Review of the first GB capacity auction

ELECTRICITY MARKET REFORMS

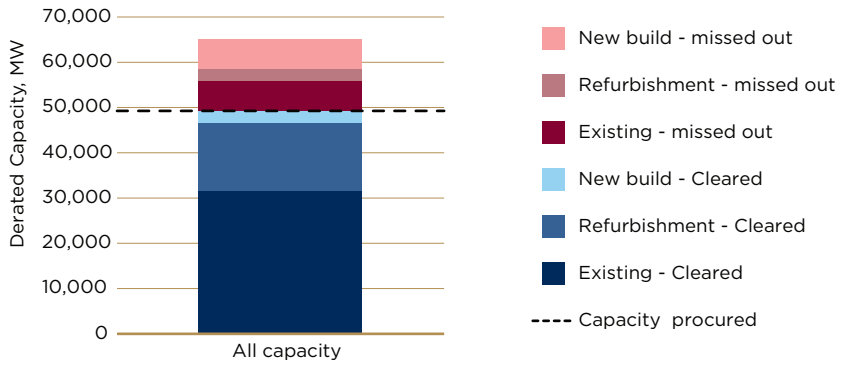
JANUARY 2015

On the 19th December National Grid and the Department of Energy and Climate Change (DECC) announced the results of the first Capacity Market auction.

This resulted from a new government policy designed to ensure that there is sufficient generation capacity to meet the demand for electricity.

The headline figure was the clearing price of £19.40 per kW which will be paid to all successful participants for providing available capacity in winter 2018/19. The cost of providing these payments will be charged back to consumers through their electricity bills with the total cost expected to be £956m in the first year. While this represents a significant cost it is considerably lower than many had anticipated given it could have potentially reached up to £3.7bn.

The lower than anticipated cost is good news for consumers and is a result of significant competition between generators. Almost 10GW of existing capacity has missed out on a capacity contract, just under 17% of the capacity which participated. These power plants now face an uncertain future, and many may face closure. In contrast, 2.9GW of new build capacity received contracts, including a large number of small projects.



In this briefing, we look at who has (and who has not) received contracts and what this can tell us about the market's view on the prospects for GB generation.

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The lower than anticipated clearing price is good news for consumers. However, many generators face an uncertain future, with almost 10GW of existing capacity having missed out on a contract.

9.8GW
of installed Gas and Coal capacity missed out on a contract.

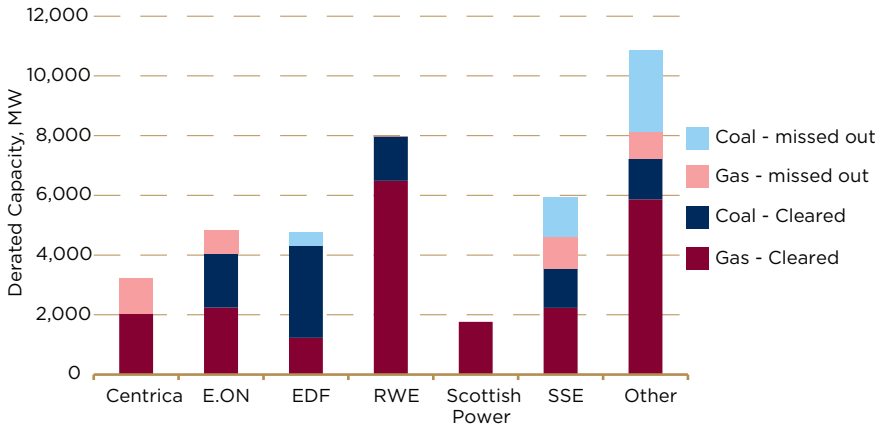
33%
of existing Coal capacity missed out on a contract, compared to 15% of existing Gas.

2.9GW
of new capacity cleared in the auction.

Portfolio by portfolio

From when the pre-qualification results were announced it was clear that a significant volume of existing plant would miss out on securing contracts. Now that we know who has missed out we can begin to understand the range of strategies and views that the major participants have on the GB market.

As anticipated the majority of plant which have missed out are either Gas or Coal generators. The chart below shows the results for the existing Gas and Coal units across the major operators.



Arguably the most notable results are for Centrica with Brigg, Barry, Killingholme A and Peterborough all missing out. This signals a negative outlook from Centrica on the profitability of the older CCGT fleet over the coming years, and suggests closure or sale of more of these units is a significant possibility. With only Langage and South Humber Bank receiving contracts, Centrica appears to be signalling a lack of confidence in the GB generation market (possibly in line with the strategy driving their sale of plant).

At the opposite end of the spectrum RWE have seen all of their major generating units receive contracts, indicating a degree of confidence in profitability of both Gas and Coal generation, either through higher spreads or higher future capacity payments.

Outside of the Big-6, four of the larger independent power stations are now also facing difficult decisions. Corby and Deeside missed out, in line with the outcome for Centrica's early-90s CCGTs. Coal stations Rugeley and Eggborough also missed out, with Eggborough missing out on a refurbishment contract just weeks after being purchased by new owners. Given that it has previously missed out on receiving support for biomass conversion, it now faces an uncertain future.

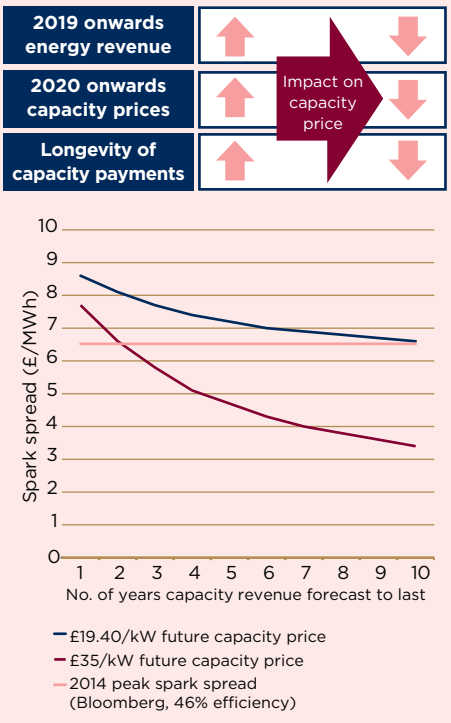
Given the low clearing price many will have been surprised to see a new build CCGT clearing in the auction. The new Trafford power station, with a total capacity of 1880MW, will become one of the largest GB power stations. In comparison Carrington, due for completion in 2016, has missed out perhaps in the expectation of higher clearing prices in future auctions. Given that a significant proportion of the cost of Carrington construction is already sunk it highlights how the different views of operators and investors can lead to counter-intuitive outcomes. Time will tell which decision will prove to have been most judicious.

What does £19.40/kW mean for energy market expectations?

In this first auction a large number of existing plant were looking to reflect in their bids potential energy market losses resulting from the commitment to remain open to 2018/19. And as a result, in our previous bulletin we identified the importance of expectations of future energy and capacity market revenues in the setting of bids by existing plants.

Clearly it is impossible to know the exact assumptions made by different market participants in the auction. But using a stylised example of an existing CCGT (assuming average efficiency and 30% load factor), we can investigate what existing plant needed to believe about future energy and capacity revenues for £19.40/kW to make sense.

Mapping assumptions consistent with £19.40/KWh



Source: Frontier Economics

Consider an existing 400MW CCGT that has set the price in the capacity auction at £19.40/kW. Assume that it has fixed running costs of £12m pa and expects to run 30% of the time going forward.

The bid is based on expectations of three assumptions:

- **future net revenues** ie what they expect the future peak clean spark spread to be and how much they expect to generate;
- the **future capacity price**; and,
- the **longevity of receiving capacity payments**.

Two scenarios are presented in the chart:

- First - if it is assumed that future capacity prices remain at £19.40/kW (dark blue line), the required spark spread is £8.6/MWh if they assumed the capacity auction only continued for one more year. It falls to £6.6/MWh if 10 years capacity revenue is taken into account.
- Second - if future capacity prices are expected to rise to £35/kW (red line) from the second auction onwards, then lower spark spreads can be tolerated. £7.7/MWh if one year of revenues is taken into account, and £3.4/MWh if 10 years is taken into account.
- These numbers compare to peak spark spreads of £6.52/MWh in 2014 for a CCGT with 49% efficiency.

Dan Roberts
Director
Frontier Economics

Without assuming higher capacity prices in future auctions or improved energy revenues, existing gas generators could struggle to maintain profitability with the clearing price of £19.40/kW.

The illustration opposite sets out the combinations of assumptions on future energy and capacity revenues, and the longevity of capacity revenues that are consistent with a bid price of £19.40/kW. From the two scenarios we can see:

1. If expectations were based on the capacity price continuing in the future at around £20/kW, then expectations of future energy revenues must be higher. In this example this would imply spark spreads increasing relative to current levels, even if up to 10 years of capacity revenue is factored in.
2. If the generator believed future auction clearing prices would be higher on average (eg £35/kW) than the first auction, then expectations of future energy revenues could be lower. In this example this suggests spark spreads more in line with those seen currently in the market. They could be even lower if enough years of future capacity revenue is taken into account.

What is apparent is that for many CCGT's currently on the system, an improvement in either energy market revenues or capacity revenues from current levels will be necessary if they are to maintain even current levels of profitability. However, it could be argued that expectations of higher capacity or energy revenues are not unrealistic.

- Higher future capacity prices could be expected if new entrants set future capacity prices. DECC's estimate of the cost of new entry in the auction is £49/kW.
- And with the potential for lower gas prices going forward, spark spreads may well improve. Indeed looking forward, peak spark spreads according to Bloomberg are closer to £10/MWh in 2017.

What next for those that missed out?

While the government is likely to be pleased with the lower than expected cost to consumers, the result of the auction still raises concerns. System security for the GB market is at its lowest level for a number of years, and if the plant which did not clear closes, the situation will worsen. What these plant will do is unclear. They face a number of possible options:

- **2019/20 auction** – Later this year a second four-year ahead auction will be held, for winter 2019/20. Plant that have missed out on a contract have the option to stay online (at a cost) and compete in this auction, in the light of updated information on future spreads. There is, however, no guarantee of a higher capacity price, and potential rule changes add further uncertainty (see final section). Plant will get an indication of the likely level of competition when the capacity requirement is published mid-way through the year.
- **Year-ahead auction** – In under three years' time another auction will be held for procuring capacity for winter 2018/19. There is however no guarantee of higher prices in this auction as there is likely to be a limited volume of capacity procured with potentially significant competition. For any plants which are currently loss-making this option also requires committing to another 2-3 years of potentially significant losses.
- **Supplemental Balancing Reserve (SBR)** – This winter National Grid brought forward the introduction of its new Supplementary Balancing Reserve (SBR) to procure additional capacity predominantly due to the recent outages for the nuclear fleet. The annual procurement of SBR provides additional revenue which could make operation in the short term financially viable. However, there will again be significant competition for these contracts, and it is not clear that SBR will have the ability to procure sufficient capacity for all the existing plant.

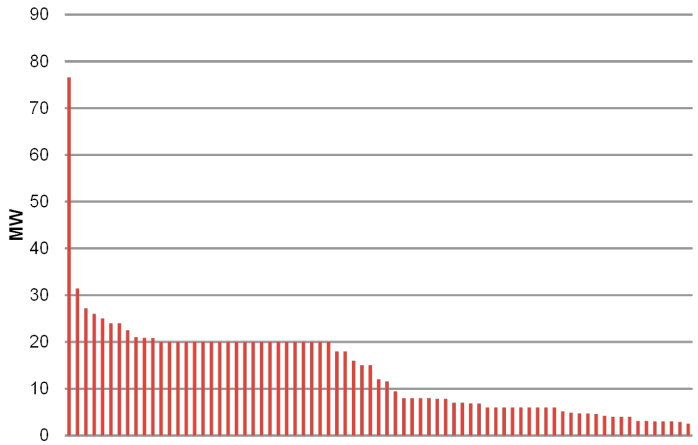
- **Trading of capacity contracts** – Secondary trading allows contracts to be exchanged between operators. If any plant which cleared the auction needs to trade out of their obligation, for example because of construction delays in a new plant, these units could benefit in this market.
- **Sale** – While the current operators of these plants may not believe them to be profitable in the medium term it is clear from the auction results that there is a diverse range of views within the market. This could create opportunities for sale of the asset to those with a more optimistic view on its future.
- **Closure**

With these options available, and in particular given current input price volatility and uncertainty, we may not see announced closures in the near future, as people adopt a wait and see approach. If we see significant closures the tightening margins in the GB market will lead to higher wholesale prices and potentially make the remaining units profitable in the near term. There is a risk that this creates a stalemate which could prove expensive for the operators but will help in maintaining GB system security.

What can we take from the large number of small new build contracts?

The auction has also brought forward significant interest from parties with small new build generation projects. Of the 116 prequalified new build projects under 100 MW, 75 received capacity agreements. This totalled 1,045MW of capacity, and was around 35% of the total new build capacity procured. The average size of new build unit receiving an agreement (excluding the Trafford CCGT plant) was just under 14MW.

Installed capacity of small units clearing in auction



Source: CM Register

What does the relative success of these smaller new build units in securing capacity agreements mean?

- **Greater diversity in ownership.** At least 17 different companies sponsored this capacity (none of whom are big six players). And, among these are some who secured capacity agreements on a number of plant and therefore have a material portfolio (e.g. UK Power Reserve with 365 MW of new build units with capacity agreements).
- **Sponsors may now see smaller, less capital intensive projects as preferable to building CCGT units.** The total capacity of the smaller units is greater than some new build CCGT projects which did not clear in the auction (for example, ESB's Carrington project at 910 MW or SSE's Abernedd project at 500 MW). This outcome could reflect two things:
  - **The changing nature of the power system.** As renewables penetration increases, conventional plant load factors reduce and it may no longer be economic to build more efficient but more capital intensive CCGT plant, as the plant may not run often enough to recover its higher up-front investment costs.
  - **A reflection of policy choices.** By making capacity revenue so much "safer" than energy revenue (capacity revenue for new plant is fixed for 15 years compared to the volatility of the energy market), plants which rely proportionately more on capacity (rather than energy) revenue to recover investment costs will have a much lower cost of capital, and so can bid more keenly in the auction. In doing so it may be that policymakers have inadvertently built an inherent preference for smaller, less efficient plant into the regime.
- **Potential for lower costs for National Grid in flexibility markets such as Short Term Operating Reserve (STOR).** In the search for revenues to supplement those under capacity agreements, balancing services contracts may be a more natural place than the energy market for small generation plant to look. Given their diverse ownership, STOR could therefore become more competitive post 2018. Furthermore, since these plant have already committed to be on the system, the costs which they would be seeking to recover through a STOR contract may be lower than those for a plant without a capacity agreement (which may be seeking to recover more capital costs through STOR payments).

Looking forward

Looking to next year's auction, it is unclear to what extent the results of this year's auction will be a reliable guide to future outcomes. In particular, the next auction is likely to be quite different for two reasons:

1. Different dynamics

The first auction was unique in that existing plant were allowed to bid in the losses they would incur in the energy market in the next few years as a result of committing to being available in 2018. This meant that a large number of existing plant acted as price makers in the first auction. Looking to the next auction, existing plant that received capacity contracts are now likely to be price takers rather than price makers in the auction (and hence will not set price).

Consequently, the shape of the part of the supply curve which sets price is likely to be determined by the profile and quantity of new build projects. Moreover, depending on NG's forecasts of residual demand and operator closure decisions in the light of the outcome of the first auction, the degree of tightness may be different, which may also result in a significantly different capacity price being set. Overall, all other things being equal (including, importantly, spreads), substantial operator closure decisions might lead us to anticipate that capacity prices next year could be higher.

2. Rule changes

There are two rule changes that may also significantly impact on the auction dynamics and outcomes.

The first of these relates to interconnectors. Unlike in the first auction, interconnectors will be allowed to participate in next year's auction. This has the potential to add materially to potential capacity bidding into the auction. We note however that in reality the materiality of the impact of allowing interconnectors to participate will depend on how they are derated. If interconnectors were to see their capacity significantly derated then their impact on the auction would be considerably reduced.

We also understand that DECC are considering further changes to the rules in relation to new capacity. In particular, DECC are considering incorporating an indifference curve in the auction mechanism. They have confirmed that this will not be introduced for the 2015 auction, so it remains to be seen whether and how this will happen. But, depending on the precise mechanism that is chosen, this may reduce the certainty afforded to new build regarding capacity payments under their 15 year contract, and may consequently make the outlook for new plant less attractive. It is unclear as to how exactly this might affect auction outcomes. For example, it might result in less new build capacity being bid into the auction mechanism. Alternatively, it might see new build capacity build this additional risk factor into their auction bids.

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 Brussels, Cologne, Dublin, London and Madrid. 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.

Contact us

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