APPLICATION FORM FOR AN OFFER OF TERMS TO CONNECT A GENERATOR TO THE ALL-ISLAND TRANSMISSION NETWORKS IN RESPECT TO A GENERATOR IN NORTHERN IRELAND

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1 Introduction

System Operator for Northern Ireland Limited ("SONI") is the **Transmission System Operator** for Northern Ireland. It is authorised to participate in the transmission of electricity by means of a Transmission Licence issued by the Department for the Economy (the "Department"), under Article 10(1)(b) of the Electricity (Northern Ireland) Order 1992 (the "**Order**"). It is regulated by the Utility Regulator for Northern Ireland (the "**Authority**").

Under its Transmission Licence SONI is responsible for the planning and operation the **Transmission System** in Northern Ireland in a safe, secure, efficient manner.

SONI is the only party in Northern Ireland entitled to offer terms to connect, or to modify an existing connection, to the **Transmission System** in line with Condition 25 of its Licence. Such terms are offered following receipt by SONI of an application containing all such information as SONI may reasonably require to prepare the terms of the offer.

SONI shall offer terms as soon as practicable and, except where the **Authority** consents to a longer period, not more than 3 months after receipt by SONI of a fully completed application containing all the information that SONI deems is required (including the relevant Application Fee). Please note that the user application date from which the 3 months period will apply can only be determined when all the information that SONI deems is required to formulate an offer for connection is provided with the application.

SONI has prepared a Transmission Connection Charging Methodology Statement ("TCCMS") in line with Condition 30 of its Licence which sets out the basis upon which charges will be made for connection to the **Transmission System**. This TCCMS provides details of the relevant connection application fees which must accompany the connection application form. The TCCMS is available on SONI website at www.soni.ltd.uk.

Please note that it is preferable that the payment of the application fee is made via electronic fund transfer into the following account:

Bank Details:

Barclays Bank PLC	Sort Code: 20-05-94
Donegall House,	Account Name: SONI Limited
Donegall Square North	Account Number: 20956007
Belfast	Swift Code: BARC GB22
BT1 5GB	IBAN: GB67 BARC 2005 9420 9560 07

Cheques are also acceptable and should be made out to "SONI Limited".

It is SONI's responsibility to determine the transmission connection method. The selected method will be based on the overall Least Cost Technically Acceptable ("LCTA") solution unless the applicant requests otherwise or SONI requires an alternative method for system reasons (see Section 6 of the TCCMS).

SONI shall not be obliged to offer to enter or to enter into any **Connection Agreement**:

(a) if to do so would involve SONI:

i. in breach of its duties under Article 12 of the **Order**; or

ii. in breach of any regulations made under Article 32 of the **Order** or of any other enactment relating to safety or standards applicable in respect of the **Transmission System**; or

iii. in breach of the conditions of its Transmission Licence;

iv. in breach of the **Grid Code**; or

(b) if the person making the application does not undertake to be bound by such parts of the **Grid Code** and to such extent as the **Authority** shall from time to time specify in directions issued to SONI for the purposes of Condition 25 of the Licence; or

(c) if, when requested to do so by SONI, NIE and/or the Republic of Ireland System Operator does not offer to enter into an agreement for connection and/or modification works in respect of the **Connection Agreement** or Transmission Use of System Agreement in question.

All **Generator**s who have equipment connected to the **Transmission System** (or all persons who are applying to become a **Generator** and seeking to have equipment connected to the **Transmission System**) must comply with (or commit to comply with) the **Grid Code**. Data submitted pursuant to this application are deemed to be submitted under the **Grid Code**. The SONI Grid Code is available on SONI website at www.soni.ltd.uk.

This application form sets out the information which must be submitted to SONI in order for SONI to prepare and issue an offer to connect a **Generator** to the **Transmission System**.

Definitions of terms used in this form can be found in the Glossary and Definition section of the **Grid Code**.

The Planning Code within the **Grid Code** defines two sets of data which must be submitted to SONI:

Preliminary Project Planning Data

Preliminary Project Planning Data must be provided to SONI when requesting an offer to connect or requesting an offer to modify an existing connection to the **Transmission System**. This set of data is set out in this application form.[1]

[1] It should be noted that under PC6.4.2 of the **Grid Code**, SONI may specifically request **Detailed Planning Data** at application stage to permit more detailed **System** or **Other Transmission System** studies for the purposes of formulating a connection offer. As such, SONI reserves the right to request additional data if necessary and the applicant should provide such information promptly during and post the connection offer process.

Detailed Planning Data

Detailed Planning Data must be submitted to SONI within 28 days of accepting a connection offer from SONI. A pro forma setting out **Detailed Planning Data** will be supplied by SONI on request. It can also be found in the **Grid Code** as part of the **Data Registration Code** ("**DRC**").

SONI recommends that all potential connection applicants carefully review the **Grid Code** and satisfy themselves that they can meet all the requirements relevant to their type of **Generator**.

SONI shall ensure that any new network additions or modifications do not result in unacceptable or unstable conditions on the **Transmission System**. This will be done by undertaking a number of system studies replicating the **Generator**'s proposed development and the effect it may have on the **Transmission System**.

Completed Application Forms should be sent to:

Generator Connection Applications
SONI Ltd
Castlereagh House
12 Manse Road
Belfast
BT6 9RT

If any additional information is required or if assistance is need in completing this form please contact:

connections@soni.ltd.uk

2 Generator Connection Application

1. We hereby apply for an offer of terms for connection to the **All-island Transmission Networks** in respect of:

(Please insert proposed name of facility or project[2])

2. We undertake for the purposes of this application to be bound by the terms of the **Grid Code** in as far as it is applicable to the facility / project and we hereby confirm that we have read the **Grid Code** and understand the compliance requirements in the context of the above proposed facility / project which we are applying to connect to the **Transmission System**.

   Further, to the best of our knowledge the facility / project shall be in compliance with the **Grid Code**. Should we become aware that the proposed facility / project will be unable to comply with any provision of the **Grid Code** then we shall without undue delay report such non-compliance(s) to SONI and shall make all reasonable efforts as are required to remedy such non-compliances as soon as reasonably practicable

3. We authorise the release of information provided pursuant to this application to NIE Networks should SONI consider it necessary and/or to progress any associated Construction Application as per the Transmission Interface Arrangements.

Signed by: For and on behalf of the applicant (as detailed in Applicant's Details section of this application)	
Date:	

[2] The TSO will take this preferred name into consideration when determining the facilities' station name but reserves the right to change it in order to avoid any potential for confusion with other projects or stations.

3 Applicant's Details

Where the application is being submitted on behalf of a company please complete Part A only. Otherwise, please complete Part B.

Part A

Company Name:	
Company Registered Address:	
Company Registration No:	
Contact within company:	
Address: (if different to above)	
Tel No:	
Email address:	
Fax No:	

Part B

Name of Applicant:	
Address:	
Tel No:	
Email address:	
Fax No:	

4 Prerequisites

Has the applicant obtained planning permission for the facility / project from the relevant Local Council(s) or the Department for Infrastructure and/or other equivalent consents?	Yes / No *
SONI requires a copy of the planning permission and/or other equivalent consents. Has this been submitted with this application?	Yes / No *
Does the applicant wish to pay a fixed price connection application fee or an outturn cost connection application fee? (See Section 8 of the TCCMS)	Fixed Application Fee / Outturn Application Fee *
A connection application fee is required. Has the relevant application fee been submitted with this application? (See Table 1 of the TCCMS)	Yes / No *

** delete as appropriate*

5 General Details of the Generator Facility / Project

Proposed Project Name:		
Address/Location of Site:		
Grid co-ordinates of the electrical **Connection Point** (Irish Grid Reference or IGR)	Easting (6 digit IGR):	Northing (6 digit IGR):
Site location plan enclosed?	Yes / No * (Please provide a 1:50,000 (approx) Ordnance Survey map with the location of the facility / project clearly marked. The electrical **Connection Point** must be clearly marked with an "X". If it is intended that facility / project will be spread geographically over a number of different sites, please also indicate each site on this site location plan, by labelling each site).	
Site layout plan enclosed?	Yes / No * (Please provide an Ordnance Survey map on an appropriate scale (e.g. 1:10,000) with the **electrical connection point clearly marked with an "X"**. All generating units and other infrastructure should be shown and labelled.)	
Target Connection Date:		
Have any connection feasibility studies for this facility / project already been carried out by SONI?	Yes / No *	
If so, date(s) of study:		

** delete as appropriate*

6 Preliminary Project Planning Data (Connection Site and User System Data)

Has a Single Line Diagram (SLD) enclosed? (Please provide a SLD of existing and proposed arrangements of main connections and primary distribution systems showing equipment ratings and if available number and nomenclature). This should include:- • Busbar layouts • Electrical circuitry (i.e. lines, cables, transformers, switchgear etc) • Phasing arrangements • Earthing arrangements • Switching facilities and interlocking arrangements • Operating voltages • Numbering and nomenclature	Yes / No *	
In the case of **Controllable** or **Dispatchable PPM**s… for Wind, a diagram showing the wind speed and direction against electrical output in MW, in "rose" format, is required. Has this information been submitted with this application? for Solar / PV, a Weather vs. Power Curve should be submitted. Has this information been submitted with this application?	Yes / No *	
Total number of generating units:		
Total **Registered Capacity**:		MW
Maximum Export Capacity:		MW
Minimum Generation (if applicable):		MW
Maximum auxiliary demand (please include the requirements for the entire connection site here – individual generating unit data to be provide in Sections 7 or 8 below as relevant) Active: Reactive:		MW MVAr
Operating regime of units not subject to **Central Dispatch** (e.g. continuous, peak lopping, intermittent) :		
Maximum 3-phase short circuit current infeed into the **Transmission System**:		kA
The minimum zero sequence impedance of the applicant's system at the point of connection with the **Transmission System**:		% on 100
Details of any transformers proposed to be connected on customer side of the **Connection Point** (if applicable) should be provided in Tables 9A and/or 9B		
Details of any additional reactive power devices proposed to be connected on customer side of the **Connection Point** (if applicable) should be provided in Table 9C		

** delete as appropriate*

7 Non Power Park Module (PPM) Unit Preliminary Project Planning Data

Where a number of Non-PPM Generating Units are proposed to be connected, the Preliminary Project Planning Data shall be submitted for each type of Generating Unit. Please complete the tables in this section.

If it is intended that Generating Units will be spread geographically over a number of separate sites, please also indicate this in the tables below, by stating the site or sites that each Generating Unit Type will be part of – this should align with the Site Location Plan submitted as part of this application.

(Please continue on separate sheet if necessary).

Table 7A. Non-PPM Generating Unit Data

	Generating Unit Type 1	**Generating Unit Type 2** (if applicable)	**Generating Unit Type 3** (if applicable)
Proposed for site(s) if applicable:			
Prime mover type:			
Generating Unit type e.g. synchronous, induction etc:			
Generating Unit Rating:	**MW**	**MW**	**MW**
Generating Unit Terminal voltage:	**kV**	**kV**	**kV**
Generating Unit Power Factor range at terminals:			
Registered Capacity:	**MW**	**MW**	**MW**
Minimum Generation: (where applicable)	**MW**	**MW**	**MW**
Generating Unit Power Factor rated power factor:			
Maximum auxiliary demand			
Active:	**MW**	**MW**	**MW**
Reactive:	**MVAr**	**MVAr**	**MVAr**
A Sustained Load diagram is required. Has this diagram been submitted along with this application?	Yes / No *	Yes / No *	Yes / No *
A CCGT Installation Matrix in respect of its CCGT Installations is required. Has this information been submitted along with this application?	Yes / No / N/A*	Yes / No / N/A*	Yes / No / N/A*

Table 7B. Data for Non-PPM Generating Units with a Registered Capacity >5MW

Generating Unit Type 1

Inertia constant:		MWs/MVA
Short circuit ratio:		
Direct axis transient reactance:		% on MVA
Direct axis sub-transient reactance:		% on MVA
Positive sequence resistance:		% on MVA
Positive sequence reactance:		% on MVA
Negative sequence resistance:		% on MVA
Negative sequence reactance:		% on MVA
Zero sequence resistance:		% on MVA
Zero sequence reactance:		% on MVA
Generating transformer Rating: Positive sequence reactance: Tap change range:		 MVA % on MVA +% to -%

Generating Unit Type 2 (if applicable)

Inertia constant:		MWs/MVA
Short circuit ratio:		
Direct axis transient reactance:		% on MVA
Direct axis sub-transient reactance:		% on MVA
Positive sequence resistance:		% on MVA
Positive sequence reactance:		% on MVA
Negative sequence resistance:		% on MVA
Negative sequence reactance:		% on MVA
Zero sequence resistance:		% on MVA
Zero sequence reactance:		% on MVA
Generating transformer Rating: Positive sequence reactance: Tap change range:		 MVA % on MVA +% to -%

Generating Unit Type 3 (if applicable)

Inertia constant:		MWs/MVA
Short circuit ratio:		
Direct axis transient reactance:		% on MVA
Direct axis sub-transient reactance:		% on MVA
Positive sequence resistance:		% on MVA
Positive sequence reactance:		% on MVA
Negative sequence resistance:		% on MVA
Negative sequence reactance:		% on MVA
Zero sequence resistance:		% on MVA
Zero sequence reactance:		% on MVA
Generating transformer Rating: Positive sequence reactance: Tap change range:		 MVA % on MVA +% to -%

8 PPM Unit Preliminary Project Planning Data

Where a number of PPM Generating Units are proposed to be connected, the Preliminary Project Planning Data shall be submitted for each type of Generating Unit. Please complete the table in this section.

		Generating Unit Type 1	**Generating Unit Type 2** (if applicable)	**Generating Unit Type 3** (if applicable)
Proposed for site(s) if applicable:				
Manufacturer of Generating Unit:				
Model of Generating Unit:				
Type of Generating Unit (e.g. DFIG):				
Number of Generating Units				
Rated power output of each generating unit:	**MW**			
Generating Unit Terminal voltage:				
Generating Unit Power Factor range at terminals:				
Registered Capacity (sent out):	**MW**			
Maximum Generation (sent out):	**MW**			
Minimum Generation (sent out):	**MW**			
Reactive Power Capability	**MVAr (Lagging)**			
	MVAr (Leading)			
Reactive Power (Max. Gen)	*For Wind please attach Wind Turbine Power Capability Curve* *For Solar / PV please attach PQ Capability Curve*			
Reactive Power (Normal Full Load)				
Reactive Power (Normal Minimum Load)				
Maximum auxiliary demand				
Active:	**MW**			
Reactive:	**MVAr**			
Inertia constant:	**MWs/MVAr**			

		Generating Unit Type 1	**Generating Unit Type 2** (if applicable)	**Generating Unit Type 3** (if applicable)
Short circuit ratio:				
Direct axis transient reactance:	**% on MVA**			
Direct axis sub-transient reactance:	**% on MVA**			
Positive sequence resistance:	**% on MVA**			
Positive sequence reactance:	**% on MVA**			
Negative sequence resistance:	**% on MVA**			
Negative sequence reactance:	**% on MVA**			
Zero sequence resistance:	**% on MVA**			
Zero sequence reactance:	**% on MVA**			
Generating transformer				
Rating:	**MVA**			
Positive sequence reactance:	**s on MVA**			
Tap change range:	**+% to -%**			

9 Additional / Alternative Data

SONI may reasonably require additional data from **User**s to represent correctly the performance of **Plant** and **Apparatus** on the **Transmission System** where the present data submissions would, in the SONI's reasonable opinion, prove insufficient for the purpose of producing meaningful system studies for the relevant parties.

There are many types of transformers. This application form specifies Two Winding Transformers and Three Winding Transformers. All impedances should be stated in % on transformer rated MVA base.

Please note that the connection voltage is determined by SONI in accordance with normal standards, as detailed in the **Grid Code**, taking into account the particulars of each development. If the connection voltage differs from that specified in the Application, SONI will request new data corresponding to the new voltage level.

If the full transformer details are not available or provided at the time of application SONI can assume values based on the expected transformer size in MVA provided by the applicant. Please note that these assumptions used by SONI, in the absence of the details being provided by the applicant, would be at the applicants risk and should these materially differ from what the applicant does install that this may result in further changes to the terms and conditions (including applicable charges) under the connection offer.

It should be noted that the Applicant will have to provide the information requested in this section and a full manufactures test report for the installed transformer prior to energisation.

Table 9A. Transformer Data – Two Winding Transformers (if applicable)

	Transformer Type 1	**Transformer Type 2** (if applicable)
Rating of Transformer (MVA)		
Transformer voltage ratio HV/ LV (kV)		
Transformer positive sequence resistance (R_1%)		
Transformer positive sequence reactance (X_1%)		
Transformer zero sequence resistance (R_0%)		
Transformer zero sequence reactance (X_0%)		
Transformer vector group		
Please provide details of tap changer (Nature of tap changer off load/on load/off circuit)	kV	kV
	+ Steps	**+** Steps
	- Steps	**-** Steps
	% Step Size	% Step Size

Table 9B. Transformer Data – Three Winding Transformers (if applicable)

Transformer Type 1

	HV Winding	LV1 Winding	LV2 Winding
Transformer rated (MVA)			
Transformer rated (kV)			
Transformer vector group			

Transformer Type 2 (if applicable)

	HV Winding	LV1 Winding	LV2 Winding
Transformer rated (MVA)			
Transformer rated (kV)			
Transformer vector group			

With regards to the transformer(s), clearly specify the MVA base which the measured impedances below are related to:

	Transformer Type 1	Transformer Type 2 (if applicable)
Transformer positive sequence resistance (R_{1HL1}%) between HV/LV_1:		
Transformer positive sequence reactance (X_{1HL1}%) between HV/LV_1:		
Transformer zero sequence resistance (R_{0HL1}%) between HV/LV_1:		
Transformer zero sequence reactance (X_{0HL1}%) between HV/LV_1:		
Transformer positive sequence resistance (R_{1HL2}%) between HV/LV_2:		
Transformer positive sequence reactance (X_{1HL2}%) between HV/LV_2:		
Transformer zero sequence resistance (R_{0HL2}%) between HV/LV_2:		

	Transformer Type 1	**Transformer Type 2** (if applicable)
Transformer zero sequence reactance (X_{0HL2}%) between HV/LV_2:		
Transformer positive sequence resistance (R_{1L1L2}%) between LV_1/LV_2:		
Transformer positive sequence reactance (X_{1L1L2}%) between LV_1/LV_2:		
Transformer zero sequence resistance (R_{0L1L2}%) between LV_1/LV_2:		
Transformer zero sequence reactance (X_{0L1L2}%) between LV_1/LV_2:		
Transformer positive sequence resistance (R_{1HL1L2} %) between HV/(LV_1+LV_2):		
Transformer positive sequence reactance (X_{1HL1L2}%) between HV/(LV_1+LV_2):		

Table 9C. Additional Reactive Power Devices (if applicable)

Please provide details of any reactive devices or power factor correction devices on the MV side of the grid connected transformer on site.

Number of inductive devices:	
Mvar capability of each device:	Please attached details of each separately
If device has more than one step:	
• No. of steps	
• Mvar per step	
Number of capacitive devices:	
Mvar capability of each device:	Please attached details of each separately
If device has more than one step:	
• No. of steps	
• Mvar per step	
Will shunt compensation as harmonic filters be utilised on site?	Yes / No *

** delete as appropriate*