

East - West Interconnector between Ireland and Great Britain
Methodology Statement for Determination of System-to-System Flow

1. Requirement for Methodology Statement

- 1.1 This Methodology Statement is produced for the purposes of paragraph 7.5 of Section R of the Balancing and Settlement Code (BSC).

2. Objective of Methodology

- 2.1 The methodology given in section 3 below describes the basis on which the system-to-system flow will be determined for the purposes of paragraph 7.5.3 of Section R of the BSC. This description is supported by the information on implementation of the methodology set out in section 4.

3. Methodology

- 3.1 The system-to-system flow will be determined from Interconnector instructions issued by the System Operator (NGESO) or the Externally Interconnected System Operator (EirGrid – System Operator of Southern Ireland) or issued automatically by equipment armed by EirGrid to respond to events on the Total System or the External System. The acceptance by the Transmission Company of any Bid or Offer submitted by an Interconnector User in respect of an Interconnector BM Unit does not constitute an Interconnector instruction in this Methodology.
- 3.2 The system-to-system flow will be determined in manner consistent with paragraph 7.5 of Section R of the BSC. Accordingly any system-to-system flow on the Interconnector will not affect, or form part of, the Interconnector Scheduled Transfer (IST). If the difference between the IST and the physical capability of the Interconnector is reduced after an Interconnector instruction has been issued the system-to-system flow may be reduced as necessary.

4. Implementation

- 4.1 The implementation of this methodology is agreed between NGESO and EIL. For information purposes an outline of the current plans to implement this methodology is given in Appendix A. However NGESO recognises that any material changes to the way in which the methodology is implemented (as described in Appendix A) will require a revised Statement to be resubmitted to the Authority for further approval.

5. Definitions

- 5.1 Unless stated otherwise, terms and expressions used in this methodology statement shall have the same meanings given to them in the BSC.

Appendix A

Operational Process for Determining the System-System Flow on the East - West Interconnector (from 1st October 2012)

A1 Calculate the Interconnector Scheduled Transfer (IST)

The Interconnector Scheduled Transfer is based on Modified Interconnector User Nominations (**MIUN**) submitted by Interconnector Users. MIUN data will be consistent with Physical Notifications submitted to NGESO by the Interconnector Administrator (acting on behalf of EIL and EWIC Interconnector Users (**IU**)), and must be within the Net Transfer Capability (**NTC**) as defined in the Operating Protocol.

A2 Calculation of the EWIC Reference Program (EWRP)

The EWRP is based on the same MIUN data that is used to determine the IST, and is subject to any Intraday Trading Limit(s) (**ITL**). The EWRP will, as far as possible, give the same energy transfer in each trading half hour period as the MIUN data used to determine the IST, within the agreed dynamic characteristic for the Interconnector.

The EWRP is delivered to NGESO by 1200 day ahead and revised EWRP's received at 1809 day ahead and on the day by 0940, after market closure's.

The EWRP will become firm 2 ½ hours before real time, becoming the Firm EWIC Reference Program (**FEWRP**).

A3 Variations to the FEWRP

After the FEWRP has been agreed it may be necessary to vary it. When this occurs for reasons other than those specified in paragraph 7 of section R of the BSC this will constitute a system-to-system flow (which may for example be recorded as Emergency Assistance, Emergency Instruction, Constraint, or Cross Border Balancing).

A4 Volume of System-to-System Changes

Where the instruction to change the FEWRP has been given for a reason that will give rise to a system-to system flow then the change to the FEWRP will be a system-to-system change. The volume associated with a system-to-system change will be calculated from the previous FEWRP as described below:

Consider the simple FEWRP shown in figure 1.

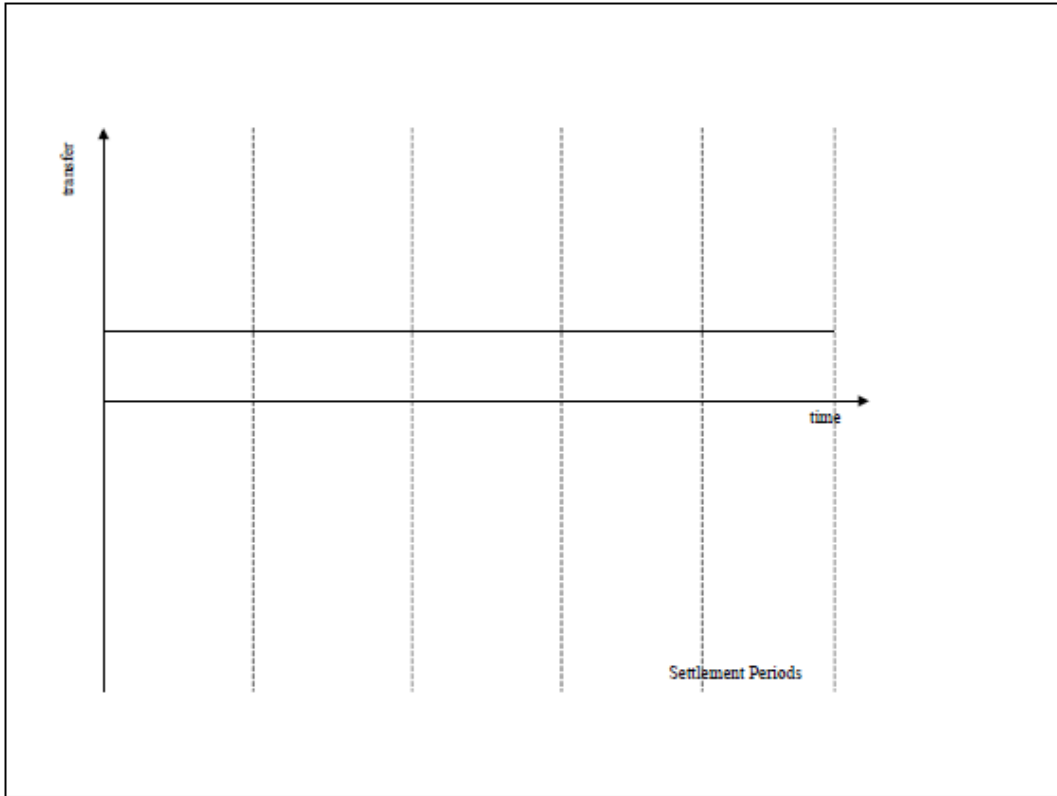


Figure 1 Firm EWIC Reference Programme

NGESO or EIL makes a request to vary the FEWRP (this request being accepted by the other party) or issued automatically by equipment armed by EIL to respond to events on the Total System or the External System.

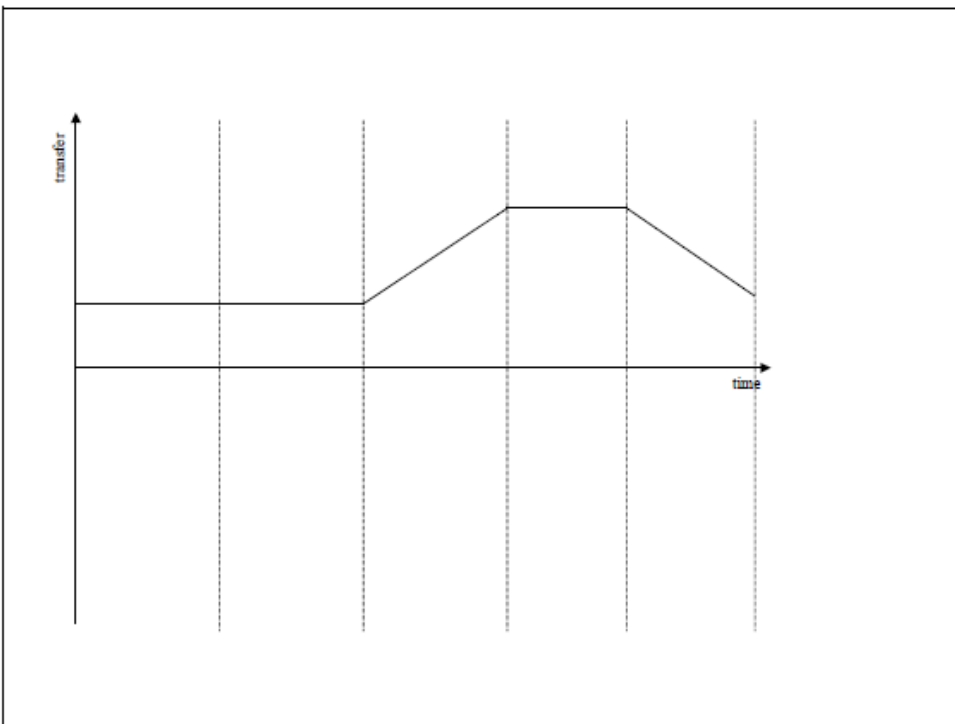


Figure 2 FEWRP revised for system-to-system flow

Labelling the revised Reference Programme as $RP_{n,s}$ and the Reference Programme prior to revision as $RP_{(n-1),s}$, then the change in the instructed transfer per settlement period is calculated as the difference between the revised Reference Programme and the previous reference programme calculated each second /revision and summated over the settlement period as derived by the equation below:

$$T_{n,j} = \sum_{s,n,j} \left(\int_0^1 \max(ICMIN_s, \min(ICMAX_s, RP_{n,s})) - \max(ICMIN_s, \min(ICMAX_s, RP_{(n-1),s})) dt \right)$$

Where

$T_{n,j}$	Is the change in transfer volume resulting from the acceptance of the revised Reference programme in respect of settlement period j.
$ICMAX_s$	Is the import value in MW to Great Britain expressed as a positive value effective at second s.
$ICMIN_s$	Is the export value in MW from Great Britain expressed as a negative value effective at second s.
$RP_{n,s}$	Is the programmed instantaneous transfer as at second s for the reference programme n. A positive value denotes a flow from Ireland to Great Britain.
$RP_{(n-1),s}$	Is the programmed instantaneous transfer at second s for the reference programme immediately prior to reference programme n. A positive value denotes a flow from Ireland to Great Britain.
$\sum_{s,n,j}$	Sum over all seconds, and reference programme changes following the submission of the final reference programme, within settlement period j

This is shown graphically below:

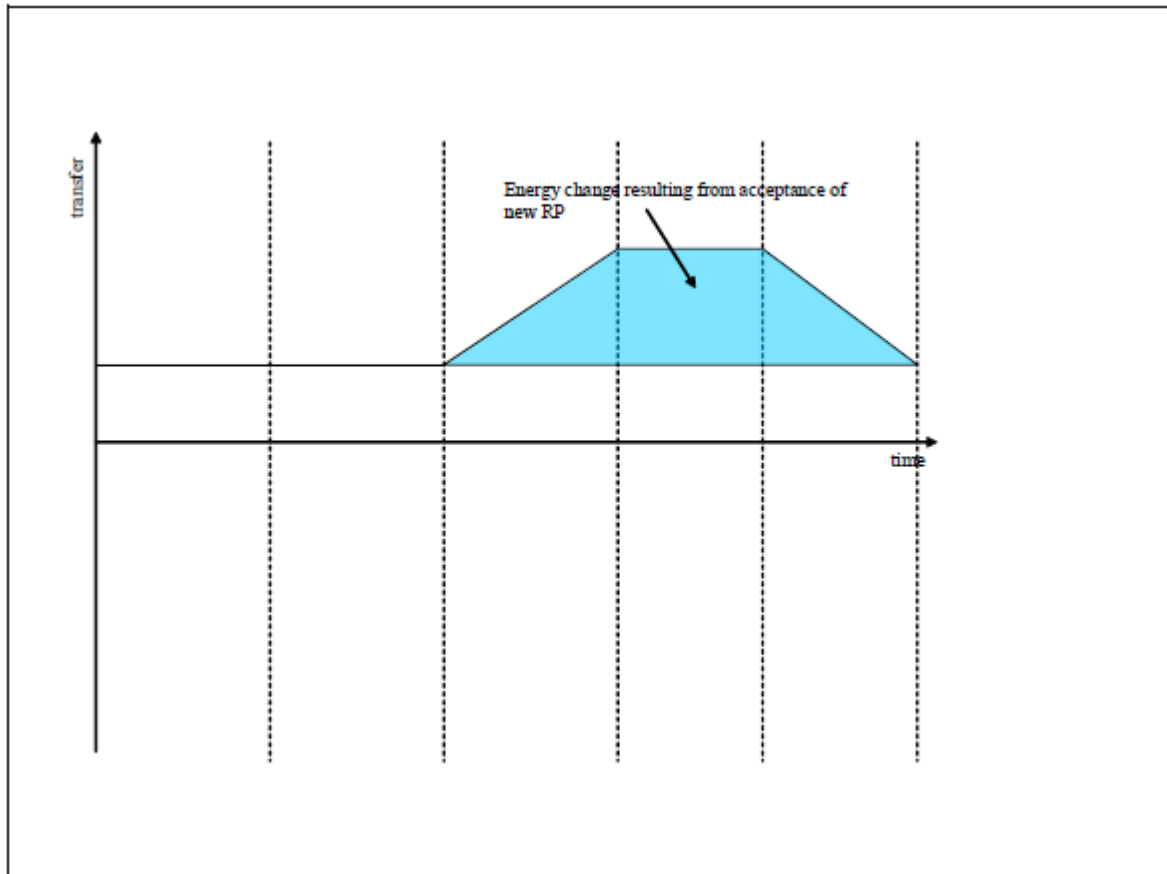


Figure 3: Change in instructed transfer volume arising from change in EWRP

The total volume of system-to-system change (T_j) will be the sum of all changes in instructed transfer volume arising due to system-to-system flows.

A5 Volume of System-to-System Flow (SSF)

The EWRP and total volume of system-to-system changes is calculate at the operational reference point, i.e. the NGESO Connahs Quay 400kv substation.

EIL are responsible for accounting for any loss factors applicable to EWIC operation up to the operational reference point.

A6 Metered Volume for Transmission Company Interconnector BM Units

The system-to-system flow is calculated and the Metered Volume allocated to the Transmission Company Interconnector BM Units (TCIBMU) as shown below:

If direction of SSF is from Ireland to GB, $SSF = T_j$

$$TCIBMU(\text{Production}) = SSF \qquad TCIBMU(\text{Consumption}) = 0$$

If direction of SSF is from GB to Ireland, $SSF = T_j$

TCIBMU(Production) = 0 TCIBMU(Consumption) = SSF

A7 *Revisions to Appendix A*

This appendix is provided for information purposes only. If material changes occur to the planned operational process for determining the system-to-system flow on the EWIC Interconnector then this appendix will be revised accordingly.

Revision No. 1 (effective from 1st April 2019)

Minor changes added to reflect Integrated Single Electricity Market changes that was undertaken on 01/10/18.

The acronyms of NGESO has been replaced with NGESO to reflect legal separation planned for 1 April 2019.

Revision No. 2 (effective from 1st April 2020)

Section A5 – The connection site has been updated from Deeside to Connahs Quay.