



Single Electricity Market

Performance

1 January 2020 – 31 March 2020

SEM-20-031

SEM Monitoring Report

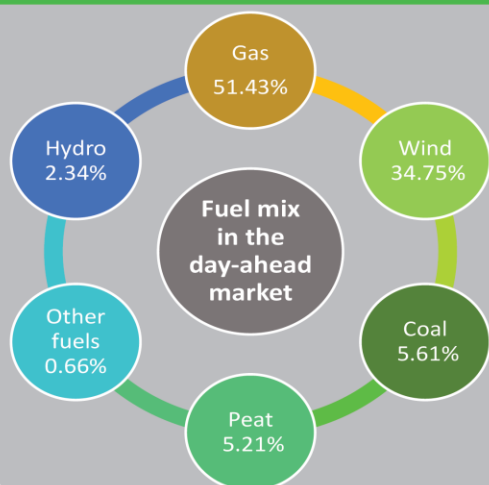
1 January 2020 - 31 March 2020



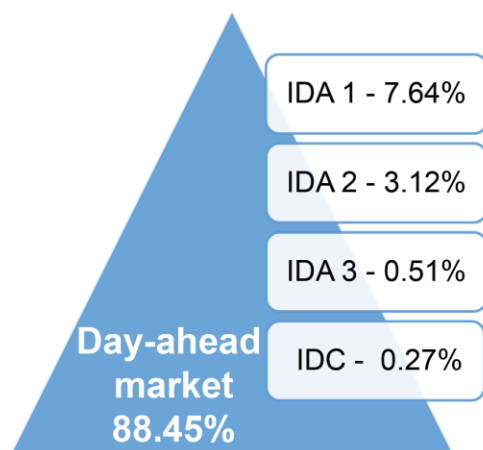
Key Highlights

- ✓ Prices in the day-ahead market were 50.54% lower than in the equivalent period last year. Decreased gas and carbon prices along with increased wind forecast in the day-ahead market contributed to the reduction.
- ✓ High liquidity concentrated in the day-ahead market with over 88% of ex-ante volumes traded with an overall value of over €404m.
- ✓ Interconnectors continue to flow efficiently between the SEM and GB.
- ✓ Two Amber alerts were issued during the period as a result of forced generator outages and low levels of wind. Neither event caused demand loss or supply disruption.

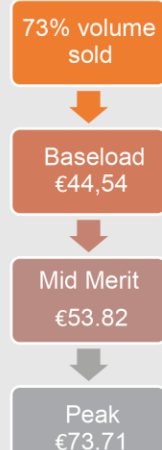
Fuel Mix



Market share by volume



DC contracts



Prices and impact of wind

- ✓ In periods of high wind, the day ahead price dropped significantly
- ✓ The highest prices are associated with a low wind forecast
- ✓ Reduction in average day-ahead price from €46.13 in previous quarter to €36.56

Average daily price in DAM €36.56
Lowest price in hourly period -€10.00
Highest price in hourly period €196.79



Highest prices during evening peak demand
Lowest prices overnight

1 INTRODUCTION

The new Single Electricity Market (SEM) is the wholesale electricity market for the island of Ireland. This report is compiled by the SEM Market Monitoring Unit (MMU), which closely monitors the market, in particular with relation to bidding controls in place and to the requirements of REMIT. The report provides an overview of the performance of the market and of the trading arrangements that exist in a number of different timeframes. These arrangements are shown graphically in Figure 1 below:



Figure 1
SEM Energy Markets

Trading in the forward market is financial only and does not entail physical delivery of power. It does however provide market participants with the opportunity to hedge their positions in the Day Ahead Market (DAM) through purchasing forward contracts.

Participation in the DAM is through coupling with the European market and is not mandatory. Following the DAM, the Intraday Market (IDM) provides market participants with the opportunity to refine their market position and minimise their exposure in the Balancing Market (BM). Through the BM the Transmission System Operators (TSOs) will buy and sell power from market participants to ensure that the demand and supply of power is exactly matched.

This report covers the first quarter of 2020 from 1 January to 31 March.

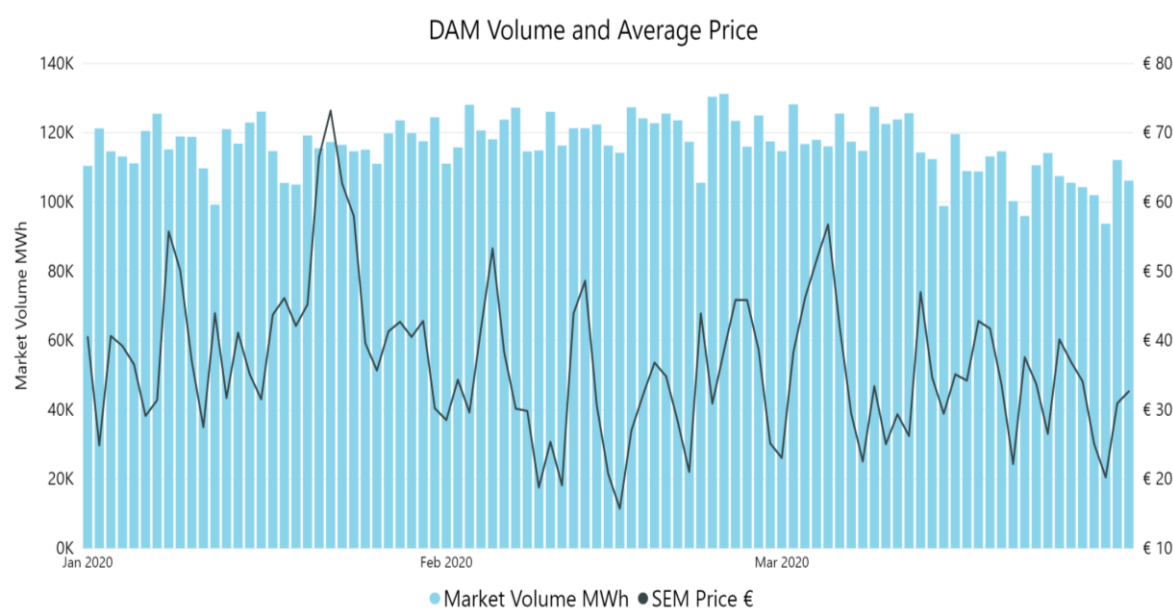
2 MARKET PERFORMANCE

The SEM was designed to allow the efficient coupling of the wholesale market on the island of Ireland with the wholesale electricity market across Europe through a single marketplace and common rules. The trading arrangements have been designed to achieve this through a liquid DAM on the island coupled with the DAM across Europe and the effective linking of the two through efficient use of the two interconnectors that link Ireland and Northern Ireland with Wales and Scotland respectively.

Further coupling has been effected in the Intra-day market timeframe and currently two auctions during this time link the SEM to the wholesale market in Great Britain. Finally the design of the SEM allows a market solution to the balancing of the demand and supply of electricity through a balancing market which takes place in real time.

2.1 DAY AHEAD MARKET

Over the period the DAM market has operated effectively and efficiently in line with the expectations of the market design. The graph below shows the daily average DAM price and volume for market in Q1 2020. In total the value of the DAM market during the period was over €404m.

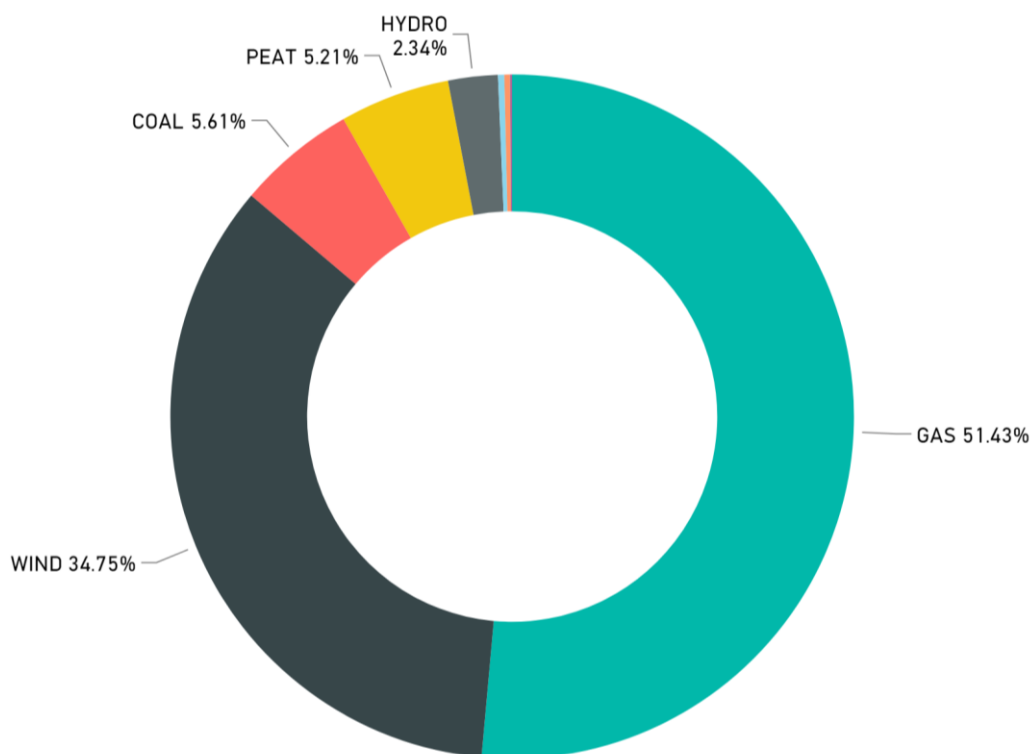


Graph 1 DAM

The average daily price in the DAM was €36.56 during the period, down from €46.13 in Q4 2019. The lowest price recorded in an hourly period was -€10.00 whilst the maximum price recorded in a single period was €196.79.

Prices in the DAM are lower than the equivalent period one year ago (decrease of 50.54%) which can broadly be accounted for by a decrease in gas and carbon prices and increased impact of wind forecast at the Day-Ahead Stage.

The share of DAM metered generation by fuel mix is shown in Graph 2 below.



Graph 2 Metered Generation by Fuel

Gas represents 51.43%, Wind 34.75%, Coal 5.61% and Peat 5.21% with the remainder made up of Hydro, Oil, Biomass and Distillate.

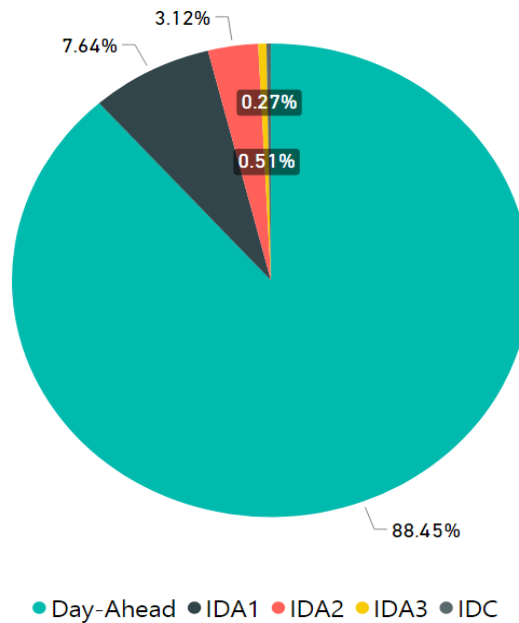
Table 1 below illustrates the relationship between prices and the forecast level of wind at day-ahead stage. It shows the highest prices over period covered occurred during evening peak demand and lowest prices occurred overnight. This has been consistent from the beginning of the market. DAM prices are significantly impacted by the level of wind in the system and the forecast of wind at the day ahead stage, with periods of high wind associated with a reduction in DAM prices. The highest prices continue to be associated with a low wind forecast while the lowest prices occurred in periods of much higher expected levels of wind.

High Price-Low Wind				Low Price-High Wind			
Date	Time	Price €	Wind Forecast MWh	Date	Time	Price €	Wind Forecast MWh
22-Jan-20	17:00	€196.79	196.69	22-Feb-20	05:00	-€10.00	4,330.74
22-Jan-20	18:00	€172.84	228.40	24-Feb-20	04:00	-€9.02	4,137.65
08-Jan-20	17:00	€170.00	371.34	24-Feb-20	05:00	-€9.02	4,080.40
13-Feb-20	18:00	€161.36	516.13	09-Feb-20	04:00	-€8.33	4,575.90
21-Jan-20	17:00	€159.00	395.51	09-Feb-20	05:00	-€8.33	4,730.00

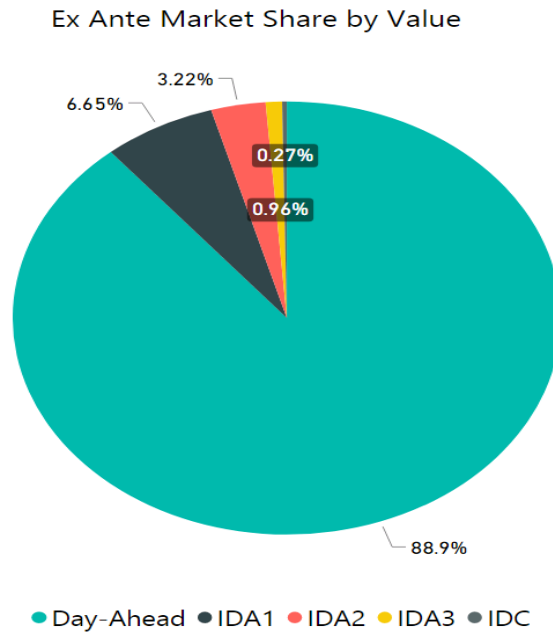
Table 1 DAM Price and Wind Forecast

The concentration of trading in the DAM is demonstrated in Graphs 3 and 4 below which shows that over 88% of ex-ante volumes are traded through the DAM. Suppliers of electricity to business and domestic customers continue to cover the majority of their demand in this market. Graph 4 also shows the relative value of each ex-ante market.

Ex Ante Market Share by Volume Traded



Graph 3 Market Shares by Volume



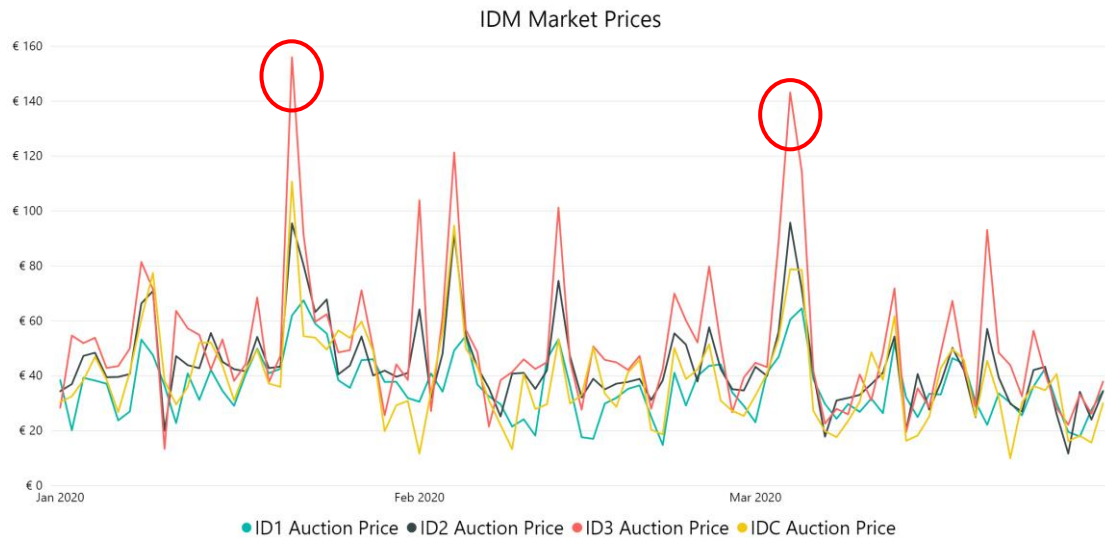
Graph 4 Market Share by Value

2.2 INTRA-DAY MARKET

The Intra-Day markets have allowed market participants to refine their market position by buying or selling closer to real time. Volumes however have been relatively low, and have generally declined through the IDM1, IDM2 and IDM3 auctions and the Intra-Day Continuous market (IDC). The IDM1 and IDM2 are coupled markets with GB while the IDM3 and IDC are local SEM-only markets. The IDM1 auction accounted for 7.64% of the total ex-ante market by volume; the IDM2 auction accounted for 3.12%, the IDM3 auction for 0.51% and the IDC for 0.27%.

Average prices show a tendency to rise during the Intra-Day timeframe as it becomes closer to real time, with average prices in IDM1 being €36.00; IDM2 €43.60 and IDM3 €49.95 and the IDC market €41.59, all of which are significantly lower than Q4 2019 averages. The total value of these markets over the period was €30.2m in IDM1; over €14m in IDM2; €4.9m in the IDM3 and over €600k in the IDC market. The IDM2 and IDM3 auctions cover a smaller timeframe and are closer to peak hours (where prices are generally higher to meet the increased level of demand and thus the average prices would be expected to be higher).

Graph 5 below illustrates the generally lower prices in the IDM1 with the higher prices in IDM3 market. Prices in all markets generally move in a similar direction with the IDM3 market showing the largest movement.



Graph 5 IDM Prices

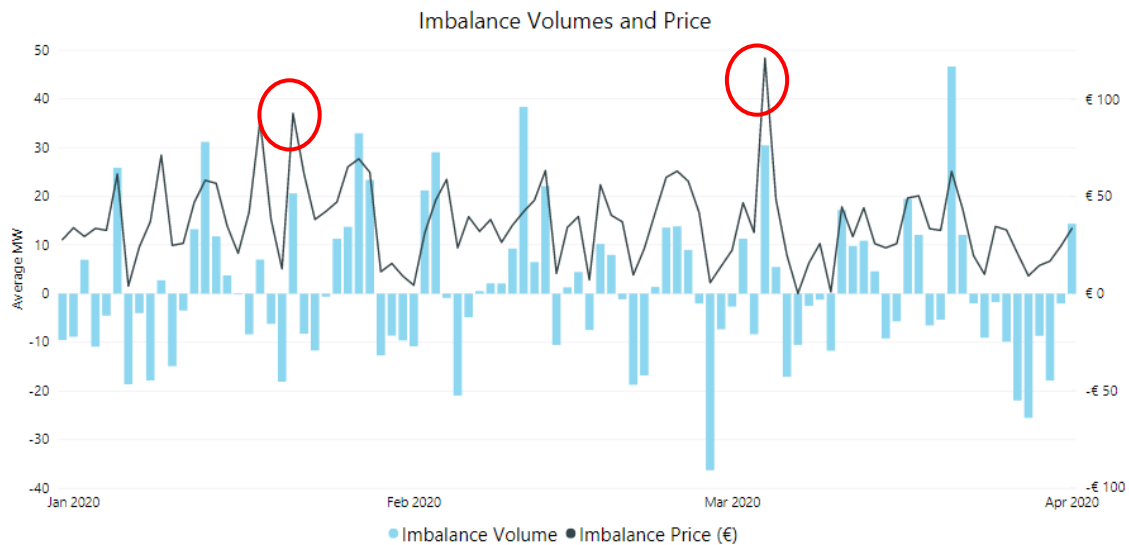
Two price spikes in the IDM3 can be observed from the graph above on 21 January and 4 March. On 21 January, there was very low wind forecast on system, coupled with a number of unplanned outages which resulted in an Amber Alert being called in NI. In the IDM3 auction, the price peaked at €159 at 17:00. At this time, there was also a significant difference of nearly 200MW between forecast and actual wind. Further information on the amber alert is detailed in section 2.3 below.

On 4 March, there was also very low wind on the system and the IDM3 price peaked at €109.56 at 18:00 when there was nearly 100MW of a difference between forecast and actual wind. This coupled with an unplanned outage of a unit, resulted in the price being driven up in the IDM3 market.

2.3 BALANCING MARKET RESULTS

Imbalance Settlement Volumes and Prices are set out below, showing relatively higher volatility in the market in both volumes and prices.

Graph 6 below shows the average Imbalance volumes and price for each trading day over a 30 minute Imbalance Price Settlement Period.



Graph 6 Imbalance Volumes and Prices

The volatility of the balancing market is illustrated in the chart above. The highest settlement price occurred on 18 January at €386.09 and the lowest price of €-334.30 occurred on 09 February.

Two Amber Alerts were issued during the period; on the 21 January and 04 March. The average Balancing Market settlement price on both of these days have been highlighted in the graph above.

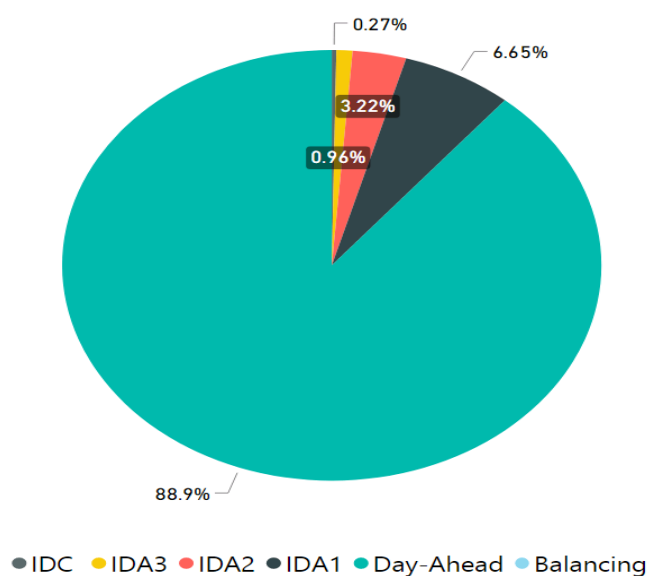
On 21 January, an Amber Alert was issued between 10:15 and 18:00. There were a number of forced outages on this day, with another unit already on planned outage. This, coupled with extremely low wind on the system (605MW Average for the day), resulted in the alert being issued. The 5 minute balancing price peaked at €434.74 at 10:15 (as the alert started) with the imbalance settlement price over the 30 minute period peaking at €350.90 (10:30). There was no loss of load during this event.

On 04 March, an Amber Alert was called, in part due to a significant variation between forecast and actual wind. Wind began to decrease around 14:00 and by 17:00 only 92MW of the forecast 500MW was available on the system. Interconnectors were utilised with emergency assistance and there was no loss of load during the alert (16:30 – 20:53). During the alert, the 5 minute price peaked at €414.75 at 20:35 and the 30 minute settlement price peaked at €189.12 at 20:30.

2.3.1 BALANCING MARKET COSTS

The balancing market is a complex market that determines the imbalance settlement price for settlement of the TSO's balancing actions and any uninstructed deviations from a participant's notified ex ante position. As part of this, it made up of numerous energy/non energy actions, charge and payment components. Using these components to calculate the cost/value of Balancing, we can show the market share of the Balancing Market in comparison to the ex-ante markets. This is illustrated in the graph below.

Market Share by Value (inc. Balancing Market)



Graph 7 Market Share (including Balancing Market)

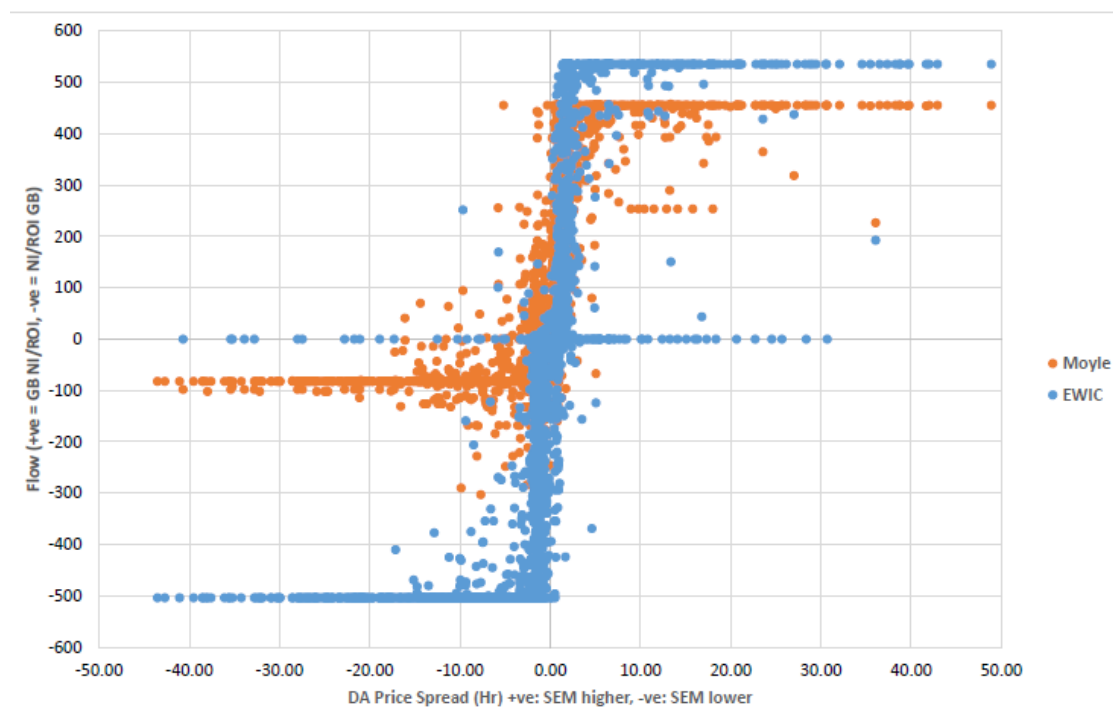
As the graph above shows, the DAM represents 77.97% of the market value, followed by the Balancing Market with 12.30%, IDM1 with 5.83%, IDM2 with 2.82%, IDM3 with 0.84% and IDC with 0.24%.

2.4 INTERCONNECTOR FLOWS

In the SEM, physical flows on Moyle and EWIC Interconnectors are linked to the SEM Day Ahead market and the price difference between it and the DAM price in GB. Where the DAM price in the SEM is higher than in GB, the interconnectors will import power into the SEM. Where the SEM price is lower, for example because there are high levels of wind on the island, the interconnectors will export power to GB.

A common means of graphing this relationship is presented in Graph 8 below. The X-axis shows the difference in DAM prices between the SEM and GB so that the positive

price difference on the right of the graph is when the SEM price is higher than the GB price and the Interconnector should be importing. The negative values on the left of the graph is when the SEM price is lower and the interconnectors should be exporting. The Y-axis shows the volume of the flow and its direction so that in the upper half of the graph, in which values are positive, the Interconnectors are importing into the SEM from GB. In the lower half the negative values indicate an export.



Graph 8 Interconnector Efficiency

For there to be evidence of efficient trading the scatter graph should show the periods of flow in the upper right of the graph and bottom left. In the upper right quadrant the SEM price is higher than the GB price and the Interconnectors are importing. In the bottom left quadrant the SEM price is lower than the GB price and the interconnectors are exporting.

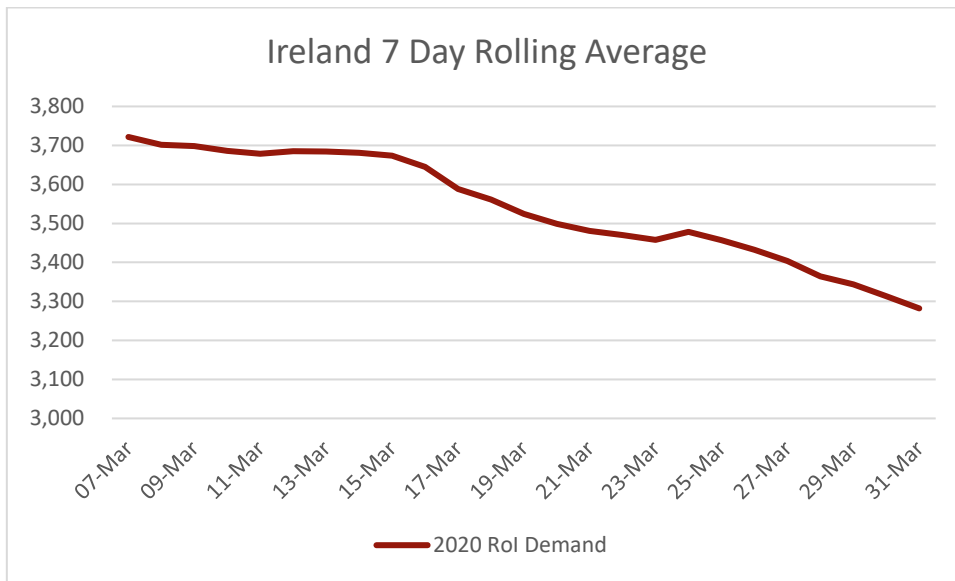
Efficient flows on the Interconnectors were a key objective of the SEM market design and the pattern shown on the graph shows that flows on Moyle (red) and EWIC (blue) are overwhelmingly in the correct direction.

Ramping constraints, which limit the speed of change in the direction of flow, have not so far entailed significant flows in the wrong direction and market coupling has been successful in ensuring efficient interconnection between the SEM and GB markets. The benefits of these flows are reduced prices when the price level is higher in the SEM than in GB and higher exports and use of wind power when prices in the SEM are lower than in GB.

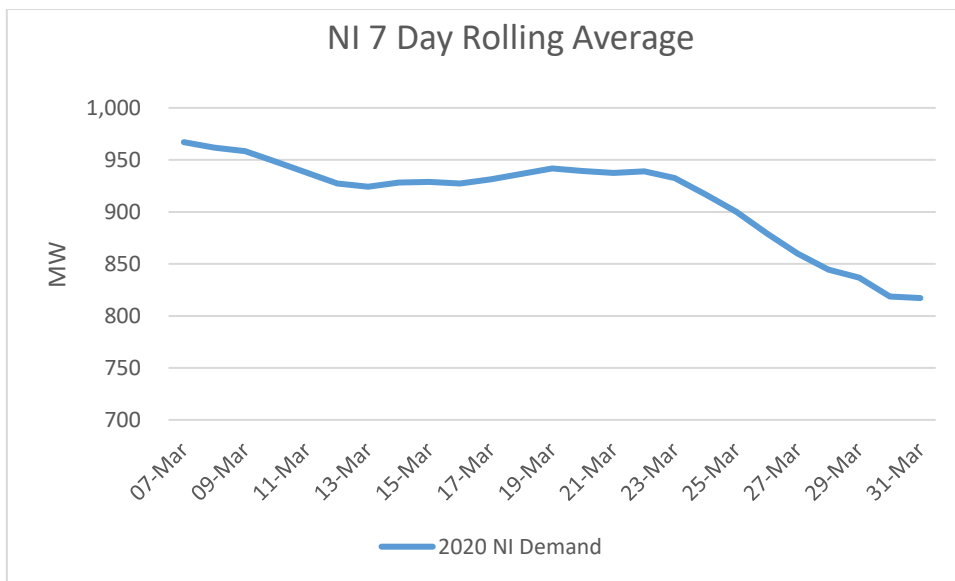
2.5 COVID-19 AND IMPACT ON DEMAND ACROSS THE SEM

COVID-19 has had a profound impact across all economies and countries, including Ireland, Northern Ireland and the SEM. The majority of the impact on the SEM is due to the lockdown restrictions imposed by both the Irish and UK Governments, and has resulted in falling demand within the SEM since lockdown commenced. This section highlights changes observed in system demand over the period 7th March to 31st March.

The graphs below show the 7 day rolling average actual system demand in Ireland and Northern Ireland for the period.



Graph 9 7 Day Rolling Average of Demand for Ireland (7th-31st March)



Graph 10 7 Day Rolling Average of Demand for Northern Ireland (7th-31st March)

Demand can be observed to be decreasing across both jurisdictions as the lockdown was imposed by both governments. In Ireland, before lockdown the average demand on the 10th March was 3,753 MW. This volume had decreased to 3,294 MW by the 30 March (3 weeks later), a reduction of 12%. In Northern Ireland the average demand for the same period reduced from 933 MW to 800 MW, a reduction of 14%. Such a reduction will also have had an impact on reducing the wholesale market price as lower demand will result in the market price being set by a cheaper unit.

The MMU notes that in the weeks following the period of this report, demand in both Ireland and Northern Ireland has continued to show a reduction, when compared to the same period in 2019. The SEM Committee continues to monitor the overall market and a further analysis will be carried out in the next Quarterly Update (covering the April-June period).

The SEM Committee has issued a statement in relation to COVID-19 which can be found [here](#).

3 DIRECTED CONTRACTS Q1 2020

3.1 DIRECTED CONTRACTS Q1 2020 ROUND 9

The tables and figures below show the price and volume of Directed Contracts subscriptions for the latest DC Round 10, which was held in March 2020 and covers the period Q3 2020 to Q2 2021.

Quarters on offer	Q3 2020 to Q2 2021		
Primary subscription dates	24-26 March 2020		
Supplementary subscription date	2 April 2020		
Volume sold	0.49 TWh		
% Volume Sold	73 %		
Average price / MWh	Baseload	Mid Merit	Peak
	€44.54	€53.82	€73.71

Table 2 Round 10 Key Information

A breakdown of the volumes sold in the Round 10 Primary and Supplemental windows are shown in Table 2:

MW	Offered in Primary Window			Sold in Primary Window			% Sold in Primary Window		
	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
Q3 2020	41			35			86%		
Q4 2020	42	152	9	20	88	1	47%	58%	15%
Q1 2021	83	101		11	15		13%	15%	
Q2 2021	33	125		30	101		91%	81%	
							59%	51%	15%

MW	Offered in Supplemental Window			Sold in Supplemental Window			% Sold in Supplemental Window		
	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
Q3 2020	6			6			100%		
Q4 2020	22	64	8	22	64	0	100%	100%	0%
Q1 2021	72	86		4	1		5%	1%	
Q2 2021	3	24		3	24		100%	100%	
							76%	67%	0%

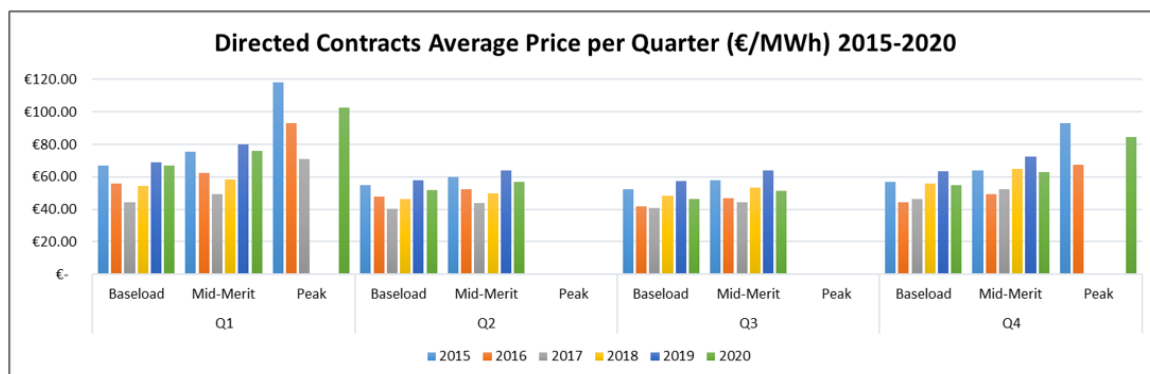
Table 3 Primary and Supplemental Window volumes

During Round 10, 59 % of Baseload, 51 % of Mid-Merit and 15 % of Peak product was sold in the Primary Subscription Window. The remaining volumes were taken up in the Supplementary Window with the exception of Q2 2020 peak and Q1 2021, where only 5 % of the remaining Baseload and 1 % of the remaining Mid-Merit product was sold.

Directed Contracts Average Price (€/MWh) 2015 – 2020

DC Average Price per Quarter (€/MWh, 2015-2020)												
Year	Q1			Q2			Q3			Q4		
	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
2015	€ 67.02	€ 75.51	€ 117.97	€ 54.77	€ 59.74		€ 52.42	€ 57.80		€ 56.64	€ 63.96	€ 93.09
2016	€ 55.61	€ 62.31	€ 93.18	€ 47.85	€ 52.55		€ 41.91	€ 46.67		€ 44.25	€ 49.31	€ 67.30
2017	€ 44.09	€ 49.12	€ 70.73	€ 40.27	€ 43.65		€ 40.69	€ 44.12		€ 46.49	€ 52.16	-
2018	€ 54.51	€ 58.48	-	€ 46.30	€ 49.68		€ 48.20	€ 53.56		€ 55.90	€ 64.66	-
2019	€ 68.92	€ 80.20	-	€ 57.76	€ 63.94		€ 57.22	€ 63.73		€ 63.46	€ 72.44	-
2020	€ 66.72	€ 76.03	€ 102.60	€ 51.62	€ 56.74		€ 46.14	€ 51.18		€ 54.75	€ 62.74	€ 84.46

Directed Contracts Average Price (€/MWh) 2015 – 2020



Directed Contracts Volumes (GWh) 2015 – 2020

DC Volumes (GWh, 2015-2020)															
Year	Q1			Q2			Q3			Q4			Total		
	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
2015	902	48	74	891	63	0	935	7	0	984	15	11	3711	133	84
2016	877	10	47	1138	7	0	1249	3	0	962	7	0	4226	26	47
2017	853	27	12	1153	161	0	690	191	0	1012	170	0	3707	549	12
2018	1392	0	0	1964	321	0	786	577	0	723	655	0	4865	1553	0
2019	816	617	0	611	365	0	531	733	0	446	862	0	2404	2577	0
2020	1233	192	7	522	438	0	200	405	0	352	508	14	2307	1544	21

Directed Contracts Volumes (GWh) 2015 – 2020

