



**SEM**  
committee

# Annual Report

Oct 2020 - Sept 2021



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## 1. Foreword from the SEM Committee

The past year has been exceptional in so many ways as we continue to face a range of challenging issues impacting our market.

Energy prices continue to dominate the headlines across the world as we faced one of the most difficult winters in decades. International wholesale fuel prices have risen to unprecedented levels and we have seen the direct impact of those costs in the SEM. End prices have surged just as wind availability dropped and we saw one of the stillest summers for many years. We have been monitoring these impacts closely and have responded where possible to take relevant action. We amended the allocation of Directed Contracts to help small suppliers who have limited options to hedge wholesale price exposures. We also made an emergency modification to the trading and settlement code to mitigate against non-performance difference charges which were having a significant and detrimental impact on the market. We have worked closely with our retail colleagues in the Regulatory Authorities to monitor the market, help inform key stakeholders, industry and governments about the cause and impacts of the increases in international wholesale fuel prices. We will continue to do all we can to protect consumers during these unprecedented times.

Against the backdrop of surging energy prices, we have also faced challenges in addressing security of supply concerns. Our capacity auctions continue to deliver significant new investment and new technology to the market but with the retirement of old plant and sustained issues with plant outages, we face security of supply concerns. The RAs have responded to these pressures and as a Committee, we have taken necessary steps to ensure the delivery of the capacity auctions and bring new investment to the market. We are working closely with government, the market operator and industry to do what is necessary to ensure we meet security of supply standards.

These challenges remain as we start 2022 and we are focused on ensuring the market runs as effectively as possible. We will continue to explore new opportunities as well as reflect and build on what has already been achieved over the past year. For the first time we published a forward work programme which set out our key priorities for the year ahead. Although significant new challenges emerged which diverted some of our resource, we were still able to deliver 71% of our projects with a further 23% progressed and only 6% delayed. We have also been able to deliver on the vast suite of business-as-usual items that make up the core of our work. We have continued to monitor the market and published our MMU Inquiry Procedure Manual which details the procedure that is to be generally followed when conducting market queries. We investigated areas of concern, carried out a suite of audits and maintain market codes and procedures to ensure the market runs as it should. This is a testament to the versatility and commitment of our teams in the RAs who continue to deliver even in the most challenging of times.

Our capacity auctions continued to run and we have brought new investment to the market. We held our first top up auction and responded to the emerging challenges in the delivery of new capacity. We continue to welcome a wide range of technologies into our generation mix and note the contribution this makes to our security of supply challenges. We successfully moved to 70% SNSP and are trialling 75% so we can maximise as far as possible the renewable generation on the system. This is a world-leading standard and an achievement of which we can all be very proud. As we work with the RAs and governments to inform and deliver on the climate change agenda, the strides we are making in the capability of our systems is most welcome.

On 1 January 2021, GB left the EU's internal energy market. This changed how capacity on our interconnectors is traded, moving from the day-ahead to the intraday market while we wait for the long-term Trade and Cooperation Agreement to be put in place. The market has adapted to this new operating regime and we see the interconnectors mostly continuing to flow in the right direction. We continue to monitor the impact of the transition to these fall back arrangements to assess if we need to take any further measures in advance of the implementation of the TCA.

We made significant progress on the delivery of the requirements of the EU's Clean Energy Package (CEP) across the year. Setting out clearly our key areas of focus, we published an updated roadmap detailing the work done to date and how we will progress remaining areas to ensure compliance. Work continues at pace but we have made significant progress and will work to implement any necessary market changes over the months ahead.

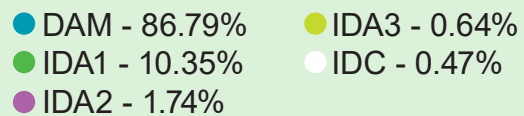
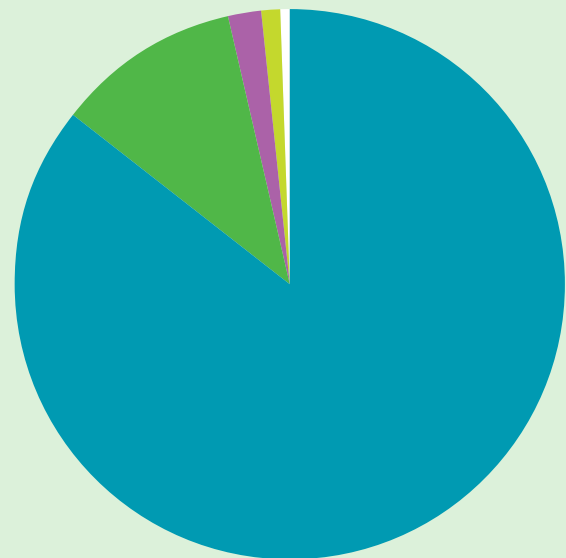
Our government colleagues in the Department of the Environment, Climate and Communications and Department for the Economy continue to support our work as we strive to deliver the best outcomes for consumers and we are grateful for our effective working relationships. We also recognise the commitment and co-operation of all market participants and other key stakeholders as we face the many challenges and successes across our market together. This collective effort continues to ensure the effective operation of the SEM, however none of this is possible without the unwavering commitment of the teams across the RAs. We thank them for their determination, ability to deliver, support in the achievement of our objectives and the effective operation of the SEM.

## 2. The Year in Summary

### Key Highlights

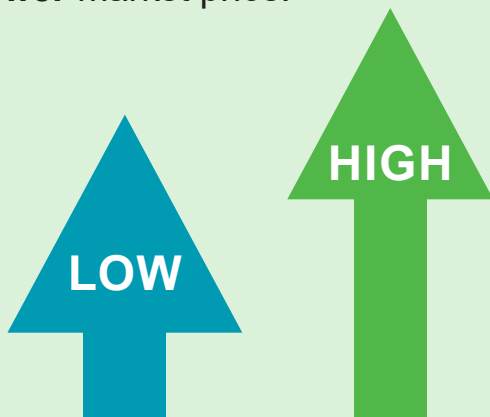
- Prices in the day-ahead market were 154% higher than the same period last year. This increase was primarily driven by a surge in the wholesale price of gas
- High liquidity is concentrated in the day-ahead market and other ex-ante markets performing as expected.
- The day-ahead market is worth over €3.79bn
- 70% SNSP new operational standard
- Successful T-4 and first T-1 top-up capacity auctions completed
- Increase in demand as Covid-19 pandemic restrictions eased

### Ex-ante market share by volume



### Interconnector efficiency

Interconnector capacity traded in the intra-day market as of 1 January 2021. Interconnectors flowing in the right direction, electricity moving from the **higher** market price to the **lower** market price.



### DS3

System operating with up to **70%** non-synchronous penetration (SNSP). Progress made to allow for move to **75%**.

Work commenced on future arrangements for system services beyond April 2023.



## Capacity Remuneration Mechanism

T-1 CY2022/23 - First 'top-up' auction

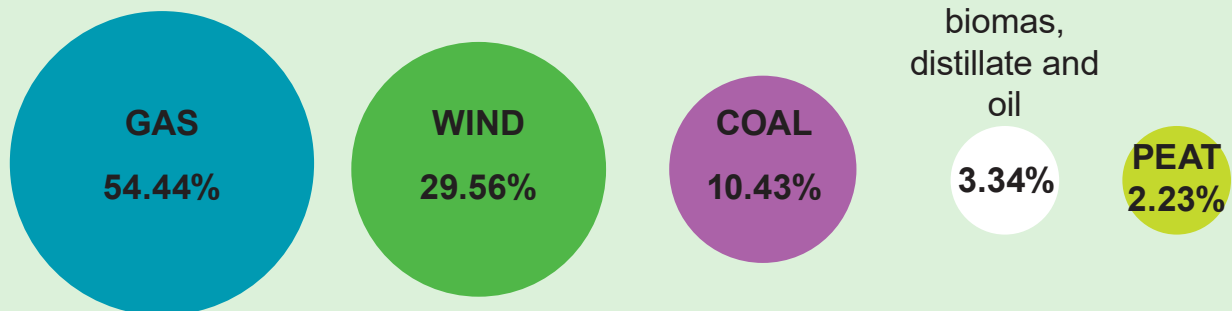
T-4 CY2024/25 - 6,168MW secured, €315m cost

When compared to the CPM, which had an estimated cost of €546m, the CRM represents an average saving of around €201m across each Capacity Auction to date. With eight auctions now having taken place that is a saving of over €1.4billion for consumers.



Secured Capacity

## Fuel Mix



## CO2 emissions

Fell from 0.254 tonnes per MWh in 2019 to 0.236 tonnes per MWh in 2020.

## Prices

Average prices in the day-ahead market were **154% higher** compared to the same period from October 2019 - September 2020. This increase has been primarily driven by a surge in the

wholesale price of gas, high carbon emission prices, low forecasted wind at key times, a number of key thermal generation units being unavailable and an increase in demand as Covid-19 restrictions are eased.



**High wind availability**  
downward pressure on prices



**Low wind availability**  
higher prices observed







### 3. How the SEM works

The Single Electricity Market (SEM) is the wholesale market on the island of Ireland where electricity generators and suppliers trade the power used by homes and businesses across the island of Ireland.

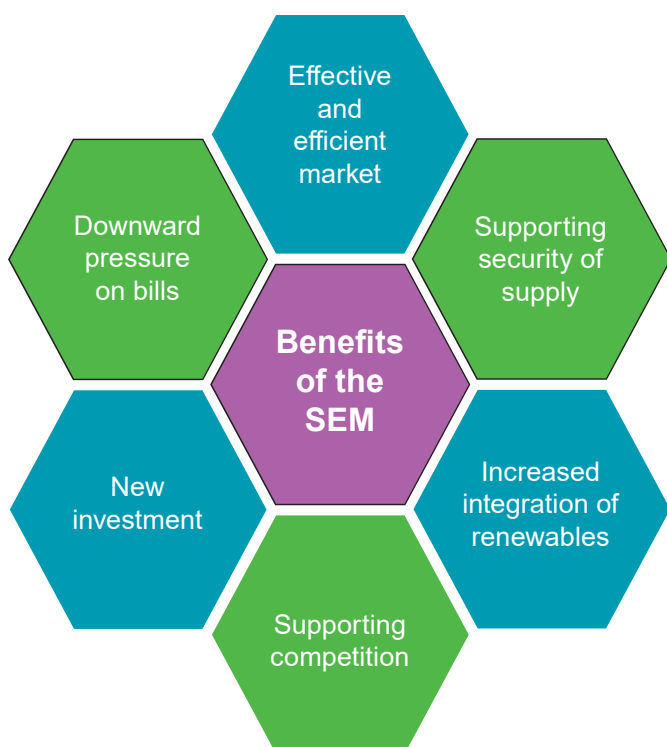
Much has changed since the SEM was established in 2007, not least the significant increase of renewable generation, introduction of new technologies and the increased advantages to be gained from interconnection with other markets.

To take advantage of new opportunities and to improve the efficiency, competitiveness and operation of the market, new operational arrangements were put in place from 1 October 2018. This project, known as ISEM, sought to make best use of all the power on the system and ensure that interconnectors operate in the most efficient way. Compliance with the EU target model and alignment of cross border trading arrangements within the region was also at the core of the project.

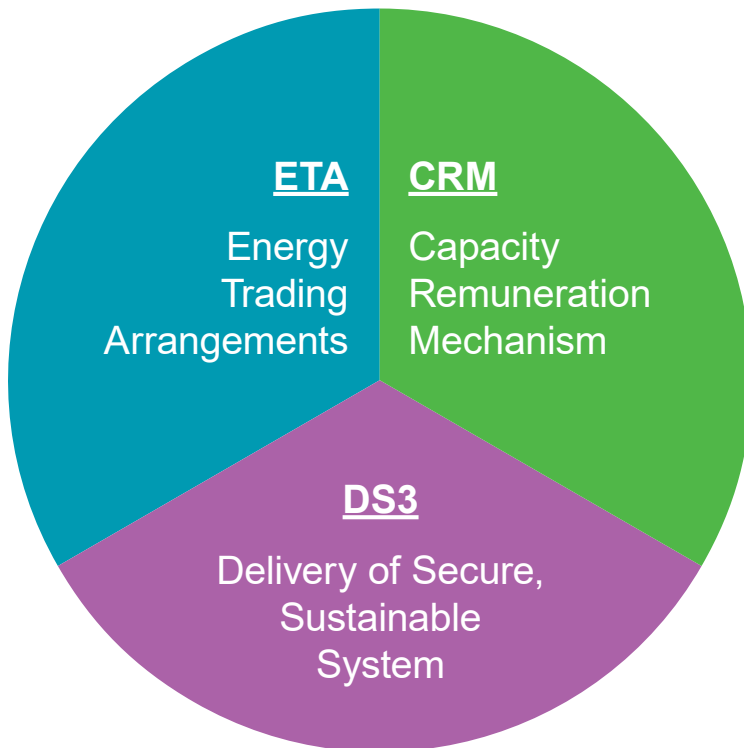
#### Benefits of the SEM

The SEM brings significant benefits for all consumers. It provides trading opportunities for generators, suppliers and investors while delivering an efficient and competitive electricity market.

The market is designed to support competition, allow increased renewables on the system, encourage new investment and support security of supply, all while placing a downward pressure on prices.



The SEM comprises three distinct areas that provide revenue streams relating to the services provided by market participants. The Energy Trading Arrangements (ETA), Capacity Remuneration Mechanism (CRM) and Delivering a Secure Sustainable Electricity System (DS3) make up the three main pillars of the market.



## Energy Trading Arrangements (ETA)

The ETA are the activities comprising wholesale energy trading, which make up the major portion of revenue and cost for the majority of market participants. A key principle of the SEM is the flexibility it offers for those who wish to sell and purchase power. A number of markets each spanning different trading time frames, have been designed to enable increasing levels of competition that place a downward pressure on prices whilst ensuring that the supply of power matches demand.

The SEM Energy Markets are broken down between forward, Day Ahead, Intraday and Balancing.



## Forwards market

To manage wholesale electricity price risk and achieve longer-term certainty, forward contracts allow generators and suppliers to contract publicly via Contract for Differences (CfDs). This allows generators to sell a fixed volume for an agreed upon price covering a specific period of time which provides both generators and suppliers with more wholesale price certainty. In the SEM there are regulated and unregulated forward contracts.

## Day ahead market

	Market Opening	Market Close	Delivery Periods	Coupling
Day Ahead Market (DAM)	11:00 (D-19)	11:00 (D-1)	23:00 - 23:00 (24 * 1 hr.)	SEM Only

The day ahead market (DAM) is the largest ex-ante market by volume and value. Bids and offers can be submitted 19 days before the market closes at 11am the day before delivery. An algorithm, call Euphemia (the acronym for Pan-European Hybrid Electricity Market Integration Algorithm), determines the market price and position for all participants on an hourly basis.

Participation in the DAM is not mandatory, but it is the only way of achieving a day-ahead position in the SEM that will minimise their exposure in the balancing market. Participants have opportunities to adjust their position by trading in the intraday market.

## Intraday market

Market Name	Order Book Opening	Order Book Closing	Delivery Periods	Coupling
IDM Continuous Trading	11:45 (D-1)	1hr before real time (t-1)	48 * ½ hours	SEM only
IDA-1	23:00 (D -19)	17:30 (D-1)	23:00 - 23:00 (48* 1/2hrs)	SEM – GB
IDA-2	23:00 (D -19)	08:00 (D)	11:00 - 23:00 (24* 1/2hrs)	SEM –GB
IDA-3	23:00 (D -19)	14.00 (D)	17:00 - 23:00 (12* 1/2hrs)	SEM auction only

The intraday market (IDM) allows participants to adjust their physical positions closer to the time power is delivered. The IDM runs right up to one hour before trading and takes account of up to date market information including, for example, unscheduled plant outages or congestion on interconnectors.

The market consists of three daily auctions with IDA-1 and IDA-2 coupled with the GB market via the interconnectors. The third Intraday Auction (IDA-3) is a local SEM auction that is not coupled with the GB bidding area.

## Balancing market

Market Name	Market Opening	Market Close	Delivery Periods	Coupling
Balancing Market	13.30 (D-1)	1hr before real time (t-1)	23:00 – 23:00 (48*1/2 hrs)	I-SEM only

The BM is different from the other markets in that it reflects actions taken by the TSO to keep the system balanced and secure. Unlike the other ex-ante markets, participation in the Balancing Market is mandatory.

The BM trading day is divided into 48 (30 minute) imbalance settlement periods, within which are six (5 minute) imbalance pricing periods. The submission window for market data opens 19 days ahead of the trading day and closes 1 hour before the start of each 30-minute imbalance settlement period. The imbalance prices for each 5-minute imbalance pricing period are used to calculate the imbalance settlement price for each 30-minute imbalance settlement period.

A rules-based, flagging-and-tagging process is used to determine the initial imbalance price in each 5-minute imbalance pricing period. The flagging-and-tagging process prevents bids and offers that are scheduled due to a system constraint, or where units are operating at a unit constraint, from influencing the imbalance price.

## Capacity market

The Capacity Remuneration Mechanism (CRM) allows generators to recover their fixed costs. It also helps to ensure there is enough capacity to meet demand and that this capacity is purchased at a competitive price via an auction.

The auctions are run a minimum of one year before the capacity is needed. Auctions for capacity required four years before delivery help to encourage new investment by providing a clear and pre-determined revenue stream. By promoting competition between market participants, it ensures payments more closely reflect the value provided by the capacity

The overall costs of these capacity payments are spread among suppliers. Those generators that do not deliver the capacity when needed are subject to a financial penalty.

## Governance arrangements and market structure

The SEM Committee are the decision making authority for all Single Electricity Market matters. Established in 2007 following the introduction of the SEM, legislation required the establishment of SEM governance in the form of a SEM Committee.

The Committee consists of three Commission for Regulation of Utilities (CRU) and three Utility Regulator (UR) representatives along with an independent and a deputy independent member appointed jointly by the Department for the Economy and Department of the Environment, Climate and Communications.

On 25th February 2014 the UR and CRU signed a Memorandum of Understanding that outlines how the two organisations will maintain and facilitate effective and beneficial co-operation and collaboration. This signifies the ongoing commitment of both regulatory authorities to work together to ensure the effective delivery of both joint and separate statutory remits and for the customers of the energy and water sectors they regulate. They are separately responsible for the licensing of market participants, implementation of market codes as well as the regulation of the network operators.

The SEM is operated by the Single Electricity Market Operator (SEMO). This is a joint venture between the transmission system operators in Ireland (EirGrid) and Northern Ireland (SONI). EirGrid and SONI are also the Nominated Electricity Market Operators (NEMOs) for Ireland and Northern Ireland respectively. The NEMO is designated a responsible for the day-ahead and intraday market coupling in each national or regional bidding zone.

Detailed market rules and procedures govern the SEM with market behaviour scrutinised by the RAs market monitoring unit.

## 4. Market Performance

The SEM spot market is divided in 3 trading time frames: Day Ahead, Intraday and Balancing Market. The bulk of the market transactions take place at the Day Ahead stage, the Intraday and Balance markets clear the residual volumes to meet the All Island Demand.

The market arrangements were developed to maximise the use of interconnection capacity between the island of Ireland and Great Britain as a part of a wider European market coupling process.

With the departure of the UK from EU, Great Britain is no longer operating under the pan European coupling process, for that reason from 01 January 2021 (end of the transition period) a new set of arrangements to allocate the cross border capacity between the two markets has been put in place.

Under the new arrangements, the SEM is no longer coupled at the Day Ahead (which is the most liquid market), instead the coupling process takes place at the Intraday time frame.

Figure 1 provides a snapshot of the overall market outcomes across the year. Explained further throughout this section, this year saw significant increases in DAM, gas, coal and carbon prices with a notable drop in wind availability particularly towards the latter end of the year. Demand increased on last year as economies continued to recover from the Covid-19 pandemic restrictions.

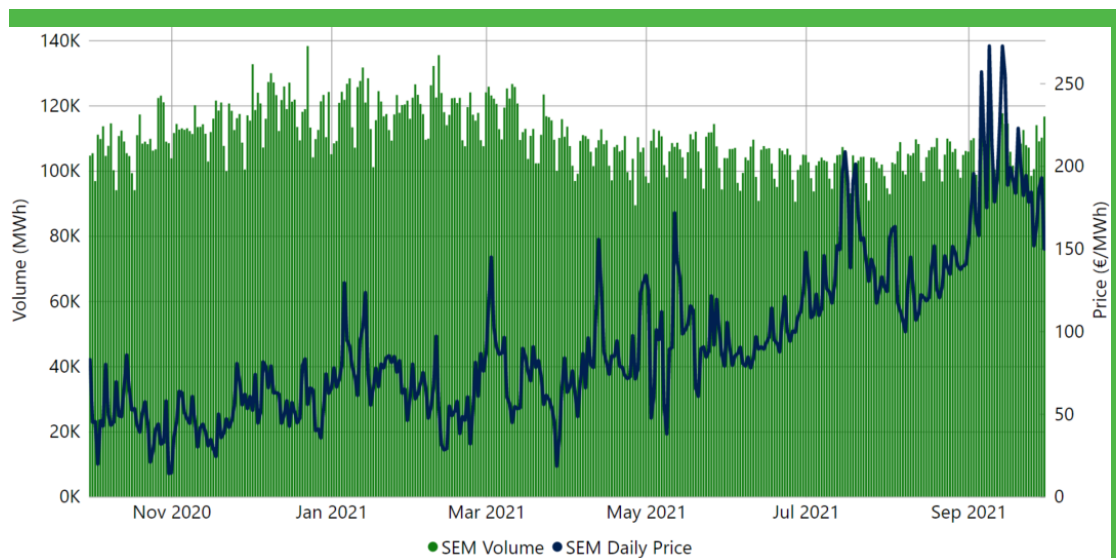
Monthly Averages	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21
<b>DAM (€/MWh)</b>	48.19	45.83	58.82	78.38	57.56	72.87	85.43	96.73	95.00	143.41	131.47	195.54
% Change from previous month	9%	-5%	28%	33%	-27%	27%	17%	13%	-2%	51%	-8%	49%
% Change from previous year	17%	-12%	29%	86%	74%	113%	205%	310%	266%	377%	256%	341%
<b>Actual System Demand (MW)</b>	4303	4519	4693	4727	4695	4503	4292	4188	4081	4111	4098	4274
% Change from previous month	5%	5%	4%	1%	-1%	-4%	-5%	-2%	-3%	1%	0%	4%
% Change from previous year	1%	-2%	5%	3%	0%	1%	14%	14%	8%	6%	5%	5%
<b>Actual Wind Generation (MW)</b>	1829	1777	2001	1513	2448	1601	1089	1069	998	449	846	873
% Change from previous month	45%	-3%	13%	-24%	62%	-35%	-32%	-2%	-7%	-55%	88%	3%
% Change from previous year	20%	25%	10%	-23%	-7%	-15%	16%	-9%	-14%	-62%	-13%	-31%
<b>Gas Price (€/therm)</b>	42.43	41.03	50.01	66.40	53.08	52.75	64.26	75.53	83.80	106.10	128.38	181.11
% Change from previous month	29%	-3%	22%	33%	-20%	-1%	22%	18%	11%	27%	21%	41%
% Change from previous year	43%	-7%	33%	101%	91%	107%	310%	477%	466%	630%	472%	449%
<b>Carbon Price (€/Tonne)</b>	25.28	26.49	31.00	33.74	38.21	41.30	45.75	52.26	52.67	53.43	56.37	61.79
% Change from previous month	-9%	5%	17%	9%	13%	8%	11%	14%	1%	1%	6%	10%
% Change from previous year	2%	8%	22%	38%	58%	109%	125%	162%	124%	94%	111%	123%
<b>Coal Price (€/Tonne)</b>	48.31	44.27	53.69	55.85	54.74	56.50	58.92	68.91	89.10	109.61	124.48	147.85
% Change from previous month	9%	-8%	21%	4%	-2%	3%	4%	17%	29%	23%	14%	19%
% Change from previous year	-11%	-13%	10%	20%	22%	32%	42%	92%	120%	153%	196%	233%
<b>EWIC % Periods Import</b>	34.14%	20.02%	32.66%	27.96%	29.02%	53.75%	55.28%	64.25%	37.00%	81.18%	38.06%	39.20%
<b>EWIC % Periods Export</b>	57.12%	58.57%	56.72%	39.25%	54.91%	31.92%	15.97%	23.66%	14.00%	0.42%	15.42%	13.92%
<b>EWIC % Not Flowing</b>	8.74%	9.41%	10.62%	31.18%	16.07%	14.32%	28.75%	12.10%	49.00%	18.40%	46.52%	46.88%
<b>Moyle % Periods Import</b>	47.31%	46.63%	39.78%	43.13%	36.46%	62.35%	74.44%	73.12%	72.00%	97.53%	69.30%	70.52%
<b>Moyle % Periods Export</b>	52.69%	53.37%	60.22%	56.32%	63.54%	37.65%	25.56%	26.88%	28.00%	2.47%	30.70%	29.48%
<b>Moyle % Not Flowing</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.56%	0.00%	0.00%	0.00%	0.00%	0.00%

Figure 1:  
Market Snapshot

## Day ahead market

The Day Ahead Market (DAM) is the key trading time frame within the SEM. The DAM prices are formed by the intersection of demand and supply of orders (to buy and sell) submitted by market participants to the Single Electricity Market Operator (SEMOpx). To calculate prices, SEMOpx uses an algorithm commonly known as EUPHEMIA (acronym for Pan-European Hybrid Electricity Market Integration Algorithm). From 01 January 2021, the SEM DAM operates in isolation as only orders originated in the Island of Ireland are taken in consideration in the price formation process. However the SEM DAM continues to be the most liquid trading time frame.

In total, the value of the DAM market for the year was over €3.79bn and the volumes and prices traded are illustrated in Figure 2.

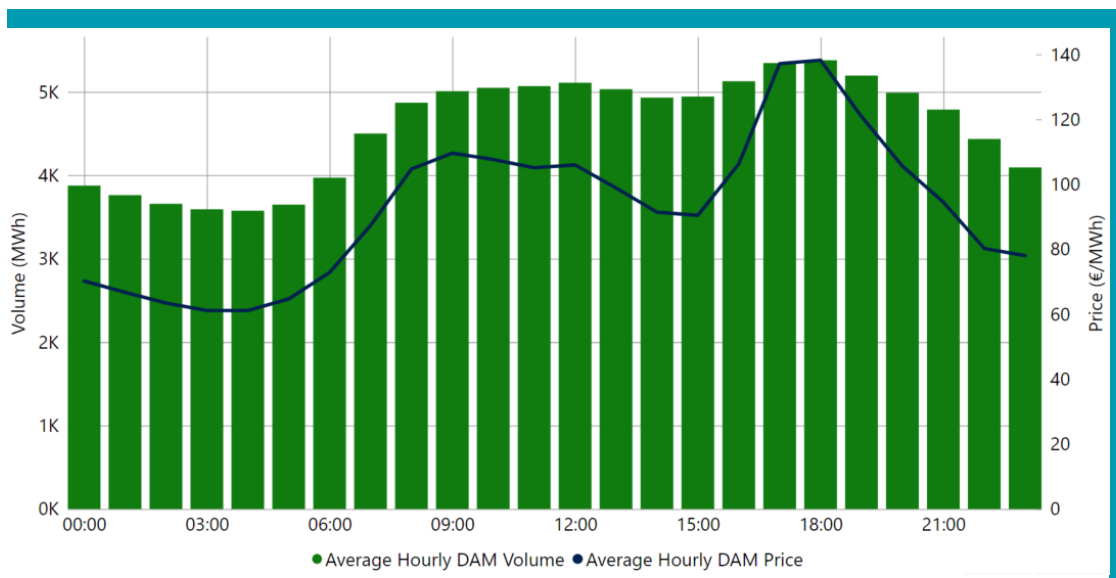


**Figure 2:**  
Daily DAM  
Volume and  
Average Daily  
DAM Price



The average daily price in the DAM was €92.59/MWh during the period from October 2020 to September 2021. The lowest price recorded in an hourly period was -€31.25/MWh and the maximum price recorded in a single period was €500/MWh. Prices in the DAM are 154% higher compared to the same period from October 2019 to September 2020. This increase has been primarily driven by a surge in the wholesale price of gas, which makes up the majority of the thermal generation on the island, high carbon emission prices, low forecasted wind at key times, a number of key thermal generation units being unavailable and an increase in demand as Covid-19 restrictions are eased.

Figure 3 shows the average volume and price across each hourly period in the DAM showing how higher prices are correlated to peak demand and vice versa.



**Figure 3:**  
Average Volume and Average DAM Price in each Hourly Period

The concentration of trading in the DAM, compared to the other markets before final balancing of supply and demand in the balancing market, has meant that over 86% of ex-ante volumes were traded through the DAM across October 2020 to September 2021 compared to 93% in October 2019 to September 2020. A change in percentage share was noted between the DAM and IDA1 after 01 January 2021 with a slight decrease in volume in the DAM and an increase in IDA1 volumes. This is illustrated in Figure 4, which shows the total daily volumes in each ex-ante market and Figure 5 translates this into a market share percentage average across the year.

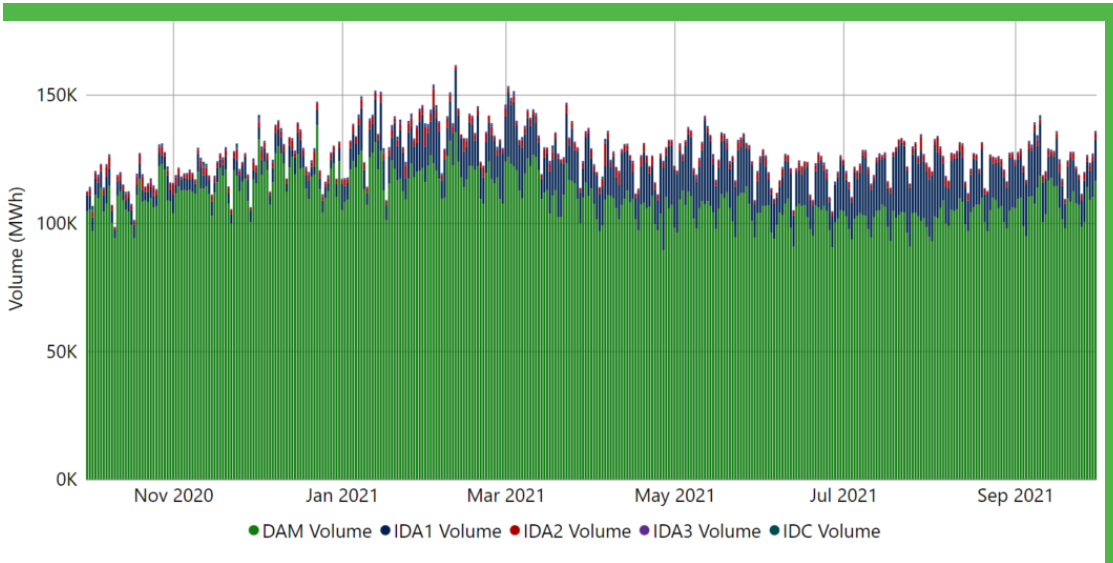


Figure 4:  
Daily Market Volume

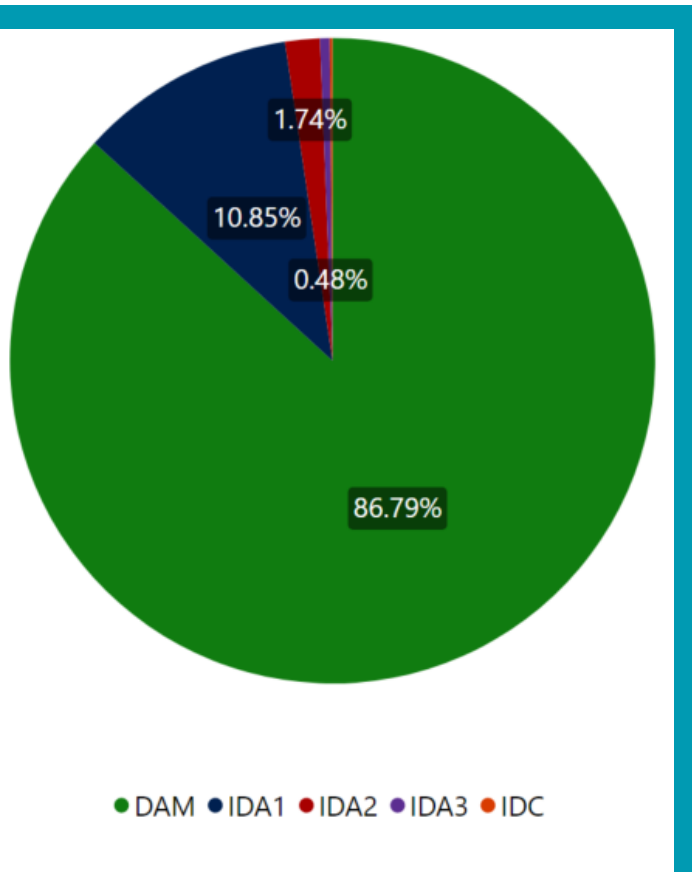
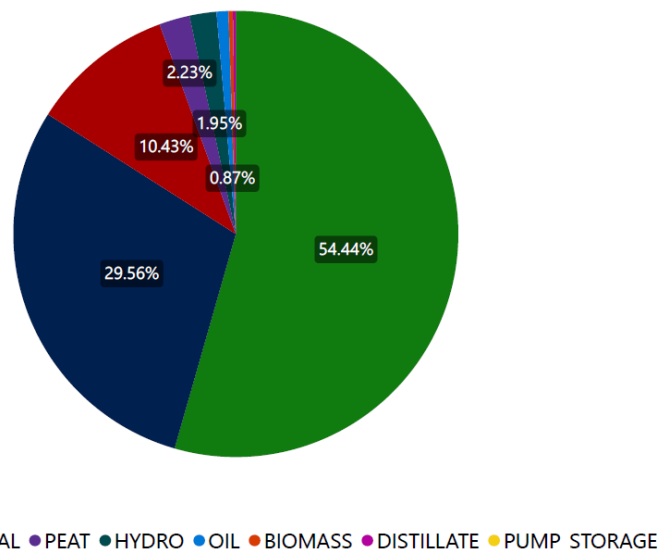


Figure 5:  
Market Share by Volume

## Fuel mix in the DAM

The fuel mix in the DAM is made up of the type of generation that supplies business and domestic customers in Ireland and Northern Ireland, including the role of renewable generation. Figure 6 shows that gas was the predominant fuel used for generation in the DAM with 54.44% of metered generation. Wind made up 29.56% with 10.43% coal and 2.23% peat. The remaining generation was made up of hydro, oil, biomass, distillate and pump storage.



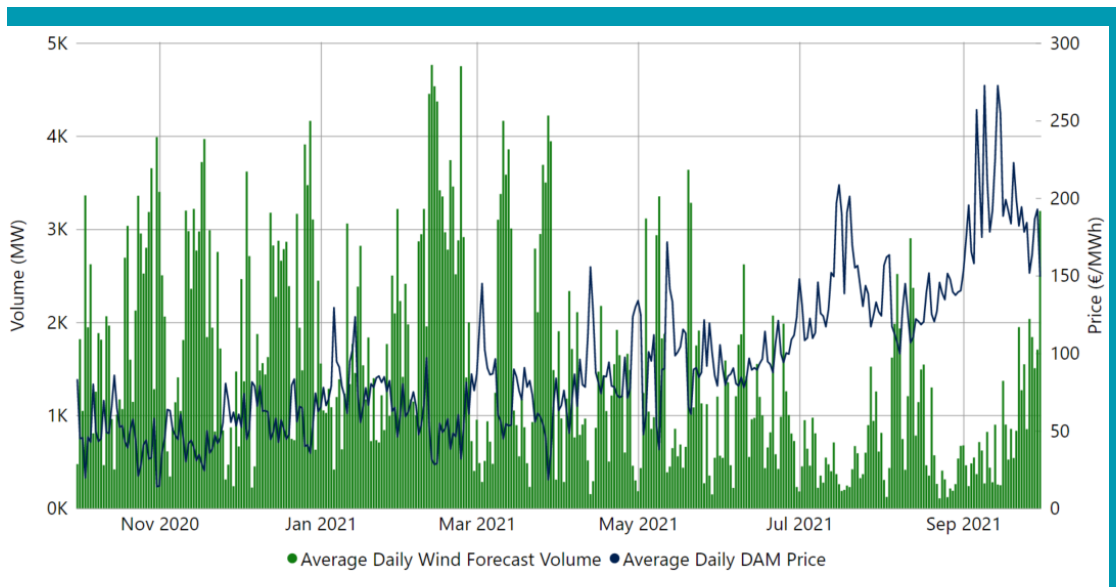
**Figure 6:**  
Metered  
Generation by  
Fuel Mix

Small scale generation, generating power less than 10MW, does not have to participate directly in the market. The fuel mix figures outlined in Figure 6 do not therefore include many of the small scale generators across the island. This generation is however captured in the overall fuel mix figures for the year as described later in this report.

## Wind and the DAM

DAM prices have been significantly impacted by the level of wind on the system and the forecast of wind at the day ahead stage. Figure 7 shows that the level of wind can vary significantly over the year, having an important influence on the fuel mix and price formation.

Figure 7 shows the daily DAM price against the daily aggregated wind forecast. It shows the volatility of wind and its impact on the level and volatility of prices. Periods of high wind (columns) are associated with a reduction in DAM prices and likewise periods of low wind are associated with an increase in DAM prices.



**Figure 7:**  
Average Daily  
Wind Forecast  
and Average  
Daily DAM  
Price

Lower prices can be directly correlated with high wind, while higher prices can be observed in periods when the level of wind is reduced. Figure 8 illustrates the relationship between prices the forecast level of wind across the year, highlighting the highest and low prices observed in the day-ahead market.

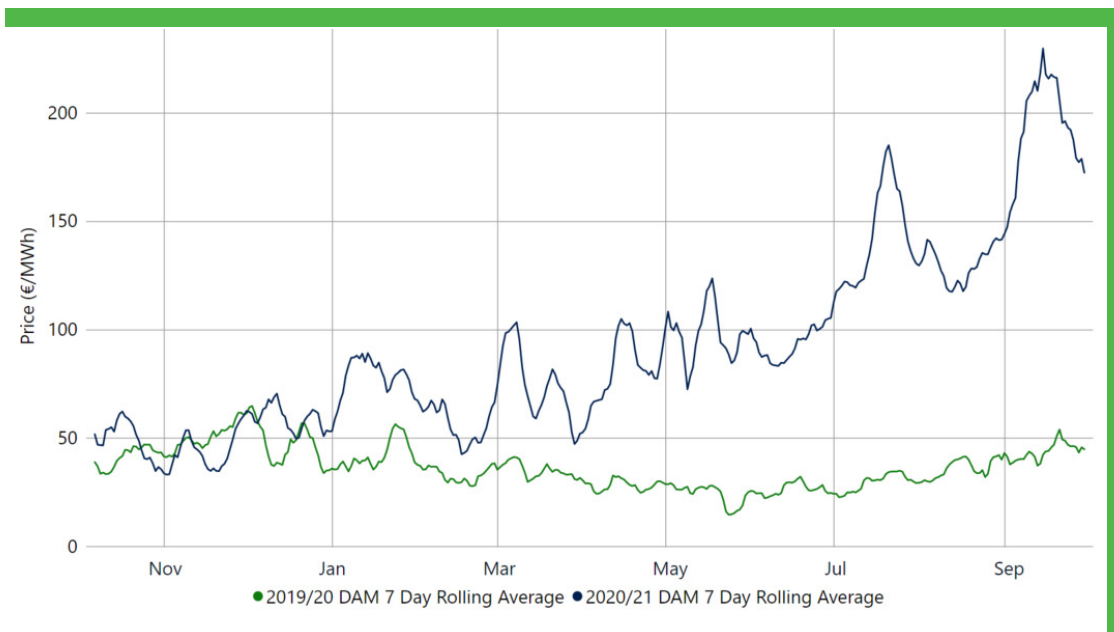
High Price-Low Wind				Low Price-High Wind			
Date	Time	Price (€/MWh)	Wind Forecast (MW)	Date	Time	Price (€/MWh)	Wind Forecast (MW)
14.01.21	17:00	500	844	01.11.20	01:00	-31.25	4586
03.03.21	18:00	500	364	01.11.20	02:00	-31.25	4493
06.09.21	18:00	500	224	01.11.20	03:00	-31.25	4319
06.09.21	17:00	497.39	251	01.11.20	04:00	-31.25	4073
02.03.21	18:00	485.92	338	01.11.20	00:00	-30.99	4549

**Figure 8:**  
**DAM Prices and Forecast Wind Periods**

The table shows that highest prices are all occurring at evening peak demand (17:00 & 18:00) with the lowest prices overnight where demand on the system is lower.

## Day ahead market price comparison

Many factors impact on DAM prices, including of levels of demand, wind, fuel prices, carbon prices and power plant availability. Figure 9 compares the seven-day rolling average DAM price 2020/21 with the DAM price in 2019/20. Over 2020/21 the average DAM price has increased (154%) compared to the same period in 2019/20.



**Figure 9:**  
**DAM Price 7 Day Rolling Average 2019/20 and 2020/21**

## Intra-day market

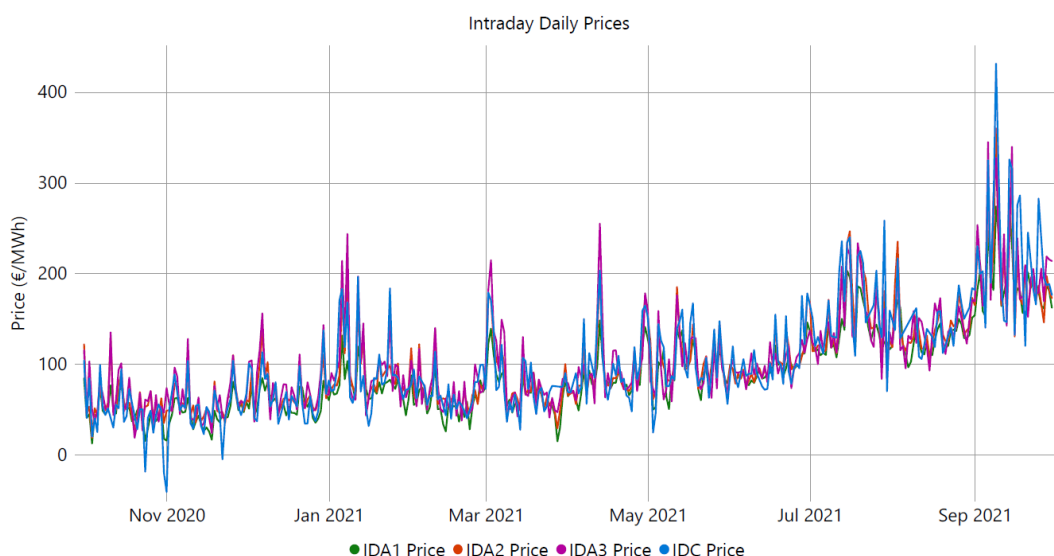
The Intra-Day markets across the year have allowed market participants to refine their market position by buying or selling nearer to real time, when power is generated and consumed. This assists market participants to balance their generation or consumption with their contracted position so that any imbalance between them is not subject to potential charges in the balancing market.

Volumes traded in the Intra-Day markets have increased since January 2021 which can be attributed to the new market coupling arrangements which began on 01 January 2021. IDA1 and IDA2 are now the only markets coupled with GB and trading across the interconnectors takes place solely during these auctions. This is where the largest volume increase is seen with the volume of IDA1 increasing by over 6% compared to the previous reporting year (Oct 2019-Sept 2020).

The IDA1 auction accounted for 10.85% of the total ex-ante market by volume, the IDA2 auction accounted for 1.74%, the IDA3 auction for 0.48% and the Intra-Day Continuous market (IDC) for 0.14%. Where overall volumes have increased, the IDA1 market saw the biggest change, with IDA2, IDA3 and IDC following similar trends to the previous year. Average prices have shown a tendency to rise during the Intra-Day time frame as it becomes closer to real time, with average prices in IDA1 being €90.65, IDA2 €101.52, IDA3 €103.96 and the IDC €105.93. The total value of these markets over the year has been €518M in IDA1; over €77.3M in IDA2; €22.6M in the IDA3 and over €7m in the IDC market.

The IDC market, unlike the other intra-day markets is not an auction in which all trades in a particular period are cleared at a single price, but involves buyers and sellers posting volumes and prices on an order book visible to the market that are cleared by sellers and buyers accepting the volumes and prices offered.

Prices in all markets generally move in a similar direction. Figure 10 below shows this trend across the year.



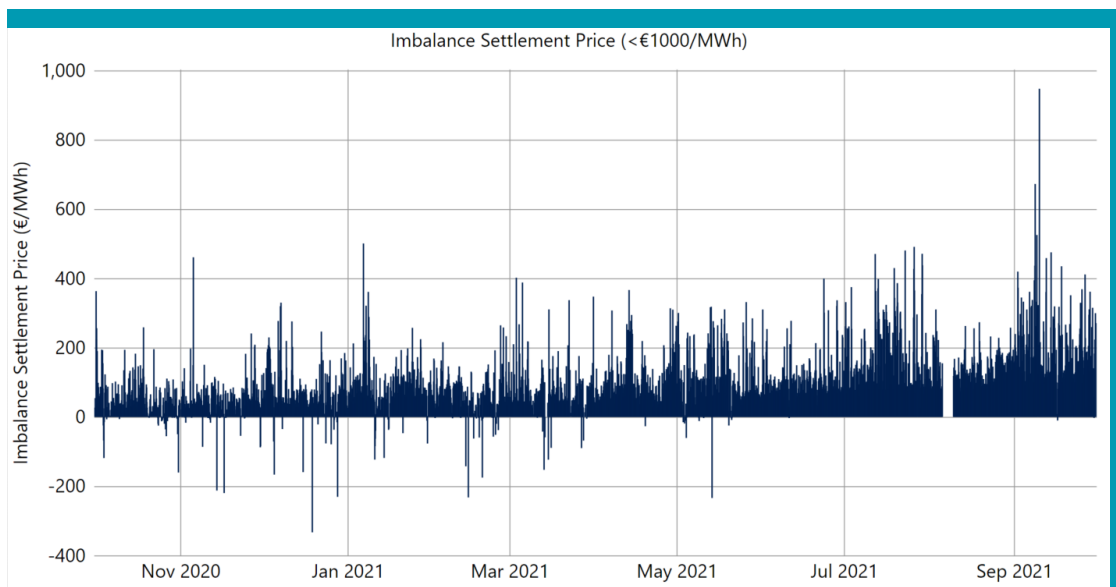
**Figure 10:**  
Intra-Day  
Market  
Average Daily  
Prices

## Balancing market

The balancing market is designed to ensure levels of supply meet the level of demand in real time. If, for example, the level of demand is higher than expected, the market operator might instruct a generator with available capacity to increase their output.

Balancing market prices show relatively higher volatility in the market in terms of prices.

Figure 11 shows the relative volatility of the Balancing Market across the year. Trading across the interconnectors to ensure security of supply contributed to a number of very high prices. Notably a settlement price of €4680 was observed on 9 September 2021 (not shown in Figure 11) with the next high price of €947.23 and a low price of €-333.33.



**Figure 11:**  
Imbalance  
Settlement  
Price <€1000/  
MWh

## Supplier Behaviour

The SEM continues to provide suppliers with a competitive environment in which to purchase energy for their retail offerings to final consumers. Over the period suppliers have continued to directly participate across the markets, while the market arrangements have continued to enable suppliers the ability to play a role in setting prices instead of being only price takers.

In the third year of operation suppliers have accurately calculated their customers' demand and sought to provide for this mainly in the DAM, which has accounted for the majority of volumes traded before balancing. The four Intra-day markets have facilitated further participation through three auctions and a continuous trading market, providing flexibility to refine their position in light of changing circumstances. The Intra-day 1 auction has seen an increase in volumes traded from 01 January 2021 when new market coupling arrangements with GB meant the markets are now only coupled across the IDA1 and IDA2 markets with the DAM excluded.

Suppliers can also purchase energy at regulated prices in the forward market through directed contracts, which are sold in advance of the Day Ahead and Intra-day markets. These contracts enable suppliers to lock-down the price they will have to pay in the SEM. They also ensure that there is adequate energy generation capacity in the market through funding regular payments to generators who have been successful in auctions to supply their capacity. This mechanism in turn protects suppliers from very high energy prices (those above a strike price) that may occur in some periods. This requires that those generators qualifying for capacity payments pay a charge that remunerates suppliers for the costs that exceed this strike price.



## 5. Interconnectors

The SEM is connected to the electricity market in Great Britain via two interconnectors. The Moyle Interconnector is a sub-marine cable running between Scotland and Northern Ireland with a maximum potential import capacity (Scotland to Northern Ireland) of 450MW and a maximum potential export capacity (Northern Ireland to Scotland) of 500MW.

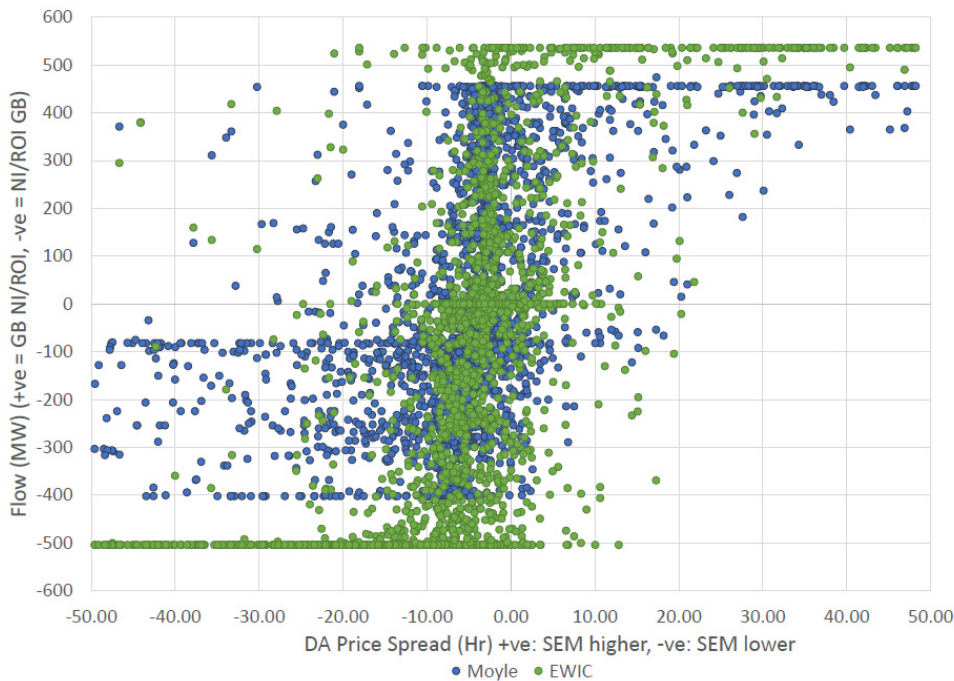
The East-West Interconnector (EWIC) is a high-voltage direct current sub-marine and subsoil power cable running between Wales and the Republic of Ireland. This provides capacity of 500MW flowing in both import and export directions.

Prior to 01 January 2021, the two interconnectors Moyle and EWIC were linked to the SEM via Day Ahead market coupling. From 01 January 2021 onwards the two interconnectors are no longer linked through day ahead coupling, but are now linked to GB via the intraday auctions IDA1 and IDA2. These new arrangements were put in place to reflect the UK exit from the Single European Day Ahead Market Coupling (SDAC). The current intraday coupling between the SEM and GB operates outside of the pan European framework market coupling between EU bidding zones.

The Intraday Coupling with GB was in operation prior to the EU exit and from 01 January 2021 it became the exclusive route for allocation of capacity between the two markets. The market coupling principles remain the same (i.e. Interconnection capacity continues to be allocated via implicit auctions).

Within an efficient market coupling mechanism, Interconnectors should flow power in the direction of the market with higher prices at a particular trading period. A common means of assessing the efficiency of interconnector flows is via the analysis scatter plot charts where the prices across both markets are correlated with the volumes (and direction) of flows. Figure 12 charts the interconnector flows prior to 01 January 2021 when they were coupled at the day-ahead stage, while Figure 13 charts the flows after 01 January 2021 where they are now coupled at the intraday stages.

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.



**Figure 12:**  
Interconnector  
Flows Based  
on DAM Price  
Spread prior  
to 01 January  
2021

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. Ideally the chart should resemble an “S” curve.

Efficient flows on the interconnectors is a key objective of the SEM market design and the pattern shown in Figure 12 shows that flows on Moyle and EWIC across the year flowed mostly in the correct direction. These points (in the upper left and bottom right quadrants) 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. Due to ramping constraints, the interconnectors are unable to change direction for this one period and then change back.

The graph below show the interconnector flows based on price spread when coupled with the IDA1 and IDA2 markets from 01 January 2021.



**Figure 13:**  
IDA1  
Interconnector  
Flows from 01  
January 2021

As it can be seen from the Figure 13, post 01 January 2021 there is a higher concentration of dots along the vertical axis, this reflects the fact that interconnector flows are being allocated under a lower price spread between SEM and GB. One of the possible causes for this is the relatively lower volumes traded at the IDA1 auction while the interconnection capacity remains the same. The two markets are also coupled at the IDA2 auction however, the volumes traded in this auction are very small and there is no discernible difference in allocation of IC flows when compared with the IDA1.



## 6. Forwards market

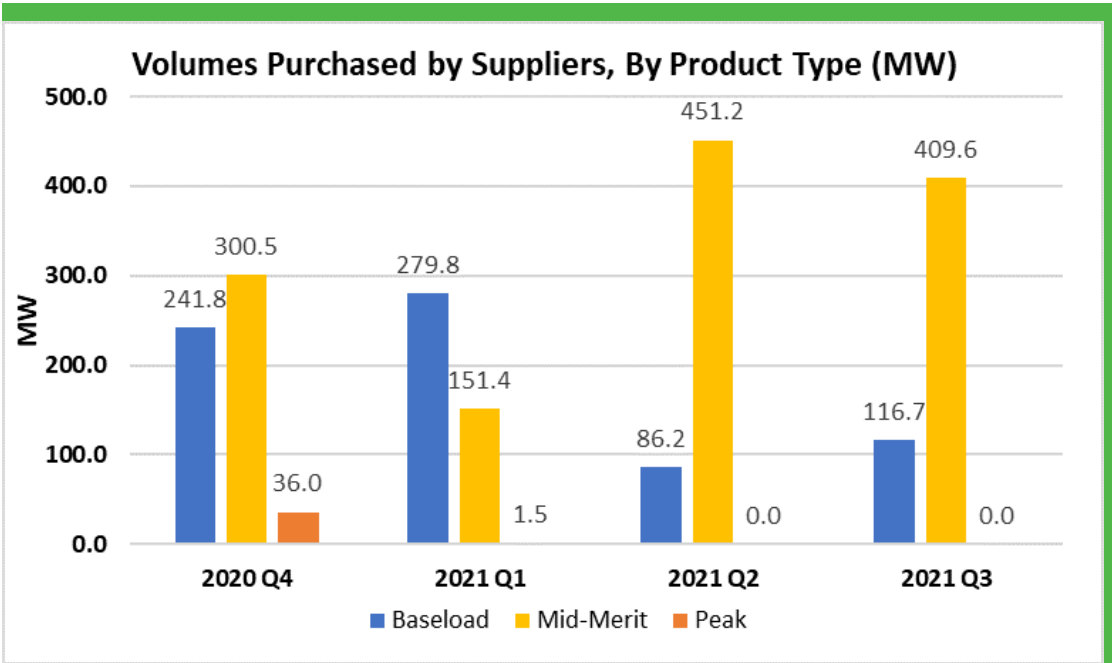
To manage wholesale electricity price risk and achieve longer-term certainty, forward contracts allow generators and suppliers to contract publicly via Contract for Differences (CfDs). This allows generators to sell a fixed volume for an agreed upon price covering a specific period of time which provides both generators and suppliers with more wholesale price certainty. In the SEM there are regulated and unregulated forward contracts.

### Regulated contracts

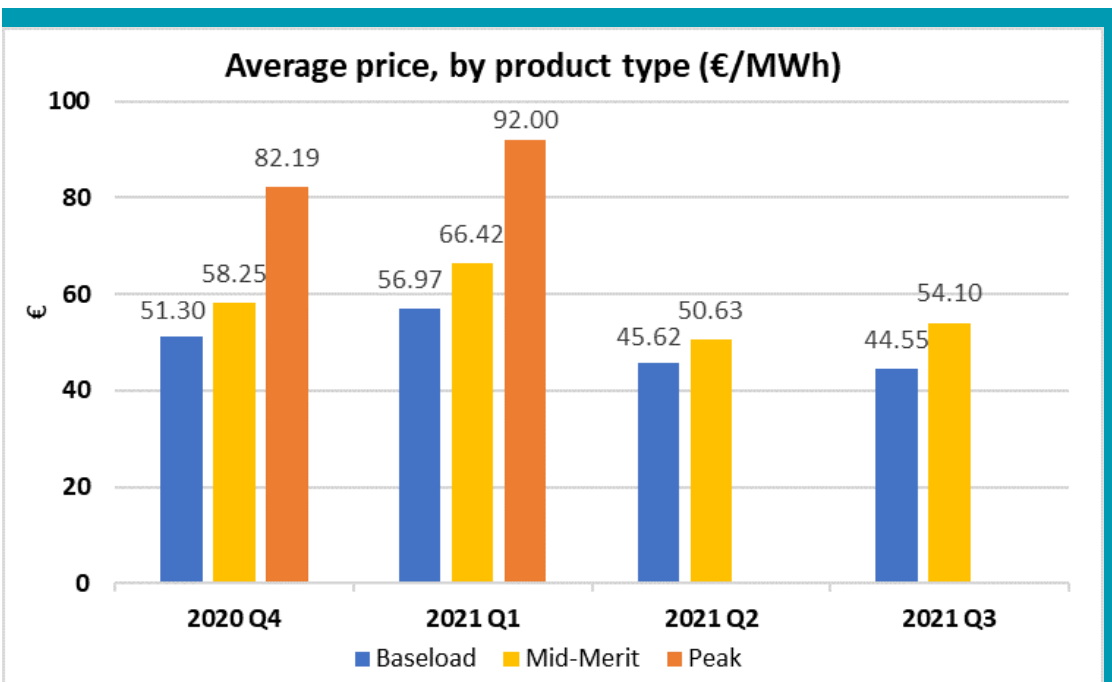
Directed Contracts (DCs) are currently the only regulated forward contract in the SEM. As part of the market power mitigation strategy, DCs are imposed on the incumbent generators with market power in the SEM. The purpose of DCs is to remove the incentives on the incumbent generators to attempt to profit from the exertion of market power. These contracts mitigate market power by reducing the incentive for the market participants to submit bids above competitive levels, or otherwise withhold capacity, to influence current spot prices or future contract prices.

DC subscription windows are typically held every quarter, with DCs being allocated on a rolling basis up to 5 quarters ahead. There are 3 DC products in the market: baseload, mid-merit, and peak. Supply companies can elect to subscribe for any given product for which they are eligible in any particular quarter from the incumbent generator, ESB.

A total of 2074.7 MW of Quarter 4 2020 to Quarter 3 2021 products were purchased by suppliers. 724.5 MW, 1312.7 MW and 37.5 MW of Baseload, Mid-Merit and Peak products were purchased respectively. The average prices of each product were: Baseload €49.61 MWh, Mid-Merit €57.35 MWh and Peak €87.10 MWh. Figures 14 and 15 outline the aggregate volumes purchased and average prices of the specific DC products.



**Figure 14:**  
Total Directed Contract Product Volumes Purchased by Suppliers (MW)



**Figure 15:**  
Average Price of Directed Contract Products (€/MWh)

## Unregulated Contracts

Generators can offer forward contracts in the SEM which suppliers are free to bid for. We have no direct role in setting the price or volume of these forward contracts, although we do monitor transaction activity. The most common type of forward contract is an Over the Counter (OTC) sale, in which the generator offers the product, setting the volume and the price. With an OTC sale the suppliers have a set window in which to purchase a product. If a supplier makes a bid at the price set by the generator, then they are able to purchase it instantly (i.e. first-come-first-served). Other hedging options include 'Proxy Hedging'. A proxy hedge involves the use of a correlated financial instrument (gas) to hedge a particular risk when a direct hedge (electricity) is not available.



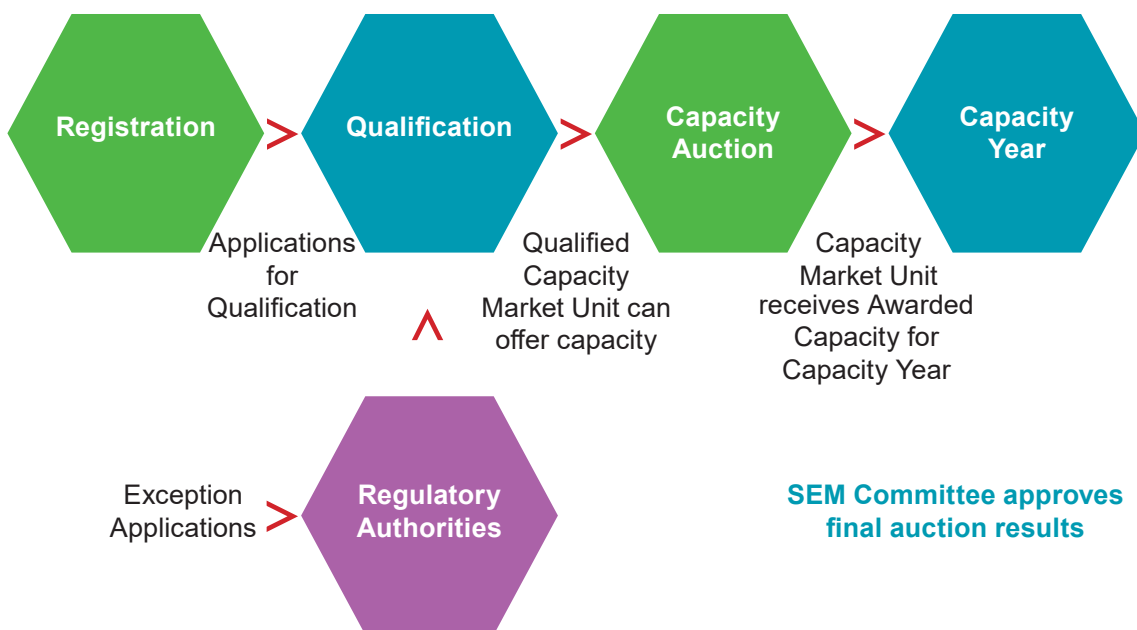


## 7. Capacity Remuneration Mechanism

The Capacity Remuneration Mechanism (CRM) is designed to ensure that the demand for electricity is always met. The overall aim of the CRM is to ensure security of supply, as well as ensuring that consumers don't pay for more capacity than is needed. The CRM was implemented as part of the revised SEM arrangements which went live on 1 October 2018, and replaced the Capacity Payment Mechanism under the previous arrangements.

Capacity providers sell qualified capacity to the market, based on generation capacity required in a future capacity year. This takes place in the form of capacity auctions. Auctions are normally held by the Transmission System Operators between one and four years ahead of delivery. Capacity providers who are successful in a capacity auction receive a regular capacity payment. This payment assists with funding generation capacity. In return, successful participants have an obligation to refund consumers for any energy prices which rises above a set strike price for each capacity auction.

Participants must submit a bid(s) that specify the volume of capacity being offered and the price sought for that capacity. Bids submitted to an auction are arranged from lowest to highest until the capacity requirement for the specific capacity year is satisfied. The level of capacity required is assessed by the Transmission System Operators in advance of the auction. Capacity that has been bid at a price less than or equal to the last accepted bid is accepted and receives this market clearing price. Capacity that is bid at a price higher than the market clearing price is deemed to have failed to clear the auction and is not paid, unless the capacity is needed to meet a local security of supply need.



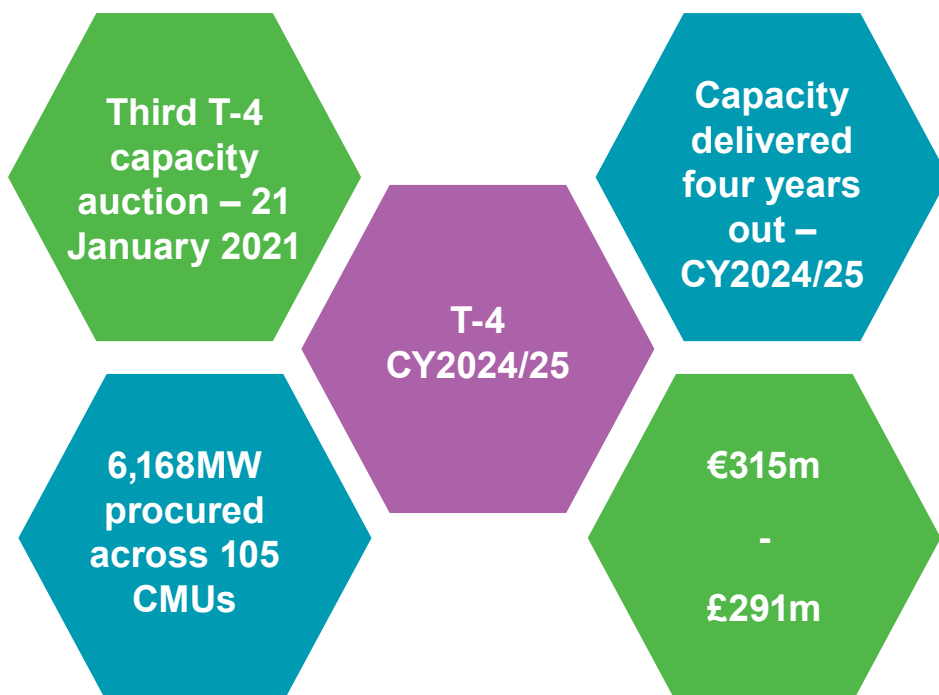
Holders of a capacity contract are expected to be available to provide their agreed generation volumes or load reductions (in the case of demand side units) when required at times of system stress or high demand. If a generator is unable to do this, they risk being exposed to substantial charges.

## Capacity Market Code

The Capacity Market Code (CMC) describes the arrangements whereby market participants can qualify for and participate in capacity auctions. It was first published in June 2017 and is regularly reviewed and modified to ensure the efficient and effective operation of the capacity auctions. The most recent, 5th version, was published on 16 April 2020. CMC Working Groups are convened every two months and have allowed for the progression and implementation of 39 modifications to date. Modifying the CMC has involved the co-operation, commitment and constructive engagement with industry participants.

## Capacity Auctions

To date, eight capacity auctions have taken place and completed successfully. Two of these auctions took place in 2021. A T-4 capacity auction took place in January and a T-1 capacity auction took place in October. The outcome of the T-4 capacity auction are as follows:



Within the 2024/25 T-4 auction, 219 MW of capacity was awarded for contracts above the clearing price to meet security of supply requirements in Northern Ireland. The average cost of this capacity was £126,500/MW. This third T-4 Capacity Auction secured a total of 452MW of new capacity and resulted in the inclusion of 42 new capacity market units. A key benefit of the T-4 auction is that it facilitates competition between new and existing generation, to deliver the best outcome for consumers. Ahead of this capacity auction process, the CRM was adapted to take account of the impact of the introduction of the Clean Energy Package. As a result, the CRM was modified to ensure that limits were imposed on existing plant in the SEM through restricted levels of annual running hours (directly relating to CO2 emissions), which take effect from July 2025. This led to the limitations on some plant to contribute towards security of supply.

The T-1 capacity Auction was the first “top-up” auction for Capacity Year 2022/23. 7,412 MW of capacity had already been secured in a T-4 Auction, which took place in March 2019.

The outcome of the T-1 Capacity auction is due to be published in December 2021.

A ‘top up’ T-3 Capacity auction is also being progressed, which will secure additional capacity for 2024-25 following market analysis which identified the need for additional capacity to be procured. Work has also progressed during the year for a 2025/26 T-4 auction to be held in March 2021.

When compared to the CPM, which had an estimated cost of €546m, the CRM represents an average saving of around €201m across each Capacity Auction to date. With eight auctions now having taken place that is a saving of over €1.4billion for consumers.



## 8. DS3 and System Services

The DS3 programme (Delivering a Secure, Sustainable Power System), aims to meet the challenges of operating the electricity system in a secure manner while achieving the renewables targets set in both Ireland and Northern Ireland.

With increasing amounts of variable renewable generation, there is a need to ensure that the power system can continue to be operated securely and sustainably. Through the successful completion of the DS3 Programme the operational limit on non-synchronous generation (i.e. level of renewable generation that can be on the system) may be increased to 75%.

Our key objective is to ensure that the interests of the all-island customer are protected throughout the programme. We do this through:

- Oversight of TSOs activities;
- Review of the impact and appropriateness of the various options and proposals put forward by the TSOs;
- Making key decisions on TSO proposals/ recommendations which will only be implemented after consultation with industry stakeholders; and
- Ensuring consistency across SEM activities and that the full implication of all actions proposed by the TSOs is considered.

The programme is now in its latter stages and has been a driver in the successful progression of SNSP increases from 50% to 70% since 2015. Facilitating additional renewables on the grid should support lower wholesale energy prices, which achieves a good outcome for consumers as well as supporting Ireland and Northern Ireland's transition to low-carbon economies. This can already be seen in the day-ahead market where increased wind generation can be seen to put a downward pressure on prices.

In 2020-2021 a number of significant steps were taken to deliver on the aims of the DS3 Programme. A 70% SNSP trial was successfully completed in April 2021, with operational practice moving to this new standard following completion of the trial. A trial on 75% SNSP commenced in Q2 2021, which was originally expected to be completed by summer 2021, however due to low levels of wind there was insufficient data to complete the trial in this period, therefore the trial has been extended out to the end of Q1 2022.

Following completion of the 75% SNSP trial, the original ambitions of the DS3 Programme will have been achieved, and the close out of the programme will be carried out. We continue to engage with the TSOs to ensure there are no further delays in closing out the DS3 programme.

Separately, the System Services work stream aims to improve the technical capability of the generation fleet and the system more generally. This is achieved by defining the capability required by the TSOs and appropriately incentivising the delivery of that capability.

Essentially System Services allow participants to provide services which support operating the system with increased renewable penetration through allowing the TSO to deploy units when a frequency deviation occurs. Participants are currently rewarded for their availability through a tariff or a contract.

We led a workstream on developing a framework for System Services to apply beyond the existing contractual arrangements which are currently scheduled to end on 30 April 2023. Following on from the Scoping Paper, which was published in July 2020, we published the responses to the paper, along with Decision Paper 1 (SEM-21-021). The objective of the project, as per the Scoping Paper, is to deliver a competitive framework for the procurement of System Services, that ensures secure operation of the electricity system with higher levels of non-synchronous generation.

Following on from this, we published a consultation paper on the High Level Design for the project (SEM-21-069). We are currently developing our decision on the High Level Design. The project will then move to the detailed design phase and we anticipate that there will be further public consultation in 2022.

## 9. Market Operation

In addition to the trading, capacity and system services elements of the market, we also oversee a number of other areas to ensure the market runs efficiently, effectively and in the best interests of consumers.

Although the TSOs, market operator and market participants are separately licenced by the Regulatory Authorities, we are responsible for overseeing a number of cross-cutting market issues.

### SEMO regulation

SEMO is licensed and regulated cooperatively by the CRU in Ireland and the Utility Regulator in Northern Ireland. SEMO is subject to a regulated price control and also has a number of licence and market rules obligations to comply with. During 2020/21, we completed two significant revenue recovery approvals including consideration of SEMO's capital investment programme for the 2018-21 period (since such analysis could not be carried out in advance of I-SEM Go-Live) and a price control review for the three year period commencing 1 October 2021.

For 2018-21, the SEM Committee approved a capital expenditure programme of c.€17 million. SEMO reports bi-annually on the status of projects. In addition, a determination for the 2021-24 SEMO price control allows for c.€37 million of operating expenditure and c.€29 million of capital expenditure. The SEMO price control review process introduced the first 'Participant Consultative Forum' to provide input and feedback from a wide range of industry representatives. It was recognised that the 2021-24 period incorporates change, some of which is unknown and cannot be scoped in detail. For this reason, allowance is provided to recognise the need for additional resourcing with a discretionary fund approved for SEMO as part of its capital expenditure allowance to enable SEMO to prioritise key projects which take into account legislative and regulatory obligations, and also views of market participants. Development of an enhanced reporting regime, to streamline existing reporting and to include more involvement by market participants, is underway.

### SEMOpx regulation

SEMOpx provides day-ahead and intraday electricity market trading as part of the Single Electricity Market and is subject to a regulated price control as part of the regulatory framework. The current price control is due to end in September 2022. SEMOpx is the designated Nominated Electricity Market Operator (NEMO) in Ireland and Northern Ireland since 2015, having been re designated in 2019 until September 2022.

SEMOpx is governed by a set of rules and operating procedures that set out the obligations on Exchange Members and process for trading on the exchange. The regulatory authorities attend biannual Exchange Committee meetings where the rules are discussed and modified as necessary.

## Audits

The 2020 SEMO Trading and Settlement Code (TSC) Market audit was completed at the start of 2021. The audit was based on the published Terms of Reference and was a core SEMO audit reported under ISAE 3000 Assurance Opinion. The 2020 audit resulted in a qualified conclusion due to two material non-compliances. Except for the two qualified material non-compliances, SEMO was found in all material respects compliant with the Code and relevant Agreed Procedures as set out in the Terms of Reference for the Market Audit 2020 for the period 01 January 2020 – 31 December 2020.

The two material non compliances (which were the basis for the qualified conclusion) were both in relation to the calculation of certain quantities related to interconnector units. The issues had been identified by SEMO and communicated to the market in the Known Issues Report. Both issues were resolved in late 2020.

The Terms of Reference for the 2021 TSC Market Audit were published for consultation on 13 August 2021.

The introduction of the new market arrangements in October 2018 introduced some new obligations on the TSOs. They are required to carry out an annual audit of the Scheduling and Dispatch process. The first Scheduling and Dispatch audit was for the period 01 October 2018 to 31 December 2019. This audit was completed in 2020 and the result of the audit published on 27 October 2020. The auditor's opinion from the audit concluded the Transmission System Operators have complied with the requirements as they relate to the specified elements of the scheduling and dispatch process during the 15 month period ended 31 December 2019.

On 11 January 2021 the TSOs published for consultation the Terms of Reference for the 2020 and 2021 Annual Audit of the Scheduling and Dispatch Process and published final Terms of Reference on 25 March 2021.

The TSOs are required to develop the Balancing Market Principles Statement (BMPS) and publish an updated version annually. The BMPS is a restatement of obligations, alongside an explanation of how these obligations are met and is intended to increase awareness and visibility of the TSOs' Scheduling & Dispatch Process. It also provides clarity and certainty to the market on the timing and nature of TSO actions. The 2021 BMPS was published for consultation 26 February 2021, and the final BMPS was published 28 April 2021.



## Fuel Mix

In October 2021, we published an Information Paper highlighting the 2020 fuel mix and CO2 emissions on average across the island and for each electricity supplier. It showed that on average across the island, 57.9% of the electricity supplied from suppliers was from renewable sources, compared to 54% in 2019, continuing a renewables growth trend seen over many years. CO2 emissions-intensity continued a downward trend, falling from 254 grammes per kWh in 2019 to 236 grammes per kWh in 2020.

Fuel mix figures do not represent only physical renewable generation, but also trade-able certificates used by suppliers called Guarantees of Origin. These Guarantees of Origin reflect renewable electricity produced in EU/EEA countries and considerably more are imported into the island than exported. The relevant figures in the Information Paper are published on bills from suppliers to electricity customers across the island and this provides customers with helpful information on the recent environmental impact of electricity from their supplier compared with the average across the island.

## Trading and Settlement Code

Through 2020 into 2021, the Trading and Settlement Code Modifications Committee continued to consider and progress modification proposals in order to further develop the SEM in line with the objectives of the Trading and Settlement Code. Thirteen modification proposals were raised across 2020 and eighteen modifications have been raised so far in 2021. These have been considered through committee meetings, working groups and constructive engagement and feedback from the Committee and broader industry observers.

At the end of 2020, the Committee discussed important issues such as the nature of actions taken on priority dispatch units and how these interact with the balancing market, which is being further considered through SEM Committee consultations. Two modifications to improve the operation of the Dispute Resolution Board and the transparency of its decisions under the Code were also raised and progressed.

In 2021, the modifications committee considered a number of proposals in relation to pricing events which occurred in the market and difference charges on capacity market units. While a number of these complex issues are still being assessed, a modification was approved to flag cross-zonal actions or trades carried out by the TSOs across interconnectors for system security or to facilitate priority dispatch. This modification was implemented in 2021 and means that such actions do not feed into imbalance pricing.

A number of changes to the composition of the Modifications Committee were progressed in 2021 to reflect the diverse range of participants currently active in the wholesale markets, with a new flexible seat and renewable seat added to the Committee.

While there were limited changes to the SEMOpx rules and operation procedures, in 2021 a significant project commenced to replace complex orders with scalable complex orders in order to improve the performance of the Euphemia algorithm for market coupling across the EU. This is being progressed by SEMOpx with monthly stakeholder meetings during each phase of the project.

In 2021, SEMO continued to manage a Bi-Annual release schedule to implement market modifications and change requests and to address incidents and defects identified. Capital projects for the 2021-24 SEMO price control period including regular market system releases have been identified and provided for through the SEM Committee's recent price control decision (SEM-21-073).

## **Generator Financial Performance Reporting**

In June 2021 we published a Generator Financial Performance Report for the financial year 2019, highlighting the financial performance of generators operating in the SEM. The report detailed an overall decrease in gross and net profit margins, consistent with decreasing revenues overall and with decreasing market prices. The exception to this was wind and solar generation, for which net margins increased. The downward trend in coal profitability continued in 2019, driven by high carbon costs and forced outages. The decrease in the coal share of the market was largely absorbed by gas with a slight increase in wind and solar.

## **Clean Energy Package**

During the year we published a number of papers to respond to the EU's Clean Energy Package (CEP).

We published an updated roadmap to CEP implementation in December 2020, summarising the work done to date on the implementation on key areas of work identified to ensure full compliance to the requirements of the Recast Regulation (2019/943) and to outline, at a high-level, the plan to continue implementation into 2021 on some of the remaining work streams. Comments were invited on this roadmap and a short information note to reflect these was published in February 2021.

Subsequent to this paper, we published a detailed consultation on the application of dispatch, re-dispatch and compensation pursuant to Regulation (EU) 2019/943 (SEM-21-026) and a proposed decision on the treatment of new units in the SEM (SEM-21-027). A workshop was held during the extended consultation period for these papers. We have further assessed responses and conducted analysis on each paper, with internal workshops carried out between the Regulatory Authorities, and intend to publish subsequent decision papers in each area by Q1 2022.

During 2020 and 2021, the Regulatory Authorities engaged with the ACER working group on adequacy to feed into the development of methodologies for calculating the value of lost load, the cost of new entry for generation or demand response and the reliability standard required under Article 25 of the CEP Regulation. The Regulatory Authorities have commenced the project to recalculate VoLL in accordance with the ACER methodology, which is expected to complete in Q2 2022. Following the calculation of VoLL, the Reliability Standard will also be updated according to the ACER methodology.

## Cross-Border Trading

As of the 1 January 2021, GB left the EU's internal energy market. The Trade and Cooperation Agreement (TCA) between the EU and the UK sets out at a high level, the agreed arrangements for cross-border trading in the Day Ahead time frame between the EU and UK post-Brexit. As these arrangements were not in place for the 1 January 2021 however, each bidding zone within the IEM that is interconnected with GB defaulted to pre-defined "fall-back" arrangements for cross-border trade with GB. For the SEM, these arrangements consist of implicit coupling between the SEM and GB markets in the Intraday time frame. This means that capacity has been allocated on EWIC and Moyle – the two interconnectors between SEM and GB – via the Intraday markets since 1 January 2021.

The SEM Committee has been monitoring the impact of the transition to these fall back arrangements. Price coupling between SEM and GB at the Intraday stage has maintained the price formation link between the two markets, with the expected levels of efficiency for implicit coupling. While there has been some movement of trade from the Day Ahead to the Intraday time frame, with an increase from approximately 6 to 12% of trade occurring in the coupled Intraday markets, the majority of volumes are still traded in the now uncoupled Day Ahead market. As of 1 January 2021, there have been no Financial Transmission Rights available on the interconnectors as the EU legislation mandating that these be offered no longer applies to Moyle and EWIC.

The agreed arrangements for cross-border trading in the Day Ahead time frame, set out in the TCA, are referred to as Multi-Region Loose Volume Coupling (MRLVC). The first agreed step is the completion of a Cost Benefit Analysis and an outline of proposals for technical procedures. The CBA was completed in April 2021 and the RAs each provided feedback to the EU and UK on the outcome of the CBA. A number of key questions related to the MRLVC process were identified by the CBA, which will need to be addressed before further progress is made. Governance of the Energy Title of the TCA sits with the Specialised Committee on Energy (SCE), a body established under the TCA. The SCE met for the first time in July 2021.

With regard to the internal operation of the SEM, with the exception of the impact on cross-border trading with GB, as described above, the SEM has continued to operate since 1 January 2021 as it did prior to Brexit.

## Market Monitoring Unit

The MMU is a joint regulatory unit that is the main monitoring function of the two Regulatory Authorities (RAs). The Unit's role is to monitor the performance of the wholesale market, including compliance with the Bidding Code of Practice (BCoP) and other market rules, and where necessary investigate potential abuse of market power.

This function of the MMU 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). The monitoring function of the Regulatory Authorities is complemented by the oversight of the Single Electricity Market Operator (SEMO) and SEMOpx which also provide surveillance to ensure the integrity of their exchanges. The purpose of the monitoring of trading activity in wholesale energy products carried out by the MMU is to:

1. Detect and prevent trading based on inside information and market manipulation.
2. Enhance transparency of the SEM and improve market integrity and functioning.
3. Assist identification of barriers to efficiency e.g. low liquidity, and possible improvements to competition in the market.

The MMU has put in place the necessary systems and processes required to actively monitor the SEM arrangements. During the year we published our Inquiry Procedure Manual which informs market participants on the procedure that is to be generally followed by the MMU when conducting market queries. It provides guidance and clarity on the process. Throughout the year the unit engaged with market participants on a number of key areas including bidding behaviour. The unit has also provided in-depth analysis on a number of market events to the SEM Committee alongside regular market updates. The MMU publishes a quarterly market monitoring report which provides useful information on the performance of the market.



## 10. Report on FWP 2020/21 projects

Our October 2019 – September 2020 FWP set some of the most significant projects identified to commence or complete across the year. Of the 35 projects identified, 71% were completed with a further 23% progressed and 6% delayed.

	Project Title	Scope & Outcomes	Timing	End of Year Position	Comments
1	Directed Contracts rounds 13 – 17	Complete quarterly Directed Contracts (DCs) modelling.	Across year	Complete	
2	SEM Plexos Model	Commence SEM plexos model validation and backcast	Q1 – Q2 2021	Partially complete	Consultation carried out and series of stakeholder engagement completed. Validated model to be published by end of 2021
3	Market Power and Liquidity	Progress scope and approach to addressing decisions following Market Power and Liquidity Discussion Paper (SEM-20-045)	Q1 – Q3 2021	Partially complete	Project scope expanded, Information paper published. Next steps carried forward to 2021-22 workplan
4	Trading and Settlement Code Parameters	Conduct a review of the Trading & Settlement Code's operational parameters	Q3 2021	Complete	
5	Imperfection charges, other charges and parameters	Assess, consult on and then publish the imperfections charges for tariff year 2021-22	Q3 2021	Complete	

	Project Title	Scope & Outcomes	Timing	End of Year Position	Comments
6	MMU IT infrastructure enhancement	Enhancement of software and IT capabilities to strengthen and widen scope of MMU monitoring activities	Across the year	Partially complete	IT infrastructure moved to cloud. Consultancy support to be procured to progress further enhancement. On 2021-22 workplan
7	Inquiry Procedure Manual	Market monitoring Inquiry Procedure Manual developed for consultation and final decision published	Q1 – Q2 2021	Complete	
8	Market queries	Effectively respond to and action market and REMIT queries.	Across the year	Complete	
9	Market overview reports	Prepare and publish quarterly market overview reports	Across the year	Complete	
10	SNSP	Support delivery of RoCoF trials and delivery of 75% SNSP	By end Q3 2021	Partially complete	Trial ongoing
11	System tools	Support implementation of TSO Control centre tools including enduring ramping tool	Across the year	Partially complete	Work commenced and scheduled for completion Q4 2021
12	System Service Qualification Trials Process	Support the TSOs in the qualification trials as appropriate	Across the year	Complete	
13	DS3+	Support development and delivery of DS3+ programme	Across the year	Delayed	Project not started
14	Regulated procurement	Support the ongoing operation of the system services tariff process	Across the year	Complete	

	Project Title	Scope & Outcomes	Timing	End of Year Position	Comments
15	Future arrangements	Consult on options for competitive procurement arrangements post 2023 and develop detailed arrangements. Publish final decision	Across the year	Partially complete	Detailed design carried forward to 2021-22 work plan
16	T-4 2024/25 capacity auction	Deliver T-4 2024-25 capacity auction and remaining milestones	Q1 2021	Complete	
17	T-4 2025/26 capacity auction	Complete auction preparation for T-4 2025/26 capacity auction	Across the year	Complete	
18	T-1 2022/23	Complete auction preparation for T-1 2022/23 capacity auction	Across the year	Complete	
19	New capacity delivery	Monitor the delivery of new capacity in the market in line with milestones required under the CMC	Across the year	Complete	
20	Capacity market and CEP	Continue implementation of CEP requirements in relation to the capacity	Across the year	Partially complete	Work commenced. Carried forward to 2021-22 work plan
21	Capacity Market Code Audit	Determine terms of reference, initiate and complete audit and publish final report of audit of the Capacity Market Code	Across the year	Complete	
22	Trading and Settlement Code Market Audit 2020	Final market audit completed with report produced and published	Q2 2021	Complete	
23	Trading and Settlement Code Market Audit 2021	Terms of reference to be consulted on and decision published.	Q3 2021	Complete	



	Project Title	Scope & Outcomes	Timing	End of Year Position	Comments
24	Scheduling and Dispatch Audit 2020	Terms of reference consulted on and decision published. Audit completed with final report published	Q4 2020 – Q3 2021	Complete	
25	Scheduling and Dispatch Audit 2021	Terms of reference consulted on and decision published. Field work to commence.	Q2 2021	Complete	
26	Clean Energy Package Recast Regulation Implementation	Continue progress on implementation of Regulation 943/2019 in line with Updated Roadmap Information Paper – SEM-20-089 Publish decision on eligibility for priority dispatch	Across the year	Partially complete	Workshops progressed and delivered. Carried forward to 2021-22 work plan
27	Imbalance settlement period	Finalise decision on 15 minutes ISP cost benefit analysis and publish	Q1 2021	Complete	
28	EBGL	Complete EBGL gap analysis and publish decision on any amendments required to ensure compliance	Across the year	Complete	
29	European Adequacy Assessment	Input into ACER work with ENTSOE on design of European Adequacy assessment	Across the year	Complete	
30	SEMO tariffs	Approval and publication of SEMO tariffs	Q3 2021	Complete	
31	SEMOpX tariffs	Approval and publication of SEMOpX tariffs	Q3 2021	Complete	
32	SEMO price control	Consult and decide upon 2021 SEMO price control proposals.	Across the year	Complete	

	Project Title	Scope & Outcomes	Timing	End of Year Position	Comments
33	Demand Side Management	Commence demand side management review to include enduring solution for energy payments to DSUs	Across the year	Delayed	Carried forward to 2021-22 work plan
34	Generator Financial Performance Report	Develop and publish the Generator Financial Performance report for 2019	Q1 2021	Complete	
35	Fuel Mix Disclosure report	Coordinate, collate and publish the Fuel Mix Disclosure report for 2020	Q3 2021	Complete	



The logo for the SEM committee is centered on a white background. It features the letters 'SEM' in a bold, sans-serif font. The 'S' is blue, the 'E' is green, and the 'M' is blue. Below the letters, the word 'committee' is written in a smaller, lowercase, grey sans-serif font. The background is split diagonally from the top-left to the bottom-right. The upper-left portion is a solid green color, and the lower-right portion is a solid teal color.

**SEM**  
committee