



Integrated Single Electricity Market (I-SEM)

Forwards and Liquidity

Discussion Paper

SEM-15-010

10 February 2015

TABLE OF CONTENTS

1	INTRODUCTION	3
1.1	<i>PURPOSE.....</i>	3
1.2	<i>CONTEXT.....</i>	4
1.3	<i>STRUCTURE OF THIS PAPER</i>	5
2	WITHIN ZONE FORWARD AND SPOT MARKET LIQUIDITY	6
2.1	<i>CONTEXT.....</i>	6
2.2	<i>OBJECTIVES.....</i>	7
2.3	<i>LESSONS LEARNED FROM FORWARD TRADING IN THE SEM</i>	8
2.4	<i>PROJECT SCOPE – WITHIN ZONE FORWARD LIQUIDITY</i>	12
2.5	<i>PROJECT SCOPE – WITHIN ZONE SPOT MARKET LIQUIDITY</i>	17
	TABLE 1 – FACTORS AFFECTING LIQUIDITY IN THE NEAR-TERM MARKETS	19
3	CROSS BORDER FINANCIAL INSTRUMENTS	21
3.1	<i>CONTEXT.....</i>	21
3.2	<i>OBJECTIVES.....</i>	21
3.3	<i>FTR VARIANTS</i>	22
3.4	<i>PROJECT SCOPE – CROSS BORDER FINANCIAL INSTRUMENTS.....</i>	22
4	SUMMARY	28
4.2	<i>WITHIN ZONE FORWARD AND SPOT MARKET LIQUIDITY.....</i>	28
4.3	<i>CROSS BORDER FINANCIAL INSTRUMENTS.....</i>	29
	APPENDIX 1 – MARKET POWER AND LIQUIDITY IN THE SEM	31
	APPENDIX 2 – OFGEM REPORT ON LIQUIDITY	37
	APPENDIX 3 – EU REGULATIONS.....	39

1 INTRODUCTION

1.1 PURPOSE

- 1.1.1 This Document is a discussion paper in relation to the Forwards and Liquidity workstream of the detailed design of the Integrated Single Electricity Market (I-SEM) project. It outlines initial views concerning issues of relevance to or affecting the workstream and seeks feedback on these topics from stakeholders to inform the progression of the workstream.
- 1.1.2 The Discussion Paper is not therefore a formal consultation paper. Formal consultation on the particular views and proposals of the SEM Committee will form part of the workstream and a formal Consultation Paper will be published later. This paper is designed to inform stakeholders of the overall intended approach and allow comments on the overall plan of work.
- 1.1.3 The workstream is divided into two categories:
- Within Zone Forward and Spot Market Liquidity; and
 - Cross-Border Forward Trading Instruments.
- 1.1.4 The key deliverables for the workstream are a SEM Committee Consultation and Decision Paper on measures to promote within zone forward and spot market liquidity and on cross-zonal financial trading arrangements.

1.2 CONTEXT

Within zone forward and spot market liquidity

- 1.2.1 The SEM Committee Decision Paper¹ on the I-SEM High Level Design (HLD) established that the Forward Market in the I-SEM will only have financial trading instruments for within zone trading. These financial trades are expected to be in the form of Contracts for Differences (CfDs) struck against a reference market, expected to be the Day-Ahead Market (DAM). This will allow market participants to hedge their exposure to variations in the reference price, which is particularly important for independent generators and retail suppliers.
- 1.2.2 The I-SEM HLD also acknowledged the importance of long term hedging opportunities for market participants, particularly independent generators and suppliers, and noted that that further measures to promote forward market liquidity may be needed.
- 1.2.3 As a result of forward trading being conducted through financial instruments only, all physical volumes must flow through closer to real-time markets. This concentrates at least 100% of physical volume into the day-ahead market (DAM), the intraday market (IDM) or the Balancing Market (BM).
- 1.2.4 The ratio of traded to physical volume can increase, with each MWh potentially being traded several times, if the near-term markets have good liquidity. If the markets are liquid, market participants should be able to reliably buy or sell products to meet their requirements in a timely way and at a cost-effective price.

Cross border financial instruments

- 1.2.5 The I-SEM HLD also determined that, subject to further discussions and agreement with neighbouring markets, Cross-Zonal trading will be supported only by Financial Transmission Rights (FTRs). FTRs on the interconnectors are considered one important means of increasing liquidity in the day ahead and intraday markets. Given the size of the I-SEM relative to interconnection capacity, the efficiency of interconnector flows is important in determining the efficiency of the new market.

¹ SEM-14-085a

1.3 STRUCTURE OF THIS PAPER

1.3.1 This paper is structured as follows:

- **Section 2:** considers within-zone forward and spot market liquidity;
- **Section 3:** considers cross border financial instruments; and
- **Section 4:** summarises the questions seeking the views of stakeholders.

2.1 CONTEXT

2.1.1 The SEM Committee Decision Paper on the I-SEM HLD established that the Forward Market in the I-SEM will only have financial trading instruments for within zone trading. These financial trades are expected to be in the form of Contracts for Differences (CfDs) struck against a reference market, expected to be the Day-Ahead Market. This will allow market participants to hedge their exposure to variations in the reference price, which is particularly important for independent generators and retail suppliers.

2.1.2 As forward trades are financial in nature, any contracts struck between market participants in the forwards timeframe will not confer a right to physically schedule generation, demand or cross-zonal capacity in the all-island market. All physical volumes will therefore flow through closer to real-time markets.

2.1.3 It is expected that the use of forward financial trading will still allow for the use of intermediary and aggregator arrangements:

- **Intermediary arrangements:** An intermediary could act for more than one generator to facilitate the mechanics of market participation, but would have to bid them separately into the DAM, Intra-Day Market (IDM) and Balancing Mechanism if they are defined as separate units.
- **Aggregator arrangements:** Where aggregation is allowed in the detailed design of the I-SEM², several units can be combined into a single bid in the centralised spot market places – i.e. effectively submit a portfolio bid. The provisions for Demand Side Units in the current SEM are an example of aggregation.

² The I-SEM HLD specified that there will be unit-based participation for generation in general, with aggregation arrangements for (some) specified variable renewable generation

2.2 OBJECTIVES

2.2.1 As set out in the HLD decision paper, the philosophy of the I-SEM is characterised by the following:

- Preference for a competitive approach that is in the interests of consumers, in accordance with the statutory duties of the SEM Committee.
- Access to all I-SEM market places for participants of all sizes and technologies.
- Liquid trading of financial forward contracts for effective hedging of short term prices, which is particularly important for independent generators and suppliers.
- Liquid and transparent centralised short term physical markets that are coupled with European trading mechanisms, and are exclusive routes to physical scheduling.
- Balance responsibility for all participants to ensure that their notifications of generation or demand best reflect their actual expectations.
- An explicit capacity remuneration mechanism to help deliver secure supplies for consumers in the all-island market, particularly with increasing variable generation.

2.2.2 In light of these characteristics, the Regulatory Authorities' (RAs) overall intention with this workstream is to develop policies that will fulfil the following objectives:

- Facilitate effective risk management: Moving from gross mandatory pool with ex-post pricing to a market place with trading in multiple timeframes will introduce new risks. Therefore effective risk management will be key:
 - i. to allow suppliers to manage risks associated with power purchase costs and to facilitate offering long-term fixed prices to end-use customers;
 - ii. to facilitate management of price and volume risk associated with variable spot market prices; and
 - iii. to allow non-vertically integrated entrants to participate on the same terms as vertically integrated incumbent firms by enabling them to effectively hedge their positions.
- Ensure transaction costs are minimised: to manage the administrative cost of trading activity.

- Facilitate the provision of long term price signals: A liquid and efficient forward market should provide long term price signals about future market development, including market entry and exit for both generators and suppliers. In turn, this should promote long term security of supply.
- Ensure spot markets are liquid and that market participants are able to reliably buy or sell products to meet their requirements in a timely way and at a cost-effective price.
- Be consistent with the other elements of the I-SEM design: The policies developed under this workstream should be consistent with the other elements of I-SEM, notably any policy measures adopted to mitigate market power and the CRM reliability options.
- Be consistent with the development of the reference price for CfDs for the UK CfD program, i.e., need for liquid/transparent forward market price as a reference for these CfDs.

2.3 LESSONS LEARNED FROM FORWARD TRADING IN THE SEM

2.3.1 In the SEM there are a number of forward contracts available to market participants. These include:

- Directed Contracts: part of the market power mitigation measures employed in SEM, these are CfDs and are required to be offered by market participants who have market power, based on a number of assumptions that are published by the RAs. The volume to be offered is set by the RAs and the reference price of the CfDs are also set by the RAs. There is no evidence of secondary trading of these CfDs.
- RoI PSO backed CfDs: these also take the form of CfDs and are based on Public Service Obligation (PSO) backed generation in Ireland. The RAs are responsible for setting the reserve price and volume of the contracts to be offered for auction on a trading platform.
- NIE PPB backed PSO contracts: these again are CfD contracts which are offered on Generator Unit Agreement (GUA) backed generation. The reserve price and volume offered are not set by the RAs but are determined by NIE PPB and offered for auction on a trading platform based on the expected value of the legacy GUA contracts.
- Non-Directed Contracts (NDCs): these contracts generally take the form of CfDs and are offered by generators based on expected costs, they can be offered Over the Counter (OTC) or via an auction platform.

Why hasn't the SEM been able to achieve the same liquidity as other markets with a liquid spot market? The table below describes some possible reasons for this and some commentary on how these may develop in the future.

Possible cause	Comment	I-SEM implications	Possible solutions
Infrequency of trading opportunities	The SEM OTC forward market generally only provides participants with the opportunity to trade twice per calendar month, supplemented by ad-hoc NDC auctions with timings and volumes determined by the sellers	Alongside I-SEM, there should be frequent trading opportunities. Other European forward power markets trade on all business days throughout the calendar year	Ensure that trade can be conducted as required by market participants. Exchanges typically operate 24/7 providing continual access to trading opportunities.
Collateral and credit levels	Sellers of CfDs require 15% credit cover and separate lines of credit from the buyer for each contract. No netting of buy/sell positions is possible, increasing credit/collateral requirements further. In addition, because all forward trade is purely financial, buyers still have to buy physical power through pool and require separate credit arrangements for this purchase. Consequently transaction costs are increased.	Forward trading will still be financial so there will still be a requirement for two lines of credit for forward power purchase.	The introduction of an exchange/clearinghouse alongside I-SEM could reduce the credit requirements linked to forward trading by allowing collateral to be posted centrally rather than on a bilateral basis.
Scheduling risk	In a centrally dispatched market generators cannot determine their own schedule. This means a generator can be 'in the money' in the forward market but unable to capture the implied margin because it is not guaranteed to be scheduled through the mandatory pool.	With the relaxation of SRMC bidding principles, generators will have greater freedom to bid at the price they choose and therefore should be able to reduce scheduling risk. However, there will still be no self-dispatch under I-SEM therefore scheduling risk will remain	Appropriate constraint payment arrangements will help. Unclear otherwise given no self-dispatch.

Possible cause	Comment	I-SEM implications	Possible solutions
Imbalance arrangements	As the SEM is centrally dispatched, parties face exposure to Uninstructed Imbalance Payments for deviations between the Dispatch Quantity (issued by the TSO) and the Actual Output. However, there is no concept of energy imbalance for deviations between contractual and physical positions. The absence of energy imbalance exposure reduces the incentive and the need to forward contract to manage imbalance risk.	I-SEM will introduce fully marginal imbalance arrangements. Imbalance exposure should increase incentives to trade in IDM to fine tune positions. Forward trades will be financial only and so not have physical volumes associated with them but financial forwards may offer a route for imbalance price risk mitigation.	Ensuring a liquid intraday market with sufficient variety of products will provide confidence to the market that participants will be able to reduce exposure to imbalance. Consequently, this will support incentives for forward trading
Market concentration / Vertical integration	ESB have a dominant market share with roughly equal generation and supply positions. Therefore there is less incentive for them to contract on a forward basis than there would be for a utility who have a long supply/short generation portfolio	The introduction of I-SEM won't change this situation	Linked to market power mitigation measures
SRMC bidding	With regulated SRMC bidding in the SEM, where thermal generators need to reflect the opportunity cost of the fuel, there is a very close correlation between spot gas prices and SMP, especially baseload. Consequently, gas generators have less incentive to forward contract as the electricity price is a natural hedge to their fuel costs.	The relaxation of SRMC bidding under I-SEM could reduce the correlation between spot gas prices and electricity prices. This would incentivise higher levels of forward trading from gas generators in the future.	n/a

Possible cause	Comment	I-SEM implications	Possible solutions
Capacity payments	In the current SEM, a significant proportion of a generator's fixed costs are covered by the capacity payment as long as the plant is available. This provides a reliable revenue stream – regardless of how much the plant runs – and reduces incentives to contract on a forward basis.	Under I-SEM, those generators that receive a capacity contract will be paid a fixed €/kW payment. This will still provide a reliable revenue stream but to a lesser extent than under the current SEM. It should therefore incentivise higher levels of forward trading	n/a
Wind generation	An increasing volume of generation will come from wind and the uncertainty around generation output limits the opportunity of this generation to be sold in the forward timeframe.	The introduction of I-SEM won't change this situation	Better forecasting of wind output
Market size	SEM is a relatively small market	The introduction of I-SEM won't change this situation	n/a

2.3.2 This workstream will need to consider the lessons learned from SEM experience to date, evaluate the causes and their applicability in I-SEM in order to shape more effective forward trading under the new market.

2.3.3 In order to inform this, stakeholder views are invited on the following questions:

- Are there other issues which have affected forward liquidity in SEM or any comments on the applicability of the issues identified above?
- Which issues are expected to persist with introduction of I-SEM?
- What are the priority issues to address under I-SEM and what possible solutions should be considered?

2.4 PROJECT SCOPE – WITHIN ZONE FORWARD LIQUIDITY

2.4.1 This section discusses the relevant liquidity promoting measures for the Forward markets that the RAs currently consider should be assessed within

this workstream. This section also highlights further questions upon which views from stakeholders are welcome. Current thinking is that the following areas should be examined:

- Specification/nature of forward products
- Nature of participation, including market participation obligations
- Interactions with market power mitigation, including Directed Contracts
- Mediums for trade and trading institutions
- Options for minimising transaction costs

Specification/nature of forward products

2.4.2 The HLD decision paper is clear that I-SEM will have only financial trading instruments for within zone trading. The expectation is that financial contracts will be in the form of CfDs, struck against a market reference market with the day-ahead market suggested as a likely option.

2.4.3 This workstream will consider the specification and nature of financial forward products under I-SEM with the aim of creating arrangements and products that promote forward liquidity and meet the requirements of market participants. This will draw on insights from international experience. The specification/nature of products will also be influenced by a number of the issues discussed in the following sections.

2.4.4 Stakeholder views are invited on the following questions:

- What forward products are expected to be needed under I-SEM?
- Should development of appropriate products be left to the market or is specification from the RAs required?

Nature of participation, including market participation obligations

2.4.5 Under the I-SEM HLD, the Day Ahead Market will be the 'exclusive' route to a physical contract (in addition to exclusive intraday continuous trading and the balancing market). This means that, in principle, participation in the forward markets is intended to be voluntary. It provides an option for financial hedging and risk management, without associated physical nominations.

2.4.6 However, there is scope to alter the nature of participation in order to support development of liquidity in the forward market, as discussed in the sub-sections below.

Market makers

- 2.4.7 One option is to introduce a requirement for “market makers”. The concept of “market makers” is a well-known liquidity promoting measure that has its origin in financial markets. It will typically be regulated through a contract defining the rules for the market maker’s obligation like required MWs offered, bid/offer spreads, number of markets/hours that should be covered etc.
- 2.4.8 This could be implemented in various forms:
- Voluntary participation ("auction" of a required quantity of MWs to be part of the market) – This is the most common way of implementing this where the market operator/regulator will define the required service and contract the desired number of market participants to deliver this service. Many of the power markets in Europe are using this; some in the physical markets (Nord Pool Spot has three market makers in the IDM) and most Financial markets use this for some of their products. Some references to voluntary schemes are at: <http://www.nasdaqomx.com/commodities/markets/marketmakers> ;
 - Mandatory on some market participants (like GB on the largest parties, California on the big 4); or
 - Mandatory for some volumes or all.
- 2.4.9 All of these market maker agreements should be subject to ex-post monitoring.
- 2.4.10 Ofgem has implemented a mandatory regime for selected market participants covering market maker requirements. The arrangements are given effect through the “Secure and Promote” licence condition, which promotes robust reference prices for forward products through a market making obligation on the six largest vertically integrated companies.
- 2.4.11 The arrangements came into effect in March 2014. Details of the arrangements can be found at: <https://www.ofgem.gov.uk/publications-and-updates/wholesale-power-market-liquidity-decision-letter>
- 2.4.12 More details on this regime can be found in the document Merit on Mandatory Participation. It is worth noting that market maker obligations, assumes that the party is vertically integrated and acts as an alternative to ring fencing of generation and supply.

[Small party access](#)

2.4.13 Other measures can also be introduced to enhance participation. For example, the ability for smaller parties to be active in forward trading can be supported by requiring larger participants to offer trading terms to such parties on request. This can take the form of minimum service standards to support market access for smaller parties.

2.4.14 In addition to market maker requirements, Ofgem's "Secure and Promote" licence condition introduced measures to promote the availability of products that support hedging by introducing a set of minimum service standards for trading between eligible suppliers and the largest eight generators, called Supplier Market Access (SMA) rules.

2.4.15 This workstream will consider the need for measures such as market maker obligations and small supplier access requirements upon market participants to support forward trading activity and assess options available for doing so in the context of I-SEM. This has overlap with market power mitigation measures and so needs to interact with this work area to deliver coherent arrangements across the piece. The role of the existing Directed Contracts within this also needs specific consideration (see section below).

2.4.16 Stakeholder views are invited on the following questions:

- Is there a requirement for market maker arrangements? If so, what options should be considered?
- Is there a requirement for arrangements to facilitate small party access? If so, what options should be considered?

[Interactions with market power mitigation, including Directed Contracts](#)

2.4.17 Directed Contracts are primarily a market power mitigation measure but also have implications for forward liquidity. The role for and potential application of Directed Contracts under I-SEM and as part of the financial forward trading arrangements needs specific consideration. There is the potential that Directed Contracts might be applied to wider circumstances, including, perhaps targeting specific 'markets' (which might relate to peaks, flexible generation, specific locations, etc.).

2.4.18 The characteristics of CfDs including volumes, shape, duration and standard terms and conditions will be reviewed including:

- The question over how wide the directed contracts would need to spread (what % of the market is covered?)

- The format of Directed contracts: They can take different forms: e.g. 2-way or 1-way CFDs

2.4.19 This workstream will consider interactions of Directed Contracts with, and implications of market power mitigation for, forward trading arrangements.

2.4.20 Stakeholder views are invited on the following questions:

- What role should Directed Contracts play under I-SEM? What form should they take?
- Are market power mitigation measures needed in the forward market? If so, what options are available and how could they be applied?

Mediums for trade and trading Institutions

2.4.21 The current market for SEM CfDs is bilateral. The sale of PSO related and non-directed CfDs for the SEM was initially carried out by the sellers in an auction, where bidders faxed in their orders. After a year or two these trades were carried out through a broker, Tullet Prebon, and the auction rules between the two main sellers became more standardised and the process become more automated. In 2011 an over the counter market was established for SEM CfDs and ESB, the largest seller, has moved from selling NDCs in auctions to this format of sale.

2.4.22 One of the biggest costs facing suppliers purchasing CfDs is the credit cover required by the seller. The level (15%) and the separate lines of credit needed for different contracts are not the most efficient arrangement and increases costs or limit trade. A pool arrangement for credit across different contracts with the same seller or through a centralised platform would help reduce this and could be achieved through a clearinghouse.

2.4.23 Exchange based trading provides an alternative to bilateral or over-the-counter (OTC) trading. Exchange based forwarding contracting provides security for market participants by acting as a counter party to all trades, allowing credit arrangements to be centralised. Power Exchanges utilize auctions and are sometimes called auction markets. An advantage of auction markets is that one need not find the best price for a good because the Power Exchange interposes itself between buyers and sellers.

2.4.24 An exchange can have a number of advantages over the current bilateral market. It can reduce trading costs, increase competition, and produce a publicly observable price.

- 2.4.25 Lowering the costs of carrying out trades of electricity CfDs should encourage greater liquidity and increase the opportunity for smaller and new entrants to the market. These costs include the fees paid to brokers or power exchange trading fees, credit cover, as well as any of the other contractual or regulatory requirements involved in trading.
- 2.4.26 These costs should be transparent and non-discriminatory, while also being cost and risk reflective. A comparison of SEM with other markets would provide a useful benchmark, when examining the different institutional arrangements for CfD trading in I-SEM. This workstream will consider the potential costs of trading under I-SEM (drawing upon insights from international experience) and consider options that will help to moderate transaction costs under the new market arrangements.
- 2.4.27 In terms of challenges, a power exchange would demand a minimum number of participants and volume of trades to be economically viable. This workstream will look at requirements for a Power Exchange serving I-SEM. This could be a local, specific exchange or an I-SEM screen on an existing exchange. It will also consider measures to facilitate the establishment of Power Exchange services for I-SEM. This will include consideration of the institutional and legal arrangements needed to develop the required institutions and trading frameworks.
- 2.4.28 Stakeholder views are invited on the following questions:
- Is an I-SEM specific exchange or an I-SEM screen on an existing exchange preferable?
 - What conditions are needed to support effective functioning of an I-SEM exchange?
 - Should development of an exchange be left to the market or is specification from the RAs required?

2.5 PROJECT SCOPE – WITHIN ZONE SPOT MARKET LIQUIDITY

- 2.5.1 This section discusses the relevant characteristics of the spot markets that will affect liquidity. This includes the following:
- Energy imbalance arrangements
 - Gate Closure
 - Product availability
 - Demand side participation
 - Variable generation participation

- Aggregation
- Non-physical participation
- Transparency and reporting
- Platform for intraday trading
- Interaction with RES support
- Interaction with Reliability Options

2.5.2 Some of these characteristics are the subject of separate workstreams and engagement with industry. The purpose of the Forward and Liquidity workstream will be to review their development from the perspective of the requirement to develop liquidity in the relevant markets.

2.5.3 The table below discusses the RAs thoughts on issues that should affect liquidity in the near term market. These initial views should be verified within the scope of the project.

TABLE 1 – FACTORS AFFECTING LIQUIDITY IN THE NEAR-TERM MARKETS

	Area	Requirement
Commercial incentives	Energy imbalance arrangements	Imbalance (or cashout) prices need to provide appropriate signals for parties to balance their contractual and metered physical positions. If signals are appropriate, parties will have commercial incentives to fine-tune contractual positions in IDM, stimulating trading activity in this timeframe. The proposal for marginal cashout prices will help to provide this signal.
	Gate Closure	Setting Gate Closure to be as close to real-time as possible allows improved forecasts of likely wind, solar, demand outturn to be backed out by trading activity in the latter stages of IDM.
	Product availability	Need IDM products to match granularity of settlement timeframes, so that parties are able to buy/sell power to manage contracted energy positions at the settlement period granularity.
Participation	Demand side participation	The demand-side of the market must be actively involved in DAM and IDM. Without this, the market is one-sided and transaction opportunities are reduced. Variations in demand forecasts will be a trigger for re-trading as real-time approaches. Suppliers should actively participate in both DAM and IDM, seeking to balance their expected physical positions with contractual positions. If they are sheltered from the market or imbalance, the incentives to trade in these timeframes are reduced.
	Variable generation participation	Variations in variable generation forecasts are another trigger for re-trading in the run-up to real-time. Parties responsible for variable generators should also actively participate in both DAM and IDM, seeking to balance their expected physical positions with contractual positions. If they are sheltered from the market or imbalance, the incentives to trade in these timeframes are reduced.
	Aggregation	Smaller scale generation can be aggregated and represented in the market by an aggregator. This allows such generation to interface with the market still, albeit, via an intermediary.
	Non-physical players	Allowing non-physical players to trade in the markets increases the pool of participants and introduces parties with different risk appetites. This may support trading opportunities.

	Area	Requirement
User friendliness	Transparency and reporting	Having access to information on traded prices / volumes and bid-offer spreads improves transparency of near-term markets and reliability of reference prices. This improves confidence in the market and willingness to trade.
	IDM trading platform	This needs to offer reliable service at an appropriate cost. Intraday auctions can pool IDM liquidity, but introduce complexity given requirement for continuous intraday trading.
Interactions with other instruments	Interaction with RES support	Supported generators should have an interest in the DAM and IDM and have an incentive to ensure that the markets produce a 'genuine' price that they can then capture. This is consistent with the State Aid guidelines which require that supported renewable generators sell directly into the market and are subject to market obligations. Where market price premium support schemes are developed, the choice of market for setting the reference price will stimulate trade in the associated market. If a DAM price is used as the reference, this is expected to concentrate trade of supported generation into this timeframe in order to mitigate basis risk.
	Interaction with Reliability Options	Similar to above, the basis for the RO reference price will have a bearing on trading behaviour in the near-term markets.

2.5.4 Stakeholder views are invited on the following questions:

- Are there other issues which will affect liquidity in the near-term markets?

3 CROSS BORDER FINANCIAL INSTRUMENTS

3.1 CONTEXT

- 3.1.1 The I-SEM HLD proposes, subject to further discussions and agreement with Ofgem as the GB market regulator, that cross-border trading will be supported through Financial Transmission Rights (FTRs) only. An FTR is effectively a Contract for Difference (CfD) where the holder receives a payment based on the difference in the Day-Ahead price between the two zones.
- 3.1.2 This decision is linked to EU Target model requirements specified in the Network Code on Forward Capacity Allocation (FCA). To allow cross-zonal transmission risk hedging, the FCA allows for auctioning of long-term cross-zonal capacity in the form of Physical Transmission Rights (PTRs) subject to Use-It-Or-Sell-It (UIOSI) provisions or FTRs.
- 3.1.3 For I-SEM, the SEM Committee identified FTRs as the preferred option given the anticipated positive effect that they have on market efficiency and liquidity in the day-ahead market. The risk of PTRs 'locking-out' capacity from the day-ahead market is particularly relevant for I-SEM given that capacity of the existing interconnectors (the East West Interconnector and the Moyle Interconnector) equates to ~20% of the all island market.
- 3.1.4 While FTRs are, therefore, to be the basis of cross-border transmission arrangements (subject to agreement with Ofgem), the HLD highlights several decisions in relation to FTRs that need to be considered during the detailed design phase:
- Nature of the product: possibilities include one-way CfDs (FTR Options) and two-way CfDs (FTR Obligations); and
 - Method of allocation: auction mechanism design and rules.
- 3.1.5 Different FTR variants are outlined below after considering the objectives for this element of the project.

3.2 OBJECTIVES

- 3.2.1 The development of FTRs should be progressed with reference to the following objectives, which are consistent with the overall objectives for I-SEM. The FTR arrangements should:

- promote efficient use of cross-zonal transmission;
- promote competition within I-SEM and between zones;
- be compatible with market power mitigation measures; and
- provide adequate return for existing assets and appropriate signals for future cross-border investment.

3.3 FTR VARIANTS

3.3.1 FTRs are financial instruments and do not entail physical nominations or flows. As highlighted above, the format of FTRs can vary in form, with FTR Options and FTR Obligations available.

3.3.2 An FTR Option is a one-way CfD struck, most likely, around the day-ahead clearing prices from market coupling for the relevant zones:

- An FTR Option for import from GB to I-SEM entitles the holder to receive the difference between zonal prices when the I-SEM price is higher, without a duty to pay when the I-SEM price is lower.
- An FTR Option for export to GB from I-SEM entitles the holder to receive the difference between zonal prices when the I-SEM price is lower, without a duty to pay when the I-SEM price is higher.

3.3.3 An FTR Obligation is a two-way CfD. Again, it is likely to be struck around day-ahead clearing prices for the relevant zones:

- An FTR Obligation for import from GB to I-SEM entitles the holder to receive the difference between zonal prices when the I-SEM price is higher (as for an FTR Option). However, when the I-SEM price is lower, the holder is obliged to pay the difference.
- An FTR Obligation for export to GB from I-SEM entitles the holder to receive the difference between zonal prices when the I-SEM price is lower (as for an FTR Option). However, when the I-SEM price is higher, the holder is obliged to pay the difference.

3.4 PROJECT SCOPE – CROSS BORDER FINANCIAL INSTRUMENTS

3.4.1 Given the HLD decision in favour of FTRs, and with the objectives outlined above in mind, work under this workstream to develop FTRs for I-SEM must take into account the following, consistent with the FCA Network Code:

- Design of I-SEM FTRs
- Allocation
- Firmness
- Revenue Adequacy
- Market Power
- Interaction With CfDs, Reliability Options And Renewable Certificates
- Transitional Arrangements

3.4.2 The workstream will have due regard to the continuing development of the FCA Network Code and the scope for discretion allowed to the I-SEM. The workstream will also give due regard to the requirement to work closely with Ofgem to ensure consistency of arrangements.

Design of I-SEM Financial Transmission Rights

3.4.3 The workstream will consult upon and decide on the nature of FTRs with a view to defining the appropriate terms and conditions for FTRs to facilitate trading of energy in the ISEM, efficient use of interconnectors (for both imports and exports), and to support forward market liquidity.

3.4.4 This will include consideration of the advantages and disadvantages of Options and Obligations as possible FTR variants with reference to the objectives for cross-border transmission rights. For example, FTR Obligations may be considered to enhance liquidity as they can facilitate netting of rights and so increase the volume of auctioned rights. But the two-way nature of payment flows has implications for risk exposure. Such issues, amongst others, will need to be considered as part of this workstream. In addition, the treatment of FTRs under financial regulations needs specific consideration. Concern exists that FTRs may be subject to financial regulation under MIFID II. It is understood that the TSOs are explicitly excluded from its provisions in Article 2(1)n of MIFID II but that the Regulation will apply to secondary trading. However MIFID II as a Directive is not directly applicable and must be transposed into national law, so that it may have application before this occurs. TSO FTR trading may also come under the scope of EMIR, which would as a minimum affect the reporting obligations of market participants. The impact of any financial regulation will therefore be considered within the scope of the workstream.

3.4.5 Also within scope will be treatment of losses on the interconnector within the FTR design.

3.4.6 Stakeholder views are invited on the following questions:

- What are the advantages and disadvantages of FTR Options or FTR Obligations? What is your preferred approach?
- What measures need to be implemented to comply with financial regulation requirements?
- How should transmission losses be factored into FTR design?

Allocation

3.4.7 FCA Network Code requires a single centralised platform for allocation and settlement of forward capacity products. Article 54 sets out the requirements of a Single Allocation Platform and Article 56 sets out requirements for harmonised allocation rules. There is currently no existing solution proposed for the Single Allocation Platform. However, it is understood that the auction offices of CASC and CAO are working towards this. The development of the auction platform and allocation rules should address the specifics of I-SEM to ensure compatibility.

3.4.8 This workstream will, therefore, consider options for fulfilling these requirements in the I-SEM context (including the preferred FTR variant) to shape the development of the Single Allocation Platform. It will also consider transitional steps necessary to move to this position, including potential development of a regional auction to bridge the transition to a single European auction platform.

3.4.9 The following issues will fall within the scope of the workstream:

- Auction design and auction provider determination (IC Owners/TSOs);
- Auction rules, timing of auctions, credit arrangements including collateral;
- Treatment of losses on the interconnectors (volumes and calculation of congestion rents);
- Conditions for provision of information and transparency of price formation;
- Potential regulation of auctions and market power/conflict of interest mitigation measures within auctions; and
- Provision of a clearing house (settlement of FTRs) function and possible arrangements for secondary trading.

3.4.10 Stakeholder views are invited on the following questions:

- What are the I-SEM specific issues that need to be considered in development of a Single Allocation Platform?
- Should development of allocation arrangements be left to the market or is specification from the RAs required?

Firmness

3.4.11 The firmness of transmission rights and associated compensation arrangements influence the allocation of risks between capacity holders and interconnector owners in the event that rights are constrained. Article 59 of the FCA Network Code identifies the concept of a Long Term Firmness Deadline (LTFD), which is the point at which full financial firmness is conferred on holders of a capacity right, with compensation for curtailment of rights after this point. The flipside is that this creates exposure for interconnector owners and/or the consumers who underwrite them, in the event that rights are curtailed and compensation must be paid. For interconnector owners, risk arises where full capacity has been auctioned but actual capacity is reduced so that the issuer of FTRs is exposed to full payment of the market spread of the capacity auctioned but receives only the congestion rent of the capacity that actually flows.

3.4.12 Clarity regarding firmness for any issued FTRs is required in order to understand associated risks and to define arrangements for settlement of FTRs. However, final definition of firmness and associated financial responsibility for compensation are still outstanding. There is continuing debate between ACER and ENTSO-E in relation to this issue. ACER considers that the risk should be allocated to the interconnector owners, i.e., those that issue the rights and are responsible for ensuring the availability of the interconnection capacity should face the risk of non-availability of that capacity, while ENTSO-E is of the view that the risk should be with Interconnector users.

3.4.13 While the European requirements are still to be finalised, this workstream, therefore, will address the following taking into account ongoing developments at a European level:

- firmness of transmission rights including potential variations between different timeframes; and
- arrangements for compensation for curtailment before day ahead, after day ahead and potential exclusions from liability for compensation, including force majeure or unexpected limitation of interconnector capacity.

3.4.14 Stakeholder views are invited on the following questions:

- What are the I-SEM specific issues that need to be considered in consideration of firmness?
- Should treatment of firmness issues be left to the market or is input from the RAs required?

Revenue Adequacy

3.4.15 This element of the work will consider the implications of FTR arrangements for revenue adequacy for existing and potential future interconnectors. It links back to the objective that FTR arrangements should provide adequate return for existing interconnector assets and appropriate signals for potential future investment.

3.4.16 The issue of revenue adequacy is related to the question of firmness. So, for example, relatively lower ramp rate on interconnection of the I-SEM means that flows across the interconnector may be in the wrong direction for a number of hours. This poses a question of how, if at all, this feature is to be included in the design of FTRs and the extent to which the value of FTRs should take account of such limitations.

3.4.17 Revenue adequacy is also influenced by any rules setting possible minimum requirements for sale and determining the amounts to be made available for sale within different timescales.

3.4.18 The objective of this element of the work programme is, therefore, to consider implications of FTRs for interconnector revenue adequacy and to develop arrangements that provide adequate financing for these assets.

3.4.19 Stakeholder views are invited on the following question:

- What are the issues relating to revenue adequacy that need to be considered?

Market Power

3.4.20 This element of the work programme will examine whether holding FTRs may lead to or exacerbate market power in the energy market in I-SEM. If such potential is identified, mitigation measures will be identified.

3.4.21 Stakeholder views are invited on the following questions:

- What potential market power issues are linked to FTRs? How can they be dealt with?

Interaction With CfDs, Reliability Options And Renewable Certificates

3.4.22 Trading in FTRs will take place alongside trading in CfDs for hedging, Reliability Options (ROs) under the Capacity Remuneration Mechanism and renewable certificates. Several forms of CfD with differing purposes are, therefore, expected to co-exist and it is possible that a party will need to make several difference payments for the same timeframe under a suite of CfDs.

3.4.23 The interaction between these different products must be mapped and potential implications identified in order to support coherent development of arrangements across the suite of products. Consideration will, therefore, be given as to the options for delivering coherent arrangements that meet the collective objectives.

3.4.24 Stakeholder views are invited on the following questions:

- What interactions with other CfDs need to be considered in development of FTRs? What potential implications does FTR design have on these areas of interaction?

Transitional Arrangements

3.4.25 Transitional arrangements for the introduction of transmission rights for financing interconnection and facilitating cross-zonal trade shall be part of the scope of the workstream. This shall include the issues set out in 3.4.8 above.

3.4.26 Stakeholder views are invited on the following questions:

- How should transition to FTRs be managed? What requirements are there during the transition phase?

4 SUMMARY

4.1.1 This discussion paper outlines initial views concerning issues of relevance to or affecting the Forwards and Liquidity workstream and seeks feedback on these topics from stakeholders to inform the progression of the workstream.

4.1.2 Specific views are sought from stakeholders on questions below, which should be received by 17:00 on 27 March 2015. Responses should be sent to James Curtin (jcurtin@cer.ie) and Joe Craig (joe.craig@uregni.gov.uk). Please note that the SEM Committee intends to publish all responses unless marked confidential.

James Curtin
Commission for Energy Regulation
The Exchange
Belgard Square North
Tallaght
Dublin 24

Joe Craig
Utility Regulator
Queens House
14 Queen Street
Belfast
BT1 6ED

4.2 WITHIN ZONE FORWARD AND SPOT MARKET LIQUIDITY

Lessons learned from SEM

- Are there other issues which have affected forward liquidity in SEM or any comments on the applicability of the issues identified above?
- Which issues are expected to persist with introduction of I-SEM?
- What are the priority issues to address under I-SEM and what possible solutions should be considered?

Specification/nature of forward products

- What forward products are expected to be needed under I-SEM?
- Should development of appropriate products be left to the market or is specification from the RAs required?

Nature of participation, including market participation obligations

- Is there a requirement for market maker arrangements? If so, what options should be considered?
- Is there a requirement for arrangements to facilitate small party access? If so, what options should be considered?

Interactions with market power mitigation, including Directed Contracts

- What role should Directed Contracts play under I-SEM? What form should they take?
- Are market power mitigation measures needed in the forward market? If so, what options are available and how could they be applied?

Mediums for trade and trading Institutions

- Is an I-SEM specific exchange or an I-SEM screen on an existing exchange preferable?
- What conditions are needed to support effective functioning of an I-SEM exchange?
- Should development of an exchange be left to the market or is specification from the RAs required?

Factors affecting liquidity in the near-term markets

- Are there other issues which will affect liquidity in the near-term markets?

4.3 CROSS BORDER FINANCIAL INSTRUMENTS

Design of I-SEM Financial Transmission Rights

- What are the advantages and disadvantages of FTR Options or FTR Obligations? What is your preferred approach?
- What measures need to be implemented to comply with financial regulation requirements?
- How should transmission losses be factored into FTR design?

Allocation

- What are the I-SEM specific issues that need to be considered in development of Single Allocation Platform?
- Should development of allocation arrangements be left to the market or is specification from the RAs required?

Firmness

- What are the I-SEM specific issues that need to be considered in consideration of firmness?
- Should treatment of firmness issues be left to the market or is input from the RAs required?

Revenue Adequacy

- What are the issues relating to revenue adequacy that need to be considered?

Market Power

- What potential market power issues are linked to FTRs? How can they be dealt with?

Interaction With CfDs, Reliability Options And Renewable Certificates

- What interactions with other CfDs need to be considered in development of FTRs? What potential implications does FTR design have on these areas of interaction?

Transitional Arrangements

- How should transition to FTRs be managed? What requirements are there during the transition phase?

APPENDIX 1 – MARKET POWER AND LIQUIDITY IN THE SEM

Trading in forward contracts outside of those where there was regulatory influence or PSO backed generation was infrequent in the initial years of the SEM. The SEM Committee conducted a review of market power and liquidity, part of the purpose of which was to analyse forward contracting available to market participants.

The SEM Committee report showed that regulated forward contracts alone did not provide all the forward liquidity to facilitate 100% coverage of supply. Including Directed contracts and PSO backed CfDs, as well as NIE PPB's PSO related CfDs, regulated forward contracts only accounted for around 6GWh of the overall energy production (approx. 35GWh).

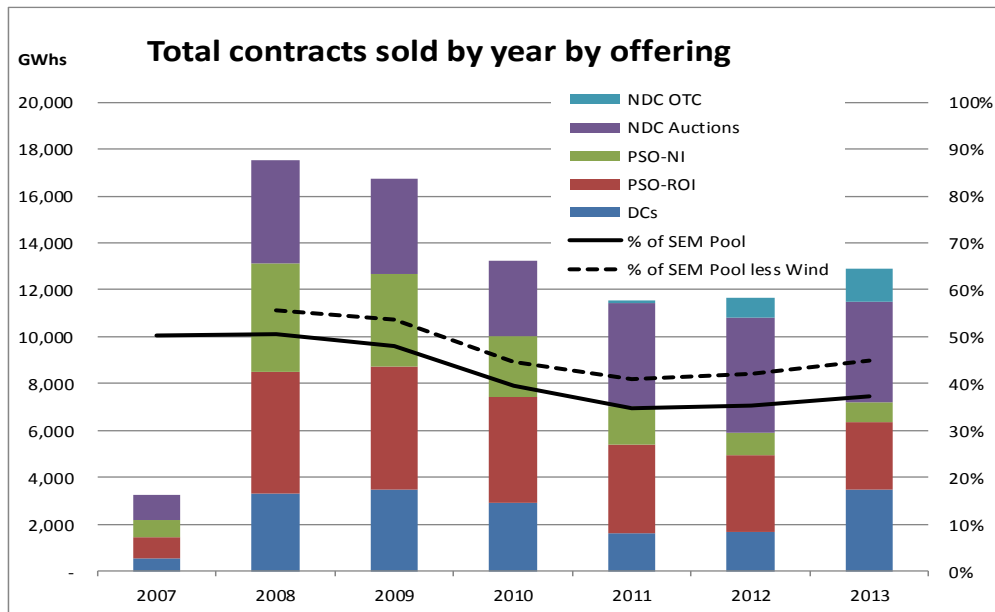
Other forward products were and are made available through OTC trades and through a trading platform and it is worth noting that this data was not included in the review. The SEM Committee acknowledged that NDC offerings by ESB made up a substantial proportion of hedging contracts available to market participants.

A more general finding indicated that forward contracts as set out above, only accounted for a maximum of 50% of total generation in SEM. These figures do not include OTC products offered by parties other than ESB, do not take into consideration those participants who are vertically integrated and can hedge internally, and do not take into account independent generators who also have the ability to offer hedging products.

The figure below shows the declining trend since the SEM Committee review and with contracts representing 37% of total SEM generation in 2013. The contract volume changes have been driven by two main factors: changing market power and reduced forecast generation of the sellers. The former factor influences the volume of DCs, which are mostly imposed on ESB Power Generation (PG), and led to an overall fall in DC volumes from 2009 to 2011 as ESB PG's spot market share/power fell. DC volumes then increased significantly in 2013 due to ESB PG and ESBI generation horizontally integrating. This horizontal integration of ESB was allowed for by the SEM Committee, following public consultation, in its decision of

SEM/12/002³, given the low market power risks involved. The latter factor has influenced the volume of PSO-related CfDs offered to the market, as the forecast generation from power stations covered by the PSO has fallen over time in both jurisdictions.

Figure 1

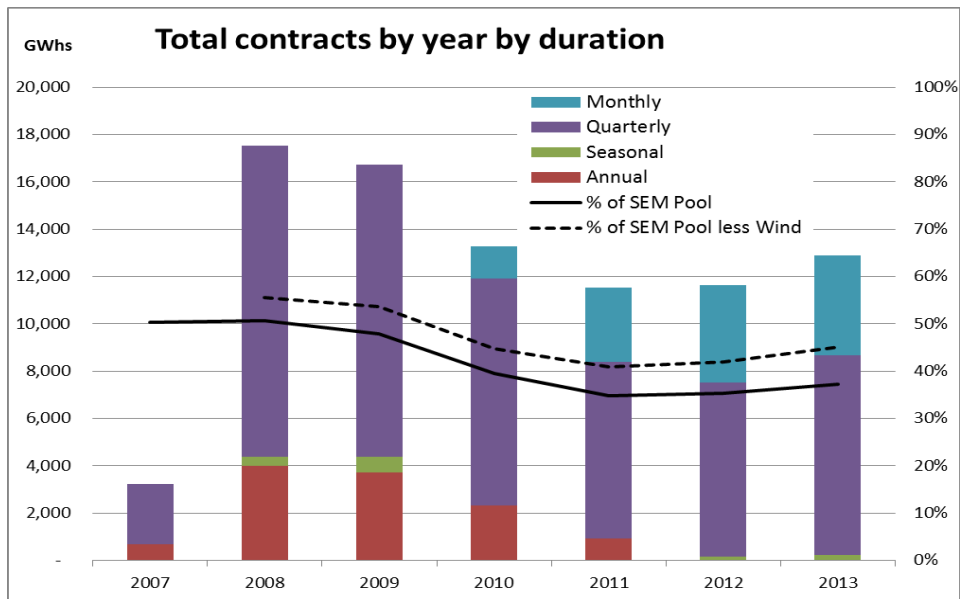


The duration that CfDs are offered for is an important aspect of buyers and sellers hedging. Shorter term products offer greater commercial flexibility and longer term products offer potentially greater commercial stability. To date there have been four duration types, annual, seasonal, quarterly and monthly.

As can be seen in the figure below, the majority of contracts in the SEM have been offered as quarterly products, driven by the DCs for which this is the sole duration. Monthly products were first introduced for 2010 and have increased over the years, helped by the change in ROI PSO-related CfDs from quarterly to monthly products, offered quarterly.

³ http://www.allislandproject.org/en/market_decision_documents.aspx?page=4&article=682a98fe-9c18-4c73-8fa3-57e75d24d85e

Figure 2



The frequency of trading contracts (based on trades made) did not change significantly in the first few years (2007-9) of the SEM and increased by nearly 40% in 2010 while gradually declining since. Overall, the share of ‘business days with CfDs traded’ peaked at 24% in 2011. Regulated contracts dominate the number of trading days in the year. In 2014 OTC trades take place on the first and last Wednesday of every month.

Figure 3

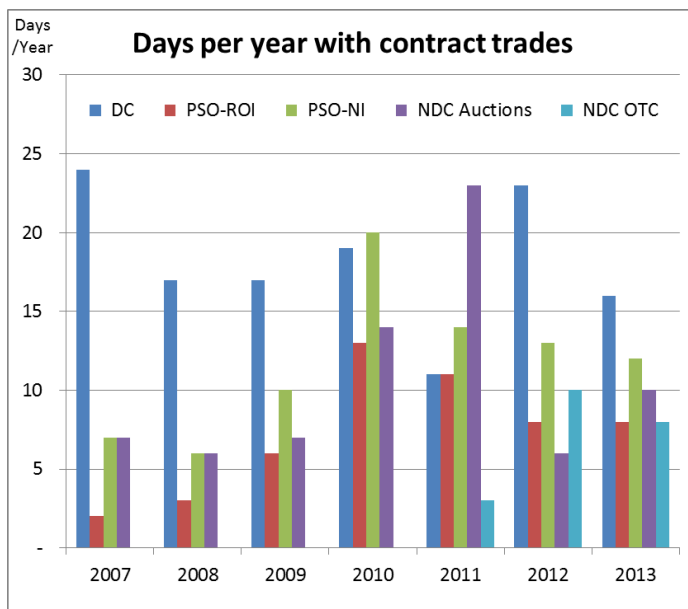
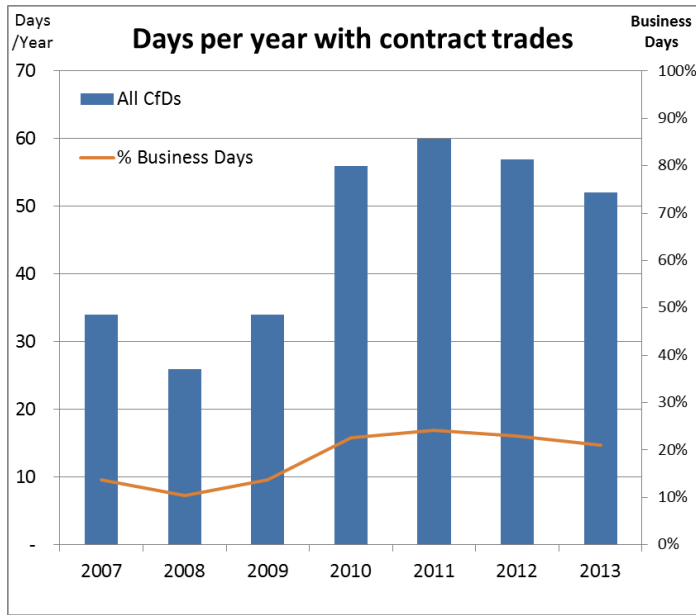


Figure 4



Contracts are sold on average between 6 and 7 months in advance of the commencement contract period. This varies by contract, such as PSO-ROI contracts are sold close to delivery (2 months on average) in recent years while in 2012 NDC auctions sold contracts over 14 months ahead. Figure 6 shows that more volume of contracts are sold 4 months ahead than any other duration but the spread of volume being sold for different durations has become less concentrated in more recent years. Between 2007-2013 between 70-95% of volume has been sold within a 12 month duration.

Figure 5

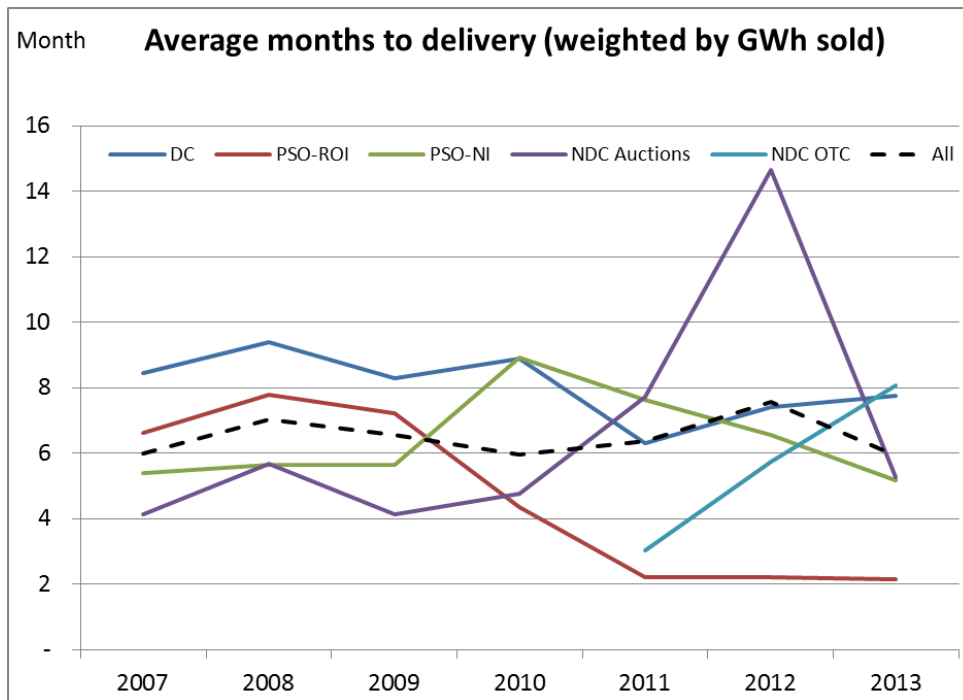


Figure 6

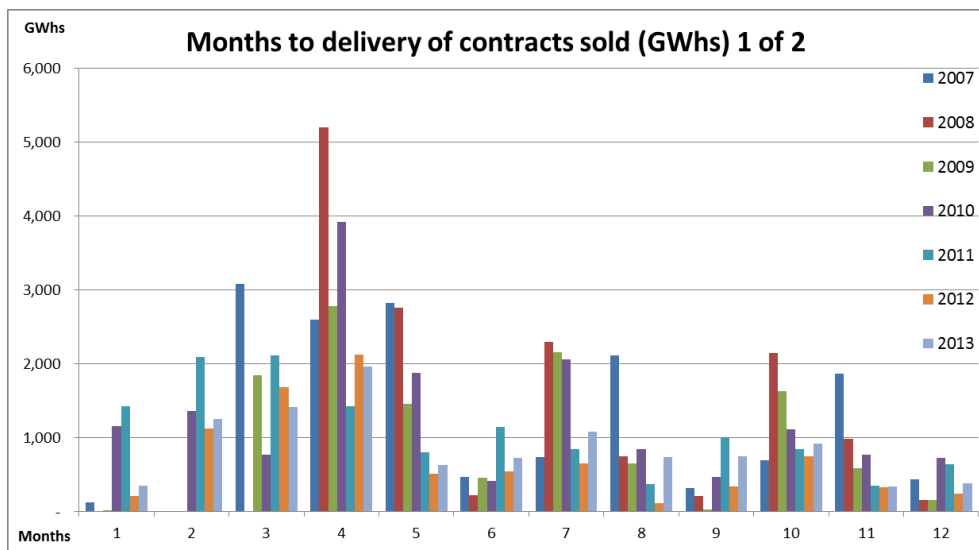
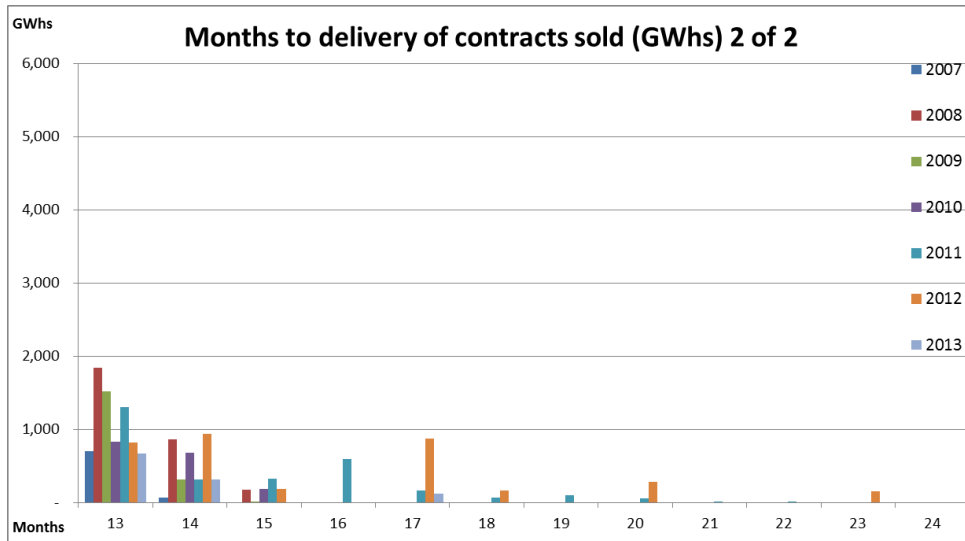


Figure 7



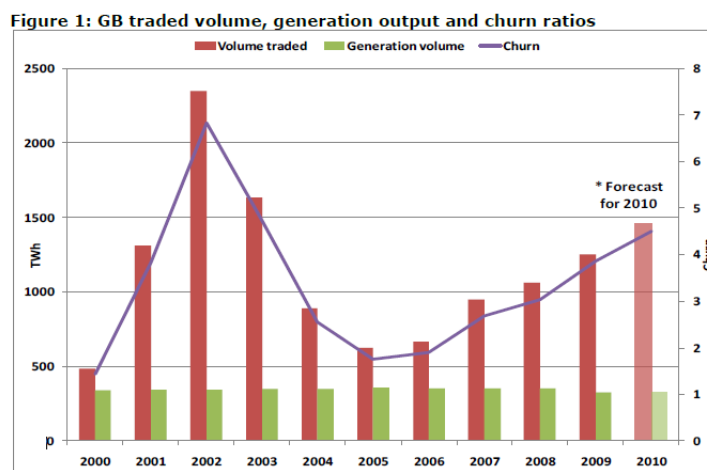
The introduction of the Tullet Prebon trading platform offered a focus point for non-regulated contract trades in addition to those offered by the incumbents. Despite this, the offering of contracts has been dominated by the incumbents, with the addition of AES. The introduction of the over the counter trading, in addition to the auctions, has allowed greater participation of suppliers in price discovery.

The experience of the SEM has therefore been that market participants have not provided enough forward market liquidity, in excess of regulated contracts, to provide sufficient hedging on a forward basis. This has impacts on independent suppliers wishing to avail of hedging products, and has resulted in those hedging products that have been offered by independent generators being offered at a significant premium to account for the potential risk associated with not being in the market schedule on the day of expected delivery.

APPENDIX 2 – OFGEM REPORT ON LIQUIDITY

OFGEM began investigating liquidity in the electricity market after it was identified that there was a potential issue relating to the level of competition in the retail energy markets. In their assessment⁴ OFGEM conducted an analysis of a total of 11 metrics. The data does not go further than 2010, although there is a significant amount of information in relation to the experience gained in BETTA and a comparison to other European electricity markets. This appendix provides only an overview of some of those metrics. Further information is available from “GB wholesale electricity market liquidity: summer 2010 assessment” OFGEM (2010).

OFGEM provided an initial overview of the traded volumes and generated volumes, which gives a good view of the churn rate within the GB market. Evidence indicates that this peaked at a churn rate of close to 7 in 2002. OFGEM’s stated explanation for the sharp increase followed by a sharp drop over the subsequent years was that “the rise and fall in churn ratios during the period 2001 - 2003 is likely to have been influenced by the introduction of NETA and the trading activities (and subsequent exit) of a number of active trading companies such as Enron, TXU, AES and AEP.” In addition to this drop in churn rate it should be noted that since 2005 churn steadily increased to around 4 in 2009 and was forecast to rise to around five in 2010. This is shown in figure 1 below.



OFGEM also provided a summary of the churn rate in other European electricity markets over a similar period. This data indicates that EPEX Spot/EEX-Germany and Nord Pool Spot/NASDAQ OMX have high churn levels relative to other European

⁴ <https://www.ofgem.gov.uk/ofgem-publications/40483/gb-wholesale-electricity-market-liquidity-summer-2010-assessment.pdf>

markets, although GB, France and the Netherlands have all experienced increases in churn rates since 2006.

Table 1: Churn rates in other European countries (sourced from OFGEM)

Year	GB	France	Germany	Netherlands	Nordpool
2001	3.8	0.4	5.0	1.1	7.9
2002	6.8	0.6	3.5	1.7	9.1
2003	4.7	0.7	4.3	2.3	5.5
2004	2.6	0.8	5.1	3.0	5.5
2005	2.0	0.9	6.0	3.6	6.4
2006	1.9	1.1	8.0	4.6	6.7
2007	2.7	1.4	8.5	5.0	7.5
2008	3.0	1.5	8.5	4.6	8.0
2009	3.9	1.8	9.6	3.4	7.6

Source: European Commission, European regulators, Ofgem calculations

The bid-offer spread is indicative of the transaction costs associated with trading in the market. A tight spread between the bid price and the offer price usually signals a liquid market as it indicates the presence of a large number of participants and allows market participants to transact at a low cost.

APPENDIX 3 – EU REGULATIONS

The high level design of I-SEM requires trading in the forwards timeframe to be by financial instruments only. The relevant legislative framework for financial trading is set out below:

REMIT

The Regulation on Energy Market Integrity and Transparency (REMIT)⁵ came into effect in December 2011, and is targeted directly at the energy sector. It is based on ex-post market surveillance, and will be applicable in the All-Island market even before the implementation of I-SEM.

The Regulation is directly applicable to member countries without transformation into national legislation, but does require certain national implementation measures, such as to give local regulators or competition authorities powers to enforce REMIT requirements, and to set up appropriate penalty regimes, which were due to be introduced by the end of June 2013. The key aspects of REMIT are to prohibit insider trading in energy markets, and to enhance trading and physical transparency.

Under REMIT, generators will be required to publish trading and plant availability data. The legislation is supervised by the Agency for the Cooperation of Energy Regulators (ACER), national regulators and the European Commission (EC). It also includes the establishment of a European register of companies active in the wholesale energy markets, including large consumers.

EMIR

EMIR regulates all OTC derivatives, such that they must be centrally reported from February 2014, and may also require that they are centrally cleared if a certain threshold is reached, with serious implications for credit provisions, and therefore costs to the end consumer.

MFID

MIFID has been in place for a number of years, and seeks to regulate financial instruments and derivatives within the financial sector. However an updated version, known as MIFID II, has recently been agreed which might mean that some energy trades will be treated as derivatives, and hence regulated by the Financial Regulatory Authority rather than the Energy RAs. In turn, if this happens, they would also count towards the EMIR threshold for central clearing.

⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:326:0001:0016:en:PDF>.