

Connection Impact Assessment (CIA) Application

This Application Form is for Generators applying for Connection Impact Assessment (“CIA”) and for Generators with a project size >10 kW.

This Application Form is required for:

- **New** Generators applying for Connection Impact Assessment (“CIA”)
- **New** Generators applying for revision to their original Connection Impact Assessment (“CIA”)
- **Existing** Generators to verify information related to current connection to the SYNERGY NORTH system.

For generation size \leq 10 kW, please fill out “Micro-Generation Connection Request Form”.

IMPORTANT: All fields below are mandatory, except where noted. Incomplete applications may be returned by SYNERGY NORTH CORPORATION (“SYNERGY NORTH”).

If you have any questions please e-mail SYNERGY NORTH at generator.connections@synergynorth.ca or call 807-343-1037.

Completed CIA Application and other required documents may be returned:

By mail to:

SYNERGY NORTH CORPORATION
Attn: Asset Management and Engineering
Generation Connection Application
37 Front Street
Thunder Bay, Ontario P7A 8B2

or by email to:

generator.connections@synergynorth.ca

Connection Impact Assessment deposit must be submitted by mail to the address above.

NOTE 1: Applicants are cautioned NOT to incur major expenses until SYNERGY NORTH approves the connection of the proposed generation facility.

NOTE 2: All technical submissions (Connection Impact Assessment Application, single line diagrams, etc.) must be signed and sealed by a licensed Ontario Professional Engineer (P.Eng.).

CHECKLIST

Please ensure that the following items are completed prior to submission. Your application will not be processed if any part is omitted or incomplete:

- Completed CIA Application Form**, must be stamped by a Professional Engineer
- Payment in full including applicable taxes** by cheque or money order payable to “SYNERGY NORTH CORPORATION.” The deposit for your application may be found in Appendix B – Study Agreement under Section 5 - Deposit.
- Signed Study Agreement (Appendix B)**
- Single-line Diagram (SLD)**, must be stamped by a Professional Engineer

DATE: _____ (dd / mm / yyyy)

PROJECT NAME: _____

APPLICATION TYPE:

CIA Revision/Rework

New CIA Application

ONTARIO POWER AUTHORITY (OPA) FEED-IN TARIFF (FIT) CONTRACT NUMBER (IF APPLICABLE): _____

PROPOSED IN-SERVICE DATE: _____ (dd / mm / yyyy)

PROJECT SIZE:

Number of Units: _____

Nameplate Rating of Each Unit: _____ kW

Generator Connecting on: single phase three phase

Existing Total Nameplate Capacity: _____ kW

Proposed Total Nameplate Capacity: _____ kW

PROJECT LOCATION:

Address: _____

City / Town / Township: _____

Lot Number(s): _____

Concession Number(s): _____

CONTACT 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 SYNERGY NORTH:

- E-mail
- Telephone
- Mail
- Fax



PROGRAM TYPE:

- Net Metering
- FIT to Net Metering Conversion
- Load Displacement

FUEL TYPE:

- | | | | |
|---------------------|--------------------------|---|--------------------------|
| Wind Turbine | <input type="checkbox"/> | Fuel Cell | <input type="checkbox"/> |
| Hydraulic Turbine | <input type="checkbox"/> | Biomass | <input type="checkbox"/> |
| Steam Turbine | <input type="checkbox"/> | Co-generation/CHP (Combined Heat & Power) | <input type="checkbox"/> |
| Solar/ Photovoltaic | <input type="checkbox"/> | Bio-diesel | <input type="checkbox"/> |
| Diesel Engine | <input type="checkbox"/> | Anaerobic Digester | <input type="checkbox"/> |
| Gas Turbine | <input type="checkbox"/> | Battery/Energy Storage | <input type="checkbox"/> |
| | | Other (Please Specify) _____ | <input type="checkbox"/> |

CUSTOMER STATUS:

- Existing SYNERGY NORTH Customer? Yes No
- If yes, SYNERGY NORTH Account Number: _____
- Customer name registered in this Account: _____
- Are you a GST registrant? Yes No
- If yes, provide your GST registration number: _____ - _____ RT _____

CONNECTION TO SYNERGY NORTH DISTRIBUTION SYSTEM:

Point of Connection means the point where the new Generator’s connection assets or new line expansion assets will be connected to the existing SYNERGY NORTH distribution system.

Point of Common Coupling or “PCC” or “Point of Supply” means the point where the Generator’s facilities are to connect to SYNERGY NORTH’s distribution system.

The Point of Connection and the PCC may be the same, especially if the Generator’s facilities lie along the existing SYNERGY NORTH distribution system; or the PCC may be located somewhere between the Point of Connection and the Generator’s facilities if new line will be owned by SYNERGY NORTH. For illustration of the Point of Connection and the PCC, refer to Appendix A attached.

UTILITY INTERCONNECTION CHARACTERISTICS:

- Voltage at Point of Connection _____ kV
- Point of Connection Feeder: _____
- Originating Station of Point of Connection Feeder: _____

GPS Coordinates (Lat, Long – Decimal Degrees Format)	Point of Connection:	Latitude	
		Longitude	
	PCC:	Latitude	
		Longitude	
	Generator’s Facilities:	Latitude	
		Longitude	

Distance from the Point of Connection to the PCC: _____ km

Fault contribution of Generator’s Facilities to a three phase fault at the PCC (use line to ground fault for single phase connections) _____ MVA

Length of Generator Owned Conductor from PCC to Generator’s Facilities (where applicable): _____ km

Size of Generator Owned Conductor from PCC to Generator’s Facilities (where applicable): _____

Does the project require establishment of joint use on SYNERGY NORTH’s poles? (i.e. Generator’s collector lines attached to SYNERGY NORTH poles on municipal right of way? Yes No

If “No” to above, will the Generator own poles and wires on a municipal right of way? Yes No

Note:

Generators requiring line construction between the Generator’s facilities and the Point of Connection should contact SYNERGY NORTH to discuss potential ownership options, construction and co-ordination logistics for these facilities. Also those Generators whom may require attaching collector lines to SYNERGY NORTH poles must also contact SYNERGY NORTH to discuss potential to engage in Joint Use of utility assets. SYNERGY NORTH will consider owning and operating new lines if they are designed and constructed to SYNERGY NORTH standard and are located on public road right-of-ways. This may change the PCC location. For details, please contact SYNERGY NORTH at generator.connections@synergynorth.ca or call 807-343-1037.

DRAWING REQUIREMENTS:

On a cut-out from the SYNERGY NORTH distribution operating map* provide location of Generator’s facilities with proposed line routings for connection to SYNERGY NORTH distribution system. It should identify the Point of Connection, the PCC, and the location (i.e. on private property or public road right-of-ways) of new lines between the Generator’s facilities and the Point of Connection.

*distribution operating map is available from SYNERGY NORTH upon request.

Proposed Line Routing Drawing Drawing / Sketch No. _____ Rev. _____

Provide a Single-line Diagram of the Generator’s Facilities including the PCC

Single-line Diagram Drawing / Sketch No. _____ Rev. _____



PROTECTION PHILOSOPHY:

Provide a protection philosophy document describing the philosophy for the detection and clearing of:

- Internal faults within the EG facility;
- External phase and ground faults (in SYNERGY NORTH’s distribution system);
- Certain abnormal system conditions such as over / under voltage, over / under frequency, open phase(s);
- Islanding
- Control strategy for any energy storage system within the project (if applicable)

Protection philosophy document shall also include a tripping matrix or similar information.

Note:

The Generator shall install utility grade relays for the interface protection. The protection design shall incorporate facilities for testing and calibrating the relays by secondary injection.

Protection Philosophy Document Title/Number: _____

GENERATOR CHARACTERISTICS

CHARACTERISTICS OF EXISTING GENERATORS

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

Characteristics of New Generators:

GENERAL:

Number of generating unit(s)*: _____

Manufacturer/Type or Model No: _____

Rated capacity of each generating unit: _____ kW _____ kVA

Rated frequency: _____ Hz

Power Conversion Technology: _____ Other (specify) _____

Generator connecting on: Single-phase Three-phase

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

Limits of range of reactive power at the machine output:

Lagging (over-excited)	_____ kVAR	_____ power factor
Leading (under-excited)	_____ kVAR	_____ power factor

Limits of range of reactive power at the PCC:

Lagging (over-excited)	_____ kVAR	_____ power factor
Leading (under-excited)	_____ kVAR	_____ power factor

Generator terminal connection: Delta Wye

Neutral grounding method of wye connected generator: Solid Ungrounded Impedance: R _____ ohms
X _____ ohms

****If photovoltaic, generating unit(s) = inverter(s)***



ENERGY STORAGE:

Does the project include any energy storage? Yes No

Number of Units: _____ Energy Storage Unit Size: _____ kWh

Total Energy Storage Size: _____ kWh Inverter Size*: _____ kW

**Enter zero for inverter size if inverter is shared with generation unit(s)*

FOR SYNCHRONOUS UNITS:

Nominal machine voltage: _____ kV

Minimum power limit for stable operation: _____ kW

Unsaturated reactance on: _____ kVA base _____ kV base

Direct axis subtransient reactance, X_d'' _____ pu

Direct axis transient reactance, X_d' _____ pu

Direct axis synchronous reactance, X_d _____ pu

Zero sequence reactance, X_0 _____ pu

Provide a plot of generator capability curve (MW output vs MVAR): _____

Document Number: _____

Rev. _____

FOR INDUCTION UNITS:

Nominal machine voltage: _____ kV

Unsaturated reactances on: _____ kVA base _____ kV base

Direct axis subtransient reactance, X_d'' _____ pu

Direct axis transient reactance, X_d' _____ pu

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

INTERFACE STEP-UP TRANSFORMER CHARACTERISTICS:

Transformer rating: _____ kVA

Nominal voltage of high (distribution) voltage winding: _____ kV

Nominal voltage of low (generator) voltage winding: _____ kV

Transformer type: Single-phase Three-phase

Transformer Impedances on: _____ kVA base _____ kV base R _____ pu X _____ pu

High voltage winding connection: Delta Wye

Grounding method of wye connected high voltage winding neutral: Solid Ungrounded Impedance: R _____ ohms X _____ ohms

Low voltage winding connection: Delta Wye

Grounding method of wye connected low voltage winding neutral: Solid Ungrounded Impedance: R _____ ohms X _____ ohms

INTERMEDIATE STEP-UP TRANSFORMER CHARACTERISTICS:

Transformer rating: _____ kVA

Nominal voltage of high (distribution) voltage winding: _____ kV

Nominal voltage of low (generator) voltage winding: _____ kV

Transformer type: Single-phase Three-phase

Transformer Impedances on: _____ kVA base _____ kV base R _____ pu X _____ pu

High voltage winding connection: Delta Wye

Grounding method of wye connected high voltage winding neutral: Solid Ungrounded Impedance: R _____ ohms X _____ ohms

Low voltage winding connection: Delta Wye

Grounding method of wye connected low voltage winding neutral: Solid Ungrounded Impedance: R _____ ohms X _____ ohms

LOAD INFORMATION:

Maximum load of the facility: _____ kVA _____ kW

Maximum load current (referred to the distribution voltage at the PCC): _____ A

Maximum inrush current (referred to the distribution voltage at the PCC): _____ A

ATTACHED DOCUMENTS:

Item No.	Description	Reference No.	No. of Pages
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

I hereby declare that all statements made in this application are true, complete, and correct to the best of my knowledge and belief. Detailed calculations and/or supporting documentation are available upon request.

Registered P.Eng (Print Name)

Registered P.Eng (Signature)

Registered P.Eng (Stamp)

Date (DD/MM/YYYY)

Appendix A: Illustrations of PCC and Point of Connection

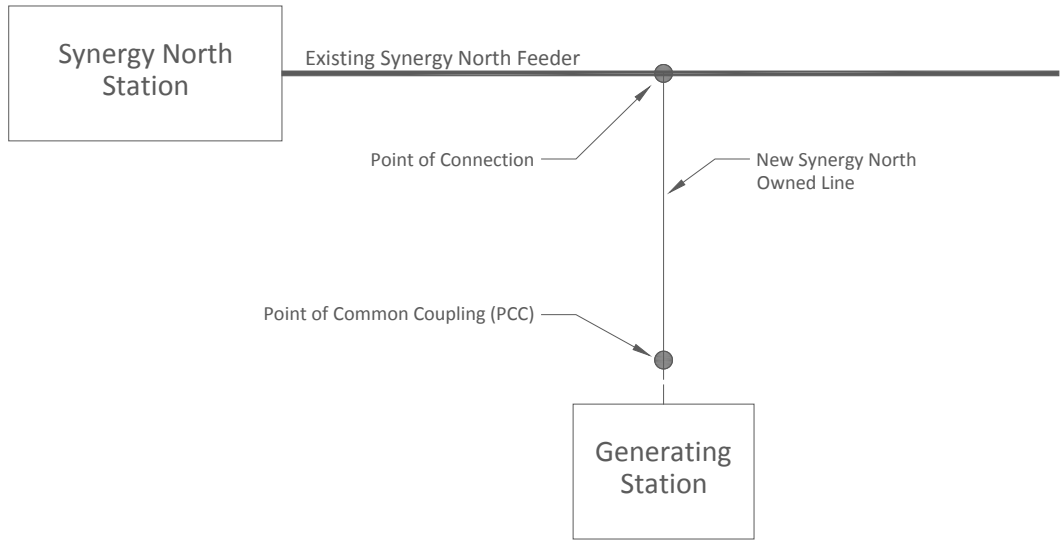


Figure 1 - SYNERGY NORTH Owns Entire Tap Line

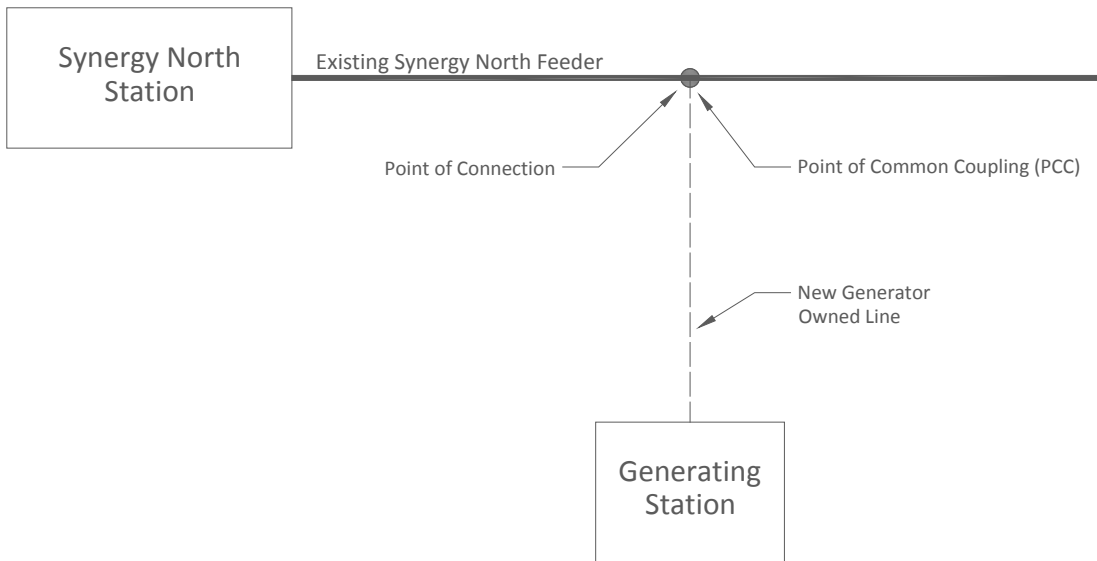


Figure 2 - Generator Owns Entire Tap Line

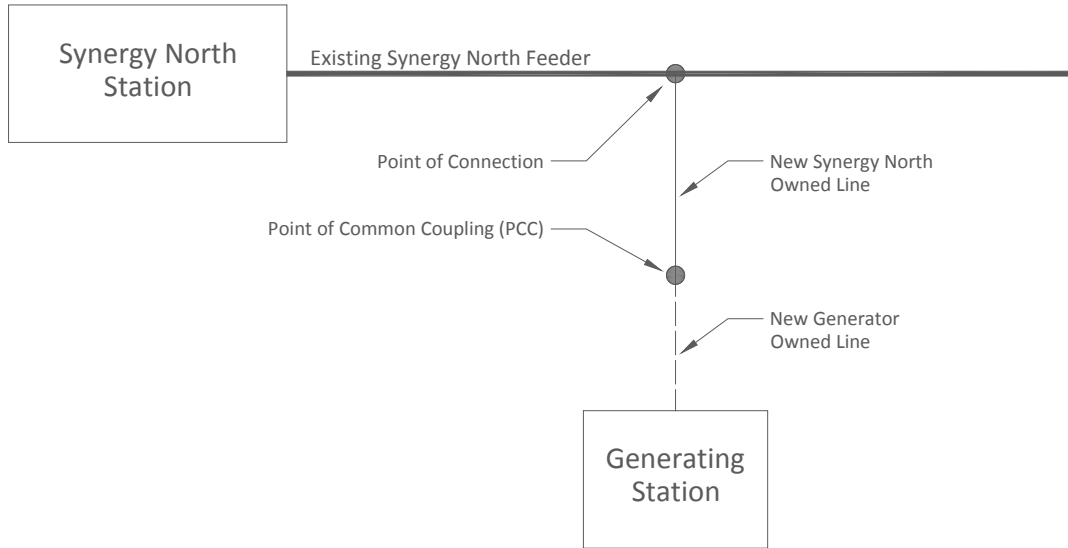


Figure 3 - SYNERGY NORTH and Generator Each Own a Portion of the Tap Line

Appendix B: Study Agreement

_____ (the "Customer") has requested and SYNERGY NORTH CORPORATION ("SYNERGY NORTH") has agreed to perform the Work described below to determine the feasibility and impact of the Proposed Project defined below and to undertake the Work as defined in Section 4, forming a part hereof (the "Agreement") dated _____.

1. **Proposed Project**

The Proposed Project is the connection of _____ (the "Generation Facility") to SYNERGY NORTH's distribution system.

2. **Completion Date:**

SYNERGY NORTH shall complete the Work, by no later than sixty (60) days after the latter of:

- a) the Customer executing this Agreement;
- b) the Customer paying SYNERGY NORTH the amount specified below in Section 5(a);
- c) the Customer providing the information described in Section 3.

3. **Impact of Subsequent Changes to the Information Provided by Customer**

Should the Customer make any changes to the information provided in the Connection Impact Application after SYNERGY NORTH has commenced the Work and those changes:

- a) result in costs to SYNERGY NORTH greater than the cost shown in Section 5(a), the Customer shall make such further payment as may be required by SYNERGY NORTH in the time specified by SYNERGY NORTH;
- b) otherwise affect any other provision of this Agreement, such as the time required for completion of the Work, the parties shall negotiate and agree upon the required amendments to this Agreement and SYNERGY NORTH shall be under no obligation to resume performance of the Work until such time as the parties agree on such amendments.

4. **Scope of Work**

- a) SYNERGY NORTH will perform and provide the Customer with a Connection Impact Assessment to determine the feasibility of the Proposed Project by reviewing the impact of the Proposed Project on SYNERGY NORTH's distribution system.
- b) SYNERGY NORTH will advise the Customer of specific requirements for each of the alternative connections that are identified by the Connection Impact Assessment.
- c) SYNERGY NORTH will describe the necessary modifications to SYNERGY NORTH's distribution system facilities based on SYNERGY NORTH's review of the Proposed Project in order to permit the connection of the Proposed Project.
- d) SYNERGY NORTH will apply for a Transmitter Connection Impact Assessment which will determine the impact of the Generation Facility on the transmitter's transmission system.



5. Deposit:

- a) The Customer shall submit a deposit of \$_____ towards SYNERGY NORTH’s Actual Cost of performing the Work. SYNERGY NORTH’s Actual Cost of performing the Work includes:
 - i. All engineering, administrative costs, and overheads associated with the Work described in Section 4 – Scope of Work;
 - ii. The Transmitter’s fee for the performance of the Transmitter’s Connection Impact Assessment.
- b) The Customer agrees to remit to SYNERGY NORTH the amount shown in Section 5(a) by no later than 15 days after the date first written above towards the Actual Cost of the Work.
- c) Within 90 days after the completion of the work, SYNERGY NORTH shall provide the Customer with a final invoice. Any difference between the final Invoice (including applicable taxes) and the amount deposited by the Customer shall be paid (refunded) within 30 days of the invoice.

6. GST Registration Information

The GST registration number for SYNERGY NORTH is 89209-0614 RT0001 and the GST registration number for the Customer is _____ RT _____.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by the signatures of their proper officers, as of the day and year first written above.

SYNERGY NORTH CORPORATION

Daniel Dillon

Title: Distribution Engineer

I have the authority to bind the corporation

_____ *(company name)*

(print and sign)

Title: _____

I have the authority to bind the corporation

SYNERGY NORTH Connection Impact Assessment (CIA) Deposit Schedule		
Proposed Generator Project Size	SYNERGY NORTH CIA Deposit	Hydro One CIA Fee
≤ 10kW	N/A	N/A
≤ 250kW Connected at < 15kV OR ≤ 500kW Connected at > 15kV	\$3,000	N/A
> 250kW ≤ 500kW Connected at < 15kV OR > 500kW ≤ 1MW Connected at < 15kV	\$5,000	\$5,728
> 500kW < 10 MW Connected at < 15kV OR > 1MW < 10 MW Connected at > 15kV	\$8,000	\$5,728
≥ 10MW	\$8,000	\$5,728