

SEM Capacity Market

Capacity Market Overview & Final 2022/2023 T-4 Auction Results Summary

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1. Purpose of this document

This document provides a brief high-level overview of the Capacity Market and a summary of the 2022/2023 T-4 Capacity Auction final results. It does not provide a detailed description of the market or an exhaustive analysis of the Capacity Auction results. All values presented are rounded to the nearest integer. The Final Capacity Auction Results document (FCAR2223T-4) and associated published data files provide a full breakdown of the detailed results in line with the publication requirements set out in the Capacity Market rules.

The Capacity Market rules are set out in the Capacity Market Code (CMC) and the Trading and Settlement Code (T&SC). Please refer to these Codes as well as the Agreed Procedure documents for the comprehensive rules of the Capacity Market. These Codes define the detailed rules required to implement the market design decisions developed by the Regulatory Authorities (RAs) in Ireland and Northern Ireland and approved by the SEM Committee (SEMC) after a public consultation process. The Capacity Market is operated jointly by the EirGrid and SONI in their roles as licensed Transmission System Operators (TSOs) for Ireland and Northern Ireland respectively.

2. Introduction

The Capacity Market is designed to help ensure that the generation capacity in Ireland and Northern Ireland (including Storage, Demand Side Units and Interconnector capacity) is sufficient to meet demand and that the regulatory approved generation adequacy standard is satisfied. It is a competitive auction-based design where the most efficient and lowest cost capacity is most likely to be successful. This design helps to promote the short-term and long term interests of consumers of electricity across Ireland and Northern Ireland with respect to price, quality, reliability and security of supply of electricity.

Only those units who are successful in the capacity auctions will receive capacity payments. Capacity providers that are successful in the capacity auction will be paid regular payments during the year for each MW of capacity they successfully sold to the market in the Auction. In return, capacity providers that have been successful in the Auction are required to deliver on their Capacity Market obligations. These include making available the awarded capacity and providing sufficient energy to satisfy their awarded capacity through participation in the day-ahead, intraday and balancing market and paying difference charges where the energy price exceeds the strike price.

It should be noted that generators and other units operating in the Single Electricity Market (SEM) can also earn revenue from the energy market and system services.

3. Brief overview of the Capacity Market processes

In advance of each auction a Capacity Auction Timetable (developed by the System Operators and approved by the Regulatory Authorities) is published which sets out the key dates for the auction process. The timetable for this auction was published on the 29th of June 2018. Figure 1 provides a brief overview of the steps involved for each auction.

Preparation for the Auction:

The parameters required for each auction are set out in the published Initial and Final Auction Information Packs. Analysis by the TSOs using detailed approved methodologies forms the main basis for some of these parameters, but all final parameters in the auction are set and approved by the Regulatory Authorities.

Capacity providers that wish to participate in a Capacity Auction must seek qualification for each Capacity Market Unit (CMU) they wish to participate. During the qualification process, prospective units must demonstrate that they meet a set of minimum requirements set out in the market rules. The qualification process helps to provide confidence that units successful in an auction will deliver on their obligations and contribute to security of supply in Ireland and Northern Ireland.

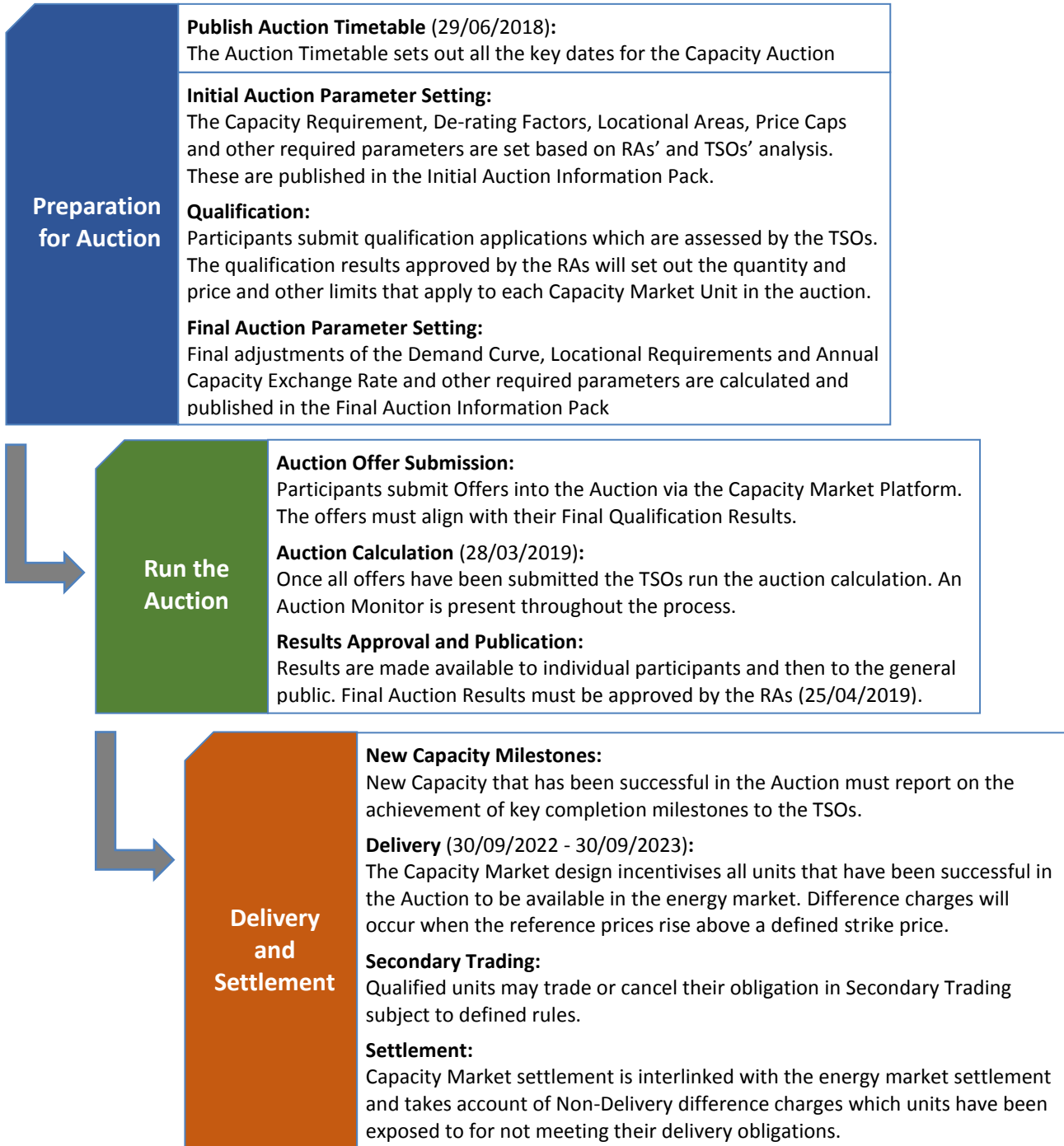


Figure 1: Simplified overview of some of the key processes of the Capacity Market. Some dates relevant to this 2022/2023 T-4 Capacity Auction are also provided.

Participation is currently limited to capacity providers on the island of Ireland. All existing Interconnectors and Dispatchable Units must apply to be qualified to participate in each Capacity Auction. Variable Generator Units are not required to register or qualify in the Capacity Market however the option to participate is open to these unit types also (subject to some exceptions associated with EU State-Aid requirements). Participation is also voluntary for generators below the De Minimis Threshold (10 MW), new capacity units not yet commissioned, and units that plan to close before the end of the Capacity Year. Each Interconnector and, typically, each generator unit will be represented as one Capacity Market Unit. However, generator units below the De Minimis Threshold and variable generator units can be aggregated into a single Capacity Market Unit.

The Capacity Market qualification process and auction uses the concept of “de-rated MWs”. The de-rating process accounts for the fact that generators and other capacity providers do not have perfect reliability. The TSOs implement a detailed approved methodology to calculate the “de-ratings factors” that apply to each unit in qualification. The methodology that takes account of a range of factors including historical availability statistics for each generator in the SEM, size and energy limits. Technology classes that are less reliable from a generation adequacy perspective get lower de-rating factors.

The all-island capacity requirement is also expressed in terms of de-rated MWs. The requirement is calculated using the same approved methodology and takes account of a wide range of future demand scenarios, generator reliability and renewable energy output. Use of this methodology helps to ensure that whatever mix of capacity is successful in the Capacity Auction will satisfy the generation adequacy standard. The final values used in the auction are in the form of a Demand Curve set by the Regulatory Authorities, which has been adjusted accordingly for reserves, non-participating capacity and capacity to be procured in future auctions.

As well as an all-island requirement there were a number of locational capacity constraint areas and associated locational minimum MW requirements set in this auction. The areas for this auction were the same as the previous two auctions (i.e. Northern Ireland, Ireland and the Greater Dublin Region). The reason for the inclusion of these areas is that there are limits on the transmission system that can restrict the flow of power to areas of demand. The minimum MW requirements set in the auction for these areas are based on the TSOs’ analysis using a detailed approved methodology, with the final values used in the auction set by the Regulatory Authorities.

Running of the Auction:

The Capacity Auctions take place on the Capacity Market Platform (CMP) which has been developed specifically for the functionality of the Capacity Market. Participants with units qualified for the auction submit their offers via this platform. Offer submissions are validated against the approved final qualification results for each Capacity Market Unit.

The gate opens for offer submissions one week before the auction and closes two hours before the auction. The auction is a simple sealed-bid format and units can offer their qualified capacity in one block or divide their offers into up to five price-quantity pairs. Units are subject to the approved offer price caps set for them during qualification. For most existing capacity, this is the Existing Capacity Price Cap defined in the Auction Information Packs. New capacity can offer into the auction at up to the Auction Price Cap. Existing or New Demand Side Unit capacity can offer into the auction at up to the Auction Price Cap. Units that have been granted a Unit Specific Price Cap by the Regulators during the qualification process can offer into the auction at up to that Unit Specific Price Cap.

Once all offers have been submitted and the gate has closed, the System Operators run the auction calculation in the Capacity Market Platform. Based on the submitted auction offers, the auction software seeks to find the lowest cost combination of capacity that will satisfy the all-island demand curve and the minimum locational requirements. The auction clearing price is set where the offer curve (based on the submitted offers) meets the demand curve. Capacity that is successful in the auction due to locational requirements does not affect the auction clearing price. Cleared offers receive the higher of their offer price and the auction clearing price.

An Auction Monitor appointed by the Regulators is present throughout the process. After the auction calculation has run the System Operators assess the results to ensure that the calculation has run correctly and is in line with the requirements of the market rules.

Delivery and Settlement:

Once a participant has been “awarded new capacity” (is successful in the auction) and the results have been approved by the Regulatory Authorities, strict delivery obligations apply. These obligations include the achievement and reporting of key delivery milestones for new capacity.

The Capacity Market is funded by suppliers, through a capacity charge. In return, the suppliers are hedged against high energy prices. Capacity providers that have been successful in the auction are required to pay difference charges to suppliers, where energy market prices exceed the defined Strike Price. The difference charges are calculated against the reference price for the market in which the generator sold the energy (i.e. Day Ahead Market, Intra-Day Market or Balancing Market). If capacity providers with Awarded Capacity do not deliver to the market at times of high energy prices, then they will not earn energy revenue but will be subject to difference charges at the Imbalance Price from the Balancing Market. This feature encourages Awarded Capacity to deliver at times of system scarcity. The market design includes stop-loss limits, which place an upper limit on how much capacity providers must pay back to the market.

Where a generator unit wishes to go on a scheduled outage during a period where they have been successful in a Capacity Auction, they have the opportunity to cover their capacity obligations via a Secondary Trading mechanism which allows them to reduce their obligation during the period of scheduled outage. During this period, they will not receive capacity payments and will not be subject to difference charges.

Capacity Auctions will be held four years (T-4) before the delivery 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). This auction was the first T-4 auction under the new arrangements and was for the 2022/2023 Capacity Year. The two remaining transitional auctions will also take place later this year, the T-1 auction for delivery in 2020/2021 and the T-2 auction for delivery in 2021/2022.

4. 2022/2023 T-4 Capacity Auction Final Results Summary

The following table gives the key price outcomes of the Capacity Auction. The Auction Clearing Price is set based on where the supply curve (offer stack) intersects the all-island Auction Demand Curve. The Auction Clearing Price for the 2022/2023 T-4 Capacity Auction is 46,150 €/MW per year or 43,030 £/MW per year. All successful capacity providers whose offers cleared at less than or equal to the Auction Clearing Price will receive this clearing price. Successful capacity providers whose offers cleared at greater than the Auction Clearing Price (e.g. for locational reasons) will receive their offer price. The cleared price of all units is provided in the final Capacity Auction Results document.

The total quantity of de-rated capacity successful in the auction is 7,412 MW. The total cost of procuring this capacity for the Capacity Year 2022/2023 is €342 million euro or £319 million pounds sterling.

	Results in €	Results in £
Auction Clearing Price:	€46,150	£43,030
Total Cleared Quantity:	7,412 MW	7,412 MW
Total Cost:	€342,295,205	£319,156,130
Average Price per MW:	€46,178	£43,057

Figure 2 illustrates the quantity of de-rated capacity successful in the auction. It gives the all-island total and the breakdown for each locational capacity constraint area. It also shows the quantity that was unsuccessful and the quantity of qualified capacity that did not offer into the auction. The yellow horizontal lines indicate the minimum requirements in each area. All minimum MW requirements set in the auction were satisfied. Note that the requirements for this auction have been adjusted by the Regulatory Authorities and this adjustment includes a consideration of the quantity of capacity to hold back for the T-1 auction for this 2022/2023 capacity year.

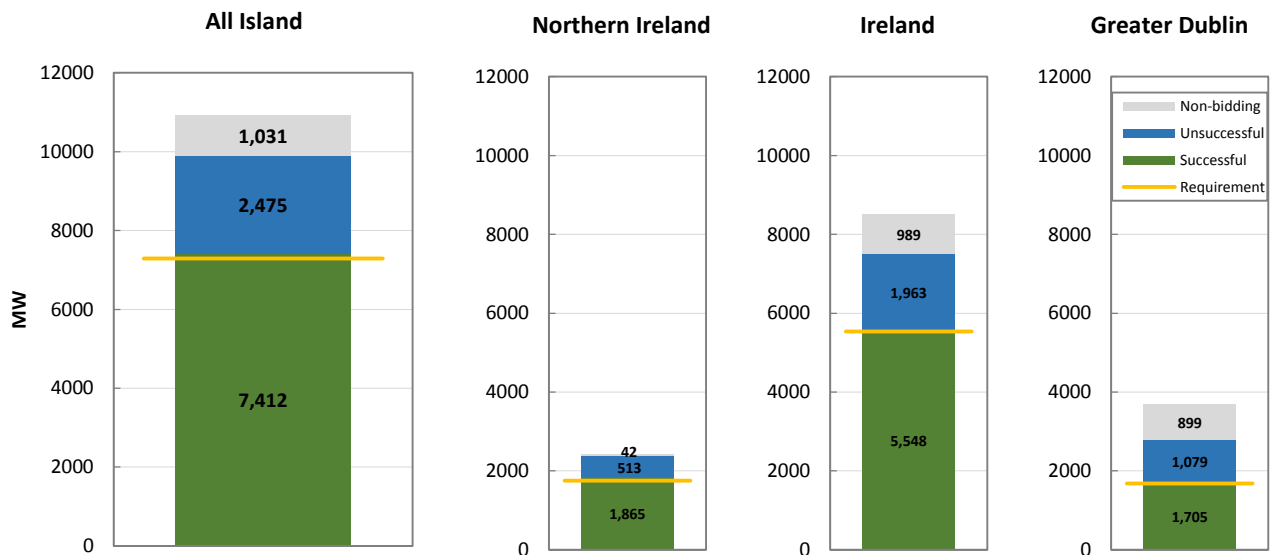


Figure 2: MW requirements and quantities successful, unsuccessful and non-bidding in the auction. The All Island values are the sum of the Northern Ireland and Ireland values. The Ireland values include Greater Dublin.

Table 1 gives the minimum MW requirements and the quantity of existing, new and total de-rated capacity successful in each locational area. A total to 7,412 MW of Capacity was successful (1,865 MW in Northern Ireland and 5,548 MW in Ireland). Table 2 gives the quantity of existing, new and total de-rated capacity that offered into the auction, but was unsuccessful.

Table 1: The requirements set in the auction and the quantity of successful existing, new and total de-rated capacity in each area

	Northern Ireland	Ireland (including Greater Dublin)	Greater Dublin	Market Total
Minimum Requirement MW	1,754	5,537	1,682	7,291
Existing De-rated MW	1,851	4,852	1,178	6,703
New De-rated MW	14	696	526	710
Total De-rated MW	1,865	5,548	1,705	7,412

Table 2: The quantity of existing, new and total de-rated capacity that offered into the auction, but was unsuccessful for each area

	Northern Ireland	Ireland (including Greater Dublin)	Greater Dublin	Market Total
Existing De-rated MW	65	1,112	302	1,178
New De-rated MW	447	850	777	1,298
Total De-rated MW	513	1,963	1,079	2,475

Table 3 gives the total quantity of qualified, offered and successful de-rated capacity for each Technology Class in the Capacity Market.

Table 3: The quantity of qualified, offered and successful de-rated capacity for each Technology Class in the Capacity Market.

(De-rated MW)	Qualified	Offered	Successful	% Qualified Successful
Demand Side Unit	600	513	415	69%
Gas Turbine	7289	6,425	4,895	67%
Hydro	190	190	190	100%
Interconnector	404	404	404	100%
Other Storage	212	134	81	38%
Pumped Hydro Storage	209	209	209	100%
Solar	2	0	0	0%
Steam Turbine	1,955	1,955	1,161	59%
Wind	56	56	56	100%

Figure 3 gives a graphical representation of the quantity of successful de-rated for each Technology Class. It gives the percentage of the total successful capacity for each Technology Class. For example, the units in the Gas Turbine technology class account for 66 % of total awarded capacity in the auction and Demand Side Units accounted for 6 %.

Figure 3 reflects the auction outcome in terms of de-rated MWs and does not indicate the final energy or installed capacity mix. It is important to note that the MW requirements set in the auction have been adjusted to take account of non-market generation and renewable generation that has not participated in the auction. To date, most renewable generation has not participated in the Capacity Auctions. Mechanisms like REFIT in Ireland and ROCs in Northern Ireland were specifically designed to encourage investment in renewable energy.

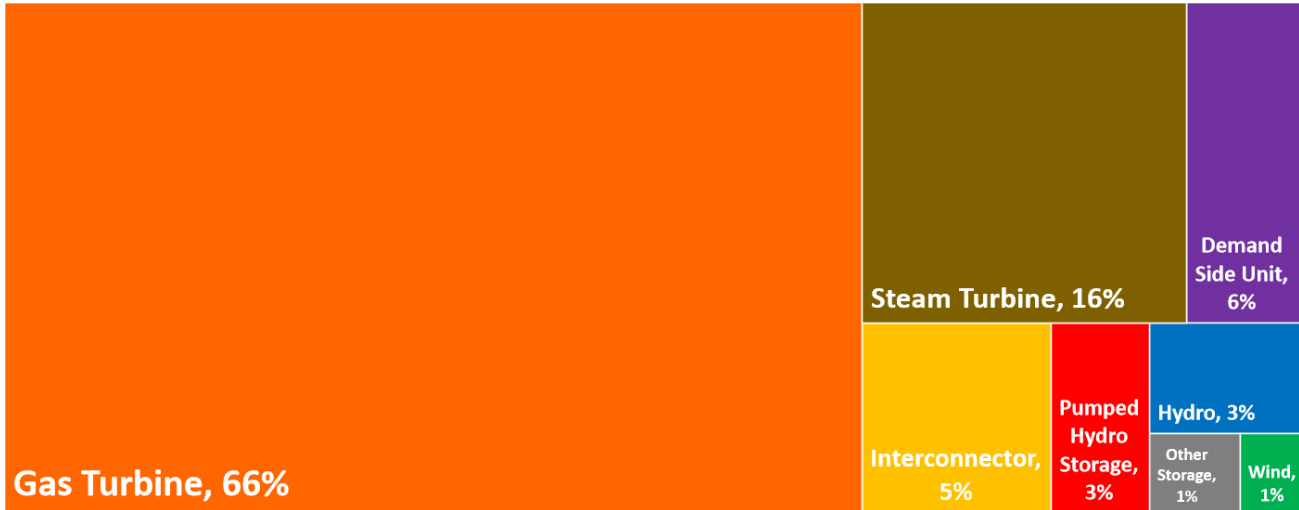


Figure 3: Illustrates the percentage of total de-rated capacity that each technology class was successful in the T-4 2022/2023 Capacity Auction. This just reflects the auction outcome in terms of de-rated MWs and does not indicate the final energy or installed capacity mix.

A total of 133 units were qualified to participate in the auction totaling 10,918 MW of de-rated capacity. 93 units were either fully or partially successful and a total of 7,412 MW of capacity awarded in the auction. Table 4 provides a breakdown of the quantity of successful de-rated capacity for each Technology Class in each Locational Constraint Area and the all-island total. It also provides the number of Capacity Market Units that were either fully or partially successful in each area.

Table 4: A breakdown of the quantity of successful de-rated capacity for each Technology Class in each Locational Constraint Area and the all-island total. It also provides the number of Capacity Market Units that were either fully or partially successful.

	Northern Ireland		Ireland (including Greater Dublin)		Greater Dublin		All-Island	
	Quantity (MW)	Number of Units	Quantity (MW)	Number of Units	Quantity (MW)	Number of Units	Quantity (MW)	Number of Units
Demand Side Unit	34	6	381	26	0	0	415	32
Gas Turbine	1,218	14	3,677	24	1,533	9	4,895	38
Hydro	0	0	190	1	0	0	190	1
Interconnector	195	1	210	1	0	0	404	2
Other Storage	0	0	81	4	74	3	81	4
Pumped Hydro Storage	0	0	209	4	0	0	209	4
Steam Turbine	418	2	743	6	53	1	1,161	8
Wind	0	0	56	4	45	1	56	4
Total	1,865	23	5,548	70	1,705	14	7,412	93

