



SEM
committee

Annual Report

Oct 2018 - Sep 2019

**The first year of
the new SEM**

The decision making authority for the Single Electricity Market on the island of Ireland

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Foreword from the SEM Committee

The past year has been undoubtedly one of the most challenging in the history of the SEM.

We welcomed the introduction of more efficient and competitive market arrangements. The most significant development to the wholesale energy market in over a decade, we have seen improvements in how the market operates, offering more opportunities for market participants, as well as improved outcomes for consumers.

As well as delivering the benefits of access to the bigger, pan-European market, the new market arrangements are designed to make the best use of all power available on the system, ensure the interconnectors work in the most efficient way and accommodate the increased renewable generation now available across the island.

Looking back over the first year we can see the market is delivering in line with expectations and bringing real benefits to consumers. Both generators and suppliers are playing an active role in the market, increasing competition with high liquidity in the day-ahead market. The system is able to accommodate increased levels of wind generation which is having a direct impact on prices, with significant reductions observed in times of high wind. The interconnectors are now flowing in the right direction delivering real benefit for consumers, a significant step change from the often inefficient and unpredictable flows in the old market. We have also seen efficiencies gained for consumers, not least the €200m savings from the Capacity Remuneration Mechanism (CRM).

The CRM seeks to protect consumers from very high prices by promoting competition between market participants and ensures payments more closely reflect the value provided by the capacity. During the year we saw the results of the first capacity auction implemented, which was carried out in December 2017, replace the more expensive Capacity Payment Mechanism of the old SEM. The first T-4 auction also took place, securing capacity for the 2022/23 year and allowing for competition between new market entrants and existing capacity to deliver the best outcome for consumers. This longer term auction sent the necessary entry signals for new investment as well as encourage less competitive generation to ensure competitiveness, reinvest or exit the market if they are not needed. The new arrangements have secured new capacity at a competitive price and ensured that all technologies, new and traditional, can take part and play their role in delivering a diverse fuel mix.

Across the year the Regulatory Authorities have developed their systems and capabilities to react to the demands of the new market. The Market Monitoring unit has developed and utilised their systems to allow them to effectively monitor market behaviour. They report regularly to the Committee on the operation of the market and address emerging issues. In the forwards market, the direct contract process saw again one hundred percent of volumes sold and gives suppliers longer-term certainty. The DS3 programme has also been progressed with decisions published in the fixed contracts contractual arrangements process and further progress made in increasing the levels of renewables that can be accommodated on the system.

Although we have seen extensive positive outcomes in this first year, it has not been without challenge. Significant volatility in the balancing market, although a predicted outcome of the market design, has resulted in the need for further regulatory intervention to address emerging issues. The IT systems are continuing to develop with technical modifications progressing to address known issues. We saw an increase in the charges that stem from constraints. The Committee has asked the Regulatory Authorities to take a closer look at the drivers for these charges but it can be said without question that the construction and operation of the second north south interconnector would be significant in driving down these costs. It would also help deliver security of supply and bring clear benefits for consumers and we have continued to work to promote its development. Although much work has been done by generators on RoCoF compliance, system and software development delays have had a knock on impact to the delivery of the final stages of the DS3 project. In this first year of the introduction of new market arrangements such issues are to be expected and we welcome the co-operative and collaborative approach of market participants and the system operators in seeking to resolve matters efficiently and effectively.

Outside the normal operational aspects of the market, a number of external emerging issues have also required attention across the year. A significant volume of work has been undertaken on ensuring preparedness for the UK's exit from the European Union. The consensus from all governments and the EU is that the SEM will continue. The Committee and the RAs have worked to ensure the SEM is prepared to continue to operate as effectively as possible in all exit scenarios. Maintaining the SEM is undoubtedly in the best interests of all consumers and the Committee continues to support this position. Implementation and implications of the Clean Energy Package has also required a significant body of work with a further programme of delivery to be undertaken during the months ahead.

We are grateful for the support and commitment from the Department of Communications, Climate Action and Environment and the Department for the Economy. It is also critical to recognise the commitment and co-operation of the TSOs, market operator, market participants and key stakeholders in what has been a very challenging year. The new market arrangements deliver an efficient and reliable system with a sustainable, modern generation fleet - all of which will deliver benefits for consumers in terms of choice, price and security of supply. None of this is possible without the collaborative and dedicated approach of all those involved. Work continues at pace to react to market developments and ensure the market is dynamic and prepared for the future and we welcome the ongoing contribution of all stakeholders in delivering ongoing success.

Finally, it is important to recognise the commitment and invaluable contributions from the RAs who provide critical advice to the SEMC and deliver on decisions made. We thank Garret Blaney for his many years of contribution to the work of the Committee as he stepped down from his role in CRU. We also welcome Jim Gannon who joins the Committee following his appointment as Commissioner in CRU and look forward as a Committee to the new challenges and successes that await across the year ahead.

2. The year in summary

Key highlights

Active engagement across the new market as per the market design.

Ex-ante markets performing as expected. High liquidity concentrated in the day-ahead market.

Day-ahead market worth over €2.25bn

Increased levels of wind putting a downward pressure on prices

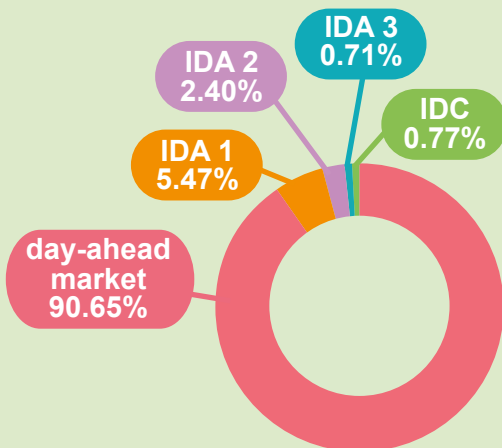
Successful CRM auctions helping to deliver security of supply at a competitive price.

Interconnector efficiency

Interconnectors flowing in the right direction



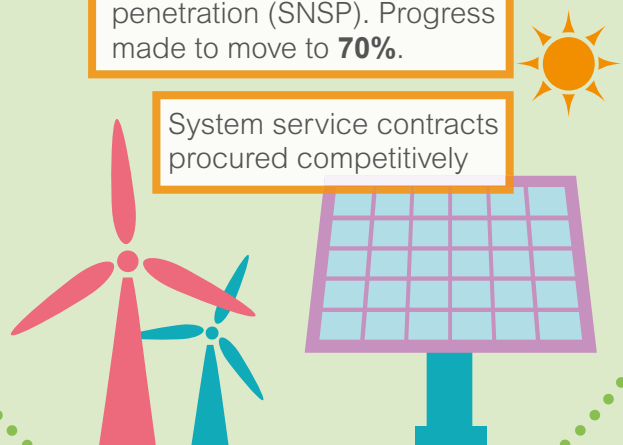
Ex-ante market share by volume



DS3

System operating with up to **65%** non-synchronous penetration (SNSP). Progress made to move to **70%**.

System service contracts procured competitively



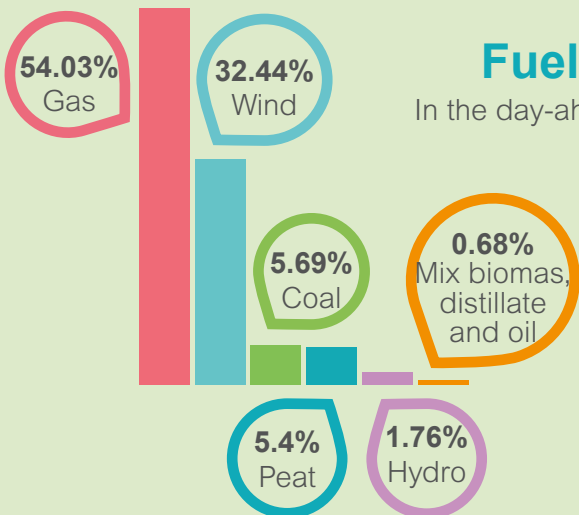
Capacity Remuneration Mechanism

CRM vs CPM = above €200m annual saving

T-1 CY2018/19 – 7,774MW capacity secured €332m cost

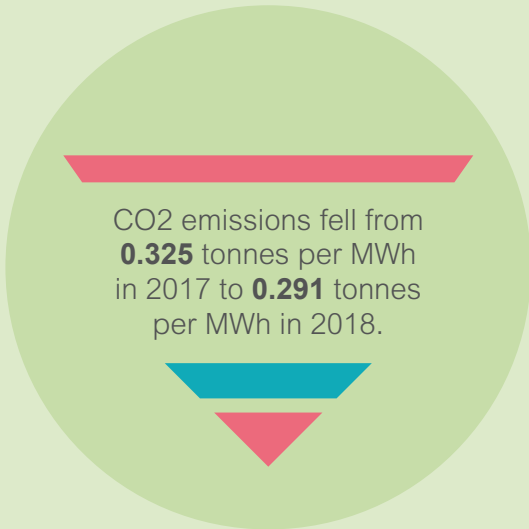
T-1 CY2019/20 – 8,266 MW capacity secured €344m cost

T-4 CY2022/23 – 7,412MW capacity secured €342m cost



Fuel mix

In the day-ahead market:

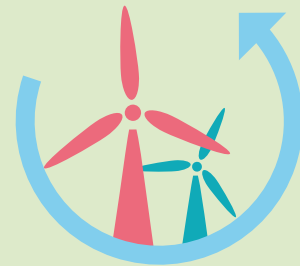


Prices

Average prices in day-ahead market were **2.86%** lower compared to the same period last year. A direct correlation between the availability of wind and prices was observed.



High wind availability – downward pressure on prices



Low wind availability – higher prices observed



3. How the SEM works

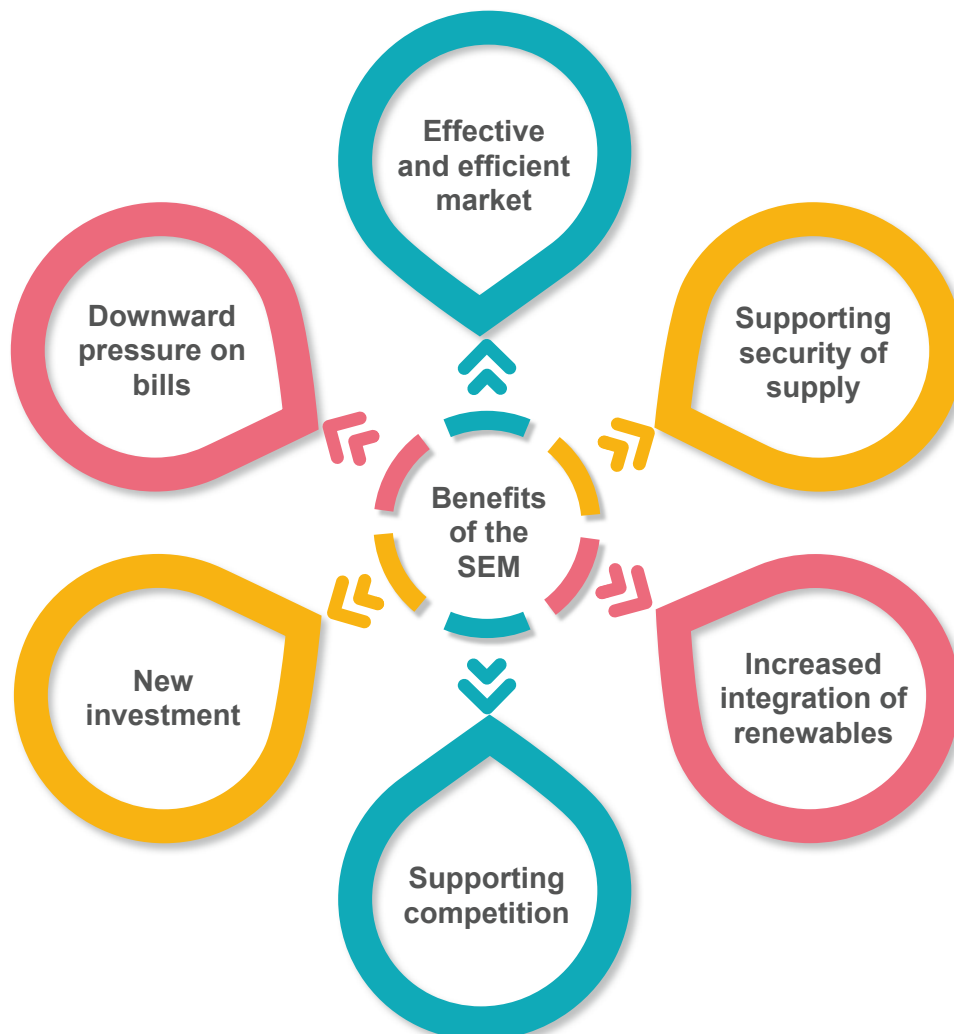
The Single Electricity Market (SEM) is the wholesale market on the island of Ireland where electricity generators and suppliers trade the power used by homes and businesses across the island of Ireland.

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.

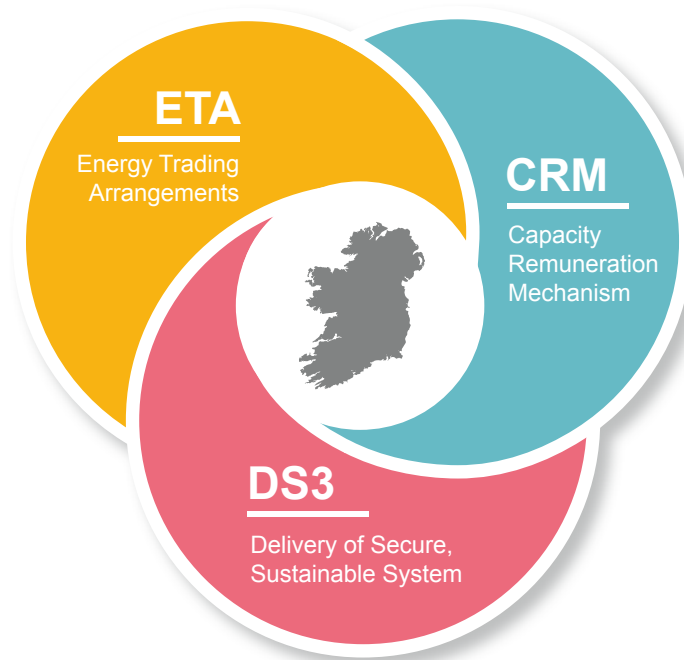
To take advantage of new opportunities and to improve the efficiency, competitiveness and operation of the market, new operational arrangements were put in place from 1 October 2018. This project, known as ISEM, sought to make best use of all the power on the system and ensure that interconnectors operate 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 new market arrangements bring significant benefits for all consumers. The new arrangements provide trading opportunities for generators, suppliers and investors while delivering an efficient and competitive electricity market. The market has been 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.



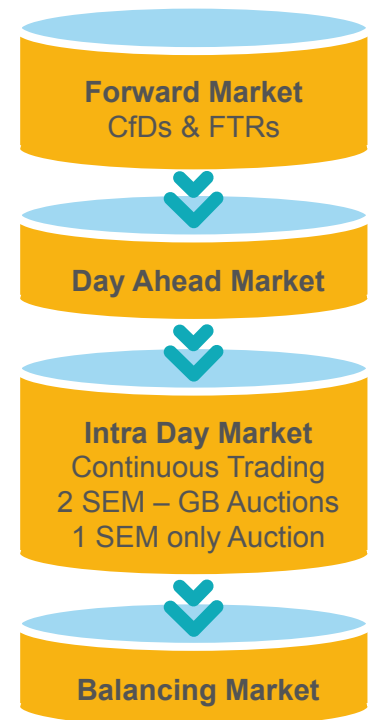
The SEM comprises of three distinct areas that provide revenue streams relating to the services provided by market participants. The Energy Trading Arrangements (ETA), Capacity Remuneration Mechanism (CRM) and Delivering a Secure Sustainable Electricity System (DS3) make up the three main pillars of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

The Forwards market is a financial market. It provides participants with the opportunity to reduce their risk of exposure to significant movements in the price. They are able to spread the risk of their financial commitments by making sure their contractual investments can be offset or spread – called hedging. These transactions can take place months to years ahead of the power being used. Products traditionally available in this timeframe include Contracts for Difference (CfD) between market participants or in the form of a Directed Contract (DC), whose price and volume is set by the Regulatory Authorities.

Financial Transmission Rights are another type of hedge available in the forwards market. They are a type of hedge purchased through an auction for those who wish to protect themselves from the price differences between the SEM and Great Britain. The differences will arise during times when the interconnection capacity between the SEM and Great Britain is insufficient to harmonise the prices between the two markets.

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.)	Across EU via a single pan EU platform

The day ahead market (DAM) is the largest ex-ante market by volume and value. The DAM is a single pan European energy trading platform that allows participants to submit bids and offers for the sale or purchase of power across Europe. 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 prices and positions for all participants in all coupled markets. Market prices are used to determine Interconnector flows, ensuring optimal cross-border flows between and within member states.

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	I-SEM only
IDA-1	23:00 (D -19)	17:30 (D-1)	23:00 - 23:00 (48* 1/2hrs)	I-SEM – GB
IDA-2	23:00 (D -19)	08:00 (D)	11:00 - 23:00 (24* 1/2hrs)	I-SEM –GB
IDA-3	23:00 (D -19)	14.00 (D)	17:00 - 23:00 (12* 1/2hrs)	I-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 Transmission System Operator (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 is 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 for Communications, Climate Action and Environment.

On 25th February 2014 the CRU and UR 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 licencing 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 has designated responsibility 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 Regulatory Authorities market monitoring unit.



L-R Odd Håkon Hoelsæter (Independent Member), Aoife MacEivilly (CRU), Jon Carlton (UR), Bill Emery (UR, SEMC Chair), Paul McGowan (CRU), Jenny Pyper (UR), David Newbery (Deputy Independent Member)



4. 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. A liquid day-ahead market on the island is coupled with the day-ahead market across Europe with the effective linking of the two through efficient use of the two interconnectors that link Ireland and Northern Ireland with Wales and Scotland respectively.

Day ahead market

The market design for the SEM anticipated an active day-ahead market (DAM) in which the majority of electricity would be traded. The price is formed by a pan-European auction that sets a single price for each hour that all buyers and sellers of power will pay and receive. The DAM price that is set in the SEM is calculated on a single trading platform by a computerised calculation procedure called EUPHEMIA that takes account of all the cross-border restrictions on the transmission of power in the European market. It has ensured that the DAM has operated effectively in line with the expectations of the market design. This has therefore ensured that the DAM is the most significant market for both generators and suppliers with by far the highest volumes traded in this market timeframe.

In total, the value of the DAM market for the year was over €2.25bn and the volumes and prices traded are illustrated in Figure 1.

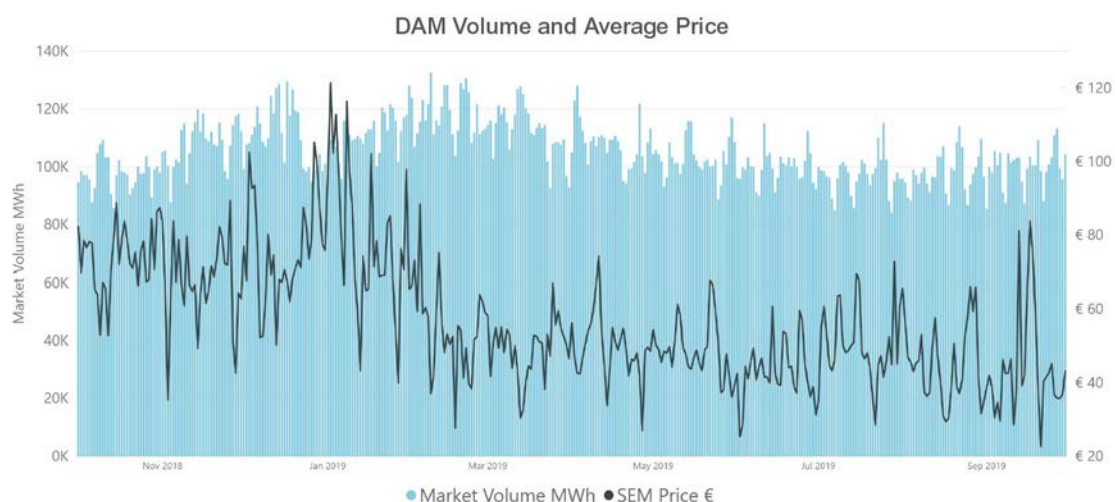


Figure 1: DAM October 2018 – September 2019

The average daily price in the DAM was €56.85. The lowest price recorded in an hourly period was -€10.29 and the maximum price recorded in a single period was €365.04. Prices in the DAM were slightly lower over the year (a decrease of 2.86%) compared to the same period from October 2017 to September 2018. In the first three months of the new market, we saw an increase in prices of 9.34%. This was the result of a number of factors including higher fuel prices earlier in the year, carbon costs and a significant number of generators unable to generate in the first months of the new market due to plant outages. The subsequent 9 months (January – September 2019) saw a decrease in prices of 14.53% compared to 2018.

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 90% of ex-ante volumes were traded through the DAM across the year. This is illustrated in Figure 2. Generators of electricity and suppliers of electricity to business and domestic customers sought in general to cover their requirements in this market.

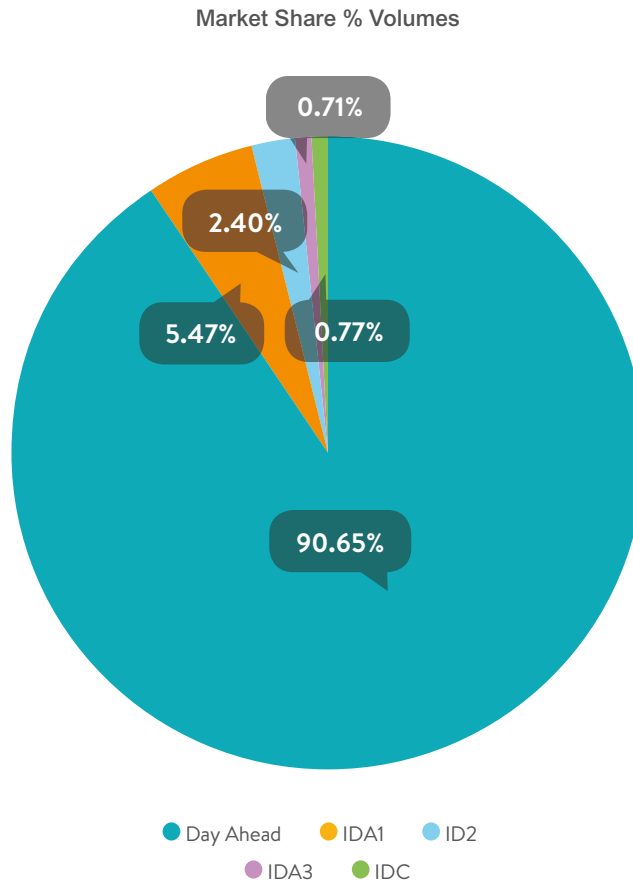


Figure 2: Market Shares by Volume

Fuel mix in the DAM

The fuel mix in the DAM illustrates the type of generation that supplies business and domestic customers in Ireland and Northern Ireland, including the role of renewable generation. Figure 3 shows that gas was the predominant fuel used for generation in the DAM with 54.03% of metered generation. Wind made up 32.44% with 5.69% coal and 5.4% peat. The remaining generation was made up of hydro, biomass, distillate and oil.

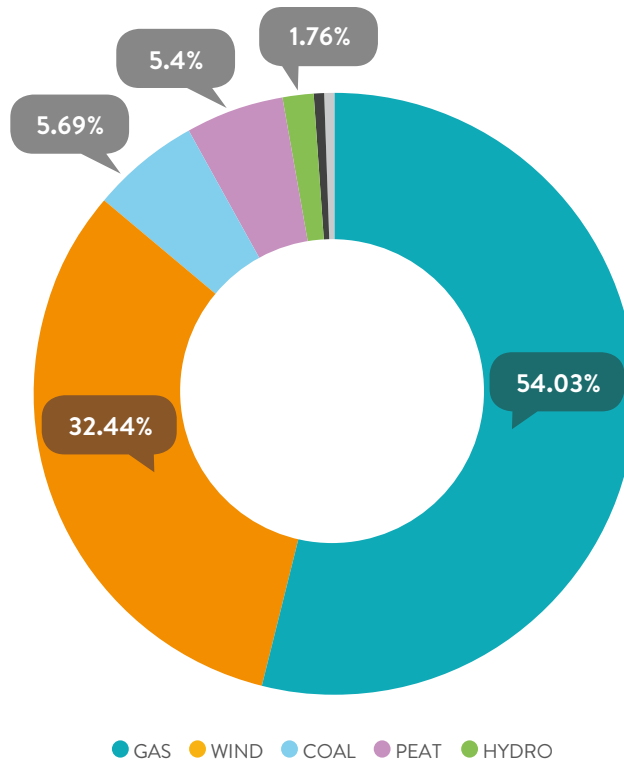


Figure 3: Metered generation by fuel

Small scale generation, generating power less than 10MW, does not have to participate directly in the market. The fuel mix figures outlined in Figure 3 does 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 day ahead market

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 4 shows that the level of wind can vary significantly over the year, having an important influence on the fuel mix and price formation.

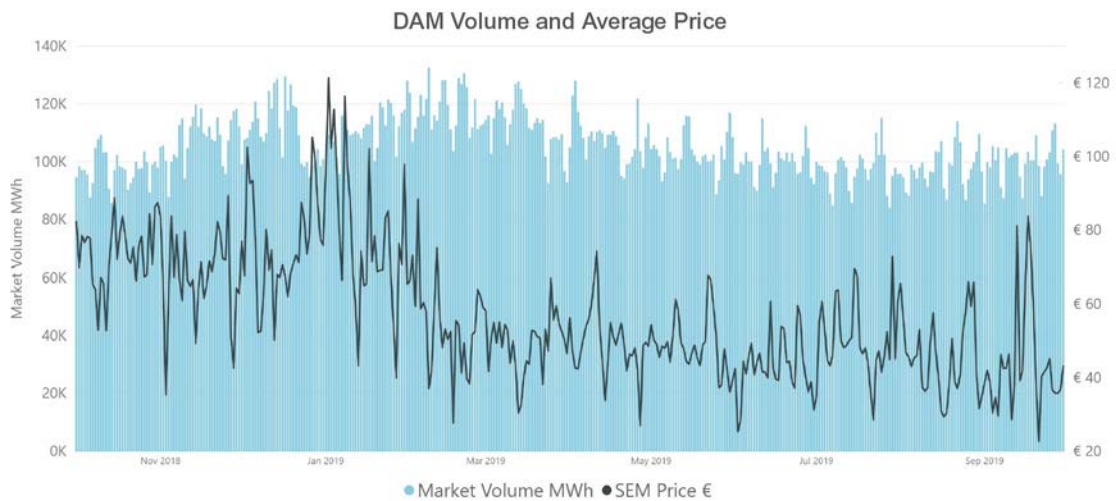


Figure 4 Monthly Level of Wind October 2018- September 2019

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 5 illustrates the relationship between prices and

the forecast level of wind across the year, highlighting the highest and low prices observed in the day-ahead market during the year.

High Price-Low Wind				Low Price-High Wind			
Date	Time	Price €	Wind Forecast	Date	Time	Price €	Wind Forecast
02-Feb-19	17:00	€365.04	383.04	17-Feb-19	05:00	-€10.29	3,069.40
27-Dec-18	17:00	€298.65	402.41	17-Feb-19	01:00	-€10.24	3,467.00
28-Dec-18	17:00	€290.00	869.02	17-Feb-19	02:00	-€10.19	3,430.70
30-Jan-19	17:00	€285.00	267.15	17-Feb-19	04:00	-€10.03	3,201.08
04-Feb-19	17:00	€285.00	193.50	17-Feb-19	06:00	-€10.03	2,935.33

Figure 5: DAM prices and forecast wind relationship

The table shows that highest prices occurred at evening peak demand (17:00) with the lowest prices overnight where demand on the system is at its lowest.

Figure 6 graphs the daily DAM price against the daily aggregated wind forecast, showing 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.

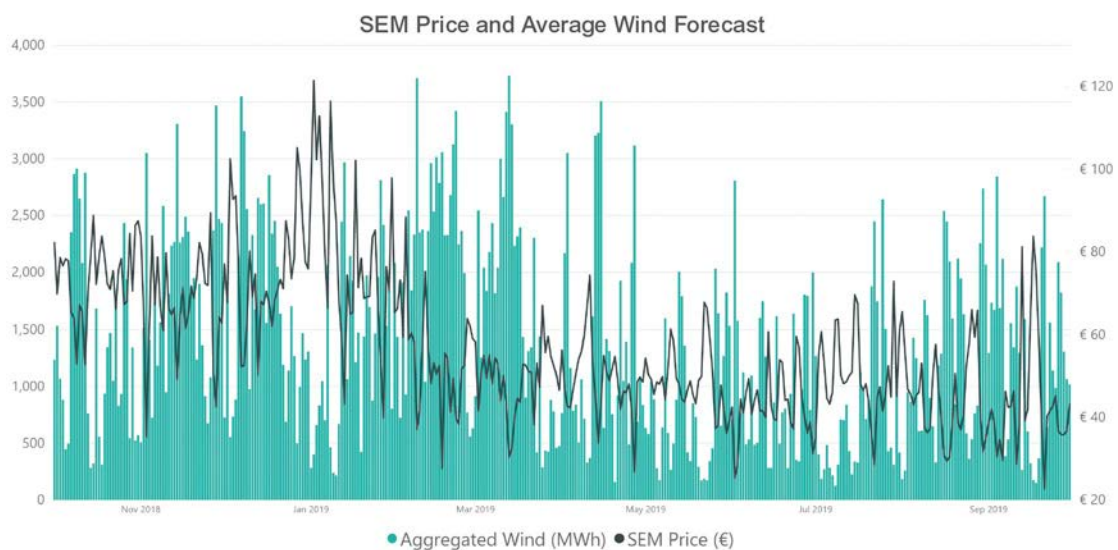


Figure 6: Daily DAM Price and Average Wind Forecast

Price comparison

Many factors impact on prices, including of levels of demand, wind, fuel prices, carbon prices, power plant availability and the flow of power into and out of the market through interconnection with GB. Figure 7 compares the seven day rolling average DAM price in the new SEM with the System Marginal Price in 2017-18 in the old market. Over the whole year the average DAM price has decreased slightly (2.86%) compared to the same period in the old market arrangements.

Figure 7 illustrates that there were broadly two periods, the first in which prices were higher in the new market than in the equivalent period in the previous year, and a second period in which they were generally lower. It shows that in the first three months prices were higher while in the subsequent nine months (January - September), DAM prices were consistently lower with only a few exceptions.

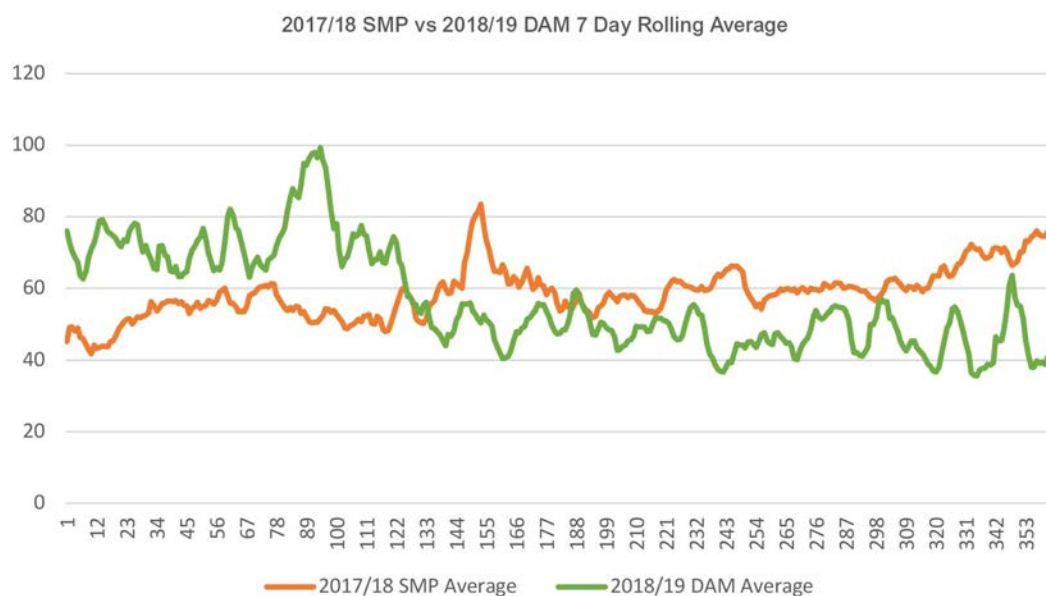


Figure 7: 2018 SMP vs 2019 DAM Prices

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 however have been relatively low, and have generally declined through the IDM1, IDM2 and IDM3 auctions, and the Intra-Day Continuous (IDC) market. The IDM1 and IDM2 are coupled markets with GB, which means prices are formed alongside the GB market, while the IDM3 and IDC are local SEM-only markets. 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. The IDM1 auction accounted for 5.55% of the total ex-ante market by volume, the IDM2 auction accounted for 2.42%, the IDM3 auction for 0.72% and the Intra-Day Continuous market (IDC) for 0.78%.

While volumes fall, average prices have shown a tendency to rise during the Intra-Day timeframe as it became closer to real time, with average prices in IDM1 being €55.85, IDM2 €63.36 and IDM3 €69.13 and the IDA Continuous market €62.36. The total value of these markets over the year has been €122m in IDM1; over €58m in IDM2; €19m in the IDM3 and over €10m in the IDC market. Overall, we saw lower prices in the IDA 1 market and the IDC market with the higher prices in IDA 3 market. Prices in all markets generally move in a similar direction with the IDA 3 market showing the largest movement.

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, or imbalance settlement volumes and prices show relatively higher volatility in the market in terms of both volumes and prices. For example, the balancing market experienced a high price spike on 24th January 2019 when an amber alert was issued for Northern Ireland. Plant outages (planned and unplanned) coupled with low wind in Northern Ireland and full

exports on the Moyle Interconnector meant the system became highly constrained. As a result, some 5 minute prices exceeded the strike price of €500.

The volatility of the balancing market is illustrated figure 8 (excluding the price spike on 24th January), which better shows the volatility of the Balancing Market. The lowest price observed was -€281.16 and the highest price was €3,773.69 (24th Jan) or €1,453.09 (excluding 24th Jan).

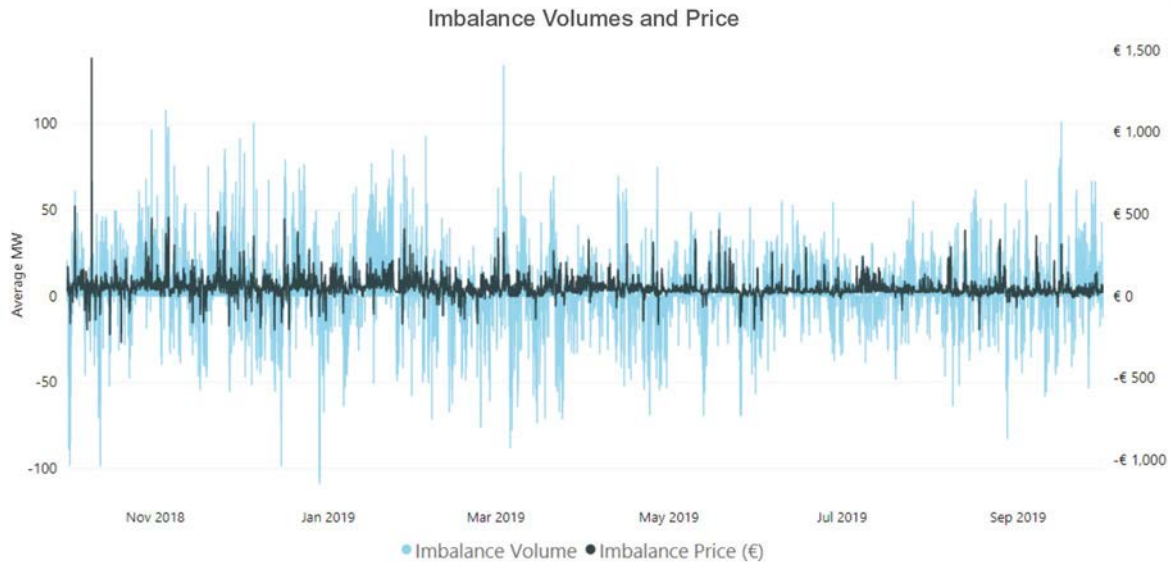


Figure 8: Imbalance Prices and Volumes (Excluding 24th January 2019).

The price spike on the 24 January including the imbalance volume is shown in Figure 9.

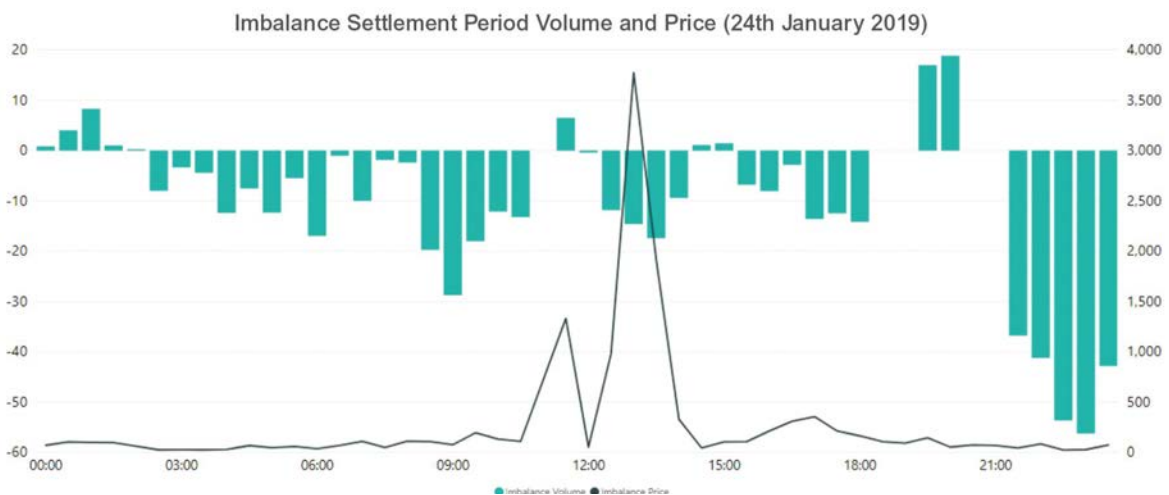


Figure 9: Imbalance Volumes and Prices 24th January

Following Go-Live, the performance of the balancing market in the new SEM was a focus of attention, especially on whether the level of price volatility appropriately reflected market fundamentals. The very high prices on 24 January 2019 was an example of balancing market outcomes that gave rise to some concern. The SEM Committee consequently decided to direct SEMO to raise an urgent modification to the SEM Trading & Settlement Code to remove a number of System Operator Flags in the imbalance pricing algorithm.

In addition, the SEM Committee issued a public consultation on further changes to the flagging and tagging approach being used in the balancing market and the removal of difference charges where operational constraints are binding. Taking account of the comments received to the consultation, and actions already taken to remove a number of flags, the SEM Committee concluded to keep this matter under ongoing review. Taking account of this and out-turn prices in the balancing market over the coming winter 2019/20, the SEM Committee may review this matter again in 2020.

Supplier behaviour

Unlike the old market arrangements, suppliers are not simply price takers and play a more active role in the market. Over one hundred supplier units are participating in the new SEM, providing them with a competitive environment in which to purchase power for their retail offerings to final consumers. This involves their direct participation, where in the previous arrangements a single buyer represented the demand side of the market, offering the potential for them to play a role in setting prices instead of being price takers. Suppliers have freedom to participate on a voluntary basis in the different market timeframes, with mandatory participation required only in the balancing market, where they are required to discharge their obligation to be balance responsible. This means suppliers must balance their offtake of power with their contracted demand.

In the first year of operation suppliers have calculated their customers' demand and sought to provide for this mainly in the Day Ahead market, which has accounted for 95 per cent of ex ante volumes in the market. 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 new arrangements have continued to facilitate supplier purchases of power 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 allow some suppliers to lock-down the price they will have to pay in the SEM. This ability of suppliers to hedge their purchase price has been enhanced through the availability of Financial Transmission Rights (FTRs), sold by the interconnectors that connect the SEM with the wholesale market in Great Britain. FTRs are contracts that allow their purchasers to receive the difference between the wholesale price of energy in the SEM and GB markets, so that the prices paid by suppliers in the SEM can be linked to the wholesale price in GB.

Suppliers 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 in times of scarcity. 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.

Suppliers have played a much more active role in the market than before and have developed new capacities and systems to allow themselves to avail of the opportunities to trade offered by the revised market arrangements.



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 import capacity (Scotland to Northern Ireland) of 450MW and a maximum export capacity (Northern Ireland to Scotland) of 80MW (variable on a daily basis up to a maximum of 380MW).

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. It has an import capacity of 530MW and an export capacity of 500MW.

In the 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 Figures 10 and 11 which chart the interconnector flows before and after the introduction of the new market arrangements. 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.

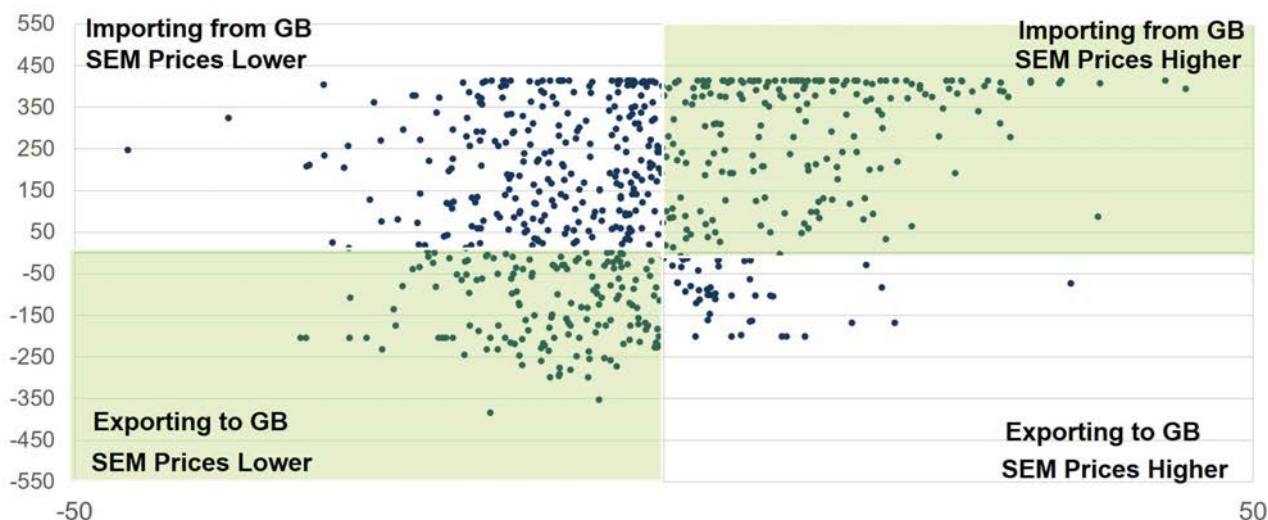


Figure 10: Interconnector flows prior to introduction of new market arrangements

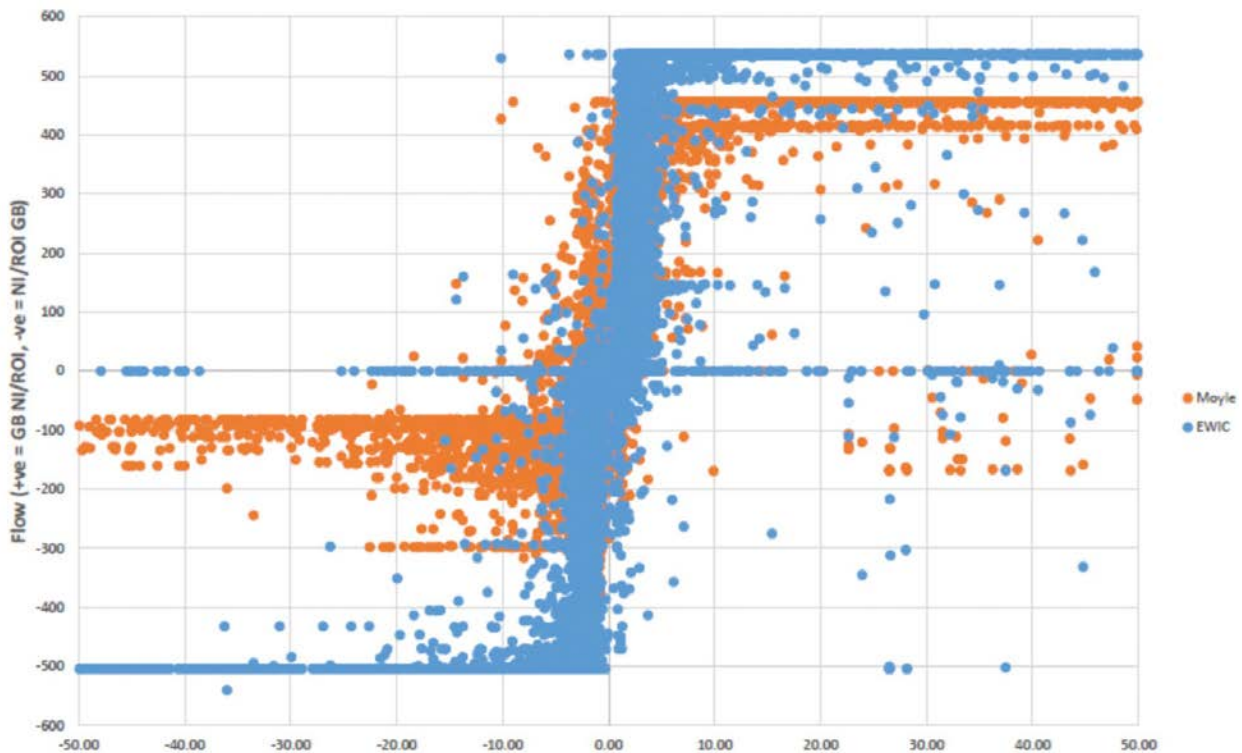


Figure 11: Interconnector efficiency in new market arrangements

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 in figure 11 shows that flows on Moyle (red) and EWIC (blue) across the year flowed overwhelmingly in the correct direction with only a few exceptions.

Ramping constraints, which limit the speed of change in the direction of flow, have not so far resulted in significant flows in the wrong direction and market coupling has been successful in ensuring efficient interconnection between the SEM and GB markets. This has resulted in 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.





6. Forwards market

To manage risk and allow supplier 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. This provides generators and suppliers with more wholesale price certainty. In the SEM there are regulated and unregulated forward contracts.

Overview of regulated contracts

There are two forms of regulated forward contracts in the SEM:

- **Directed Contracts (DCs); and**
- **Public Service Obligation (PSO) supported CfDs.**

As part of the Regulatory Authorities' 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. In 2018/2019 a total of 2,446 MW of Directed Contract volumes were bought by market participants. 979 MW of these were baseload volumes, and 1,467 MW were mid-merit volumes. The average baseload price for 2018/2019 was €61.27 whilst the average mid-merit price is €69.53. Figures 12 and 13 provide a quarterly breakdown of DC volumes and prices.

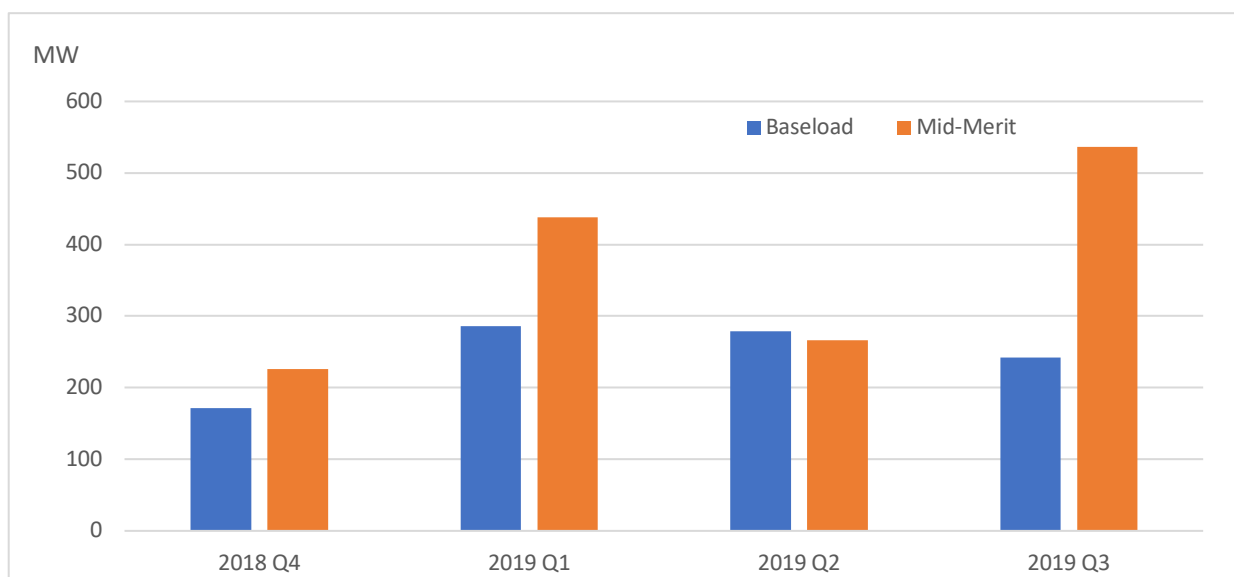


Figure 12: Total Directed Contract Volumes offered by quarter (2018-2019)

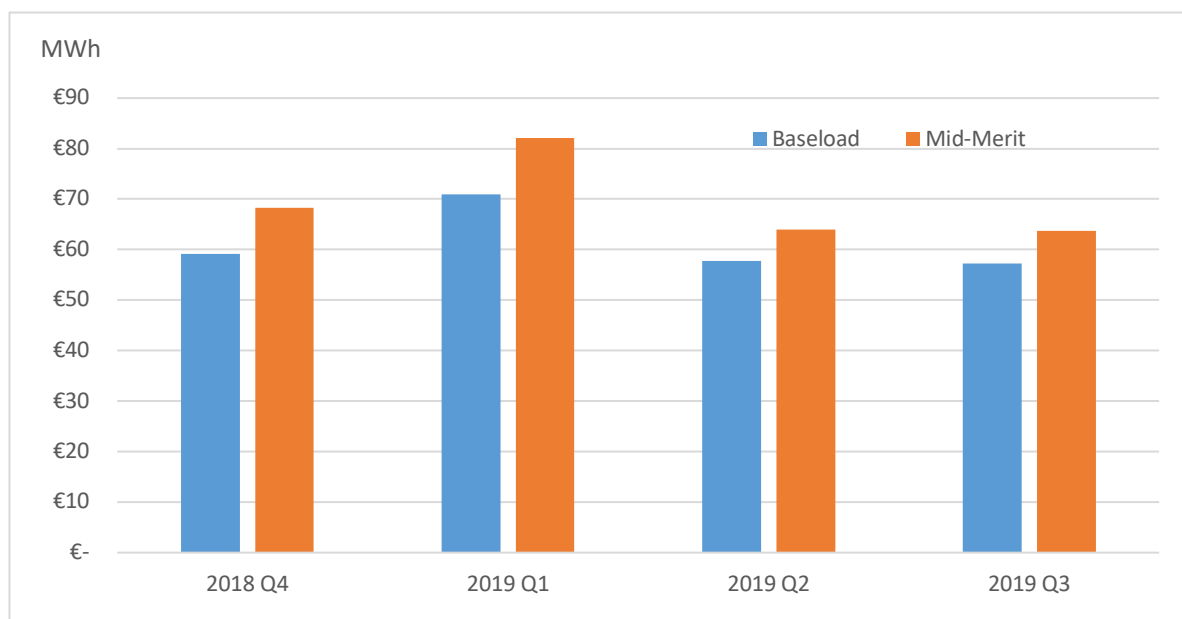


Figure 13: Average Directed Contract price by quarter (2018-2019)

PSO supported CfDs are associated with ESB's thermal generating plants (i.e. Lough Ree & West Offaly) covered under the PSO levy in Ireland, offered via auction over the Tullett Prebon platform. The Peat PSO Support scheme is set to terminate at the end of 2019. As a result, the PSO Supported CfDs will no longer be offered by ESB to the market.

Overview of Unregulated Contracts

Generators can offer forward contracts in the SEM which suppliers are free to bid for. The RAs have no direct role in setting the price or volume of these forward contracts, although the RAs do monitor liquidity levels.

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).

Since 1st October 2018 there was 1,724 MW worth of forward contracts (excluding DCs and PSO CfDs) traded in SEM, which includes contracts as far out as Q4 2020¹. Whilst the majority of forward contracts have been for Baseload hours, there has been an increase in the types of forward contracts, with more Mid-Merit and Mid-Merit 2 products being offered.

Other hedging options include Financial Transmission Rights (FTRs), and 'Proxy Hedging'. FTRs are a financial instrument that allow the holder to receive the positive difference in the Day Ahead Market (DAM) price between the GB market and the SEM. If the DAM price in one market is higher and one holds an FTR in that direction, then the FTR holder is entitled to that difference.

Proxy hedging involves the use of a correlated financial instrument (gas) to hedge a particular risk when a direct hedge (electricity) is not available.

¹ Based on data from Tullett Prebon and Energy Brokers Ireland (EBI). In July 2019, EBI (part of Marex Spectron Group) established an energy trading platform to facilitate the trading of electricity CfDs in SEM.



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7. Capacity Remuneration Mechanism

The Capacity Remuneration Mechanism (CRM) process is designed to ensure that the demand for electricity is always met. The overall aim of the CRM is to ensure security of supply on the island of Ireland as well as ensuring that consumers don't pay for more capacity than is needed.

In order to achieve this, capacity providers sell qualified capacity to the market based on generation capacity required in a future capacity year. This process takes place in the form of Capacity Auctions. Capacity providers who are successful in a Capacity Auction receive a regular capacity payment which assists with funding generation capacity. In return, the successful participants have an obligation to refund consumers for any energy prices when this energy price rises above a set "Strike Price" for each Capacity Auction.

To successfully gain a capacity payment, participants bid for contracts in competitive auctions which are held in advance of delivery in a specified capacity year. Auctions are normally held by the System Operator either one or four years ahead of delivery.

In order to sell capacity in a Capacity Auction, participants are required to submit a bid(s) that specify the amount of capacity (MW) being offered and the price sought for that capacity (£/€). Bids submitted into an auction are arranged from lowest to highest price until the capacity requirement for the specific capacity year is satisfied. The level of capacity required is assessed by the Transmission System Operators. Capacity that has been bid in at or less than the last bid price clears the in the auction and is paid this market clearing price. Capacity that has been bid at more than the market clearing price is deemed to have failed to clear the auction and therefore is not paid, unless the capacity is needed to meet a local security of supply need.



Figure 14: CRM auction process

During the delivery year, capacity providers will receive monthly payments for their agreed obligation at the auction clearing price. The expectation is placed on providers to be available to respond with their agreed generation volumes or load reductions when called on at times of

system stress or high demand. If a generator is unable to do this they risk being exposed to substantial charges.

The Capacity Market Code (CMC) sets out the arrangements whereby market participants can qualify for and participate in auctions for the award of capacity.

The CRM went live on 1st October 2018 and was put in place to replace the Capacity Payment Mechanism (known formally as the Annual Capacity Payment Sum, "ACPS").

This ACPS was received by generators for being available to generate largely based on a demand shape in each given calendar month, known as the Capacity Payment Period Sum ("CPPS").

Capacity auctions

To date three Capacity Auctions have taken place and completed successfully. This includes two T-1 and one T-4 Capacity Auctions. The outcomes of the Capacity Auctions completed to date are as follows:



Figure 15: CRM auction results

In comparison, the cost of the CPM for the same delivery year was estimated at €546m. The CRM therefore represented a saving of over €200m for the same period.

The second capacity auction secured capacity at an approximate 3% nominal increase when compared to the cost of the 2018/19 capacity year. However, this increase was as a result of securing additional capacity to meet the needs of the 2019/20 capacity year and ensuring the security of supply on the Island.

The first T-4 Capacity Auction took place and secured capacity for 2022/23. Of the total capacity procured, 710MW was new capacity and resulted in the inclusion of more than 30 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.

Work has progressed during the year for two additional auctions, scheduled for the end of 2019 to cater for Capacity years 2020-21 and 2021-22. At the end of March 2020, an additional auction is scheduled for Capacity Years 2023-2024.



8. DS3

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 (ie level of renewable generation that can be on the system) may be increased to 75%.

The SEM Committee’s key objective is to ensure that the interests of the all-island customer are protected throughout the programme. It does 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 65% 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 a low-carbon economy. This can already be seen in the day-ahead market where increased wind generation has been placing a downward pressure on prices.

There are three primary DS3 pillars - System Tools, System Performance and System Policies, with 11 workstreams spread under these pillars.

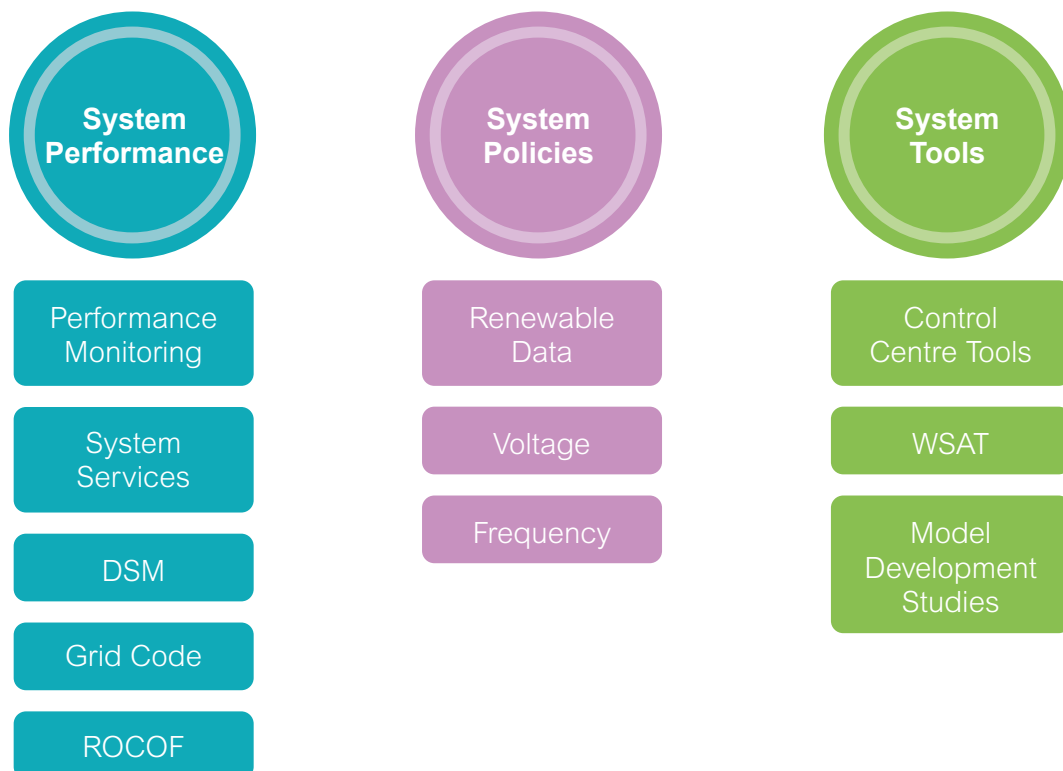


Figure 16: DS3 pillars and workstreams

The System Services workstream 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 TSO 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.

By completion of the DS3 Programme it is intended that there will be 14 services in total, covering different timeframes and provided by different units.

During 2018/19 there has been extensive engagement on DS3 Fixed Contracts Contractual Arrangements with final decisions published. This followed work in 2017 and 2018 all with the goal of securing system services contracts for a six-year period at a competitive price for consumers. The process was a success with contracts from two parties for the provision of five services being secured at less than 20% of the value of the regulated tariffs.

Significant continued progression of System Services was seen during the 2018/19 year however work continues on some key areas. In order to allow a trial of 70% SNSP, changes to the rate of change of frequency (RoCoF) need to be complete. This has involved an intensive work programme by the distribution system operators (DNOs) to ensure both large scale generators, and the large amount of small scale generators have made the necessary technical changes to ensure RoCoF compliance. Significant progress has been delivered across the year by DNOs to ensure compliance of small scale generators with further work still required for a small number of large scale generators.

The delivery programme intended that all RoCoF changes would be complete and Control Centre Tools in place to allow a trial of 70% SNSP by Q4 2019. However further work on the delivery of the TSO systems required to ensure the delivery of SNSP is required. This resulted in the reprogramming of the DS3 delivery plan with trials on 70% SNSP now scheduled to commence in Q2 2020. This will result in an overall six month delay to the movement to 75% SNSP and completion of the DS3 Programme. The SEM Committee continue to monitor the progress of the outstanding actions to ensure the workstreams are delivered within the revised timelines and benefits to consumers delivered.





9. ISEM project

Project objectives

The purpose of the ISEM project was to develop trading arrangements that would be compliant with the market coupling requirement of the European third energy package. This would result in the harmonisation of cross-border trading rules (Day Ahead Markets, Intraday Markets, Interconnector Flows) and, by implication, national market designs (Capacity Markets and Balancing Markets).

The new market arrangements aimed to ensure tighter integration with neighbouring electricity markets. Being part of a wider European electricity market, where interconnectors are used efficiently and cross border trade is maximised, will bring benefits for consumers in terms of increased competition, reduced costs, increased trade and security of supply.

The new market design was also developed to take into account the significant changes since the launch of the Single Electricity Market in 2007. Greater levels of interconnection, increased levels of renewables as well as the introduction of new technologies into the market are all notable market developments in the last decade.

In Ireland and Northern Ireland, the Department of Communications, Energy and Natural resources (DCENR – now DCCAE) and the Department of Enterprise Trade and Investment (DETI – now DfE) respectively charged the SEM Committee with responsibility for developing trading arrangements that would be compliant with the Target Model.

Project delivery

An extensive programme of work across the RAs, TSOs, market participants, government departments and other key stakeholders saw the delivery of over 138 project milestones, over 23 consultation processes through to decisions and an extensive suite of licence modifications, code developments and modifications. Over 24 major IT systems were changed with new systems developed and over 106 separate interfaces were changed and tested to work together. The project was managed through an effective governance structure including the SEM Committee, Joint Project Boards, Programme Managers groups and numerous other working groups.

The ISEM project was very complex and represented the largest change to the wholesale market in over a decade. Following the development of the market high level design, published in September 2014, a delivery date of October 2017 was planned. Although the project delivered much success, it was not without its challenges.

During the staged gate approach to managing the project, a stocktake was carried out in the summer of 2016 which identified some areas of concern. This included the need for more time to complete the first capacity auction in advance of go-live, time required for testing, market coupling agreements to be completed and preparedness of market participants.

As a result, the go-live date was revised to May 2018.

However, a late completion of system build by the software developer for the TSOs and the subsequent knock on impact to software testing, delayed the start of clean market trial for participants.

A final date of October 2018 was re-planned to allow additional time for this, an overall one year delay. This resulted in final TSO Recoverable Costs for delivering ISEM of €94.5m². The final

² This excludes any NPV adjustment

costs were higher than initial project estimates mainly due to:

- The increase in complexity and breadth of scope which had a knock on effect on resources required by Eirgrid-SONI and their main software developer.
- The late delivery of software and the quality of software which pushed back Integration Testing with the Eirgrid-SONI existing IT systems and delayed the start of Market Trials with participants.

While there are lessons to be learned in relation to the project delivery, the scale of testing the combined and collaborative approach of the TSOs and all market participants ensured that the new market arrangements were delivered in accordance with the market design.

Project evaluation

The ISEM has delivered on the project objectives

- The Day Ahead Market is executed on a single pan-European energy trading platform in the ex-ante time frame using a price coupling algorithm called EUPHEMIA.
- Over the period the Day Ahead Market has operated effectively and efficiently in line with the expectations of the market design. The prices reflect the fundamentals (e.g. gas), supply and demand, impact of competition, efficiency of the interconnectors and maximisation of renewables.
- The Interconnectors are demonstrably used more effectively. Where “physical capacity” could be reserved/ring-fenced in the old SEM, in the new SEM physical flows on Moyle and EWIC are linked to the markets (Day Ahead and Intraday Market Coupling).

Where the Day Ahead Market price in the SEM is higher than in GB the interconnectors will import electricity and where the DAM price in the SEM is lower (higher levels of wind), the interconnectors will export.

- Cross Border (GB-SEM) trade has been improved. In the ACER Market Monitoring Report 2018 they reference significant welfare benefits due to market coupling. It details that the overall estimated ‘loss in social welfare’ due to the absence of market coupling on borders that still applied explicit DA auctions. We would expect to see the delivery of the expected social welfare gains (up to €60M) in the next ACER Market Monitoring Report
- There is increased competition and trade. Suppliers and generators are participating in the available ex-ante markets and are reacting to market dynamics including responding to the availability of wind. As evidenced in the results of the CRM auctions, there is increased competition - not all generators qualify for the auctions and not all generators have received an RO in the auction. New generation has entered the auction and received an RO with less competitive plant receiving signals to reinvest or exit the market.

The costs for providing capacity has also greatly reduced. The average cost of the old capacity market was €550m. For the Capacity Years 2018-19, 2019-20 and 2022-2023 this has reduced to €332M, €344m and €342m respectively, with a derived total savings of c.€632m Euros.

- In relation to security of supply, in the old market arrangements all available generators received capacity payments which incentivised them to remain operational. Now with competition in the capacity market and the subsequent exit signals sent to some generators, the market arrangements had to ensure ongoing security of supply across the market.

To target regions where capacity is most needed, Locational Capacity Constraint Areas were identified so that security of supply could be targeted for those regions.

Under the Grid Code, generators have to give three-years notice of closure. This notice period is important for the stability of the market (by giving the market time to respond to exit) and for system security reasons (by giving the TSO time to respond to any system issues).

The use of Locational Constraints and the obligations under the grid code allow for efficient entry and exit from the market helping to facilitate security of supply.





10. Market Operation

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

Although the TSO's, market operators and market participants are separately licenced by the Regulatory Authorities, the SEM Committee is responsible for overseeing a number of cross-cutting market issues.

SEMO regulation

Across 2018-19, the SEM Committee consulted on a number of matters relating to the regulation of SEMO and SEMOpx.

A key decision influencing a number of areas of the regulatory framework for Nominated Electricity Market Operators (NEMOs) in the SEM, were contained in the SEM Committee's decision on future regulation of NEMOs in the SEM. Following consideration of responses from interested stakeholders to the RAs' proposals, the SEM Committee decided on a number of issues relating to the next designation by the RAs including the timing and length of re-designation, the application of a price control and the details of regulation of one or more NEMOs in the Single Electricity Market. Based on the decisions outlined in this paper, the regulatory framework will apply in the event of the entry of another NEMO to the market or not.

The CRU and UR also coordinated the re-designation of SEMOpx (a contractual joint venture between SONI Limited and EirGrid plc) in July 2019 through the SEM Committee. The UR and CRU (together the Regulatory Authorities) published decisions to designate SONI and EirGrid Plc as NEMOs under Article 4 of the Capacity Allocation and Congestion Management (CACM) guidelines which came into force on 14 August 2015.

These decisions follow publication of invitations for applications for NEMO designation, with one application being received from SONI Ltd for designation in Northern Ireland and one application being received from EirGrid Plc for designation in Ireland. The applications were assessed on a cooperative basis by both the UR and CRU against the NEMO designation criteria as stated in Article 6 of the CACM Regulation. The designation applies from 3 October 2019 until 3 October 2022.

SEMO Key performance indicators

The SEM Committee consulted on the Key Performance Indicators to apply to SEMO, the Single Electricity Market Operator. SEMO is responsible for the operation of the Balancing Market, Imbalance Settlement and Capacity Market Settlement and is required to administer and maintain the Single Electricity Market Trading and Settlement Code. SEMO is subject to a revenue control with approximate revenues of €11 million per year.

Key Performance indicators are used to incentivise improvements in performance by attaching financial rewards to specific measures of performance. This allows for increased visibility of the operation of a regulated entity which can help inform future price reviews and lead to better outcomes for market participants and consumers. The overall aim of the KPIs presented in the SEM Committee's decision paper was to further incentivise a high standard of performance and service for the benefit of market participants and other stakeholders while recognising the difficulties faced by SEMO in the first year of the market with regard to the stability of the new market systems. The SEM Committee sought to strike a balance between acknowledging that such a new, complex systems will inevitably take some time to bed in, with the legitimate demands of market participants to expect a high level of service. The KPIs targeted improving

performance, promoting customer service, increasing efficiencies and value to customers, but only applied from 1 October 2019 to acknowledge that the first year of market operation is not representative of a steady-state system and applying KPIs would not be a reasonable representation of the work of SEMO in maintaining market operations in challenging circumstances.

The SEM Committee will be consulting on a price control for SEMOpx to apply for the period of the recent designation (October 2019 – October 2022).

Trading and Settlement Code

The Trading and Settlement Code Modifications Committee has been very active since the introduction of the new market arrangements with a significant number of modifications progressed through the Committee. Since the SEM Committee approval of the Trading and Settlement Code Amendments decision in April 2017, there have been over 50 modifications made to the Code following review and discussion by the Modifications Committee. There have also been a small number of Modifications made to the SEMOpx Rules and Procedures, which govern the operation of the day-ahead and intra-day markets. This work has progressed with the co-operation, commitment and constructive engagement of the industry participants who sit on, and attend as observers, the TSC Modifications Committee.

During the course of the year, a number of issues were identified with the imbalance pricing calculations – prices related to approximately 5% of traded volumes. Some of these issues impacted on a high number of pricing periods and as a result there was an expectation that these prices would need to be recalculated in line with the requirements of the Trading and Settlement Code.

Following extensive engagement with industry, it was agreed that there were issues with the balancing prices for the periods in the first number of months of the new market. There was agreement however that on balance there was greater value in certainty regarding these prices than in the accuracy gained by repricing. The SEM Committee published a decision in relation to this in November 2019, whereby a temporary modification to the TSC was raised to allow SEMO to seek a temporary derogation from repricing for a specific time period.



While resettlement was delayed for a number of months, since early November 2019 and the implementation of SEMO's latest software release, all resettlement is occurring on time.

Capacity Market Code

The Capacity Market Code sets out the arrangements whereby market participants can qualify for, and participate in, auctions for the award of capacity. It was first published in June 2017 and is regularly reviewed and modified to ensure the efficient and effective operation of the capacity auctions. Across the year CMC working groups have allowed for the progression and implementation of 16 modifications. Modifying the CMC has involved the co-operation, commitment and constructive engagement with industry participants.

Fuel Mix

In September 2019, the SEM Committee published an Information Paper highlighting the 2018 fuel mix and CO₂ emissions on average across the island and for each electricity supplier. It showed that on average across the island, 49% of the electricity supplied from suppliers was from renewable sources, compared to 44% in 2017, continuing a renewables growth trend seen over many years. Related, CO₂ emissions continued a downward trend, falling from 0.325 tonnes per MWh in 2017 to 0.291 tonnes per MWh in 2018. Fuel mix figures do not represent only physical renewable generation, but also tradeable 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. This provides customers with helpful information on the recent environmental impact of electricity from their supplier compared with the average.

Generator Financial Performance Reporting

In April 2019 the SEM Committee published a Generator Financial Performance Report for 2016 and 2017, highlighting the financial performance of generators operating in the SEM. It showed that the average operating profit margin of reported SEM generators was 26% in 2017, while the net margin excluding impairment was 6%.

Furthermore, following a public consultation, the SEM Committee published updated generator financial reporting requirements to align with the new SEM arrangements. The updated requirements apply to the reporting for 2018, to be submitted to the RAs in Quarter 4 2019. An aggregated report will be published by the RAs in Quarter 1 2020.

REMIT

The RAs continue to work together to provide for effective implementation of REMIT on the island, in order to improve transparency in the SEM and to detect whether there is potential market abuse, thereby helping to protect consumers.

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 with Wales and Scotland.

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. 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.

Tariffs

In August 2019, the SEM Committee approved a range of SEM tariffs, including an increased imperfections tariff. The increase in the imperfections tariff was primarily driven by structural factors such as increases in fuel and carbon costs and the limitations of the electricity network resulting in constraints (the ability to get the electricity from where it is generated to where it is used). The 2019/20 tariff also includes an under-recovery from the 2018/2019 tariff year.

While the primary driver of these increased costs stem from structural factors, the SEM Committee has commenced a detailed review of all the drivers of the imperfections tariff and has requested the two Regulatory Authorities consider how to reduce drivers of imperfections. This includes working with the TSOs to help them identify how they could relieve the physical and operational constraints on their respective systems. The SEM Committee has also made a number of minor market-rule changes in the balancing market to address emerging issues. The SEM Committee is keeping this issue under close scrutiny, and seeking to minimise these costs as far as possible in the best interest of all consumers.

Brexit

Following the result of the 23 June 2016 EU referendum, work has been ongoing to identify the potential implications for the SEM when the UK leaves the European Union.

With the support of both the UK and Irish Governments, it is clear that the best outcome for consumers is to maintain the SEM. Work has therefore focused on maintaining the SEM in any exit scenario.

Across the year the RAs have led an extensive body of work to ensure preparedness for Brexit, working in conjunction with Departments and with the Transmission System Operators and Market Operators (EirGrid, SONI and SEMO, SEMOpX).

A number of information notes have been published by the RAs and the SEM Committee to ensure market participants are informed and prepared should the UK exit the EU in the absence of a withdrawal agreement. A consultation on potential licence modifications required Northern Ireland licence holders was also undertaken.

Market monitoring

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 new market arrangements. 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 published the first quarterly market monitoring reports since the introduction of the new market arrangements which provide useful information on the performance of the market.

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