

Application Form
for Offer of Terms to connect an
**Energy Storage Power Station
(ESPS)**
in Northern Ireland
to the All-Island Transmission System

March 2024



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1 Introduction

System Operator for Northern Ireland (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	<u>Sort Code:</u>	20-05-94
Donegall House,	<u>Account Name:</u>	SONI Limited
Donegall Square North	<u>Account Number:</u>	20956007
Belfast	<u>Swift Code:</u>	BARC GB22
BT1 5GB	<u>IBAN:</u>	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 **Generators** 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 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 project²)

Consent to Release Information Form

2. 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: An appropriately authorised ³ person, acting for and on behalf of the applicant	
Print Name:	
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 As per Companies House <https://beta.companieshouse.gov.uk/> or equivalent

Application Declaration Form

3. We undertake for the purposes of this application to be bound by the terms of the **Grid Code**⁴ 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 operate in compliance with the terms of 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 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.

Signed by: An appropriately authorised ⁵ person, acting for and on behalf of the applicant	
Print Name:	
Date:	

⁴ Available on the SONI website (<http://www.soni.ltd.uk/>), please consider both the Grid Code and approved modifications

⁵ As per Companies House <https://beta.companieshouse.gov.uk/> or equivalent

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 signed the Application Declaration (in part 2 of this form)?	Yes / No *
If assumed data will need to be used, has the Applicant provided the relevant declaration? <i>See Appendix 1</i>	Yes / No * / NA
Has the applicant paid the relevant application fee? (See Section 8 and Table 1 of the TCCMS)	Yes / No *

* *delete as appropriate*

5 General Details of the ESPS 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 & clearly labeled?	Yes / No *	
	Please provide a 1:50,000 (approx.) Ordnance Survey map with the location of the facility / project clearly marked. 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 & clearly labeled?	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:		
Planning/Relevant Consent Reference Number?		
Do you currently have a live Connection Application or Offer associated with this Planning / Relevant Consent Reference Number?	<input type="checkbox"/>	
Will the unit(s) operation be restricted in any way? If yes, please provide details (e.g. subject to run hour restrictions to comply with environmental regulations etc. or any other reason)		

* delete as appropriate

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

<p>User System Layout</p> <p>Has a Single Line Diagram (SLD) enclosed?</p> <p>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:</p> <ul style="list-style-type: none"> • 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 *
<p>Total number of ESUs:</p>	
<p>Details for the total number of generating units:</p>	
<p>Total Registered Capacity:</p>	MW
<p>Maximum Export Capacity:</p>	MW
<p>Minimum Generation (if applicable):</p>	MW
<p>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):</p> <p style="padding-left: 40px;">Active:</p> <p style="padding-left: 40px;">Reactive:</p>	MW MVAr
<p>Operating regime of units not subject to Central Dispatch (e.g. continuous, peak lopping, intermittent):</p>	
<p>Short Circuit Infeed to the NI System</p> <p>The total short circuit infeeds calculated in accordance with good industry practice into the NI System from the User System at the Connection Point as follows:</p>	
<ul style="list-style-type: none"> • maximum 3-phase short circuit current infeed into the Transmission System • minimum zero sequence impedance of the User System at the Connection Point with the Transmission System 	MVA % on 100

Short circuit ratio:		ESU Type 1	ESU Type 2	ESU Type 3
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			

User System Demand (Active and Reactive Power)	
Forecast daily Demand profiles net of the output profile of all Generating Plant directly connected to the User System in time marked half hours throughout the day as follows:	
• peak day on the User System	/ MW / MVA _r
• day of peak Demand (Active Power)	MW
• day of minimum Demand (Active Power)	MW
Details of any transformers proposed to be connected on customer side of the Connection Point (if applicable) should be provided in Tables 10A and/or 10B	
SONI will use the relevant minimum power factor range at the Connection Point applicable for the technology from Grid Code. Please specify if a wider power factor range is required and the resulting total MVA at the Connection Point .	

* delete as appropriate

7 ESPS Preliminary Project Planning Data

Table 7A. Demand (Active & Reactive Power) Data Requirements (PC. A2.2.2)

Maximum Import Capacity (MIC): (This is the amount of importing transmission capacity that will be provided in the connection offer).		MW / MVA
Forecast peak day Demand profile (Reactive Power) (Please provide graph if necessary).		MVAr
Forecast peak day Demand profile (Active Power) (Please provide graph if necessary).		MW
Monthly peak Demand variations (net of the output profile of all Independent Generating Plant) in time marked half hours throughout the day. (Please provide graph if necessary).		MW
Please provide a graph of the facility's Load Factor over 1 year.	Please attach graph separately	
Please provide a description of the expected operating profile in relation to renewables and demand profile and unplanned system events	Please attach separately	
Energy Capacity (representing the maximum continuous duration that the ESPS can export at full MEC)		MWh
Type and electrical loading of equipment to be connected: <ul style="list-style-type: none"> • number and size of motors • types of drive and control arrangements • other large items of equipment 	Please attach details of each separately	
The sensitivity of the Demand to any variations in voltage and Frequency on the Transmission System .		MW / kV MVAr / kV MW / Hz MVAr / Hz
The maximum phase unbalance / harmonic content which the User would expect its Demand to impose on the Transmission System .		%
The average phase unbalance / harmonic content which the User would expect its Demand to impose on the Transmission System .		%
Please provide details of any items of plant which can contribute significant levels of harmonic distortion. (i.e. Large variable speed drives, large inverters, IT equipment, etc.)	Please attach details of each separately	

Table 7B. Fluctuating Loads > 5 MVA (PC. A2.2.3)

Details of the cyclic variation of Demand (Active Power and Reactive Power)	Please attached details separately	
The rates of change of Demand :		
• Active Power increasing		MW / min
• Active Power decreasing		MW / min
• Reactive Power increasing		MVAr / min
• Reactive Power decreasing		MVAr / min
The shortest repetitive time interval between fluctuations in Demand :		
• Active Power		min(s)
• Reactive Power		min(s)
The magnitude of the largest step changes in Demand :		
• Active Power increasing		MW
• Active Power decreasing		MW
• Reactive Power increasing		MVAr
• Reactive Power decreasing		MVAr
Maximum energy demanded per half hour by the fluctuating load cycle		MW / ½hr
Steady state residual Demand (Active Power) occurring between Demand fluctuations		MW

8 ESPS Unit Preliminary Project Planning Data

Where a number of energy Storage Units (ESUs) are proposed to be connected, the Preliminary Project Planning Data shall be submitted for each type of ESU. Please complete the table in this section.

		ESU Type 1	ESU Type 2 (if applicable)	ESU Type 3 (if applicable)
Proposed for site(s) if applicable:				
Manufacturer of ESU:				
Model of ESU:				
Type of ESU				
Number of ESU				
Rated power output of each generating unit:	MW			
ESU Terminal voltage:				
ESU 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)	<i>For wind please attach Wind Turbine Power Capability Curve</i>			
Reactive Power (Normal Full Load)				
Reactive Power (Normal Minimum Load)		<i>For Solar / PV please attach PQ Capability Curve</i>		
Maximum auxiliary demand				
Active:	MW			
Reactive:	MVAr			

		ESU Type 1	ESU Type 2 (if applicable)	ESU Type 3 (if applicable)
Inertia constant:	MWs/ MVA			

Generating transformer				
Rating:	MVA			
Positive sequence reactance:	s on MVA			
Tap change range:	+% to -%			

9 User's Abnormal Loads (PC. A2.2.4)

Details should be provided on any individual **Loads** which have characteristics differing from the normal typical range of **Loads** in the domestic, commercial or industrial fields. In particular, details on arc furnaces, rolling mills, traction installations, etc. which are liable to cause flicker problems.

Please attach any relevant details separately.

10 Additional / Alternative Data

- SONI may reasonably require additional data from **Users** 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 10 A. 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	•	•
<ul style="list-style-type: none"> • Please provide details of tap changer • (Nature of tap changer off load/on load/off circuit) 	• kV	• kV
	• Steps +	• Steps +
	• Steps -	• Steps -
	• Size % Step	• Size % Step

Table 10 B. Transformer Data – Three Winding Transformers (if applicable)

Transformer Type 1 (if applicable)

	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 in relation to the LV ₁ MVA:		
Transformer positive sequence reactance ($X_{1HL1}\%$) between HV/LV ₁ in relation to the LV ₁ MVA:		
Transformer zero sequence resistance ($R_{0HL1}\%$) between HV/LV ₁ in relation to the LV ₁ MVA:		
Transformer zero sequence reactance ($X_{0HL1}\%$) between HV/LV ₁ in relation to the LV ₁ MVA:		
Transformer positive sequence resistance ($R_{1HL2}\%$) between HV/LV ₂ in relation to the LV ₂ MVA:		
Transformer positive sequence reactance ($X_{1HL2}\%$) between HV/LV ₂ in relation to the LV ₂ MVA:		
Transformer zero sequence resistance ($R_{0HL2}\%$) between HV/LV ₂ in relation to the LV ₂ MVA:		
Transformer zero sequence reactance ($X_{0HL2}\%$) between HV/LV ₂ in relation to the LV ₂ MVA:		
Transformer positive sequence resistance ($R_{1L1L2}\%$) between LV ₁ /LV ₂ in relation to the LV ₁ MVA:		
Transformer positive sequence reactance ($X_{1L1L2}\%$) between LV ₁ /LV ₂ in relation to the LV ₁ MVA:		
Transformer zero sequence resistance ($R_{0L1L2}\%$) between LV ₁ /LV ₂ in relation to the LV ₁ MVA:		
Transformer zero sequence reactance ($X_{0L1L2}\%$) between LV ₁ /LV ₂ in relation to the LV ₁ MVA:		
Transformer positive sequence resistance ($R_{1HL1L2}\%$) between HV/(LV ₁ +LV ₂) in relation to the HV ₁ MVA:		

	Transformer Type 1	Transformer Type 2 (if applicable)
Transformer positive sequence reactance ($X_{1HL1L2}\%$) between HV/(LV ₁ +LV ₂) in relation to the HV ₁ MVA:		

Table 10 C. 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

Appendix 1

I confirm that we cannot provide all of the required planning data as outlined within the **Planning Code** (part of the **Grid Code**) at this time, and any detailed planning data as requested by SONI.

I further confirm that the Applicant fully understands the implications of not doing so for this project in terms of applying for connection to the transmission system.

In particular, but without limitation, the Applicant is fully aware and understands that: (a) SONI may make assumptions regarding the Planning Data for the purpose of carrying out its Transmission connection studies, (b) these assumptions will inform the terms of any connection offer (**Offer**) SONI Limited (**SONI**) may subsequently make to the Applicant, and (c) SONI does so entirely at the Applicant's risk.

The Applicant acknowledges that the terms of any Offer, including the connection method, charges, lead-times or other details may be revised as and when the complete set of Planning Data is subsequently submitted, and acknowledges that SONI cannot accept any responsibility or liability for or in respect of such revisions, including for any loss or liability suffered or incurred by the Applicant as a result of same.

This declaration shall be deemed a part of the connection application submitted by the Applicant and is made in consideration of the processing of the Applicant's application by SONI. It shall form part of any subsequent connection or other agreement between the Applicant and SONI and shall further be subject to the terms of any such agreement.

Signed by a duly authorised director of the Applicant acting for and on its behalf:

SIGN NAME

PRINT NAME

DIRECTOR/AUTHORISED SIGNATORY

COMPANY NAME