

Single Electricity Market Committee

ESB Power Generation Directed Contract Subscription Rules

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1 Introduction

The Commission for Energy Regulation (“CER”), in consultation with the Northern Ireland Authority for Utility Regulation (jointly referred to as the Regulatory Authorities), have directed ESB Power Generation (“ESB”) to offer Contracts for Difference in the I-SEM Market to licensed retail suppliers in Ireland and Northern Ireland. The Regulatory Authorities have provided the form of contract that is to be used, such contracts referred to as Directed Contracts. Each transaction under a Directed Contract will be comprised of a two-way Contract for Difference and a European style Commodity Call Option with automatic exercise to hedge capacity market Reliability Option exposure. Prior to each round of Directed Contracts, the Regulatory Authorities will publish an Information Paper specifying the relevant parameters for the product offering, i.e. aggregate volumes to be offered and the method by which the contracts will be priced. In addition, the Regulatory Authorities have specified a subscription process by which licensed retail suppliers may enter into these “Directed Contracts” during a specified time frame. All licensed retail suppliers serving customers in Ireland or Northern Ireland circa three weeks in advance of the beginning of the Primary Subscription window are eligible to participate in the Directed Contracts subscription process scheduled as advised by the Regulatory Authorities. In addition, new entrants licensed during a Primary Subscription window circa one week in advance of the Supplemental Subscription window will be permitted to participate in a Supplemental Subscription Window, as described in Section 7 below. For subsequent Subscription Windows, see paragraph 7 also.

This document contains rules designed to facilitate and to clarify a subscription process for suppliers. The rules were developed by ESB in consultation with the Regulatory Authorities. The document has been submitted to the CER for approval in accordance with condition 4 of ESB’s licence to generate electricity. As this is a SEM matter the SEM Committee¹ has reviewed and decided to approve this guideline document on behalf of CER.

¹ The SEM Committee is established in Ireland and Northern Ireland by virtue of section 8A of the Electricity Regulation Act 1999 as inserted by section 4 of the Electricity (Amendment) Act 2007, and Article 6 (1) of Electricity (Single Wholesale Market) (Northern Ireland) Order 2007 respectively. The SEM Committee is a Committee of both CER and NIAUR (together the Regulatory Authorities) that on behalf of the Regulatory Authorities, takes any decision as to the exercise of a relevant function of CER or NIAUR in relation to an SEM matter.

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2 Dates for Directed Contract Subscriptions

. The timetable for the Subscription Windows will be advised by the Regulatory Authorities as published in the Information Paper for the relevant Subscription Window..

3 Execution of Directed Contract Documentation

Any eligible supplier wishing to enter into Directed Contracts during the Subscription Window must have:

1. Executed the relevant Contract, Contract for Differences (being a Directed Contract) Financial Energy Master Agreement together with the Schedule (hereinafter, the “CfD DC FEMA”) Credit Support Annex (“CSA”) and relevant Confirmation(s) with ESB. The executed agreement must be in the form published by the Regulatory Authorities;
2. Posted the appropriate credit cover, i.e. margin (as defined herein);
3. Executed ESB’s Counterparty Dealing Mandate as set out under the Schedule to the CfD DC FEMA; in accordance with ESB Corporate Governance policy (as may be amended, modified, supplemented or replaced from time to time)
4. Provided ESB with a list of its authorised traders, authorised signatories and relevant contact details as set out under the Schedule to the CfD DC FEMA; and
5. 5-ESB provided a copy of the Specification to the eligible supplier as set out in Part 3 of the Schedule to the CfD DC FEMA.

This complete suite of documentation must be received by ESB at a minimum of two (2) Business Days prior to commencement of any trading activity between the supplier and ESB for either the Subscription Window or the Supplemental Subscription Window.

Unless expressly provided otherwise in these Subscription Rules, words and expressions shall have the same meanings as are respectively given to them in the CfD DC FEMA, CSA and relevant Confirmation(s).

4 Supplier Eligibility

In advance of a Directed Contract (DC) Subscription Window the Regulatory Authorities will issue each eligible supplier a matrix showing the total megawatt quantity of Directed Contracts for which they are entitled to subscribe. Suppliers will be subject to eligible contract participant criteria as set out under the relevant financial regulations, and will need to meet them before entering into a Directed Contract with ESB.

The eligibility is broken down by quarter and by product, as illustrated in the table below

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per the products as defined below:

	<i>[Supplier: Name] Eligibilities for Directed Contracts with ESB</i>		
Quarter	Baseload Quantity (MW)	Mid-Merit Quantity (MW)	Peak Quantity (MW)
QX 201X	X	X	X
QX 201X	X	X	X
QX 201X	X	X	X
QX 201X	X	X	X

ESB has been provided with each supplier’s eligibility and will confirm that each supplier’s elections are within the eligibility parameters set by the Regulatory Authorities.

5 Pricing of Contracts (Commercial/Modelling/Market Risk)

5.1 CFD Fixed Price

For I- SEM Subscription Windows, (i.e. Subscription Windows prior to the conclusion of the Forwards and Liquidity Consultation Process), the CFD Fixed Price for each transaction will be set using the published formulae and associated forward fuel prices. The formulae and formulae constants will be published by the Regulatory Authorities in an information paper prior to each round of DCs. For the I-SEM Subscription Windows the formulae used to calculate the Fixed Reference Price will be based on the last published SEM formulae for the relevant quarter. For the avoidance of doubt the following table sets out formulae to be used for I- SEM Subscription Windows.

Multiply Gas coefficient by euro/therm Gas price, Coal coefficient by euro/tonne, Coal price and CO ₂ coefficient by euro/tonne CO ₂ price.					
Contract (p)	Quarter (q)	Constant (α_{q,p})	Gas (β_{q,p})	Coal (δ_{q,p})	CO₂ (ε_{q,p})
Baseload	Q3 18	10.62	56.051	0.0477	0.4352
Mid Merit	Q3 18	10.61	60.835	0.041	0.445
Baseload	Q4 18 ¹	13.77	51.352	0.0713	0.4881
Mid Merit	Q4 18 ¹	16.74	58.313	0.0610	0.4797
Peak	Q4 18 ¹	38.25	40.038	0.0754	0.5674
Baseload	Q1 19 ¹	16.72	48.392	0.1010	0.5813
Mid Merit	Q1 19 ¹	21.680	50.297	0.1106	0.6014
Peak	Q1 19 ¹	42.98	31.578	0.1885	0.8043

¹Q4’18 is based on Q4’ 17 and Q1’19 is based on Q1’18, both of which were published in SEM-17-036 in June.

The forward price indices for each fuel to be inputted to the formulae are described below.

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For the avoidance of doubt, the prices in the formulae are denominated in euros per therm or euros per tonne, as appropriate. The fuel indices below therefore have to be converted from sterling pence per therm (in the case of Natural Gas) and US dollars per metric tonne (in the case of Coal) into euros using the spot daily Sterling-Euro Foreign Exchange Rate and spot daily Dollar-Euro Foreign Exchange Rate. The Natural Gas price also has to be converted from euro cents per therm to euros per therm by dividing by 100.

The rounding rules to be used in the calculation of the Directed Contract CfD Fixed Price using the formulae are as follows:

- 1 The fuel prices and exchange rates should be used to the number of decimal places to which they are published (by ECB, ICE, etc.). In other words, if a price/exchange rate can be quoted to five decimal places (as exchange rates sometimes are), it should be used in the calculations with five (5) decimal places. In the case of the regression coefficients in the DC strike price formulae, the coefficients should be used with the number of decimal places published by the Regulatory Authorities.
- 2 In any subsequent calculations (e.g. in converting from US\$/tonne into €/tonne), the result of the calculation should be rounded to the number of decimal places of the constituent number in the calculation with the lowest number of decimal places. So in the case of a fuel whose price is quoted to two (2) decimal places, the result of converting from sterling/dollars into euros should be rounded to two (2) decimal places.
- 3 In the case of the gas prices, when dividing by 100 to get from euro cents per therm to euros per therm, no further rounding should be done. In other words if the result of applying rule (2) above is 39.45 euro cents per therm, the price in euros per therm should be €0.3945/therm. It should not be rounded at this stage.
- 4 The constituent fuel terms in each formula should each be rounded to two (2) decimal places. In MS Excel formula terms the formula would look like this:
= ROUND(coefficient *price, 2)
- 5 Where a constituent term in the formula includes the product of two fuel prices (e.g. the gas squared term), the rounding takes place on the result of the three values (i.e., the regression coefficient and the two fuel prices) being multiplied

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together. In MS Excel formula terms the formula would look like this:

= ROUND(coefficient *price₁*price₂, 2)

- 6 The constituent fuel terms in each formula, individually calculated using the rounding rules set out above, should then be added together, together with the constant.
- 7 Subject this Part 5.1, the result of the addition of the various constituent terms in the CfD Fixed Price equations shall be rounded, , to two (2) decimal places.

5.1.1 Natural Gas

The Settle price (in pence sterling per therm) for the Quarterly Intercontinental Exchange ("ICE") Natural Gas Futures as reported on www.theice.com as the "Daily Volumes for ICE UK Natural Gas Futures (Quarters)" will be used. If no quarterly future price is published, the quarterly price will be calculated using the monthly index prices quoted on ICE for the months within that quarter C

5.1.2 Coal

The midpoint of the Bid and Ask prices (in US dollars per tonne) for quarterly Forward Coal CIF ARA API2 swap transactions as reported daily in Argus Coal Daily International will be used. If no price is available from "Argus Coal Daily International" for a given quarter, the price for the nearest preceding quarter for which a price is available will be used.

5.1.3 Carbon

The daily settle price (in euro per tonne of Carbon Dioxide) for the December month Intercontinental Exchange ECX EUA Carbon futures as reported on www.theice.com as "ICE EUA Futures (monthly)" for the given calendar year will be used. This data is available under the report section of this website once the following options are selected – Category "End of Day Report"; Market – "ICE Futures Europe"; Contract – "ICE EuA Futures ". If the weighted average price is zero due to a zero volume of transactions on the day in question, or if no price is published in respect of a particular day, the value to be used shall be the value published the last time a transaction was concluded.

5.1.4 Foreign Exchange

The forward fuel prices to be used in the daily CfD Fixed Price calculation will be converted to euro per tonne using the daily spot Dollar-Euro Foreign Exchange Rate and into euro per therm using the daily spot Sterling-Euro Foreign Exchange Rate, as

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defined in the Directed Contract Master Contracts for Differences Agreement. The source is the daily euro foreign exchange reference spot rate from the European Central Bank as set out on its website:

<http://www.ecb.int/stats/exchange/eurofxref/html/index.en.html>.

Appendix 2 to these Subscription Rules sets out further detail on how the fuel prices will be used.

5.2 CFD Fixed Price Formulae

The Regulatory Authorities have reserved the right to alter and republish the pricing formulae during a Subscription Window and a Supplemental Subscription Window. The formulae may be altered if there is recognition that they are no longer correct. This could occur where the daily price of a fuel or carbon falls outside the range of fuel/carbon prices under which the formulae was developed or where there is a significant change in future plant availability.

5.3 Reference Prices

Each transaction under a Directed Contract will be composed of a Contract for Difference and a Commodity Call Option to hedge capacity market Reliability Option exposure. The reference prices and applicable sources are outlined below

	Reference Price	Source
Contract for Difference	SEMO Px Day Ahead Hourly Index for the relevant Calculation Period	As published by EPEX
Option	Reliability Option Index for the relevant Calculation Period	Published by CER source [cf. SEMOpX]

- Market Disruption Events are as set out in Part 4 of the CFD DC FEMA
- Corrections to any Reference Price shall be in accordance with the SEMOpX Rules and any resulting payment adjustments shall be made in accordance with Part 2(f) of the CFD DC FEMA

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6 Subscription Window

6.1 Subscription Limits

On each Business Day during a Subscription Window and subject to meeting the credit requirements set out in Section 8, suppliers can elect to enter into transactions for a quantity expressed in MWs less than or equal to their eligibility for each product and quarter.

To do so, suppliers shall send ESB via electronic transmission (a scanned PDF of its Daily DC Supplier Subscription Form and corresponding WORD or EXCEL version as set out in Appendix 1) between 10:00amGMT and 12:00pm GMT on a given election day with the following:

- a) the product that is being subscribed (i.e. baseload, mid-merit or peak); and
- b) the quantity in MW that is being subscribed in each quarter.

The MW quantity must be rounded to one (1) decimal place less than or equal to the supplier's eligibility for that product and quarter. Where a supplier's election does not constitute a number rounded to one (1) decimal place, ESB shall round the subscription down to the nearest decimal place. Suppliers may elect different MW quantities of the different products and across quarters. Suppliers may also choose not to elect a particular product or quarter.

The quantity subscribed for a given product and quarter on a given Business Day is subject to a minimum.

- The minimum subscription will be 0.1 MW for a particular product and quarter (the "Minimum Daily Amount").

In the event that a supplier submits a subscription that:

- On any given day exceeds its eligibility for any product and quarter as per the matrix in Section 4 above, ESB will calculate the maximum volume consistent with the total eligibility matrix and will deem the subscription to be for that amount.
- Is for an amount less than the Minimum Daily Amount, ESB will deem the subscription in respect of that day to be rejected for that product and quarter.

ESB will notify each supplier of any rejections (by product and quarter), and the cause of

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the rejection, on the relevant trading day by 2:00pm GMT.

6.2 Subscription Logistics

As stipulated in Section 6.1, subscriptions by eligible suppliers must be made via electronic transmission (in the prescribed form as set out in Appendix 1) between 10:00amGMT and 12:00pmGMT on business days during the Subscription Window. The form must be signed by an authorised trader (as notified to ESB under Section 3).

Suppliers should submit via email to ESB (pgdc@esb.ie) a scanned pdf of the Daily DC Supplier Subscription Form along with corresponding Word (.docx) or Excel (.xlsx) file on any given trading day within the 10am to 12noon period. In the event that the Supplier is unable to transmit its subscription form via email, the Supplier may communicate the details of its subscription form to ESB by means of one or more recorded telephone conversation(s) with a scanned pdf of the details of the concluded transaction to be sent to ESB once email transmission is resumed.

ESB will use the DC CFD Fixed Price formulae as set by the Regulatory Authorities to determine transaction prices by product and by quarter.

The Regulatory Authorities have specified that ESB shall input each trading day's closing forward fuel and emissions and foreign exchange prices into the Directed Contract pricing formulae to set the transaction prices. Hence, while the subscriptions will be made in the 10:00 AMGMT to 12:00 PMGMT period, the transaction prices will not be known until that trading day's closing fuel and emissions prices and exchange rates are published.

The transaction will be affirmed as set out in part 2 of the CFD DC FEMA within two (2) Business Days following the subscription.

6.3 Notification of Subscriptions

At the end of each Business Day within the Subscription Window, ESB will notify the Regulatory Authorities and the eligible suppliers of the total cumulative MW quantity (by product and quarter) of Directed Contract volumes subscribed to, up to and including that date.

ESB will also notify the Regulatory Authorities by 3:00pm GMT on the following Business Day for a given trading day of:

1. the volumes transacted by each supplier, by product for each quarter, and

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2. ESB's calculation of the ESTSEM prices per product and quarter, for each trading day during the Subscription Window.

7 Supplemental Subscription Window

The Supplemental Subscription Window is designed to give suppliers who have fully subscribed their eligibility for a product and quarter during a Primary Subscription Window an opportunity to enter into additional Directed Contract transactions for those products and quarters.

New entrants who were licensed circa one week prior to the opening of a Supplemental Subscription Window and are not affiliated with any existing market participant will also be permitted to participate in the Supplemental Subscription Window. Such suppliers will have a maximum entitlement based on their MIC as measured on the third day preceding the start of a Supplemental Subscription Window. New entrant eligibility will be notified to ESB by the Regulatory Authorities. ESB will monitor new entrant activity during a Supplemental Subscription Window to assure that subscriptions by new entrants do not exceed eligibilities.

Suppliers who participated in a Primary Subscription Window will be eligible to participate in a subsequent Supplemental Subscription Window for a specific product and quarter if they subscribed the total MW quantity of their eligibility for that specific product and quarter. A supplier who is fully subscribed for baseload in a given quarter, for example, but not fully subscribed for peak will be permitted to make additional elections during a Supplemental Subscription Window for baseload in that quarter but not for peak.

Following a Primary Subscription Window, ESB will notify those suppliers who are eligible to participate in a Supplemental Subscription Window of the unsubscribed quantities that remain for each product (i.e. baseload, mid-merit and peak) and for each quarter. These unsubscribed volumes will be rounded to one (1) decimal place before being issued. The eligibility of suppliers will be reset for the purposes of a Supplemental Subscription Window and each supplier who is eligible to participate will be separately eligible to take all of the unsubscribed quantities over the course of a Supplemental Subscription Window, subject to the daily subscription limits described below and the posting of sufficient credit cover.

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7.1 Subscription Logistics

Suppliers making quantity elections during a Supplemental Subscription Window will be required to do so in the same manner in which the elections were made during a Primary Subscription Window.

In particular, the subscriptions must be made via electronic transmission between 10:00 AM GMT and 12:00PM GMT on Business Days during a Supplemental Subscription Window as per the form in Appendix 1.

Further, as was the case during a Primary Subscription Window, the following also apply to suppliers in a Supplemental Subscription Window:

- Supplier subscriptions will be subject to a minimum of 0.1 MW (the “Minimum Daily Amount”). Suppliers also may choose not to elect a particular product or quarter.
- Supplier subscriptions must be specified as MW quantities rounded to one (1) decimal place.
- Suppliers may elect different MW quantities of the different products and quarters.
- Subscriptions are subject to the credit requirements set out in Section 8.

ESB shall apply the same rules as during a Primary Subscription Window for breaches of Minimum Daily Limits. Where a supplier’s election does not constitute numbers rounded to one (1) decimal place, ESB shall round the subscription down to the nearest decimal place.

7.2 Oversubscription

If the available Directed Contract quantities for a given product and quarter are oversubscribed as a result of multiple suppliers’ electing the same transaction on the same day during a Supplemental Subscription Window, those suppliers’ valid elections will be scaled down on a *pro rata* basis until all of the available Directed Contract quantities are subscribed.

7.3 Notification of Subscriptions

ESB shall apply the same notifications during the Supplemental Subscription Window as

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during the Subscription Window to both the Regulatory Authorities and eligible suppliers.

8 Management of Credit Cover (i.e. margin)

The SEM Committee has decided that the credit cover requirements for Directed Contracts may be determined by the seller. The arrangements should take account of, *inter alia*, the seller's legal or statutory requirements and risk tolerance. The arrangements however should be no more onerous than those specified in the CfD DC FEMA and CSA.

ESB's requirements are set out below:

Each supplier with Directed Contract (DC) eligibility intending to exercise any of its DC eligibility will need to have posted credit cover in the form of an Independent Amount as determined by ESB in a commercially reasonable manner in advance of the relevant Subscription Window. Suppliers will be required to provide such Independent Amount in the form of a Letter of Credit from an authorised issuer with a minimal long term, unsecured and unsubordinated indebtedness which is publicly rated A- by S&P Ratings Group, a division of The McGraw Hill Companies Inc. or any successor thereto ("S&P") or A3 by Moody's Investor Services, Inc. or any successors thereto ("Moody's") in accordance with ESB Group Risk policy or Cash Deposit in respect of the relevant Subscription Window. Any such Independent Amount will be posted solely for use in respect of the relevant Subscription Window. Any unutilised collateral posted as cover against Non-Directed and/or PSO contracts will not be entitled to be utilised for the purpose of upcoming DC subscriptions. ESB is entitled to review appropriate collateral arrangements where cross-product close-out netting and margining may be requested by suppliers in accordance with ESB's Group Risk policy. Such requests will be considered on a by counterparty basis.

The credit cover requirements for the relevant Subscription Window is calculated as follows:

- A matrix of $ESTSEM_{p,q}$ prices is calculated based on the closing fuel and carbon prices and exchange rates on a date set by the Regulatory Authorities. This will be detailed in the information paper issued by the Regulatory Authorities prior to each round of DCs.
- This matrix will be "baselined" for the duration of the Primary Subscription Window

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and the Supplemental Subscription Window for the purpose of credit cover calculations.

- Each supplier is required to provide ESB with 15% of the value of the underlying energy in credit cover (the “Independent Amount”) for any volumes they wish to subscribe for based upon the baseline prices. ESB has the right to decline any subscription volume for which a d e q u a t e credit cover (i.e. Independent Amount) is not provided.
- Therefore each supplier should calculate the maximum DC volume they may wish to subscribe for during the relevant Subscription Window in MWh (see the non-binding worked example below).
- If a supplier’s elections exceed the amount of credit cover lodged then ESB will:
 - Calculate the credit cover required for the otherwise eligible bids for that day
 - Compare that value to the remaining unused credit cover.
 - If the required credit cover is greater than the remaining credit cover then all the otherwise eligible bids for that day are scaled back by the ratio of “remaining credit cover” to “required credit cover” and rounded down to the nearest whole number percentage.
 - Send out confirmations for the accepted subscriptions consistent with the standard timetable for confirmations.

If a supplier subsequently posts additional credit cover before the end of the relevant Subscription Window, they will be eligible for additional subscriptions up to the limit of the additional credit cover. If the supplier in question does not lodge the additional credit cover until late in the Subscription Window, it may be at risk of not being able to subscribe to its total eligibility as per the total eligibility matrix.

Note that the above process has been based upon certain assumptions. ESB reserves the right to amend the above process if there are material changes in the following areas:

- The duration between the date the DC pricing formulae are published (and hence the date the prices are “baselined” for the purposes of the upfront credit requirements) and the start of a Primary Subscription Window.

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- The duration between the start of a Primary Subscription Window and the end of the Supplemental Subscription Window.
- Revisions to the DC CfD Fixed Price formulae in accordance with the provisions set out in Section 5.2 above. Any revisions to the DC Pricing formulae will apply to both new and existing trades for the purposes of credit calculation.

Once a Primary Subscription Window and a Supplemental Subscription Window processes have been completed, the specific provisions covering credit during the subscription process as described in this section will expire. The normal monthly margining provisions will apply as per the CSA. For clarity the normal monthly margining process is set out below:

Credit Support Amount means in relation to a Transferor on a Valuation Day, (i) the aggregate of the Transferee's Exposure as determined by the Valuation Agent in accordance with the Subscription Rules plus (ii) all Independent Amounts applicable to the Transferor (if any) minus (iii) all Independent Amounts applicable to the Transferee, if any, minus (iv) the Transferor's Threshold Amount, if any. Calculations which result in a negative number shall be deemed to be zero. For the avoidance of doubt, only eligible Suppliers post collateral under the CfD DC FEMA. Notwithstanding the provisions under this Part 8, Threshold Amount in respect of Party B (i.e. the Buyer under the CfD and "Transferor" under the CSA) shall be zero.

Exposure (as defined under the CSA) will be determined as follows:

[Independent Amount for the relevant Subscription Window] + [Receivables] + [Forward Exposure].

For this purpose Forward Exposure means:

For each Transaction and for each Quarter and Product type (i.e. Baseload, Mid-Merit or Peak) during the remaining Term:

$$\text{Forward Exposure} = (1 + \text{VAT}_j) * (\text{CfD Fixed PRICE} - 0.85 * \text{ESTSEM}_{p,q}) * Q * \text{Hours}_{p,q}$$

where:

CfD Fixed Price is the Fixed Price in [€/MWh]/[£/MWh] for that Transaction for that Quarter.

ESTSEM_{p,q} is an estimate of the average ISEM price in €/MWh or £/MWh for that Quarter

and for the Product that corresponds to the Transaction, calculated as set out below;

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Q is the Contract Quantity (in MW) for that Transaction;

Hours p,q is the number of hours for a given Product in a given Quarter, as specified below

VAT_j is the VAT rate payable to the relevant VAT Authorities in jurisdiction (Republic of Ireland/ Northern Ireland), in the event that VAT is payable on termination payments on Transactions under this Agreement.

Quarter means any of the following periods in any calendar year: October to December; January to March, April to June and July to September.

Receivables is the aggregate net amounts owing for difference payments (as set out under Part 2(d) of the DC FEMA) incurred but not yet paid for all Transactions under the DC FEMA inclusive of any VAT amounts that may be payable in respect of such Transactions.

Term means the effective date of the CfD DC FEMA and continuing until it is terminated in accordance with its terms

By way of a non-binding illustrative example of a Forward Exposure calculation:

CfDF IXED PRICE = 55
ESTSEM_{p,q} = 55.8
Q = 5MW
Hours_{p,q} = 368
VAT_j = 0

Then the Forward Exposure will be: $(55 - 0.85 * 55.8) * 5 * 368 = 13,929$

For each Transaction, Forward Exposure is aggregated across all remaining Quarters in the Term to arrive at a Forward Exposure value for that Transaction. Forward Exposure is then aggregated across Transactions to arrive at an aggregate net Forward Exposure for all Transactions to be used in the calculation of Exposure.

Any negative Forward Exposure amounts will offset positive Forward Exposure amounts in the calculation of Forward Exposure for a Transaction and in the calculation of net aggregate Forward Exposure for all Transactions.

For each subsequent quarterly DC subscription each supplier must:

- post sufficient credit to cover all existing positions held from the most recent Valuation Date.

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- post 15% of the value of the underlying energy in credit cover for any volumes they wish to subscribe for, based upon the most recent baseline price to be deemed an eligible supplier.

In the instance where the date of a Valuation Date falls within a DC Primary Subscription Window or a DC Supplemental Subscription Window, or where the date of a Valuation Date falls between a DC Primary Subscription Window and the corresponding DC Supplemental Subscription Window, all DC subscriptions executed within the DC Primary Subscription Window and the DC Supplemental Subscription Window shall be excluded from the Exposure calculation.

In the instance where the date of the Valuation Date falls less than five (5) Business Days after the last day of the DC Supplemental Subscription Window, all DC subscriptions executed within the DC Supplemental Subscription Window shall be excluded from the Exposure calculation.

Supplier eligibility shall not be affected by the Valuation Date once the supplier has met the initial eligibility requirement of 15% of the value of the underlying energy in credit cover for any volumes they wish to subscribe, unless they fail to meet their obligations under the credit margin conditions as provided in the the CSA.

If resulting from the Valuation Date which falls within a DC Subscription Window and by using the updated DC pricing formulae as advised by the RAs a supplier's existing Exposure increases, the Supplier must then increase their posted credit cover within the credit margin timeframe in order to continue DC subscriptions.

Note (1): when a Valuation Date falls within a Subscription Window ESB advises suppliers to consider their existing credit requirements based on any revised publication of the DC pricing formulae when posting credit to cover potential subscriptions.

Note (2): a supplier may elect to forgo eligibility to a DC Subscription Window after a Valuation Date by informing ESB of their intention to allocate additional credit cover posted for the purposes of DC participation to cover additional margin requirements.

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Non- binding Worked Example from Q4 2017 to Q3 2018:¹

- Suppose a supplier decides that they wish to subscribe to the following volumes:

	Baseload	Mid Merit	Peak
Q4 2017	4,000 MWh	4,000 MWh	1,000 MWh
Q1 2018	4,000 MWh	4,000 MWh	1,000 MWh.
Q2 2018	4,000 MWh	8,000 MWh	
Q3 2018	4,000 MWh	8,000 MWh	

- Suppose the ESTSEM_{p,q} prices are below:

	ESTSEM _{p,q}		
	Baseload	Mid Merit	Peak
Q4 2017	€45.96 /MWh	€51.57 /MWh	€65.62/MWh
Q1 2018	€51.53 /MWh	€58.22/MWh	€75.78/MWh
Q2 2018	€43.68 /MWh	€46.08/MWh	
Q3 2018	€42.23 /MWh	€44.51/MWh	

- Then the supplier should calculate the credit cover required to support their likely maximum DC subscription as follows:

	Baseload	Mid Merit	Peak	Total
Q4 2017	€45.96/MWh x 4,000 MWh x 15% = 27,576	€51.57/MWh x 4,000 MWh x 15% = €30,942	€65.62 /MWh x 1,000 MWh x 15% = €9,843	€68,361
Q1 2018	€51.53/MWh x 4,000 MWh x 15% = €30,918	€58.22 /MWh x 4,000 MWh x 15% = €34,932	€75.78 /MWh x 1,000 MWh x 15% = €11,367	€ 77,217

¹ EST SEM based on figures calculated on 23rd of June 2017

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Q2 2018	€43.68/MWh x 4,000 MWh x 15% = €26,208	€46.08 /MWh x 8,000 MWh x 15% = €55,296		€ 81,504
Q3 2018	€42.23/MWh x 4,000 MWh x 15% = €25,338	€44.51 /MWh x 8,000 MWh x 15% = €53,412		€ 78,750
Total	€110,040	€174,582	€21,210	€305,832

The following scenarios demonstrate how adequate credit cover can be managed by a supplier.

Scenario 1: Standard Approach; Counterparty has posted 15% Independent Amount (in the form of Cash or LC as described above) and has advised it will post cash or LC i.e. “Eligible Credit Support” under the CSA to cover all DC credit margining requirements.

Scenario 2: ESB has agreed to accept a Parent Company Guarantee (PCG) under the DC FEMA Schedule to cover all DC credit margining requirements. (Note: Where ESB and the counterparty have negotiated and agreed to cross-product close-out netting & margining, an increase in the credit exposure arising from non-DC products would also be covered by the PCG.)

Scenario 3: ESB has agreed to accept a PCG under the DC FEMA Schedule to cover all DC credit margining requirements up to an agreed cap. In this example the agreed cap is €300,000.

	Independent Amount (Cash or LC) ²	Exposure ³ (from most recent Valuation Date)	Credit Support Amount
Scenario 1	305,832	350,000	=305,832, + 350,000 = 655,832
Scenario 2	305,832	350,000	=305,832 +0 (PCG covers Exposure)) = 305,832
Scenario 3	305,832	350,000	=305,832 + 350,000 - 300,000 (Cap on PCG) = 355,832

² IA required for new Subscription Window

³ Exposure determined from recent Valuation Date (i.e. monthly margin call)

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<p>Scenario 1: Standard approach Independent Amount (IA) = 15% Eligible Collateral = Cash or LC Collateral Lodged prior to Subscription Window = 305,832 Exposure arising from monthly margin = 350,000 Total Credit Support Amount = 655,832</p>
<p>Scenario 2: Unlimited PCG to cover DC exposures, in excess of Independent Amount IA = 15% Eligible Collateral = Cash or LC Collateral Lodged prior to Subscription Window = 305,832 Exposure arising from monthly margin = 350,000 Total Credit Support Amount = 305,832 (PCG covers exposure)</p>
<p>Scenario 3: PCG with Cap to cover DC exposures, in excess of Independent Amount IA = 15% PCG Cap = 300,000 Eligible Collateral = Cash or LC Collateral Lodged prior to Subscription Window = 305,832 Exposure arising from monthly margin = 350,000 Total Credit Support Amount = 461,664 (PCG covers exposure up to 300k) Collateral required post Subscription Window =50,000 Counterparty to provide top-up in form of cash or LCs</p>

8.1.1 Credit Margin

The following data will be used as the relevant monthly prices for the remaining months in the Quarter:

“Current Month Natural Gas Price” means the midpoint NBP price for the Balance of Month (BOM) contract under the caption “NBP Price assessment” as reported in “European Spot Gas Markets” published by Heren Energy.

“Current Month Low Sulphur Fuel Oil Price” means the midpoint spot price for Low Sulphur Fuel Oil FOB NWE Energy Swap Contract as reported by Thomson Reuters Eikon.

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“Current Month Gasoil Price” means the midpoint spot price for Gas oil 0.1% FOB NWE Energy Swap Contract as reported by Thomson Reuters Eikon.

“Current Month Coal price” means the midpoint spot price for “up to 1% Sulphur” coal cif ARA under the caption “International Coal Prices” as reported by Argus Coal Daily International”.

Other remaining months in the quarter: The remaining months in the quarter will be quoted at monthly granularity for the relevant indices, based on the forward fuel price definitions contained in Section 5 herein

9 Appendix

9.1 Appendix 1: Daily DC Supplier Subscription Form (Part 1) (non binding example)



**Daily DC Supplier Subscription Form
Directed Contracts**

Part 1: Supplier Information

General Information

This submission form must be submitted to ESB before the close of daily Subscription Window and in accordance with the DC Subscription Rules.

Each Eligible Supplier must complete:

- (a) the information required in Table 1 of Part 1 and all of Part 2, and
- (b) submit scanned pdf of the fully completed subscription form to ESB via email to: pgdc@esb.ie, as executed by an


Table 1: Identity of Supplier
(to be completed by Eligible Supplier)

Participant Entity Name:	
Address:	
Telephone:	
Email address:	
Authorised Representative:	

Note: For the avoidance of doubt in legibility, please complete this form electronically and provide ESB with the printed version of this form fully completed via fax.

For the Attention of: Power Trading

Appendix 1: Sample Daily DC Supplier Subscription Form (Part 2)

 Part 2: Directed Contracts Subscription Form				
Supplier Name:				
Trading Date:				
	Qx 201x	Qx 201x	Qx 201x	Qx 201x
Baseload	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Mid-Merit (0700-2300)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Peak (1700-2100)	<input style="background-color: #cccccc;" type="text"/>	<input style="background-color: #cccccc;" type="text"/>	<input type="text"/>	<input type="text"/>
Note: The products above are as defined in the Directed Contract, Contract for Differences Financial Energy Master				
<p>IMPORTANT NOTICE: This Subscription Form is issued by ESB in accordance with the DC Subscription Rules. Only an Eligible Supplier may submit an election in this DC Subscription Window.</p> <p>By submitting a bid in this DC Subscription Window, the Eligible Supplier shall be deemed to have unconditionally accepted:</p> <ul style="list-style-type: none"> (a) the terms and conditions of the Subscription Rules; and (b) that successful bids will be transacted under the Contract for Differences (being a Directed Contract) Financial Energy Master Agreement (“CfD DC FEMA”) between ESB and the Supplier, including the Schedule, Credit Support Annex and relevant Confirmation(s) to that Master Agreement. 				
Please return a scanned pdf of this template and corresponding file in EXCEL (.xlsx) or WORD (.docx) file format via email to pgdc@esb.ic between 10am to 12pm GMT today. ** PLEASE DO NOT ALTER FORMAT **				
Supplier				Date:
Name of				

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9.2 Appendix 2: Fuel Indexation Methodology

The rules described below set out the methodology for applying fuel indices in the strike price calculation during the Subscription Windows..

Natural Gas ICE, NBP

Approach	Rationale
Use appropriate published quarterly price	Quarterly prices will be directly observable by the start of the subscription window

Coal (CIF ARA API2)

Approach	Rationale
Use published quarterly price for each quarter. If this is unavailable then use the price for the latest preceding quarter for which a price is available	Quarterly prices will be directly observable by the start of the subscription window for most quarters. Quarterly prices may not be directly observable by the start of the subscription window for the final quarter.

Carbon

Approach	Rationale
Use the Intercontinental Exchange ECX daily settle price for EUAs for the relevant December contract. E.g. - for Q1-Q4 2014 use Dec 14 contract	The December month contract is the most liquid contract for any given year.