



**Single Electricity Market
Performance**

1 July 2019 – 30 September 2019

SEM-19-070

SEM Monitoring Report

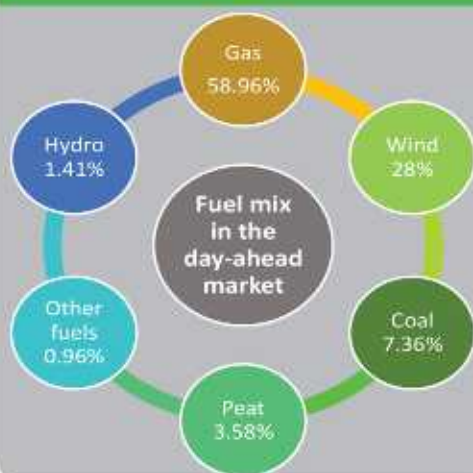
1 July - 30 September 2019

SEM
committee

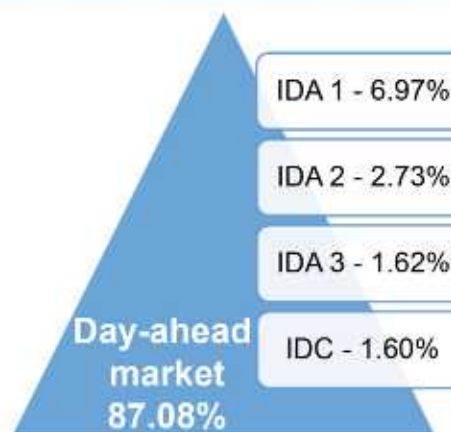
Key Highlights

- ✓ Prices in the day-ahead market were 27% 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 87% of ex-ante volumes traded with an overall value of over €433m.
- ✓ Interconnectors continue to flow efficiently between the SEM and GB.
- ✓ Continued volatility can be seen in the balancing market.
- ✓ All available contracts sold in Directed Contracts round 8 Q1 2020 to Q4 2020

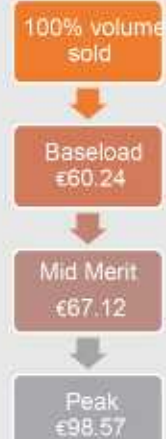
Fuel Mix



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 €47.18 in previous quarter to €46.68

Average daily price in DAM €46.68
Lowest price in hourly period -€1.00
Highest price in hourly period €150.00



Highest prices during morning/mid-morning peak
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 new 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 third quarter of 2019 from 1 July to 30 September.

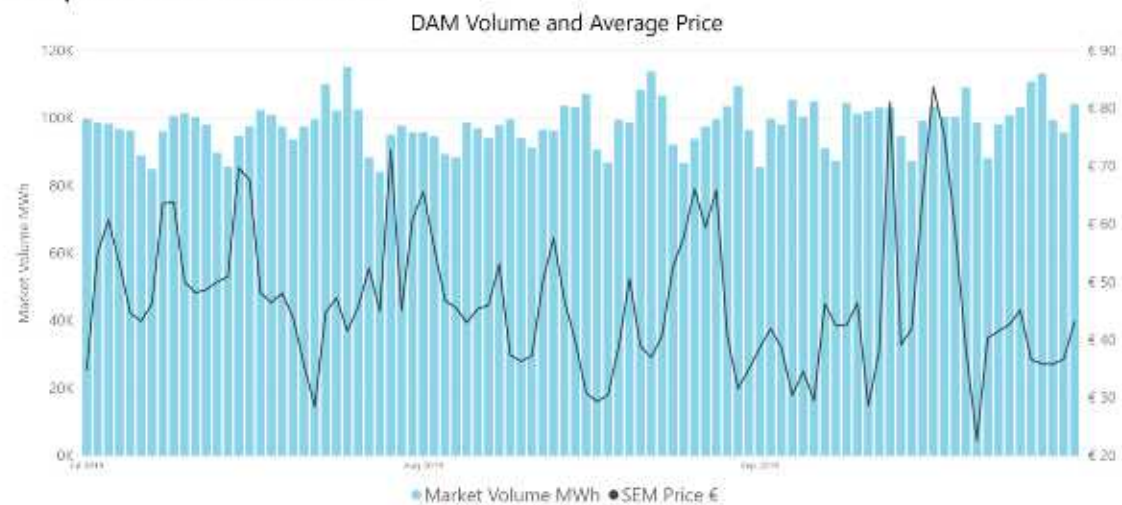
2 MARKET PERFORMANCE

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 Q3 2019. In total the value of the DAM market during the period was over €433m.

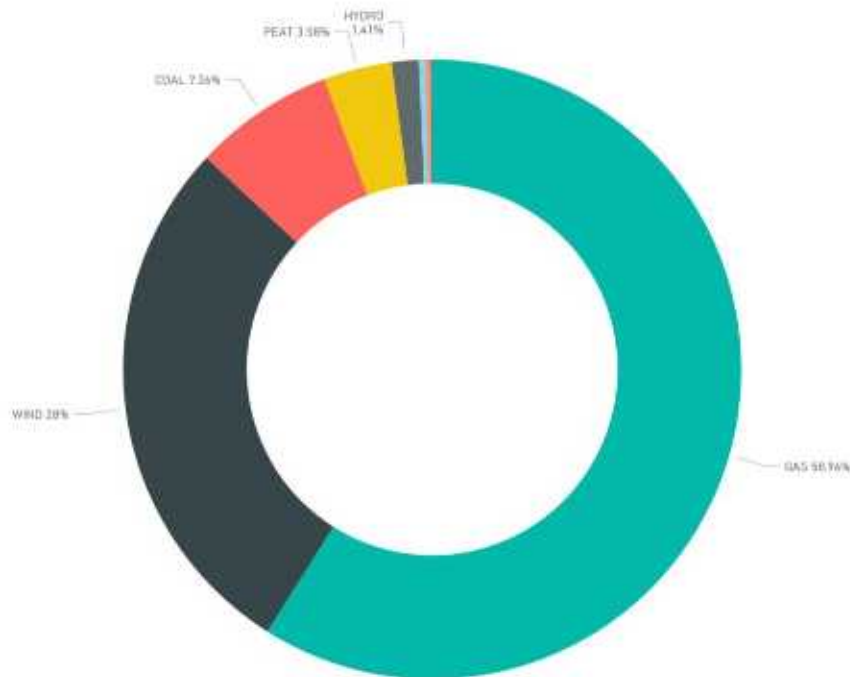


Graph 1 DAM

The average daily price in the DAM was €46.68 during the period, down from €47.18 in Q2 2019. The lowest price recorded in an hourly period was -€1.00. The maximum price recorded in a single period was €150.00.

Prices in the DAM are lower than the equivalent period one year ago (decrease of 27%) 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

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 morning/mid-morning 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
13-Sep-19	09:00	€150.00	193.31	21-Sep-19	05:00	-€1.00	3,075.38
13-Sep-19	10:00	€145.84	195.28	21-Sep-19	03:00	-€0.90	3,069.05
13-Sep-19	08:00	€140.00	194.63	21-Sep-19	04:00	-€0.90	3,085.94
13-Sep-19	11:00	€140.00	207.28	11-Sep-19	02:00	-€0.01	2,930.53
13-Sep-19	12:00	€139.80	234.33	11-Sep-19	03:00	-€0.01	2,793.04

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 87% of ex-ante volumes are traded through the DAM. Suppliers of electricity to business and domestic customers are in general seeking to cover their requirements 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 6.97% of the total ex-ante market by volume; the IDM2 auction accounted for 2.73%, the IDM3 auction for 1.62% and the Intra-Day Continuous market (IDC) for 1.60%.

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 €46,08; IDM2 €51.20 and IDM3 €53.19 and the IDA Continuous market €50.77. The total value of these markets over the period was €32.34m in IDM1; over €13m in IDM2; €4m in the IDM3 and over €4.5m in the IDC market, all increased from Q2. 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).

Graph 5 below illustrates the generally lower prices in the IDA 1 with the higher prices in IDA 3 and IDC markets. Prices in all markets generally move in a similar direction with the IDC market showing the largest movement.

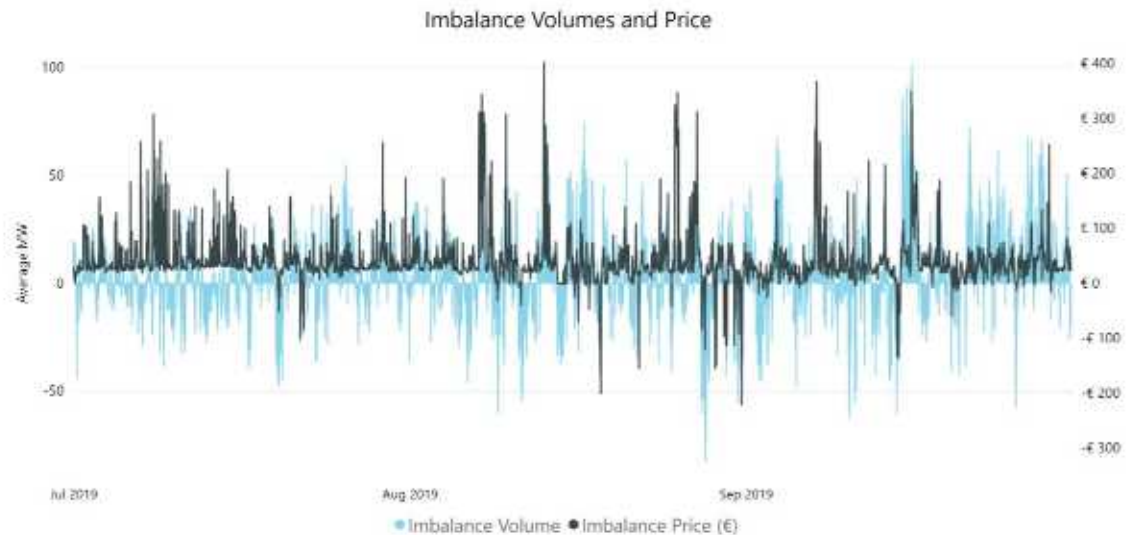


Graph 5 IDM Prices

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 13 August at €403.01 and the lowest price of €-221.26 observed on 31 August.

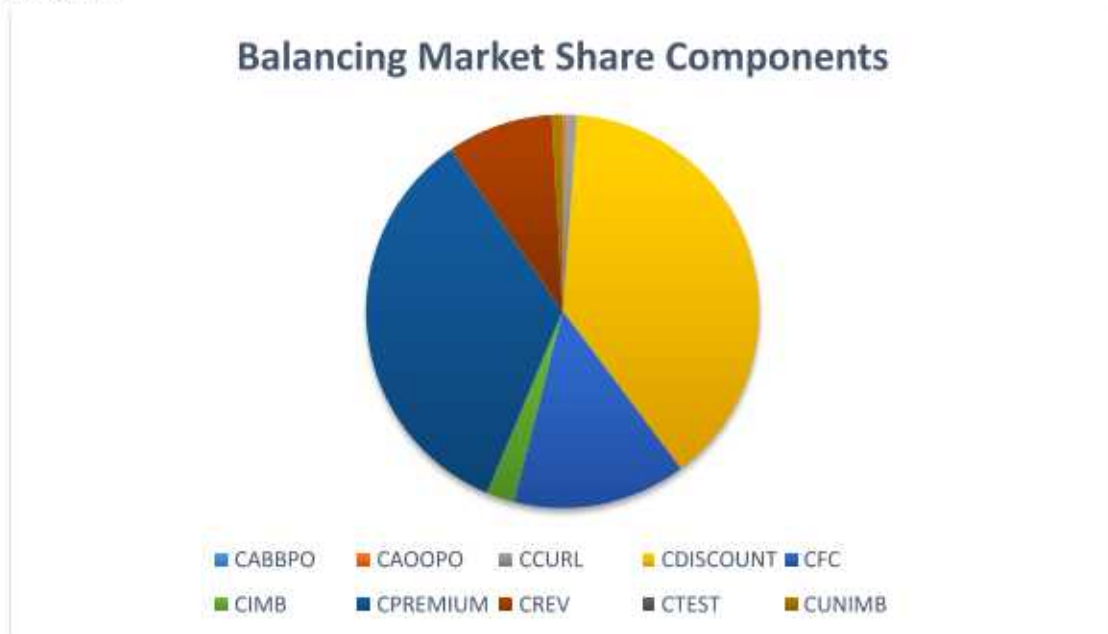
The balancing market is a complex market with numerous charge and payment components. In order to accurately, or as accurately as possible, determine the value of the Balancing Market, the following components are calculated and netted to give the relative cost of Balancing Actions.

COMPONENT	DESCRIPTION
CABBPO	Bid Price Only Accepted Bid: an adjustment for a generator to ensure that bids intended to reverse previous BM trades for the same volume in the same period are remunerated at the bid price only.
CAOPO	Offer Price Only Accepted Offer: an adjustment for a generator to ensure that bids intended to reverse previous BM trades for the same volume in the same period are remunerated at the offer price only.
CCURL	Curtailment: an adjustment for a generator unit to ensure that Accepted Bid Quantities due to a Dispatch Instruction curtailing the Unit are settled at the Curtailment Price only.
CDISCOUNT	Discount Component Payment: an additional payment in respect of a generator to reimburse the Participant where an

	Accepted Bid Quantity has an associated price which is less than the Imbalance Settlement Price.
CFC	Fixed Cost: a charge or payment for a generator to account for specific additional costs incurred or saved in respect of a unit where, as a result of a Dispatch Instruction, the Unit is dispatched differently to its Final Physical Notification.
CIMB	Imbalance Component: a payment or charge for a generator or supplier in an Imbalance Settlement Period/Day, at the Imbalance Settlement Price for any imbalance including imbalances arising from Dispatch Instructions and Uninstructed Imbalances.
CPREMIUM	Premium Component Payment: An additional payment in respect of a generator unit to reimburse the participant where an Accepted Offer Quantity has an associated price which is greater than the Imbalance Settlement Price.
CREV	Residual Error Volume Charge: the charge on a supplier unit to fund the cost of the Residual Error Volume.
CTEST	Testing Charge: the testing charge to a generator based on the Testing Tariff Price.
CUNIMB	Uninstructed Imbalance Charge: an additional charge to a generator for not generating within a tolerance of its Dispatch Quantity to encourage units to closely follow those Dispatch Instructions.

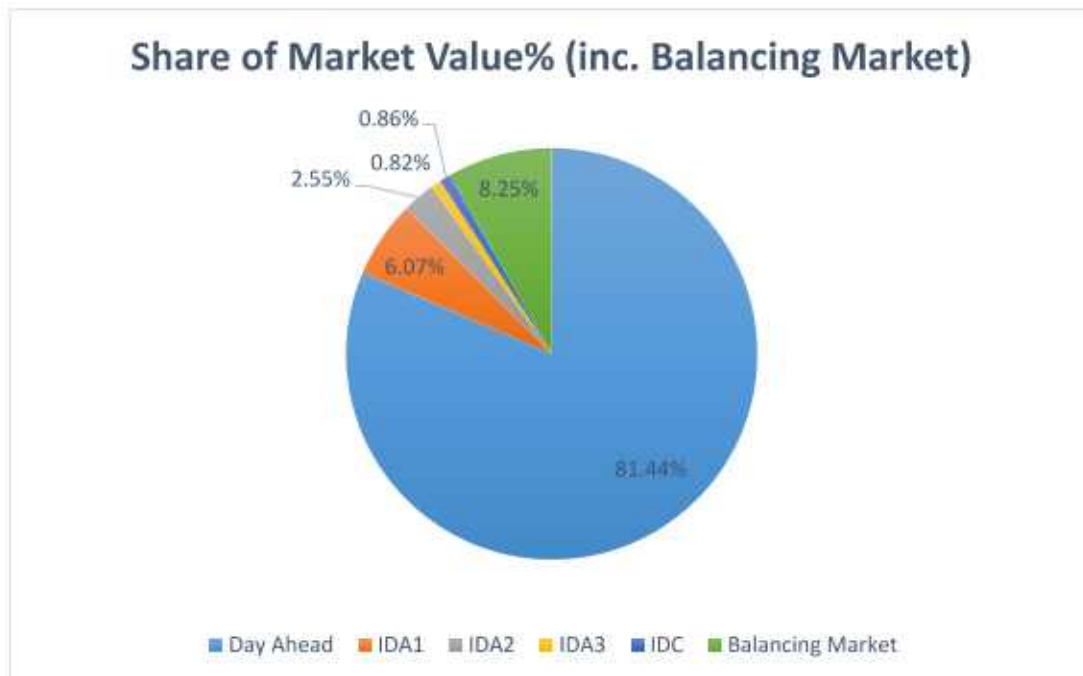
Source: Trading and Settlement Code Glossary

The graph below shows the share of these components within the cost of balancing actions.



Graph 7 Balancing Value Components

Using these components to calculate the cost of Balancing, we can calculate the Balancing Market share in comparison to the ex-ante markets. This is shown in the graph below.



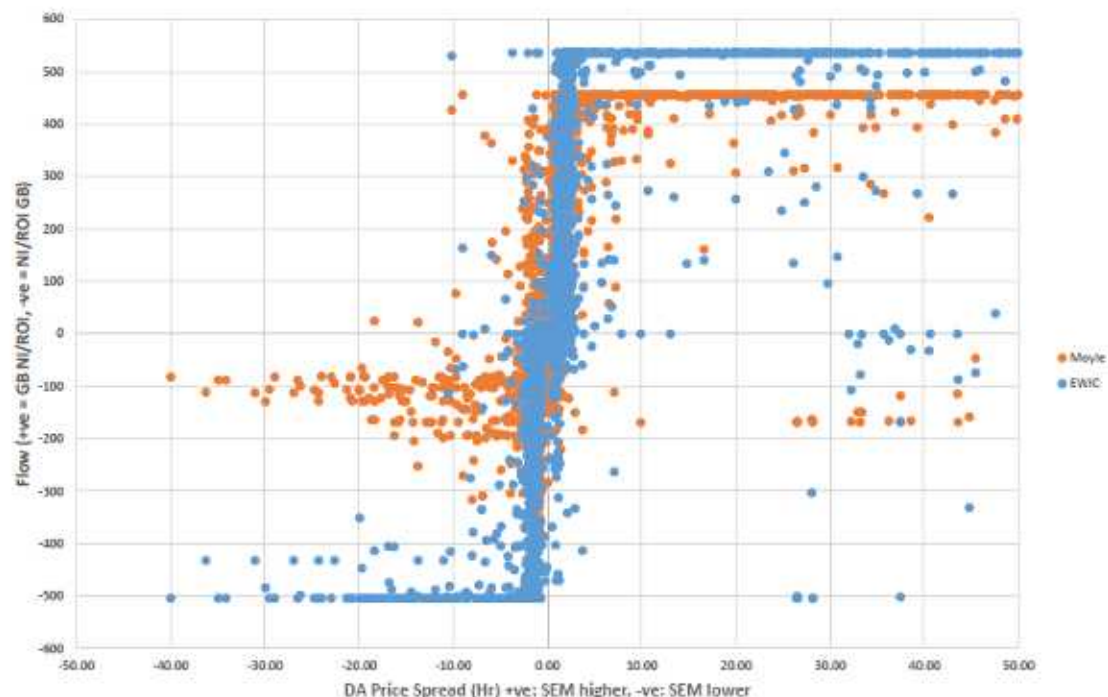
Graph 8 Market Share (including Balancing Market)

As the graph above shows, the cost of the DAM (in comparison to all other ex-ante markets and the Balancing Market) represents 82.15% of the market, followed by the Balancing Market with 8.32%, IDA1 with 6.13%, IDA2 with 2.58% and IDA3 with 0.82%.

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 7 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 9 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. However a few exceptions in the lower right quadrant can be observed. These can be attributed to a database error on 23 August which resulted in no GB price being available to calculate the relevant spread.

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 Q3 2019

3.1 DIRECTED CONTRACTS Q3 2019 ROUND 8

The tables and figures below show the price and volume of Directed Contracts subscriptions for the latest DC Round 8, which was held in September 2019 and covers the period Q1 2020 to Q4 2020.

Quarters on offer	Q1 2020 to Q4 2020		
Primary subscription dates	17-19 September 2019		
Supplementary subscription date	26 September 2019		
Volume sold	1.55 TWh		
% Volume Sold	100 %		
Average price / MWh	Baseload	Mid Merit	Peak
	€60.24	€67.12	€98.57

Table 2 Round 8 Key Information

A breakdown of the volumes sold in the Primary and Supplemental windows are shown in Table 3:

MW	Offered in Primary Window			Sold in Primary Window			% Sold in Primary Window		
	BL	MM	PK	BL	MM	PK	BL	MM	PK
2020 Q1	206	0	20	187	0	5	91%	0%	25%
2020 Q2	127	83	N/A	115	76	N/A	91%	92%	N/A
2020 Q3	68	160	N/A	62	146	N/A	91%	91%	N/A
2020 Q4	94	84	29	85	76	11	90%	90%	38%

MW	Offered in Supplemental Window			Sold in Supplemental Window			% Sold in Supplemental Window		
	BL	MM	PK	BL	MM	PK	BL	MM	PK
2020 Q1	17.9	0	15.2	17.9	0	15.2	100%	0%	100%
2020 Q2	11.5	7.3	N/A	11.5	7.3	N/A	100%	100%	N/A
2020 Q3	6.2	13.9	N/A	6	13.9	N/A	100%	100%	N/A
2020 Q4	8.4	7.5	17.9	8.4	7.5	17.9	100%	100%	100%

Table 3 Primary and Supplemental Window volumes

During Round 8, 91 % of Baseload and Mid-Merit products were sold in the Primary Subscription Window while 31 % of Peak product was sold in the Primary Subscription Window. The remaining volumes were all taken up in the Supplemental Window.

3.2 DIRECTED CONTRACTS AVERAGE PRICE 2015 - 2020

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	-	€ 46.90	€ 49.68		€ 48.20	€ 53.56		€ 55.90	€ 64.66	-
2019	€ 68.92	€ 80.20	-	€ 57.26	€ 63.94		€ 57.22	€ 63.73		€ 63.46	€ 77.44	-
2020	€ 66.72	€ 76.03	€ 102.60	€ 54.72	€ 59.93		€ 53.98	€ 59.51		€ 62.35	€ 70.31	€ 94.54

Table 4 Directed Contracts Average Price

Directed Contracts average price (€/MWh), 2015-2020



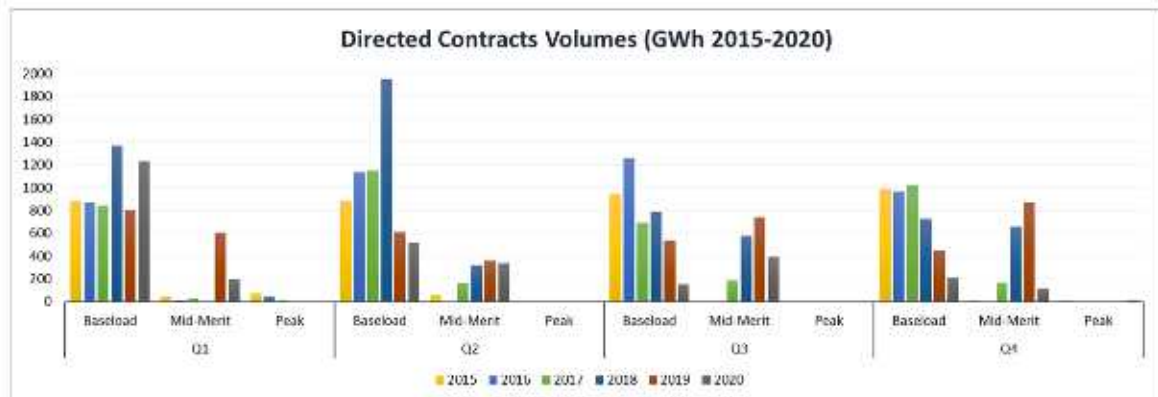
Graph 10 Directed Contracts Average Price

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	857	47	74	885	62	0	945	7	0	990	15	11	3707	132	84	
2016	671	10	47	1135	7	0	1259	3	0	967	7	0	4232	28	47	
2017	841	21	12	1148	160	0	605	191	0	1023	122	0	3207	540	12	
2018	1140	0	0	1958	120	0	296	580	0	727	699	0	4866	1558	0	
2019	801	606	0	609	362	0	535	739	0	450	871	0	2384	2579	0	
2020	1231	198	7	518	399	0	153	392	0	207	116	11	2109	1099	18	

Table 5 Directed Contracts Volumes

Directed Contracts volumes (GWh), 2015-2020



Graph 11 Directed Contracts Volume