



**Single Electricity Market
Performance
01 July 2021 – 30 September 2021
SEM-21-081**

SEM Monitoring Report

1st July 2021 - 30th September 2021

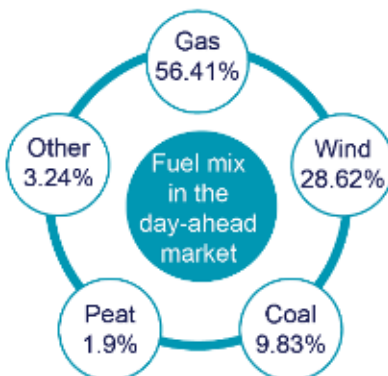
SEM

committee

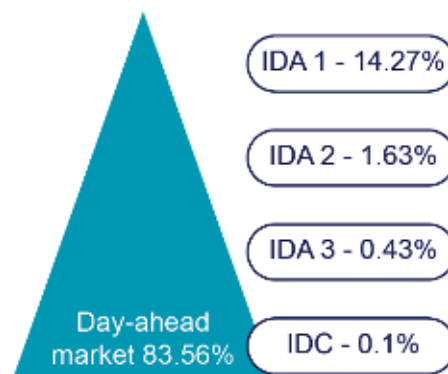
Key Highlights

- Prices in the day-ahead market were €156.40/MWh for Q3 2021. This was primarily due to increased wholesale fuel prices and carbon costs. Lower forecasted wind on the system and plant outages also contributed to the higher prices. Prices compared to the same period last year increased by €119.38/MWh.
- High liquidity continues to be concentrated in the day-ahead market with over 83.56% of ex-ante volumes traded with an overall value of over €1.56 billion.
- Overall, the actual system demand in across the quarter has remained above the levels seen when compared to the same period in 2020, with a contributing factor being a difference in COVID-19 governmental restrictions seen between the two periods.

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
- The average wind forecast across the quarter was 32.9% lower when compared to the last quarter.



Average daily price in DAM
€156.40/MWh

Lowest average daily price
€99.72/MWh

Highest average daily price
€272.50/MWh

Highest prices during morning or 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 in relation to bidding controls in place and to the requirements of the Regulation on Wholesale Energy Market Integrity and Transparency (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 forwards 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) enable 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.

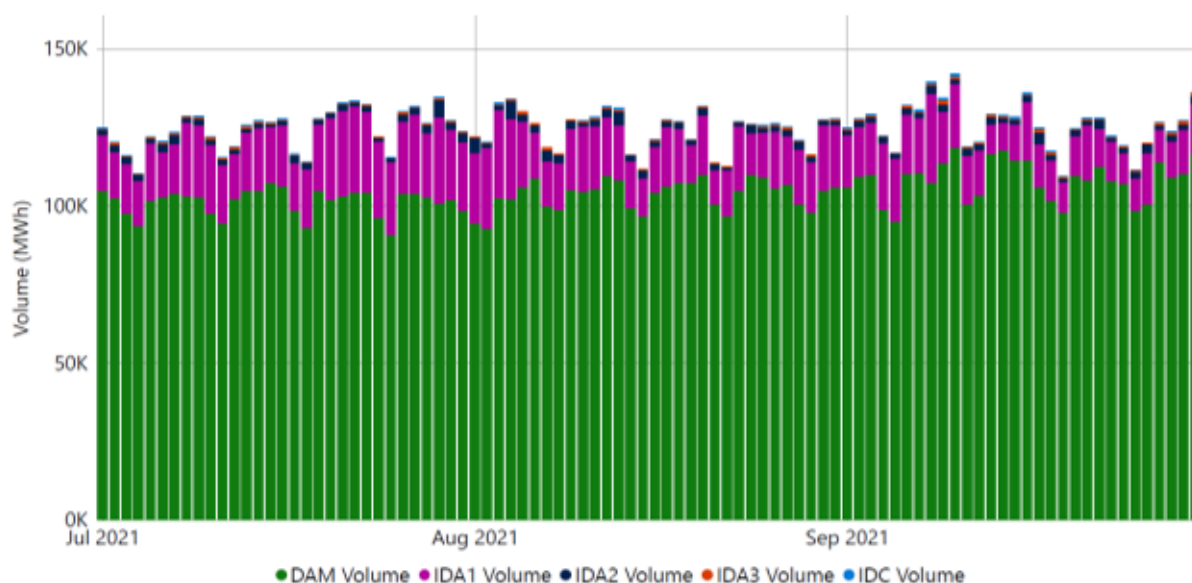
This report covers the second quarter of 2021 from 01 July to 30 September.

2 MARKET PERFORMANCE

2.1 OVERALL PERFORMANCE

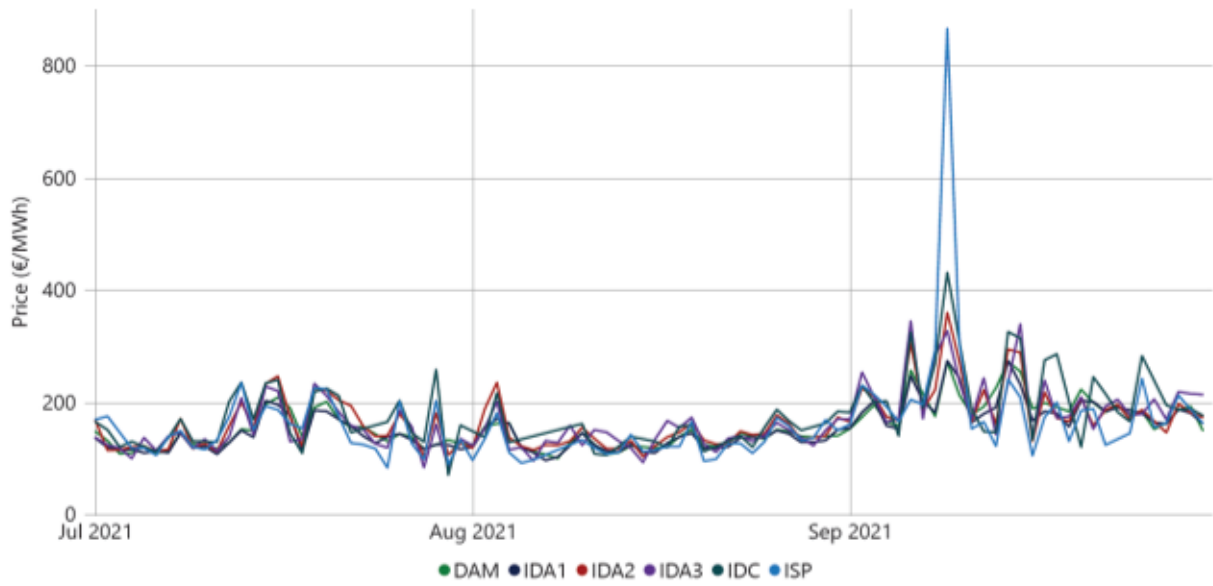
This section summarises overall SEM performance for the period 01 July 2021 to 30 September 2021.

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 104,298 MWhs with the average daily volume in IDA1 17,811 MWhs, IDA2 2,036 MWhs, IDA3 539 MWhs and IDC 146 MWhs.



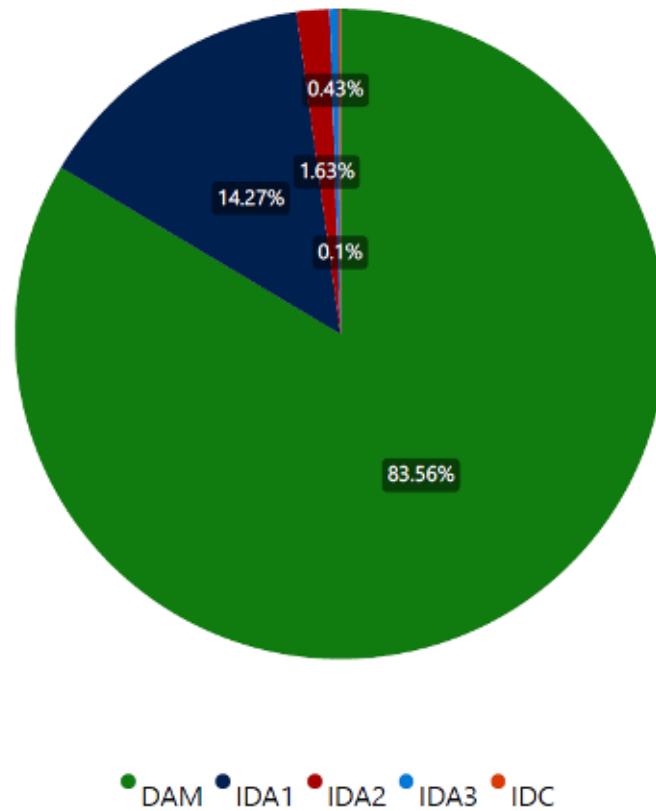
Graph 1 - SEM Ex-Ante Daily Volumes

The graph below shows the daily average Ex-Ante and Balancing Market prices across the quarter. The average daily DAM price was €156.40/MWh, IDA1 €152.26/MWh, IDA2 €165.68/MWh, IDA3 €164.99/MWh, IDC €198.28/MWh and the Imbalance Settlement Price was €163.19/MWh.



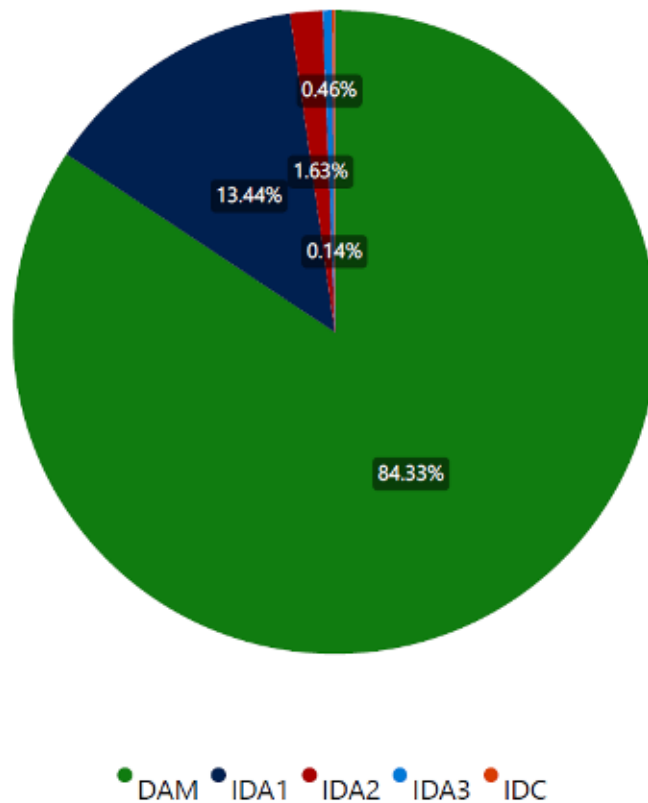
Graph 2 - SEM Ex-Ante & Balancing Market Daily Average Price

Graphs 3 and 4 below show the market share for each Ex-Ante Market by volume and value. By volumes (MWh), the DAM represented 83.56% of volumes traded, followed by IDA1 14.27%, IDA2 1.63%, IDA3 0.43% and IDC 0.1%.



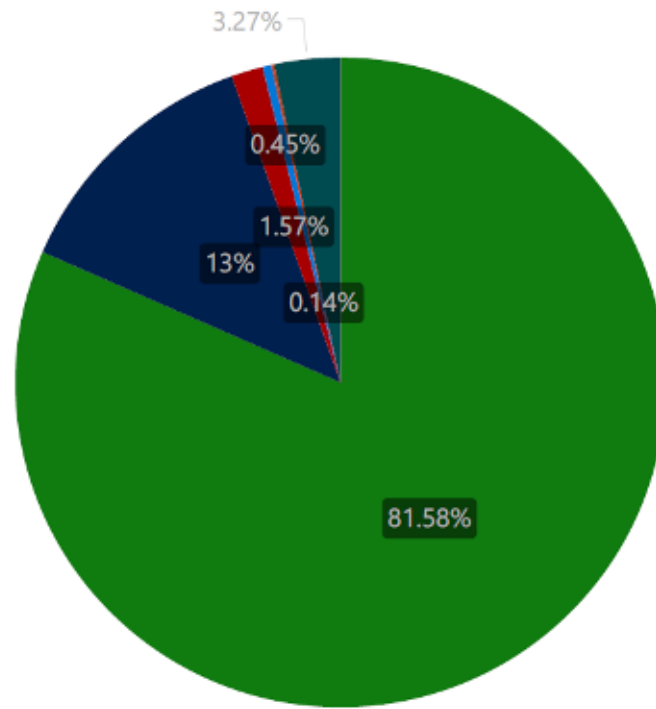
Graph 3 - Market (Ex-Ante) Share by Volume (MWh)

By value, the DAM represents 83.33 %, IDA1 13.44%, IDA2 1.63%, IDA3 0.46% and IDC 0.14%.



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

The graph below shows, when the Balancing Market value is included with the Ex-Ante Markets, the DAM represents 81.58% of the market, followed by the IDA1 with 13%, Balancing Market with 3.27%, IDA2 with 1.57%, IDA3 with 0.45% and the IDC with 0.14%.



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

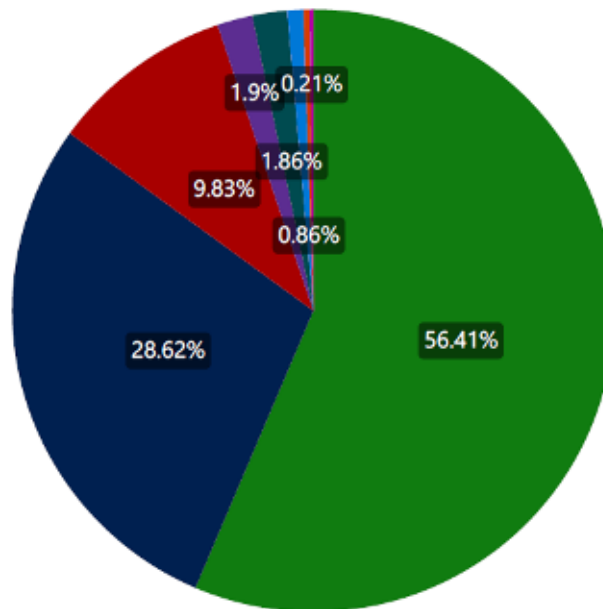
Graph 5 - Market Share by Value (inc. Balancing Market) (€)

Overall, as shown in the graph below, actual system demand in across the quarter has remained above the levels seen when compared to the same period in 2020, with a contributing factor being a difference in COVID-19 governmental restrictions seen between the two periods.



Graph 6 – 7 Day Rolling System Demand Average

Demand is being met by a number of fuel types. The below graph shows the fuel mix of metered generation across the Island in Q3 2021.



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

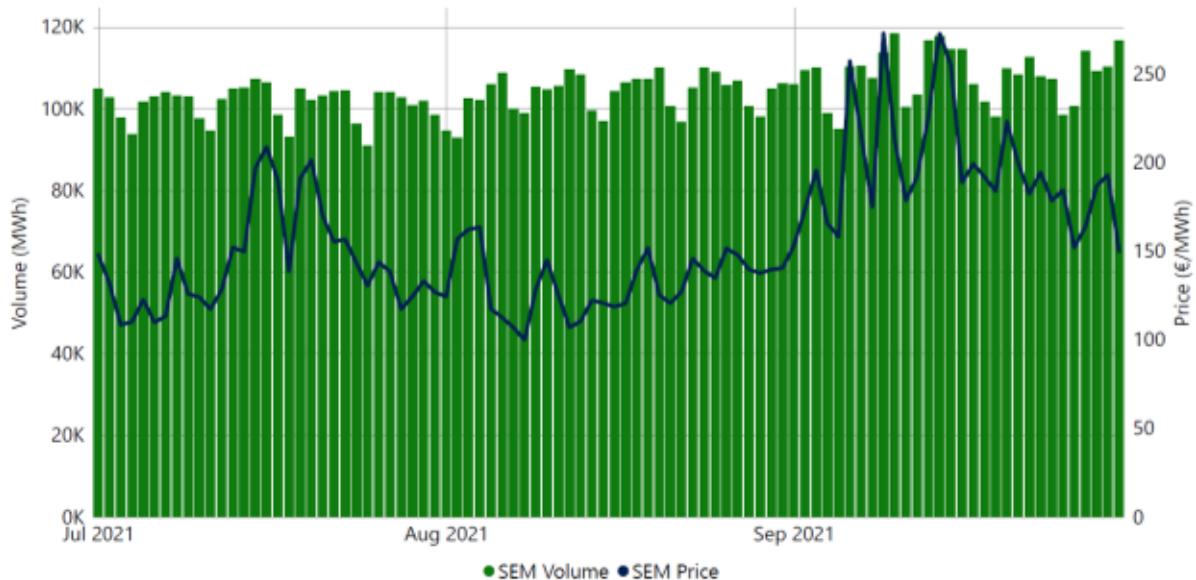
Graph 7 – Fuel Mix Metered Generation

This quarter gas represented 56.41%, Wind 28.62%, Coal 9.83%, Peat 1.9%, Hydro 1.63% and Oil 0.86% with the remainder made up of Biomass, Distillate and Pumped Storage. Compared to last quarter, Gas (56.44%), Coal (8.3%) and Oil (0.75%) have all increased their % of metered generation compared to last quarter while Wind has decreased by 5.23%.

2.2 DAY AHEAD MARKET

The graph below shows the daily average DAM price and volume for the market in Q3 2021. In total, the value of the DAM market during the period was €1.56 billion. The average daily price in the DAM was €156.40/MWh during the period, up from €92.44/MWh in Q2 2021, a 69.2% increase. This is also a 322% increase on the average price in Q3 2020 (€37.02/MWh). The lowest average daily price was €99.72/MWh seen on 08 August, with the highest average daily price €272.50/MWh seen on 09 September. The lowest price recorded in an individual hourly period was €0/MWh at 02:00 on 30 September whilst the maximum price recorded in a single period was €500/MWh at 18:00 on 09 September.

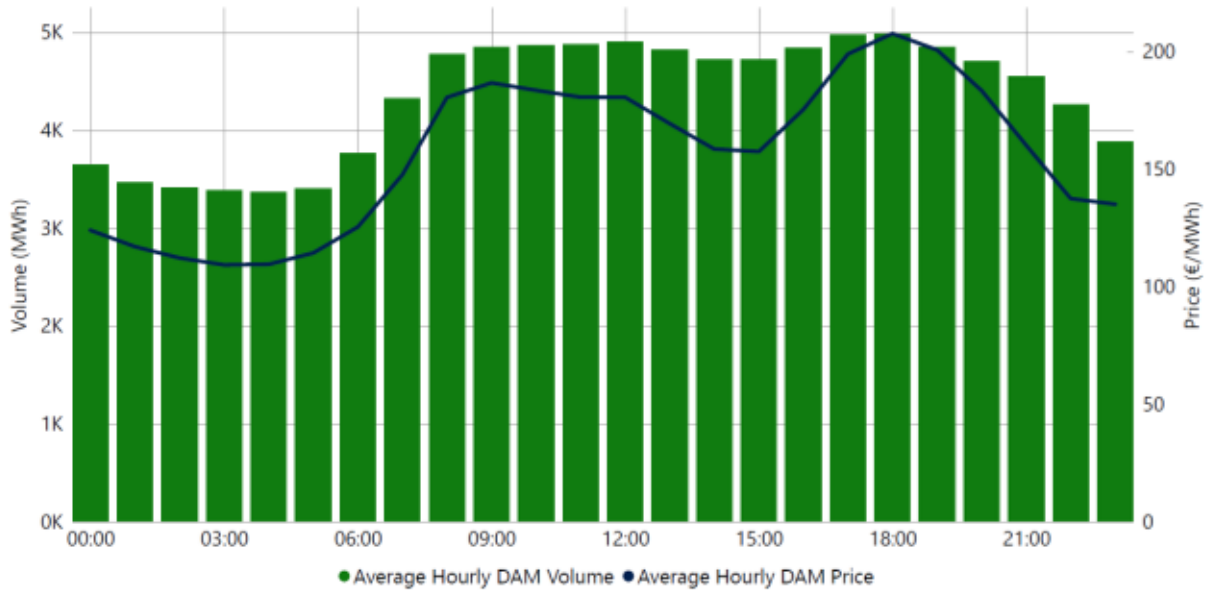
Higher market prices over the period have been driven primarily by increased input costs (mainly wholesale fuel prices, in particular Gas and Coal prices which increased throughout the period), increased carbon costs coupled with lower volumes of forecasted wind on the system and several units continuing to be unavailable due to unexpected long term outages (CCGT units at Whitegate and Huntstown 2).



Graph 8 - 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 are traded across peak morning and evening periods where the highest prices are seen. However, the dip in volumes between

these periods is seen to be less than in previous quarters indicating a more steady DAM demand volume across the day.



DAM price formation continues 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 affected by low wind forecast while the lowest prices occurred during periods of much higher expected levels of wind. The average wind forecast across the quarter was 798 MW compared to 1190 MW in the previous quarter, a 32.9% reduction.

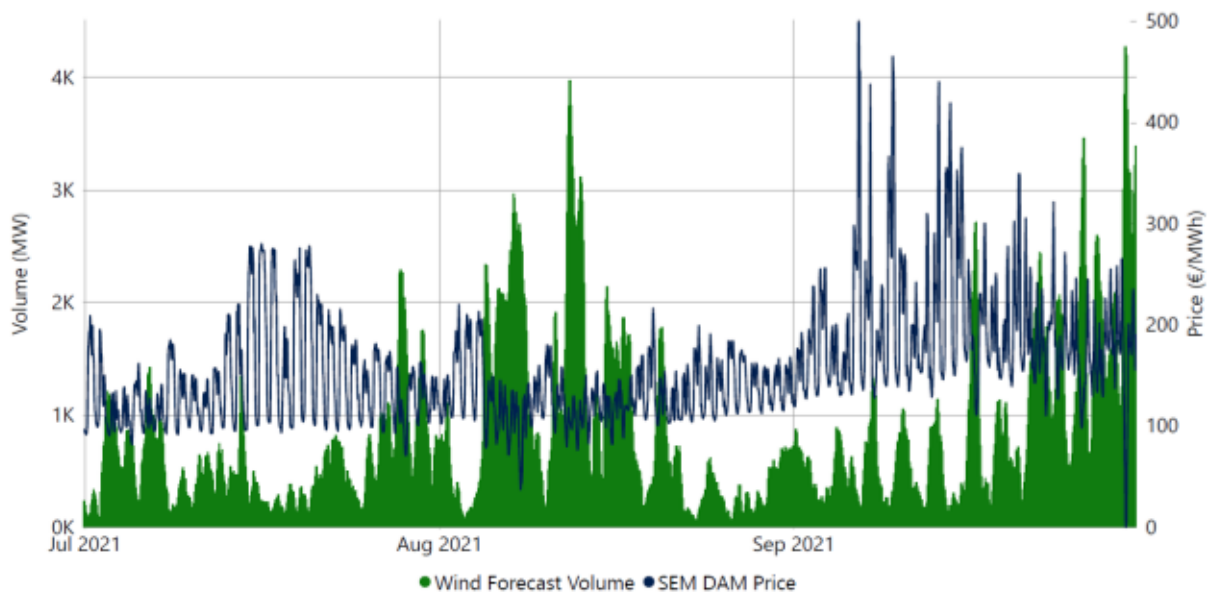


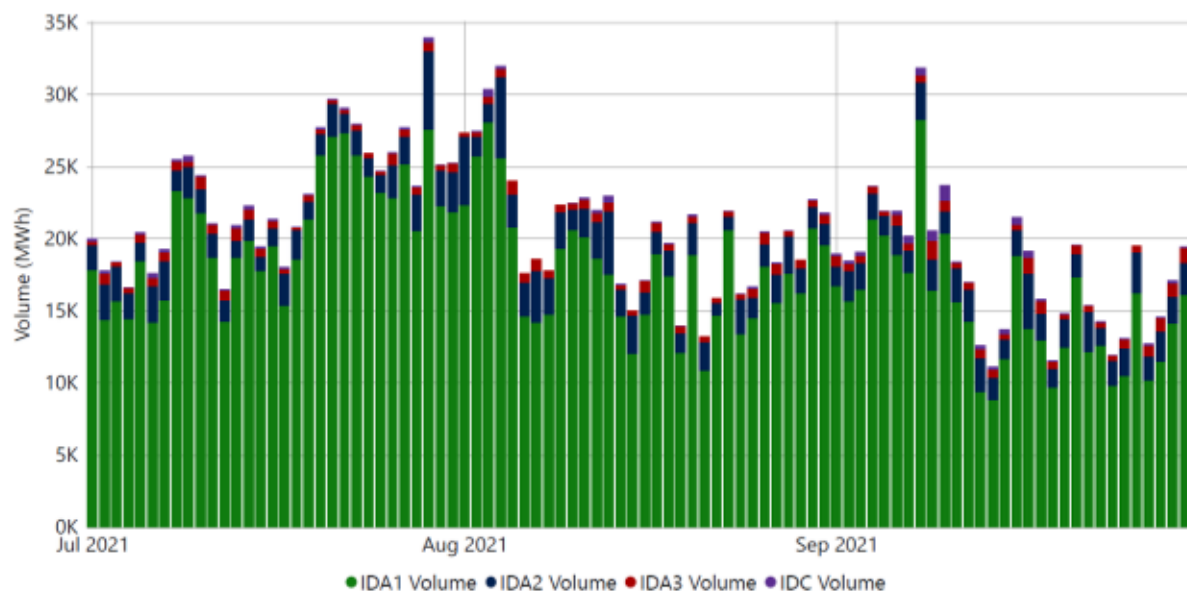
Table 1 below illustrates the relationship between prices and the forecast level of wind at day-ahead stage. It shows the highest prices over the period covered occurred during morning or evening peak demand and the lowest prices occurring overnight.

High Price-Low Wind				Low Price-High Wind			
Date	Time	Price (€/MWh)	Wind Forecast (MW)	Date	Time	Price (€/MWh)	Wind Forecast (MW)
06/09/2021	18:00	500	224	30/09/2021	02:00	0	4266
06/09/2021	17:00	497.39	251	30/09/2021	03:00	0	4200
09/09/2021	17:00	464.9	322	30/09/2021	04:00	4.84	3995
09/09/2021	18:00	456.5	320	08/08/2021	04:00	37	2572
06/09/2021	19:00	452.28	181	08/08/2021	05:00	43.54	2506

Table 1- DAM Price and Wind Forecast

2.2 INTRADAY MARKET

During Q3 IDA1 accounted for 14.27% of ex-ante traded volumes up from 13.62% in Q2, IDA2 accounted for 1.63%, IDA3 accounted for 0.43% of trades by volume and the IDC accounted for 0.1% of traded volumes of the ex-ante markets. The share of the market by value is similar, with IDA1 accounting for 13.44% of total ex-ante market value, IDA2 1.63%, IDA3 0.46% and IDC 0.14%.

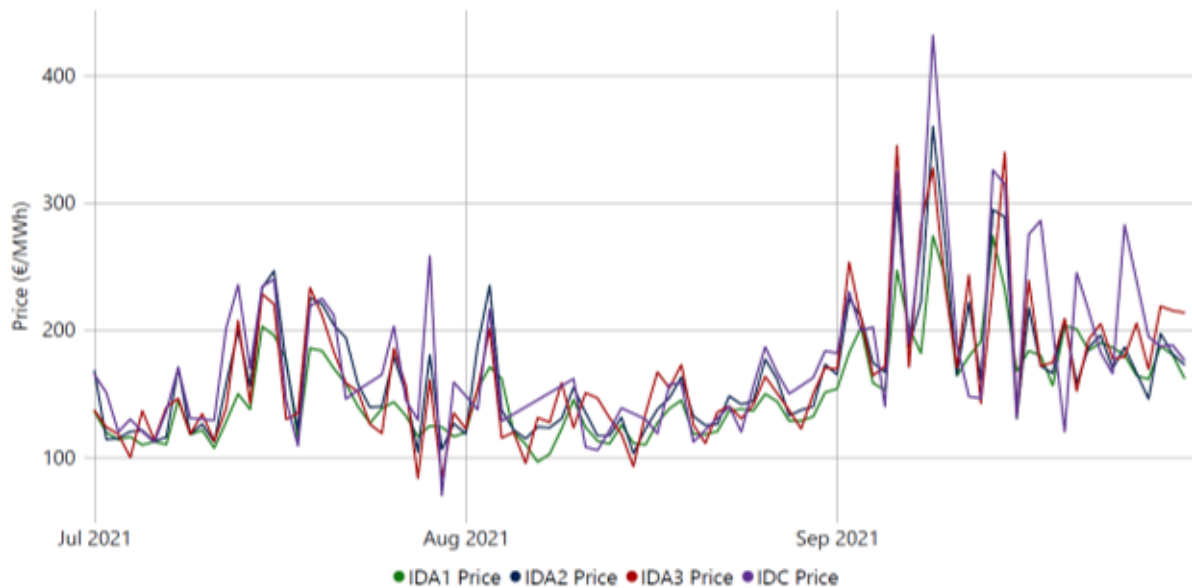


Graph 11 – Total Intraday Volumes

Average prices in each auction have risen when compared to last quarter, with the average price in IDA1 in Q2 was €152.26/MWh compared to €91.64/MWh in Q1, IDA2 €165.68/MWh compared to €98.75/MWh in Q1, IDA3 €164.99/MWh compared to €99.15/MWh in Q1 and the IDC market €198.28/MWh compared to €97.88/MWh in Q1. The total value of these

markets over the period was €248M in IDA1, €30M in IDA2, €8.5M in the IDA3 and €2.61M in the IDC market. The IDA2 and IDA3 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). However, all the rise of prices in all intraday actions follows a similar trend and reasoning to that seen in the DAM.

Graph 12 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.



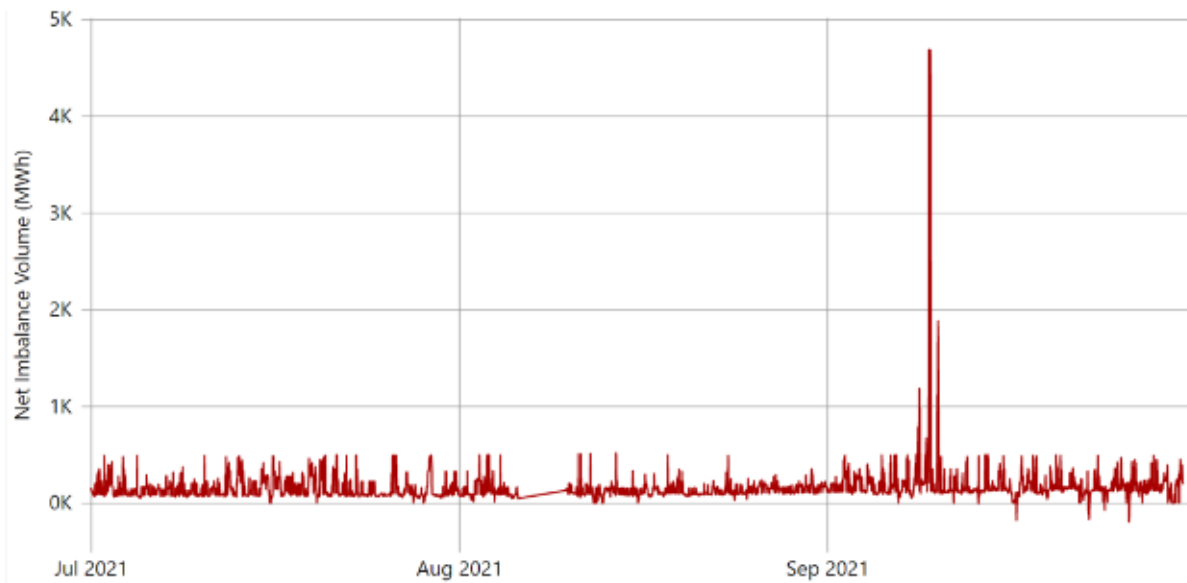
Graph 12 – Average Daily Intraday Prices

2.3 BALANCING MARKET

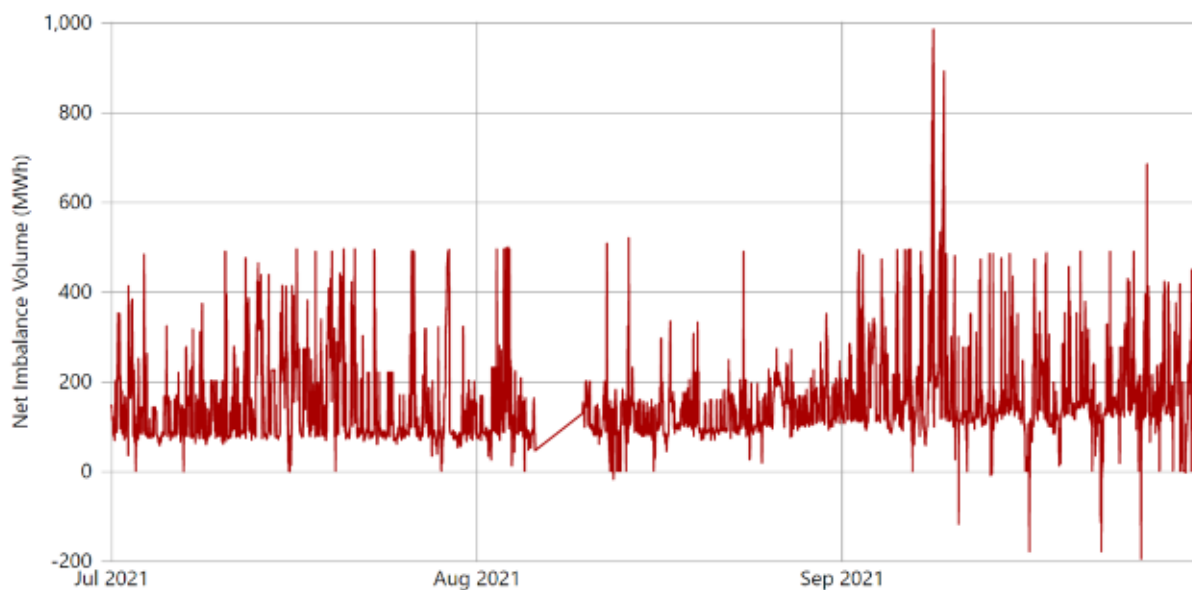
The balancing market is a complex market that determines the Imbalance Settlement Price for settlement of the TSO’s balancing actions and any uninstructed deviations from a participant’s notified ex ante position. It is made up of numerous energy/non energy actions, charge and payment components. Using these components to calculate the value of balancing, we can show the value of the overall Balancing Market value for Q3 2021 was €62.33M.

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 €163.17/MWh compared to €93.13/MWh in Q2.



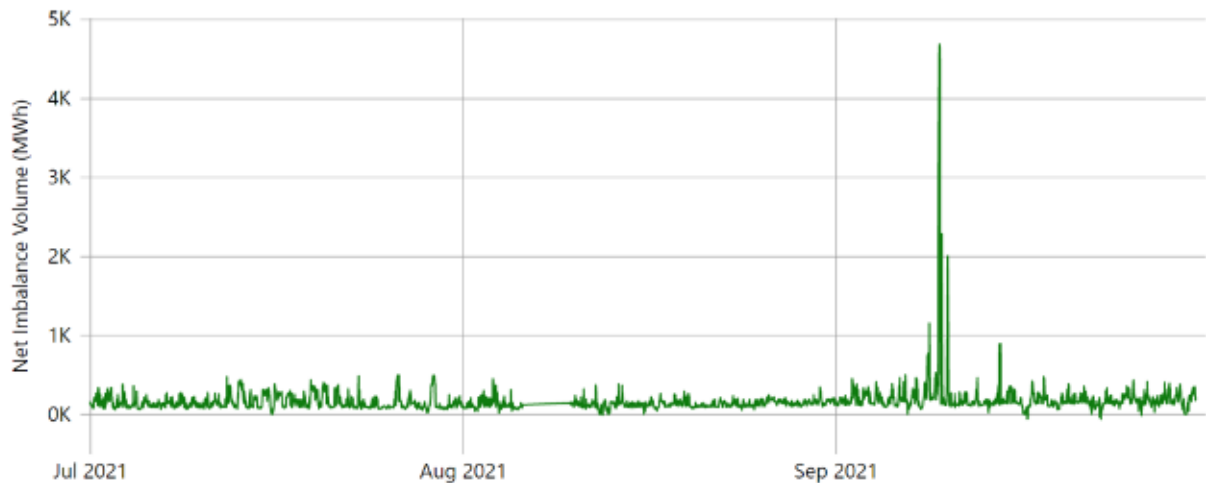
Graph 13 – 5 Minute Imbalance Price



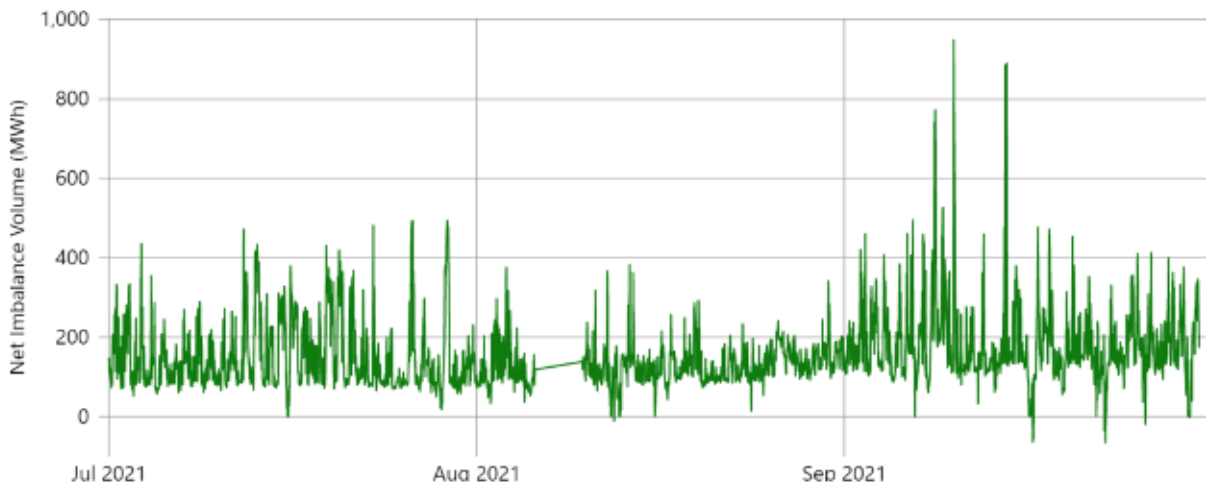
Graph 14 – 5 Minute Imbalance Price (Cropped €1000/MWh)

The highest settlement 5 minute Imbalance Price occurred on 09 September at 13:40 of €4,683.49/MWh. This high price was due to trading across the interconnectors to ensure security of supply and the same reasons contributed to a number of other very high prices across the quarter. The lowest 5 minute Imbalance Price of (-)€195.32 occurred on 26 September at 10:05.

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 15 – 30 Minute Imbalance Settlement Price



Graph 16 – 30 Minute Imbalance Settlement Price (Cropped €1000/MWh)

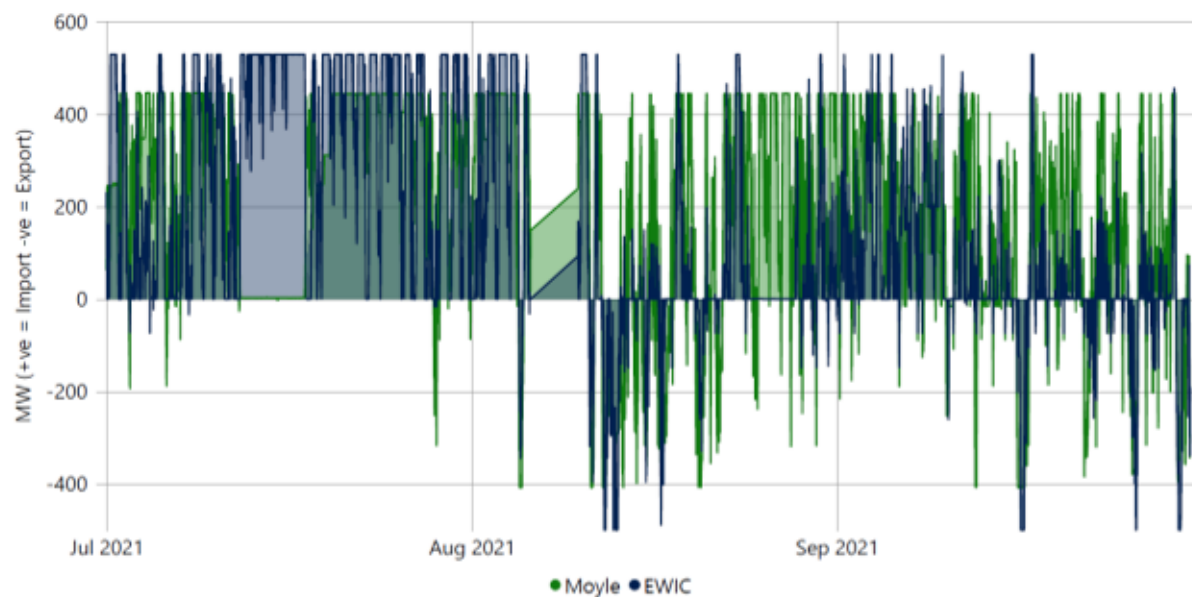
During the quarter, the highest 30 minute Imbalance Settlement Price was €947.23/MWh at 06:30 on 10 September. The lowest 30-minute settlement price was (-) €66.72/MWh at 01:30 on 23 September. The average Imbalance Settlement Price across the quarter was €154.22/MWh compared to €93.32/MWh in Q2.

2.4 INTERCONNECTION

As mentioned in previous reports, 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. 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 quarter. 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. Due to the price spreads between SEM and GB showing a more expensive price in SEM, a vast majority of periods in the quarter show imports on both interconnectors.



Graph 17 – Actual Interconnector Flows (15 Minute Intervals)

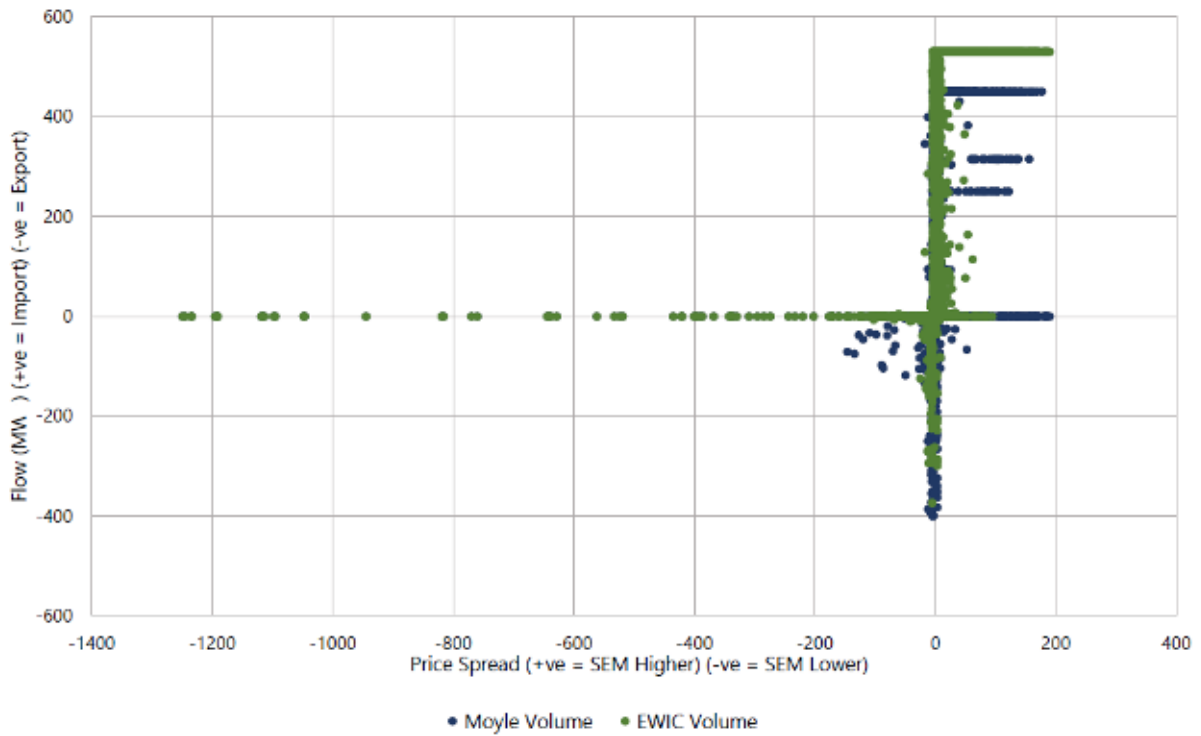
In the graph below, the X-axis shows the difference in IDA1 prices between the SEM and GB so that the positive price difference on the right of the graph is when the SEM price is higher than the GB price and the interconnector should be importing. The negative values on the left of the graph is when the SEM price is lower and the interconnectors should be exporting. The Y-axis shows the auction result 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.



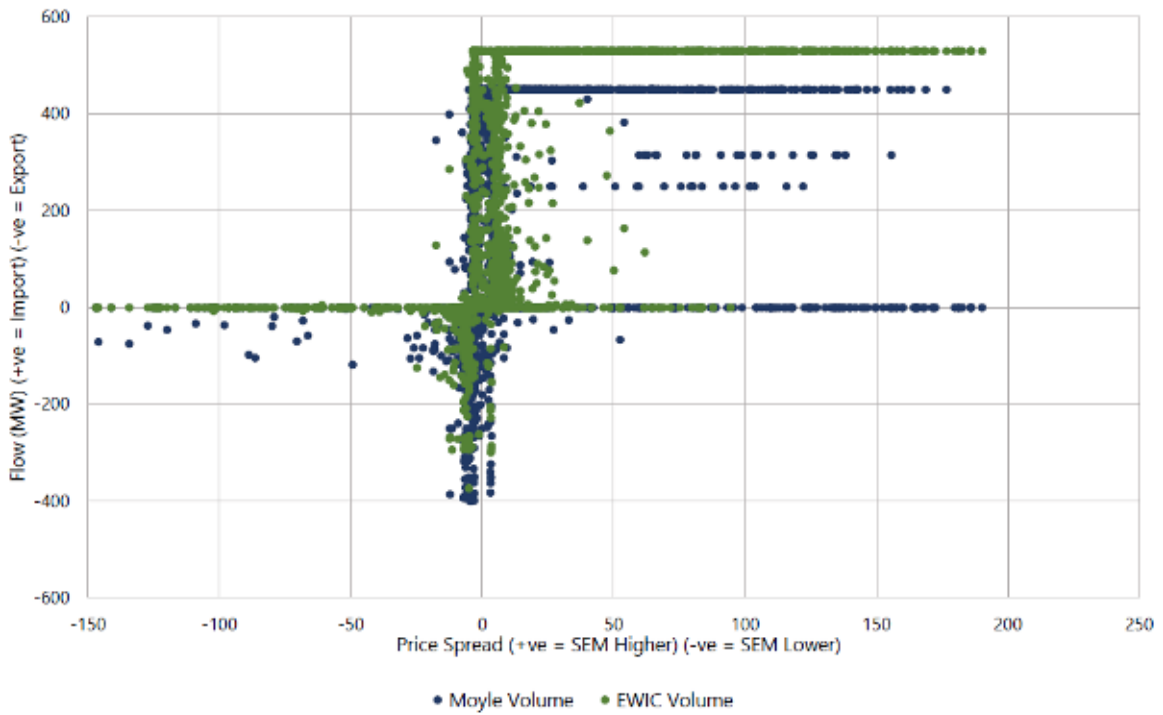
Graph 18 – IDA1 Interconnector Schedule Efficiency

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 scheduled to export or import across a number of periods in the expected direction based on the SEM/GB price spread, then the price spread inverts for one period or small number of periods before reverting back to the previous positive or negative spread. The interconnectors are also ramping up or down from high imports or exports where the price differential has already inverted thus the points appear counter-intuitive.

The two figures below graph the interconnector flows based on the IDA2 results. The IDA2 covers periods across peak evening times and the flow volumes are based upon a combination of IDA1 and IDA2 with the direction being determined by the price spread. This graph also shows that due to some high prices seen across these periods in GB, the price spread becomes highly negative (SEM lower than GB) which would indicate that SEM should be scheduled to export and also highly positive (SEM higher than GB) which would indicate that SEM should be scheduled to import. However, due to security of supply reasons the Net Transfer Capacity across a number of periods in September was set to 0 MW and so no volume allocated in the auctions.



Graph 19 – IDA2 Interconnector Schedule Efficiency



Graph 20 – IDA2 Interconnector Schedule Efficiency (Cropped (-)€150/MWh)

3 REGULATION UPDATE

3.1 REMIT UPDATE

Monitoring the performance of the wholesale electricity market is a regulatory function of the MMU which is carried out alongside that of the Agency for the Cooperation of Energy Regulators (ACER) and is provided for by Regulation (EU) No 1227/2011 of 25 October 2011 on wholesale energy market integrity and transparency (REMIT).

REMIT places legal obligations on National Regulatory Authorities (NRAs), including the UR and CRU, to cooperate with ACER in monitoring the wholesale electricity market, including sharing of information and investigation of potential market abuse or manipulation. In this context the MMU is responsible for discharging the monitoring and investigation responsibilities of the NRAs under REMIT. REMIT is also a legal obligation that all market participants in the SEM must abide by.

ACER has recently addressed the topic of potential market manipulation a contributing to high energy prices ([Energy Prices Final.pdf \(europa.eu\)](#)). Based on the information and data available to them, there was no obvious indication nor evidence of systematic manipulative behavior or insider trading under REMIT causing high energy prices.

ACER's market surveillance efforts alongside those of the NRAs continue under REMIT with these duties in the SEM being actively undertaken by the MMU. The process by which the MMU will investigate potential market abuse or manipulation is outlined in SEM-20-084 MMU Inquiry Procedure Manual.

4 DIRECTED CONTRACTS Q3 2021

4.1 DIRECTED CONTRACTS Q3 2021 ROUND 16.

The tables and figures below show the price and volume of Directed Contracts subscriptions for the latest DC Round 16, which was held in September 2021, covering the period Q1 2022 to Q4 2022.

Key information is summarised in Table 2 below.

Quarters on offer	Q1 2022 to Q4 2022		
Primary subscription dates	14 th – 16 th September 2021		
Supplementary subscription date	23 rd September 2021		
Volume sold	0.26 TWh		
% Volume Sold	100%		
Average price / MWh	Baseload	Mid Merit	Peak
	N/A	€113.4	€182.2

Table 2 - Round 16 Key Information

A breakdown of the volumes sold in the Round 16 Primary and Supplemental windows are shown in Table 3 and Table 4.

MW	Offered in the Primary Window			Sold in the Primary Window			% Sold in Primary Window		
	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
Q1 2022	0	0	133	0	0	110	-	-	83%
Q2 2022	0	0	-	0	0	-	-	-	-
Q3 2022	0	109	-	0	95	-	-	87%	-
Q4 2022	0	43	10	0	41	8	-	96%	83%

Table 3 - Round 16 Primary Window Volumes Summary

MW	Offered in the Supplemental Window			Sold in the supplemental Window			% Sold in Supplemental Window		
	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak	Baseload	Mid-Merit	Peak
Q1 2022	-	-	23	-	-	23	-	-	100%
Q2 2022	-	-	-	-	-	-	-	-	-
Q3 2022	-	14	-	-	14	-	-	100%	-
Q4 2022	-	2	2	-	2	2	-	100%	100%

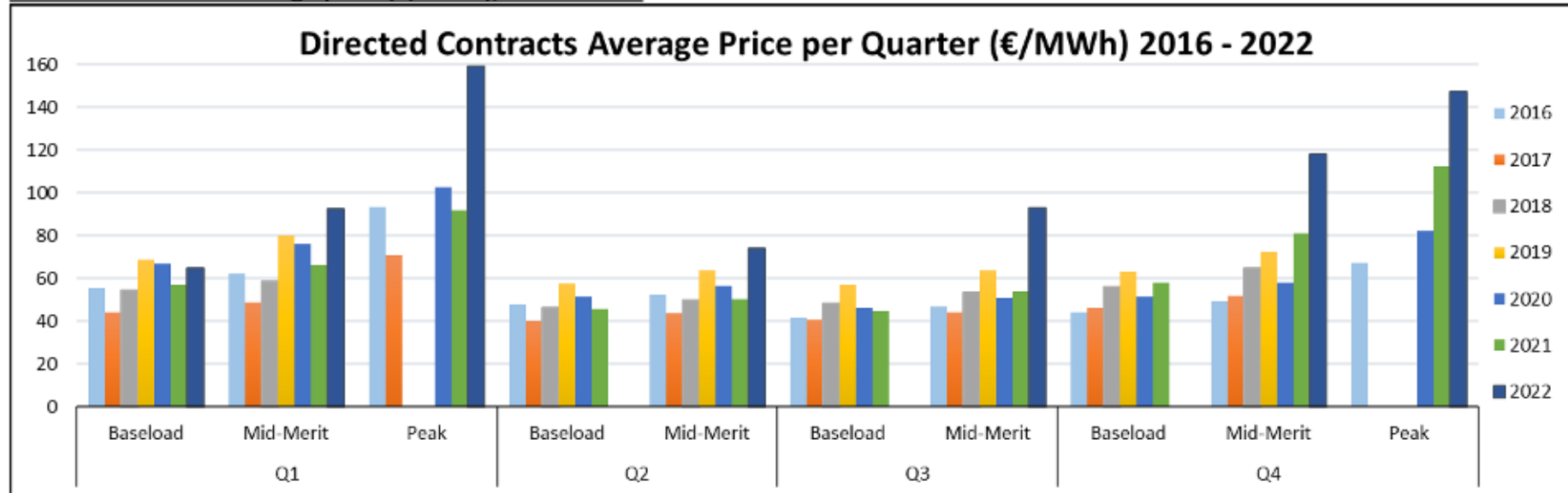
Table 4 - Round 16 Supplemental Window Volumes Summary

During Round 16, an average of 92% of Mid-Merit products and 83% of Peak products were sold in the Primary Subscription Window. The remaining volumes were purchased in the Supplemental 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	€ 81.29	€ 112.42
2022	€ 64.86	€ 92.40	€ 159.06	-	€ 74.21		-	€ 92.99		-	€ 117.94	€ 147.19

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	505	26	1308	1890	27
2022	149	313	51	0	257	0	0	349	0	0	59	4	149	978	55

Directed Contracts volumes (GWh), 2016 – 2022

