



**Single Electricity Market
Performance
01 April 2021 – 30 June 2021
SEM-21-075**

SEM Monitoring Report

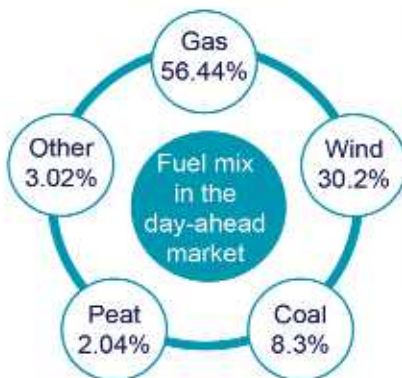
1st April 2021 - 30th June 2021

SEM
committee

Key Highlights

- Prices in the day-ahead market were €22.46 higher than the previous quarter, Q1 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 €66.63.
- 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 €898.3m.
- Overall system demand across the quarter remained significantly above the demand seen in the same period in 2020. Government restrictions resulting from the Covid-19 pandemic were the primary cause for the difference in demand.

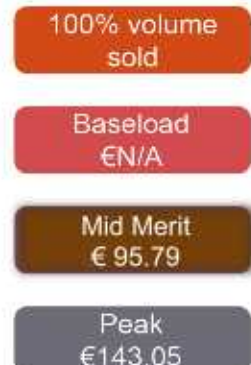
Fuel Mix



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 39.87% lower when compared to the same period in 2020.



Average daily price in DAM
€92.44

Lowest average daily price
€37.46

Highest average daily price
€171.22

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 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.

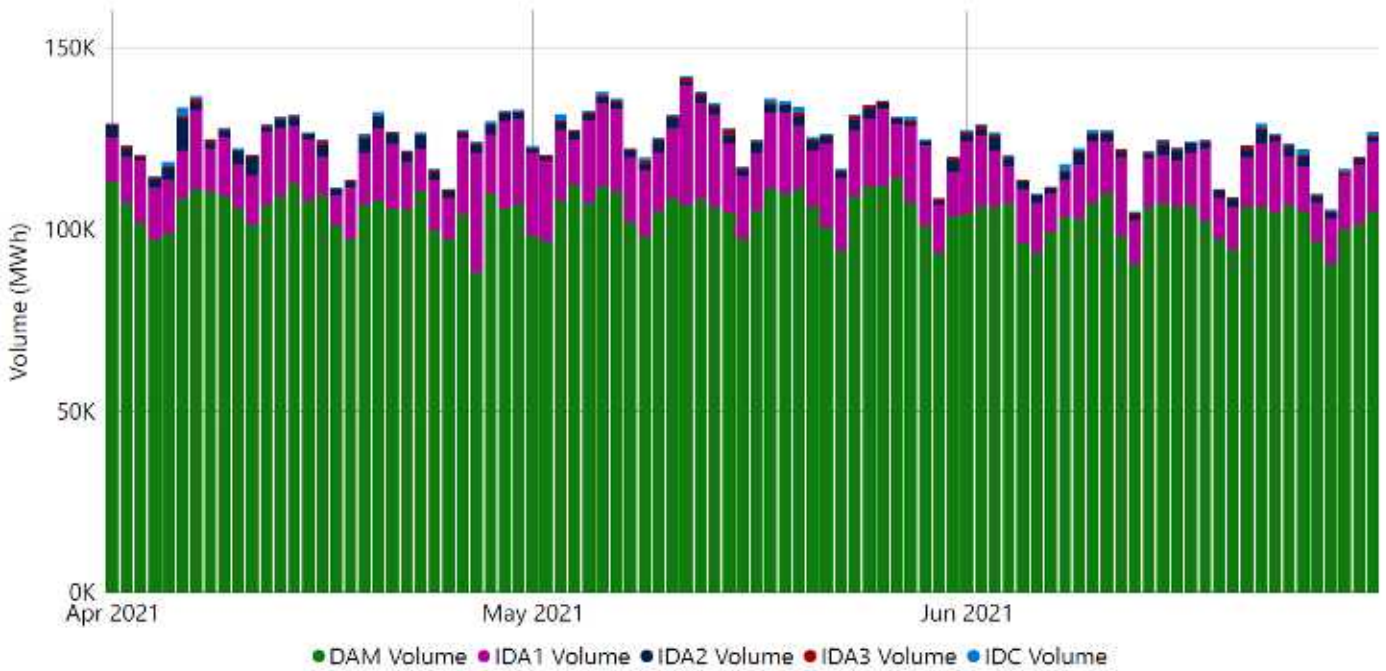
The DAM is a daily auction that takes place at 11:00 each day. Participation in the DAM is not mandatory. This market is no longer coupled with Great Britain (GB). Following the DAM, the Intraday Auctions (IDA) enables participants to adjust their physical positions closer to real time. IDA1 and IDA2 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 second quarter of 2021 from 01 April to 30 June.

2.1 OVERALL PERFORMANCE

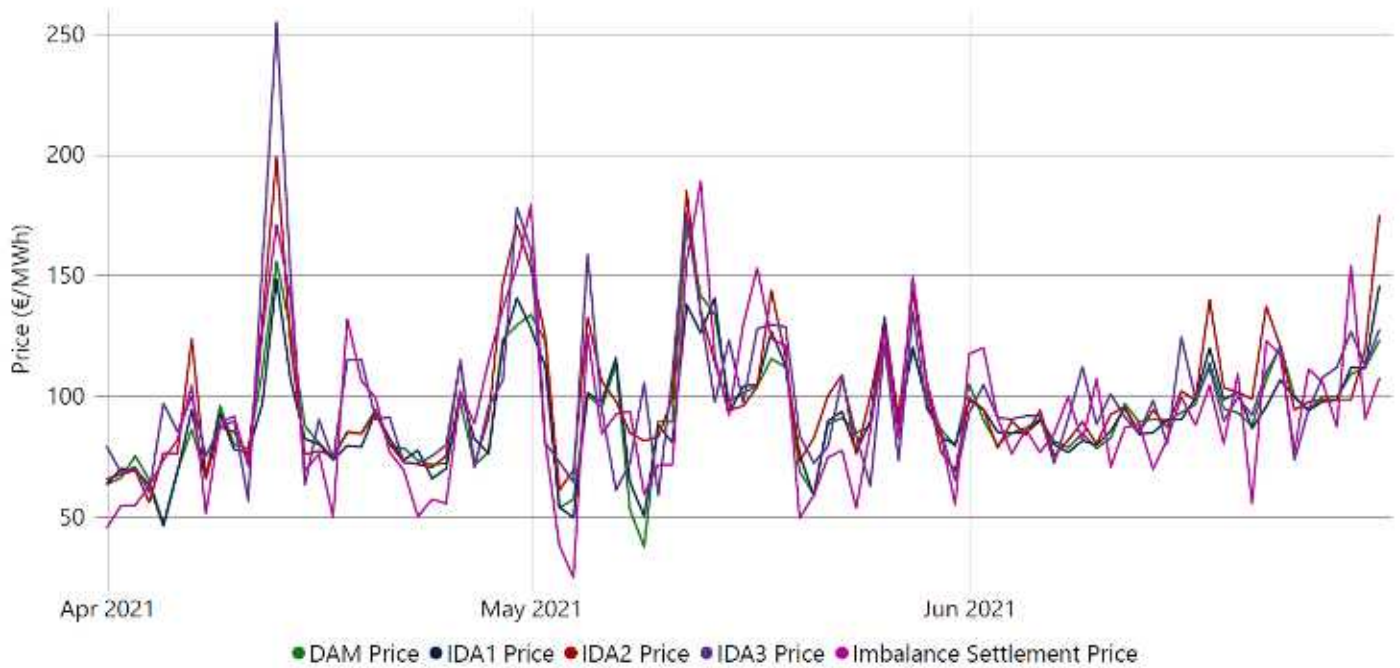
This section summarises overall SEM performance for the period 01 April 2021 to 30 June 2021.

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 104,535 MWhs with the average daily volume in IDA1 16,945 MWhs, IDA2 2,084 MWhs, IDA3 555 MWhs and IDC 325 MWhs.



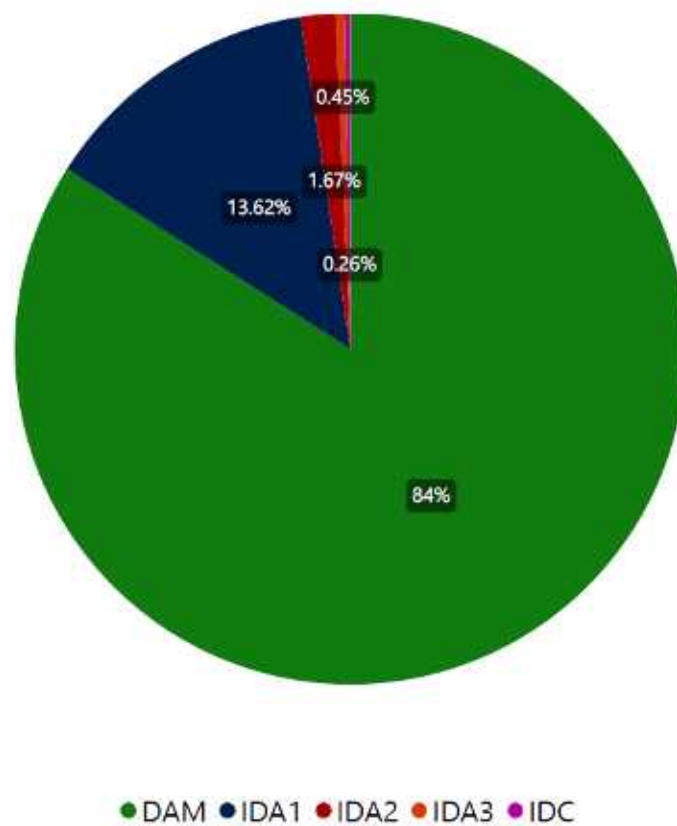
Graph 1 - SEM Ex-Ante Daily Volumes

The graph below shows the daily average Ex-Ante and Balancing Market prices across the quarter. The average daily DAM price was €92.44/MWh, IDA1 €91.64/MWh, IDA2 €98.75/MWh, IDA3 €99.15/MWh, IDC €97.88/MWh and the Imbalance Settlement Price was €93.42/MWh.



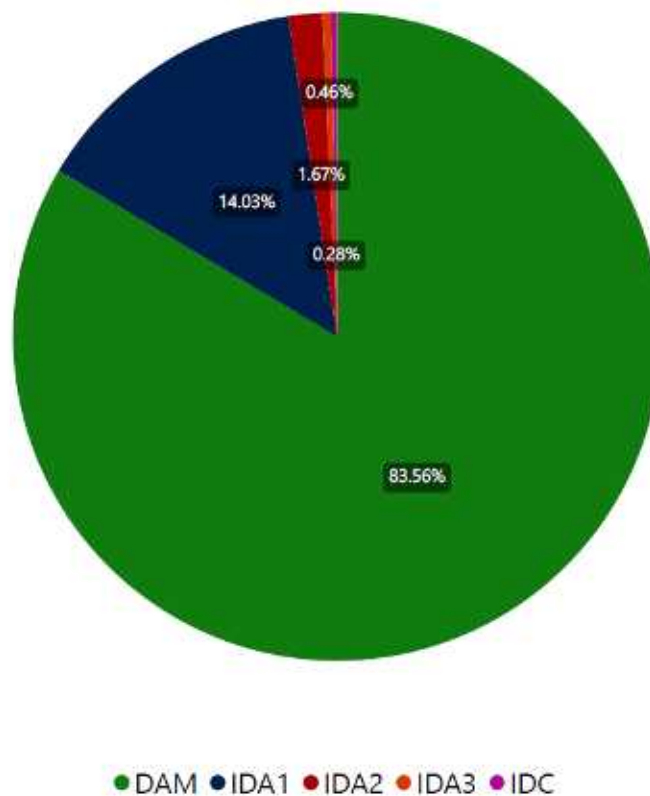
Graph 2 - SEM Ex-Ante & Balancing Market Daily Average Price

Graphs 3 and 4 below show the market share for each Ex-Ante Market by volume and value. By volumes (MWh), the DAM represented 84% of volumes traded, followed by IDA1 13.62%, IDA2 1.67%, IDA3 0.45% and IDC 0.26%.



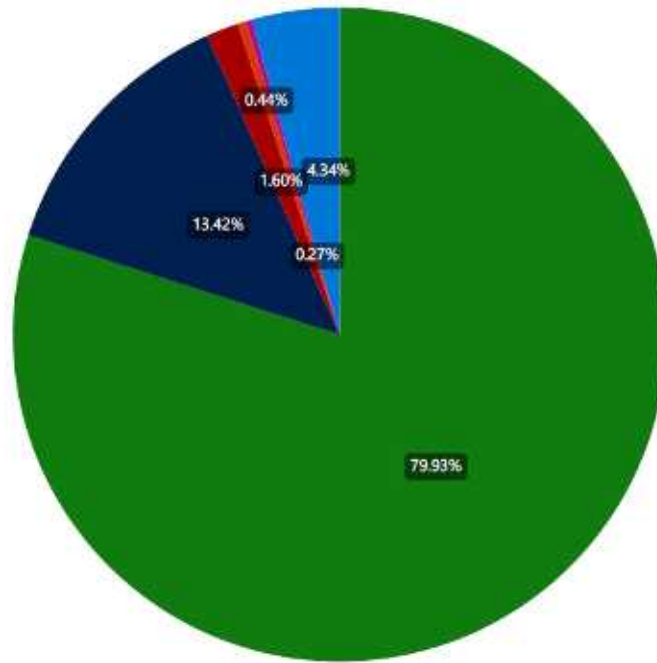
Graph 3 - Market (Ex-Ante) Share by Volume (MWh)

By value, the DAM represents 83.56%, IDA1 14.03%, IDA2 1.67%, IDA3 0.46% and IDC 0.28%.



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

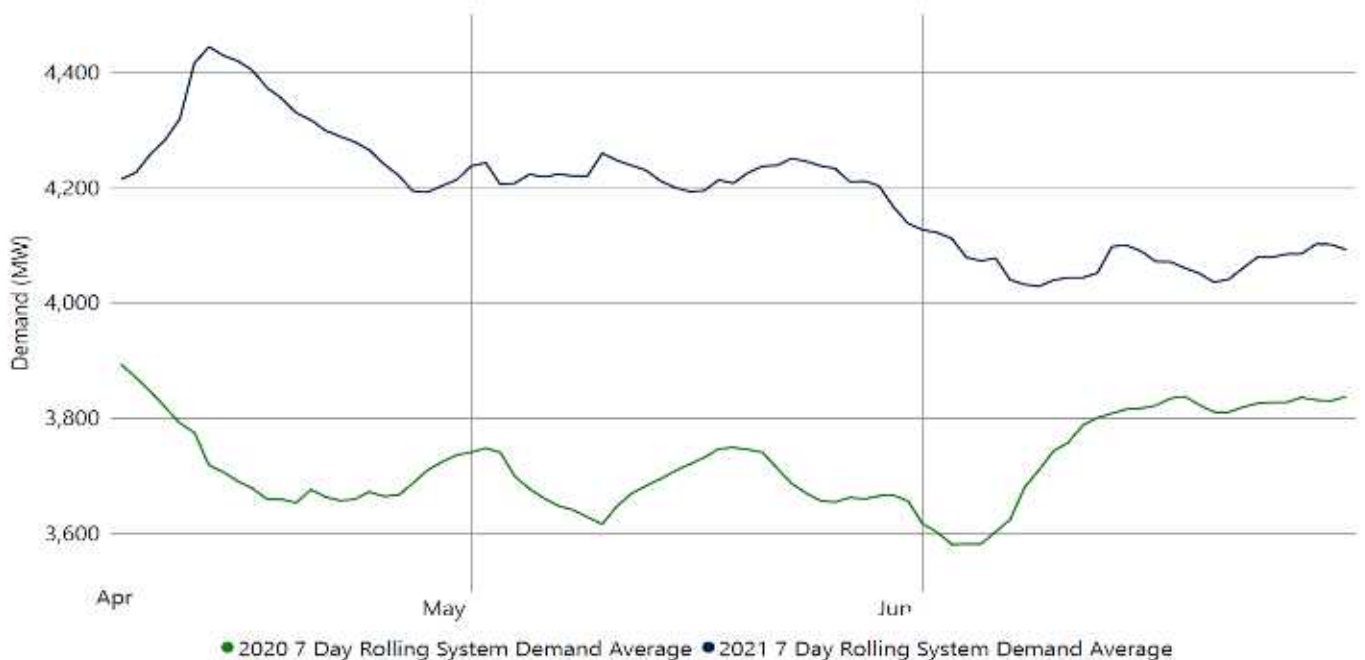
The graph below shows, when the Balancing Market value is included with the Ex-Ante Markets, the DAM represents 79.93% of the market, followed by the IDA1 with 13.42%, Balancing Market with 4.34%, IDA2 with 1.6%, IDA3 with 0.44% and the IDC with 0.27%.



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

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

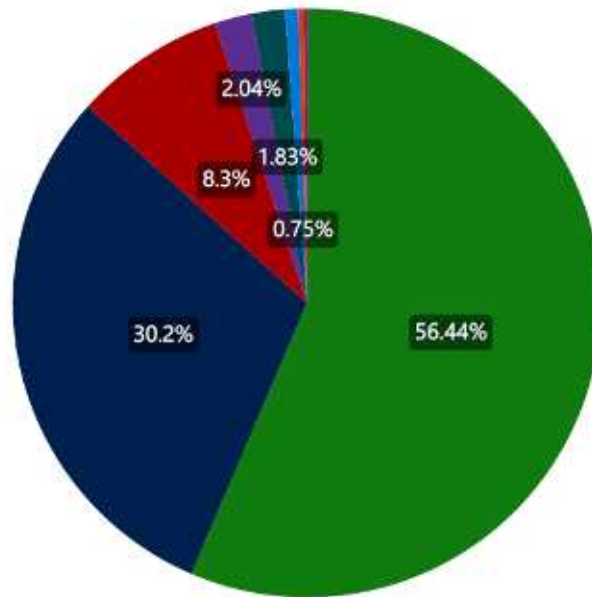
Overall, actual system demand in across the quarter has remained above the levels seen when compared to the same period in 2020, with a contributing factor being a difference in COVID-19 governmental restrictions seen between the two periods.



● 2020 7 Day Rolling System Demand Average ● 2021 7 Day Rolling System Demand Average

Graph 6 – 7 Day Rolling System Demand Average

The fuel mix of metered generation is shown in Graph 7 below.



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

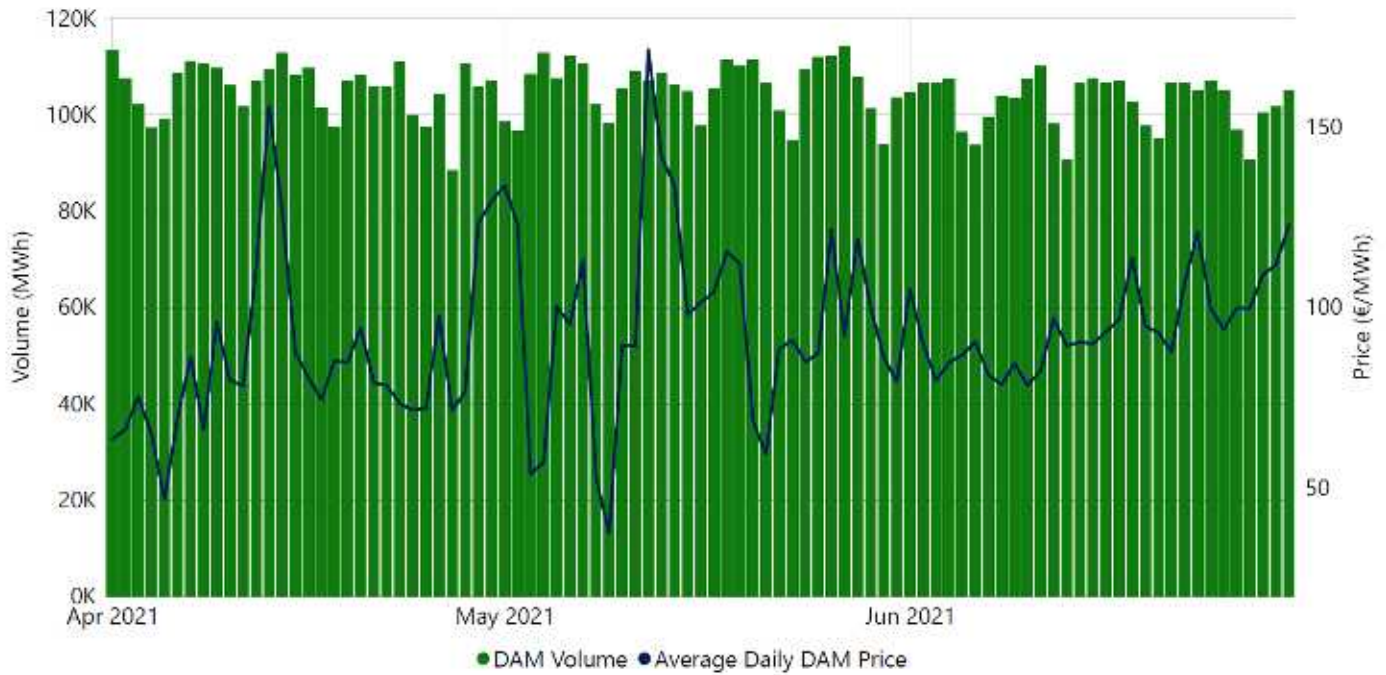
Graph 7 – Fuel Mix Metered Generation

This quarter gas represented 56.44%, Wind 30.2%, Coal 8.3%, Peat 2.04%, Hydro 1.83% and Oil 0.75% with the remainder made up of Biomass, Distillate and Pumped Storage. Compared to last quarter, Gas (51.12%), Coal (6.98%) and Oil (0.55%) have all increased their % of metered generation compared to last quarter while Wind has decreased by 3.02%.

2.2 DAY AHEAD MARKET

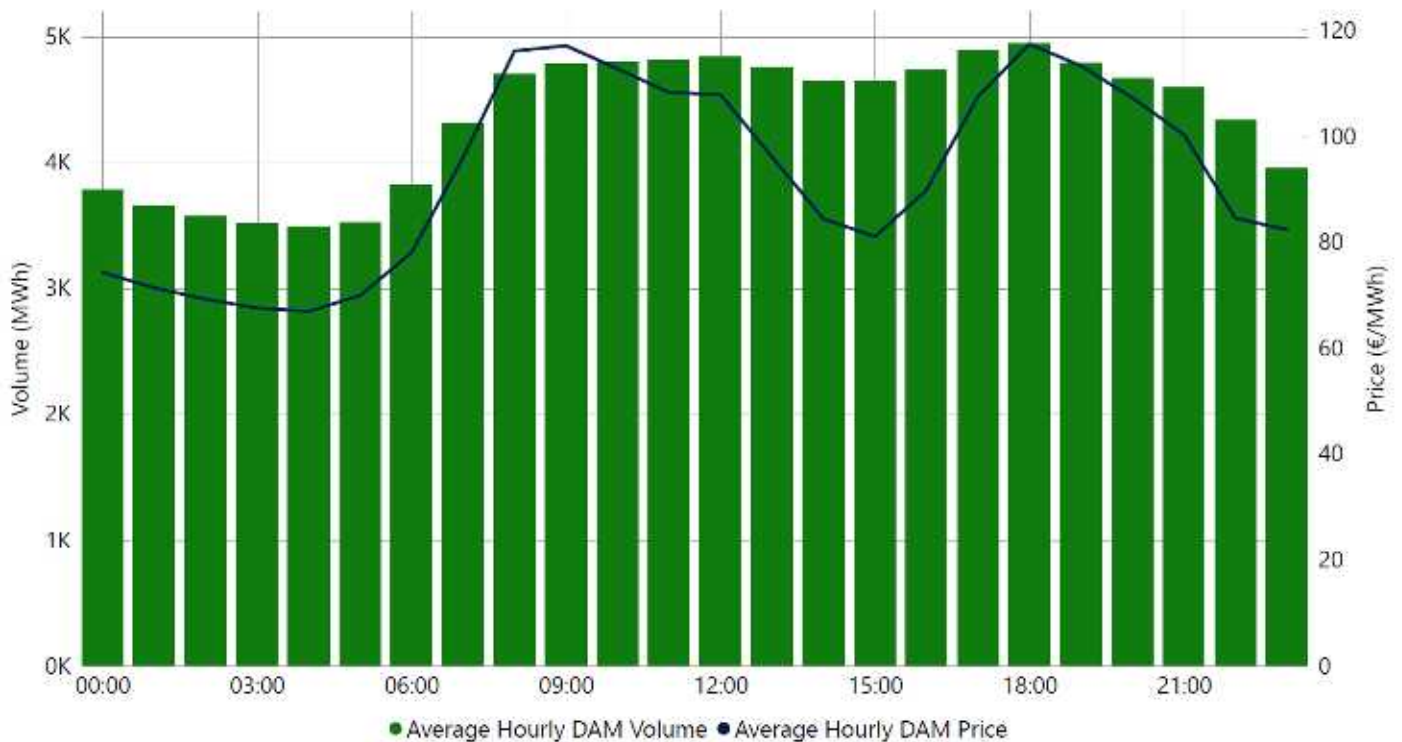
The graph below shows the daily average DAM price and volume for the market in Q2 2021. In total, the value of the DAM market during the period was €898.3M. The average daily price in the DAM was €92.44/MWh during the period, up from €69.98/MWh in Q1 2021, a 32.1% increase. This is a €66.63/MWh increase on the average price in Q2 2020.. The lowest average daily price was €37.46/MWh seen on 09 May, with the highest average daily price €171.22/MWh seen on 12 May. The lowest price recorded in an individual hourly period was (-) €12.02/MWh at 06:00 on 09 May whilst the maximum price recorded in a single period was €361.36/MWh at 18:00 on 13 April.

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), coupled with lower volumes of forecasted wind on the system and several units continuing to be being unavailable due to unexpected long term outages (CCGT units at Whitegate and Huntstown 2).



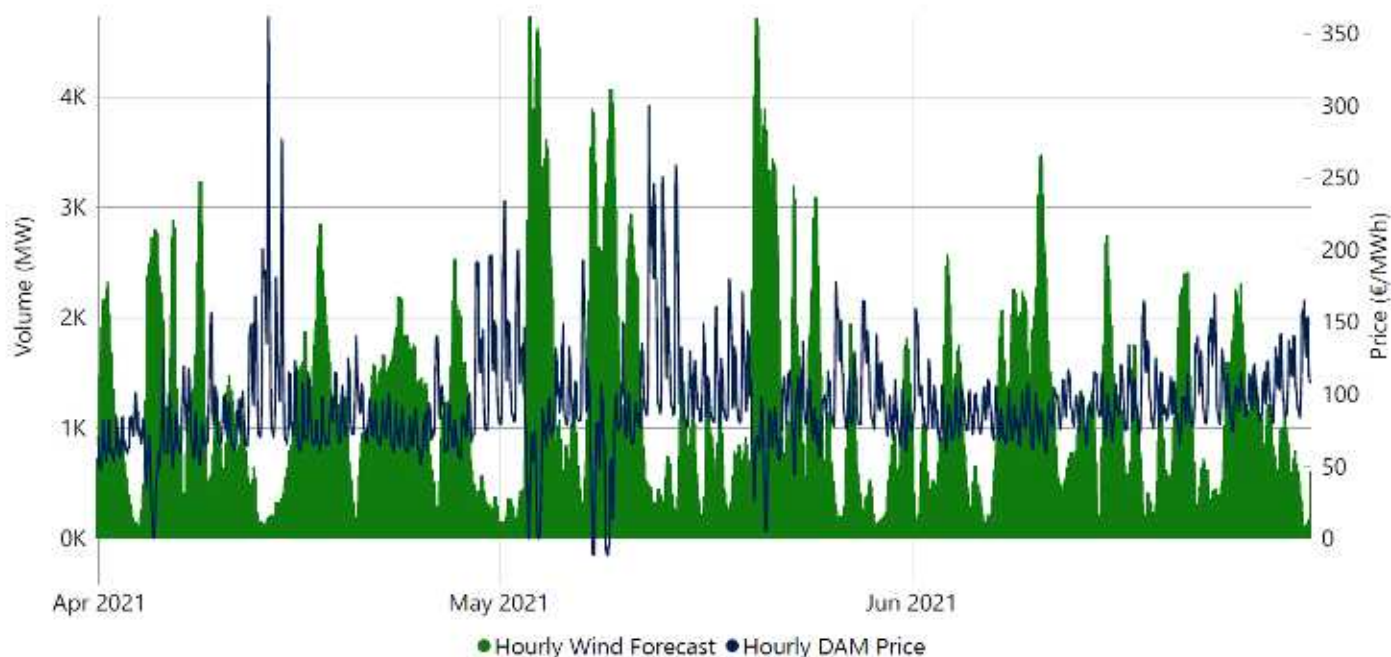
Graph 8 - DAM Market Volume and Average Daily DAM Price

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.



Graph 9 – Average Volume and Price per Hourly Period

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 1190 MW compared to 1799 MW in the previous quarter, a 39.87% reduction.



Graph 10 – 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 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)
13/04/2021	18:00	361.36	181	09/05/2021	06:00	-12.02	3565
12/05/2021	08:00	300	435	09/05/2021	05:00	-11.54	3467
14/04/2021	18:00	277.05	357	08/05/2021	05:00	-11.3	3717
13/04/2021	19:00	269	186	08/05/2021	02:00	-11.04	3881
13/04/2021	17:00	268.17	183	08/05/2021	03:00	-11.04	3852

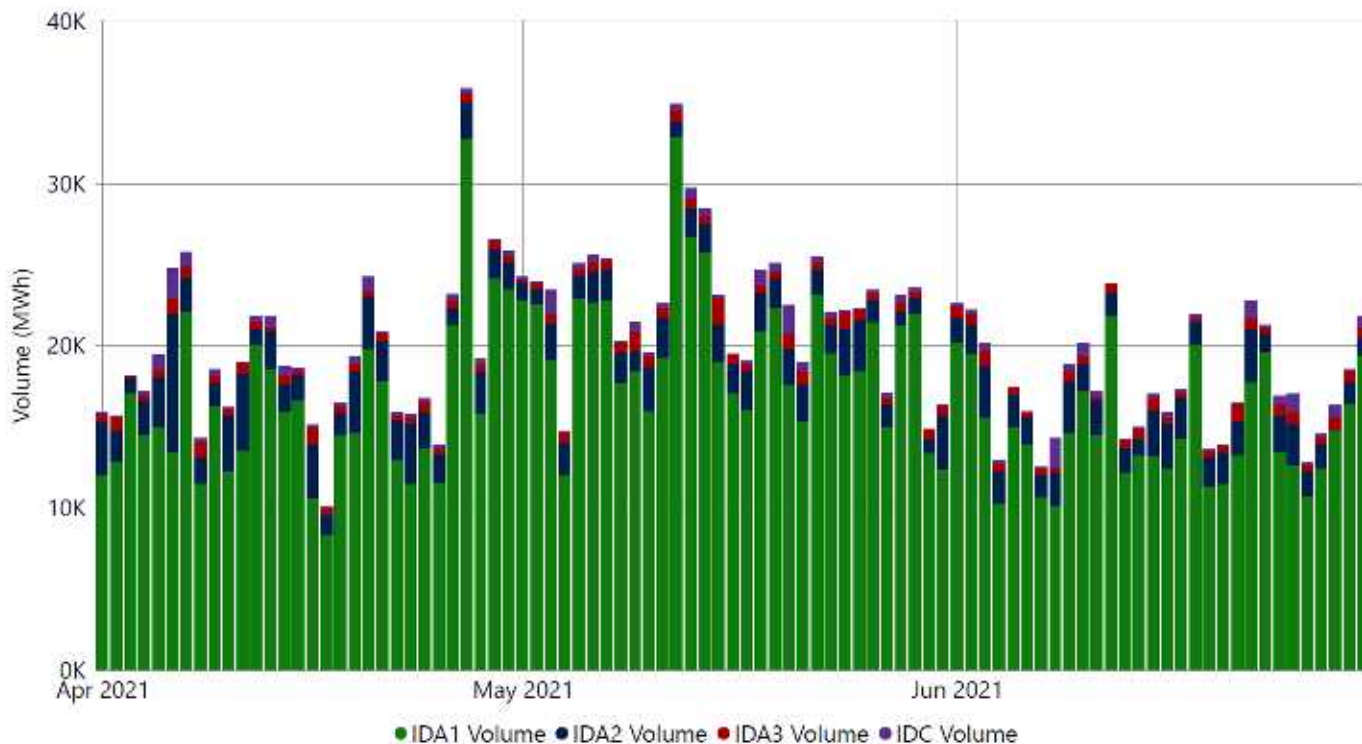
Table 1- DAM Price and Wind Forecast

2.2 INTRADAY MARKET

Overall traded volumes in the Intra-Day markets have increased across Q2 2021 when compared to those in Q1 2021. This can be partially attributed to the trading arrangement where the IDA1 and IDA2 are now the only markets coupled with GB and trading across the interconnectors takes place during these auctions.

During Q2 IDA1 accounted for 13.62% of ex-ante traded volumes up from 10.89% in Q1, IDA2 accounted for 1.67%, IDA3 accounted for 0.45% of trades by volume and the IDC accounted for 0.26% of traded volumes

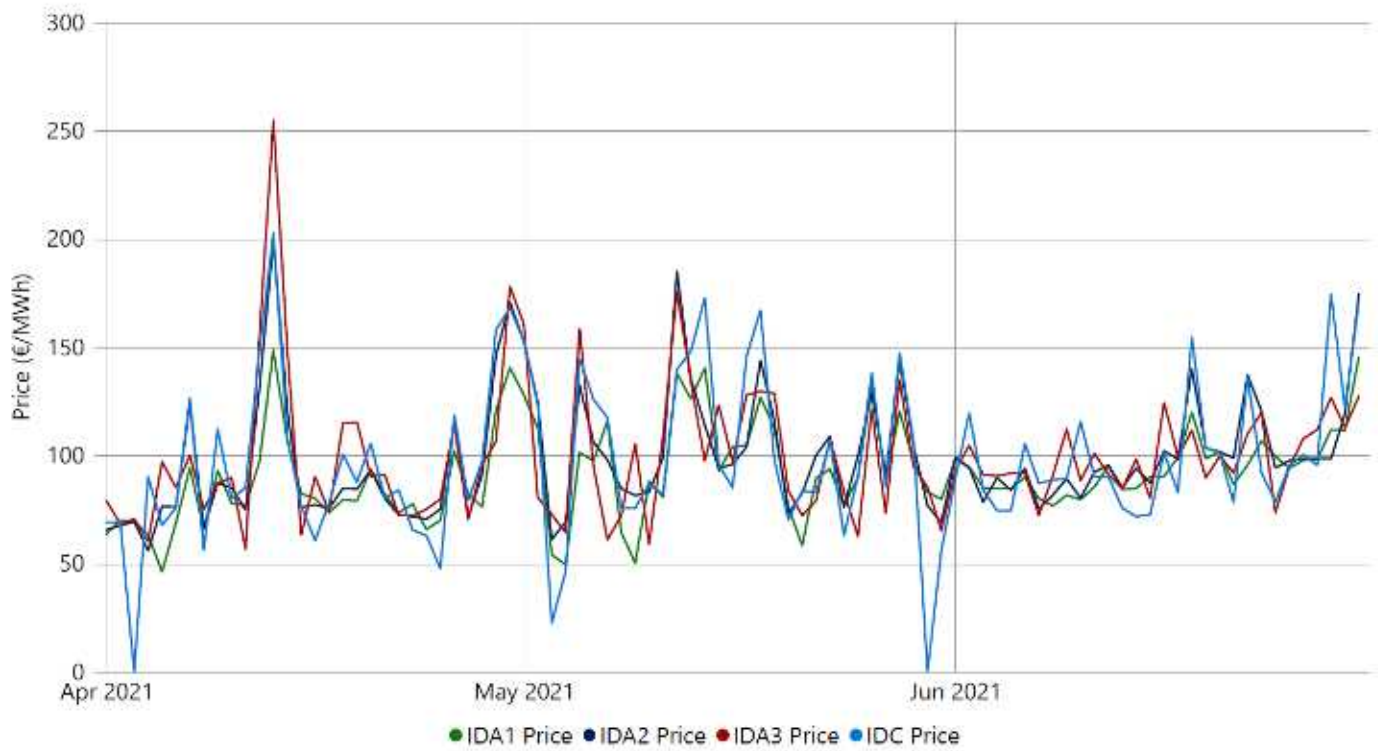
of the ex-ante markets. The share of the market by value is similar, with IDA1 accounting for 14.03% of total ex-ante market value, IDA2 1.67%, IDA3 0.46% and IDC 0.28%.



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 €91.64/MWh compared to €68.78/MWh in Q1, IDA2 €98.75/MWh compared to €80.63/MWh in Q1, IDA3 €99.15/MWh compared to €86/MWh in Q1 and the IDC market €97.88/MWh compared to €78.63/MWh in Q1. The total value of these markets over the period was €150.88M in IDA1, €17.98M in IDA2, €4.9M in the IDA3 and €2.98 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.



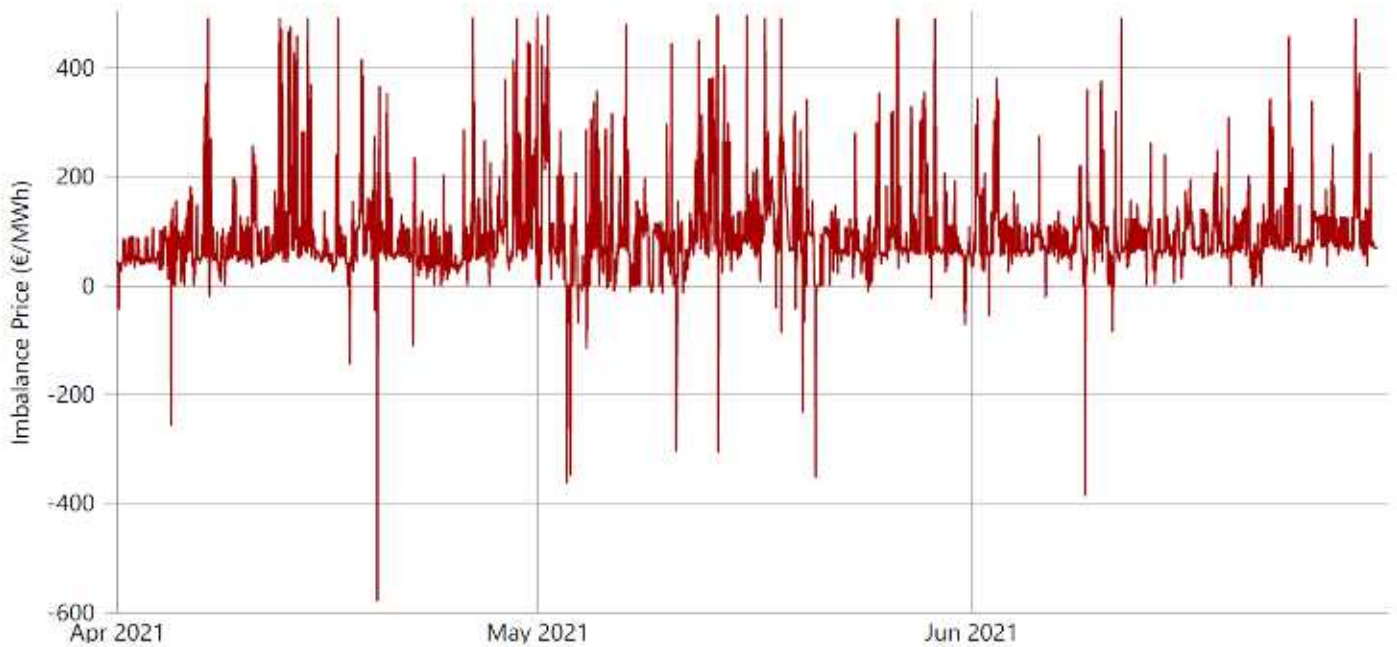
Graph 12 – Average Daily Intraday Prices

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 Q2 2021 was €48.83M.

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

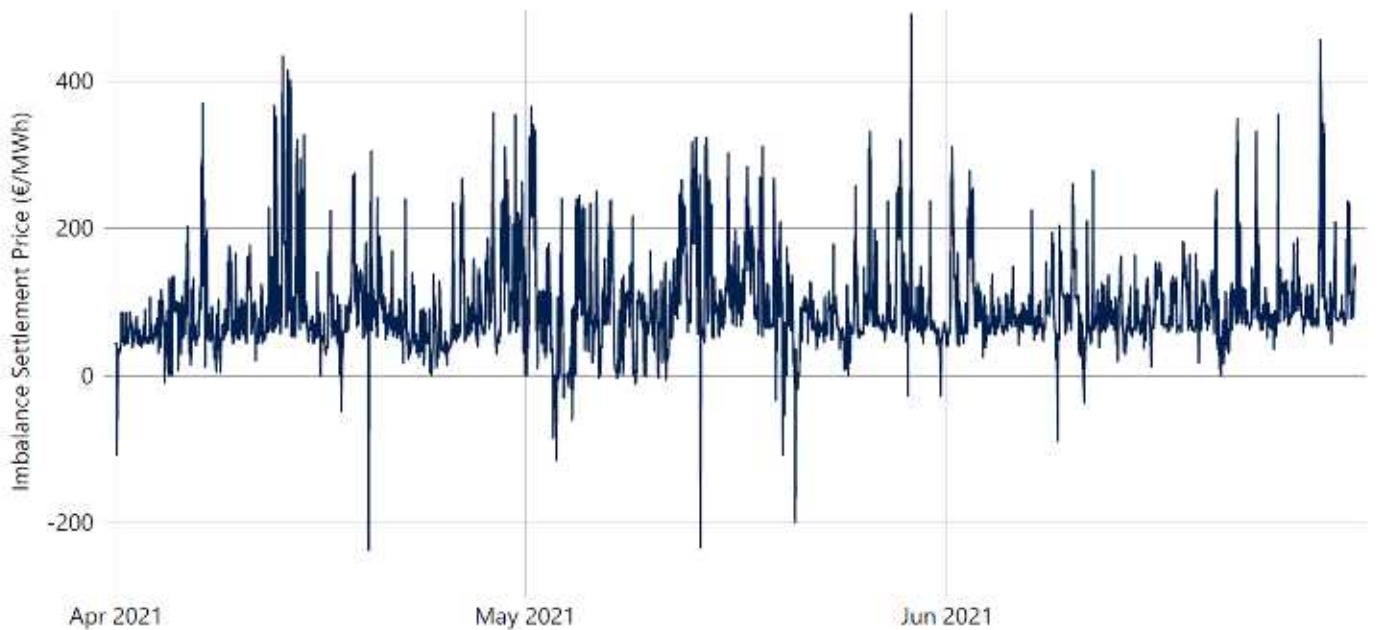
The graph below shows the price for each 5 minute Imbalance Price Period, highlighting the underlying price volatility in the Balancing Market. The average 5 minute price across the quarter was €93.13/MWh compared to €66.83/MWh in Q1



Graph 13 – 5 Minute Imbalance Price

The highest settlement 5 minute Imbalance Price occurred on 15 May at 23:25 of €495.31/MWh and the lowest 5 minute Imbalance Price of (-)€578.35 occurred on 19 April at 14:20.

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.



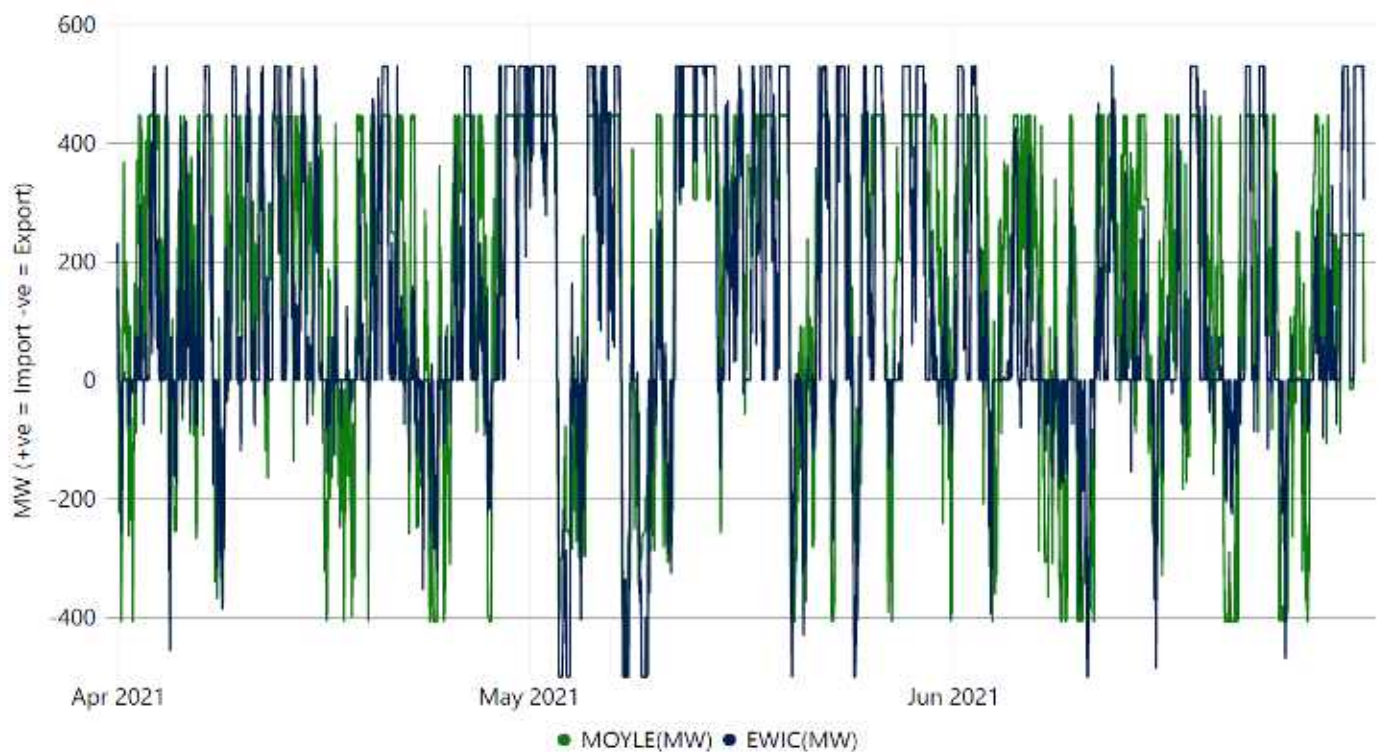
Graph 14 – 30 Minute Imbalance Settlement Price

During the quarter, the highest 30 minute Imbalance Settlement Price was €490.10/MWh at 09:30 on 29 May. The lowest 30-minute settlement price was (-) €237.23/MWh at 14:30 on 19 April. The average Imbalance Settlement Price across the quarter was €93.32/MWh compared to €66.69/MWh in Q2.

2.4 INTERCONNECTION

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 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 GB, a vast majority of periods in the quarter show imports on both interconnectors.



Graph 15 – Actual Interconnector Flows (15 Minute Intervals)

This relationship is presented in Graph 16 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 16 - 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 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.

3 DIRECTED CONTRACTS Q2 2021

3.1 DIRECTED CONTRACTS Q2 2021 ROUND 15.

The tables and figures below show the price and volume of Directed Contracts subscriptions for the latest DC Round 15, which was held in June 2021, covering the period Q4 2021 to Q3 2022.

Key information is summarised in Table 1 below.

Quarters on offer	Q4 2021 to Q3 2022		
Primary subscription dates	15 th – 17 th June 2021		
Supplementary subscription date	24 th June 2021		
Volume sold	0.63 TWh		
% Volume Sold	100%		
Average price / MWh	Baseload	Mid Merit	Peak
	N/A	€95.79	€143.05

Table 1: Round 15 Key Information

A breakdown of the volumes sold in the Round 15 Primary and Supplemental windows are shown in Table 2 and Table 3.

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
Q4 2021	0	131	25	0	120	17	-	92%	69%
Q1 2022	0	56	6	0	51	4	-	91%	67%
Q2 2022	0	126	-	0	115	-	-	91%	-
Q3 2022	0	144	-	0	131	-	-	91%	-
								91%	68%

Table 2: Round 15 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
Q4 2021	0	11	8	0	11	8	-	100%	100%
Q1 2022	0	5	2	0	5	2	-	100%	100%
Q2 2022	0	11	-	0	11	-	-	100%	-
Q3 2022	0	12	-	0	13	-	-	100%	-

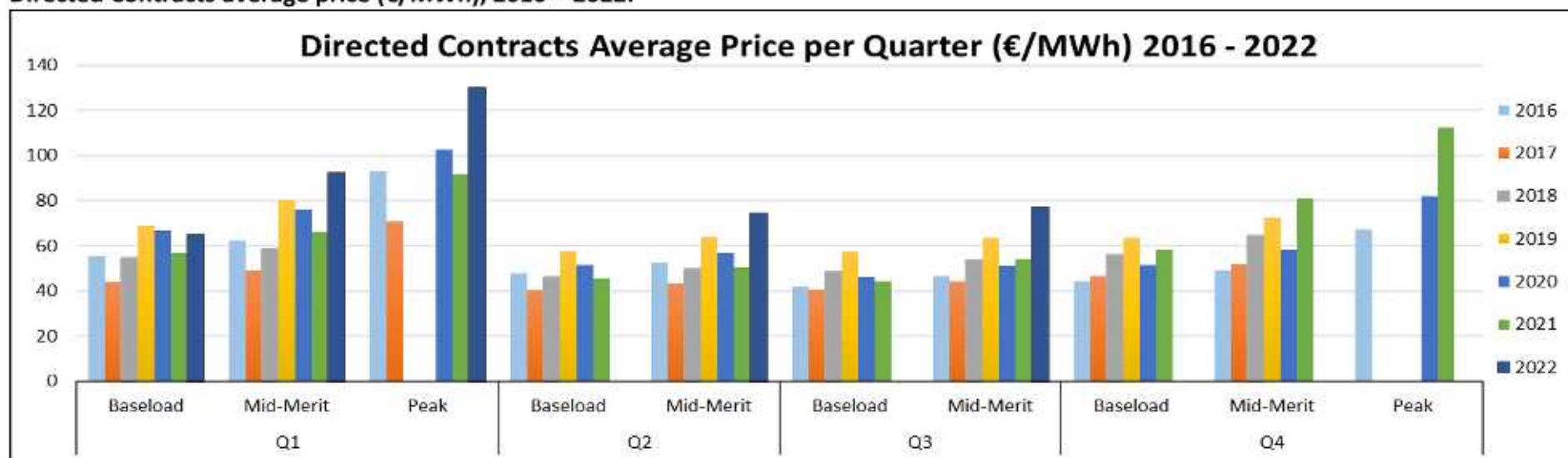
Table 3: Round 15 Supplemental Window Volumes Summary

During Round 15, an average of 91% of Mid-Merit product and 68% 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	€ 81.29	€ 112.42
2022	€ 64.86	€ 92.40	€ 129.92	-	€ 74.21		-	€ 76.96		-	-	-

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	3	0	257	0	0	198	0	0	0	0	149	768	3	

Directed Contracts volumes (GWh), 2016 – 2022;

