HydroOttawa

Project Name:
Project Address:

Form B – Connection Impact Assessment Application (CIA)
For connection to the Hydro Ottawa distribution grid

This document is to be completed by the proponent interested in connecting a generator to the Hydro Ottawa distribution grid. This form, the Connection Impact Assessment (CIA) Application, forms an agreement between Hydro Ottawa (HO) and the Generator for completion of a CIA associated with connecting a generator to the HOL distribution grid. As per the Conditions of Service, Form B will also become part of the required servicing (electrical installation, maintenance and operating) agreements between Hydro Ottawa and the proponent. Through this process, Hydro Ottawa will be the proponent's contact with the provincial transmission system provider (Hydro One Networks Inc.) and, if necessary, the provincial market operator the Independent Electricity System Operator.

For guidance on completing this form, please refer to the corresponding instructions. For the technical requirements associated with the connection of your generator, refer to the relevant Hydro Ottawa standards, referenced in the instructions at www.hydroottawa.com (select Renewable Generation).

IMPORTANT: All the fields below are mandatory, except where noted. Incomplete applications will be returned.

If you have any questions please e-mail FIT@hydroottawa.com or call 613-738-5499 ext. 7312.

Payment of the required fees must be received by Hydro Ottawa before the Connection Impact Assessment (CIA) process begins.

Hydro Ottawa
Attn: CIA – Asset Management and Planning
1970 Merivale Road
Ottawa, ON K2G 6Y9

FIT@hydroottawa.com

Note: Proponents are advised NOT to incur any expenses associated with the proposed project until Hydro Ottawa provides written approval by means of an "Offer-to-Connect" and has jointly signed the Connection Cost Recovery Agreement (CCRA).

Requirement 1: All technical submissions (Form B, single line diagrams, protection schemes, etc.) must be signed and sealed by a professional engineer licensed in the province of Ontario.

Requirement 2: Hydro Ottawa's CIA costs are as follows (based on the new generation capacity being added):

- Small Generators (≤500 kW connected at <15kV , OR ≤1,000kW if connected at ≥ 15kV): $ 1,000 plus HST
- Medium Size Generators (10MW or less): $ 4,750 plus HST
- Large Generators (Greater than 10MW): $ 5,700 plus HST

Application (Re)Submission Date _____
(YYYY/MM/DD)

Application Type ❑ New CIA Application ❑ CIA Revision/Rework ❑ CIA for Incremental Generation

1. **Original CIA Project ID Number** *(if applicable)* _____

   Project Name (Generation Facility Name) _____

   Proponent Name (Generator) _____

2. **Contract Type**

   ❑ Ontario Power Authority (OPA) Power Purchase Agreement ❑ Feed-In Tariff (FIT) ❑ Load Displacement (Net Metering)

   Contract Number *(if applicable)* _____

3. **OPA Reference Number and Date** (if applicable) _____
   (YYYY/MM/DD)

4. **Proposed In-Service Date** _____
   (YYYY/MM/DD)

5. **Embedded Generation Facility Capacity Rating**

   a) Total rating of the *Embedded Generation Facility* (sum of all generation output = i + ii) (kW) _____

      i. Existing total generation output capacity (kW) _____

      ii. Proposed total additional generation output capacity (kW) _____

   b) Generation connecting on: ❑ Single phase ❑ Three phase

6. **Project Location** Street Address _____

   City/Town/Township _____

   Lot Number(s) _____

   Concession Number(s) _____

   Global Positioning System (GPS) co-ordinates _____

7. **Project Information** *Choose a single point of contact*

	❑ Generator	❑ Host Customer	❑ Consultant
Company / Person			
Contact person			
Mailing address			
Telephone			
Cell phone			
Fax			
Email			

Preferred method of contact: ❑ Email ❑ Phone ❑ Mail ❑ Fax

8. Fuel Type

a) Existing generation *(if incremental project)* ❑ NOT APPLICABLE

❑ Wind turbine	❑ Hydraulic turbine	❑ Steam turbine
❑ Solar/Photovoltaic	❑ Diesel engine	❑ Gas turbine
❑ Fuel cell	❑ Biomass	❑ Bio-diesel
❑ Co-generation/CHP *(Combined heat & power)*	❑ Anaerobic digester	❑ Other _____

b) New generation ❑ NOT APPLICABLE

❑ Wind turbine	❑ Hydraulic turbine	❑ Steam turbine
❑ Solar/Photovoltaic	❑ Diesel engine	❑ Gas turbine
❑ Fuel cell	❑ Biomass	❑ Bio-diesel
❑ Co-generation/CHP *(Combined heat & power)*	❑ Anaerobic digester	❑ Other _____

9. Customer Information

a) Host Customer account information Is the host customer an existing Hydro Ottawa customer? ❑ Yes ❑ No

Hydro Ottawa account number _____

Name as shown on Hydro Ottawa account _____

b) Generator HST registration number *(if applicable)* _____

10. Location and Site Plan Drawing/sketch No. _____ Rev._____

11. Connection to Hydro Ottawa's Distribution System

Stretch (*add more as needed)*	**Cable/Conductor Type** *(i.e., Al, Cu; number of wires/ phases)*	**Cable/Conductor size** *(i.e., #4, or 250kcmil)*	**Length** *(meters)*	**Impedance**	**Comment**
Demarcation Point to Generator fused disconnect					
Generator fused disconnect to generation meter					
Generation meter to generator disconnect					
Generator disconnect to					
Intermediate Transformer *(if applicable)*					
Intermediate Transformer to inverter					
OR Generator disconnect to inverter					

12. Single Line Diagram (SLD) SLD Drawing No. _____ Rev. _____

13. Protection Scheme, Tripping Matrix and Equipment Setting

Provide a document describing the protection scheme for detecting and clearing the situations listed in the instructions.

Equipment specification sheets, document number(s):	Protection scheme, tripping matrix and equipment setting document number(s):

14. Characteristics of Existing Generators ❑ NOT APPLICABLE

Number of generating unit(s):	Manufacturer, type and/or model no.:
Rated capacity of each unit kW: kVA:	
Rated frequency (Hz):	Generator phases: ____ single ____ three
Rotating machine type: ❑ synchronous ❑ induction ❑ other ❑ not applicable	

Limits of range of reactive power	**At the machine output**		**At the point of common coupling**	
Lagging (over-excited)	kVAR	PF (%)	kVAR	PF (%)
Leading (under-excited)	kVAR	PF (%)	kVAR	PF (%)

Starting inrush current _____ pu (multiple of full load current)

Nominal machine voltage _____ kV	Unsaturated reactance on a: kVA base_____ ; kV base _____
For synchronous units	**For induction units**
Min. power limit for stable operation _____ kW	Direct axis sub-transient reactance, Xd_____ pu
Direct axis sub-transient reactance, Xd_____ pu	Direct axis transient reactance, Xd_____ pu
Direct axis transient reactance, Xd _____ pu	Total PF correction installed _____ kVAR
Direct axis synchronous reactance, Xd _____ pu	Number of regulating steps _____
Zero sequence reactance, X0 _____ pu	PF correction switched per step _____ kVAR
Provide a plot of generator capability curve (MW output vs MVAR) Drawing No. _____ Rev._____	Are PF correction capacitors automatically switched off when generator breaker opens: ❑ Yes ❑ No

Existing generating unit sheet number _____ of _____

For inverter based units	Manufacturer, Model No. and Qty:

Single or three phase unit: _____	If three phase, is it three or four wire? _____
Max. continuous output power _____ kW	Nominal output voltage _____ V
Nominal output current _____ A	Maximum output fault current _____ A
Peak inverter efficiency _____ %	CEC efficiency _____ %
Night-time power consumption _____ W	Input protection (reverse flow): _____

Certified or tested to: ❑ IEEE 1547; ❑ UL 1741 (2005 Edition); ❑ CSA22.2 No. 107.1-01; ❑ FCC Part 15 Class A;

❑ Other _____

Existing inverter unit sheet number _____ of _____

15. Characteristics of New Generators ❑ NOT APPLICABLE

Number of generating unit(s):			Manufacturer, type and/or model no.:	
Rated capacity of each unit kW: kVA:				
Rated frequency (Hz):			Generator phases: ____ single ____ three	
Rotating machine type: ❑ synchronous ❑ induction ❑ other ❑ not applicable				
Limits of range of reactive power	**At the machine output**		**At the point of common coupling**	
Lagging (over-excited)	kVAR	PF (%)	kVAR	PF (%)
Leading (under-excited)	kVAR	PF (%)	kVAR	PF (%)
Starting inrush current _____ pu (multiple of full load current)				
Nominal machine voltage _____ kV			Unsaturated reactance on a: kVA base_____ ; kV base _____	
For synchronous units			**For induction units**	
Min. power limit for stable operation _____ kW			Direct axis sub-transient reactance, Xd_____ pu	
Direct axis sub-transient reactance, Xd_____ pu			Direct axis transient reactance, Xd_____ pu	
Direct axis transient reactance, Xd _____ pu			Total PF correction installed _____ kVAR	
Direct axis synchronous reactance, Xd _____ pu			Number of regulating steps _____	
Zero sequence reactance, X0 _____ pu			PF correction switched per step _____ kVAR	
Provide a plot of generator capability curve (MW output vs MVAR) Drawing No. _____ Rev._____			Are PF correction capacitors automatically switched off when generator breaker opens: ❑ Yes ❑ No	
New generating unit sheet number _____ of _____				
For inverter based units	Manufacturer, Model No. and Qty:			
Single or three phase unit: _____			If three phase, is it three or four wire? _____	
Max. continuous output power _____ kW			Nominal output voltage _____ V	
Nominal output current _____ A			Maximum output fault current _____ A	
Peak inverter efficiency _____ %			CEC efficiency _____ %	
Night-time power consumption _____ W			Input protection (reverse flow): _____	
Certified or tested to: ❑ IEEE 1547; ❑ UL 1741 (2005 Edition); ❑ CSA22.2 No. 107.1-01; ❑ FCC Part 15 Class A; ❑ Other _____				
New inverter unit sheet number _____ of _____				

16. Interface Step-Up Transformer Characteristics *(if customer owned)* ❑ NOT APPLICABLE

Transformer nomenclature: _____	Transformer rating (kVA): _____	
Nominal high voltage winding (kV): _____	Nominal low voltage winding (kV): _____	
Number of transformers: _____	Number of phases: _____	
Impedance on _____ kVA base _____ kV base	R _____ pu X _____ pu	Z% _____

Side	**High Voltage**	**Low Voltage**
Winding connection:		
Grounding method:		
If impedance (ohms):	R X	R X

17. Intermediate Transformer Characteristics ❑ NOT APPLICABLE

Transformer nomenclature: _____	Transformer rating (kVA): _____	
Nominal high voltage winding (kV): _____	Nominal low voltage winding (kV): _____	
Number of transformers: _____	Number of phases: _____	
Impedance on: _____ kVA base _____ kV base	R _____ pu X _____ pu	Z% _____

Side	**High Voltage**	**Low Voltage**
Winding connection:		
Grounding method:		
If impedance (ohms):	R X	R X
Loss of phase protection:	Manufacturer: _____	Model No.: _____

18. Load Information ***(if new, expanded or renovated facility)*** ❑ NOT APPLICABLE ❑ NOT KNOWN

Maximum facility load:	_____ kVA _____ kW
Maximum load current *(referred to the nominal voltage at the connection point to Hydro Ottawa system):*	_____ A
Maximum inrush current *(referred to the nominal voltage at the connection point to Hydro Ottawa system):*	_____ A

Attached Documents

Item Number	Description	Reference Number	Number of Pages
1	Equipment specifications		
2	Protection scheme, tripping matrix and equipment setting		
3	Loss of phase protection (product sheet), if applicable		
4	Right of Access documents		
5			
6			
7			

Attached Drawings

Item Number	Description	Reference Number	Number of Pages
1	Location and site plan		
2	Single Line Diagram (SLD)		
3			
4			
5			

Checklist

Please ensure the following items are completed prior to submission. Your application will not be processed if any part of this form is incomplete:

- ❑ This CIA Application, Form B, completed in full with signature and seal of a professional engineer licensed in the province of Ontario.
- ❑ Payment in full including applicable taxes (by certified cheque, bank draft or money order payable to Hydro Ottawa Limited) has been made. Please note that when there is an upstream local distribution company (Hydro One) an additional fee will be required for costs associated with that local distribution company's CIA.
- ❑ Single Line Diagram (SLD) is signed and sealed by a professional engineer licensed in the province of Ontario.
- ❑ Demonstrated site control, (such as easements, memorandum of understandings, access contracts for maintenance and operation, etc.) over the property upon which the generation facility is proposed and any required adjacent or buffer lands.
- ❑ All supporting specification sheets and signed and sealed technical documents as listed in the attachment summary tables.

Appendix A: Distribution System Connection Information

Project Name: Project Address:

The following information is provided by Hydro Ottawa following the initial consultation and therefore is not subject to a professional engineer signature or sealing.

1. Connection to Hydro Ottawa's Distribution System

Hydro Ottawa's distribution system voltage that the generation facility will connect to (kV)

	First Station	**High Voltage Distribution Station**
Name		
Buss		
Feeder		

Date information provided by Hydro Ottawa: _____
(YYYY/MM/DD)

16. Interface Step-Up Transformer Characteristics

Transformer nomenclature: _____	Transformer rating (kVA): _____	
Nominal high voltage winding (kV): _____	Nominal low voltage winding (kV): _____	
Number of transformers: _____	Number of phases: _____	
Impedance on _____ kVA base _____ kV base	R _____ pu X _____ pu	Z% _____

Side	**High Voltage**	**Low Voltage**
Winding connection:		
Grounding method:		
If impedance (ohms):	R X	R X

Date information provided by Hydro Ottawa: _____
(YYYY/MM/DD)

18. Load Information

Maximum facility load:	_____ kVA _____ kW
Maximum load current: *(referred to the nominal voltage at the connection point to Hydro Ottawa system)*	_____ A
Maximum inrush current *(referred to the nominal voltage at the connection point to Hydro Ottawa system)*	_____ A

Date information provided by Hydro Ottawa: _____
(YYYY/MM/DD)

Appendix A continued

Miscellaneous Comments

Information on primary metering, delta primary distribution, excess transformation at a supply point, etc.