



**Single Electricity Market  
Performance  
01 January 2021 – 31 March 2021  
SEM-21-040**

# SEM Monitoring Report

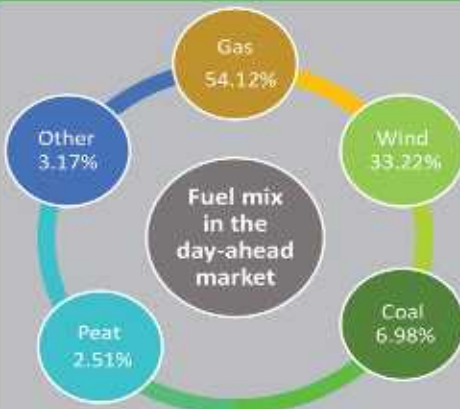
1 January 2021 - 31 March 2021

**SEM**  
committee

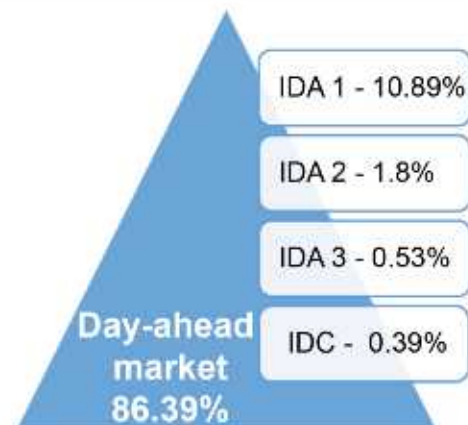
## Key Highlights

- ✓ Prices in the day-ahead market were 37.3% higher than the previous quarter. Increased carbon and gas prices along with lower forecasted wind and plant outages led to the higher market prices. Prices compared to the same period last year have increased by 91.83%. Increased fuel costs, increased demand and lower levels of wind on the system accounts for this increase.
- ✓ High liquidity continues to be concentrated in the day-ahead market with over 86% of ex-ante volumes traded with an overall value of over €772.28m.
- ✓ From 1 January 2021, market coupling across the interconnectors has taken place in the intraday auctions 1 and 2 only.

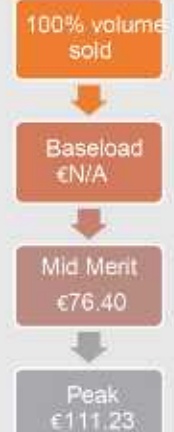
## Fuel Mix



## 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
- ✓ Increase in average day-ahead price from €50.97 in previous quarter to €69.98

Average daily price in DAM €69.98  
Lowest average daily price €18.68  
Highest average daily price €145.12



Highest prices during evening peak demand  
Lowest prices overnight

## 1 INTRODUCTION

The 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 forward contracts.

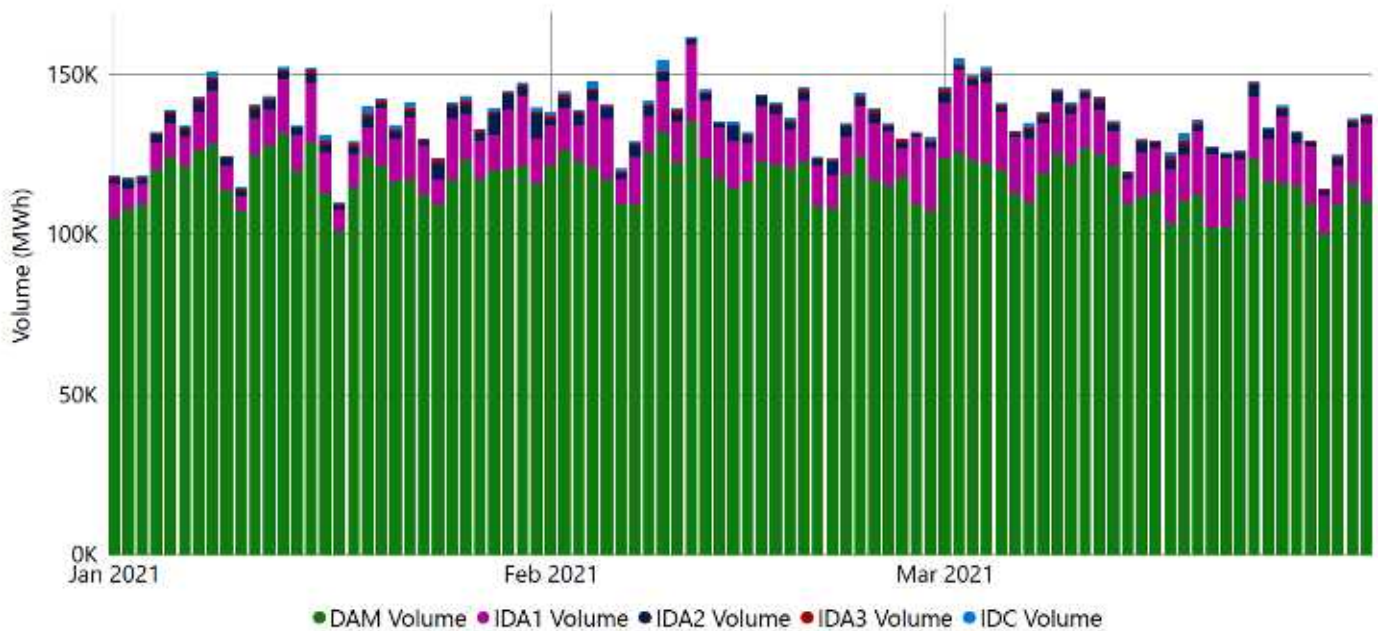
The DAM is a daily auction that takes place at 11:00 each day. Participation in the DAM is not mandatory. This market is no longer coupled with Great Britain (GB). Following the DAM, the Intraday Auctions (IDA) enables participants to adjust their physical positions closer to real time. IDA1 and IDA2 are coupled with the GB market. The Intraday Continuous Market (IDC) also 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) 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 2021 from 01 January to 31 March

2.1 OVERALL PERFORMANCE

This section summarises overall SEM performance for the period 01 January 2021 to 31 March 2021.

The graph below charts the daily volumes in each Ex-Ante market in the SEM during the quarter. The average DAM daily volume for the period was 117,449 MWhs with the average daily volume in IDA1 14,810 MWhs, IDA2 2,441 MWhs, IDA3 723 MWhs and IDC 530 MWhs.



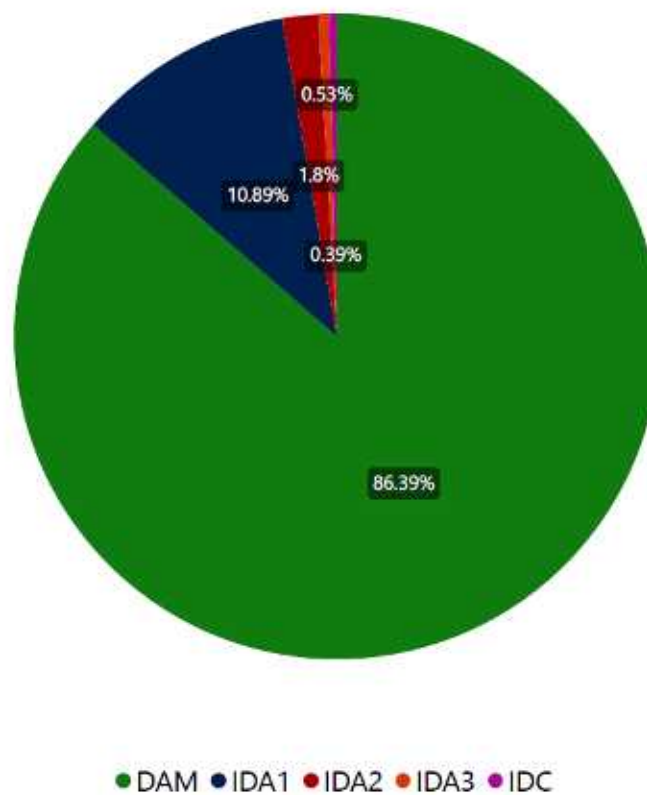
Graph 1 - SEM Ex-Ante Daily Volumes

The graph below shows the daily average Ex-Ante and Balancing Market prices across the quarter. The average daily DAM price was €69.98/MWh, IDA1 €68.78/MWh, IDA2 €80.63/MWh, IDA3 €86.00/MWh, IDC €78.63/MWh and the Imbalance Settlement Price was €66.75/MWh.



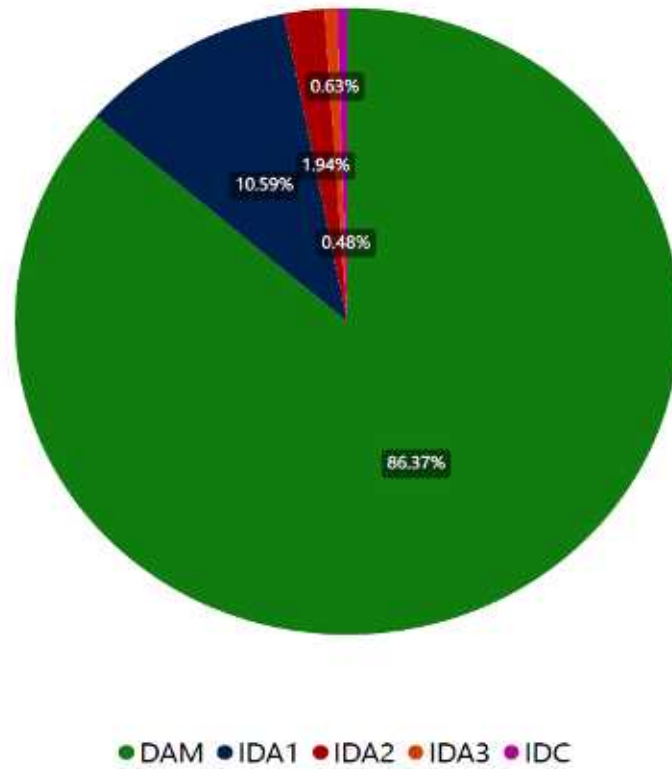
**Graph 2 - SEM Ex-Ante & Balancing Market Daily Average Price**

Graphs 3 and 4 below show the market share for each Ex-Ante Market by volume and value. By volumes (MWh), the DAM represented 86.39% of volumes traded, followed by IDA1 10.89%, IDA2 1.8%, IDA3 0.53% and IDC 0.39%.



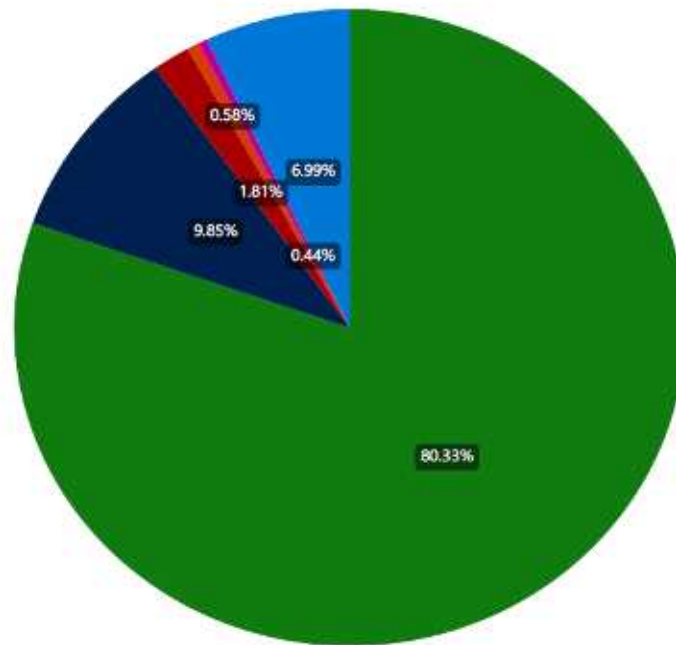
**Graph 3 - Market (Ex-Ante) Share by Volume (MWh)**

By value, the DAM represents 86.37%, IDA1 10.59%, IDA2 1.94%, IDA3 0.63% and IDC 0.48%.



Graph 4 - Market (Ex-Ante) Share by Value (€)

As the graph below shows, when the Balancing Market value is included with the Ex-Ante Markets, the DAM represents 80.33% of the market, followed by the IDA1 with 9.85%, Balancing Market with 6.99%, IDA2 with 1.81%, IDA3 with 0.58% and the IDC with 0.44%.



● DAM ● IDA1 ● IDA2 ● IDA3 ● IDC ● Balancing Market

**Graph 5 - Market Share by Value (inc. Balancing Market) (€)**

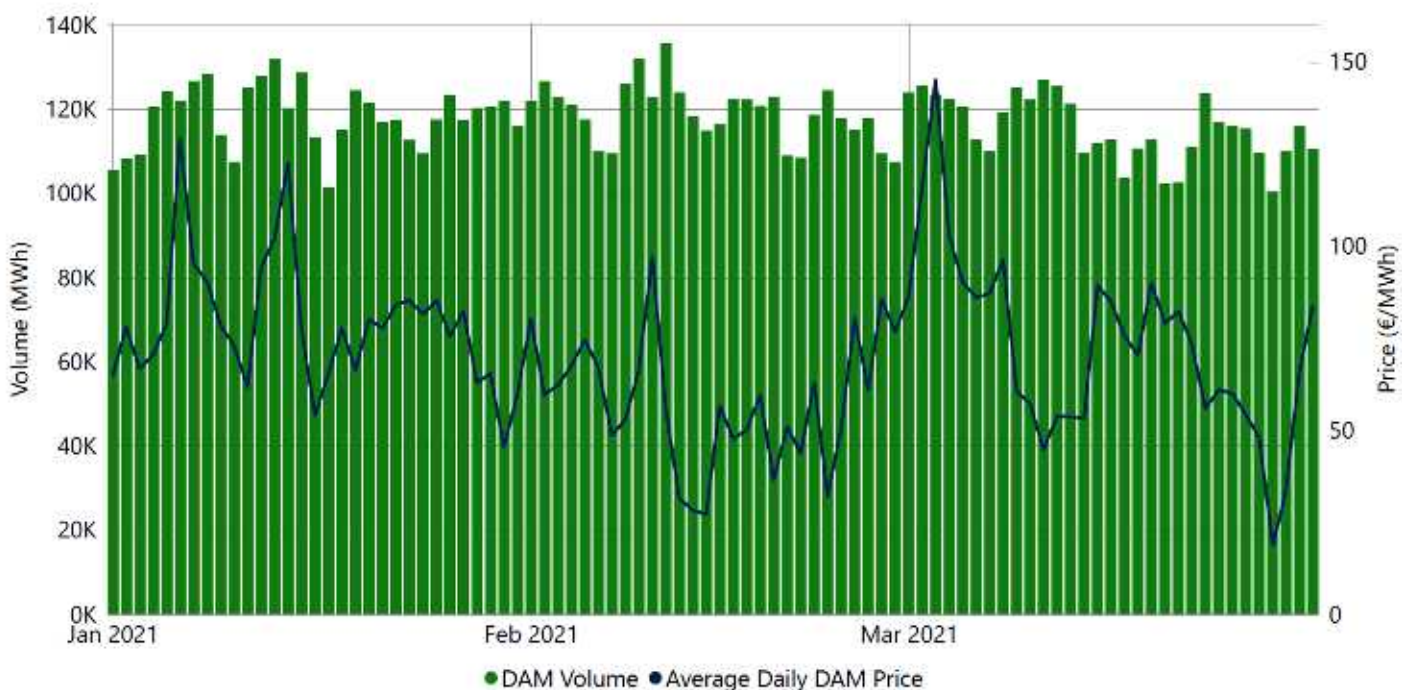
Overall, actual system demand in across the quarter has generally remained above or close to the levels seen when compared to the same period in 2020. Towards the end of March 2020 the effect of COVID-19 lockdown restrictions can be observed by the steep decrease in system demand.



2.2 DAY AHEAD MARKET

The graph below shows the daily average DAM price and volume for the market in Q1 2021. In total, the value of the DAM market during the period was €772.28M. The average daily price in the DAM was €69.98/MWh during the period, up from €50.97/MWh in Q4 2020, a 37.3% increase. The lowest average daily price was €18.68/MWh with the highest average daily price €145.12/MWh. The lowest price recorded in an individual hourly period was (-) €20.43/MWh whilst the maximum price recorded in a single period was €500/MWh.

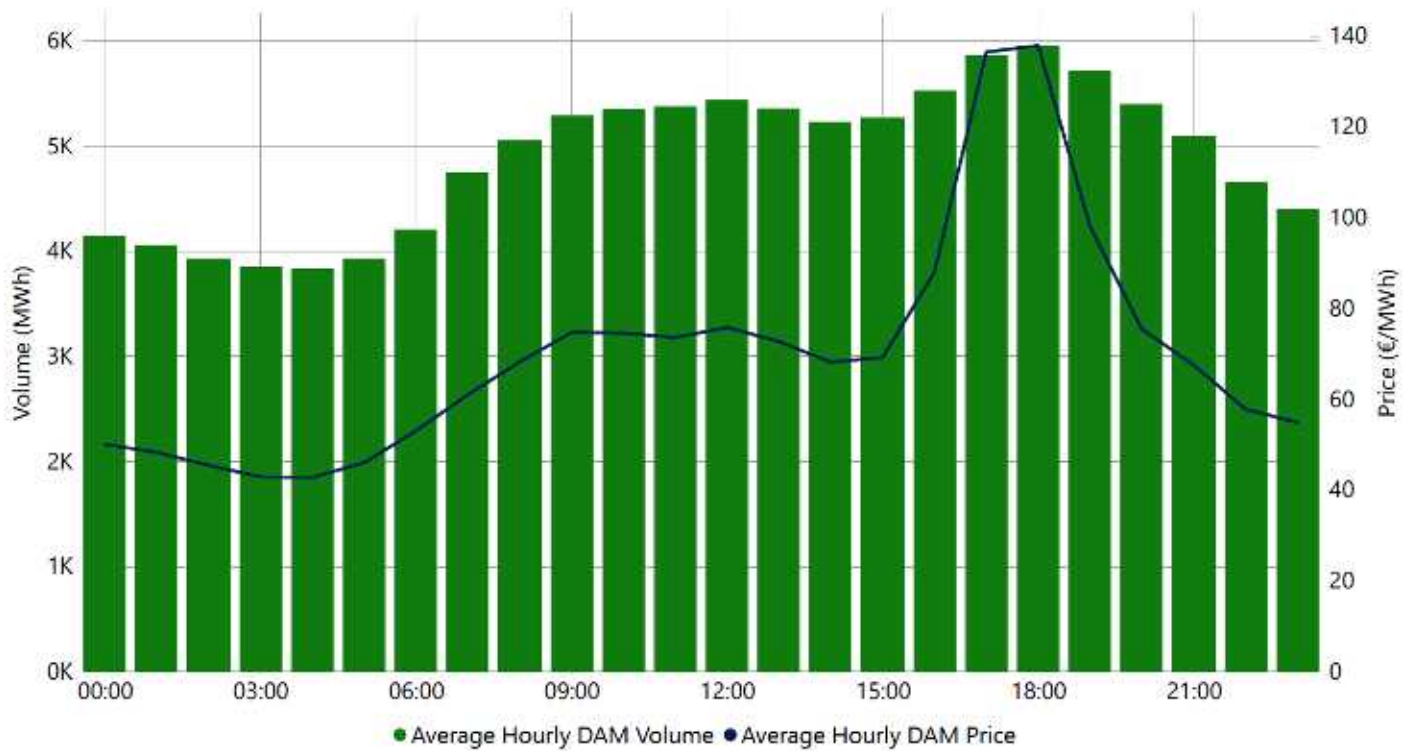
Higher market prices over the period were due to increased Gas and Carbon costs, coupled with on account of lower forecasted wind on the system and several units being unavailable.



Graph 7 - DAM Market Volume and Average Daily DAM Price

The below graph shows the average volume and price across each hourly period in the trading day. It continues to show that the highest volumes were traded across peak evening periods and this is where highest prices occurred.

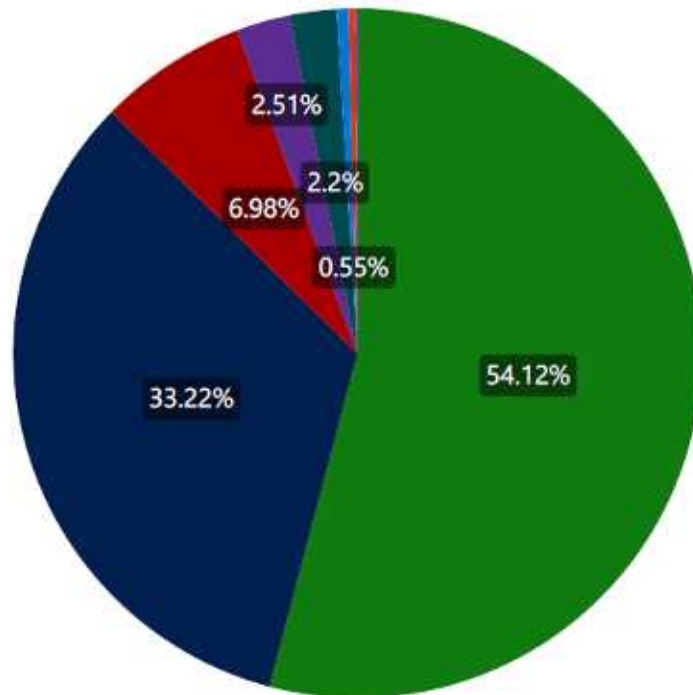




**Graph 7 – Average Volume and Price per Hourly Period**

Prices in the DAM are higher than the equivalent period one year ago (January 2020 to March 2020) (increase of 91.83%) which can broadly be accounted for by an increase in input costs, demand and lower levels of wind on the system.

The share of DAM metered generation by fuel mix is shown in Graph 8 below.

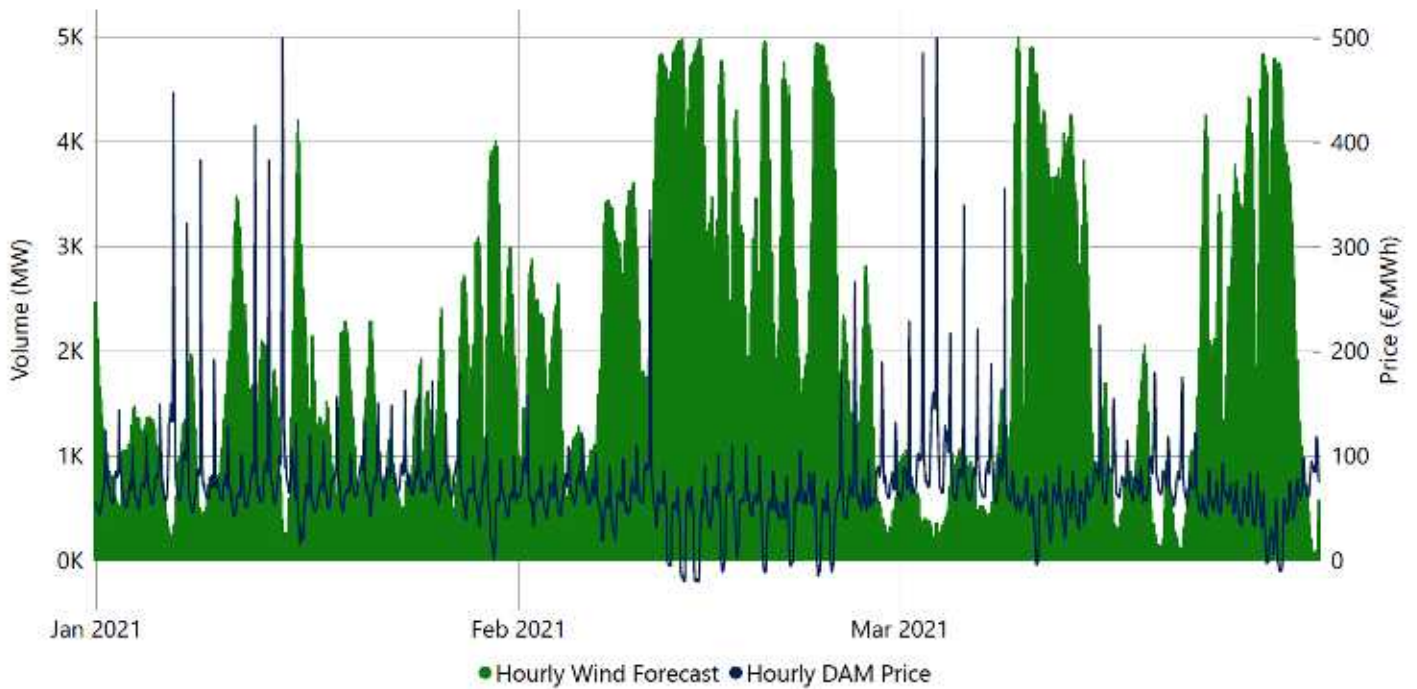


● GAS ● WIND ● COAL ● PEAT ● HYDRO ● OIL ● BIOMASS ● DISTILLATE ● PUMP STORAGE

**Graph 8 – DAM Metered Generation by Fuel Mix**

Gas represents 54.12%, Wind 33.22%, Coal 6.98% and Peat 2.51% with the remainder made up of Oil, Hydro, Biomass, Distillate and Pumped Storage.

DAM prices continue to be 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 during periods of much higher expected levels of wind.



**Graph 9 – Hourly Wind Forecast and Hourly DAM Price**

Table 1 below illustrates the relationship between prices and the forecast level of wind at day-ahead stage. It shows the highest prices over the period covered occurred during evening peak demand and the lowest prices occurring overnight.

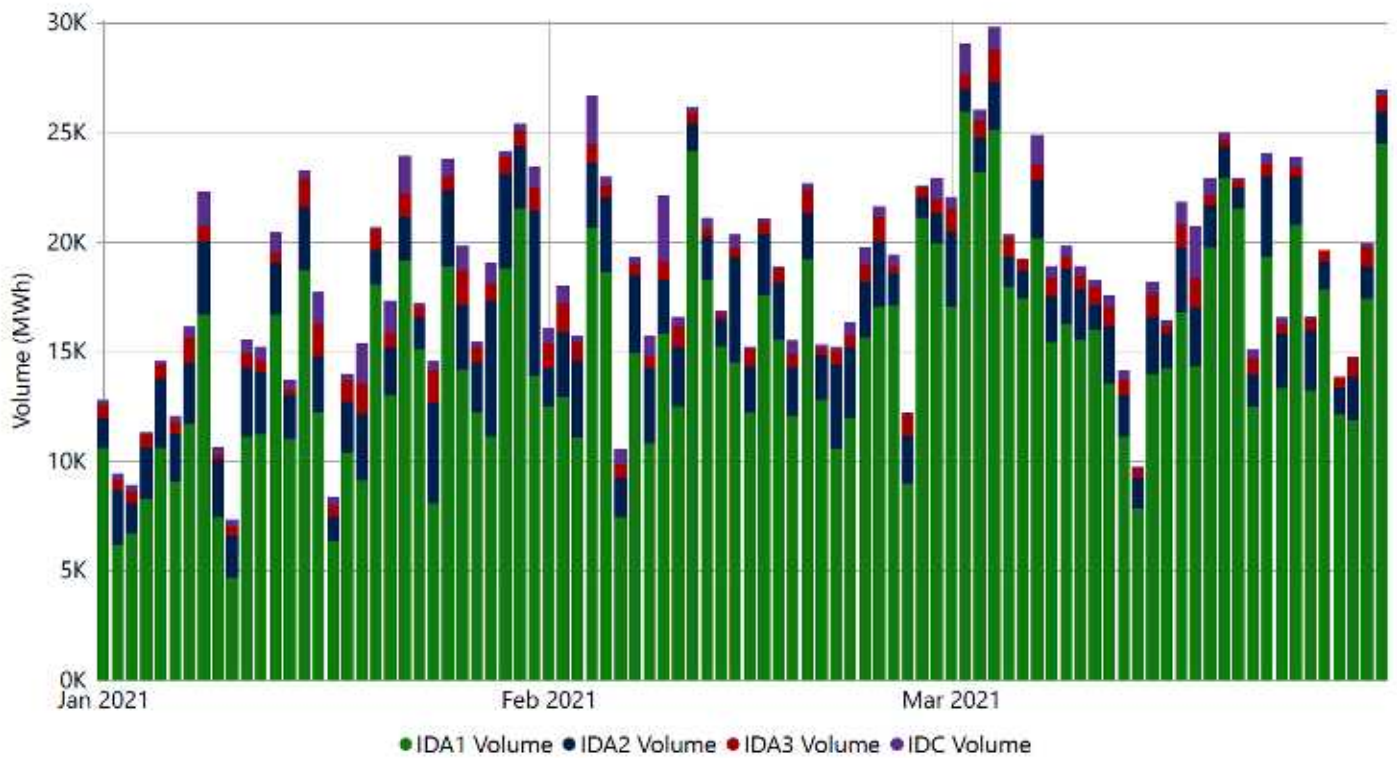
High Price-Low Wind				Low Price-High Wind			
Date	Time	Price (€/MWh)	Wind Forecast (MW)	Date	Time	Price (€/MWh)	Wind Forecast (MW)
03/03/2021	18:00	500	364	14/02/2021	06:00	-20.43	4929
14/01/2021	17:00	500	296	13/02/2021	06:00	-20.12	4175
02/03/2021	18:00	485.92	338	14/02/2021	05:00	-20.04	4910
14/01/2021	18:00	450	223	14/02/2021	07:00	-20.04	4967
06/01/2021	17:00	447.43	290	13/02/2021	04:00	-20	4870

**Table 1- DAM Price and Wind Forecast**

## 2.2 INTRADAY MARKET

Traded volumes in the Intra-Day markets have increased across Q1 2021 when compared to those in Q4 2020. This can be partially attributed to the new trading arrangement as a result of Brexit where the IDA1 and IDA2 are now the only markets coupled with GB and trading across the interconnectors takes place during these auctions.

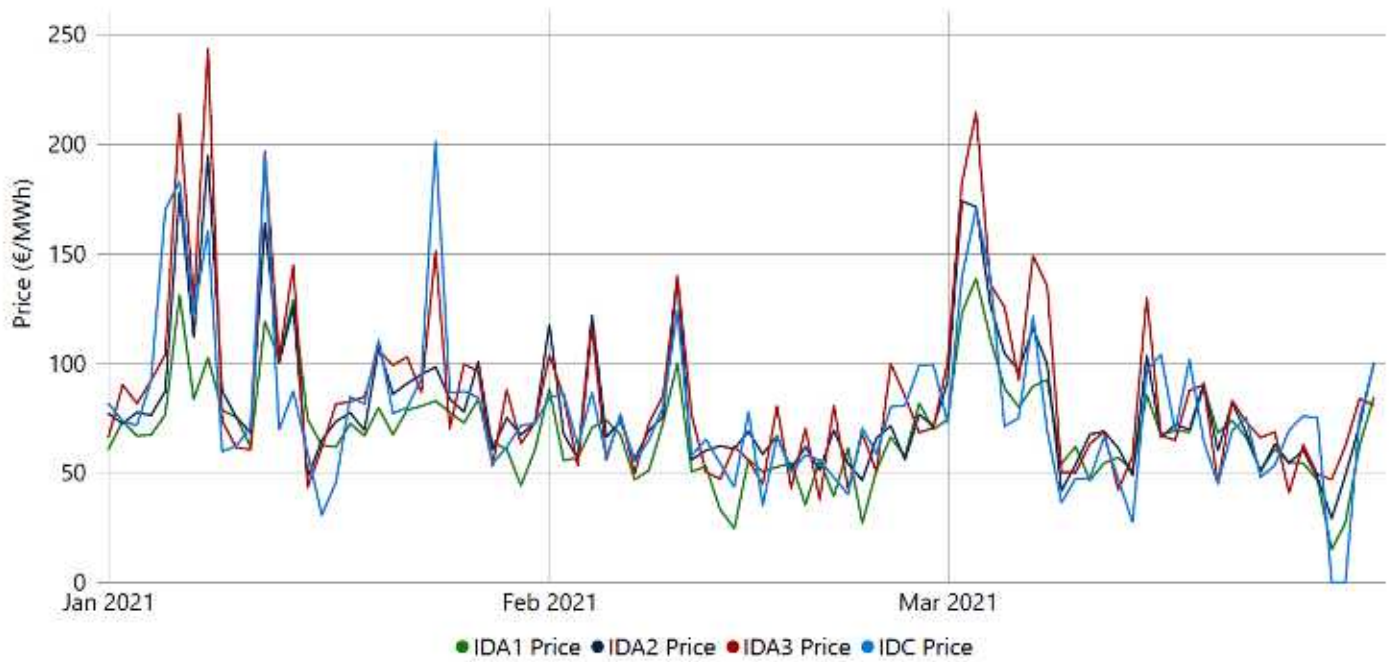
During Q1 IDA1 accounted for 10.89% of ex-ante traded volumes, IDA2 accounted for 1.8%, IDA3 accounted for 0.53% of trades by volume and the IDC accounted for 0.39% of traded volumes of the ex-ante markets. The share of the market by value is similar, with IDA1 accounting for 10.59% of total ex-ante market value, IDA2 1.94%, IDA3 0.63% and IDC 0.48%.



**Graph 10 – Total Intraday Volumes**

Average prices show a tendency to rise during the intraday timeframe as it becomes closer to real time, with average prices in IDA1 being €68.78/MWh; IDA2 €80.63/MWh and IDA3 €86.00/MWh and the IDC market €78.63/MWh. The total value of these markets over the period was €94.66M in IDA1; €17.38M in IDA2; €5.61M in the IDA3 and €4.26M in the IDC market. The IDA2 and IDA3 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 11 below illustrates the generally lower prices in the IDA1 with the higher prices in the IDA3 market. Prices in all markets generally move in a similar direction.



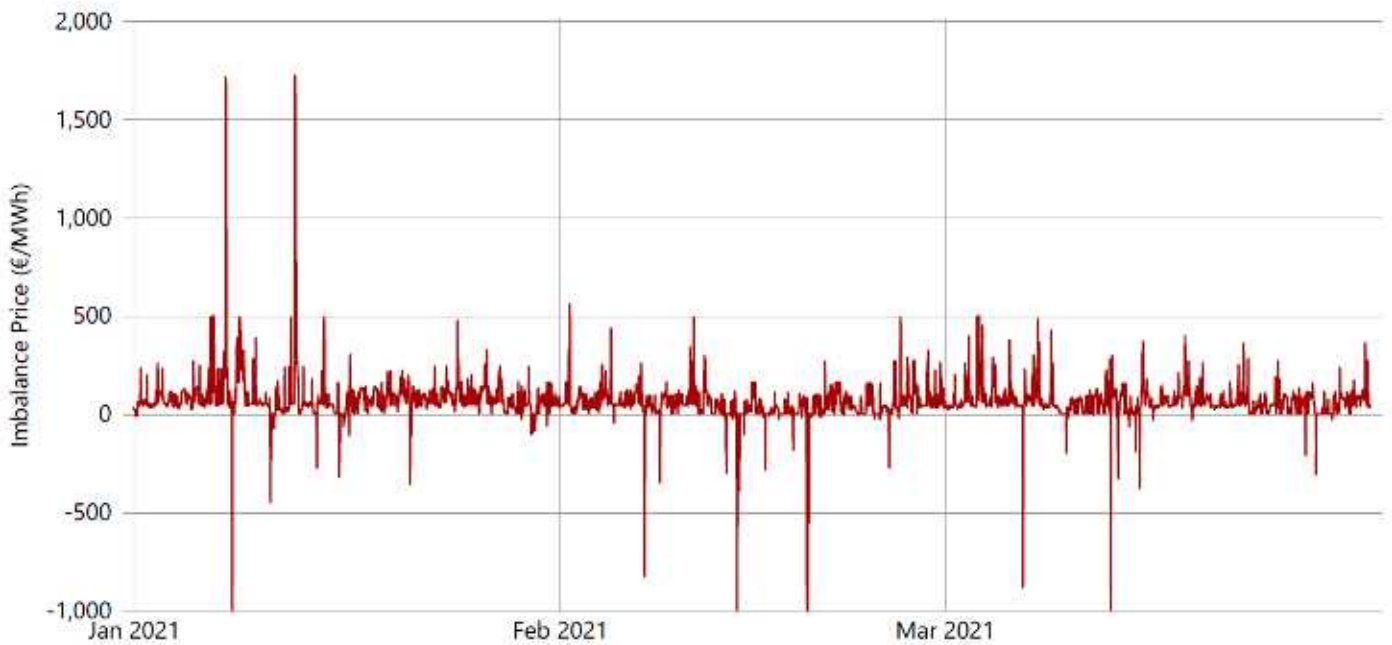
**Graph 11 – Average Daily Intraday Prices**

### 2.3 BALANCING MARKET

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. It is made up of numerous energy/non energy actions, charge and payment components. Using these components to calculate the value of balancing, we can show the value of the overall Balancing Market value for Q1 2021 was €67.17M.

Imbalance Prices for 5 minute and 30 minute periods are set out below, showing relatively higher volatility in the market.

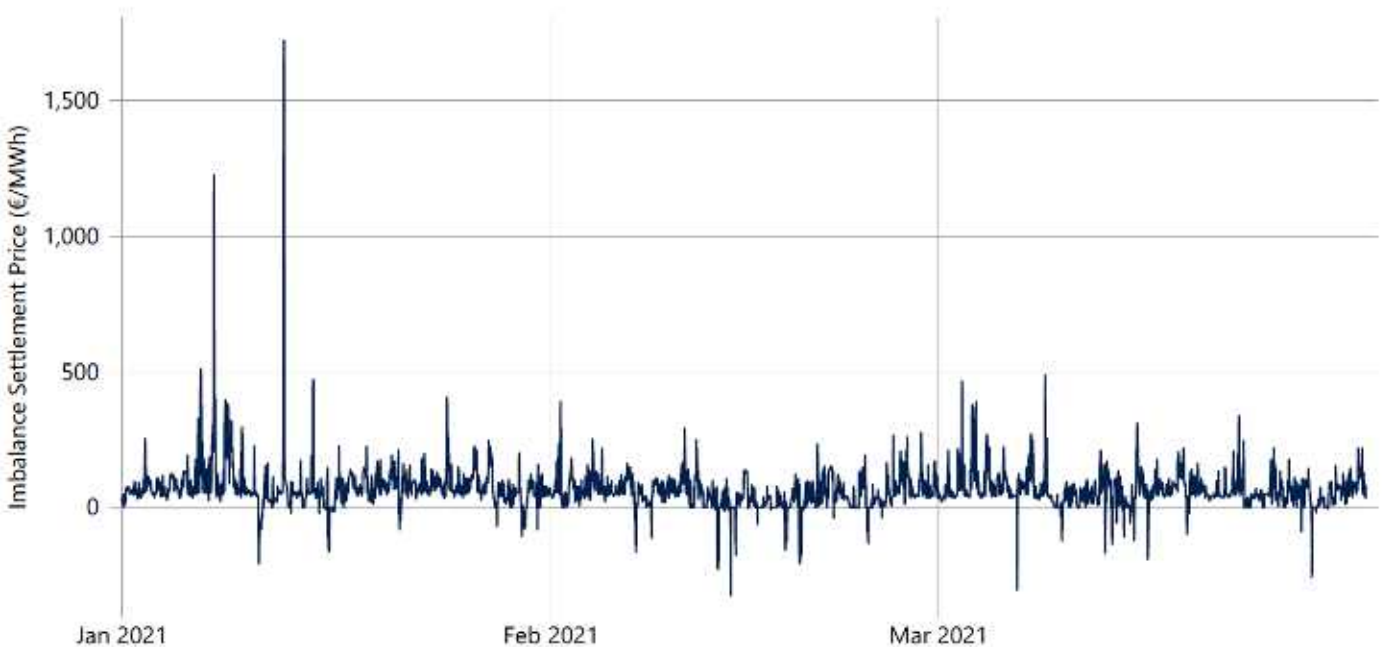
The graph below shows the price for each 5 minute Imbalance Price Period, highlighting the underlying price volatility in the Balancing Market. The average 5 minute price across the quarter was €66.83/MWh.



**Graph 12 – 5 Minute Imbalance Price**

The highest settlement 5 minute Imbalance Price occurred on 12 January at 17:05 of €1720.50/MWh and the lowest 5 minute Imbalance Price of (-)€1000 occurred on 08 January at 03:55.

The 5 minute Imbalance Price is used in the 30 minute Imbalance Price formation. In the below graph the Imbalance Settlement Price across the quarter can be seen.



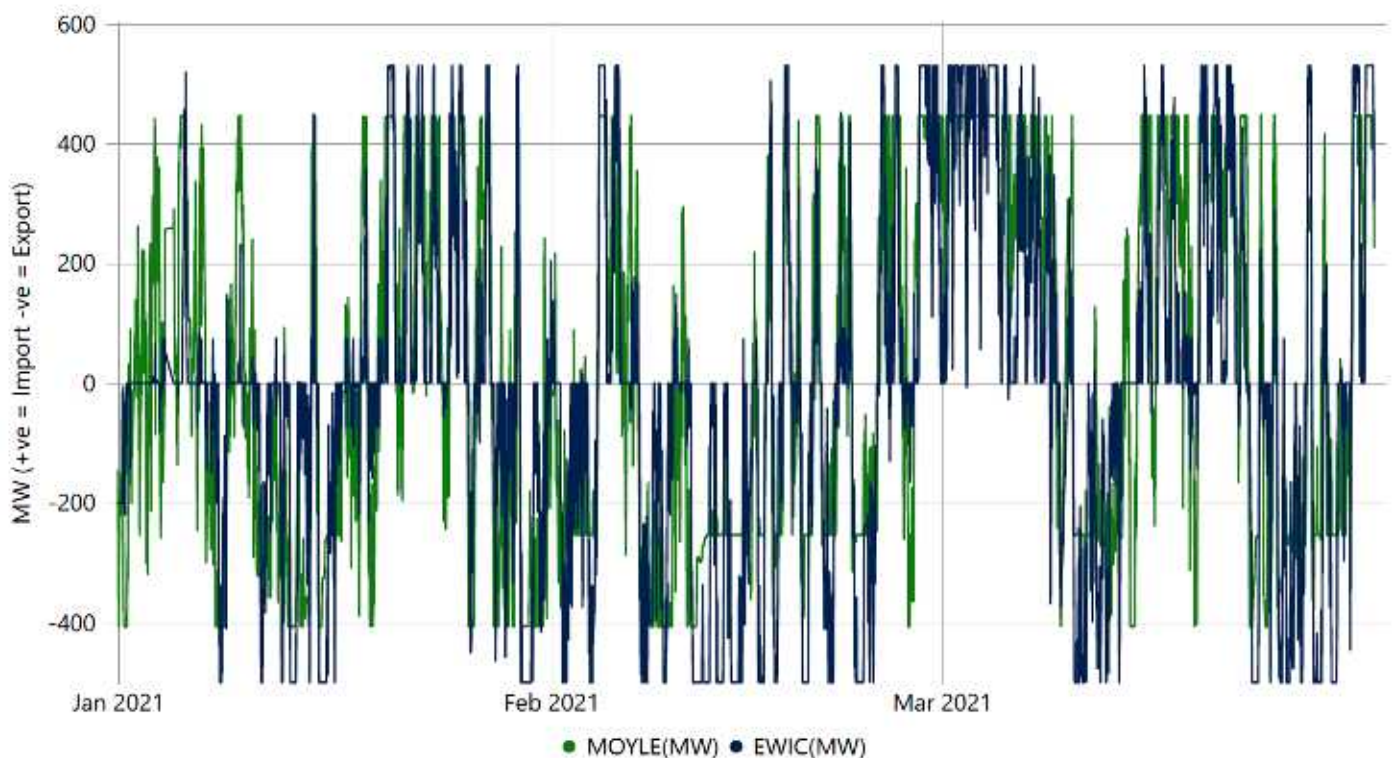
**Graph 13 – 30 Minute Imbalance Settlement Price**

During the quarter, the highest 30 minute Imbalance Settlement Price was €1720.50/MWh at 17:30 on 12 January. The lowest 30 minute settlement price was (-) €325.31/MWh at 01:00 on 14 February. The average Imbalance Settlement Price across the quarter was €66.69/MWh.

## 2.4 INTERCONNECTION

Due to the end of the Brexit transition period, a change in market coupling arrangements with GB came into operation. From 01 January 2021 cross border capacity is no longer coupled through the DAM. Cross border trading has however continued in the intraday timeframe via the IDA1 and IDA2 auctions. As with the previous coupling arrangement, scheduling of the flows on each of the interconnectors is determined by the price spread between SEM and GB in the IDA 1 and IDA 2 auctions. A spread where the SEM is priced higher than GB the interconnectors should import and where the SEM is priced lower than GB the interconnectors should be exporting.

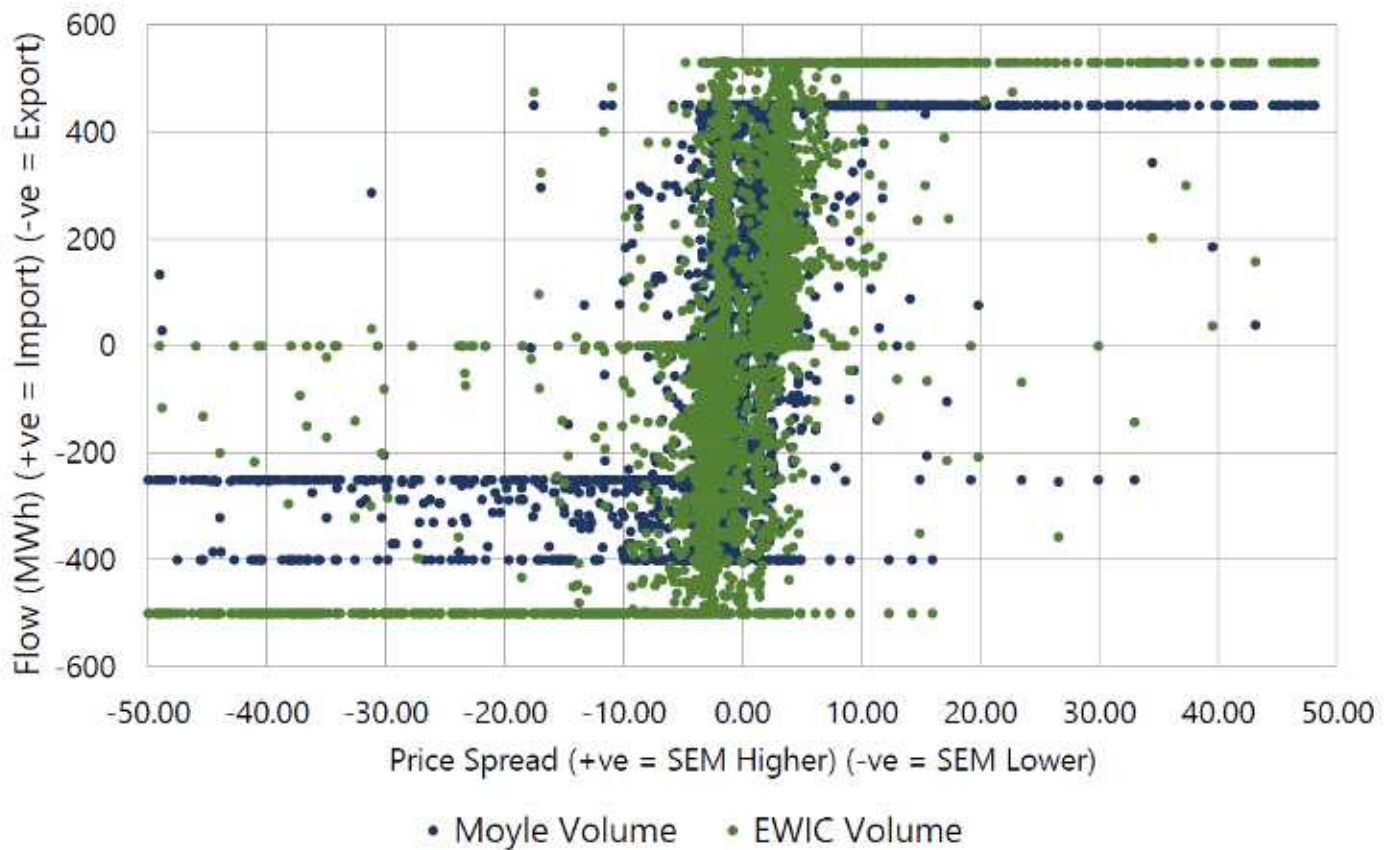
In the graph below, the actual flows of each interconnector are shown across the month. A positive flow on the top half of the graph shows the interconnectors importing, indicating that the intraday SEM prices are higher than the intraday GB price. A negative flow in the bottom half of the graph shows that the SEM is exporting, indicating that the SEM price is lower.



**Graph 14 – Actual Interconnector Flows (15 Minute Intervals)**

This relationship is presented in Graph 15 below. The X-axis shows the difference in IDA 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 Total Contracted Volume Flow on the day and their direction so that in the upper half of the graph, in which values

are positive, the interconnectors are scheduled to be importing into the SEM from GB. In the lower half the negative values indicate scheduled export.



**Graph 15 - Interconnector Efficiency (Price spread limit +/- €50)**

In the graph above there are points in the top left and bottom right quadrants that appear to show flows in the counter-intuitive direction based upon the SEM/GB price spread. These points are due to the interconnectors either exporting or importing across a number of periods in the expected direction based on the SEM/GB price spread, then the price spread inverts for one period before reverting back to the previous positive or negative spread.



### 3 DIRECTED CONTRACTS Q1 2021

#### 3.1 DIRECTED CONTRACTS Q1 2021 ROUND 14.

The tables and figures below show the price and volume of Directed Contracts subscriptions for the latest DC Round 14, which was held in March and April 2021, covering the period Q3 2021 to Q2 2022.

Key information is summarised in Table 2 below.

<b>Quarters on offer</b>	Q3 2021 to Q2 2022		
<b>Primary subscription dates</b>	23 <sup>rd</sup> – 25 <sup>th</sup> March 2021		
<b>Supplementary subscription date</b>	1 <sup>st</sup> April 2021		
<b>Volume sold</b>	0.49 TWh		
<b>% Volume Sold</b>	100%		
<b>Average price / MWh</b>	Baseload	Mid Merit	Peak
	N/A	€76.40	€111.23

Table 2: Round 14 Key Information

A breakdown of the volumes sold in the Round 14 Primary and Supplemental windows are shown in Table 3 and Table 4.

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
<b>Quarter</b>									
Q3 2021	-	144	-	-	132	-	-	91%	-
Q4 2021	-	34	43	-	31	32	-	91%	75%
Q1 2022	-	104	3	-	82	2	-	79%	63%
Q2 2022	-	64	-	-	59	-	-	92%	-
							-	<b>88%</b>	<b>69%</b>

Table 3: Round 14 Primary Window Volumes Summary

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
<b>Quarter</b>									
Q3 2021	-	12	-	-	12	-	-	100%	-
Q4 2021	-	3	11	-	3	11	-	100%	100%
Q1 2022	-	22	1	-	22	1	-	100%	100%
Q2 2022	-	5	-	-	5	-	-	100%	-
							-	<b>100%</b>	<b>100%</b>

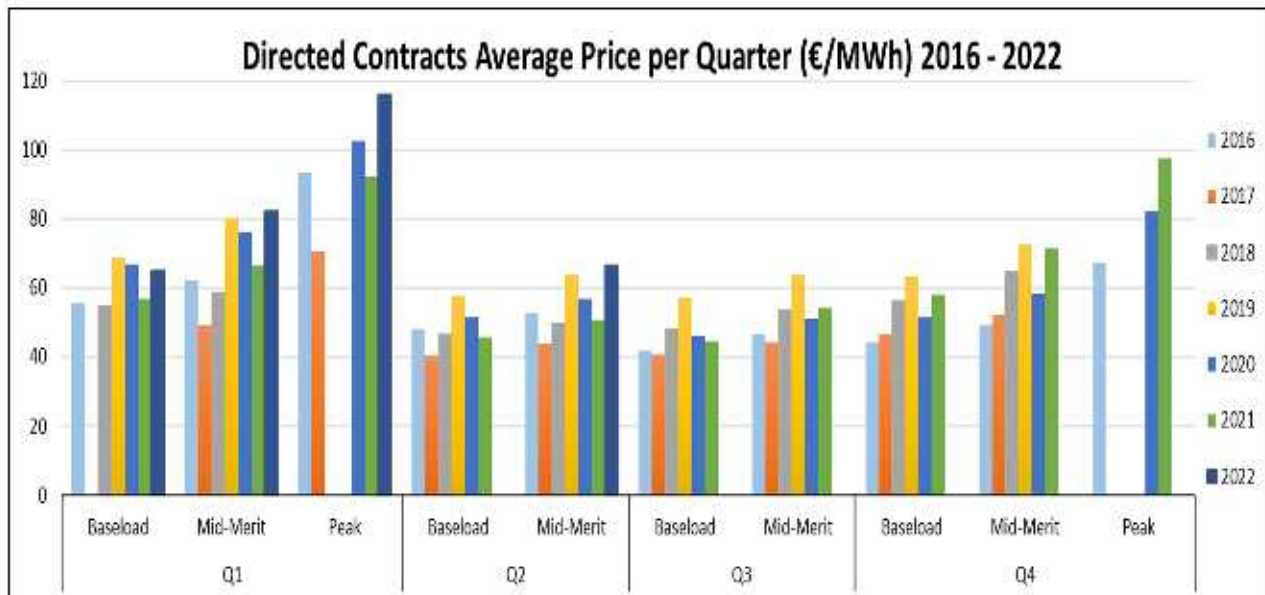
Table 4: Round 14 Supplemental Window Volumes Summary

During Round 14, an average of 88% of Mid-Merit product and 69% of Peak products was sold in the Primary Subscription Window. The remaining volumes were taken up in the Supplementary Window

### Directed Contracts average price (€/MWh), 2016 – 2022;

DC Average Price per Quarter (€/MWh, 2016 - 2022)												
Year	Q1			Q2			Q3			Q4		
	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
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		€ 51.30	€ 58.25	€ 82.19
2021	€ 56.97	€ 66.42	€ 92.00	€ 45.62	€ 50.63		€ 44.55	€ 54.10		€ 58.14	€ 71.30	€ 97.50
2022	€ 64.86	€ 82.08	€ 116.01	-	€ 66.55		-	-		-	-	-

### Directed Contracts average price (€/MWh), 2016 – 2022



### Directed Contracts volumes (GWh), 2016 – 2022;

DC Volumes (GWh, 2016 - 2022)															
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
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	293	407	0	534	414	13	2577	1450	20
2021	604	204	1	188	615	0	258	565	0	258	325	17	1308	1709	18
2022	149	237	1	0	87	0	0	0	0	0	0	0	149	324	1

**Directed Contracts volumes (GWh), 2016 – 2022;**

