

# Review of the T-4 2025/26 GB capacity market auction

2022

*The T-4 Capacity Auction for delivery in 2025/26 (“T-4 2021 auction”) concluded on 22nd February 2022. This was a landmark year for the Capacity Market, with the auction delivering a record price and a fourfold increase in new battery capacity. In this bulletin, we provide our reflections on the auction results.*

## Headlines

- The T-4 2021 auction cleared at a price of £30.59/kW/year, higher than the clearing price observed in any T-4 capacity auction to date and nearly twice the average price observed across previous T-4 auctions. The high clearing pricing follows the T-1 auction for delivery year 2022/23 held a week earlier that cleared at the price cap of £75.00/kW/year.
- 42.4GW of aggregate de-rated capacity<sup>2</sup> was procured in this auction, a little above the 42.1GW target.
- Similar to the T-4 auction for delivery in 2024/25 (“T-4 2020 auction”) that cleared last year at £18.00/kW/year, non-new-build capacity clearing in the auction was 1.7GW short of the target capacity, making way for new build to clear the auction at a higher price.
- There are a number of reasons for this shortfall. Target capacity increased by about 2GW, and a further 2GW of nuclear capacity (half of which had cleared in the T-4 2020 auction) did not enter the auction.
- This was partly offset by the clearing in this auction of two existing CCGTs, Intergen’s 747MW Rocksavage and SSE’s Keadby 1, that had failed to clear in the T-4 2020 auction.
- The success of new build capacity varied by technology. Around 900MW of new build thermal plant received contracts. New build battery storage capacity clearing more than quadrupled to 1,033MW. This includes Intergen’s 127MW (320MW non-de-rated) Gateway battery project set to be one of the UK and Europe’s largest.<sup>2</sup>
- Only 10MW of de-rated renewable capacity cleared (154MW non-de-rated, all onshore wind), down from 40MW in the previous auction . This included 6.8MW (109MW non-de-rated) from Orsted’s onshore wind farm, that received a 15-year contract.
- All interconnectors entering the auction cleared, and all had participated in previous auctions. As in previous auctions, there was no meaningful change in Demand Side Response (DSR) capacity clearing in this auction.

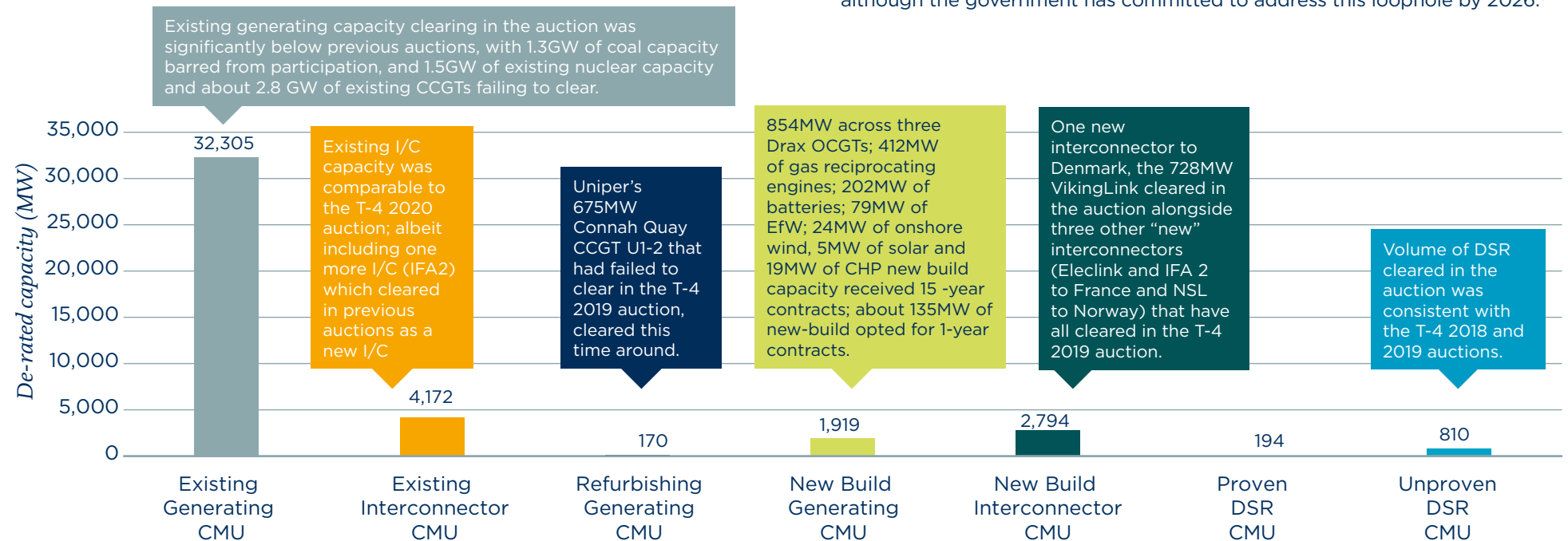
<sup>1</sup> All capacity referred to in this bulletin is on a de-rated basis unless specified otherwise.

<sup>2</sup> InterGen secures Capacity Market agreement for world-leading Gateway battery project. 24 February 2022. Available at: <https://www.intergen.com/news-insights/categories/news/intergen-secures-capacity-market-agreement-for-world-leading-gateway-battery-project/>

# Winners and losers

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

- Existing CCGTs:** Two CCGTs failing to clear last time round (Intergen’s 747MW Rocksavage CCGT and SSE’s 716MW Keadby) were awarded one-year contracts in this auction. SSE’s 662MW Medway did not clear - this is the fourth year in a row where it has failed to secure a T-4 contract. Calon Energy’s 764MW Severn and 765MW Sutton Bridge plant (which came out of administration and were returned to the company’s directors last year) failed to prequalify in this auction despite indications that the company directors were keen to have them return to market.<sup>3</sup>
- OCGTs and reciprocating engines:** Around 800MW of new-build gas assets secured long-term agreements, almost 600MW lower than last year’s auction. Only one large new build OCGT, VPI Immingham’s 285MW plant cleared after failing to clear in the T-4 2020 auction. The de-rating factors for both OCGTs and CCGTs was slightly higher<sup>4</sup> compared to previous auctions, increasing the gas-fired generation capacity clearing this time around. We note that a quarter of new build gas capacity clearing in the auction comprised gas reciprocating engine units less than 20MW. This is the threshold below which plant presently do not have to pay for the UK ETS; although the government has committed to address this loophole by 2026.<sup>5</sup>



3 S&P Global. Calon Energy directors regain control of two mothballed UK gas-fired power plants. 13 May 2021. Available at: <https://www.spglobal.com/platts/en/market-insights/latest-news/electric-power/051321-calon-energy-directors-regain-control-of-two-mothballed-uk-gas-fired-power-plants>; The Telegraph. Energy bosses race to resurrect gas-fired power stations by Christmas. 15 October 2021. Available at: <https://www.telegraph.co.uk/business/2021/10/15/energy-bosses-race-resurrect-gas-fired-power-stations-christmas/>

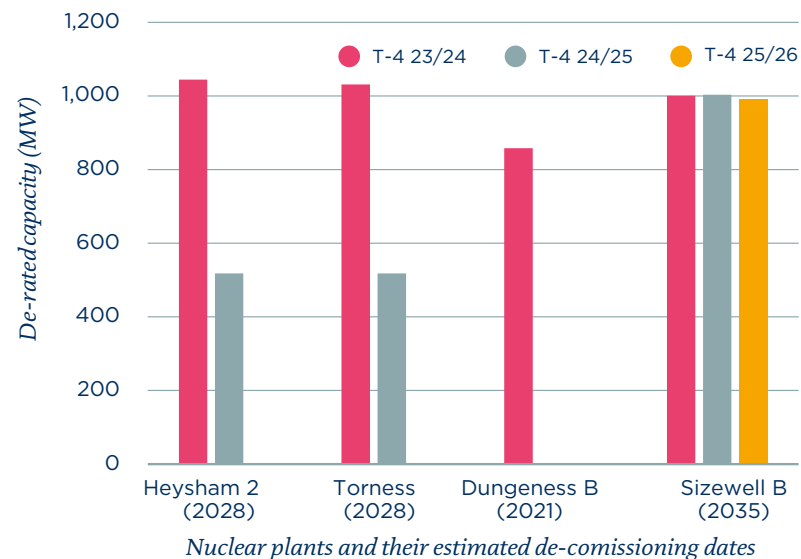
4 CCGT: 90.92% instead of around 90% in previous auctions; OCGTs: 95.47% instead of 94.98 in previous auctions. See here: <https://www.emrdeliverybody.com/Capacity%20Markets%20Document%20Library/Auction%20Guidelines%20and%20User%20Guide%20V1.00.pdf>

5 Page 87 here: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf)

# Winners and losers

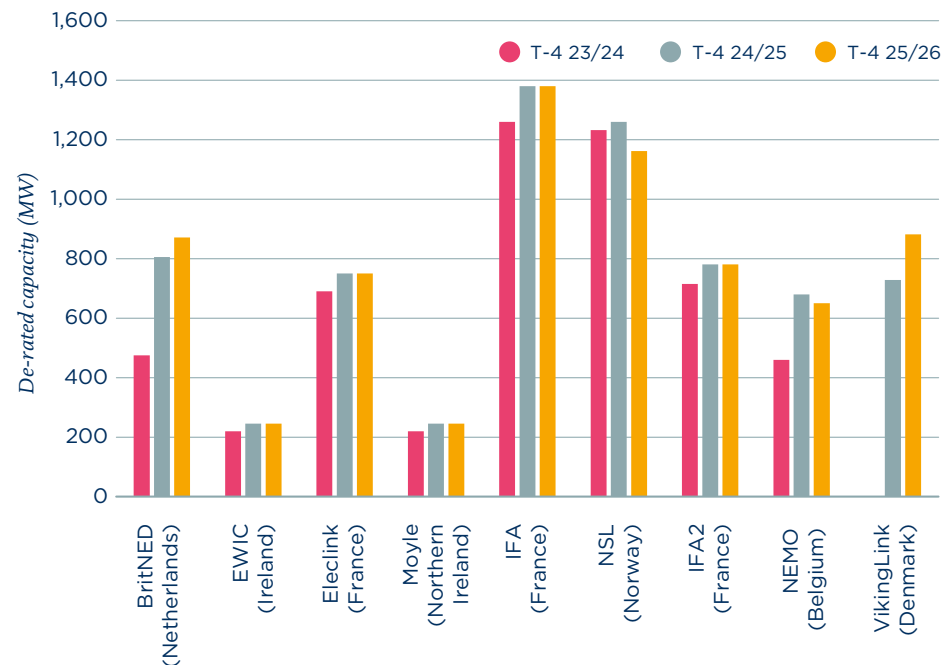
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### Awarded Nuclear Capacity



- **Nuclear plant:** Clearing nuclear capacity has roughly reduced by a factor of two over each of the last two auctions. Similar to the T-4 2020 auction, EDF's 858MW Dungeness B failed to pre-qualify this time, which was little surprise given EDF's decision last year to not restart the plant and move it into the defueling stage significantly ahead of its scheduled retirement in 2028. However, perhaps more surprisingly, neither Heysham-2 nor Torness pre-qualified for this year's auction (both expected to retire in 2028<sup>6</sup>) leading to a reduction of 1,036MW of nuclear capacity clearing compared to the previous T-4 auction. Not clearing in this auction makes it seem likely that EDF is retaining the option to close these plant significantly ahead of 2028.
- Both units of Sizewell B (which is expected to retire in 2035<sup>7</sup>) won contracts for approximately 1GW of capacity in this auction.

### Awarded Interconnector Capacity



- **Interconnectors:** The same nine interconnectors that cleared at the previous T-4 auction (comprising approximately 7GW of de-rated capacity or 9.8GW non-de-rated capacity) also cleared at this auction. The de-rating factors for most of these interconnectors appear to have stabilised compared to the previous T-4 auction, with only 92MW in net additional de-rated capacity awarded compared to last year. With the government recently affirming their target to have 18GW (non-de-rated) of interconnector capacity by 2030, it is likely that we will see more interconnectors coming online and participating in future capacity auctions.

<sup>6</sup> This is earlier than their scheduled retirement date (2030) following revelations that their reactor cores had started cracking earlier than expected. Heysham 2 and Torness end dates brought forward by EDF. 11 January 2022. Available at: <https://www.world-nuclear-news.org/Articles/EDF-confirms-earlier-end-date-for-Heysham-2-and-To>

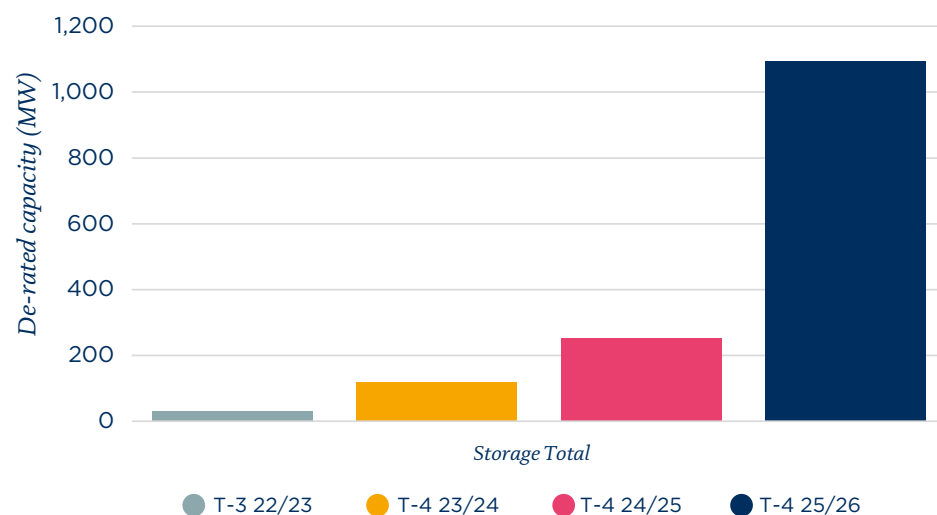
<sup>7</sup> <https://www.edfenergy.com/energy/nuclear-lifetime-management>

# Winners and losers

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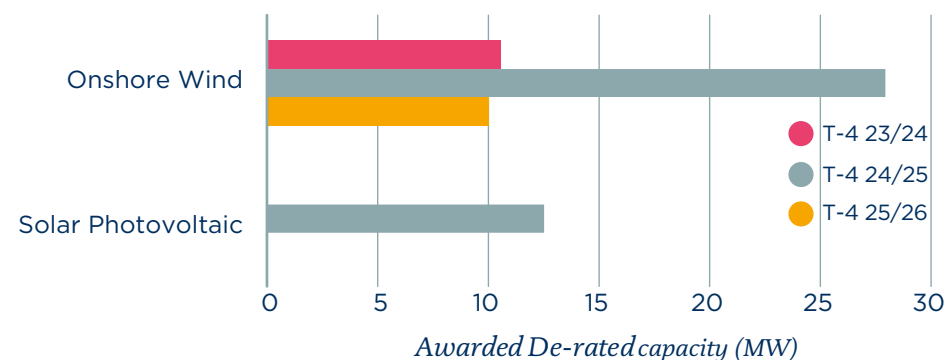
- Battery storage:** After cleared volumes more than doubled to 252MW in the T-4 2020 auction, the most recent auction saw clearing battery storage capacity quadrupling to 1,077MW (3,556MW of nameplate capacity). 1,033MW of this was new build, and 963MW received 15-year contracts. While the majority of storage units are relatively small (below 50MW non-de-rated), the new 127MW (320MW non-de-rated) Intergen Gateway Energy Centre battery represents a significant increase in the size of operating batteries in the GB market and is set to be one of the largest in Europe.<sup>8</sup>

### Awarded Battery Storage Capacity



- Renewables:** Only 10MW (de-rated, 154MW non-de-rated) of onshore wind capacity cleared in this auction. This perhaps indicates that government's assurances that there will be more frequent auctions for Contracts for Differences (CfD) for a wide range of renewable technologies (including solar and wind) are being recognized by the industry.

### Renewable Awarded Capacity



Of the renewable capacity clearing in this auction, Orsted's 109MW Kennoxhead Phase 2 onshore wind farm<sup>9</sup> received a 15-year contract for 6.8MW of de-rated capacity. This plant already has a corporate power purchase agreement (CPPA) with Amazon to help power their data centres, warehouses and offices.<sup>10</sup> In recent years, UK has emerged as one of the most active CPPA markets in Europe with several major players - M&S, Unilever, Sainsbury's, McDonalds, Nestlé, HSBC and Mars - having committed to meet all or a portion of their energy usage from renewable energy under the RE 100 initiative.<sup>11</sup> As such, it seems possible that going forward we will see more renewable plant under CPPAs participating in the CM to obtain an additional revenue stream, albeit one which is relatively small after derating.

<sup>8</sup> <https://www.intergen.com/news-insights/categories/news/intergen-secures-capacity-market-agreement-for-world-leading-gateway-battery-project/>

<sup>9</sup> Orsted. Kennoxhead Phase 2: 14 onshore wind turbines adding an anticipated 112MW installed capacity. Available at: <https://kennoxheadwind.co.uk/kennoxhead-phase-two>

<sup>10</sup> Amazon takes renewable offtake to 6.5GW. 10 December 2020. Available at: <https://renews.biz/65054/amazon-takes-renewables-offtake-to-65gw/>

<sup>11</sup> CMS Cameron McKenna Nabarro Olswang LLP. The Renewable Energy Law Review: United Kingdom. August 2021. Available at: <https://thelawreviews.co.uk/title/the-renewable-energy-law-review/united-kingdom>

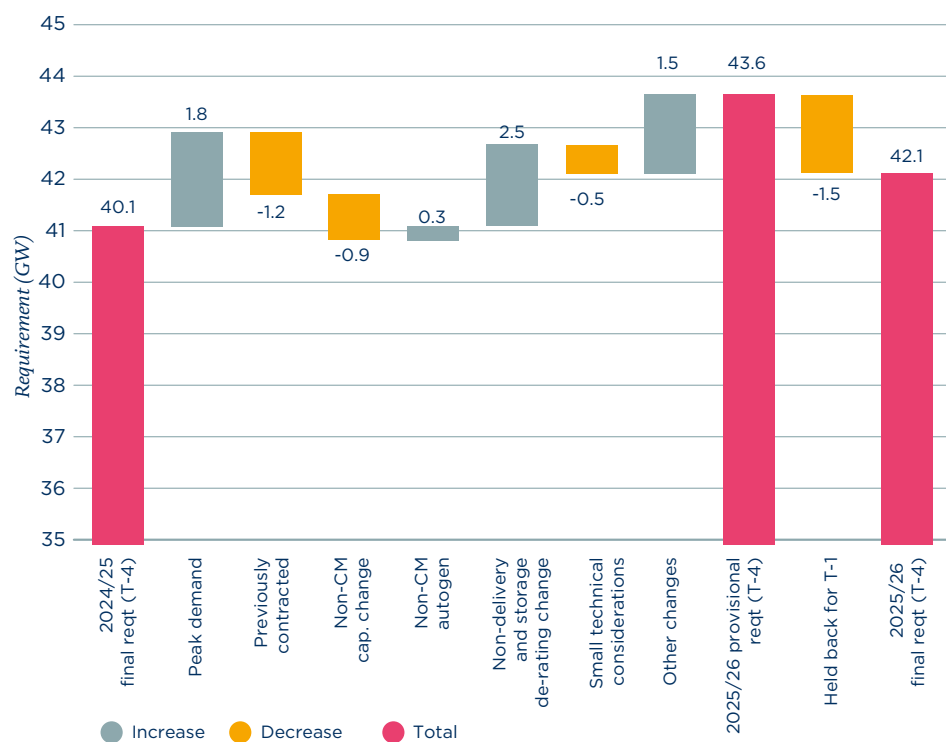
# Drivers of the clearing price

The clearing price of £30.59/kW/year observed in this auction was higher than any previous T-4 auction and was significantly higher than the T-4 2020 auction which cleared at £18.00/kW/year. There are explanations for the high clearing price in this auction on both the demand and supply side.

## Demand - higher target capacity in this auction

Relative to the T-4 2020 auction, the target capacity in this auction increased by about 2GW to 42.1GW (in contrast to the declining trend in target capacity across previous T-4 auctions).

### Drivers impacting the target capacity



### Two main reasons lie behind this increase:

1. Peak demand is forecast to be 1.8GW higher in 2025/26 than in last year's 2024/25 forecast, more than reversing a 1.4GW drop in the previous year. The 1.8GW rise is due to higher industrial and commercial energy demand (1.1GW, mainly due to lower energy efficiency), and the electrification of heat and transport (0.7GW). The rise due to electrification is more than double last year's rise of 0.3GW - it is likely that we will see further increases in this factor in future auctions as the pace of electrification picks up.
2. The Least Worst Regrets (LWR) analysis used this year resulted in a requirement that was 2.8GW more than the basecase scenario, an increase of 2.0GW compared to last year. This year's LWR analysis included a large range of non-delivery sensitivities, covering up to 5.6GW of non-delivery. These were included on recommendation from the Panel of Technical Experts (PTE) to address the risks associated with plant failing to deliver on their CM contracts (as was seen this year with 5.36GW needing to be procured in this year's T-1). The largest risks identified were associated with large thermal, nuclear and interconnection and the final LWR recommendation fell closest to the 2.8GW non-delivery sensitivity.

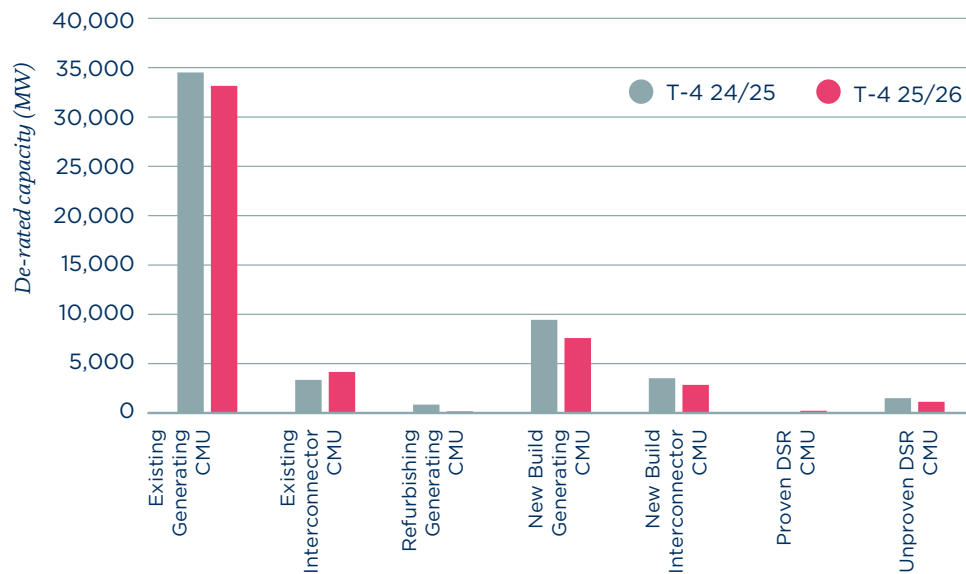
# Drivers of the clearing price

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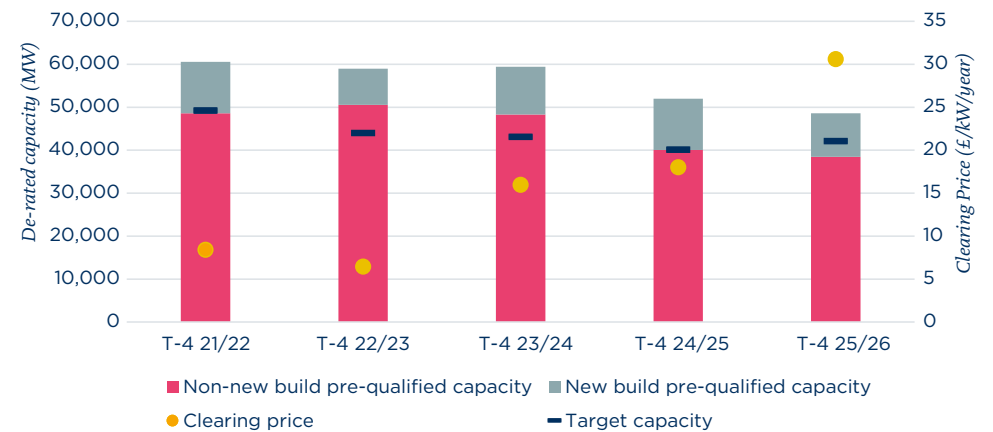
### Supply - reduced existing capacity

The capacity prequalifying in this auction was nearly 4GW lower than the T-4 2020 auction. Most importantly from a price perspective, prequalified existing generation capacity was around 1.3GW lower, at 33.1GW, while prequalified new build generation capacity was 1.8GW lower, at 7.6GW.

**Total Pre-Qualified Capacity**



**Pre-qualified capacity, target capacity and clearing prices**

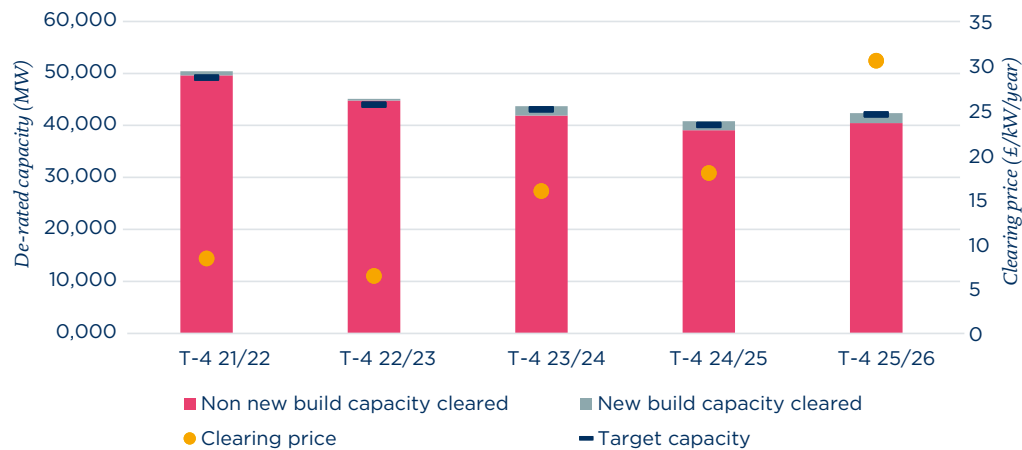


Collectively, this meant that non-new build capacity clearing in the auction was once again not sufficient to meet the auction's target capacity, making way for 1.9GW of new build capacity to clear.

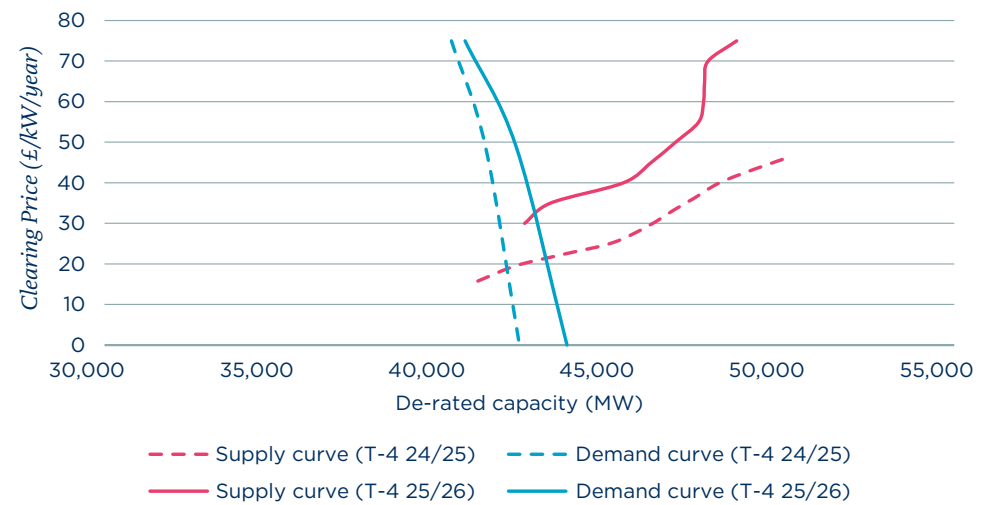
# Drivers of the clearing price

## Continued

**New build/non-new build capacity, target capacity and clearing prices**



**Auction results: implied supply and demand**



The significantly higher clearing price in this auction compared to the T-4 2020 auction was due to both lower volumes of new build capacity available to fill the gap between the target capacity and non new build capacity but also the bidding behaviour of the new build capacity participating in this auction. Comparing the supply curves for the two auctions it suggests participants bidding this year had generally reduced expectations of energy margins (and therefore higher expectations of CM revenues) and it appears particularly likely that some of the new build gas-fired capacity exited the auction at higher pricing rounds than was previously the case.

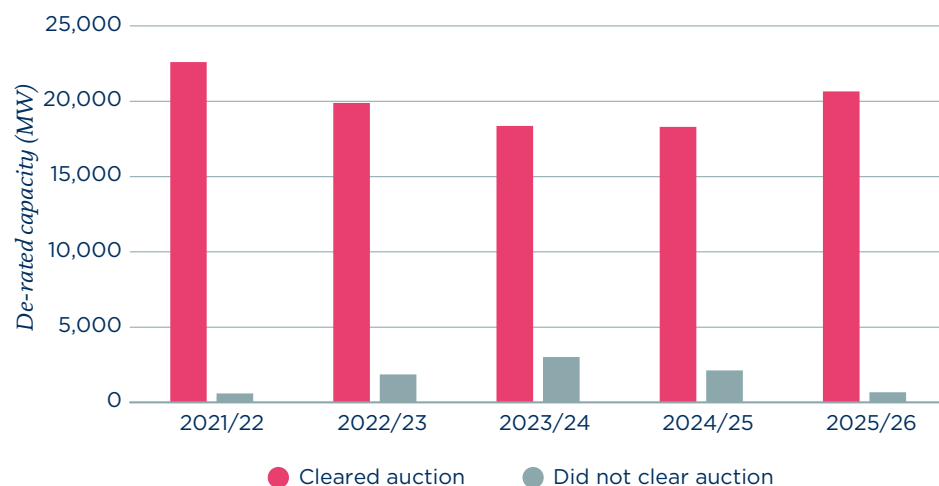
# Energy transition in action

The outcome of this auction provides an early indication of how the ongoing energy transition is likely to influence demand/supply in future auctions: the auction paints a negative picture for new build large CCGT and OCGT, but a much more positive picture for battery storage.

## Uncertain future for gas-fired capacity

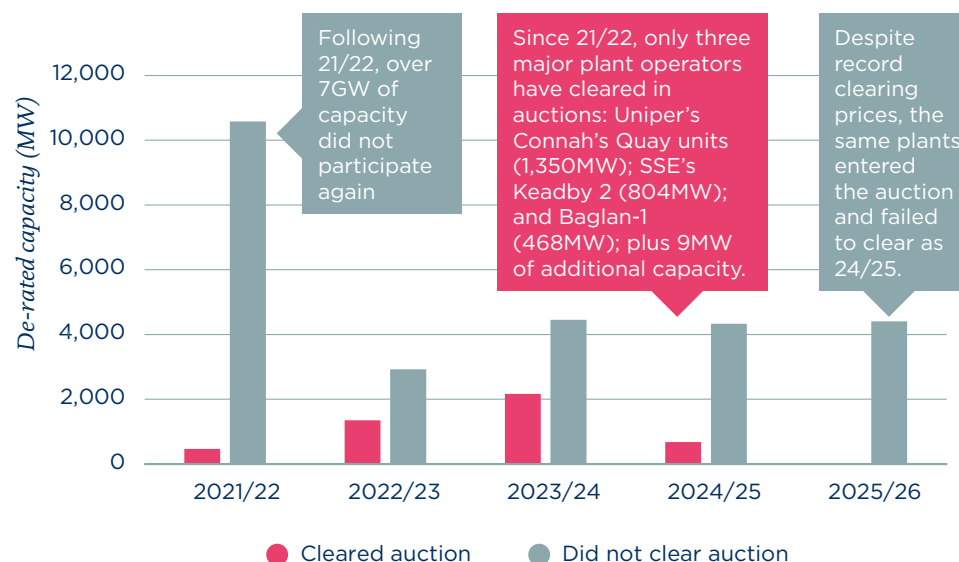
As we note above, this auction saw a reduction in the volume of existing CCGT capacity missing out on a contract.

### Existing CCGT by auction



The story is different for new build CCGT: this is the first time that no new build or refurbished CCGT generation cleared in an auction with a clearing price above £15/kW/year. The volume of new build or refurbished CCGT capacity prequalifying for the auction has decreased significantly since the T-4 auction for delivery in 2021/22.

### New build and refurbished CCGT by auction



Developers may be giving up on new CCGT projects in the GB market: only a single large new CCGT has cleared (the 804MW Keadby 2 project) in the CM auctions held to date. Similarly, three new OCGTs failed to clear in this auction after the last auction saw three OCGTs being developed by Drax receive 15-year agreements for 854MW capacity at a much lower clearing price (£18/kW).

Here policy risk is likely to have been a key issue. In October 2021, the government announced their plans to fully decarbonise the electricity sector by 2035, subject to security of supply. To achieve this, significant renewable capacity would need to be added to the system, reducing wholesale prices and expected load factors early in the life of any gas plant. Indeed, on this timeline, decarbonisation of electricity generation should be complete a few years before the 15-year contracting period of new build plant clearing in this auction has elapsed. To be consistent with this target, developers will likely now be pricing in their need for early cashflows in order to substantively recover costs ahead of 2035 (unless planning to install carbon capture and storage equipment or switch to a green gas such as hydrogen). As part of its call for evidence in relation to the capacity mechanism, the government invited views on limiting long term capacity agreements to lower carbon generation to avoid 'locking in' higher carbon capacity.



# Energy transition in action

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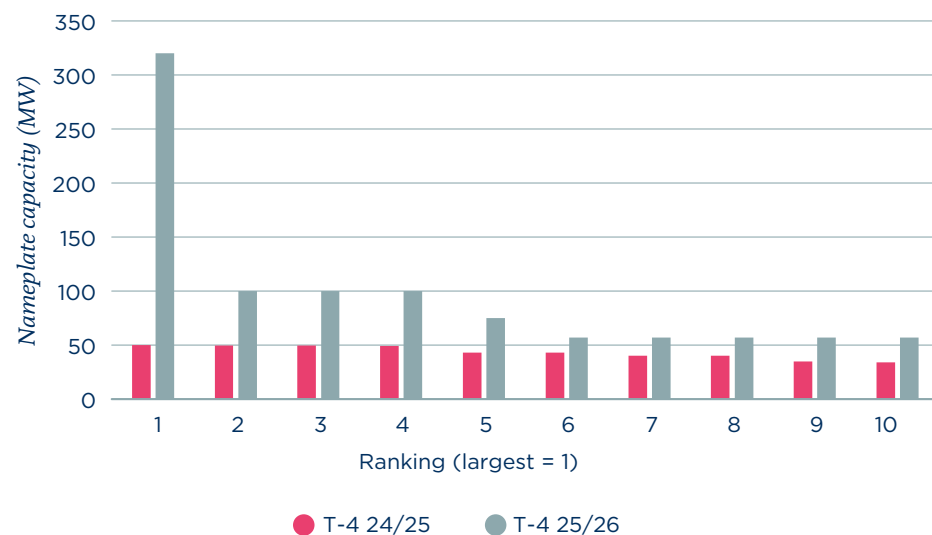
### Increase in battery storage

As discussed above, awarded battery storage capacity increased significantly in this auction - an increase of 817MW (324% y-o-y). This is on top of last year's increase of 134MW (113% y-o-y).

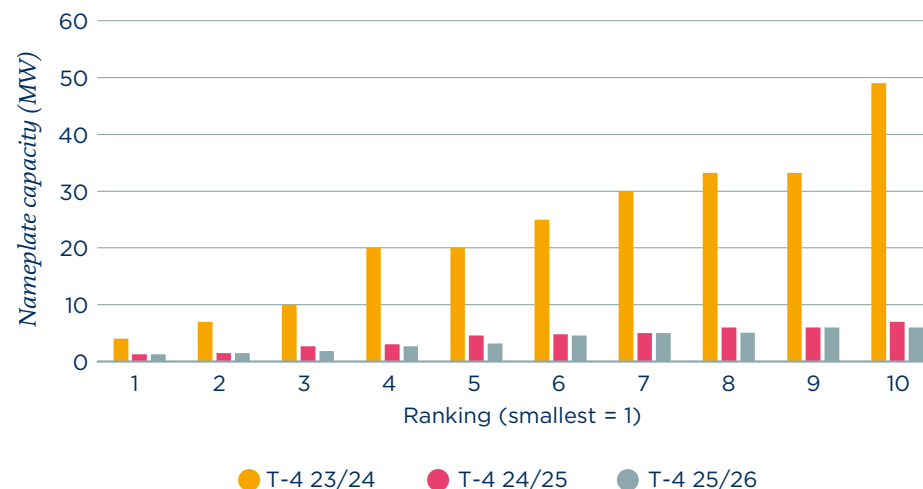
We have previously commented on how a host of factors<sup>12</sup> are improving the commercial case for energy storage in GB contributing to the increase in clearing battery storage capacity in the T-4 2020 auction. Subsequently, in July 2021 the government issued their Smart Systems and Flexibility plan<sup>13</sup>, in which they affirmed their commitment to removing barriers to deployment of electricity storage in the GB market by improving the regulatory framework, creating a level playing field for different sized storage operators (including domestic storage) and de-risking investment in long duration storage solutions.

In this auction, two changes can be observed in the types of batteries which have cleared. First, there is significantly increased diversity in the size of battery storage clearing.

Rank of battery storage cleared (top ten batteries, by nameplate capacity)



Rank of battery storage cleared (bottom ten batteries, by nameplate capacity)



<sup>12</sup> Including, its classification as electricity generation (hence removal of final consumption levies); earlier removal of double charging of electricity storage (both as generation and demand); reduced planning requirements; and improvements in arbitrage opportunities and revenues from provision of flexibility services (e.g. Dynamic Containment). See here: <https://www.frontier-economics.com/media/4691/cm-2021-briefing.pdf>

<sup>13</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf)

# Energy transition in action

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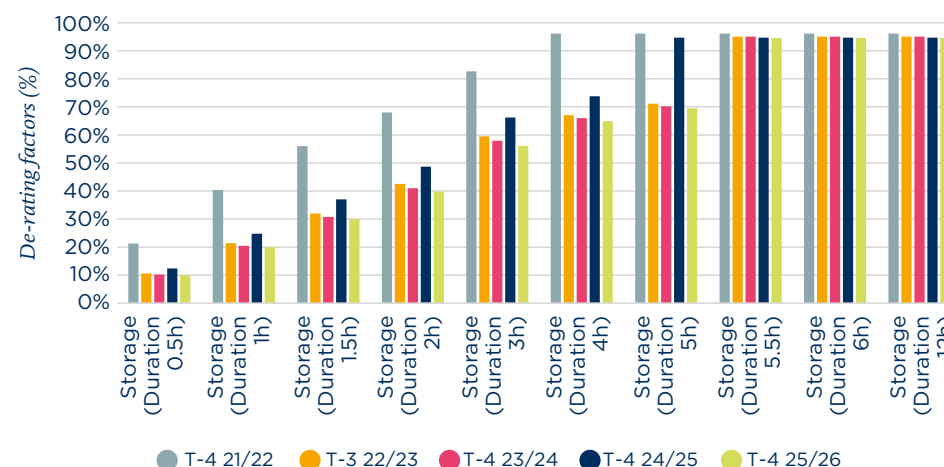
There has been an increase in the number of large batteries; notably, Intergen’s 320MW battery<sup>14</sup> (nameplate capacity) cleared alongside ten other battery storage operators with nameplate capacities above 50MW. In contrast the largest battery that cleared in the T-4 2020 auction had a nameplate capacity of 50MW. Other than technological improvements that have facilitated increase in size of battery units, changes to planning law allowing energy storage projects over 50MW to bypass the Nationally Significant Infrastructure Project (NSIP) process are likely to have contributed.<sup>15</sup>

At the other end of the spectrum, the smallest battery storage operator are now getting even smaller. This trend began at last year’s auction, facilitated by a reduction in the Minimum Capacity Threshold from 2MW to 1MW in July 2020<sup>16</sup>. Government has committed to improving access to market of small-scale (commercial and domestic) batteries in their Smart System and Flexibility Plan<sup>17</sup>.



De-rating factors for battery storage have decreased significantly (particularly for lower duration batteries) over the past five years, and continue to change annually (albeit that they are now much more stable year to year).<sup>18</sup> The changes in derating factors over time mean that the batteries on the system by delivery year 2025/26 will be providing a different level of capacity (and therefore implied security of supply) than that which was assumed in the years that they were purchased (and contracted for): in aggregate de-rated capacity will be around 323MW lower than assumed in the years in which they were purchased.

### Storage de-rating factors



We observed in the last auction an increasing amount of longer duration storage clearing, partly due to longer duration storage having higher de-rating factors. The trend continued in this auction that saw an increase in clearing volumes particularly for longer duration batteries, including a small amount (6MW) of longer than 2-hour duration storage clearing for the first time.<sup>19</sup>

14 <https://www.intergen.com/news-insights/categories/news/intergen-secures-capacity-market-agreement-for-world-leading-gateway-battery-project/>

15 <https://www.gov.uk/guidance/consents-and-planning-applications-for-national-energy-infrastructure-projects>

16 <https://www.legislation.gov.uk/ukdsi/2020/9780111196199/note?view=plain>

17 Including through the development of local flexibility markets and considering options for removing final consumption levies on electricity imported by domestic storage for the purpose of re-exporting back to the grid, as well as the VAT regime’s impact on domestic storage

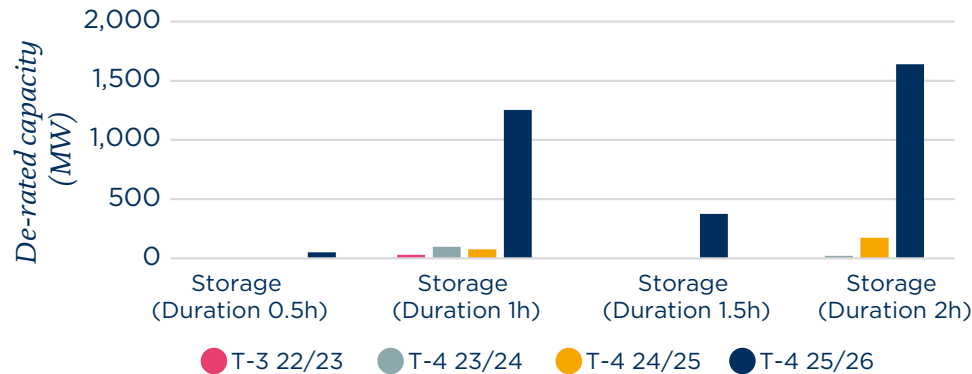
18 De-rating factors for limited duration storage are determined using a methodology that calculates the equivalent firm capacity that would provide the same contribution to system security (specifically, the expected energy unserved). The de-rated capacity for limited duration storage is not constant since the availability of supply is dependent on factors such as the expected length of system security events and the availability of other capacity in the market (in particular from other storage operators).

19 4-hour duration battery co-located with Gridserve’s hybrid solar farm: <https://gridserve.com/2019/12/19/gridserve-complete-game-changing-hybrid-solar-farm/>

# Energy transition in action

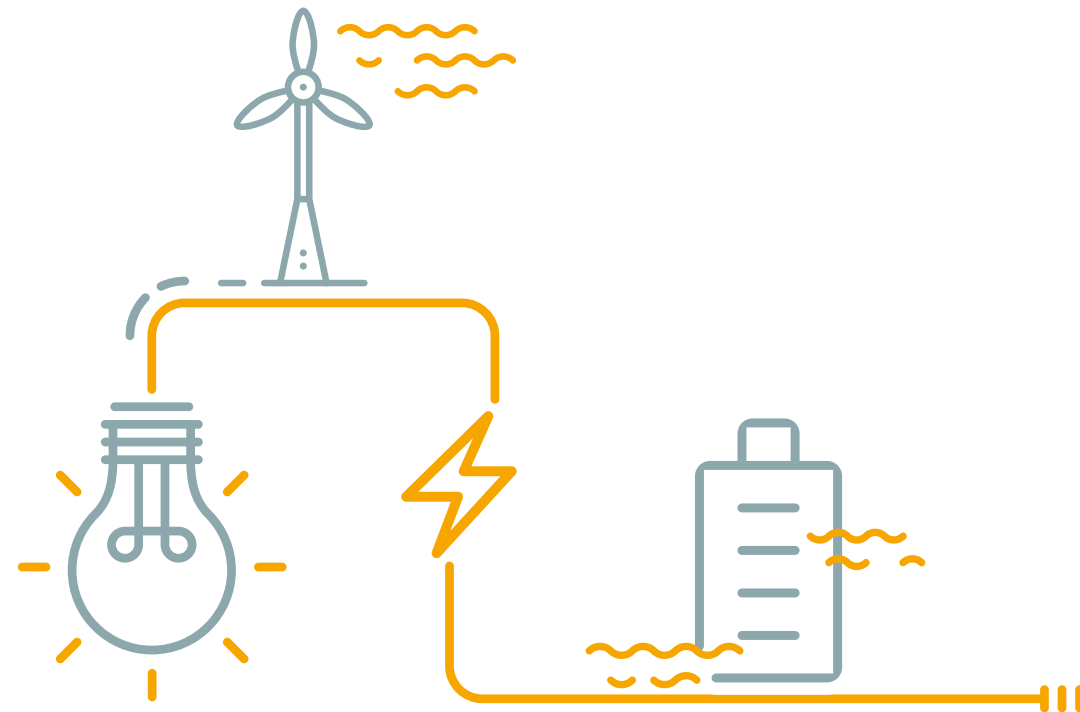
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### Awarded Battery Storage Capacity



This may be the first signs of the GB market edging towards storage technologies with 4-hour plus duration<sup>20</sup> and comes close on the heels of the recently-announced government-backed competition for long-duration storage technologies in GB<sup>21</sup> which could eventually start appearing in future auctions.

With both electricity demand and penetration of wind generation continuing to grow going forward, there will be an increasing need for storage to manage the difference between high wind / low demand periods and low wind / high demand periods. Periods of low wind (which will likely drive high power prices in the future) tend to last longer than periods of high demand (which currently drive high power prices). The same is true of periods of high wind, which last longer than periods of low demand. This presents an opportunity for longer duration storage that can capitalise on these longer periods of extreme prices, as well as providing grid stability.



<sup>20</sup> One example is a 24-28 hour duration zinc based storage system called e-zinc. Read more about it here: <https://e-zinc.ca/technology/>

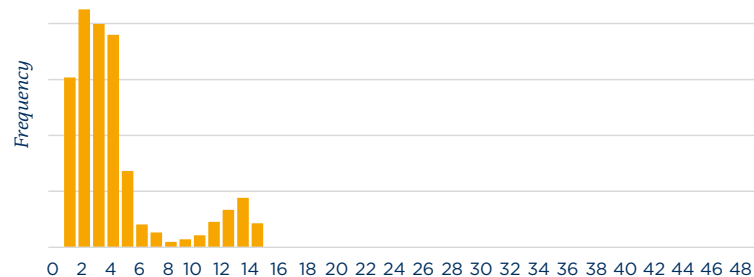
<sup>21</sup> Currently, twenty-four projects have received revenues from the first round of funding, with a range of technologies being developed. Successful projects could benefit from a greater tranche of funding from a second phase of the competition.

# Energy transition in action

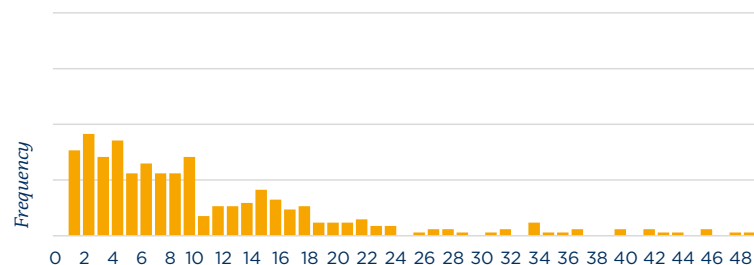
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### Drivers of high price events

Extreme Demand Streaks, highest 5%



Extreme Wind Streaks, lowest 5%



Whilst the increasing need for long-duration storage is clear, it is not clear whether the capacity market will necessarily be the mechanism that can incentivise the necessary investment. No large new build long-duration storage project (e.g. a pumped hydro plant) has cleared in previous CM auctions or indeed been built in the market since the 1980s. The most recent capacity market call for evidence by the government acknowledges some of the existing barriers to new long-duration storage like pumped hydro, notably the long lead times associated with their development. This call for evidence also reiterated the government's commitment to remove barriers to entry for energy storage projects, as per the Smart Systems and Flexibility Plan.<sup>23</sup>

<sup>23</sup> Section 2.4, here: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1005672/capacity-market-cfe.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005672/capacity-market-cfe.pdf)

<sup>24</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf)

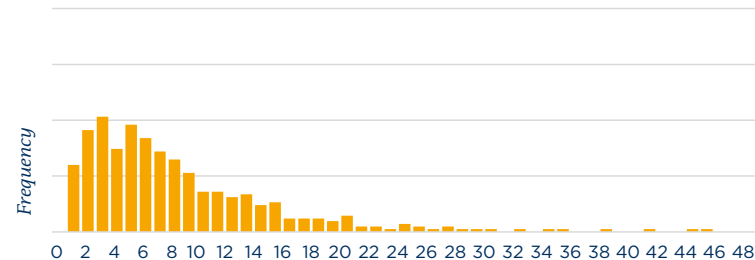
<sup>25</sup> [https://www.drax.com/press\\_release/potential-solution-to-unlock-investment-in-climate-critical-storage-technologies/](https://www.drax.com/press_release/potential-solution-to-unlock-investment-in-climate-critical-storage-technologies/)

### Drivers of low price events

Extreme Demand Streaks, lowest 5%



Extreme Wind Streaks, highest 5%



In recent months there have been calls to kickstart investment in this area through a technology specific support scheme for long duration storage. One example is the cap and floor mechanism proposed by Drax and SSE that would reduce risks for investors by providing guaranteed revenues to the operator, while encouraging operators to respond to system needs.<sup>24</sup>

These calls raise an important question whether we currently have the right market design to make long duration storage investments viable and ensure the right technology choices across all flexible technologies. Given the imperative need for long duration storage and flexibility more generally for a decarbonised electricity system, ensuring that this aspect of the market design is fit for net zero will need to be a major focus for policy makers. Given the lead times for policy making and investment, the challenge starts now.

## Contact us

If you would like more information please contact your usual LCP adviser or one of our specialists below.



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