

## Capacity Market Auction Guidelines

2023 one year ahead Capacity Market Auction (T-1)

Delivery year 2024/25

2023 four year ahead Capacity Market Auction (T-4)

Delivery year 2027/28

18<sup>th</sup> July 2023

V1.00

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# Capacity Market Auction Guidelines

These Auction Guidelines must be used in conjunction with the Electricity Capacity Regulations 2014 (with subsequent amendments) and Capacity Market Rules 2014 (with subsequent amendments); failure to do so may result in unsuccessful Prequalification or failure to gain a capacity agreement in the Capacity Auction.

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# Executive summary

The Electricity Capacity Regulations 2014 (“the Regulations”) and the Capacity Market Rules 2014 (“the Rules”), both as amended, oblige National Grid Electricity System Operator Limited in its role as Delivery Body to publish Auction Guidelines. This document has been prepared to discharge that obligation.

The Regulations, the Rules, and these Auction Guidelines set out the requirements for market participants wishing to enter the Capacity Market and for owners of Mandatory CMUs not wishing to enter the Capacity Market. In addition to these obligatory Auction Guidelines, the Delivery Body is also preparing non-statutory user support guides, providing information and training which is referenced in this document.

Capitalised terms used in these Auction Guidelines shall have the meanings given in the Rules.

In accordance with the Regulations and Rules these Auction Guidelines provide the following specific information for the One Year Ahead Capacity Auction for Delivery Year 2024/25 (T-1) and the Four Year Ahead Capacity Auction for Delivery Year 2027/28 (T-4).

- The date on which the Capacity Auctions will start
- The timetable for submission and determination of applications
- Details of how to apply to prequalify to participate in the Capacity Auction
- Instructions on using the EMR Delivery Body Portal and the IT Auction System
- The Auction Parameters determined by the Secretary of State
- The approved De-Rating Factor for each Generating Technology Class, each DSR CMU and each Interconnector CMU
- Contingency arrangements for auction bidding, in the event of failure of a participant’s access to the system

Other supporting documentation will be provided in the form of:

**Pre-Auction Activities guidance** – these slide packs were available following Prequalification Results Day 2022 and are applicable to all Prequalified CMUs and will be available on the [EMR Delivery Body Portal](#) at the appropriate time. Here you will also find previous versions published after PQRD 2022 for reference.

**Pre-Auction Activities Guidance Videos** – there are guidance videos on how to complete the relevant tasks outline within the Guidance slide packs published in 2022. Updated versions of the slide packs will be made available post-PQRD 2023. These videos are available on our YouTube Channel [here](#).

**Pre-Auction Activities Webinar** – the webinar, produced by the EMR Delivery Body Capacity Market Auction Team will delve into more depth regarding certain Pre-Auction Activities to be completed prior to or during the Confirmation of Entry window, as well as providing information regarding the Auction System. The previous version published in 2022 is available [here](#) and on our YouTube Channel [here](#).

**System-Specific Training** – Follow the webinar detailing key Auction information including the use of the Auction System will be arranged where successful applicants could use the Auction system in a sandbox environment

This system will be accessed via the EMR Delivery Body Portal at [www.emrdeliverybody.com](http://www.emrdeliverybody.com)

## All Auction Participants please be aware:

We have been instructed by BEIS that, if the Remaining Capacity exceeds the capacity determined by the Demand Curve at the end of the Bidding Round where the Bidding Round Floor Price is £0, the auction does not clear and no agreements will be issued. We would like to remind Bidders that if an Auction Participant fails to enter a bid, this is interpreted to be a bid at £0 (zero price bid) and would therefore not lead to an agreement should the auction fail to clear.

# 1. Auction Data

## 1.1 Auction Timetable

**Table 1** provides the timetable for the One Year Ahead Capacity Auction for 2023/24 (T-1) and the Four Year Ahead Capacity Auction for 2027/28 (T-4).

Auction	T-1	T-4
Prequalification Window opens	26/07/2023	26/07/2023
Prequalification Window closes	19/09/2023	19/09/2023
Prequalification Results Day (post disputes)	31/10/2023	31/10/2023
Notification of Prequalified CMUs pursuant to Rule 5.5.10(b) and associated update of affected Auction Parameters	T-3 weeks 30/01/2024	T-3 weeks 06/02/2024
Notification of updated Auction Parameters and confirmation of the conditional Prequalified Applicants who have fully Prequalified pursuant to Rule 4.6.3	T-3 weeks 30/01/2024	T-3 weeks 06/02/2024
Confirmation of Entry and decisions under Rules 5.5.11, 5.5.13 and 5.5.14 notified to DB	T-15 to T-10 30/01/2024 to 06/02/2024	T-15 to T-10 06/2/2024 to 13/02/2024
<b>Mock Auction</b> – users' login, check CMU details, run through a scripted auction in readiness for live auction	T-8 days 08/02/2024	T-8 days 15/02/2024
Auction start (T)	20/02/2024	27/02/2024

**Table 1.** Auction timetable

## 1.2 Auction Parameters

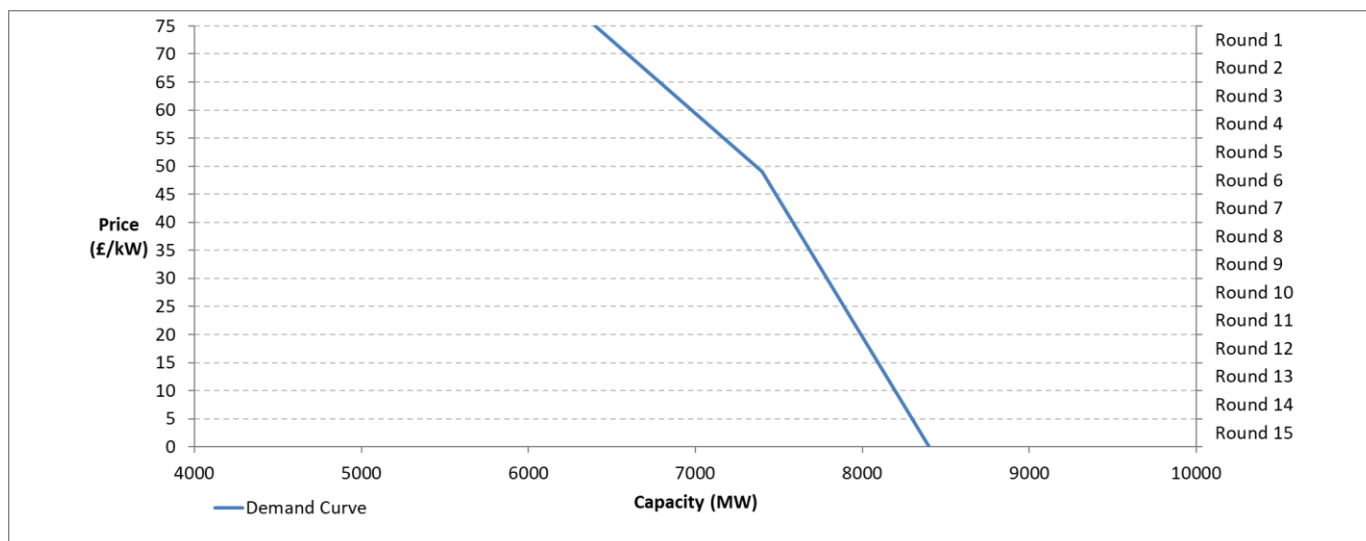
The Auction Parameters for each Capacity Market Auction are determined by the Secretary of State, informed by analysis undertaken by National Grid ESO. The Secretary of State has specified the quantity of capacity required at certain prices during the Auction. These parameters are given in **Table 2**.

Auction	T-1	T-4
Target capacity	7.4 GW	43.0 GW
Demand curve coordinate – volume at price cap	6.4 GW	41.5 GW
Demand curve coordinate – volume at £0/kW	8.4 GW	44.5 GW
Reliability Standard	3 hours LOLE	3 hours LOLE
Price cap	£75 /kW/year	£75 /kW/year
Net CONE	£49 /kW/year	£49 /kW/year
Price Taker Threshold	£25 /kW/year	£25 /kW/year
15 Year Minimum £/kW Threshold	N/A	£325/kW (De-rated capacity)
3 Year Minimum £/kW Threshold	N/A	£165/kW (De-rated capacity)
Indexation base period	N/A	2022/23
Round price decrement	£5	£5

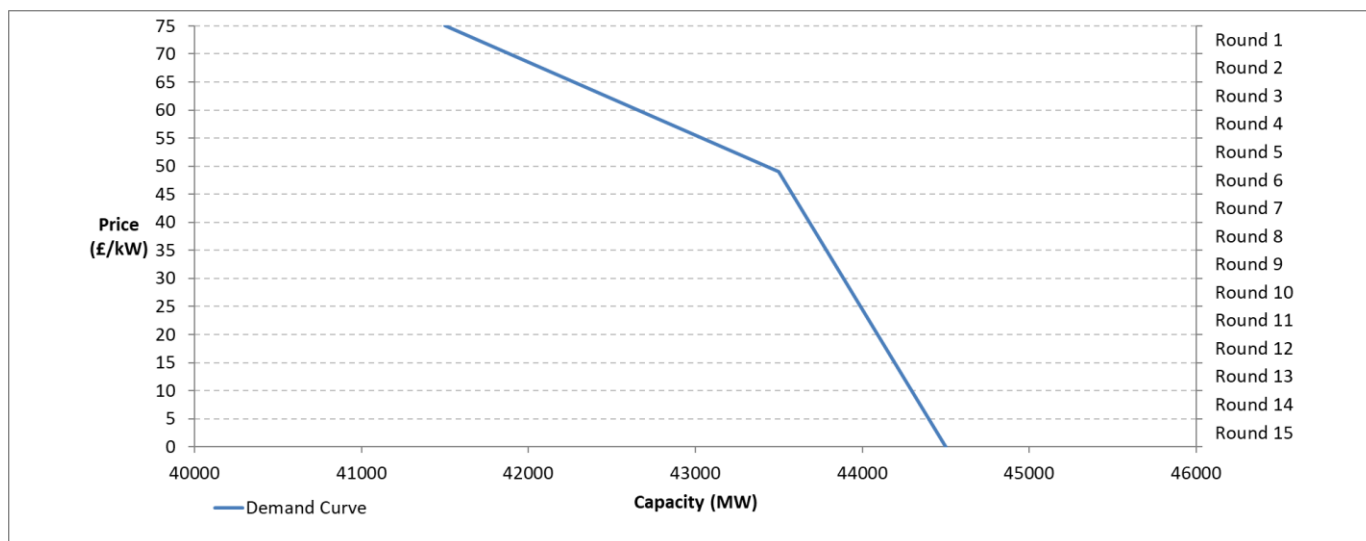
**Table 2.** Auction Parameters



The ascending capacity sought at descending prices is illustrated in the Demand Curve (**Figure 1** below). The Demand Curve captures the trade-off between the cost of capacity and the security of supply. The Demand Curve is sloped so that more capacity is procured as the price descends, reflecting the changing appetite for capacity at different prices. The key coordinates for this are supplied by the Secretary of State.



**Figure 1.** T-1 DY2024/25 Capacity Auction Demand Curve



**Figure 2.** T-4 DY2027/28 Capacity Auction Demand Curve

### 1.3 De-rating Factors

The De-Rating Factor for each Generating Technology Class and DSR have been calculated in accordance with the methodology in Rule 2.3.5. and are explained in more detail within the Electricity Capacity Report (ECR). These factors are set out in **Table 3** overleaf.

The interconnector de-rating methodology is detailed in the Secretary of State (SoS) Confirmation of Capacity Auction Parameters communicated on the 18<sup>th</sup> of July, the same date that the ECR/AG is published. Please note that the De-Rating Factors for Secondary Trading Entrants applying for the Delivery Year 2024/25 will be the T-1 2024/25 Auction De-Rating Factors.

Name for Technology Class	Plant Types Included	De-rating factors T-1 & ST (%)	De-rating factors T-4 (%)
Oil-fired steam generators	Conventional steam generators using fuel oil	94.35	94.35
Open Cycle Gas Turbine (OCGT)	Gas turbines running in open cycle fired mode	94.35	94.35
Reciprocating engines <sup>1</sup>	Gas turbines running in open cycle fired mode Reciprocating engines not used for auto-generation	94.35	94.35
Nuclear	Nuclear plants generating electricity	78.00	78.00
Hydro (excluding tidal / waves / ocean currents/ geothermal / storage)	Generating Units driven by water, other than such units: (a) driven by tidal flows, waves, ocean currents or geothermal sources; or (b) which form part of a Storage Facility	91.20	91.20
	Storage Duration: 0.5h	05.71	03.87
	Storage Duration: 1h	11.34	07.74
	Storage Duration: 1.5h	17.05	11.52
	Storage Duration: 2h	22.67	15.39
	Storage Duration: 2.5h	28.38	19.26
	Storage Duration: 3h	34.10	23.04
	Storage Duration: 3.5h	39.63	26.91
	Storage Duration: 4h	44.60	30.78
	Storage Duration: 4.5h	48.57	34.65
	Storage Duration: 5h	51.88	38.43
	Storage Duration: 5.5h	54.93	42.12
	Storage Duration: 6h	58.06	45.80
	Storage Duration: 6.5h	61.10	49.49
	Storage Duration: 7h	64.14	53.08
	Storage Duration: 7.5h	67.27	56.77
Storage Duration: 8h	94.37	60.36	
Storage Duration: 8.5h	94.37	63.86	
Storage Duration: 9h	94.37	94.37	
Storage Duration: 9.5h+	94.37	94.37	
Storage	Conversion of imported electricity into a form of energy which can be stored, the storing of the energy which has been so converted and the re-conversion of the stored energy into electrical energy Includes hydro Generating Units which form part of a Storage Facility (pumped storage hydro stations).		
Combined Cycle Gas Turbine (CCGT)	Combined Cycle Gas Turbine plants	91.59	91.59
Combined Heat and Power (CHP)	Combined heat and Power plants (large and small-scale)	91.59	91.59
Biomass <sup>2</sup>	Conventional steam generators using biomass	88.52	88.52

<sup>1</sup> There is no Transmission connected data for these technologies (as per 2.3 of Capacity market rules) the de-rating is based on the closest transmission technology. (Biomass and EFW comes from coal, Reciprocating comes from OCGT)

<sup>2</sup> There is no Transmission connected data for these technologies (as per 2.3 of Capacity market rules) the de-rating is based on the closest transmission technology. (Biomass and EFW comes from coal, Reciprocating comes from OCGT)

Energy from Waste <sup>2</sup>	Generation of energy from waste, including the generation of energy from: (a) conventional steam generators using waste; (b) anaerobic digestion; (c) pyrolysis; and (d) gasification	88.52	88.52
DSR	Demand Side Response	79.02	79.02
Intermittent Renewable Technologies	Onshore Wind	08.40	07.03
	Offshore Wind	11.52	08.69
	Solar PV	05.08	06.35
Interconnectors	IFA (France)	-	59.00
	IFA2 (France)	-	60.00
	Eleclink (France)	-	64.00
	BritNED (Netherlands)	-	61.00
	Greenlink (Republic of Ireland)	-	54.00
	Moyle (Northern Ireland)	-	54.00
	EWIC (Republic of Ireland)	-	54.00
	NemoLink (Belgium)	-	64.00
	NSL (Norway)	-	83.00
VikingLink (Denmark)	-	55.00	

**Table 3.** De-Rating Factors by Generating Technology Class



## 2. Processes

### 2.1 Prequalification

The EMR Delivery Body uses an online system for Applicants to submit Applications and supporting information for Prequalification.

This system can be accessed via the EMR Delivery Body Portal: <https://www.emrdeliverybody.com/cm/home.aspx>.

#### 2.1.1 Prequalification guidance

Further information on the submission of Prequalification information and the overall process is included in the [Capacity Market Prequalification guidance document 2023](#) which also includes:

- Instructions on how to use the EMR Delivery Body Portal for Prequalification activities
- How to Register, including how to complete security and identity checks for all individuals that require access to the EMR Delivery Body Portal System
- Where to access the relevant forms to be completed by Applicants as part of the Prequalification process
- Required file formats for the uploading of any supporting documentation

#### 2.1.2 Capacity Market Operational Plan

The [Capacity Market Operational Plan](#) identifies the key milestones and activities required to deliver the Capacity Market Auctions in 2024. The timeline of operations for the 2023/24 Capacity Market is based on the Capacity Market Regulations and Rules and covers the T-1 and T-4 Auctions.

### 2.2 Capacity Market Register

The Capacity Market Register for each Auction can be accessed on the [EMR Delivery Body website](#).

### 2.3 Notifications

All notifications from Applicants should be submitted to the Delivery Body through the EMR Delivery Body Portal. Applicants are required to first Register to use the EMR Delivery Body Portal before notifications can be issued and received.

#### 2.3.1 Prequalification results

The EMR Delivery Body has provided notification to each Applicant that submitted an Application informing them if they were successful or otherwise by 5pm on Prequalification Results Day.

## 3. Auction

### 3.1 What is the Auction?

The Capacity Market Auction is the competitive process to award Capacity Market Agreements to try and meet the target capacity for the relevant Delivery Year. Capacity market Units (CMUs) which have been Prequalified and if necessary have confirmed entry will enter into the Auction.

**Table 4** indicates the relevant start dates of each Capacity Market Auction scheduled, including the relevant start times. The Auction will continue until it clears or the end of the final round is reached and the Auction has not cleared (see bold paragraph), this must be within 2 working days of Auction commencement.

The Capacity Auction is a descending clock auction (also known as “pay as clear” or “Dutch auction”), where Bidders withdraw capacity as the price drops subject to the conditions set out in Chapter 5 of the Rules. This means:

- The Auction starts at a price cap set out in section 1.2 of this document
- The price is reduced in each round by a set decrement
- Bids must be placed in fixed windows
- Participants must submit an Exit Bid to leave the Auction
- The Exit Bid is the minimum price at which you would accept a Capacity Agreement
- The Auction clears when the capacity that remains in the Auction is less than the capacity sought

All successful CMUs receive the same agreement price (the clearing price). The Auction will start at the Price Cap indicated in **Table 2** and will have the price decrement also indicated in **Table 2**. **Table 4** indicates how the Auction is structured in terms of the rounds, an Auction table is provided in Appendix A. The Auction will continue as scheduled over the two days until a “Clearing Round” is reached whereby at the end of the round the supplied capacity is less than the capacity demanded. At the end of this round the Clearing Price will be calculated, anyone still in the Auction below the Clearing price will be eligible for an Agreement.

Provisional Capacity Auction results are notified to Bidders within 24 hours of the Capacity Auction clearing. Results are published, and the Capacity Market Register is updated, within 8 working days subject to Rule 5.10.6.

**We have been instructed by BEIS that, if the Remaining Capacity exceeds the capacity determined by the Demand Curve at the end of the Bidding Round where the Bidding Round Floor Price is £0, the auction does not clear and no agreements will be issued. We would like to remind Bidders that if an Auction Participant fails to enter a bid, this is interpreted to be a bid at £0 (zero price bid) and would therefore not lead to an agreement should the auction fail to clear.**

The T-1 and T-4 auctions will be a Non-Variable Price Duration Auction. All successful Bidders receive the Clearing Price. **Table 4** below sets out further information pertaining to each Auction.

Parameters	T-1	T-4
Non-Variable or Variable Price-Duration auction	Non-Variable Price Duration auction	
Bidding round price spread	£5/kW/year per round	
Auction start time	20/02/2024 09:00	27/02/2024 09:00
First bidding round (of both days) duration	60mins	
Bidding round duration thereafter	30mins	
The time between rounds (recess)	15mins	
Number of auction rounds per day	Day1 10 rounds   Day2- 5 rounds	
Number of auction days planned	2 days	

**Table 4.** Auction-specific summary information

The IT Auction System is an online system, accessed by standard web browsers. Prequalified Applicants will be provided with access details to allow them to enter via the EMR Delivery Body Portal. Within the IT Auction System, bidders will be able to enter and modify their exit bids and eligible bidders will be able to change their agreement length by entering data directly on the online system.

**Training** on the use of the system, including placing Exit Bids, will be available in advance of the system going live. Training will commence from January 2024 and will include a bidder manual, screencasts, user trials and a mock auction.

**Table 5** summarises the activities participants must carry out during T-15 to T-10 window for the T-1 and T-4 Auctions. More details and guidance will be available nearer to this time.

Activity	Task	System to use
Bidder setup	Amend bidding groups	
	Setup Authorised Individuals for bidding (Minimum recommendation of 2 AI's/ Maximum per Bidding Group of 4)	
Confirmation of Entry	Existing CMUs: check Price Maker/Taker status	<a href="#">EMR Delivery Body Portal</a>
	New Build/Refurbishing CMUs: to check the length of the agreement and Confirm Entry	
	DSR CMUs: check capacity, Agreement Length and Confirm Entry	
Mock Auction	Login to Auction System and check CMU details	
	Participate in Mock Auction	<a href="#">The Auction System</a>
Live Auction	Participate in Auction	

**Table 5.** Summary of activities for participants to carry out prior to the Auction

### 3.2 Bidding Company and Authorised Individual Management

Bidding Companies will be automatically created in the EMR Delivery Body Portal for each participant who has been pre-qualified or conditionally pre-qualified for the relevant auctions. These will be created at sub-company level. If the participant only has one company, the Bidding Company will be at the main company level.

Main Admin users of the main/sub-company, will be the default Authorised Individuals (AI's) for access to the Auction System. **A minimum of 2 Authorised Individuals is recommended by the EMR Delivery Body**, however, Bidding Companies are able to have a maximum of 4. Please refer to [the Pre-Auction Activities guidance document](#) for managing Bidding Companies and Authorised Individuals.

### 3.3 Contingency Bidding Arrangements

This section describes the backup systems referred to in Rule 5.5.21 and which are to be utilised in the circumstances where a Bidder is unable to submit a Duration Bid Amendment or Exit Bid through the IT Auction System due to a technical fault in their connection to the system. In such circumstances, the Auctioneer can place bids on behalf of Authorised Individuals (AI's) by telephone. AI's are the named users registered to bid Prequalified CMUs. This is only available as a contingency arrangement in the event of system loss.

The procedure for placing bids by telephone will be as follows:

- The AI is unable to place bids on IT Auction System
- The AI contacts Auction Manager by telephone
- Using a pre-defined unique code, the identity of the bidder is confirmed by the Auction Manager
- The AI requests the Auction Manager to place a bid in that round
- The Auction Manager enters the bid in the auction system on behalf of the bidding company and confirms, in the call the value entered
- All telephone calls will be recorded and a confirmation receipt can be requested
- The placing of the bid on the auction system on behalf of the Bidding Company will be shown in the audit log

**Note: It is recommended that the identity verification codes (instructions in the user guide for the auction system) are printed off and retained by participants before the auction starts as they would be needed for the auctioneer to authenticate the caller in the event of IT failure or disaster recovery. Telephone instructions cannot be actioned unless the caller can provide the relevant unique identification code.**

### 3.4 Auction Monitor

As per Rule 5.14 the EMR Delivery Body must appoint a third party to monitor the conduct of each Capacity Auction (an "Auction Monitor"). The Auction Monitor must carry out the role as described in the Rules.

The Auction Monitor must report to the Secretary of State, with a copy to the Authority, within 2 Working Days of the conclusion of the Capacity Market Auction on whether the procedures in the Rules and Auction Guidelines have been properly followed in the conduct of the Capacity Market Auction. The identity of the Monitor is made available 15 days before the start of the Capacity Market Auction.

### 3.5 Reporting of Results

#### 3.5.1 Intra-Round reporting

As per Rule 5.5.18; prior to the start of each round the high-level round results will be made publicly available. This will include the Bidding Round Price Spread, Potential Clearing Capacity at the price floor for that round and Excess Capacity rounded to 1GW for the T-4 auction. **The Excess Capacity will be rounded to 100MW for the T-1 auction due to the lower demand.**

The EMR Delivery Body Portal is used to display these round updates.

#### 3.5.2 Detail around the Auction reporting following the clearing round

To allow participants, the opportunity to prepare for the release of results the below describes the timeline and process which differs depending on the round that clears.

On the day that the auction clears, the provisional results will be published after markets have closed:

- EMR Delivery Body publishes on the website the Clearing Round price range within the cleared round recess.
- EMR Delivery Body sends the individual Provisional Results to bidders via the auction system by 19:30 and also publishes the Clearing Price on the EMR Delivery Portal.
- EMR Delivery Body will endeavour to upload the full provisional report to the EMR Delivery Body website around 19:00.

The EMR Delivery Body must within 24 hours of the Capacity Market Auction clearing notify Bidders whether, based on the Provisional Results, they have been provisionally awarded a Capacity Agreement concerning, a Bidding CMU. Such notification is provisional only and does not constitute notification of a Capacity Agreement.

#### 3.5.3 Final results

The Auction Monitor will send a report to BEIS (and copy to Ofgem) with their findings within 2 working days following the Capacity Market Auction and unless instructed otherwise at 8 working days after the auction the EMR Delivery Body publishes the final results to Bidders (this becomes the 'Auction Results Day'). The result is final when it is entered into the Capacity Market Register. Within 8 working days of the Auction Results Day, the EMR Delivery Body notifies each bidding CMU whether or not they have been awarded a capacity agreement.

### 3.6 What happens during the Capacity Market Auction?

The Capacity Market Auction is held on a web platform and can only be accessed by the Bidders selected in advance by each Applicant. Please refer to the [Auction System User Manual and in the online tutorials](#) for more information on how to use the Auction System.

#### 3.6.1 Start of the Capacity Market Auction

When the Capacity Market Auction starts, each Bidder will see their CMUs, the agreement lengths and the capacities as specified in advance of the Capacity Market Auction. Bidders are also strongly advised to print a copy of their Offline Verification Codes. These will be required if the Bidder needs to contact the Auctioneer via telephone. The Auctioneer will not be able to provide any assistance without first verifying the Offline Verification Code.

#### 3.6.2 During Bidding Rounds

During Bidding Rounds, participants will have the opportunity to:

- Submit Exit Bids that take effect in that Bidding Round
- Submit Exit Bids to take effect in a later round (a Proxy Bid)
- Amend or delete any Exit Bids

**A Bidder must place an Exit Bid to exit the Capacity Market Auction. If bidders do not place an Exit Bid, they will remain in the Capacity Market Auction and will be awarded an agreement.**

The minimum price specified by the Applicant at which they would seek an agreement is known in the Auction as an Exit Bid. Price Makers can submit Exit Bids at any price in the Capacity Market Auction.

### 3.6.3 Price Maker CMUs

A CMU's status as a Price Maker will have been confirmed in either the Applicant's notification of Prequalification Results; their notification of a Reconsidered Decision following a Tier 1 Appeal; or via notification from the EMR Delivery Body (if an Applicant subsequently provided a Price-Maker Memorandum and Certificate).

A Price Maker CMU is able to specify an Exit Bid at any price at or below the Price Cap in the Capacity Market Auction, and bids that have not yet been realised can be revised within rounds.

If the Capacity Market Auction continues past the round for which the Exit Bid was made, the CMU will be out of the Capacity Market Auction and if that round is not the Clearing Round then the CMU will not get a Capacity Agreement. If that round is the Clearing Round then the Exit Bid will be deemed a Relevant Exit Bid and will be considered in the clearing calculation.

If a Bidder does not enter an Exit Bid, they will receive a Capacity Agreement at the Clearing Price, subject to tie-break rules.

### 3.6.4 End of Bidding Round

At the end of each round, the Bidding window will close at which time bids will no longer be able to be amended or placed. During the recess, if the Capacity Market Auction continues, then the Auctioneer will post the results of the round that has just closed and announce the next bidding round.

### 3.6.5 Start of a new Bidding Round

The excess capacity at the start of the Bidding Round will be announced during the recess before the start of the next Bidding Round. The Auctioneer will announce the capacity required in line with the published Demand Curve. The next round will then be opened for Bidders in line with the Capacity Market Auction schedule (See Appendix A).

In accordance with the Rules, the excess capacity is rounded to the nearest 1GW in the Capacity Market Auction. For example, if the excess capacity is 1500.000MW, the bidders will see an excess capacity of 2GW stated. If the excess is 1499.999MW, the bidders would see an excess of 1GW stated.

### 3.6.6 End of the Capacity Market Auction

Once the Clearing Round has been identified, there will be no further rounds and the Capacity Market Auction will remain in recess. Within 24 hours Bidders will be notified of the Provisional Results for their CMUs via the Capacity Market Auction System (discharging EMR Delivery Body obligations under Rule 5.10.1). This will specify the Clearing Price for which a Bidder's CMU will have been awarded an agreement as well as the capacity and duration of the agreement. For the avoidance of doubt, you will only see provisional results for your own CMUs.

## 3.7 How and when does the Capacity Market Auction finish?

In the Clearing Round, the Capacity Market Auction will finish when there is more capacity demanded than supplied at the end of the Bidding round.

### 3.7.1 Capacity Market Auction Clearing

If a completed round is identified as the Clearing Round, then all the CMUs that have not been subject to an Exit Bid above the Clearing Round price floor will be eligible for an agreement. In addition to these units, the Auction System will also identify CMUs (if any) that submitted an Exit Bid in the Clearing Round are also eligible for an Agreement. In doing so, this will determine what the Clearing Price of the Auction is.

An Exit Bid which is made in the Clearing Round is known as a Relevant Exit Bid. Relevant Exit Bids are ranked by the following methodology and order

1. Price (lowest to highest)
2. Capacity Offered (highest to lowest)
3. Duration of Agreement (lowest to highest)
4. Lottery via a random number (lowest to highest)

**Table 6** overleaf demonstrates this Exit Bid ranking. In the event of a tiebreak, the system will use this hierarchy to decide who is eligible for an agreement.

Rank	CMU	Exit Bid	Capacity	Duration	Lottery
1	CMU 1	£6	100	3	5
2	CMU 2	£7	105	3	4
3	CMU 3	£7	100	1	3
4	CMU 4	£7	100	3	1
5	CMU 5	£7	100	3	2

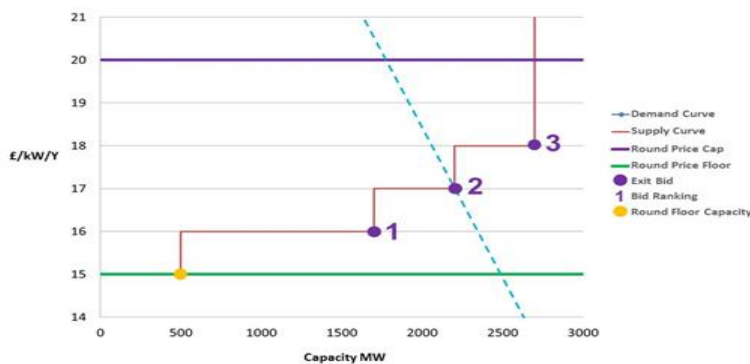
**Table 6.** Exit Bid ranking example sorting bids by price, capacity, duration and then via lottery. CMU 5 is not eligible for an agreement.

When the Capacity Market Auction clears, there are two possible scenarios. The Capacity Market Auction System will first check if there has been an Exact Match between the capacity supplied and the capacity demanded at a particular price within the round. If there has not been an Exact Match, it will assess if over-procuring or under-procuring capacity would be most economically beneficial for the consumer. This is calculated using the Net Welfare Algorithm (NWA).

Once the Clearing Round has been identified, the system will determine if the Capacity Market Auction has cleared via an Exact Match, or if it needs to apply the Net Welfare Algorithm. To establish how the Capacity Market Auction has cleared, the system will first calculate the capacity remaining at the end of the Clearing Round (the total Capacity of all CMUs that have not exited the Auction at this point).

### 3.7.2 Exact Match

After the system has calculated the capacity remaining at the end of the Clearing Round, it will then work backwards up the supply curve to add back the Relevant Exit Bids in order from the highest ranked to the lowest ranked in order to determine if it can establish a point on the supply curve that exactly meets a point on the Demand Curve (**Figure 2**)



**Figure 2.** An example of a Clearing Round where there is an exact match. The starting point for the calculation is represented by the orange dot on the supply curve at the Clearing Round price floor (which is equal to the total capacity of all continuing CMUs at the price floor). Bid 1 is the highest ranked whilst bid 3 is the lowest ranked.

The highest-ranked bid is added back first, which takes us to point 1 on the supply curve. This is not a point on the Demand Curve so we have not established an exact match. Relevant Exit Bids continue to be added back until either an Exact Match has been identified, or until we have reached a point where the supply curve has crossed the Demand Curve and no exact match has been found. In the example shown in **Figure 2**, the second Relevant Exit Bid which is added back (point 2) takes us to a point on the supply curve which is also a point on the Demand Curve and therefore an Exact Match has been established.

In an Exact Match clearing scenario, the Relevant Exit Bid which caused the exact match would set the Clearing Price and capacity. This means all CMUs which were still in the Capacity Market Auction at the end of the Clearing Round, including all CMUs with Relevant Exit Bids ranked higher than the CMU that caused the exact match (along with the CMU that caused the exact match) would all be eligible for a capacity agreement. CMUs that have a lower Exit Ranking than the CMU which caused clearing e.g. the CMU that exited at point 3) together with all CMUs which had exited in a previous round would not be eligible for a Capacity Agreement.



### 3.7.3 Net Welfare Algorithm

In reality, it is unlikely the Capacity Market Auction will clear via an Exact Match since the supply curve and the Demand Curve would need to match the exact kW. Therefore, the Clearing Price and capacity is likely to be determined by the Net Welfare Algorithm.

The purpose of the Net Welfare Algorithm is to establish where the Capacity Market Auction should clear when there is not an exact match. This is completed by comparing the nearest points of supply on either side of the Demand Curve to determine which point is most beneficial to the consumer.

The Net Welfare Algorithm is defined in the Capacity Market Rules as shown in **Figure 3**.

For the purposes of Rule 5.9.4(c) the Auctioneer must calculate the integral

$$\int_{Q_l}^{Q_h} P(Q)dQ$$

and subtract the product of

$$(PhQ_h - Q_lP_l)$$

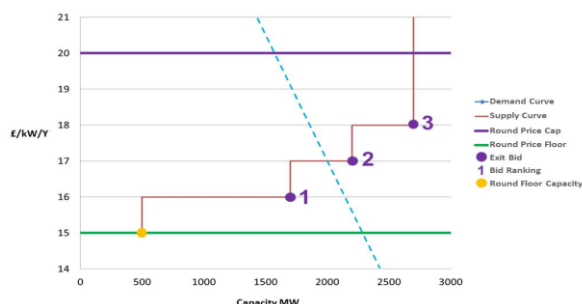
**Figure 3.** The Net Welfare Algorithm is used to assess if over-procuring or under-procuring capacity would be most economically beneficial for the consumer the most in the event there are tied bids.

In order to calculate the Net Welfare we first need to determine the values of the inputs into the clearing algorithm, these are shown in **Table 7**.

Net Welfare Algorithm Inputs	Explanation
PI	PI is the price of the lowest ranked Relevant Exit Bid that is below the demand curve. If there is no Relevant Exit Bid below the demand curve then PI is the price at the Clearing Round Floor.
QI	QI is the capacity of all continuing bids, plus the capacity of all Relevant Exit Bids in the ranking order, up to and including the lowest-ranked Relevant Exit Bid that is below the demand curve. If there is no Relevant Exit Bid below the demand curve, then QI is the capacity supplied at the Clearing Round Floor.
Ph	Ph is the price of the highest-ranked Relevant Exit Bid that is above the demand curve. If there is no Relevant Exit Bid above the demand curve then Ph is the price at the Clearing Round Cap.
Qh	Qh is the capacity of all continuing bids, plus the capacity of all Relevant Exit Bids in the ranking order, up to and including the highest-ranked Relevant Exit Bid that is above the demand curve. If there is no Relevant Exit Bid above the demand curve, then Qh is the capacity supplied at the Clearing Round Cap.
P(Q)	Represents the Demand Curve as specified by the Secretary of State (price as a function of quantity)

**Table 7.** Net Welfare Algorithm Inputs and Explanations

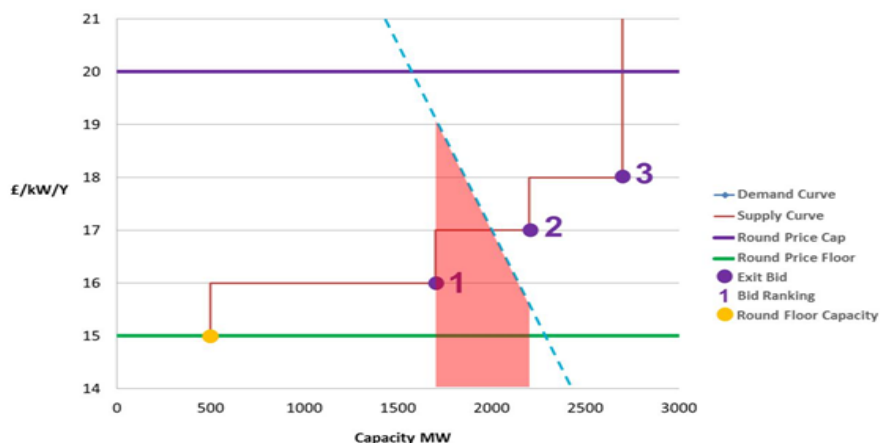
To find these inputs we use the same starting point as when calculating an exact match. On this occasion, we are looking to identify the closest Relevant Exit Bids on the supply curve that fall on either side of the Demand Curve. In **Figure 4** the Relevant Exit Bids ranked 1 & 2 would be used to identify these input values, with the lowest ranked bid below the Demand Curve (Bid 1) setting QI/PI and the highest ranked bid above the Demand Curve (Bid 2) setting Qh/Ph.



**Figure 4.** Tied bids scenario where the use of the Net Welfare Algorithm is required.

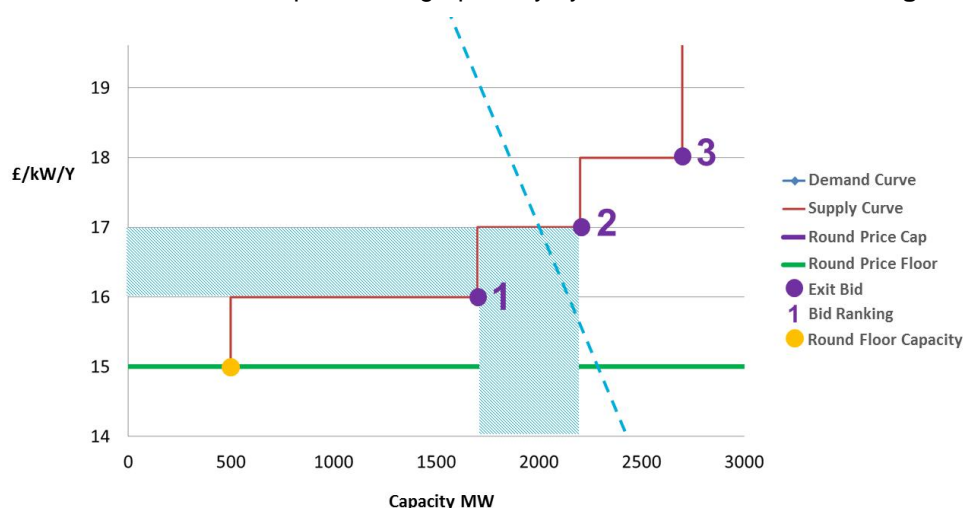
Please note that in some scenarios there may not be a Relevant Exit Bid below and/or above the Demand Curve. If there are no Relevant Exit Bids below the Demand Curve, then  $Q_I/P_I$  will be taken from the point where the supply curve crosses the bidding round floor price. Equally, if there are no bids above the Demand Curve, then  $Q_h/P_h$  will be the point where the supply curve crosses the bidding round cap price.

Once the inputs into the Net Welfare Algorithm have been established, we can then calculate at which point the Capacity Market Auction should clear at. The first step is to calculate the integral of the Demand Curve between  $Q_I$  and  $Q_h$  (this is the area under the Demand Curve between the two points specified), a calculation that represents the extra benefit for the consumer in clearing the Capacity Market Auction at the higher quantity ( $Q_h$ ) rather than the at the lower quantity ( $Q_I$ ). The red-shaded area in **Figure 5** shows the result of the integral calculation between bids 1 and 2.



**Figure 5.** Tied bids scenario where the use of the Net Welfare Algorithm is required with the area below the demand curve as highlighted.

Once we have established the extra benefit of the higher capacity to the consumer, we must then calculate the additional cost of procuring the higher level of capacity, in order to see if the benefit outweighs the cost. To do this we calculate the total cost of procuring the higher amount of capacity ( $PhQ_h$ ) and subtract the total cost of procuring the lower amount of capacity ( $Q_I P_I$ ). The result of this calculation gives us the extra cost associated with procuring  $Q_h$  rather than  $Q_I$ . This is represented graphically by the blue-shaded area in **Figure 6**.



**Figure 6.** Tied bids scenario where the use of the Net Welfare Algorithm is required with a total cost of procuring the higher amount of capacity ( $PhQ_h$ ) minus the total cost of procuring the lower amount of capacity ( $Q_I P_I$ ) highlighted in blue.

Finally, to determine the outcome of the Net Welfare Algorithm, the product of ( $PhQ_h - Q_I P_I$ ) must be subtracted from the integral calculation. If the result of the Net Welfare Algorithm is positive, this means the benefit of procuring  $Q_h$  outweighs the additional cost and the Capacity Market Auction clears at a capacity of  $Q_h$  and a price of  $P_h$ . Otherwise, if the result is not positive, then the benefit does not outweigh the cost and the Capacity Market Auction would clear at a capacity of  $Q_I$  and a price of  $P_I$ .

In this scenario, all CMUs still in the Capacity Market Auction at the end of the Clearing Round, including all CMUs in the exit ranking (up to including the CMU that sets clearing) would be eligible for an agreement.

As previously mentioned, in some scenarios there may not be a Relevant Exit Bid below and/or above the Demand Curve. In such a scenario if the Net Welfare Algorithm results in selecting QI/PI at the Clearing Round floor, then all CMUs that remain in the auction at the end of the clearing round would be eligible for an agreement. Similarly, if the Net Welfare Algorithm results in selecting Qh/Ph, and this is at the Clearing Round cap, then all CMUs who were still in the auction at the start of the clearing round would be eligible for an agreement.

## 4. Important Information

### 4.1 Offline Verification Codes

The offline verification codes will be used to verify a Bidder's identity for Capacity Market Auction-related queries from D-9. These codes will also be necessary for the use of the backup bidding procedure during both the mock and the actual Capacity Market Auction. It is strongly advised that all Bidders print these verification codes off from the system at the earliest opportunity as without them you will not be able to make any backup bids via the telephone. Each code is used sequentially and can only be used once. Instructions on how to find the access codes can be found in the bidder support guide.

### 4.2 Help During the Capacity Market Auction

If you require help during the Capacity Market Auction, either submit a message on the Auction System platform or call 01926 656574. This number should only be used in the event of a systems failure and to use this line you will need to quote your offline verification codes in order to confirm your identity.

For all queries not specific to the Capacity Market Auction process including general Rule queries, please call the Capacity Market Auction helpline on 01926 655300.

Please be aware that if you exit the Capacity Market Auction by accident there is nothing the Auctioneer can do. Users are therefore advised to submit Exit Bids with care.

## 5. Frequently Asked Questions (FAQs)

### **Can I submit my Exit Bids at the start of the Capacity Market Auction?**

Yes, providing the Bidding Round is open you can submit an Exit Bid at any time. An Exit Bid that will become active in a later Bidding Round is called a Proxy Bid.

### **Within my Bidders can I see who has submitted Exit Bids and/or Duration Bid Amendments?**

Bidders can see this information within the Capacity Market Auction system. They would find this information in the downloads section called My Exit Bids and Duration Bid Amendments.

### **Can a Price Maker still get an agreement below the Price Taker Threshold? Can a Price Maker submit an Exit price below the Price Taker Threshold?**

A Price Maker is able to submit an Exit Bid at any price between the Price Cap and £0 as such they are entitled to an agreement at a clearing price below the Price Taker Threshold, providing they did not submit an Exit Bid that took effect in an earlier Bidding Round. If a Price Maker exits the Capacity Market Auction above the Price Taker Threshold then they will not be entitled to an agreement if the Capacity Market Auction clears below the threshold.

### **Can a Price Taker get an agreement above the Price Taker Threshold?**

A Price taker will get an agreement above the Price Taker Threshold if the Capacity Market Auction clears above the Price Taker Threshold. Exit Bids for Price Taker CMUs must be at or below the Price Taker Threshold.

### **If I have a Refurbishing capacity of 180MW and a Pre-Refurbishing capacity of 150MW what is the capacity seen by the auction system, is it 330MW?**

When the Refurbishing CMU is in the Capacity Market Auction the system will see a capacity of 180MW, then when/if you submit a Duration Bid Amendment and switch to the Pre-Refurbishing State, which then takes effect, the system will see 150MW. The auction system will never combine the capacity of the two different states.

### **If I don't get an agreement in the provisional results is it likely that this will change when the results are final?**

The provisional results become final following checks from the Auction Monitor and Secretary of State, there will not be a change to the demand.

## Appendix A- Auction Timetable

<b>Day 1</b> T-1 24/25: 20 <sup>th</sup> February 2024 T-4 27/28: 27 <sup>th</sup> February 2024	<b>Round Spread</b> (£)	<b>Start Round</b>	<b>End Round</b>	<b>Recess</b>
R1	75-70	09:00	10:00	15mins
R2	70-65	10:15	10:45	15mins
R3	65-60	11:00	11:30	15mins
R4	60-55	11:45	12:15	15mins
R5	55-50	12:30	13:00	15mins
R6	50-45	13:15	13:45	15mins
R7	45-40	14:00	14:30	15mins
R8	40-35	14:45	15:15	15mins
R9	35-30	15:30	16:00	15mins
R10	30-25	16:15	16:45	15mins
<b>Day 2</b> T-1 24/25: 21 <sup>st</sup> February 2024 T-4 27/28: 28 <sup>th</sup> February 2024	<b>Round Spread</b> (£)	<b>Start Round</b>	<b>End Round</b>	<b>Recess</b>
R11	25-20	09:00	10:00	15mins
R12	20-15	10:15	10:45	15mins
R13	15-10	11:00	11:30	15mins
R14	10-5	11:45	12:15	15mins
R15	5-0	12:30	13:00	15mins



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