



NETWORKS



REQUEST FOR TENDER

FOR

**NATIONAL NETWORK, LOCAL CONNECTIONS
PROGRAMME – FLEXIBILITY SERVICES PILOT
CONTRACT**

SECTION 3 – FLEXIBILITY SPECIFICATION



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1 Glossary / Definitions¹

| Term | Definition |
|---|---|
| Availability | The Flexibility Services are available to be delivered for the duration of the service window and delivery period. |
| Availability Fee | Fee payable to the Flexible Service Provider for making available the Flexible Service Unit. |
| Baseline | The normal expected behaviour of an asset when a flexibility service is not being provided. This baseline position will be used to accurately validate and assess delivery of a flexibility service and calculate settlement due to the Flexible Service Provider. |
| Business Day | Any day other than a Saturday, or a Sunday or a public holiday in Ireland. |
| Business Hours | Between 9:00 am and 5:00 pm on a Business Day. |
| Connection Agreement | Has the meaning set out in the General Conditions for Connection of Industrial and Commercial Customers and Generators to the Distribution System, and Conditions for Connection to the Distribution System for Customers less than 100kVA. |
| Delivery Period | The time periods, expressed in hours, during the Service Window where the Flexible Service Provider agrees to make available, the Flexibility Services. |
| Distributed Energy Resource (DER) | A generation, storage or demand response asset connected to the distribution system. |
| Distribution System | The system which consists of electric lines, electric plant, transformers and switchgear and which is used for conveying electricity to final Customers. |
| Flexible Capacity | The change in active power relative to the baseline for the Flexible Service Unit which is offered, and which will be delivered during the Delivery Period. |
| Flexible Service Asset (FSA) | A single standalone DER asset and/or installation capable of providing a flexibility service. A Flexible Service Asset shall have the technical and operational capability to deliver flexible services in response to dispatch instructions from the relevant System Operator in accordance with the relevant Grid Code or Distribution Code. |
| Flexibility Service Provider (FSP) | A legal entity which owns or has rights to operate Flexible Service Unit(s) consisting of Flexible Service Asset(s). |
| Flexible Service Unit (FSU) | A single or aggregated Flexible Services Asset(s) in the same flexibility zone acting collectively to provide a Flexible Service. The FSUs, and assets within, shall have the technical and operational capability to collectively deliver Flexible Services in response to dispatch instructions from the relevant System Operator in accordance with the relevant Grid Code or Distribution Code. |
| Flexibility | The ability of the distribution system and its customers (generation, demand, storage and prosumers) to respond to changing states of generation, demand and network characteristics over specific timeframes and adapt individual or collective user behaviour so as |

¹ The Definitions and Interpretation in the Flexibility Services Contract takes precedence over this Glossary should there be any differences.

| | | |
|-----------------------------------|---------------|--|
| | | to improve the overall utilisation and security of the electrical system and its resources. |
| Flexibility Product | | A discrete change in an electrical characteristic of an electricity system user such as active power, reactive power, voltage or stored energy over a specific timeframe that is quantifiable and measurable. |
| Flexibility Service | | The provision of flexibility products, under a set of agreed terms which give the System Operator the ability to manage the load at a specific point of the Network at certain points in time. |
| Flexibility Zone | | An area of electrical connectivity where a network need has been identified' or where the Flexibility Services will be provided and to which the Flexibility Services will be delivered. |
| Levelised Cost | | The total cost of the bid divided by the flexible capacity offered (for evaluation purposes only). |
| MPRN | | Means a meter point reference number. |
| Maximum Capacity | Import | The maximum permissible amount of electricity to be imported from the Distribution System at the Connection Point expressed in kVA and referred to as being the "Maximum Import Capacity" in Schedule 1 to the Connection Agreement. |
| Maximum Capacity | Export | The maximum permissible amount of electricity to be exported onto the Distribution System at the Connection Point expressed in kVA and referred to as being the "Maximum Export Capacity" in Schedule 1 to the Connection Agreement. |
| Partial Asset Capacity bid | | Means ESB Networks will accept a bid from a FSP who has the entire required capacity per the tender but choose not to bid for the entire required capacity. |
| Performance Statement | | A statement in relation to the performance of Flexibility Services providers responding to Utilisation instructions and the state of their Availability. |
| Service Window | | The time periods, expressed in days and months, during which the FSP agrees to make Available, and provide in accordance with this Agreement, the Flexibility Services to the ESB Networks. |
| Unavailable | | Means that the Flexibility Services, in accordance with the Service Requirements, are not available to be delivered to ESB Networks. |
| Utilisation | | The provision of a response of a Flexible Service Unit/Asset to agreed product characteristics per the Flexibility Services Contract. |
| Utilisation Fee | | The amount payable by ESB Networks to the FSP for the utilisation of any Flexibility Service Unit/Asset |
| Utilisation Instructions | | An instruction by ESB Networks to the FSP to deliver Flexibility Services. |

1.1 National Network, Local Connections Programme

The decarbonisation of Irish society relies on fundamental changes to how energy is generated and consumed. To enable these changes at the right pace and the right price, we will rely on the electricity network, and we need to make the connection between how renewable energy is generated, and how we use or store it. Every Irish home, farm, community, and business is being called on to play a part.

To support Ireland's 2030 Climate Action targets ESB Networks have committed to:

1. Facilitate people in Ireland adopting up to 936,000 electric vehicles and 600,000 heat pumps
2. Connect up to an additional 10 GW of renewable generation at transmission and distribution level, so that we can charge our cars and heat our homes using renewable electricity.
3. Operate on up to 80% renewable electricity in Ireland.

The National Network, Local Connections Programme has been established to work with, and for, customers to make this possible.

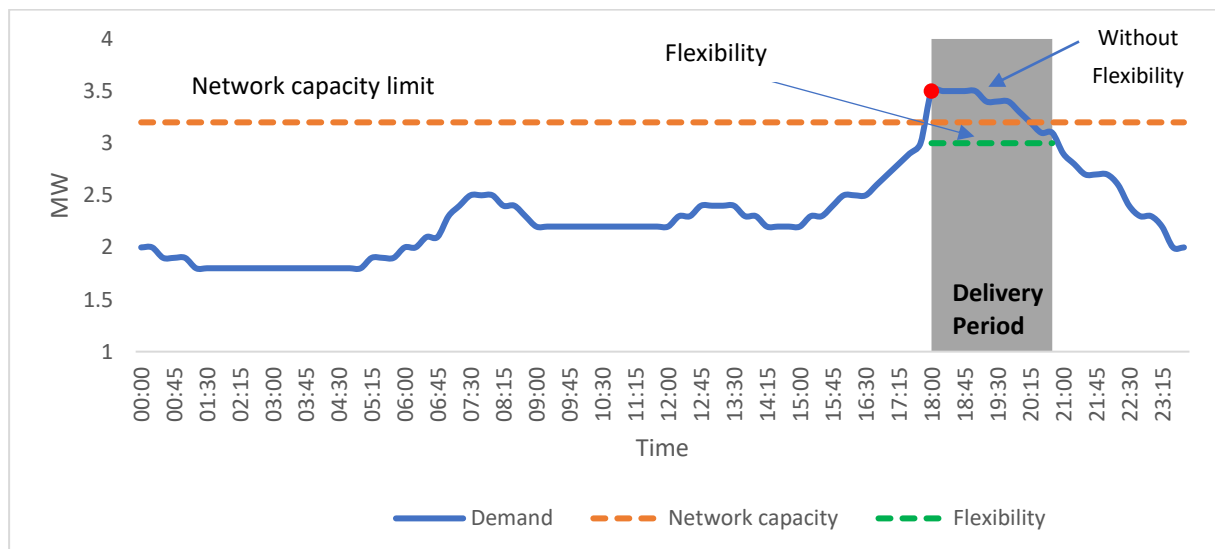
It will be phased in a manner that meets short term flexibility needs (i.e. both ESB Networks requirement to use flexibility, and customers' ability and need to deliver flexibility services in the short term) while building towards integrated active system management, that enables secure, efficient and sympathetic operation of the transmission and distribution systems, and of the market.

2 Flexibility Services and Products Overview.

2.1 Flexibility Services

ESB Networks is, in the first pilot, procuring flexibility services from providers in the form of generation up or demand down as illustrated in Graph 1 below to relieve demand driven congestion.

Graph 1



2.2 Flexibility Products

ESB Networks, is aligning its products to the Energy Networks Association (ENA) Open Networks standard products which are industry proven and in use in the UK and Northern Ireland.

The table below provides an overview of all the products. Note not all products will apply to each zone and **Sustain does not form part of this RfT.**

Table 1

| Product | Application | Requirement | DSO Use Case Example |
|---------|----------------------------------|--|---|
| Sustain | Scheduled congestion management | Regular requirement for a service, scheduled ahead of time, to ensure that network capacity is not exceeded. | A particular known loading issue in a particular zone every day at peak time. |
| Secure | Pre fault congestion management | Requirement for a service, ahead of time but utilised based on conditions closer to real time, if and when a network limit is forecast to be breached. | Managing a pre-planned network outage. |
| Dynamic | Post fault congestion management | Requirement for a service, utilised based on a fault or unforecastable event occurring, to return network to within capacity limits. | Managing a network fault. |
| Restore | Restoration support management | Requirement whereby, following a loss of supply, the Network Operator instructs a provider to reconnect with lower demand, or to reconnect and supply generation to support increased and faster load restoration under depleted network conditions. | Total loss of supply in a network zone. |

2.3 Technical Parameters (Product Characteristics)

Figure 1 below is a representation of the technical product characteristics using a generator as an example. The glossary and Table 2 below provides further details on the meaning of the terms. Note not all characteristics are applicable to each product.

Figure 1

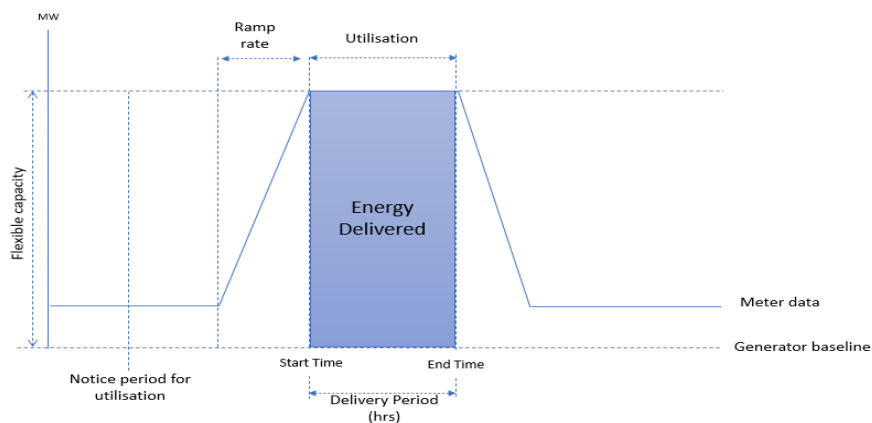


Table 2

| Product Characteristic | Characteristic Definition |
|---|---|
| Notice Period for utilisation (Secure Product only) | Notice which is given between the Utilisation Instruction issuing, as defined in the Contract and the start of the delivery period. |
| Max Ramp rate to start of delivery period. | Max rate (in kW/min) of ramping to full flexible capacity in advance of delivery period commencing. |
| Max Ramp rate following delivery period. | Max rate (in kW/min) of ramping back from full flexible capacity at the end of the delivery period. |
| Response Time (Dynamic and Restore Products only) | The time in which a FSP is required to respond to a utilisation instruction. |
| Minimum FSU flexible capacity | The minimum level (MW) at which an FSU must be able to deliver |
| Minimum flexible asset capacity | The minimum level of flexible capacity that an individual asset must be to be part of an aggregated FSU. |
| Recovery period | Minimum duration between the end of the utilisation of one Delivery Period and the beginning of the following utilisation. |
| Aggregation allowed | This attribute determines whether a grouped offering of power by covering several units via an aggregator is allowed. |

3 Flexibility Requirements

3.1 Product Characteristics per Zone

The technical characteristics that apply to each of the products is outlined in Table 3 below noting that Sustain does not form part of this RfT. Contracted FSPs need to ensure that these FSU/FSAs can deliver these technical requirements. Unless otherwise stated, technical requirements are assessed against the aggregate capability of the FSU.

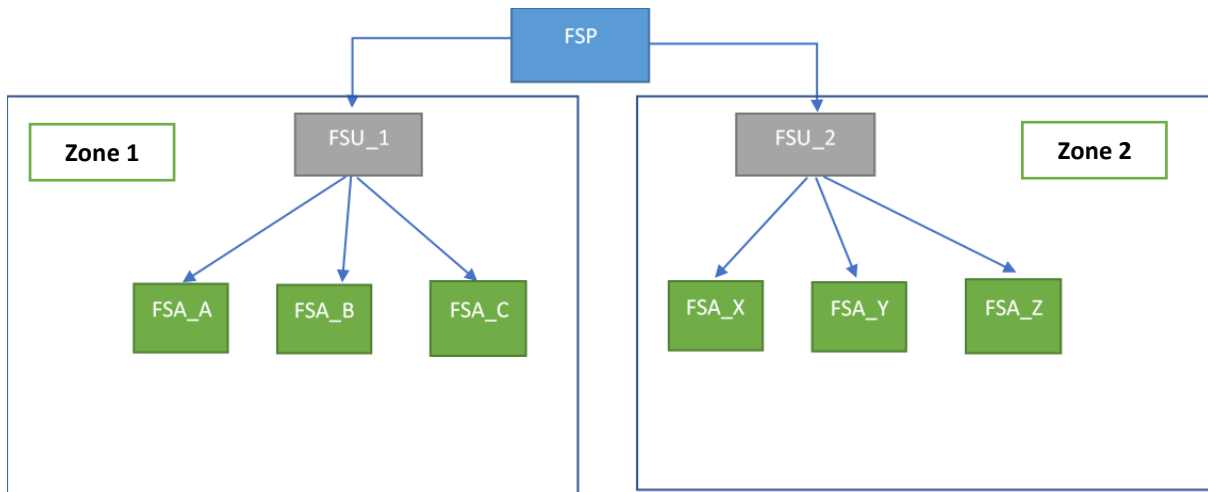


Table 3

| Technical Requirement | Product | | | |
|---|--|--|--|--|
| Name | Sustain | Secure | Dynamic | Restore |
| Description | Scheduled Service | Pre-Fault Service | Post Fault Service | Restoration Service |
| Minimum flexible service unit capacity (aggregated) | 0.1MW (100kW) | | | |
| Minimum flexible service asset capacity | 0.001MW (1kW) | | | |
| Notice period for utilisation / Scheduling | As this is a scheduled service, there is no notice as FSP is required to deliver per the contract. | The FSP will be notified of an upcoming utilisation event at least one day ahead . | As this is post fault there is no notice period. ESB Networks will advise FSP post fault. | As this is post fault there is no notice period. ESB Networks will advise FSP post fault. |
| Response time | The FSP is required to deliver per the contracted Delivery Periods. | The FSP is required to deliver per the instructed Delivery Periods. | The FSP is required to respond to a Utilisation Instruction within 15 minutes following the Instruction. | The FSP is required to respond to a Utilisation Instruction within 15-30 mins following the Instruction. |
| Service window | Refer to Appendix 1 for Zone specific details. | | | |
| Duration of delivery period | 30 minutes minimum | | | |
| Required quantity | Refer to Appendix 1 for Zone specific details | | | |
| Recovery period | Refer to Appendix 1 for Zone specific details | | | |
| Aggregation allowed | yes | | | |

3.2 Interactions between Flexible Market Entities

The infographic below shows the interactions between a Flexible Service Provider, and the Flexible Service Unit and Asset(s). For each flexibility zone a target volume of each flexible product is determined (see Appendix 1). A flexibility zone is an area of electrical connectivity where a network need has been identified.



- A FSP can have multiple FSUs in different zones.
- A FSP can have multiple FSUs in the same zone but the assets within the FSUs must be different. The same FSA cannot be under two different FSUs
- Each FSU can contain multiple FSAs noting that the FSU must be 0.1MW or greater and can be a single or aggregate assets.
- A FSA must be registered under a FSU in the relevant zone.

4 Baseline Position

A baseline is the normal expected behaviour of a Flexible Service Asset when a flexibility service is not being provided. Each FSP will need a baseline position for each FSU so that ESB Networks can accurately validate and assess delivery of a contracted service. ESB Networks will also need to assess the capacity offered by the FSU relative to the baseline.

The baseline is set at the FSU level. The output of a baseline calculation is a singular MW value (0.3 MW for example) applied to each FSU.



The FSU baseline will be calculated per the relevant asset type and the FSP will need to determine how much Flexible Capacity the FSU can provide during the Service Window and Delivery Period. This effectively creates an inferred set point which is a target demand or generation value for the FSU.

For demand, this is the baseline position minus the Flexible Capacity offered. This means, that the FSU is committing to, reducing to, and staying at or below the inferred set point. Refer to Graph 1 for a graphical example.

For generation, this is the baseline position plus the Flexible Capacity offered. This means, that the FSU is committing to, reaching, and staying at or above the inferred set point.

Note that an inferred set point cannot and will not apply to an FSU with a mixture of asset types because the flexibility capacity is a combination of demand and generation.

4.1 Demand Side Baseline

ESB Networks will baseline demand side units using historical data from a reference year. For the purposes of this contract the reference year is 1st of January 2019 to 31st December 2019 inclusive. This year was chosen as it is the most representative year for electricity consumption patterns in recent years due to the Covid-19 pandemic. ESB Networks will specify, for each zone, the 10 days of highest peak demand in the required Service Window in the reference year. The baseline for each FSA is the average of the 15-minute (or 30 minutes if applicable) meter data across the 10 days in 2019, during the Service Window and Delivery Period per Appendix 1 of this document. If there are multiple FSAs aggregated up to the FSU level, the baseline calculation will sum the FSA meter data before calculating the average of the meter data.

Example of a baseline

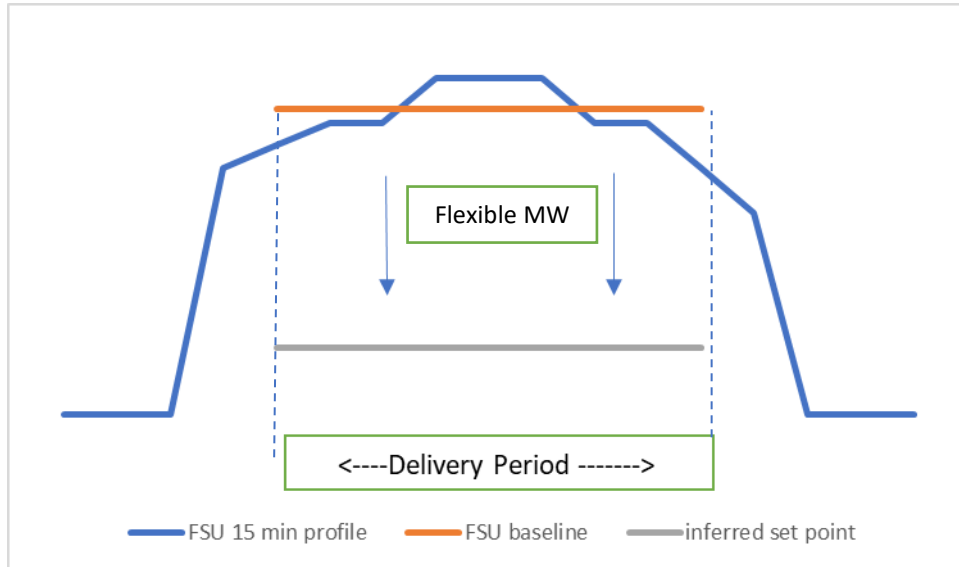
ESB Networks Requirements:

- a) *Service Window: October to March inclusive*
- b) *Delivery Period: 17:00 – 19:00*

ESB Networks will identify the 10 days of highest peak demand in the zone across October to March. The baseline for a FSU/FSA is calculated as the average of the 15 minute meter data on the 10 peak days during the Delivery Period.

Graph 2 is an example of an FSU that is offering a demand down service i.e. reducing the amount of MW. A baseline (the orange line) is calculated using the historical meter data (the blue line). The FSP determines how much flexible capacity it can offer to ESB Networks, which creates the inferred set point (grey line).

Graph 2



4.1.1 DEMAND SITE WITH ONSITE GENERATION

If the demand site has onsite generation classified as either autoproducer or CHP producer, the following baseline methodology shall apply.

1. If a CHP producer or autoproducer has an $MIC \geq MEC$ it is said to be using the network predominantly to import and is called an importing CHP producer or autoproducer and will be baselined on import only.
2. If a CHP producer or autoproducer has an $MEC > MIC$ it is said to be using the network predominantly to export and is called an exporting CHP producer or autoproducer and will be baselined the same as a generator which is detailed in section 4.2 below.

4.2 Non-Weather Dependent Generation Baselining

A generator's baseline shall be 0 (neither exporting nor importing) as that is considered the default behaviour before any flexibility market incentives are put in place.

4.3 Storage Baseline

A storage unit's baseline will be 0 (neither importing nor exporting) as that is considered the default behaviour before any flexibility market incentives are put in place.

4.4 Additional Baseline information

ESB Networks will also consider alternative baseline methodologies proposed by the FSP. Sufficient justification will be required for alternatives to the process identified above.

The baseline shall remain in place for the duration of the Flexibility Services Contract unless there are substantial changes at the site which would need to be notified to ESB Networks.

If an FSP site does not have any historical metering data, either due to being a new site, or there being no meter data available for the Reference Year, two options will be considered:

1. a nominated baseline for the first year of the Flexibility Services Contract; nominated baseline is a forecast of what the FSU/FSA expects would be their peak demand before any flexibility market incentives are put in place. The baseline will be updated at the end of the first year in line with the methodology outlined in Section 4.1 above using the previous year as the reference year.
2. before and after window; where a meter reading is taken before the FSU/FSA(s) is utilised for a flexibility service, and then compared to a meter reading when the flexibility service is being delivered.

5 Operational Requirements

The FSP must ensure that the FSU/FSA(s) do not plan any outages for the duration of the Service Window as defined in Schedule 1 of the Flexibility Services Contract.

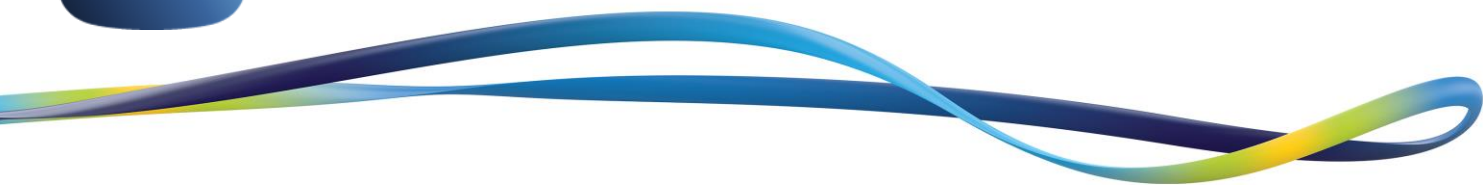
5.1 Communications

5.1.1 RECEIVING INSTRUCTIONS

The FSP must be able to receive SMS, email, telephone instructions as agreed with ESB Networks following award of the Flexibility Services Contract. The FSP will be the primary point of communication and control.

5.1.2 UTILISATION INSTRUCTIONS

The FSP shall have the appropriate systems and processes in place to deliver flexibility according to the utilisation instruction and contracted Flexible Capacity.



5.2 Proving tests

A proving test shall be required before the Service Window commences. The proving test shall take place during conditions that reflect normal operation of the FSU in so far as is possible. Further details on Proving Tests requirements are available in Schedule 5 of the Flexibility Services Contract

6 Appendix 1 Zone Specific Requirements

The following applies to each Zone:

1. The Service Window month means a full month i.e., Oct to March means 1 Oct – 31 March.
2. The Expected hours of Utilisation is a forecast used for the purposes of setting a levelised cost and doesn't guarantee a level of utilisation. Actual utilised hours will be based on network needs closer to real time.

6.1 Clonroche Flexibility Zone

| | Secure | Dynamic |
|---|-----------------------------|----------------------------|
| Service Window (Months) | October to March inclusive | October to March inclusive |
| Service Window (Days) | Monday to Sunday inclusive | Monday to Sunday inclusive |
| Delivery Period (Hours) | 15:30-21:00 | 15:30-21:00 |
| Flexible Capacity required, not cumulative (MWs) | 2MW | 2MW |
| Recovery Period (hours) | Less than 19 hours | Less than 19 hours |
| Expected hours of utilisation per Service Window | 90 | 35 |
| Response Time | Per Table 3 | |
| Notice Period | Per Table 3 | |

6.2 Blake Edenderry Flexibility Zone

| | Secure | Restore |
|---|--------------------------------|--------------------------------|
| Service Window (Months) | November to February inclusive | November to February inclusive |
| Service Window (Days) | Monday to Sunday inclusive | Monday to Sunday inclusive |
| Delivery Period (Hours) | 16:00-19:00 | 16:00-19:00 |
| Flexible Capacity required, not cumulative (MWs) | 0.6 | 0.6 |
| Recovery Period (hours) | Less than 21 hours | Less than 21 hours |
| Expected hours of utilisation per Service Window | 21 | 0 |
| Response Time | Per Table 3 | |
| Notice Period | Per Table 3 | |

6.3 Corduff Zone Flexibility Zone

| | Secure | Dynamic |
|---|-----------------------------|----------------------------|
| Service Window (Months) | March to October inclusive | October to March inclusive |
| Service Window (Days) | Monday to Sunday inclusive | Monday to Sunday inclusive |
| Delivery Period (Hours) | 17:00-20:00 | 17:00-19:00 |
| Flexible Capacity required, not cumulative (MWs) | 13 | 13 |
| Recovery Period (hours) | Less than 21 hours | Less than 22 hours |
| Expected hours of utilisation per Service Window | 57 | 14 |
| Response Time | Per Table 3 | |
| Notice Period | Per Table 3 | |

6.4 Finglas McDermott Flexibility Zone

| | Secure | Dynamic |
|---|------------------------------|-----------------------------|
| Service Window (Months) | August* to October inclusive | November to March inclusive |
| Service Window (Days) | Monday to Sunday inclusive | Monday to Sunday inclusive |
| Delivery Period (Hours) | 17:00-20:00 | 17:00-19:00 |
| Flexible Capacity required, not cumulative (MWs) | 12 | 12 |
| Recovery Period (hours) | Less than 21 hours | Less than 22 hours |
| Expected hours of utilisation per Service Window | No less than 21 | 14 |
| Response Time | Per Table 3 | |
| Notice Period | Per Table 3 | |

*Commences in August 2023

6.5 Tullow Shillelagh Baltinglass Flexibility Zone

| | Secure | Restore |
|---|-----------------------------|----------------------------|
| Service Window (Months) | October to March inclusive | October to March inclusive |
| Service Window (Days) | Monday to Friday inclusive | Monday to Friday inclusive |
| Delivery Period (Hours) | 15:30-20.30 | 15:30-20.30 |
| Flexible Capacity required, not cumulative (MWs) | 4 | 4 |
| Recovery Period (hours) | Less than 20 hours | Less than 20 hours |
| Expected hours of utilisation per Service Window | 28 | 0 |
| Response Time | Per Table 3 | |
| Notice Period | Per Table 3 | |