Synchronous Area Operational Agreement for Synchronous Area IE/NI

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Notice

This document, provided by EirGrid and SONI, is the draft for stakeholder consultation of the proposal for the IE/NI Synchronous Area Operational Agreements in accordance with Article 118 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation

EIRGRID SONI

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Introduction

This Synchronous Area Operational Agreement (hereafter referred to as "SAOA") applies to the Synchronous Area IE/NI and contains agreement required by Article 118 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereafter referred to as “SOGL”).

This SAOA is implemented in the Synchronous Area IE/NI taking into account:

Whereas

1. This document is a proposal jointly developed by EirGrid and the System Operator Northern Ireland (hereafter referred to as “SONI”) regarding a SAOA for the Synchronous Area IE/NI. It recognises that the transmission systems of Ireland and NI are electrically connected and synchronised. EirGrid and SONI shall work closely as required by the respective TSO licences to ensure that security standards are maintained on the Synchronous Area IE/NI.

2. This proposal takes into account the general principles and goals set in SOGL as well as Commission Regulation (EU) 2015/1222 establishing a guideline on capacity allocation and congestion management (hereafter referred to as “CACM”), and Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity (hereafter referred to as “Regulation (EC) No 714/2009”). The goal of SOGL is to safeguard operational security, frequency quality and the efficient use of the interconnected system and resources.

3. SOGL, Part IV, Load Frequency Control & Reserves section, recognises the need for a degree of flexibility to cater for physics of scale in different synchronous areas as well as specific time varying influence of network connectivity and technology in the energy mix in determining how system operators’ processes and the reserve provider services meet the system quality criteria. This flexibility is achieved through the development of agreements and methodologies.

4. According to Article 6 (6) of the SOGL, the expected impact of the IE/NI SAOA proposal on the objectives of the SOGL has to be described. This is presented below. The SAOA proposal generally contributes to the achievement of the objectives of the SOGL. In particular this SAOA serves the objective of ensuring the conditions for maintaining a frequency quality level for the synchronous area IE/NI; for determining common load-frequency control processes and control structures within IE/NI; ensuring conditions for maintaining operational security; the publication of IE/NI methods and specific values in the common language of SOGL promotes transparency and reliability of information on transmission system operation, facilitating greater cross-border cooperation and the efficient operation of the electricity transmission system in the Union.

5. Furthermore, the methodologies contained in this SAOA proposal shall ensure the application of the principles of proportionality and non-discrimination; transparency; optimisation between the highest overall efficiency and lowest total costs for all industry

stakeholders and consumers; and use of market-based mechanisms as far as possible, to promote frequency quality and operational security.

6. This agreement works in harmony with those aspects addressing all-island transmission system operation within the existing System Operator Agreement[1] as required under condition number 4 of the EirGrid TSO licence and condition number 24 of the SONI TSO licence.

7. In conclusion, the methodologies contained in this SAOA proposal shall contribute to the general objectives of the SOGL to the benefit of all TSOs, the Agency, regulatory authorities, market participants and the end consumers.

TITLE 1
General Provisions

Article 1 Subject matter and scope

1. This Synchronous Area Operational Agreement (SAOA) document for Synchronous Area IE/NI contains:

   a. Title 2: Those Articles referenced from both SOGL Articles 118 and 6(3). These are subject to public consultation in accordance with SOGL Article 11 and approval by the regulatory authorities of Ireland and Northern Ireland.

   b. Title 3: Those articles referenced in SOGL Article 118 but not found in SOGL Articles 6 or 11. These articles are not subject to either regulatory approval or public consultation.

Article 2 Definitions and interpretation

1. For the purposes of this proposal, the terms used shall have the meaning of the definitions included in Article 3 of Regulation 2017/1485 (SOGL), Article 2 of Regulation 2015/1222 (CACM) and the other items of legislation referenced therein.

2. The terms and definitions used by EirGrid and SONI in existing methodologies, policies, procedures and agreements may differ from those used within SOGL. The following interpretation shall be used within this SAOA.

[1] System Operator Agreement

Terminology used in the System Operations Guideline (SOGL)	Interpretation based on terms normally used by EirGrid and SONI
FCR – Frequency Containment Reserve	Shall include Primary Operating Reserve (POR) as defined in the EirGrid and SONI Grid Codes and Fast Frequency Response (FFR) as defined in the System Services Technical Definitions decision paper[2]
FRR – Frequency Restoration Reserve	Shall include Secondary Operating Reserve (SOR) and Tertiary Operating Reserve (TOR) as defined the EirGrid and SONI Grid Codes[3][4]
RR – Replacement Reserve	Shall include Replacement Reserve (RR) as defined in the EirGrid and SONI Grid Codes
PGM - Power Generating Module	Shall mean the Grid Code definition 'Generating Unit' as defined in the EirGrid and SONI Grid Codes
Demand Unit	Shall mean the Grid Code definition 'Demand Side Unit (DSU)' as defined in the EirGrid and SONI Grid Codes
Cross border sharing and exchange of reserves categories FCR, FRR and RR.	The Interconnector Operating Protocols (IOP)[5] make reference to a number of reserve services which are available to the TSOs: • These existing arrangements describe the current explicit services enabling the TSOs' to share reserves across HVDC interconnectors. These services are not intended to preclude alternative methods of sharing or exchanging reserves • Static response may be used for cross-border sharing of FCR and FRR between the IE/NI synchronous area and the GB synchronous area.

[2] System Services Technical Definitions decision paper
[3] SONI Grid Code,
[4] EirGrid Grid Code
[5] The IOP is *Commercial in Confidence* – Nonetheless, information relevant to this SAOA is reproduced in this SAOA or included in the Operational Constraints Update

FCR, FRR and RR providing units	Grid Code defines the requirements for the provision of POR, SOR and TOR by certain Grid Code Users in respect of their generating units and demand side units. In addition to those Grid Code requirements, reserve services are also defined in the System Services Technical Definitions decision paper. These define additional reserve categories such as Fast Frequency Response.
Reference incident for the purposes of dimensioning FCR	In IE/NI this is typically referred to as the loss of the largest single infeed (or outfeed) when determining the requirements for reserve scheduling.

Table 1: SOGL Interpretation

TITLE 2

Methodologies, Conditions and Values developed jointly by EirGrid and SONI to satisfy the SOGL requirements within the SAOA for IE/NI, which are subject to approval by the NRAs of IE and NI

Article 3 The dimensioning rules for FCR in accordance with SOGL Article 153

1. The Operating Reserve Requirements section of the joint Operational Constraints Update[6] publication specifies the standards which are used to dimension FCR for Synchronous Area IE/NI.

   EirGrid and SONI shall cooperate to determine the reserve capacity for FCR required for the IE/NI synchronous area at least daily and refine this requirement according to changes in system conditions, in the period through to real time. FCR shall be dimensioned in accordance with the principles as outlined in the Operating Reserve Requirements section of the Operational Constraints Update in respect of positive and negative POR.

   The Operating Reserve Requirements section of the Operational Constraints Update shall indicate any requirements for minimum POR requirements from dynamic sources for each monitoring area.

[6] Operational Constraints September Update. Latest update is at the Library section of the EirGrid website

Article 4 Additional properties of FCR in accordance with SOGL Article 154(2)

1. All technical properties for FCR services in IE/NI are specific to those services and no common additional properties have been specified by EirGrid and SONI.

Article 5 The frequency quality defining parameters and the frequency quality target parameters in accordance with SOGL Article 127

The Frequency Quality Defining Parameters and the Frequency Quality Target Parameters for IE/NI are detailed in table 2 and table 3 of this SAOA in agreement with Annex III of the SOGL.

standard frequency range	± 200 mHz
maximum instantaneous frequency deviation	1000 mHz
maximum steady-state frequency deviation	500 mHz
time to recover frequency	1 minute
frequency recovery range	± 500 mHz
time to restore frequency	15 minutes
frequency restoration range	± 200 mHz
alert state trigger time	10 minutes

Table 2: Frequency quality defining parameters of the IE/NI synchronous area

maximum number of minutes outside the standard frequency range	15 000

Table 3: Frequency quality target parameters of the IE/NI synchronous area

Article 6 For the IE/NI synchronous area, measures to ensure the recovery of energy reservoirs in accordance with SOGL Article 156(13)(a)

1. From the time of I-SEM Go Live, EirGrid and SONI shall cease to prescribe the management of FCR availability from energy limited FCR providers. Instead, EirGrid and SONI shall optimally schedule FCR based on the declared availability, technical parameters, physical notifications and commercial offers submitted by FCR providers in respect of their FCR providing units.
2. When operating the IE/NI synchronous system, EirGrid and SONI take into account the depletion of energy limited reservoirs to minimise operational risk in real time where applicable.

Article 7 If applicable, for synchronous areas other than CE, limits for the exchange of FCR between the TSOs in accordance with SOGL Article 163(2)

1. This article is not applicable to IE/NI since the LFC Block Structure has a single LFC Block and a single LFC Area within the IE/NI Synchronous Area. In addition, EirGrid and SONI do not have arrangements for the exchange of reserves.

Article 8 The methodology to determine limits on the amount of sharing of FCR between synchronous areas defined in accordance with SOGL Article 174(2)

1. EirGrid and SONI shall maintain minimum levels of FCR in Ireland and NI respectively. EirGrid and SONI shall also consider the total requirements for FCR in Ireland and Northern Ireland as defined by the dimensioning rules. The requirements for total and jurisdictional FCR provision shall be developed and reviewed jointly. The TSOs shall publish the FCR requirements within the Operating Reserve Requirements section of the Operational Constraints Update. EirGrid and SONI shall utilise Scheduling and Dispatch optimisation software to regularly calculate the most economic allocation of FCR between NI and IE subject to the limitations imposed by tie line operational constraints between the systems of Ireland and Northern Ireland. The Balancing Market Principles Statement[7] contains further explanation of the role of the Scheduling and Dispatch optimisation applications used by EirGrid and SONI. FCR sharing with the GB synchronous area shall also be included within this optimisation process.
2. EirGrid and SONI shall determine the maximum amount of FCR sharing that could be accommodated with the GB synchronous area by considering the following factors:
   a. The contractual limit on FCR sharing contained within the Interconnector Operating Protocols;
   b. The availability of interconnector capacity to facilitate the transfer of FCR between synchronous areas;
   c. Tie Line limitations between NI and IE when there is a risk that these may restrict the ability of the TSOs to share FCR with the GB synchronous area;
   d. Whether the loss of an interconnector to the GB synchronous area constitutes the IE/NI reference incident;

[7] Balancing Market Principles Statement

e. Whether sharing of FCR with the GB synchronous area can be accommodated by both EirGrid and SONI under expected system conditions whilst complying with their respective Operating Security Standards;

f. The probability and impact of FCR shortfalls that could arise due to sharing for economic reasons.

Article 9 The methodology to determine limits on the amount of exchange of FRR between synchronous areas defined in accordance with SOGL Article 176(1) and the methodology to determine limits on the amount of sharing of FRR between synchronous areas defined in accordance with SOGL Article 177(1)

1. EirGrid and SONI shall schedule minimum sufficient levels of available capacity and ramping capability subject to the availability declarations, technical parameters, commercial offers and physical notifications submitted to the TSOs in compliance with Scheduling and Dispatch Code SDC1 of the EirGrid and SONI Grid Codes in order to ensure sufficient FRR is available to the IE/NI synchronous area.

   EirGrid and SONI shall use Scheduling and Dispatch optimisation software to determine the most economic allocation of FRR to each FRR providing unit and between NI and IE subject to cross border Tie Line limitations. FRR exchange with the GB synchronous area shall also be considered on a similar basis subject to the agreement with the associated TSO in the other synchronous area in accordance with the process as described in the Operational Constraints Update. The underpinning intention is that FRR provision from the GB synchronous area should be considered by EirGrid and SONI acting prudently as equivalent to the provision of FRR from a provider located in IE/NI.

2. EirGrid and SONI shall determine the maximum amount of FRR exchange that could be accommodated with the GB synchronous area by considering the following:

   a. The technical and commercial offers exchanged with the TSO in the GB synchronous area in accordance with the Interconnector Operating Protocols;

   b. The availability of interconnector capacity to transfer FRR between the IE/NI and GB synchronous areas;

   c. Tie line limitations between NI and IE when there is a risk that these may restrict the ability of the TSOs to share or exchange FRR with the GB synchronous area;

   d. Whether the loss of an interconnection to the GB synchronous area constitutes the IE/NI reference incident;

   e. Whether exchange of FRR with the GB synchronous area can be accommodated by EirGrid and SONI under expected system conditions whilst complying with the respective Operating Security Standards;

f. The probability and impact of FRR shortfalls that could arise due to exchange with the GB synchronous area for economic reasons.

Article 10 The methodology to determine limits on the amount of exchange of RR between synchronous areas defined in accordance with SOGL Article 178(1) and the methodology to determine limits on the amount of sharing of RR between synchronous areas defined in accordance with SOGL Article 179(1).

1. EirGrid maintains a minimum level of RR in Ireland and SONI maintains a minimum level of RR in the NI. EirGrid and SONI also jointly consider the overall RR requirement for the IE/NI synchronous area. Scheduling and Dispatch optimisation software is used to determine the most economic allocation of RR between NI and IE subject to cross border Tie Line limitations. RR sharing with the GB synchronous area may also be considered.

2. EirGrid and SONI determine the maximum amount of RR sharing and exchange that could be accommodated from other synchronous areas and between Ireland and Northern Ireland by considering the following:
    1. The availability of interconnector capacity to transfer RR between synchronous areas;
    2. Tie Line limitations between NI and IE when this has the risk to limit RR sharing and exchange with the IE/NI synchronous area;
    3. Whether the loss of an interconnection to the GB synchronous area constitutes the IE/NI reference incident;
    4. Whether sharing and exchange of RR can be accommodated by EirGrid and SONI under expected system conditions whilst complying with the respective Operating Security Standards;
    5. The probability and impact of RR shortfalls that could arise due to sharing for economic reasons.

TITLE 3

Methodologies, Conditions and Values developed by EirGrid and SONI within SAOA for IE/NI to meet the objectives of the SOGL but not requiring NRA approval

Article 11 Methodology to assess the risk and the evolution of exhaustion of FCR in synchronous area IE/NI in accordance with SOGL Article 131(2)

1. Common methodology will be published by EirGrid and SONI on March 29th 2019.

Article 12 Proposals for synchronous area monitor in accordance with SOGL Article 133

1. EirGrid shall undertake the role of synchronous area monitor and discharge the obligations described in SOGL Article 133. In the event that EirGrid is unable to fulfil these obligations, SONI will undertake the duties of synchronous area monitor by coordination with EirGrid.

Article 13 Restrictions for the active power output of HVDC interconnectors between synchronous areas in accordance with SOGL Article 137

1. The combined maximum ramping rate for all HVDC interconnectors connecting the synchronous area IE/NI to another synchronous area shall be as per the most recently published Operational Constraints Report. This ramp rate restriction shall not apply to imbalance netting, frequency coupling as well as the cross-border activation of FCR over HVDC interconnectors connected to the IE/NI synchronous area.

Article 14 Load frequency control structure in accordance with SOGL Article 139

1. In accordance with the CRU Request for Amendment dated 27th June 2018, and the Utility Regulator Request for Amendment dated 27th June 2018, the LFC structure for synchronous area IE/NI shall be:
    a. 1 synchronous area,
    b. 1 load frequency control block,
    c. 2 monitoring areas (1 monitoring area for IE and 1 monitoring area for NI).
2. EirGrid and SONI shall cooperate to ensure that sufficient FCR is scheduled in the IE/NI synchronous area. Power system optimization software shall be used in order to optimise FCR:

a. Whilst respecting the applicable constraints described in the Operational Constraints Update for primary operating reserves, secondary operating reserves and tertiary operating reserves,

b. Based on the availability declarations, technical parameters and commercial offers submitted by SEM participants as required under SDC1 of the EirGrid and SONI Grid Codes in respect of their generating units and demand side units.

3. EirGrid and SONI shall cooperate to ensure that sufficient FRR is scheduled in the IE/NI synchronous area. For any generating unit or demand side unit, the difference between the Physical Notifications submitted in pursuance of SDC1 of the EirGrid and SONI Grid Codes and the corresponding dispatch quantities issued by EirGrid and SONI in pursuance of SDC2 of the EirGrid and SONI Grid Codes shall be the FRR for that generating unit or demand side unit. Power system optimization software shall be used in order to optimize FRR:

   a. Whilst respecting the rules described in the Operational Constraints Update,

   b. Based on the availability declarations, technical parameters and commercial offers submitted by SEM participants as required under SDC1 of the EirGrid and SONI Grid Codes in respect of their generating units and demand side units.

4. EirGrid and SONI shall cooperate to ensure that sufficient RR is scheduled in the IE/NI synchronous area to ensure that operating security standards are maintained, subject to the availability declarations and technical parameters of SEM participants in respect of their generating units and demand side units.

Article 15 Reduction of electrical time deviation in accordance with SOGL Article 181

1. EirGrid and SONI shall cooperate to ensure that the synchronous time error shall not normally exceed ± 10 seconds as required by the provisions of the System Operator Agreement Inter-jurisdictional procedures.

Article 16 Allocation of responsibilities for the operation of the IE/NI synchronous area in accordance with SOGL Article 141

1. EirGrid and SONI shall cooperate in discharge of all responsibilities required for enabling the operation of synchronous area IE/NI recognising the obligations contained in the respective TSO licences.

   a. EirGrid TSO Licence Condition 1(9)

   b. SONI TSO Licence Condition 1(7)

Article 17 Operational procedures in the case of exhausted FCR in accordance with SOGL Article 152(7)

1. Following a system event which results in the partial or total exhaustion of FCR, EirGrid and SONI shall re-establish FCR in accordance with the levels detailed in the Operating Constraints Update for POR by dispatching sufficient additional generating units and demand side units. FCR shall be optimised using power system optimisation software as soon as reasonably practicable following the event that caused FCR to be fully or partially exhausted. The optimisation of FCR shall be based on the declared availability, technical parameters and commercial offers submitted to EirGrid or SONI by SEM participants in accordance with the EirGrid and SONI Grid Codes in respect of their FCR providing units. Provision of FCR shall always respect the minimum jurisdictional limits for POR as detailed in the Operational Constraints Update.

Article 18 Operational procedures to reduce system frequency deviation to restore the system state to normal state and limit risk of entering into an emergency state in accordance with SOGL Article 152(10)

1. A common methodology will be published by EirGrid and SONI on March 29th 2019

Article 19 Roles and responsibilities of TSOs implementing imbalance netting process, cross-border FRR activation or a cross-border RR activation process in accordance with SOGL Article 149(2)

1. EirGrid and SONI shall use power system optimisation software to identify the most appropriate resources for the provision of FRR and RR based on the availability declarations, technical parameters and commercial offers submitted to the TSOs in accordance with SDC1 of the respective Grid Codes and respecting the limitations detailed in the Operating Constraints Update.
2. EirGrid and SONI shall be responsible for instructing FRR and RR providing units in accordance with the requirements of the respective EirGrid and SONI Grid Codes using a shared electronic dispatch instruction logger (EDIL) application or an alternative agreed means of communication should EDIL be unavailable.
3. Since the synchronous area IE/NI is operated as a single bidding zone, there is no requirement for EirGrid and SONI to implement an imbalance netting process for IE/NI.
4. This SAOA does not preclude any arrangements which EirGrid or SONI may agree with TSOs in other synchronous areas for services covered within the scope of this Article. EirGrid and SONI shall cooperate in the development and operation of such arrangements with TSOs in other synchronous areas in accordance with the respective TSO licences.

Article 20 Requirements concerning the availability, reliability and redundancy of technical infrastructure in accordance with SOGL Article 151(2)

1. Requirements will be published by EirGrid and SONI on March 29th 2019.

Article 21 Common rules for the operation in normal state and alert state in accordance with SOGL Article 152(6) and the actions referred to in Article SOGL Article 152(15)

1. Common Rules will be published by EirGrid and SONI on March 29th 2019.

Article 22 Roles and responsibilities of the reserve connecting TSO, the reserve receiving TSO and the affected TSO as regards the exchange of FRR and RR defined in accordance with SOGL Article 165(1)

1. EirGrid and SONI do not require arrangements for the exchange of FRR or RR between Ireland and Northern Ireland, since these services are shared within the IE/NI synchronous area subject to the restrictions detailed in the Operating Reserves section of the Operational Constraints Update.

Article 23 Roles and responsibilities of the control capability providing TSO, the control capability receiving TSO and the affected TSO for the sharing of FRR and RR defined in accordance with SOGL Article 166(1)

1. EirGrid and SONI shall share FRR and RR resources in order to optimise power system operation in IE/NI, subject to the limits detailed in the Operational Constraints Update.
2. Based on the indicative operating schedules, produced in accordance with SDC1 of the EirGrid and SONI, EirGrid and SONI shall be responsible for dispatching FRR and RR from the generating units and demand side units located within their respective control areas in accordance with the TSO licences.

Article 24 Roles and responsibilities of the reserve connecting TSO, the reserve receiving TSO and the reserve affected TSO for the exchange of reserves between synchronous areas and of the control capability providing TSO, the control capability receiving TSO and the affected TSO for the sharing of reserves between synchronous areas defined in accordance with SOGL Article 171(2)

1. EirGrid and SONI shall be responsible for scheduling the provision of reserve services with other synchronous areas in accordance with the terms of the relevant Interconnectors Operating Protocols.
2. EirGrid and SONI shall cooperate in accordance with the requirements of the TSO licences to optimise the operation of the IE/NI synchronous area, including as appropriate the use of reserve services provided from other synchronous areas via HVDC interconnectors.
3. EirGrid and SONI shall comply with the limits for the provision of reserve from HVDC interconnectors detailed within the Operational Constraints Update.

Article 25 Methodology to determine the limits on the amount of sharing of FCR between synchronous areas defined in accordance with Article 174(2)

1. The Operating Reserves Requirements section of the Operational Constraints Update indicates the minimum requirements for FCR within the IE and NI. Taken together, these represent the methodology for the minimum FCR provision in synchronous area IE/NI.

	FCR	FRR	RR
Exchange	N	N	N
Sharing	Y	Y	Y

Table 4 Within the synchronous area IE/NI

	FCR	FRR	RR
Exchange	N	Y	Y
Sharing	Y	Y	N

Table 5 Between the synchronous area of IE/NI and GB

TITLE 4 Final Provisions

Article 26 Timescale for implementation

1. The SAOA will enter into force 3 months after its approval by the Regulatory Authorities of Ireland and Northern Ireland (not earlier than 14th June 2019) in accordance with SOGL article 118 (2).

Article 27 Language

1. The reference language for this SAOA shall be English.