

Flexible Demand Operating Protocol

<Insert Customer Name & Site(s)>

<Date>



The Oval, 160 Shelbourne Road, Ballsbridge, Dublin D04 FW28
Telephone: +353 1 677 1700 | www.eirgrid.ie

Table of Contents

Glossary of Terms	4
1 Overview	5
2 Implementation of Flexible Demand	6
2.1 Activation	6
2.2 Deactivation	7
2.3 Failure to Respond	8
3 Testing	9
Appendix 1 Site Implementation Stages	10
Appendix 2 Flexible Demand Details	11
Appendix 3 Signal List	12
Appendix 4 Contact Details	13
4.1 EirGrid Contact Details	13
4.2 ESB Networks Contact Details	13
4.3 Customer Contact Details	13
Appendix 5 Single Line Diagram	13

Revision	Date	Description
1.0	26 March 2021	Generic version for publication.
2.0	10 February 2022	Revised generic version for publication.
3.0	25 September 2024	Revised generic version with the addition of Demand Reduction Limited / Unavailable signal.

Approver	Representing	Date
TBC	EirGrid Group	TBC
TBC	ESB Networks	TBC
TBC	Customer	TBC

Glossary of Terms

Term	Description
Demand Reduction Acknowledgement ON/OFF	An ON/OFF indication from the Customer to the System Operator acknowledging that demand reduction is required (based on an instruction from the System Operator).
Demand Reduction Activation/De-Activation	A signal from the System Operator to the customer instructing activation or de-activation of demand reduction.
Demand Reduction in Progress ON/OFF	An ON/OFF indication issued from the Customer to the System Operator indicating that the demand is ramping towards the issued MW Limit Setpoint.
Demand Reduction Limited /Unavailable ON/OFFON/OFF	An ON/OFFON/OFF indication issued from the Customer to the System Operator indicating when ON that Flexible Demand Arrangement is limited or unavailable.
EirGrid	The Transmission System Operator (TSO).
ESB Networks	The Distribution System Operator (DSO).
Flexible Demand	The portion of the site demand that can be reduced on instruction as defined in the Connection Agreement.
Flexible Demand Ramp Down Rate Limit	The maximum rate (in MW / min) at which demand can be reduced.
Flexible Demand Ramp Up Rate Limit	The maximum rate (in MW / min) at which demand can be increased.
MIC	Maximum Import Capacity.
MVA	MegaVolt Amperes.
MW	MegaWatt.
MW Limit Setpoint	The maximum site import level set during activation of demand reduction.
Operation Instruction	The document agreed between EirGrid, ESB Networks and the Customer that includes the arrangements for switching operations at the interface.
System Operator	The Transmission System Operator (TSO) or Distribution System Operator (DSO).
Transmission System	As defined by the EirGrid Grid Code.

1 Overview

This protocol sets out the operational arrangements in place between the System Operator and the Customer for implementation of Flexible Demand Arrangement at the Customer's site(s).

Flexible Demand is the portion of a Customer's electrical load that can be varied on instruction as set out in the Customer's Connection Agreement.

The Flexible Demand Arrangement is invoked in situations where there is a shortage of generation capacity on the Power System or to alleviate a local network constraint. The Flexible Demand Arrangement may be activated to avoid entering an Alert State. The Flexible Demand Arrangement may be deactivated once the Flexible Demand reduction is no longer required.

2 Implementation of Flexible Demand

This section sets out the operational process for activation and deactivation of the Flexible Demand Arrangements. In addition, it sets out the operational procedure to be followed in the event of a failure to respond to a Flexible Demand activation instruction.

2.1 Activation

2.1.1 A **Demand Reduction Activation** instruction and a **MW Limit Setpoint** will be issued electronically from the System Operator's control centre to the Customer's site(s).

2.1.2 The **MW Limit Setpoint** instruction will be no lower than the Firm MIC MW equivalent as set out in Appendix 2.

2.1.3 The Customer will acknowledge the instruction by electronic means by responding with a **Demand Reduction Acknowledgement ON** indication within two (2) minutes of receipt of the instruction.

2.1.4 The Customer will then reduce their electrical demand to achieve the **MW Limit Setpoint**, or below, within five (5) minutes of the **Demand Reduction Acknowledgement**.

2.1.5 The Customer will send a **Demand Reduction in Progress ON** signal as their load is ramping to the **MW Limit Setpoint** that has been issued by the System Operator. The Customer will no longer send a **Demand Reduction in Progress ON** signal once the **MW Limit Setpoint** has been achieved.

2.1.6 The rate of change in electrical demand will be no greater than the maximum **Flexible Demand Ramp Rate Limits** (defined in Appendix 2).

2.1.7 The Customer will await further **MW Limit Setpoint** instructions and be capable of achieving the new setpoints (either increased or decreased MW limits) as per the maximum **Flexible Demand Ramp Rate Limit** (defined in Appendix 2).

2.1.8 The System Operator may issue the **MW Limit Setpoint** in steps to manage the wider system impact of the change in electrical demand.

2.2 Deactivation

2.2.1 A **MW Limit Setpoint** equal to the Customers MIC and a **Demand Reduction De-activation** instruction will be issued. This will be issued from the System Operator's control centre electronically to the Customer's site(s).

2.2.2 The Customer will acknowledge the instruction by electronic means by responding with a **Demand Reduction Acknowledgement OFF** indication within two (2) minutes of receipt of the instruction.

2.2.3 The Customer may then restore their electrical demand up to the **MW Limit Setpoint** within one (1) hour of receipt of the **Demand Reduction De-activation** signal.

2.2.4 The rate of increase in electrical demand will be no greater than the maximum **Flexible Demand Ramp Up Rate Limit** (defined in Appendix 2).

2.2.5 The System Operator may issue the **MW Limit Setpoint** in steps to manage the wider system impact of the change in electrical demand.

2.2.6 Should the Customer experience difficulty in restoring their electrical demand within one (1) hour of receipt of the **Demand Reduction De-activation** signal or anticipate experiencing difficulty they should inform the System Operator and co-ordinate the demand restoration.

2.3 Failure to Respond

2.3.1 In the event of the Flexible Demand availability being compromised at any time the Customer should activate a **Demand Reduction Limited/Unavailable signal** and inform the System Operator.

2.3.2 The Customer must provide the System Operator with a written explanation of the reason for Flexible Demand being limited or unavailable within 24 hours of activation.

2.3.3 The **Demand Reduction Limited/Unavailable** signal being in an active status does not preclude the System Operator from disconnecting the Customer's site.

2.3.4 If the **Demand Reduction Limited/Unavailable** signal is activated, the System Operator will reasonably endeavour to exhaust the other effective Flexible Demand Arrangements before disconnecting the Customer's site.

2.3.5 Failure of the Customer to respond to an instruction to reduce their electrical demand will result in disconnection of the Customer from the Transmission/Distribution System by the System Operator without further notice.

2.3.6 Reconnection of the Customer site(s) will be facilitated once the Flexible Demand Arrangement is no longer required and will be in line with the Operation Instruction (switching arrangements) for the connection interface.

2.3.7 The System Operator will contact the Customer and inform them that the load may now be restored at the agreed rate when the Customer is ready to do so.

2.3.8 The System Operator will restore supply to the disconnected Customer's site(s) in line with the Operation Instruction for the connection interface.

2.3.9 The Customer must provide the System Operator with a written explanation of the reason for failing to comply with the instructed demand reduction, and steps taken to avoid reoccurrence, within 24 hours of the original instruction.

3 Testing

The Customer will facilitate at least one annual test of these arrangements if deemed necessary by the System Operator. This will include a requirement for the Customer to demonstrate their capability to implement the arrangement across the full range of their Flexible Demand in the required timeframe.

The System Operator may require additional tests should the required performance not be achieved.

Appendix 1 Site Implementation Stages

(Sample text for illustration - Please remove and replace with site specific text)

At (Substation Name) 110 kV Station, the (Customers Name) campus is set to increase in demand in five stages over several years. The stages are summarised as follows:

Stage 1 - Sept 2024 to Oct 2024: 40 MVA MIC with 20 MVA firm.

Stage 2 - Oct 2024 to Apr 2025: 60 MVA MIC with 20 MVA firm.

Stage 3 - Apr 2024 to Jun 2025: 80 MVA MIC with 20 MVA firm.

Stage 4 - Jun 2025 to Dec 2025: 100 MVA MIC with 20 MVA firm.

Stage 5 - Dec 2025 to May 2026: 120 MVA MIC with 20 MVA firm.

These figures are indicative and may be subject to change for various reasons including the delay to any Site Related Connection Equipment as set out in the Connection Agreement. Also, any updated demand ramp schedules should be reflected in the site's Connection Agreement.

Appendix 2 Flexible Demand Details

(Sample data for illustration - Please remove and replace with site specific data)

Contract / Calculated Data

	Contract Data			Calculated Data		
Site	MIC (MVA)	Firm (MVA)	Flexible Demand (MVA)	Power Factor	MIC (MW Equivalent)	Firm (MW Equivalent)
A	100	60	40	0.95	95	57
B	40	20	20	0.98	39	20
C	50	0	50	1.0	50	0

Flexible Demand Reduction / Restoration Ramp Rate Limits

Site	Flexible Demand (MVA)	Ramp Down Rate Limit* (MW / min)	Ramp Up Rate Limit* (MW / min)	Ramp Down Implementation (Demand Reduction)	Ramp Up Implementation (Demand Restoration)
A	40	10	10	Demand will be reduced in blocks of 5 MW every 30 seconds.	Demand will be increased in blocks of 2 MW every 1 minute.
B	20	10	10	Demand will be reduced in blocks of 15 MW every 1 minute.	Demand will be increased in blocks of 10 MW every 2 minutes.
C	50	10	10	Demand will be reduced in blocks of 10 MW every 30 seconds.	Demand will be increased in blocks of 5 MW every 30 seconds.

*The rate of reduction / restoration should be no greater than.

Appendix 3 Signal List

The Customer should refer to their site-specific signal list.

System Operator Flexible Demand Signal List			
Digital Output Signals (from System Operator)			
<i>Double Command Outputs (Remote Control)</i>			
Name	Status	Type	Duration
Demand Reduction	Activated	Pulse	0.5 second
Demand Reduction	De-activated	Pulse	0.5 second
Strobe Enable Pulse*			
Demand Reduction Setpoint Enable		Pulse	0.5 second
Digital Input Signals (to System Operator)			
<i>Double Point Status Indications (P.I.)</i>			
Name	Status		
Demand Reduction Acknowledgement	ON		
Demand Reduction Acknowledgement	OFF		
Demand Reduction in Progress	ON		
Demand Reduction in Progress	OFF		
Demand Reduction Limited/Unavailable	ON		
Demand Reduction Limited/Unavailable	OFF		
Analogue Output Signals (from System Operator)			
<i>Analogue Output Signals from System Operator to Customer</i>			
Name	mA range	Analogue Range	Unit
MW Limit Setpoint	4 - 20	0 - YYY**	MW
Analogue Input Signals (to System Operator)			
<i>Analogue Input Signals from Customer to System Operator</i>			
Name	mA range	Analogue Range	Unit
MW Limit Setpoint (Feedback)	0 - 10	0 - YYY**	MW
* Logic configuration in System Operator side Remote Terminal Unit (RTU).			
** Site-specific Total Demand (i.e. Firm + Flexible) in MVA converted to MW using agreed power factor.			

Appendix 4 Contact Details

4.1 EirGrid Contact Details

National Control Centre Primary (24/7): TBD

National Control Centre Secondary (24/7): TBD

4.2 ESB Networks Contact Details

National Distribution Control Centre Primary (24/7): TBD

National Distribution Control Centre Secondary (24/7): TBD

4.3 Customer Contact Details

Customer Contact Site A Primary (24/7): TBD

Customer Contact Site A Secondary (24/7): TBD

Customer Contact Site B Primary (24/7): TBD

Customer Contact Site B Secondary (24/7): TBD

Customer Contact Site C Primary (24/7): TBD

Customer Contact Site C Secondary (24/7): TBD

Appendix 5 Single Line Diagram

See Operation Instruction for the connection interface.