

# SEM Capacity Market

## Capacity Market Overview & 2022/2023 T-1 Auction Results Summary

Date: 03/11/2021

Document: OARS2223T-1

Version: 1.0



## Disclaimer

EirGrid plc (EirGrid) and SONI Limited (SONI) in their capacity as System Operators have published this document to provide Participants with a brief high-level overview of the Capacity Market and a summary of the 2022/2023 T-1 Capacity Auction provisional results.

Prior to taking business decisions, interested parties should not rely on the information set out in this document as a substitute for obtaining separate and independent advice in relation to the matters covered by this publication. Information in this document does not amount to a recommendation or advice in respect of any possible investment. The use of information contained within this document for any form of decision making is done so at the user's own risk. This document should be read in conjunction with the Capacity Market Code and Trading and Settlement Code including any amendments to these rules.

Whilst every effort is made to provide information that is useful and care has been taken in the preparation of the information, EirGrid and SONI give no warranties or representations, expressed or implied, of any kind, with respect to the contents of this document, including without limitation, its quality, accuracy and completeness.

EirGrid and SONI and their respective advisers, consultants and other contributors to this document (or their respective associated companies, businesses, partners, directors, officers or employees) hereby exclude to the fullest extent permitted by law, all and any liability for any errors, omissions, defects or misrepresentations in the information contained in this document, or for any loss or damage suffered by persons who use or rely on such information (including by reason of negligence, negligent misstatement or otherwise).

## Copyright Notice

Copyright 2021 EirGrid plc. All Rights Reserved; Copyright 2021 SONI Limited. All Rights Reserved. The entire publication is subject to the laws of copyright. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or manual, including photocopying without the prior written permission of EirGrid plc and SONI Limited.

The Oval,  
160 Shelbourne Road,  
Ballsbridge, Dublin 4,  
D04 FW28  
Ireland.

## Capacity Market Contact Details

If you have any questions in relation to this document, please contact us using the details below:

Email Correspondence: [capacitymarket@sem-o.com](mailto:capacitymarket@sem-o.com)

Phone Correspondence: 1800 726772 (ROI) or 0800 0726772 (NI)  
+353 (1) 2370584 (International)

## 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-1 Capacity Auction provisional 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 provisional Capacity Auction Results document (PCAR2223T-1) 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 22<sup>nd</sup> of December 2020. 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.

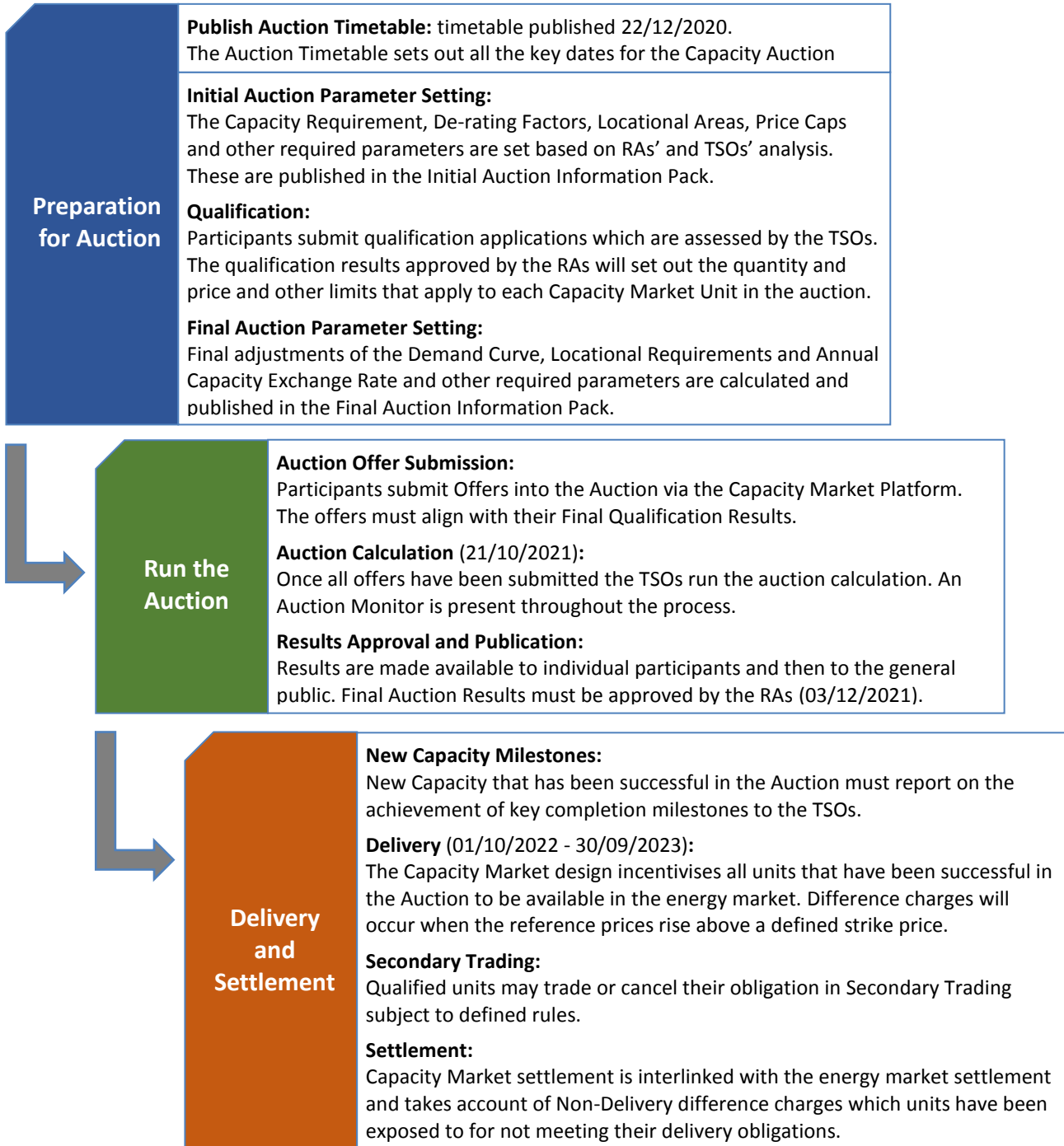


Figure 1: Simplified overview of some of the key processes of the Capacity Market. Some dates relevant to this 2022/2023 T-1 Capacity Auction are also provided.

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 is based on the Capacity Requirement adjusted accordingly for Awarded Capacity from previous auctions for the Capacity Year, changes in forecast capacity requirements (as considered appropriate by the Regulatory Authorities) and non-participating capacity (i.e. capacity that is forecast to be operational during the Capacity Year but which will not be participating in the Capacity Auction).

As well as an all-island requirement there were a number of locational capacity constraint areas and associated locational required quantities set in this auction. The areas for this auction are Northern Ireland, Ireland and the Greater Dublin Region, and the Rest of Ireland. 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. Similar to the Demand Curve, the final auction required quantities for each locational area are adjusted accordingly for Awarded Capacity from previous auctions for the Capacity Year, changes in forecast capacity requirements (as considered appropriate by the Regulatory Authorities) and non-participating capacity (i.e. capacity that is forecast to be operational during the Capacity Year but which will not be participating in the Capacity Auction).

### **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.

The provisional results are made available to participants via the Capacity Market Platform on the approved date. The provisional results are then made available to general public via publication on the SEMO website on the agreed date. The results remain provisional until approved by the Regulatory Authorities. The approval of the Final Auction Results for this 2022/2023 T-1 auction is due to occur on or before the 3<sup>th</sup> of December 2021.

### **Delivery and Settlement:**

For new capacity, once a participant 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, if required for incremental capacity, held closer to the Capacity Year, e.g. in the year prior to the capacity year start (T-1), or two years prior to the Capacity Year (T-2). The next auction (T-3 2024/2025) is scheduled to take place on the 20<sup>th</sup> of January 2022 and will be for the 2024/2025 Capacity Year.

#### 4. 2022/2023 T-1 Capacity Auction Provisional 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-1 Capacity Auction is 46,150 €/MW per year or 39,910.52 £/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 provisional Capacity Auction Results document.

The total quantity of de-rated capacity successful in the auction is 1,120 MW. The total cost of procuring this capacity for the Capacity Year 2022/2023 is 59 million euro or 51 million pounds sterling.

	Results in €	Results in £
<b>Auction Clearing Price</b>	€46,150	£39,910.52
<b>Total Cleared Quantity</b>	1,120.546 MW	1,120.546 MW
<b>Total Cost</b>	€58,964,536.15	£50,992,530.86
<b>Average Price per MW</b>	€52,621.25	£45,506.86

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 of qualified capacity that did not offer into the auction. The black horizontal lines indicate the auction required quantities in each area.

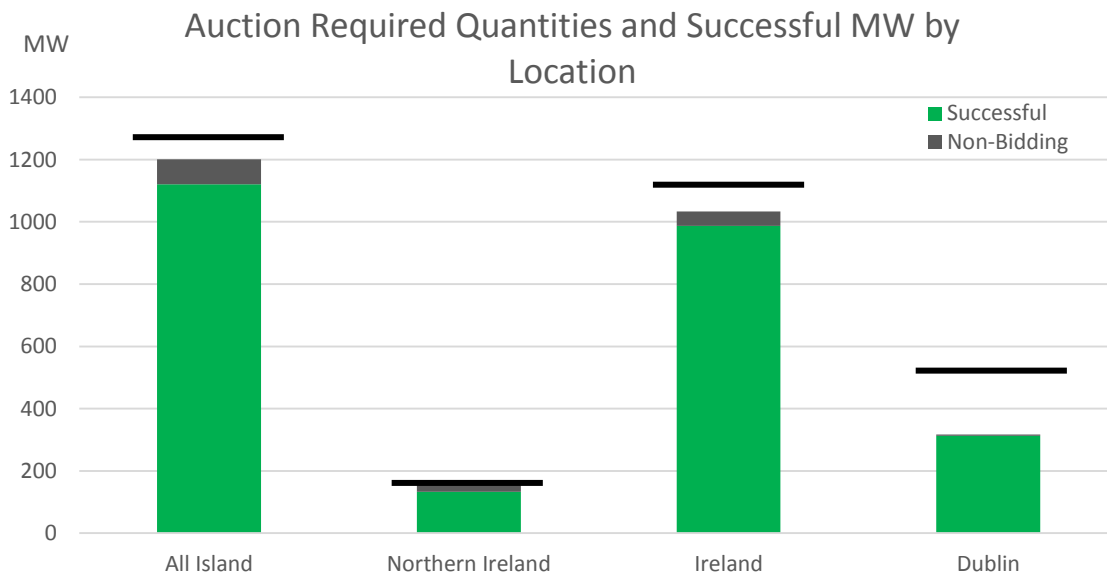


Figure 2: Auction required quantities and quantities successful and non-bidding in the auction. The All Island values are the sum of the Northern Ireland and Ireland values. The Ireland values include Greater Dublin and Rest of Ireland.

Table 1 gives the net auction required quantities and the quantity of existing, new and total de-rated capacity successful in each locational area. A total of 1,120 MW of Capacity was successful (133 MW in Northern Ireland and 987 MW in Ireland).

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

	Northern Ireland	Ireland (inc Dublin)	Greater Dublin	Market Total
<b>Auction Required Quantity MW</b>	153	1,125	529	1,278
<b>Existing De-rated MW</b>	87	936	292	1,023
<b>New De-rated MW</b>	46	51	21	97
<b>Total De-rated MW</b>	<b>133</b>	<b>987</b>	<b>313</b>	<b>1,120</b>

Table 2 gives the total quantity of qualified, offered and successful de-rated capacity for each Technology Class in the Capacity Market.

**Table 2: 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 Offered
<b>Demand Side Unit</b>	188	116	116	62%
<b>Gas Turbine</b>	352	346	346	98%
<b>Hydro</b>	6	6	6	100%
<b>Interconnector</b>	17	17	17	100%
<b>Other Storage (Batteries)</b>	57	54	54	95%
<b>Steam Turbine</b>	556	556	556	100%
<b>Wind</b>	26	26	26	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 Steam Turbine technology class account for ~50 % of total awarded capacity in the auction and Demand Side Units accounted for ~10 %.

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 auction required quantities 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 and more recently RESS in Ireland and ROCs in Northern Ireland were specifically designed to encourage investment in renewable energy.



### Successful Capacity by Technology Class

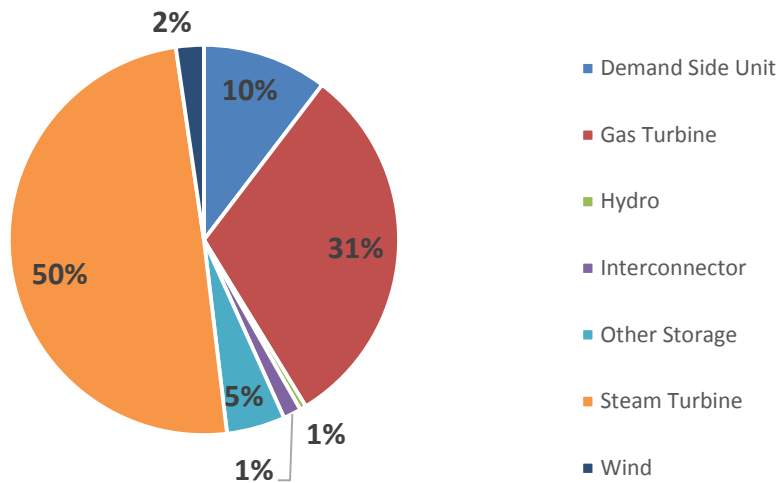


Figure 3: Illustrates the percentage of total de-rated capacity that each technology class was successful in the T-1 2022/2023 Capacity Auction. This just reflects the auction outcome in terms of de-rated MWs and does not indicate the final energy or installed capacity mix.

A total of 61 units were qualified to participate in the auction totaling 1,201 MW of de-rated capacity. 52 units were fully successful and a total of 1,120 MW of capacity awarded in the auction. Table 3 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 3: 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 (CMUs) that were either fully or partially successful.

	Northern Ireland		Ireland (Inc Dublin)		Dublin		All-Island	
	Quantity (MW)	CMUs	Quantity (MW)	CMUs	Quantity (MW)	CMUs	Quantity (MW)	CMUs
Demand Side Unit	40	8	76	17	19	4	116	25
Gas Turbine	52	2	294	2	292	1	346	4
Hydro	0	0	6	1	0	0	6	1
Interconnector	8	1	9	1	0	0	17	2
Battery Storage	33	4	21	7	2	1	54	11
Pumped Hydro Storage	0	0	0	0	0	0	0	0
Steam Turbine	0	0	556	5	0	0	556	5
Wind	0	0	26	4	0	0	26	4
<b>Total</b>	<b>133</b>	<b>15</b>	<b>987</b>	<b>37</b>	<b>313</b>	<b>6</b>	<b>1,120</b>	<b>52</b>

