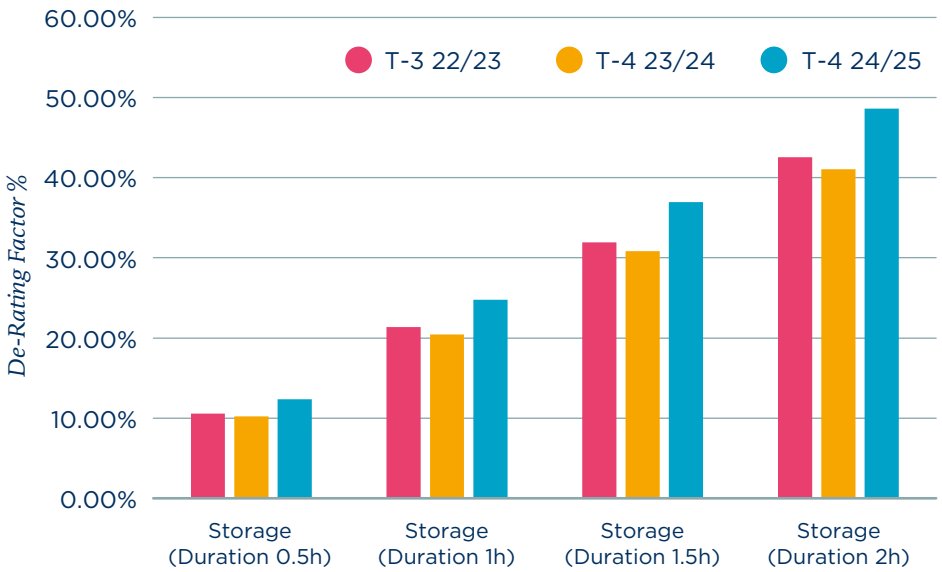
Deep dive on key technologies

Continued

Battery storage

Cleared battery storage capacity has more than doubled since last year, with an increasing amount of longer duration storage clearing, partly due to longer duration storage having a higher de-rating factor. In this auction, 69% of the cleared de-rated capacity was in longer 2-hour duration storage, compared to 17% and 0% in 2023/24 and 2022/23 auctions respectively.

Storage De-Rating Factors



A number of favourable policy and regulatory changes recently implemented for electricity storage could have contributed to this growth in cleared storage capacity. These include its classification as electricity generation (hence removal of final consumption levies); earlier removal of double charging of electricity storage (both as generation and demand); and changes to planning law allowing energy storage projects over 50MW to bypass the Nationally Significant Infrastructure Project (NSIP) process.

It is understandable that there is so much interest around batteries. The value from arbitrage looks to be positive going forwards, with the gas prices recovering and more renewables being deployed, providing more opportunities for energy storage in the intraday and balancing markets. Moreover, Dynamic Containment (DC) continues to provide contracts at £17/MW/h, although the value of these contracts can be expected to fall as the market becomes saturated.[12]

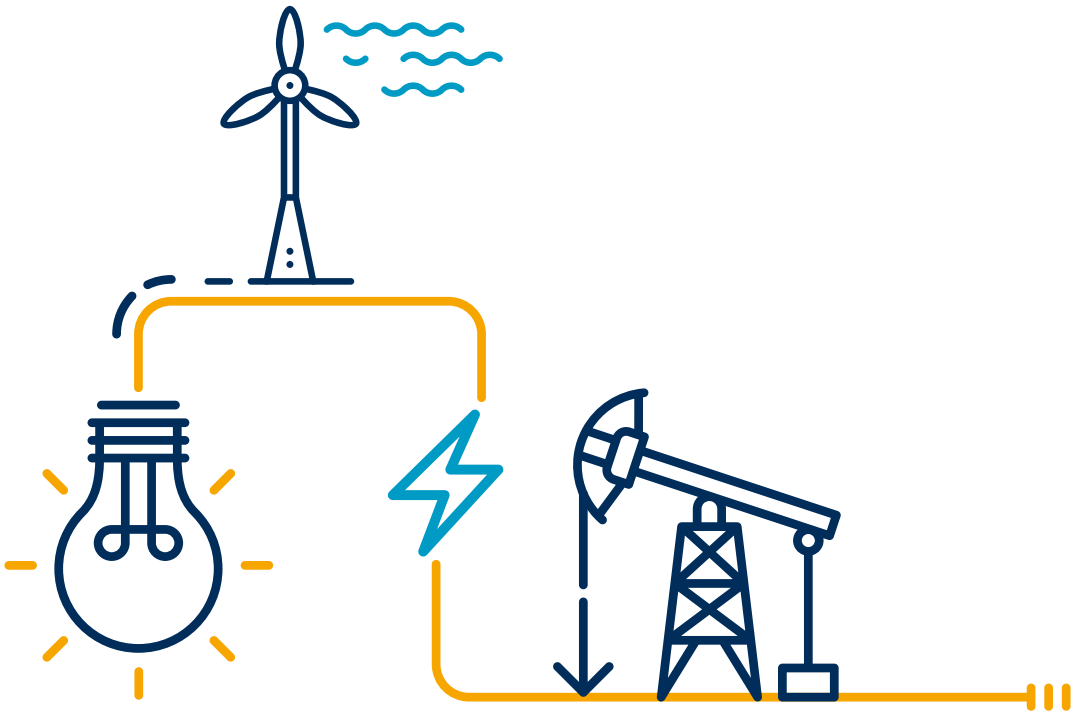
12 Further information on the opportunities available for battery storage assets in the GB power market can be found in LCP's report 'Is battery storage a good investment opportunity?'

Looking ahead

As we noted above, technical changes around interconnector de-rating may be an important factor in forthcoming auctions. Beyond this, ACER recently published their decision on common rules for cross-border participation of capacity in the capacity mechanisms of other EU Member States, which serves to implement the requirements of Regulation 2019/943. However, the EU-UK Free Trade Agreement clearly placed no requirement on either party to 'permit capacity situated in the territory of the other party to participate in any capacity mechanism in its electricity markets'.[13] As a result, the UK has freedom to use its own preferred cross-border model going forward, making the continuation of direct interconnector participation on UK borders perhaps the most likely model for the foreseeable future. While this model remains in place it seems unlikely that neighbouring EU Member States would open their markets to direct participation from GB generation capacity.

One other aspect of the capacity mechanism that has not yet received much attention pertains to secondary trading of capacity agreements, allowing units to transfer their secured CM agreements to other parties. To date this has occurred in a small number of instances usually when the unit holding the agreement has decided to retire earlier than planned.[14] While few secondary trades have occurred to date, the need for secondary trading may grow over the next few years as more capacity reaches the end of its life, bringing greater risk of capacity closing prematurely and at short notice, to be replaced through secondary trading.

Ofgem highlighted secondary trading as an area they would like to improve in their Five-year Review of the Rules and they are working on proposals to reduce rule complexity, remove barriers to entry and ensure appropriate transfer of risk. In addition to regulatory changes, one other interesting possibility being explored at present (through a BEIS funded project) is the automation of the process of transferring capacity and allowing local Distribution System Operators (DSO) flexibility which has not secured a CM contract to be offered into the secondary capacity market.[15]



13 "Each Party shall ensure that any capacity mechanism in electricity markets is clearly defined, transparent, proportionate and non-discriminatory. Neither Party is required to permit capacity situated in the territory of the other Party to participate in any capacity mechanism in its electricity markets." P. 175, paragraph 3 here: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22020A1231(01)&from=EN

14 Following the closure of RWE's Aberthaw coal fired power station in March 2020 the station's existing Capacity Market agreements for the years 2019/2020 and 2020/2021 were transferred to other market participants and a small proportion to other units within RWE's fleet.

15 Much of this process is done manually including contract negotiation and bidding and there is no transparent way to find opportunities for trade. Piclo Blog. Five things you should know about secondary markets. Available at: https://blog.piclo.energy/post/641931263886966784/five-things-you-should-know-about-secondary

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