ENERGY MARKETS

- Capacity Market
- Power Purchase Agreements

Capacity Market

KEY FEATURES

- An income stream in return for delivering capacity in times of network stress
- Eligible assets include CHP generation, energy storage and demand side response
- Capacity market agreements range from 1 year to 15 years
- Capacity auctions for 1 year ahead and 4 years ahead markets
- Penalties for non-delivery but these can be mitigated through secondary trading

1. What Is the Capacity Market?

The Capacity Market is a potential additional income steam for hospital sites that are already running controllable generation equipment such as CHPs or are planning to do so. While there could be other potential ways in which Trusts could participate in the Capacity Market, such as through use of backup generators, UPS system or demand-side response, these would potential reduce site resilience.

The Capacity Market was introduced as part of the UK Government's Electricity Market Reform (EMR) package, with the aims of securing the future supply of electricity in the UK.

It is a technology-neutral scheme designed to secure a predetermined amount of capacity each year, at the best possible cost for the end customer.

A capacity provider will receive a predictable income stream in return for National Grid being able to call on it to deliver capacity in times of stress on the network. As such the Capacity must be controllable, as it needs to be generating a specified amount when called upon, and not receiving low carbon support, which rules out most renewable generation.

The Capacity Market requires specialist knowledge of the rules and regulations, which is unlikely to be readily found with in most Trusts. It is therefore likely that a third party will be required for Trust to participate in the scheme.

2. Eligibility to participate

The Capacity Market is open to existing and new capacity providers, including Trusts with existing and new:

- Combined Heat and Power (CHP) systems.
- Energy storage systems.
- Demand-Side Response (DSR) providers (organisations that can reduce their demand when requested).

Although the Capacity Market is technology-agnostic, there are some key criteria for being eligible to participate which Trusts need to consider:

- Minimum size 2MW (aggregation with other units at other sites is possible).
- Should not be receiving other low carbon supports (such as FIT, CFD, ROCs etc.).
- Not receiving long term STOR contracts.

Embedded generation (i.e. connected to the distribution network) can enter either as DSR or existing generation. Although the minimum size to enter is 2MW, it is possible to aggregate several smaller assets into a single Capacity Market Unit (CMU) to reach this threshold. This can be achieved across the whole Trust portfolio or aggregators can be used to join up with other small generators looking to enter the capacity market.

3. Participation

Organisations that enter the Capacity Market, whether generation or DSR, are known as Capacity Market Units (CMUs). All CMUs go through a prequalification and auction process.

4. Prequalification

All prospective Trust CMUs that wish to enter the auction and obtain a CMA will first need to prequalify the asset, to allow the EMR Delivery Body to undertake certain checks to ensure the CMU will be able to meet its obligation and is eligible to participate. Prequalification can only take place during a predefined window each year, which is open for 10 weeks over the summer months. Each CMU needs to apply separately, and an application is required for each auction the CMU intends to enter. The prequalification process requires each prospective CMU to provide information to verify that the CMU is eligible to participate.

Key information required includes:

- Copies of Connection Agreements.
- Single line diagrams of CMUs.
- Review of metering.
- Calculation of capacity figure and evidence of recent highest outputs.

In most cases for existing hospital generation new metering will need to be installed. However, this does not need to occur until after successful bidding and therefore does not pose an upfront cost risk. The metering accuracy required for the Capacity Market is greater than normal utility meter accuracy. It requires the meter accuracy to be better than 1.5%, compared to a typical utility meter accuracy of around 2%.

After the prequalification window closes, the EMR Delivery Body will check all the information provided and several weeks later will either confirm successful prequalification and entry into the auction, or reject the CMU. If a CMU is rejected it will have the option to go through an appeal process to rectify the reasons for the rejection.

5. Auction

The Capacity Market auction is a competitive process designed to award the required capacity for each delivery year at the lowest cost to the end consumer. The main risk is on the amount actual secured for the capacity.

There are two auctions each year, one for a four-year-ahead auction (T-4) and one for the year-ahead auction (T-1). For example, in 2017 the two auctions taking place will be for capacity delivery year October 2021 to September2022 (T-4) and for delivery year October 2018 to September 2019 (T-1).

The EMR Delivery Body will aim to secure the majority of the capacity in the T-4 auction, to ensure security of supply, with a much reduced amount of capacity being left to the T-1 auction.

If a CMU has already received an agreement for a delivery year in the T-4 auction, it cannot subsequently enter the T-1 auction for the same delivery year. However, T-4 auctions generally deliver a higher price as the capacity is being guaranteed further in advance.

Results. National Grid will notify all bidders whether they have been successful or not within 24 hours of the auction closing, and at the same time will notify the Government. The final results will be made public within eight working days of the auction closing.

Past auction results. The Capacity Market has seen several auctions already, with varying clearing prices, as shown in the table below.

Capacity Market auction prices

Delivery year	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
T- 4 £/kW - Cleared price		■ £19.40	■ £18.00	■ £22.50	■ £8.50	n/a	■ £15.97
T- 1 £/kW - Cleared price	■ £6.95	■ £6.00	■ £0.77	■ £1.00			

● Auctions in which customers could participate

■ Auction has already taken place. Now closed

Due to a ruling by the General Court of the Court of Justice of the European Union the Capacity Market was suspended at the end of 2018. The Court did not find the design of the GB Capacity Market to be incompatible with State aid guidelines. This causes a pause in all payments and auctions while the UK government worked closely with the European Commission to resolve the issue. This cause the lower clearance prices and a missed T-4 auction for 2022/23. The missed T-4 auction was replaced by a T-3 auction which cleared £6.44.

Example of Capacity Market Income:
*A 2MW CHP that had participated in the T-4 auction for 2020/2021 delivery year would have received: £22.50/kW * 2,000 = **£45,000***

The Capacity Market payments are issued monthly from the start of the delivery year, to a set schedule, so are a predictable source of revenue for participants.

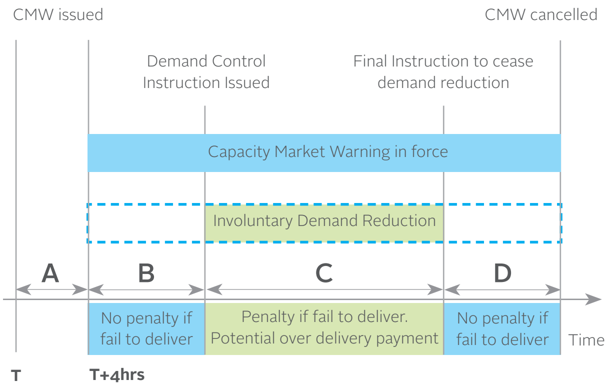
6. Delivery

Capacity market delivery year. All CMUs which are successful in a Capacity Market auction will receive the CMA which details their obligation to deliver a certain amount of capacity in the case of a 'system stress event' for the relevant delivery year. All CMUs will need to be available at all times (24 hours, 365 days a year) in case the System Operator (National Grid) issues a Capacity Market Warning (CMW). This is a signal to all participants that a system stress event is expected and it will be issued four hours in advance. Currently, there is no limit on how long a CMW can be issued for, as the rules do not determine a maximum length.

Capacity market penalties for non delivery. If any CMW periods become a system stress event through further notification, any CMU not delivering their obligation will be subject to penalties. It is important to note that not every CMW will become a system stress event and CMUs are not penalised on whether they react to these warnings.

The penalties only apply if a CMW has been issued and subsequently a system stress event occurs. To ensure CMUs meet their Capacity Market obligation, it is advisable to ensure they can react to all CMWs.

All penalties are linked to a CMU's Capacity Market payment, the Penalty Rate for a missed stress event is 1/24 of the of this. In any one month, a CMU can be penalised a maximum of 200% of a potential monthly payment. However, over the Delivery Year the sum of all monthly penalties cannot be greater than the sum of all the CMU's Capacity Payments (i.e. capped at 100%).



Source: National Grid, https://www.emrdeliverybody.com/CM/Delivery.aspx

7. Potential impact on MCPD

Participation in the Capacity Market can bring forward the compliance date for the Medium Combustion Plant Directive (MCPD) requirements as well as any associated costs (EA applications fees etc.). New CHPs will already need these in place and therefore there would be no change.

There is also the possibility that additional work would need to be carried out in order to obtain the relevant EA permit such as flue dispersion modelling. Other potential impacts of the MCPD on older high NOx CHPs is that they may need to be detuned in order to achieve the required NOx levels. This would slightly reduce the efficiency and output of the unit.

8. Secondary trading

There are potentially two other options available to Trust that are in line to receive penalties or are no longer able to meet their obligation - volume reallocation, and physical trading.

Volume reallocation. Once a stress event has occurred, CMUs that have over-delivered on their obligation can transfer this capacity to another CMU that has under-delivered. The CMU which has under-delivered will not receive any penalties, as it will have met its obligation through a combination of its own capacity output and that of the nominations from other CMUs. This process is managed by the Capacity Market Settlement Body.

Physical trading. Physical trading allows any CMU with an obligation to sell the obligation in its entirety to another CMU and completely remove its participation in the Capacity Market. The original holder of the CMA would no longer receive any payment and completely eliminates any exposure to penalties. Any potential CMU wishing to purchase a CMA will have needed to prequalify and cannot have already received an obligation for the capacity. The trading of CMAs can take place once the T-1 auction for the delivery year is complete, up to the end of the delivery year.

References

- ***Ofgem, Capacity Market Rules*** - *https://www.ofgem.gov.uk*