Single Electricity Market

Performance

1 October 2019 – 31 December 2019

SEM-20-015

SEM Monitoring Report

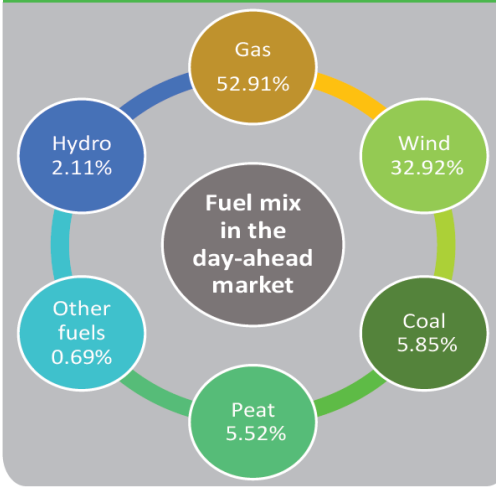
1 October 2019 - 31 December 2019

SEM committee

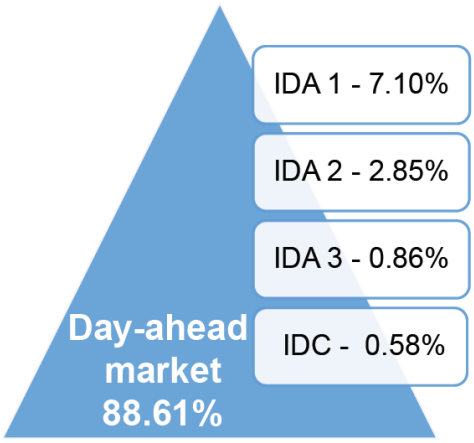
Key Highlights

- Prices in the day-ahead market were 36% lower than in the equivalent period last year. Increased wind forecast in the day-ahead market and lower gas prices 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 €501m.
- Interconnectors continue to flow efficiently between the SEM and GB.
- Amber alert in Northern Ireland following forced generator outages. Event did not cause demand loss or supply disruption.

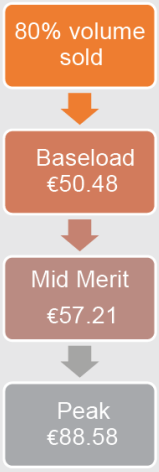
Fuel Mix



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
- Slight reduction in average day-ahead price from €46.68 in previous quarter to €46.13

Average daily price in DAM €46.13
Lowest price in hourly period -€11.86
Highest price in hourly period €205.25

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 new market, in particular in relation to bidding controls in place and to the requirements of REMIT. It 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 will buy and sell power from market participants to ensure that the demand and supply of power is exactly matched.

This report covers the fourth quarter of 2019 from 1 October to 31 December.

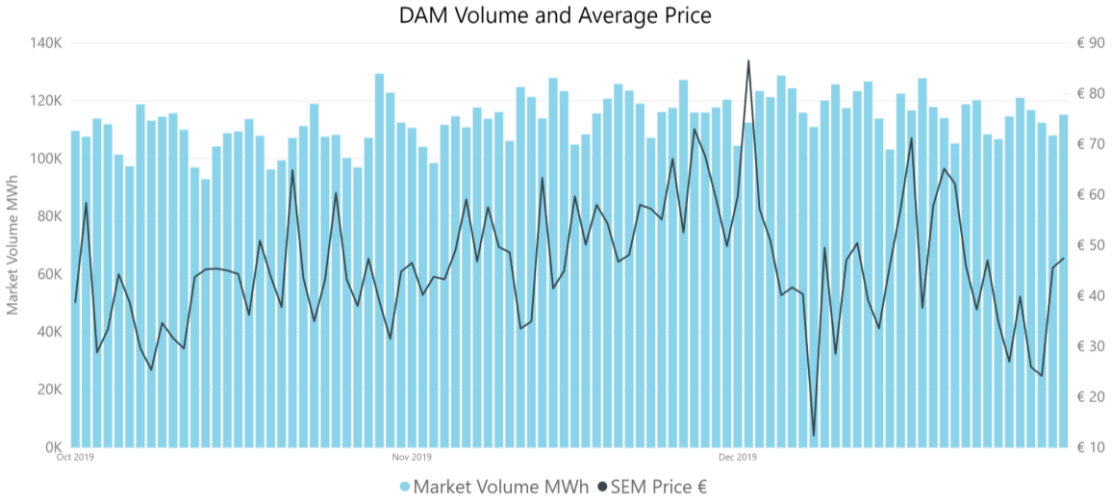
2 MARKET PERFORMANCE

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 though 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 Q4 2019. In total the value of the DAM market during the period was over €501m.

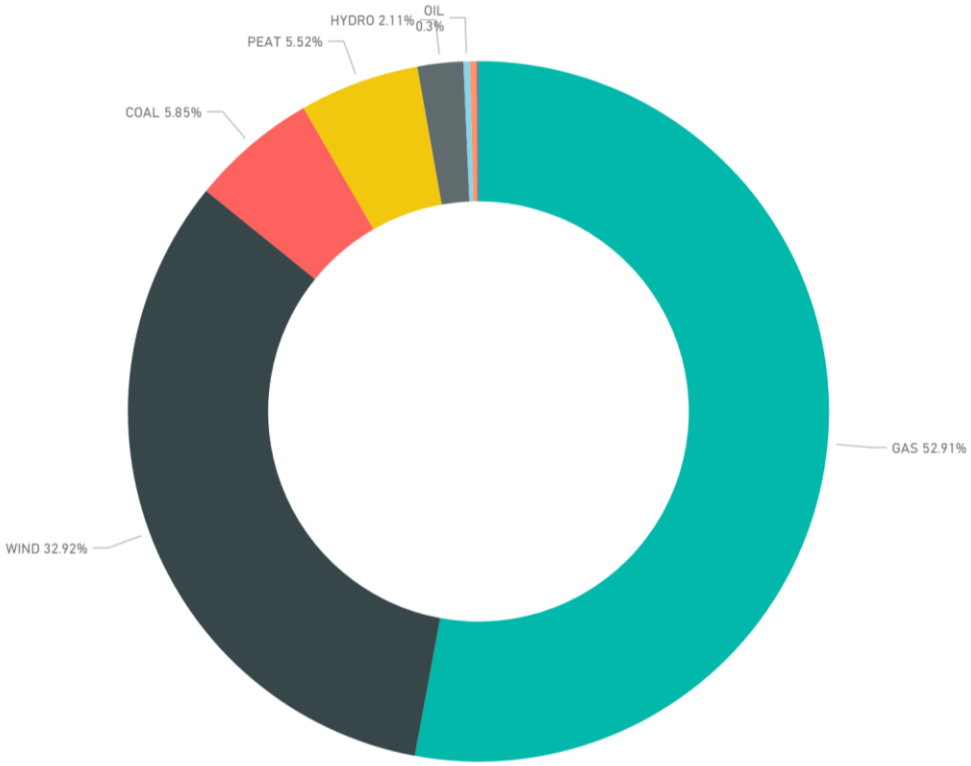


Graph 1 DAM

The average daily price in the DAM was €46.13 during the period, down slightly from €46.68 in Q3 2019. The lowest price recorded in an hourly period was -€11.86. The maximum price recorded in a single period was €205.25.

Prices in the DAM are lower than the equivalent period one year ago (decrease of 36%) which can broadly be accounted for by a decrease in gas 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

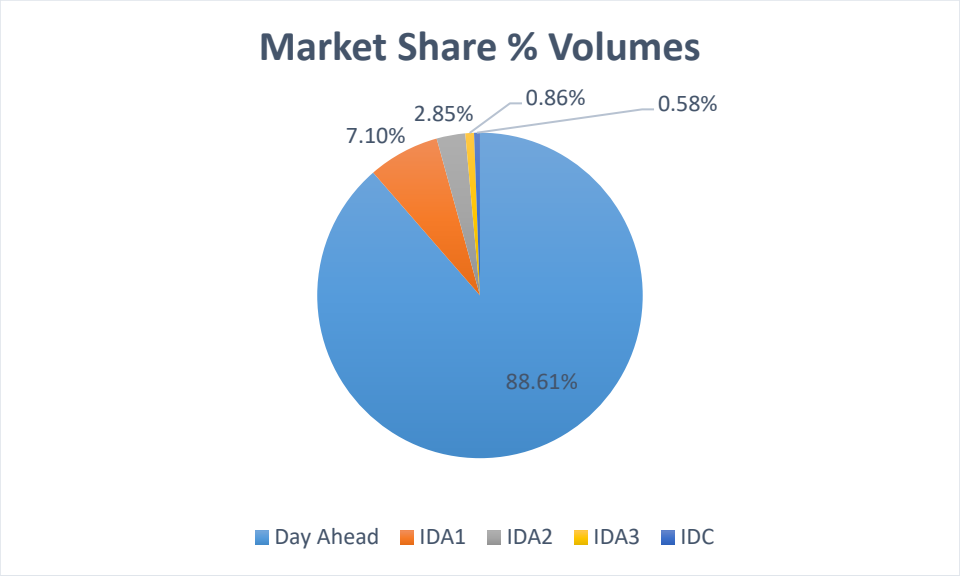
Gas represents 52.91%, Wind 32.92%, Coal 5.85% and Peat 5.52% with the remainder made up of Hydro, Oil, Biomass and Distillate.

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. 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.

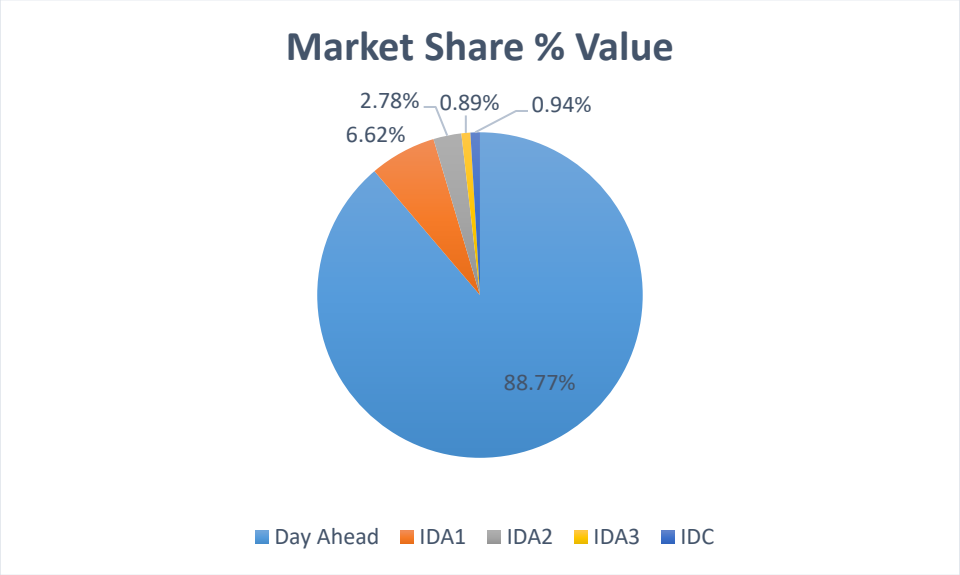
High Price-Low Wind				Low Price-High Wind			
Date	Time	Price €	Wind Forecast MWh	Date	Time	Price €	Wind Forecast MWh
19-Dec-19	17:00	€205.25	373.35	08-Dec-19	05:00	-€11.86	4,085.66
21-Dec-19	17:00	€200.00	117.64	08-Dec-19	03:00	-€10.00	3,948.44
17-Dec-19	17:00	€174.15	327.21	08-Dec-19	04:00	-€10.00	4,020.71
02-Dec-19	17:00	€170.20	443.25	08-Dec-19	06:00	-€10.00	4,134.29
19-Dec-19	18:00	€169.97	407.82	09-Dec-19	02:00	-€5.99	4,273.94

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.



Graph 3 Market Shares by Volume



Graph 4 Market Share by Value

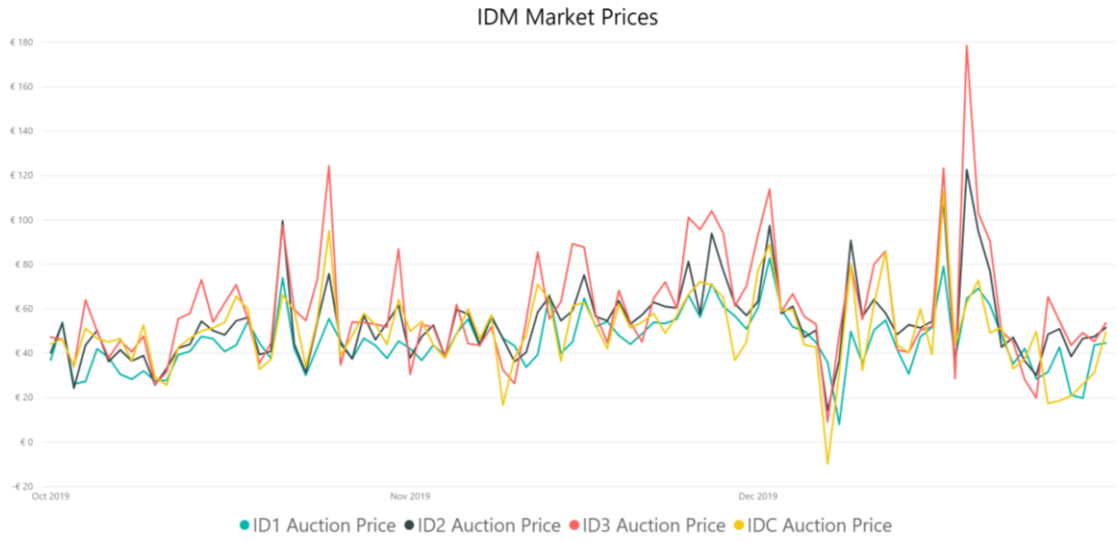
2.2 INTRA-DAY MARKET

The Intra-Day markets have allowed market participants to refine their market position by buying or selling nearer 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. The IDM1 and IDM2 are coupled markets with GB while the IDM3 and IDC are local SEM-only markets. The IDM1 auction accounted for 7.10% of the total ex-ante market by volume; the IDM2 auction accounted for 2.85%, the IDM3 auction for 0.86% and the Intra-Day Continuous market (IDC) for 0.58%.

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 €45.65; IDM2 €53.83 and IDM3 €58.62 and the IDA Continuous market €52.54. The total value of these markets over the period was €38.63 in IDM1; over €17m in IDM2; €5.8m in the IDM3 and over €1.9m in the IDC market, all increased from Q3 with the exception of IDC. 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 IDA 1 with the higher prices in IDA 3 market. Prices in all markets generally move in a similar direction with the IDA 3 market showing the largest movement.



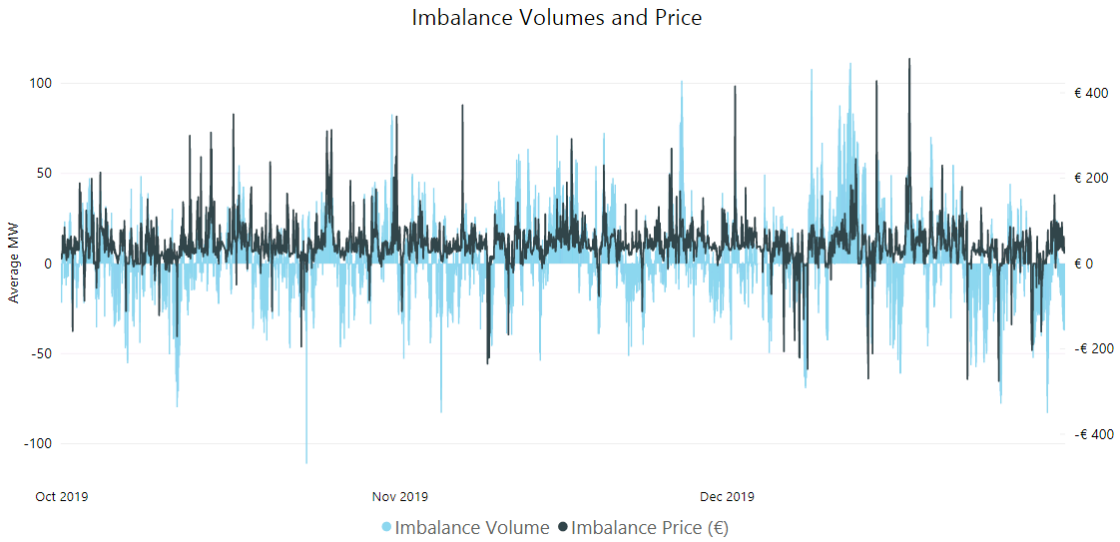
Graph 5 IDM Prices

A price spike in the IDA3 Market can be observed from the graph above on 19 December. On this day, the forecast wind at the Day-Ahead stage was significantly more than the actual wind which appeared on the system. As the day progressed, it became apparent that the level of wind wasn't what was initially forecast and this resulted in more movement in the latter auctions (IDA 2 and 3) which are closer to peak times resulting in higher prices. During this auction (IDA 3), the price peaked at €301.10 at 17:30.

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 Imbalance volumes and price for each 30 minute Imbalance Price Settlement Period.

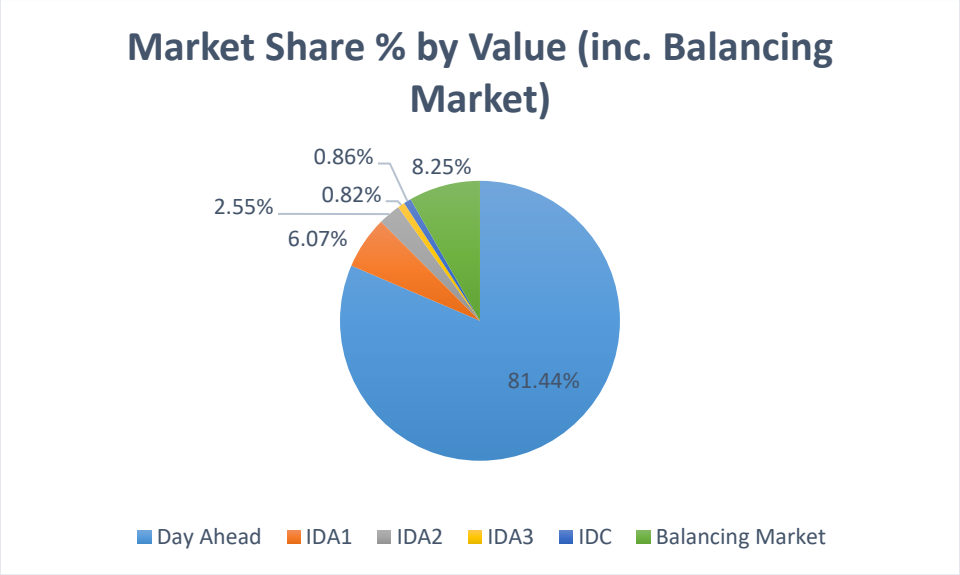


Graph 6 Imbalance Volumes and Prices

The volatility of the balancing market is illustrated in the chart above. The highest prices can be observed on 17 December at €479.80 and the lowest price of €-275.35 observed on 25 December.

On Wednesday 6th November, SONI issued an amber alert in Northern Ireland due to a combination of generator forced outages (two related trips within 20 minutes) and low renewable generation output on the island. Across the same period, Ireland was experiencing constraint issues which were managed alongside the alert in NI. This event did not cause demand loss or any disruption to customers with the highest price recorded at €371.07 in the Balancing Market at 17:30.

The balancing market is a complex market with numerous charge and payment components. Using these components to calculate the cost/value of Balancing, we can calculate the Balancing Market share in comparison to the ex-ante markets. This is shown in the graph below.



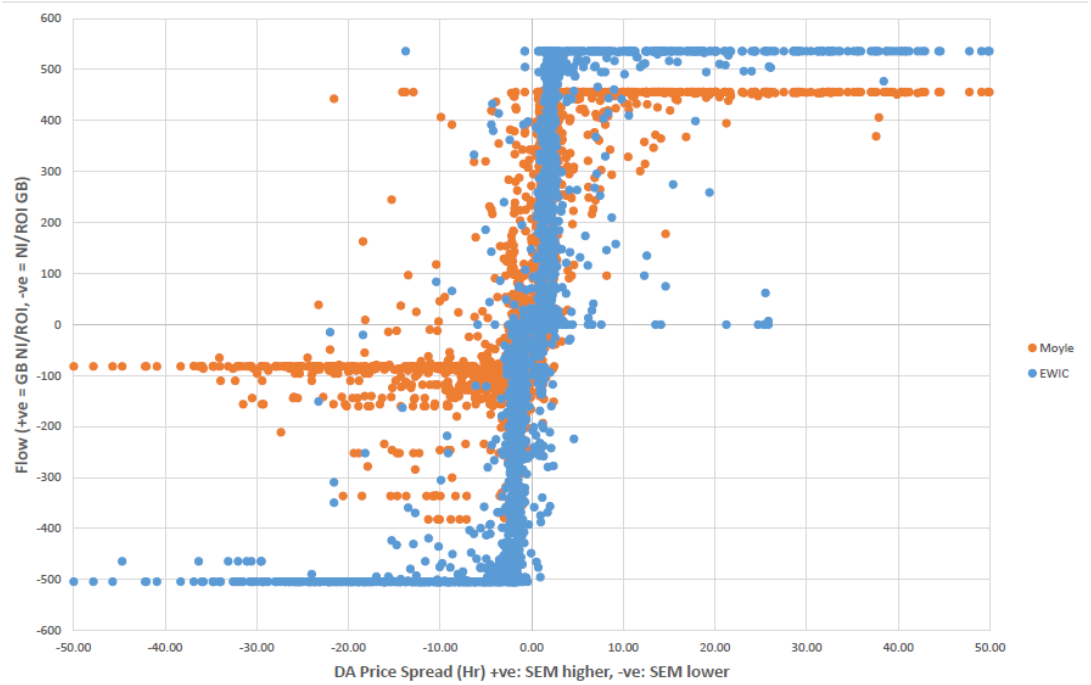
Graph 7 Market Share (including Balancing Market)

As the graph above shows, the DAM represents 81.44% of the market value, followed by the Balancing Market with 8.25%, IDA1 with 6.07%, IDA2 with 2.55%, IDA3 with 0.82% and IDC with 0.86%.

2.4 INTERCONNECTOR FLOWS

In the new 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.

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 9, which was held in January 2020 and covers the period Q2 2020 to Q1 2021.

Quarters on offer	Q2 2020 to Q1 2021		
Primary subscription dates	28-30 January 2020		
Supplementary subscription date	6 February 2020		
Volume sold	0.45 TWh		
% Volume Sold	80 %		
Average price / MWh	Baseload	Mid Merit	Peak
	€50.48	€57.21	€88.58

Table 2 Round 9 Key Information

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

MW	Offered in Primary Window			Sold in Primary Window			% Sold in Primary Window		
Quarter	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
2020 Q2		72			66			92%	
2020 Q3	23	11		21	10		91%	92%	
2020 Q4	79	65	6	65	54	2	82%	83%	27%
2021 Q1	65	6	10	9	1	2	15%	17%	15%

MW	Offered in Supplemental Window			Sold in Supplemental Window			% Sold is Supplemental Window		
Quarter	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
2020 Q2		6			6			100%	
2020 Q3	2	1		2	1		100%	100%	
2020 Q4	14	11	4	14	11	4	100%	100%	100%
2021 Q1	55	5	8	0	3	0	0%	50%	0%

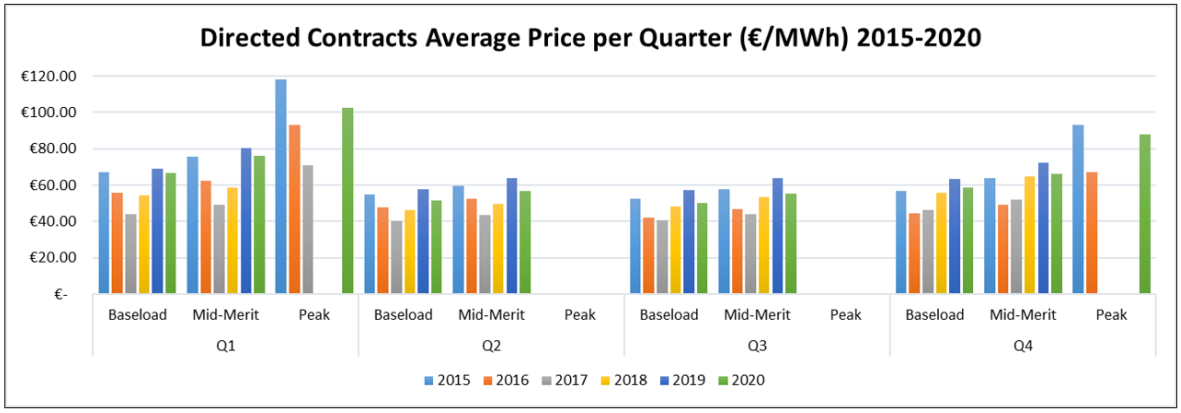
Table 3 Primary and Supplemental Window volumes

During Round 9, 63 % of Baseload, 71 % of Mid-Merit and 21 % of Peak product was sold in the Primary Subscription Window. The remaining volumes were taken up in the Supplementary Window with the exception of Q1 2021, where only 50 % of the remaining Mid-Merit product was sold. None of the offered Baseload and Peak product were taken up for Q1 2021.

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-Mer	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		€ 50.02	€ 55.28		€ 58.49	€ 66.10	€ 88.06

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	887	47	74	885	62	0	945	7	0	990	15	11	3707	132	84
2016	871	10	47	1135	7	0	1259	3	0	967	7	0	4232	26	47
2017	841	27	12	1148	160	0	695	191	0	1023	172	0	3707	550	12
2018	1370	0	0	1958	320	0	790	580	0	727	659	0	4846	1558	0
2019	801	606	0	609	362	0	535	739	0	450	871	0	2394	2579	0
2020	1231	193	7	518	436	0	203	407	0	381	205	13	2333	1241	20

Directed Contracts Volumes (GWh) 2015 – 2020