# Capacity Market:

## A Helicopter Guide to Understanding the Capacity Market

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# 1. Purpose of this Document

The purpose of this document is to provide a high-level summary of the Capacity Market (CM) and to deliver a brief understanding of how the CM operates and who can participate in the Capacity Auctions. The comprehensive requirements and details of the Capacity Market are set out in the Capacity Market Code (CMC).

# 2. The Capacity Market

**"…capacity providers will <u>only</u> receive payments if they are successful in a Capacity Auction."**

In the current SEM, capacity providers receive payment for being available to generate electricity when required by the system. This is known as the Capacity Payment Mechanism (CPM). The new I-SEM arrangements are due to commence in October 2018. In the new I-SEM, the administratively determined CPM is being replaced with a competitively determined Capacity Market. Much like the current process, the new CM will ensure that electricity generation in Ireland and Northern Ireland along with Interconnector capacity is sufficient to reliably meet demand, but in a more efficient manner. Unlike the CPM, capacity providers will <u>only</u> receive payments if they are successful in a Capacity Auction. The first such Auction, which covers a period from Market Cutover Time to 30th September 2019, was held in December 2017.

Capacity providers (including Demand Side Units) and Interconnectors that are "Awarded Capacity" in the Capacity Auction will be paid a per MW rate for the capacity they successfully sold to the market within the Auction. Payments from the Auction can then assist with funding existing and future generation capacity and capacity investment.

In return, generators with Awarded Capacity in the Auction have an obligation to make difference payments to Suppliers, where energy market prices exceed the Strike Price. The difference payments are calculated against the Reference Price for the market in which the generator sold the energy – whether within the Day Ahead Market (DAM), Intra-Day Market (IDM) or the Balancing Market (BM). If the capacity is not made available to the market at times of high energy prices, then generators with Awarded Capacity will not earn revenue to cover these difference payments and the Reference Price will be derived from the Balancing Market. This feature encourages Awarded Capacity to be available at times of system stress.

The ultimate objective of the CM is to ensure that there is sufficient supply to meet demand within set security standards, even during times when the system is operating under stress.

# 3. How Does It Work?

## 3.1. The Auction

The Capacity Auctions will take place for a period of one Capacity Year which will commence at the start of the trading day on 1st of October and finish at the end of the trading day on 30th September of the following year. In the long term, Capacity Auctions will be held four years (T-4) before a Capacity Year with additional Auctions for incremental capacity held closer to the

Capacity Year, e.g. in the year prior to the Capacity Year start (T-1). For the years prior to that Capacity Year, only T-1 Auctions are being held for each Capacity Year.

The timelines for each Auction are developed by the System Operators (SOs) and approved by the Regulatory Authorities (RAs). The Auction Timetable takes various processes and parameters into account such as qualification timeframes, publishing of provisional and final qualification results, running the Auction and post-Auction processes and results. Participants will be notified of the set timings for each Auction when confirmed by RAs and published by the SOs via the Initial and Final Auction Information Packs.

Participants that have qualified for an Auction will submit Capacity Auction offers via the Capacity Market Platform (CMP) which implements the functionality of the Capacity Market in line with the Capacity Market Code (CMC). The Auction schedules capacity against a Demand Curve set by the RAs. Capacity awarded this way will receive an Auction Clearing Price. In addition, Locational Capacity Constraints are imposed to ensure that sufficient capacity is procured in certain regions where there are transmission limitations. Any additional capacity awarded to satisfy these limits will be paid based on offered price.

## 3.2. Settlement of the Capacity Market

**"The revenue to fund Awarded Capacity is recovered from suppliers, through a capacity charge. In return, the suppliers are hedged against high energy prices."**

The revenue to fund Awarded Capacity is recovered from suppliers, through a capacity charge. In return, the suppliers are hedged against high energy prices. When energy prices exceed a "Strike Price", the market pays suppliers the difference between the energy price and the Strike Price. For example, if the Strike Price is €500/MWh, and the energy price is €600/MWh, the supplier is charged €600/MWh in the first instance but is credited back €100/MWh by the market. This means that the effective price that suppliers covered by this hedge pay is capped at the Strike Price. The Strike Price is updated monthly based on a formula that considers prices of fuels, unit efficiency and Demand Side Unit (DSU) running costs.

Those Participants holding Awarded Capacity fund this hedge. If operating at times of high price they receive the high energy price, but must pay money back to the market, called "Difference Charges" on their Awarded Capacity. The Difference Charge applies when a "Reference Price" exceeds the Strike Price. The Reference Price is a derived price that reflects the price at which the capacity provider traded in the Day Ahead Market (DAM), Intra-Day Market (IDM) and Balancing Market (BM). For Interconnectors the Difference Charges are based on availability rather than delivered energy. Using the example above, a generator with Awarded Capacity that sells that energy into the Balancing Market might earn €600/MWh but must pay €100/MWh back to the market on its Awarded Capacity to fund the hedge for suppliers. The generator's price is effectively capped at the Strike Price if generating. If the generator was not generating, then it would earn nothing in the energy market but would still have to pay the €100/MWh back to the market on its full Awarded Capacity.

Those with Awarded Capacity are most likely to be exposed to Difference Charges if they fail to deliver capacity during periods of peak demand, though they could be exposed at other times.

They therefore have a strong incentive to be available at times that the Reference Price might go above the Strike Price because they must pay capacity Difference Charges whether they are selling energy or ancillary services or not. The market design includes stop loss limits (that are published in the Final Auction Information Pack for the relevant Capacity Auction) which place an upper limit on how much capacity providers must pay back to the market within a billing period or over the Capacity Year.

At times of low demand, there is more capacity available to the system than is required, and the hedging needs of suppliers are reduced. This frees up capacity so that one capacity provider can use its capacity to offset the obligations of a second provider while that second provider's capacity unit undergoes maintenance. The trade of Awarded Capacity reduces the obligations on the second provider allowing it to avoid exposure to Difference Charges. This provides an opportunity for generator units or Interconnectors with Awarded Capacity to undergo an outage for maintenance etc.

## 4. Who Can and Who Must Participate?

Participation is limited to current and future capacity providers on the island of Ireland, including Interconnectors that connect to the Ireland and Northern Ireland Systems. All existing Dispatchable Generators with a capacity above the De Minimis Threshold of 10 MW and all Interconnectors must apply to be qualified to participate in each Capacity Auction. Non-Dispatchable Generators, Dispatchable Generators with a capacity below the De Minimis Threshold, proposed new but not commissioned Dispatchable Generators with a capacity above the De Minimis Threshold, and Variable Generator units are not required to register or qualify in the Capacity Market but may do so voluntarily. Wind and solar generators fall under the Variable Generators category and are not required to register or qualify, but must do so if they wish to earn capacity remuneration.

**"All existing Dispatchable Generators with a capacity above the De Minimis Threshold of 10 MW and all Interconnectors must apply to be qualified to participate in each Capacity Auction."**

New Capacity, which refers to capacity yet to be commissioned, must hold a Connection Offer before commencing the qualification process. Capacity yet to be commissioned could include new units or additional capacity for existing units. Full requirements are comprehensively detailed in the CMC.

If a participant is registered under the CMC, but fails to qualify a unit when qualification is mandatory, then that unit will be qualified via the Alternative Qualification Process based on data held by the System Operators.

## 5. Qualified Capacity

Qualification determines the De-Rated capacity of a unit. De-Rating is a process of reducing the available capacity to a level that reflects the expected capability of that unit to meet the system capacity requirement. The De-Rating Factor accounts for outages (both planned and unplanned), as well as limitations to operation, such as wind units that are dependent on wind energy in order to generate, and their marginal impact on meeting the Capacity Requirement.

De-rating Factors differ with technology class and unit size. The Regulatory Authorities set De-Rating Factors which are to be used within applications for qualification to determine which De-Rating Factor should be applied. The approved De-Rating Factors are set out in the Initial Auction Information Pack published for each Capacity Auction. These factors are applied to the "Initial Capacity" of a unit. For an existing generator the Initial Capacity is normally the lesser of the Registered Capacity or Firm Offer Requirement of that unit. Therefore, for an existing generator, the De-Rated capacity is normally the product of its Initial Capacity multiplied by the appropriate technology class De-Rating Factor. This is further explained in "The Quick Guide to Understanding Qualification" and in Section C and Section E.8 of the Capacity Market Code.

The qualification process will use the De-Rating Factor when assessing the value of capacity seeking qualification.

The qualification process assesses information on physical units which are referred to as Candidate Units (CUs). CUs can apply to become a Combined Candidate Unit (CCU) under certain conditions, please see CMC for further details. Units that qualify for the CM will then be known as a Capacity Market Unit (CMU). Each Interconnector and, typically, each generator will be represented as one CMU.

Generators below the De Minimis Threshold (10 MW) and Variable Generator units may request to become an Aggregated Generator Unit under a single CMU. The CMU must be registered to the same participant as the Generator Unit or Interconnector.

The qualification process sets a maximum quantity that can be offered into a Capacity Auction. In respect of existing capacity only, the lesser of this capacity and a De-Rated measure of the firm network access that the Capacity Market Unit has must be offered into the Auction. If it is not offered then the Auction process will create an offer at the maximum allowed price for that unit.

## 6. How To Register

Details on the Registration process, Registration and Qualification Forms, along with the appropriate Guides are available here.

## 7. FAQs

A Frequently Asked Questions - Working Document was published in June 2018. An updated document will be uploaded to the website in advance of each Auction.

## 8. Supporting Documentation

This document should be read in conjunction with the following publications:

- Initial Auction Information Pack (IAIP1920T-1)
- Final Auction Information Pack FAIP1920T-1 (due to be published on 30th November 2018)
- Capacity Market Registration Guides included in the Registration & Qualification Forms are available here.
- Capacity Market: The Quick Guide to Understanding Qualification
- Capacity Market: A Helicopter Guide for the Capacity Auction
- The Capacity Market Code (CMC)
- Agreed Procedures:
    - CMC Agreed Procedure 1 – Registration
    - CMC Agreed Procedure 2 – Default and Suspension
    - CMC Agreed Procedure 3 – Qualification and Auction Process
    - CMC Agreed Procedure 4 – Communication Channel Qualification
    - CMC Agreed Procedure 5 – System Operation, Testing, Upgrading and Support
    - CMC Agreed Procedure 6 – System and Communication Failures

The Capacity Market is governed by the Capacity Market Code (CMC). Please refer to the CMC as well as the Agreed Procedure documents for comprehensive Code items, definitions and procedure details.

The Registration Guides provide a point of reference for completing the Registration and Qualification processes.

The Initial and Final Auction Information Packs are also an essential point of reference as they outline values and parameters set for each individual Capacity Auction.

Approved Capacity Auction Timetables are published in advance of each Capacity Auction and can be viewed on the SEMO website – here.

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