



Single Electricity Market

Performance

1 April 2019 – 30 June 2019

SEM-19-035

SEM Monitoring Report

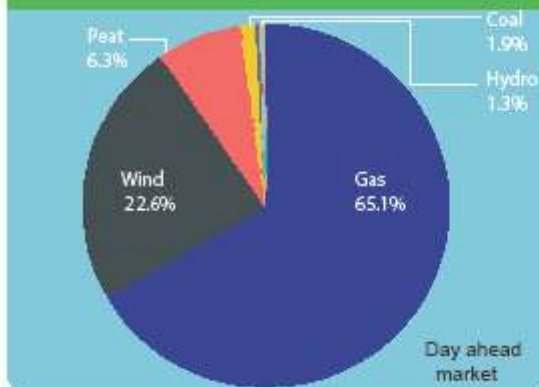
1 April - 30 June 2019



Key Highlights

- ✓ Prices in the day-ahead market were 19% lower than in the equivalent period last year. Increased wind and lower gas prices contributed to the reduction.
- ✓ High liquidity concentrated in the day-ahead market with over 94% of ex-ante volumes traded with an overall value of €454m.
- ✓ Interconnectors continue to flow efficiently between the SEM and GB.
- ✓ Continued volatility can be seen in the balancing market with changes made to the imbalance pricing process.

Fuel Mix



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
- ✓ Wind forecast at day ahead stage increased by 187% compared to the same period last year
- ✓ Reduction in average day-ahead price from €61.27 in previous quarter to €47.18

Average daily price in DAM €47.18
 Lowest price in hourly period -€0.35
 Highest price in hourly period €152.78



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 second quarter of 2019 from 1 April to 30 June.

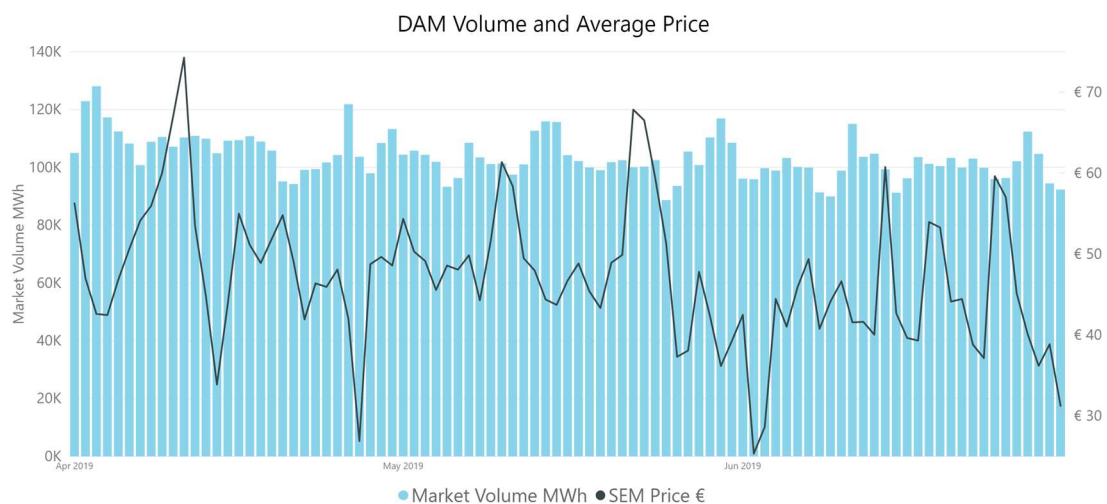
2 MARKET PERFORMANCE

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 Q2 2019. In total the value of the DAM market during the period was over €454m.

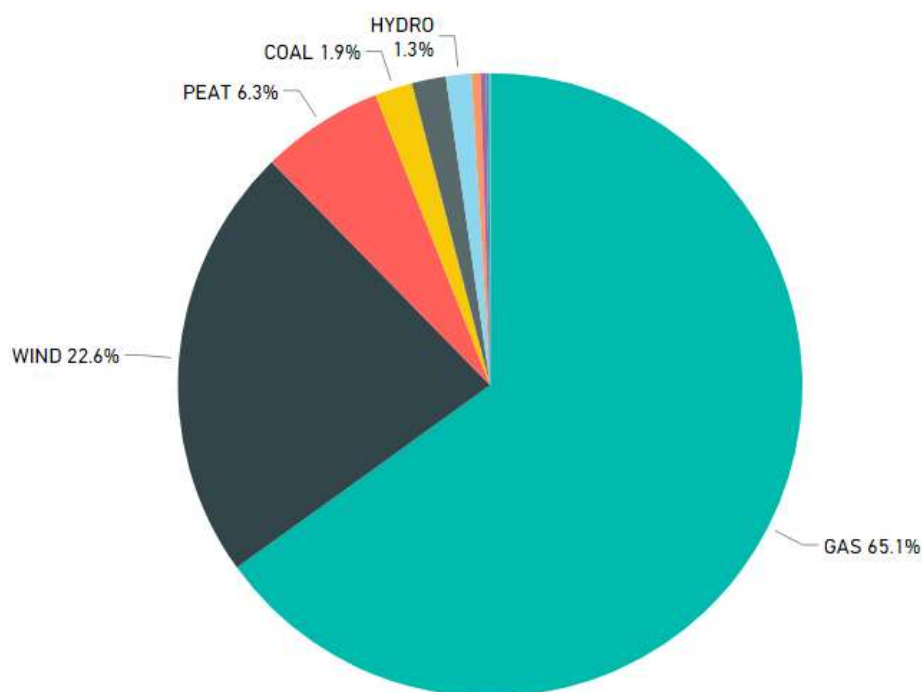


Graph 1 DAM

The average daily price in the DAM was €47.18 during the period, down from €61.27 in Q1 2019. The lowest price recorded in an hourly period was -€0.35. The maximum price recorded in a single period was €152.78, down from €365.04 in Q1.

Prices in the DAM are lower than the equivalent period one year ago (decrease of 19%) which can broadly be accounted for by a decrease in gas prices.

The share of 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. It shows the highest prices during the Report period occurring at 08:00 (during morning peak demand) and lowest prices 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.

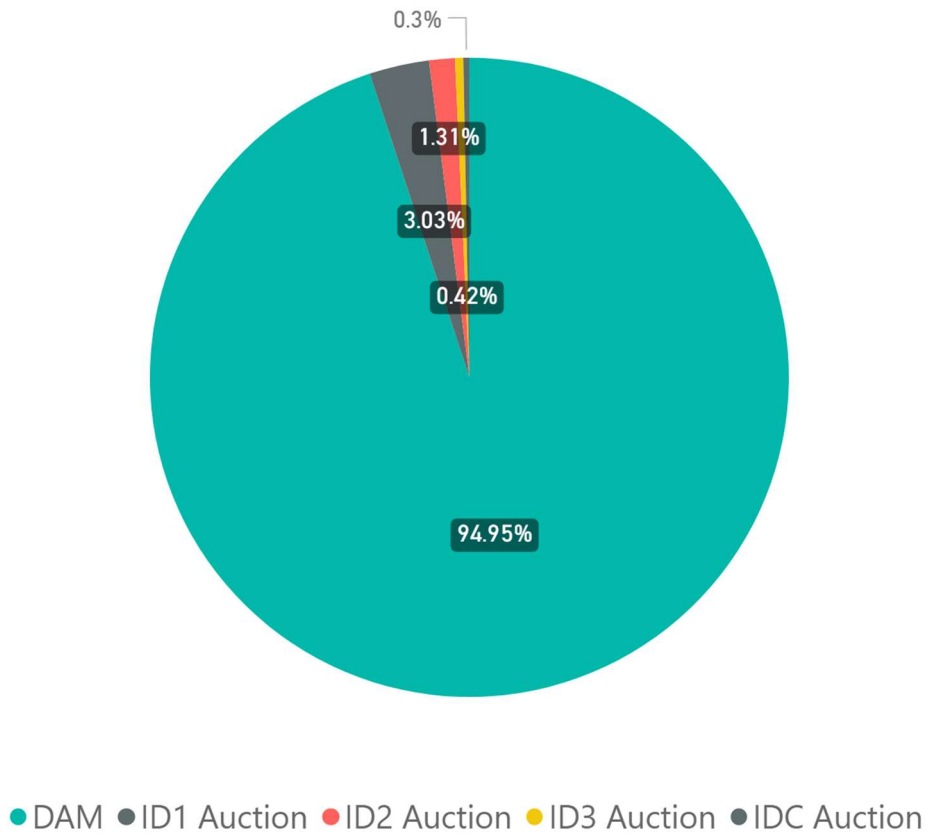
High Price-Low Wind				Low Price-High Wind			
Date	Time	Price €	Wind Forecast	Date	Time	Price €	Wind Forecast
14-Jun	08:00	€152.78	208.48	03-Jun	01:00	-€0.35	2483.47
14-Jun	09:00	€147.27	242.29	03-Jun	02:00	-€0.35	2368.29
22-May	08:00	€135.20	116.07	14-Apr	04:00	-€0.10	3836.37
19-Jun	08:00	€134.00	461.57	14-Apr	05:00	-€0.10	3875.7
14-Jun	10:00	€125.00	267.09	03-Jun	03:00	-€0.05	2256.01

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 94% of ex-ante volumes are traded through the DAM. Suppliers

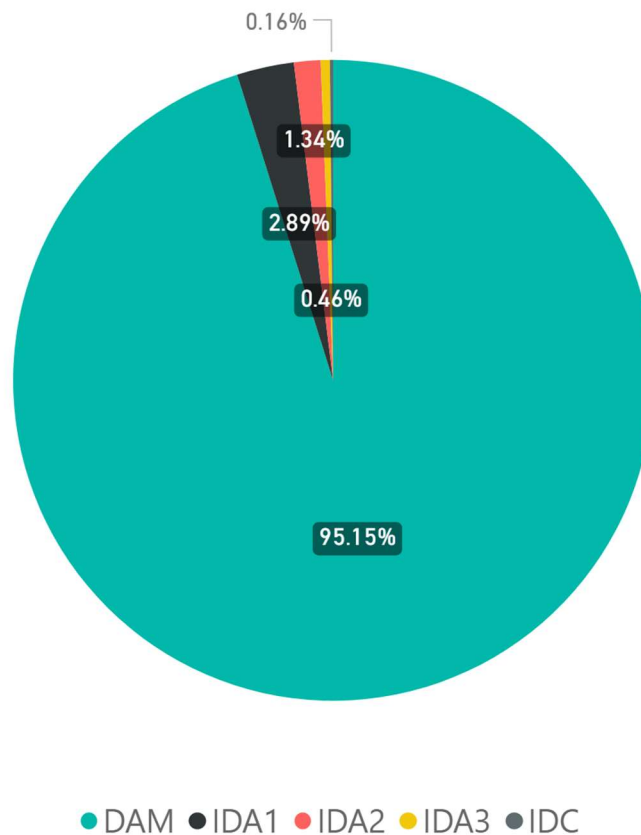
of electricity to business and domestic customers are in general seeking to cover their requirements in this market. Graph 4 also shows the relative value of each market.

Market Share by Volume



Graph 3 Market Shares by Volume

Market Share by Value



Graph 4 Market Share by Value

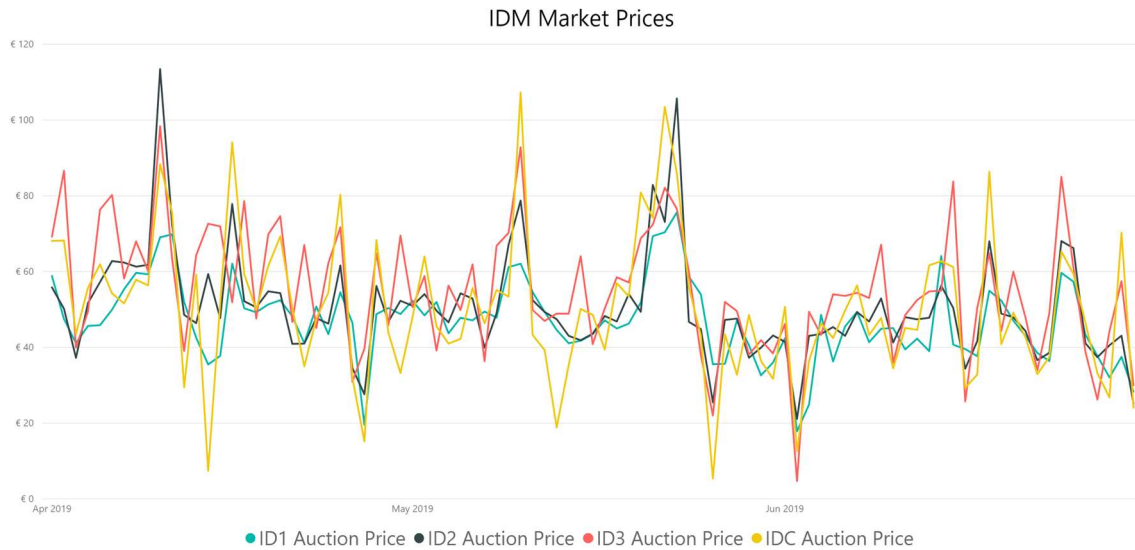
2.2 INTRA-DAY MARKET

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 3.03% of the total ex-ante market by volume; the IDM2 auction accounted for 1.31%, the IDM3 auction for 0.42% and the Intra-Day Continuous market (IDC) for 0.3%.

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 €47.03; IDM2 €50.47 and IDM3 €54.58 and the IDA Continuous market €51.35, all of which are significantly down from

Q1. The total value of these markets over the period was €27.63m in IDM1; over €12m in IDM2; €4m in the IDM3 and over €1.6m in the IDC market.

Graph 5 below illustrates the generally lower prices in the IDA 1 market and the IDC market with the higher prices in IDA 2 market. Prices in all markets generally move in a similar direction with the IDC market showing the largest movement.

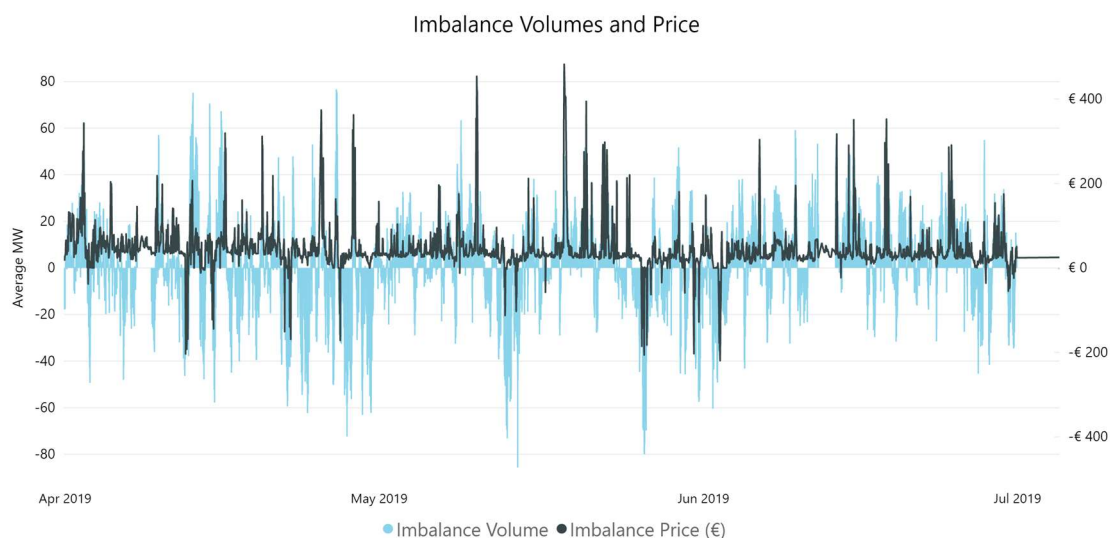


Graph 5 IDM Prices

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 18 May at €482.09 and the lowest price of €-219.60 observed on 02 June.

A General Systems Failure (GSF) effected systems from 12 to 14 June related to database corruption. All market and operational services were effected, and the TSOs implemented GSF Major Incident Process. Partial service was restored at circa 07:00 on 12th June following an application switch to Belfast. Over the next two days, the Balancing Market and SEMO Settlement experienced intermitted issues with market backup prices successfully used during this period. All systems were fully operational by 16:00 on 14 June.

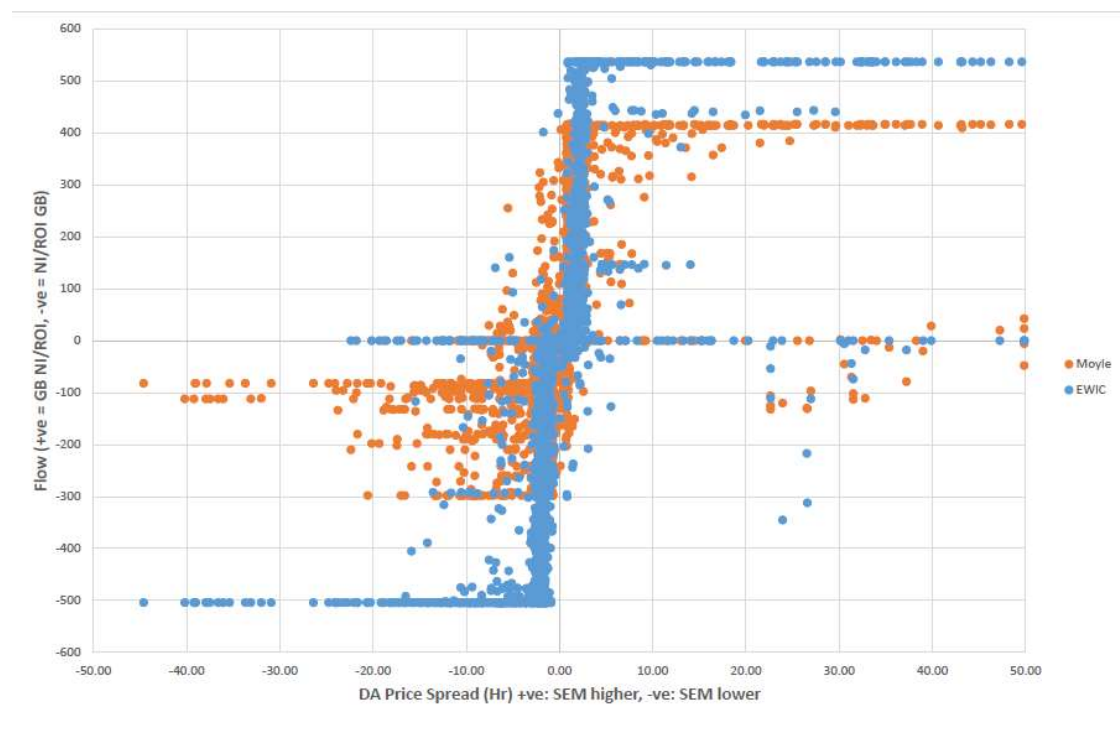
The Regulatory Authorities continue to monitor the Balancing Market and an Urgent Modification to the Trading and Settlement Code to make a change to the imbalance pricing process has been put into effect. A consultation paper on potential changes was published on 30 May 2019 with responses due by 12 July 2019.

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 7 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 the market coupling error which occurred at the beginning of June (7th) due to a technical issue experience by EPEX. The issue was caused by the submission of a corrupt order, not one placed from

a SEM participant, nor an issue with the market coupling algorithm. As per the fall back procedure, local auctions were held for each national market area. This resulted in no GB price being available to provide the market price spread for this period.

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.

2.5 M+4 RESETTLEMENT

Commencement of M+4 resettlement began on 5th July. Payment of accrued Fixed Charges from October 2018 to January 2019 also commenced on this date.

3 DIRECTED CONTRACTS Q2 2019

3.1 DIRECTED CONTRACTS Q2 2019 ROUND 7

The tables and figures below show the price and volume of Directed Contracts subscriptions for the latest DC Round: 7, which was held in June 2019 and covers the period Q4 2019 to Q3 2020.

Quarters on offer	Q4 2019 to Q3 2020		
Primary subscription dates	18-20 June 2019		
Supplementary subscription date	27 June 2019		
Volume sold	1.12 TWh		
% Volume Sold	100 %		
Average price / MWh	Baseload	Mid Merit	Peak
	€57.13	€64.06	—

Table 2 Round 7 Key Information

Directed Contract prices in the period have been heavily influenced by the forward carbon prices, which were 24 % higher than the previous quarter.

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		Sold in Supplemental Window	
	Baseload	Mid-Merit	Baseload	Mid-Merit	Baseload	Mid-Merit	Baseload	Mid-Merit
2019 Q4	22	183	20	169	91%	92%	2	14
2020 Q1	137	75	96	53	70%	69%	41	22
2020 Q2	59	76	54	69	92%	91%	5	7
2020 Q3	2	136	1	124	70%	91%	1	12

Table 3 Primary and Supplemental Window volumes

During this round, 81 % of baseload products were sold in the Primary Subscription Window. For Mid Merit, 86 % was sold in the Primary Subscription Window. The remaining volumes were all taken up in the Supplemental Window.

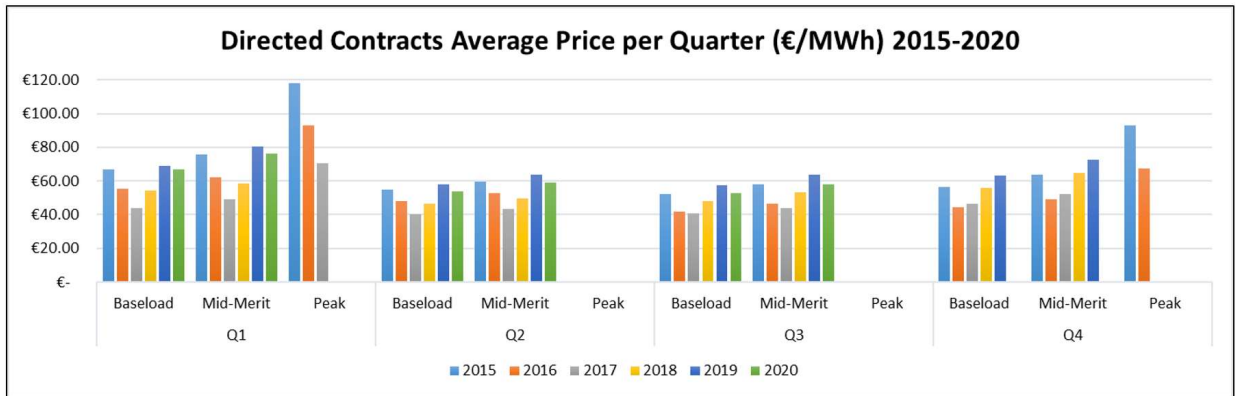
3.2 DIRECTED CONTRACTS AVERAGE PRICE 2015 - 2020

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	-	€ 46.30	€ 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	€ 66.83	€ 76.35	-	€ 53.64	€ 58.83		€ 52.59	€ 58.06		-	-	-

Table 4 Directed Contracts Average Price

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



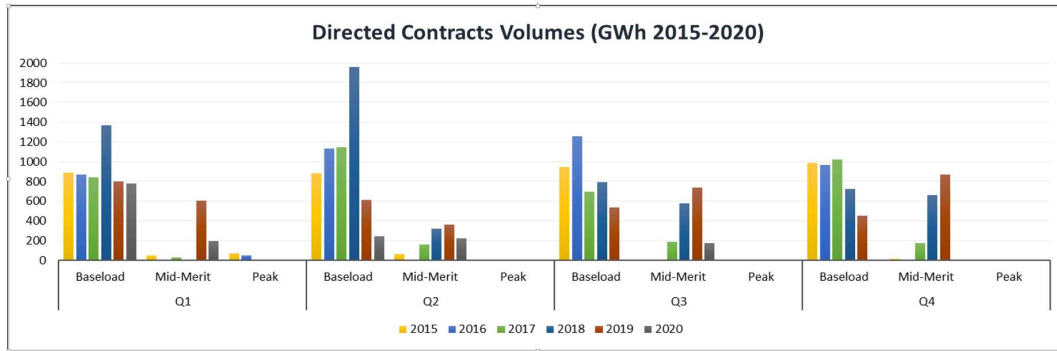
Graph 8 Directed Contracts Average Price

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	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	782	193	0	242	226	0	3	171	0	0	0	0	1027	590	0

Table 5 Directed Contracts Volumes

Directed Contracts volumes (GWh), 2015-2020



Graph 9 Directed Contracts Volumes

4 SUMMARY

The market continues to exhibit many of the features specified in the design, including a liquid Day Ahead Market and efficient interconnection. This facilitates the formation of efficient prices, a competitive market and the maximisation of renewable generation and its export to GB.

As expected with the implementation of a new market design a number of issues have arisen over the period that are being addressed by the Single Electricity Market Operator (SEMO) and the TSOs. These issues are generally focused on the operation of the Balancing Market. These include data issues that impinge on the timely and accurate publication of data and technical issues related to the operation of the new systems. Pricing and settlement issues have also arisen in a number of periods and the resolution of these are being progressed by the Market Operator. A consultation paper on further potential changes to the Balancing Market was published on 30 May 2019 with responses due by 12 July 2019.

The SEM Committee continues to be encouraged by the performance of the market overall and will continue to report on market performance in future reports, including the impact of any future changes.