Connection Impact Assessment Application Form

This Application Form is for Generators applying for a Connection Impact Assessment (CIA). In certain circumstances, London Hydro may require additional information to conduct the Impact Assessment. Should this be the case the Generator will be duly advised.

This Application Form is required for:

- **<u>New</u> Generators applying for Connection Impact Assessment ("CIA")**
- **<u>New</u> Generators applying for revision to their original Connection Impact Assessment ("CIA")**
- **<u>Existing</u> Generators to verify information related to current connection to the London Hydro system. It is part of the overall Distribution Connection Agreement.**

NOTES:

1. **Applicants and generators are cautioned NOT to incur major expenses until London Hydro has completed a Connection Impact Assessment (CIA) study and approval to connect the proposed generation is granted.**
2. **All fields below are mandatory, except where noted. Incomplete applications may be returned by London Hydro Inc. ("London Hydro").**
3. **All technical submissions (Connection Impact Assessment, single line diagrams, etc.) must be signed and sealed by a licensed Ontario Professional Engineer (P.Eng.).**

Date: _____ (dd / mm / yyyy) Contact Person Name: _____
Signature: _____

Application Type: ☐ New CIA Application ☐ CIA Revision/Rework

LDC Name:	**LONDON HYDRO INC.**
Contact Person:	**Dane Kirilovic**
Mailing Address:	**111 Horton Street, P.O. Box 2700**
	London, ON, N6A 4H6
Telephone:	**519-661-5800 ext. 5723**
Fax:	**519-661-5275**
E-mail:	**generation@londonhydro.com**

1. **Original CIA Project ID# (if applicable):** _____ **Project Name:** _____
2. **Project Type:** ☐ **FIT** ☐ **Net Metering** ☐ **Load Displacement**
3. **Independent Electricity System Operator (IESO) Feed-In Tariff (FIT) #:** _____
4. **Project Dates:** Proposed Start of Construction: _____ (dd/mm/yyyy)
   Proposed In-Service: _____ (dd/mm/yyyy)
5. **Project Size:** Nameplate Capacity _____ kW
6. **Project Location:** Municipal Address _____

7. Project Information:

Choose a Single Point of Contact: ☐ Owner ☐ Consultant

	Generator *(Mandatory)*	**Owner** *(Mandatory)*	**Consultant** *(Optional)*
Company/Person			
Contact Person			
Mailing Address Line 1			
Mailing Address Line 2			
Telephone			
Cell			
Fax			
E-mail			

Preferred method of communication with London Hydro: ☐ E-mail ☐ Telephone ☐ Mail ☐ Fax

8. Customer Status:

Billing Account Number: _____

Customer name registered to this Account: _____

Are you a HST registrant? ☐ Yes ☐ No

If yes, provide your HST registration number: _____ - _____ RT _____

9. Fuel Type:

☐ Wind Turbine ☐ Hydraulic Turbine ☐ Steam Turbine ☐ Solar/ Photovoltaic

☐ Diesel Engine ☐ Gas Turbine ☐ Fuel Cell ☐ Biomass

☐ Co-generation/CHP (Combined Heat & Power) ☐ Bio-diesel

☐ Anaerobic Digester ☐ Battery

☐ Other (Please Specify) _____

10. Please provide a sketch of your proposed point of connection to London Hydro distribution system.

Drawing / Sketch No. _____, Rev. _____

11. Connection to London Hydro's Distribution System (provided in your original IFA):

a. Proposed connection voltage to London Hydro's distribution system: _____ kV

b. Feeder Name: _____

c. Hydro One Transformer Station Name: _____

d. GPS coordinates of the connection point _____

e. Fault contribution from Generator's facilities, with the fault location at the PCC:

☐ Three-phase generators: 3-phase short circuit _____ MVA;

☐ Single-phase generators: 1-phase short circuit _____ MVA.

12. Single Line Diagram (SLD):

Provide detailed and updated SLD of the EG facility including the Demarcation Point / Point of Common Coupling ("PCC") to London Hydro's distribution system. This drawing shall include, but not be limited to:

- Electrical equipment at EG's facilities, their principal ratings, impedances, winding configurations, neutral grounding methods, etc.
- Protective relaying, synchronizing and revenue metering arrangements. The device numbers should be in accordance with those adopted in the ANSI / IEEE Standard C37.2 – 1979: *IEEE Standard Electrical Power System Device Function Numbers.*

The SLD shall include the following, as applicable:

- Disconnecting device at the connection point with London Hydro's distribution system
- Load break switches
- Fuses
- Circuit breakers
- Interface step-up transformer
- Intermediate transformer(s)
- CTs and VTs (quantity, location, connection, ratio)
- Generators (rotating / static)
- Power factor correction capacitors and their switching arrangements (particularly for induction units)
- Motors
- Power cables
- Surge arresters
- Any other relevant electrical equipment.

- SLD Drawing Number: _____ Rev._____

13. Generator Characteristics

a. Characteristics of Existing Generators

If Generator's facilities include existing generators, provide details as an attached document.

b. Characteristics of New Generators:

NOTE:
Please provide the manufacturer's technical data (electrical) for the generator or inverter.

Number of generating unit(s): _____
Manufacturer / Type or Model No: _____ / _____
Rated capacity of each unit: _____ kW _____ kVA
If unit outputs are different, please fill in additional sheets to provide the information.
Rated frequency: _____ Hz
Rotating Machine Type:
☐ Synchronous ☐ Induction ☐ Inverter ☐ Other (Please Specify) _____
(If the machine type is "Other", please provide values equivalent to a Synchronous or Induction type Generator)
Generator connecting on: ☐ single phase ☐ three phase

Limits of range of reactive power at the machine output:
i. Lagging (over-excited): _____ kVAR power factor _____
ii. Leading (under-excited) _____ kVAR power factor _____
Limits of range of reactive power at the PCC:
iii. Lagging (over-excited): _____ kVAR power factor _____
iv. Leading (under-excited) _____ kVAR power factor _____

Starting inrush current: _____ pu (multiple of full load current)
Generator terminal connection: ☐ delta ☐ star
Neutral grounding method of star connected generator:
☐ Solid ☐ Ungrounded ☐ Impedance: R _____ ohms X _____ ohms

For Synchronous Units:

i. Nominal machine voltage: _____ kV
ii. Minimum power limit for stable operation: _____ kW
iii. Unsaturated reactances on: _____ kVA base _____ kV base
Direct axis subtransient reactance, Xd'' _____ pu
Direct axis transient reactance, Xd' _____ pu
Direct axis synchronous reactance, Xd _____ pu
Zero sequence reactance, X0 _____ pu
iv. Provide a plot of generator capability curve (MW output vs MVAR)
Document Number: _____, Rev._____

For Induction Units:

i. Nominal machine voltage: _____ kV
ii. Unsaturated reactances on: _____ kVA base _____ kV base
Direct axis subtransient reactance, Xd'' _____ pu
Direct axis transient reactance, Xd' _____ pu
iii. Total power factor correction installed: _____ kVAR
- Number of regulating steps _____
- Power factor correction switched per step _____ kVAR
- Power factor correction capacitors are automatically switched off when generator breaker opens

☐ Yes ☐ No

For SPC / Inverter type units:

i. Terminal voltage _____ V
ii. Line - interactive type (i.e. intended for parallel operation with electric utility) ☐ Yes ☐ No
iii. Power factor _____p.u.
iv. Battery backup provided ☐ Yes ☐ No
v. Maximum fault current for terminal faults _____A
vi. Standards according to which built _____
vii. Provide Manufacturer's technical brochure and specification sheet _____ Doc. No

14. Interface Step-Up Transformer Characteristics:

a. Transformer ownership: ☐ Customer / ☐ London Hydro
b. Transformer rating: _____ kVA
c. Nominal voltage of high voltage winding: _____ kV
d. Nominal voltage of low voltage winding: _____ kV
e. Transformer type: ☐ single phase ☐ three phase
f. Impedances on: _____ kVA base _____ kV base
R: _____ pu, X: _____ pu
g. High voltage winding connection: ☐ delta ☐ star
Grounding method of star connected high voltage winding neutral:
☐ Solid ☐ Ungrounded ☐ Impedance: R: _____ ohms X: _____ ohms
Nameplate rating and impedance values of High Voltage Grounding Transformer (If applicable):
Voltage:_____ V Rating: _____KVA R:_____ pu X:_____pu

h. Low voltage winding connection: ☐ delta ☐ star
Grounding method of star connected low voltage winding neutral:
☐ Solid ☐ Ungrounded ☐ Impedance: R: _____ ohms X: _____ ohms

NOTE:

- The term 'High Voltage' refers to the connection voltage to London Hydro's distribution system and 'Low Voltage' refers to the generation or any other intermediate voltage.

15. Intermediate Transformer Characteristics (if applicable):

a. Transformer rating: _____ kVA
b. Nominal voltage of high voltage winding: _____ kV
c. Nominal voltage of low voltage winding: _____ kV
d. Transformer type: ☐ single phase ☐ three phase
e. Impedances on: _____ kVA base _____ kV base
R _____ pu X _____ pu
f. High voltage winding connection: ☐ delta ☐ star
Grounding method of star connected high voltage winding neutral:
☐ Solid ☐ Ungrounded ☐ Impedance: R _____ ohms X _____ ohms
g. Low voltage winding connection: ☐ delta ☐ star
Grounding method of star connected low voltage winding neutral:
☐ Solid ☐ Ungrounded ☐ Impedance: R _____ ohms X _____ ohms

NOTE: The term 'High Voltage' refers to the intermediate voltage that is input to the interface step-up transformer and the 'Low Voltage' refers to the generation voltage.

16. Load information:

a. Maximum load of the facility: _____ kVA _____ kW
b. Maximum load current (referred to the nominal voltage at the connection point to London Hydro's system): _____ A
c. Maximum inrush current to loads (referred to the nominal voltage at the connection point to London Hydro's system): _____ A

Attached Documents:

Item No.	Description	Document No.	No. of Pages
1			
2			
3			

Attached Drawings:

Item No.	Description	Document No.	No. of Pages
1			
2			
3			

CHECKLIST
Please ensure the following items are completed prior to submission. The application shall be returned if incomplete:

- ☐ Completed form stamped by a Professional Engineer
- ☐ Signed Study Agreement along with payment listed in the Study Agreement
- ☐ Single Line Diagram (SLD) of the Generator's facilities, must be stamped by a Professional Engineer

NOTE:

By submitting a completed CIA application, the Proponent authorizes the collection by London Hydro Inc. ("London Hydro"), of any agreements and any information pertaining to agreements made between the Proponent and the Ontario Power Authority from the Ontario Power Authority, the information set out in the CIA application and otherwise collected in accordance with the terms hereof, the terms of London Hydro's Conditions of Service and the requirements of the Distribution System Code and the use of such information for the purposes of the connection of the generation facility to London Hydro's distribution system.

Expected Monthly Generation, Consumption and Output From the EG Facility:

Expected:	**Total Generation (a)**		**Total Internal Consumption (b)**		**Total Output (to London Hydro's Distribution System) (a-b)***	
	kWh	**Peak kW**	**kWh**	**Peak kW**	**kWh**	**Peak kW**
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

* This value would be negative when the generators are not in operation or when the internal consumption exceeds generation.