frontier economics

LCP INSIGHT CLARITY ADVICE

Review of the T-4 2018 CM auction

19 March 2018

The T-4 2018 Capacity Market (CM) auction for delivery in year 2021/22 commenced on 6 February 2018 and concluded on 8 February 2018. In this bulletin, we provide our reflections on the results.

Headlines

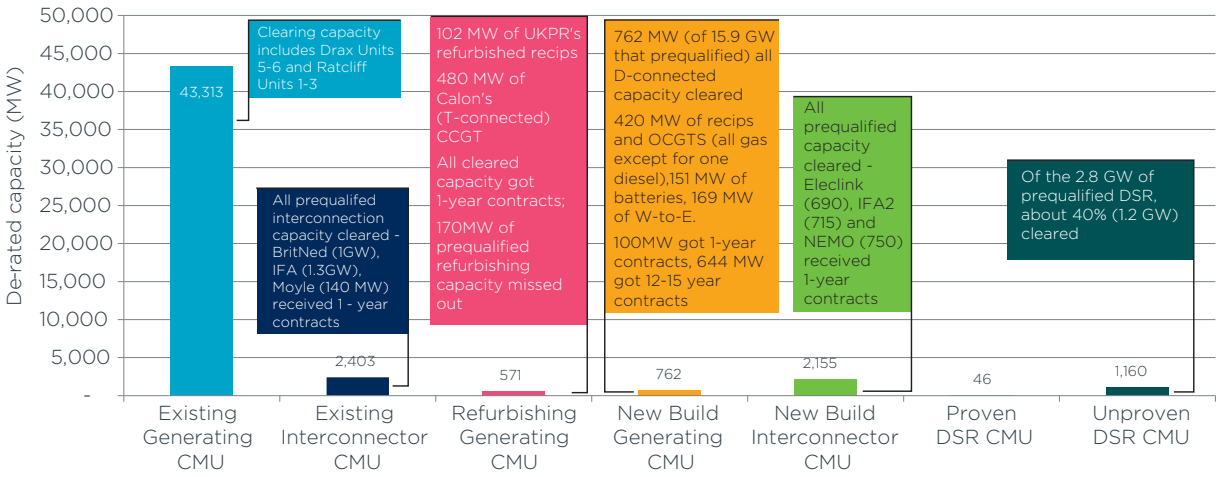
- The auction cleared at a price of £8.40 per kW, significantly below the T-4 2016 clearing price of £22.50 per kW and below the clearing price observed in any of the three previous T-4 auctions.
- The aggregate de-rated capacity procured in the auction was 50.4 GW, the vast majority of which was existing generation, and interconnection.
- For the first time, three new interconnectors cleared in a T-4 auction, all receiving one-year contracts.
- 2.6GW of existing coal plant (Drax Units 5 and 6; Ratcliffe Units 1-3) cleared in the auction despite the low clearing price. 7.7 GW of existing coal plant failed to win a contract increasing the probability that these units will retire before the delivery period 2021/22.
- a small amount (762 MW) of new-build capacity cleared in the auction, mostly small-scale, "embedded" gas reciprocating engines (420 MW), CHP and Waste-to Energy plant and a small amount of new build batteries (151 MW).
- Similar to the T-4 2016 auction, a large amount (1.2 GW) of Demand Side Response (DSR) cleared in the auction, a significant proportion of which is behind-the-meter generation.

£8.40 per kW

and below the clearing price observed in any of the three previous T-4 auctions

Winners and losers

Customers were arguably the biggest winners. The headline figure was the clearing price of £8.40/kW (in 2016/17 prices) which will be paid to all successful participants for providing available capacity in winter 2021/22. This is less than half the observed clearing price in any of the previous three T-4 auctions held to date, as well as below where many market commentators were expecting it to be. However, a low clearing price in the auction was not altogether surprising (as we explain below).



43.3 GW (or c.84%) of prequalified existing generating capacity cleared the auction, alongside 2.4GW of prequalifying existing interconnection capacity – BritNed, IFA and Moyle. The East-West interconnector or EWIC – which had been successful in T-4 2016, failed to prequalify.

570 MW of refurbishing capacity cleared, including Calon Energy's 470 MW CCGT and 100 MW of UKPR's reciprocating engines. While refurbishing capacity can be awarded up to three-year contracts, unsurprisingly the low clearing price meant all clearing refurbishing capacity accepted one-year contracts.

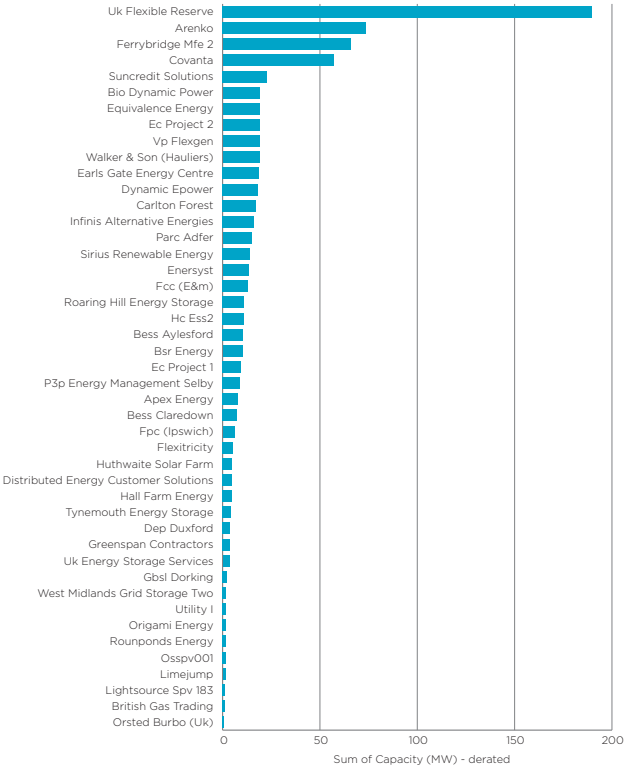
Some new capacity also cleared:

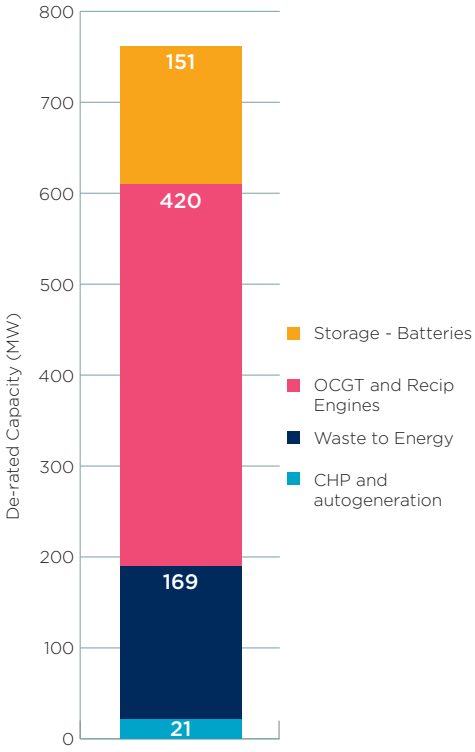
- **Interconnectors:** For the first time ever, new interconnectors cleared in a T-4 auction:
  - Two, 1GW interconnectors with France: Eleclink (690 MW on a de-rated basis) and IFA 2 (715 MW); and
  - 1GW interconnector with Belgium - NEMO (750 MW).

IFA2 and NEMO fall within Ofgem's cap-and-floor regime, the primary scheme supporting new interconnection in GB. Eleclink is being built on a merchant basis.

43.3GW
of prequalified existing generating capacity cleared the auction

- **New generation:** 762 MW of new build generation capacity also cleared. This new generation covers a mix of technologies:
  - CHP and Waste-to-Energy (190 MW);
  - "embedded" reciprocating engines, mostly gas, and half of which were from one developer, UKPR (420 MW); and
  - batteries, half of which were from one developer, Arenko (151 MW).

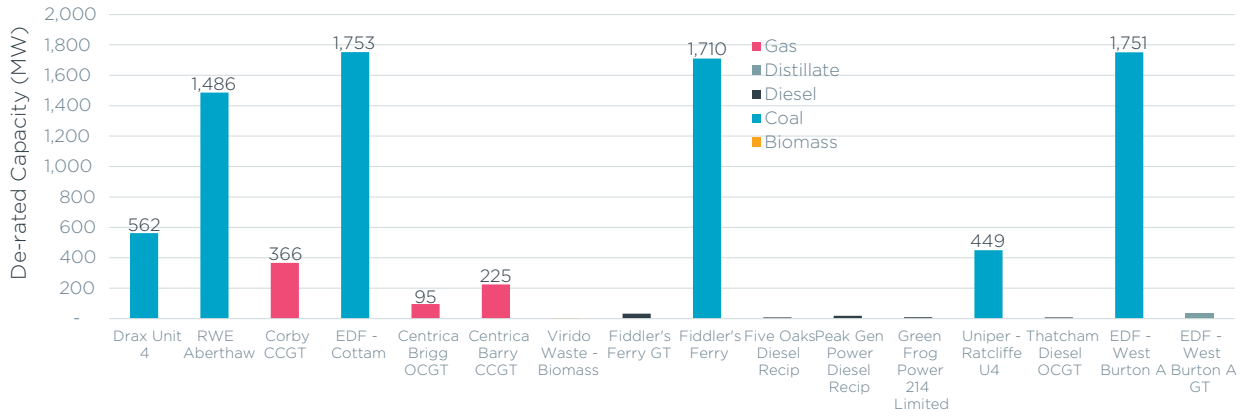




Finally, and similar to the previous T-4 auction, a significant volume of DSR (1.2 GW) cleared the auction. The vast majority (>95%) of the successful DSR capacity was "unproven" meaning it must undergo tests to verify the actual level of load that can be reduced. A material proportion of this DSR is behind the meter generation or storage, rather than load reduction.

The clear losers in the auction were existing coal plant. 7.7 GW of existing coal capacity failed to secure a contract. This makes it more likely that these plant will close prior to the delivery year 2021/22, although it does not make it certain: some may bid again in next year's T-4 auction (Cottam, Fiddler's Ferry, and West Burton Unit 3 did not clear in the 2016 T-4 auction and bid again this time around).

7.7 GW
of existing coal capacity failed to secure a contract



Another clear loser in the auction was new build capacity, with 14GW of prequalified new build capacity failing to clear. This capacity comprised about 10.6GW of new CCGTs, 2.5GW of OCGT and recips, and approximately 1GW of battery storage.

Why so low?

Based on the pre-qualification data there was a close balance between existing plant and demand. Consequently, the key to the clearing price was always going to be the behaviour of the existing capacity with the highest net going forward costs: 10 GW of existing coal plant and some of the older existing gas plant. Previous auctions had seen some of these existing plant exit the auction somewhere in the £15/kW - £25/kW range[1].

However, this time two things clearly happened.

First, significant new build capacity contributed to what was already a healthy supply situation. This came largely from interconnection which requires little capacity income to be delivered. New build interconnectors (NEMO) had prequalified in the previous two T-4 auctions but had failed to clear. This appears to have been driven more by the certainty with which the project could be delivered in the relevant year than the capacity price level, given the outlook for GB vs. continental price and the fact that NEMO falls within the cap and floor arrangements. This time around, three interconnectors demonstrated that even at very low capacity price levels, they would be willing to commit to provide capacity.

Second, while lots of coal did exit above the clearing price, 2.6GW of existing coal capacity eventually accepted a price significantly below the range at which coal units had dropped out in previous auctions. Competition between existing plant therefore appears to have pulled the clearing price down to its final level.

"New interconnection looks set to be a feature of capacity auctions in the next few years. Setting the derating factors appropriately will be critical to getting the security of supply we are paying for"

Tom Porter, LCP

1 Cottam, Fiddler's Ferry, and West Burton - CMU 3 did not clear in the T-4 2016 at the clearing price of £22.50/kW. It could hence be expected for these plant to exit the T-4 2018 auction around the same price range.

Changes in the mix

The results of the auction potentially herald two major changes in the supply mix for the GB system:

- the role of coal; and
- the growth of interconnection.

Coal

Significant volumes of coal generation failed to secure a contract in the auction, and may now close ahead of the government's backstop date of 2025 for the closure of coal plant. If plant that did not clear decide to close, then from 2021/22, there will only be 2.6 GW of coal left on the system.

Moreover, for remaining coal plant, as the government's backstop date approaches, it is increasingly likely that plant owners will be optimising their going forward costs, balancing the benefit of avoiding maintenance with the risk it may create of unplanned unavailability during a stress event (along with resulting penalties). It is possible that this optimisation influenced auction bid strategies, as it seems likely that coal plant which did clear must have been close to or at their going forward costs.

Interconnection

New interconnection contributing to the supply curve looks set to be more than an isolated trend. In addition to the 2.2 GW of new interconnection capacity that cleared, another 8.5GW of interconnection capacity has been granted the right to participate in the cap and floor regime and can be expected to bid in future CM auctions. While delay in the commissioning of some of these links is likely, a substantial percentage of GB supply security is set to come from interconnection going forward. If all of these links come to fruition, at an average derating factor of 60%, they would equate to more than 10% of the 2021/22 demand curve target capacity of 49.2 GW.

It is perfectly appropriate for the links to participate in the capacity auction. Interconnectors are, in theory, just as capable of supporting GB security of supply as local generation. But it does mean that it is important to ensure that the derating factors applied to interconnectors are well justified. Assuming markets are well functioning, they should reflect the probability of an outage on the link itself, and the probability of coincident stress in the interconnected countries. If markets are not functioning well, a more conservative assessment may be justified.

In this regard, the potential impact of Brexit on the access of GB links to market coupling arrangements is relevant. As a recent House of Lords report noted[2], Switzerland does not have access to market coupling. Were GB not to have this access, some assessment would need to be made of the detrimental impact on the benefits of interconnection from the point of view of security of supply.

If all of the planned 8.5GW of further new interconnectors came to fruition, at an average derating factor of **60%**, they would equate to more than

10%

of the 2021/22 demand curve target capacity of **49.2 GW**.

2 Brexit: energy security, report by the European Union Committee (29th January, 2018)

Outlook for the future

The auction results tell us relatively little about the prospects of different technologies going forward. Significant quantities of CCGT, batteries and small generators dropped out of the auction above the final clearing price. The relative position of these technologies in the supply stack therefore remains unknown (although it is clear that CCGT projects are still well out of the money).

However, we believe there are a number of important issues to consider regarding the future prospects of:

- behind the meter generation, which appears as DSR in the auction; and
- reciprocating engines (recips) and batteries.

"Bidding flexible plant into the auction is, at the moment, a shot in the dark. Its not easy, but it would help investors immensely if National Grid gave an idea of the future demand for different ancillary and balancing products"

Dan Roberts, Frontier Economics

DSR

Our previous briefings highlighted the importance of triad income as a driver of auction prices. While triad income has been significantly reduced for many plant, for others it is still in the process of being reduced.

Ofgem recognised that their CMP 264/265 decision left open some opportunities to profit from network charge avoidance strategies, perhaps most notably from behind the meter generation (BTMG). Such capacity can still help customers reduce their demand TNUoS bills, and hence can secure a healthy payment on top of other revenues.

BTMG appears as DSR in the auction. This year's auction saw 1.2 GW of demand side response clearing[3], relative to 1.4 GW last year. Ofgem's Targeted Charging Review looks set to remove this distortion, although it may take time. How quickly and to what extent this will affect DSR capacity in forthcoming auctions remains uncertain.

Recips and batteries

About 4 GW of sub-100MW, distribution connected ("embedded") OCGT and reciprocating engines prequalified in this auction. While the vast majority dropped out above the clearing price, some developers had projects that cleared the auction. In some cases, these were identical sites to those which failed to clear last year with a price of £22.50/kW.

3 Across proven and unproven DSR.

This raises the question as to why these bidders believe they can build this capacity profitably – or whether they really do. In some cases, the fact that developers are trying to sell portfolios of reciprocating engines may have distorted incentives.

However, it seems that some developers believe that at or near £8.40/kW, new capacity can be profitable. This implies an expectation of higher revenue streams from the wholesale energy, balancing and ancillary services markets.

Similarly, in relation to storage, 151 MW of new build batteries cleared in this auction. As we commented following the 2016 auction, it was clear that the 96% derating factor for shorter duration batteries was inappropriate. With significantly reduced derating factors in this auction, arguably competition between batteries and thermal generation was on a more level playing field. The developers of the projects which cleared presumably believe that intertemporal arbitrage and ancillary service / balancing income will, in combination with even a very low capacity income, result in a profitable build.

But to some extent, both battery and reciprocating engine investment is, at the moment, a bit of a shot in the dark. Investors are being left to form their own views about major income streams, namely the volume and price of the different ancillary services and balancing requirements which National Grid expects to need in the future. This is more difficult to predict compared to modelling wholesale market supply and demand. But efficient market outcomes require good information. If investors are being too optimistic, we may be seeing too many small flexible projects coming through.

National Grid is arguably best placed to provide a view on the link between future evolutions of the mix and future demand for ancillary services. No one would say that this is an easy task, but it is one where there may be a big payoff. Better information on future balancing requirements would help investors to form views of what type of capacity will be required and when, which would in turn lead to more efficient capacity auction outcomes, to the benefit of customers.

About LCP

LCP's Energy Analytics practice has been at the heart of Electricity Market Reform (EMR) analysis since the first design proposals. We provide analytic and consulting services that support the industry in understanding the impacts of these significant reforms to the GB power market. We also provide some of the key tools in the industry, including the Dynamic Dispatch Model that is used by DECC and National Grid for analysis such as the final EMR delivery plan and the setting of the capacity requirement for the first capacity auction. More widely we support our clients to understand how these fundamental changes to the market will affect portfolio profitability and risk over the medium to long term. We provide a range of services including asset valuation, impact analysis and strategic advice.

About Frontier Economics

Frontier Economics is one of the largest economic consultancies in Europe with offices in Berlin, Brussels, Cologne, Dublin, London, Madrid and Paris. We use economics to help clients improve performance, make better decisions and keep ahead of the competition. Our expertise is broad, covering not just micro-economics but finance, statistical modelling, game theory, market research and even the psychological side of economics.

We work with a wide range of clients from the private sector, government, regulators, other public authorities and charities. We distil complex issues to focus on what matters to our clients. We help them make credible arguments and good decisions, backed up by robust evidence and analysis. While our analysis may be complex, the advice we provide is clear, honest and delivered using plain language.

Tom Porter
Partner
tom.porter@lcp.uk.com
+44 (0)20 7439 3063

Dan Roberts
Director
dan.roberts@frontier-economics.com
+44 (0)20 7031 7000

Contact us

If you would like to discuss any aspects of the Capacity Market in more detail or any of our wider services please contact Tom Porter (LCP) or Dan Roberts (Frontier Economics) using the details opposite.

At LCP, our experts provide clear, concise advice focused on your needs. We use innovative technology to give you real time insight & control. Our experts work in pensions, investment, insurance, energy and employee benefits.

Lane Clark & Peacock LLP
London, UK
Tel: +44 (0)20 7439 2266
enquiries@lcp.uk.com

Lane Clark & Peacock LLP
Winchester, UK
Tel: +44 (0)1962 870060
enquiries@lcp.uk.com

Lane Clark & Peacock Ireland Limited
Dublin, Ireland
Tel: +353 (0)1 614 43 93
enquiries@lcpireland.com

Lane Clark & Peacock Netherlands B.V.
Utrecht, Netherlands
Tel: +31 (0)30 256 76 30
info@lcpnl.com