

Distribution Generator Interconnections Data Form (DGIDF)- Simplified

This application form shall be used for the distribution generator project, that have a combined total nameplate capacity over 100 kW to interconnect with BC Hydro Non-Integrated Area (NIA) Distribution system or, that will inject up to 1MW generation to BC Hydro Integrated Area Distribution system at the Point of Metering (POM). You can visit our [webpage](#) for an overview of the interconnection process and more details about interconnection requirements. If you have any questions, please contact your BC Hydro Interconnections Manager or email Distribution.Generators@bchydro.com. An EGBC practicing Professional Engineer (P.Eng.) must seal, sign and date this completed form. If this form is transmitted electronically, this document must be authenticated digitally (digital sealing and signing image) as per [Quality Management Guideline of EGBC](#).

Application Submission Date

You may need to submit this application more than once as we make sure this application information is deemed complete. We prefer that you submit this application by email as one single pdf with all the required attachments. If you submit your application as multiple pdfs, please make sure each pdf is clearly titled. This will ensure there is no delay when we assess your application for completeness.

For System Impact Studies (SIS):

Sections and/or Fields with ** (i.e., double asterisks) are the minimum fields required to initiate the System Impact Study. However, the rest of the information must be submitted within **30 days of kicking off the SIS work**, otherwise the study will be paused until the remaining information is received.

For As-Built Record Information purposes, all information is to be provided.

Project Interconnection Process Milestones

What date was your Basic Distribution System Information Request completed?

What date was your Screening Study completed, if applicable?

1. Interconnection Customer (IC) Information**

Project name

Company name

Mailing address

Project Contacts

| Role | Owner/developer** | Consultant** | Engineer** |
|---------|-------------------|--------------|------------|
| Name** | | | |
| Phone** | | | |
| Email** | | | |

2. Project Information

Generating Station Location**

| | |
|------------------------|-------------------------|
| Latitude (deg:min:sec) | Longitude (deg:min:sec) |
|------------------------|-------------------------|

Proposed Point of Interconnection (POI) - (From Basic-D or previously agreed location)**

| | |
|---------------------------------|-------------------------|
| Latitude (deg:min:sec) | Longitude (deg:min:sec) |
| Address (optional) | |
| Closest city, town or community | |

Facility General Information

| | |
|-----------------------------------------------------------------------------------------|--------------------|
| Does this facility currently have electric service from BC Hydro? If yes, answer below. | |
| BC Hydro Meter # | BC Hydro Account # |

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| Project Milestones | |
|----------------------------------------------------------|----------------------------------------------------------|
| Will this project need construction power from BC Hydro? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| If yes, please provide the date construction begins. | |
| Generator testing date | |
| Proposed In-Service date** | |

| <input type="checkbox"/> Project Information Attachment 2.1: Site Plan** | | |
|--------------------------------------------------------------------------|-----------------|------|
| Drawing number | Revision number | Date |
| | | |

You need to include a Site Plan with this application. Your Site Plan should include:

- Your project title, date and revision number, site address, and the name of person and/or firm that prepared the drawing
- Plan view of the site, with nearby roads
- Location of POI, BC Hydro metering, electrical equipment, and generator/inverter
- Equipment names (which should match the single line diagram)
- Routing of the overhead and/or underground lines and proposed terminal pole or service manhole

| <input type="checkbox"/> Project Information Attachment 2.2: Single Line Diagram (SLD)** | | |
|------------------------------------------------------------------------------------------|-----------------|------|
| Drawing number | Revision number | Date |
| | | |

You need to include a single line diagram (SLD) of your proposed project with this application. Your SLD should include:

- Your project title, date and revision number, site address and the name of person and/or firm that prepared the drawing
- Differentiation between new and existing equipment (clouds or dividing lines)
- Equipment at the POI
- All electrical equipment between the POI and the generator (switches, breakers, cables, etc.) with voltage levels and equipment ratings. All switches, breakers, and relays must have distinct identifiers or names.
- BC Hydro Revenue Meter (RM), Interconnection Customer's metering instrument transformers with associated isolation switch(es) and/or interlocking mechanism.

| <input type="checkbox"/> Project Information Attachment 2.3: Protection Single Line (metering and relaying) Diagram | | |
|---------------------------------------------------------------------------------------------------------------------|-----------------|------|
| Drawing number | Revision number | Date |
| | | |

You need to include a Protection Single Line (Metering and Relaying) Diagram with your application. This diagram should show all the protective relaying, metering, major control and telecommunications interface to tie in the generator, transformer and plant protection. This diagram should also provide the CT & VT ratios and accuracy classes. This information may be already included in your Single Line Diagram (SLD) or Attachment 2.3. If this information is already included in your SLD, please enter N/A in the drawing number, revision number and date fields.

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3. Generator information

| Basic generator information** | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|------|
| What is your generator's energy source? (if not listed in the drop down menu, please type in) | | | 3.1 |
| What is the total generation (MW) of all generators at your site? (Existing and new.) | | | 3.2 |
| What is the total number of generators at your site? (Existing and new.) | | | 3.3 |
| Generator operating mode capability (if not listed in the drop down menu, please type in) | | | 3.4 |
| Will your generating facility be designed for intentional islanding with BC Hydro system, if required | | | 3.5 |
| What is the peak load at the facility ? (Please include the peak charging demand if there is any energy storage system if the energy storage system charges from BC Hydro system) | kW | | 3.6 |
| | kvar | | 3.7 |
| What is the minimum load at your facility during the peak generation? | kW | | 3.8 |
| | kvar | | 3.9 |
| During abnormal voltage conditions (refer to IEEE 1547-2018 and addendum), which category curve does your generator comply with? | | | 3.10 |

Maximum power output of your generator(s)

Please provide the proposed maximum power output of your generator(s) month by month. Minimum and average monthly generation values are also preferred but not mandatory.

| | Maximum (MW)** | Minimum (MW) | Average (MW) |
|-------------|----------------|--------------|--------------|
| January** | | | |
| February** | | | |
| March** | | | |
| April** | | | |
| May** | | | |
| June** | | | |
| July** | | | |
| August** | | | |
| September** | | | |
| October** | | | |
| November** | | | |
| December** | | | |

Daily Generation Profile of The Generator(s), if non-dispatchable**

| Document number | Revision number | Date |
|-----------------|-----------------|------|
| | | |

Non-dispatchable generators include but are not limited to Photovoltaic Solar, Wind, etc. generation sources without any energy storage system.

Please provide a 24 hours (daily) generation profile, (preferably 15 min or less interval data on spreadsheet) in per unit generation of Maximum (MW). Prepare and submit 4 (four) representative daily generation profiles for 4 (four) seasons; Summer (May to Sept), Fall (Oct, Nov), Winter (Dec to Feb), Spring (March, April), such that each profile should be representative for each season. This profile is only applicable to non-dispatchable generation units.

Vendor Specific Generator Model in PSCAD/EMTDC or EMTP-RV, if available

| Vendor name | Model file name with extension | Model help file name |
|-------------|--------------------------------|----------------------|
| | | |

When available, please provide the vendor specific generator simulation model in either PSCAD/EMTDC or EMTP-RV



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3.11 Specific generator type section instructions

This application has a different section for inverter, synchronous and induction type generators. You only need to fill out the appropriate section for your generator type.

If your proposed project has more than one generator types, you will need to fill out multiple generator sections of the appropriate generator type, one for each generator. If you have more than one unit of generation, please include the information under each unit separately. For solar or Battery system, same types of inverters can be grouped under a single unit.

If your proposed project has a doubly fed induction generator or another type of generator not covered in this application form, please contact your project's BC Hydro Interconnections Manager for specific instructions.

Induction generator

Induction generator information**

| | | | | |
|---------------------------------------------------------------------|------------------------|--|--|--------|
| Unit Designation (use default unit designation or type in new name) | | | | |
| Manufacturer (optional) | | | | Ind 1 |
| Model (optional) | | | | Ind 2 |
| Rated apparent power (kVA) | | | | Ind 3 |
| Rated real power (kW) | | | | Ind 4 |
| Rated voltage (kV) | | | | Ind 5 |
| Rated continuous current (A) | | | | Ind 6 |
| Rated Power Factor (%) | | | | Ind 7 |
| Rated Efficiency (%) | | | | Ind 8 |
| Rated Speed (rpm) | | | | Ind 9 |
| Rated Frequency (Hz) | | | | Ind 10 |
| Subtransient Impedance X_d'' (pu) | | | | Ind 11 |
| Inertia Constant of Generator H_G (MW-sec / MVA) | | | | Ind 12 |
| Generator Moment of Inertia J_G or WR_G^2 (kg·m ²) | | | | Ind 13 |
| Inertia of all rotating mass | H (MW s / MVA) | | | Ind 14 |
| | J (kg·m ²) | | | Ind 15 |
| Power Factor Correction Capacitor Size (kvar) (if applicable) | | | | Ind 17 |
| Power Factor Correction Capacitor Voltage (V) (if applicable) | | | | Ind 18 |
| Any external self excitation system (Yes/No) | | | | Ind 19 |

Induction Attachment ind1.1: Induction generator data sheet

| Unit(s) | Document title and/or number | Revision number | Date |
|---------|------------------------------|-----------------|------|
| | | | |
| | | | |

Induction Attachment ind1.2: Induction generator equivalent circuit diagram

| Unit(s) | Drawing number | Revision number | Date |
|---------|----------------|-----------------|------|
| | | | |
| | | | |

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Inverter generator

| Inverter Information** | | | | |
|----------------------------------------------------------------------------------|------------------------------------------------------|--|--|--------|
| Group Designation (use default unit designation or type in new name) | | | | |
| Manufacturer (optional) | | | | Inv 1 |
| Model (optional) | | | | Inv 2 |
| Rated apparent power (kVA) - each unit of inverter | | | | Inv 3 |
| Rated real power (kW) - each unit of inverter | | | | Inv 4 |
| Rated voltage (kV) | | | | Inv 5 |
| Number of phases (1-phase or 3-phase) | | | | Inv 6 |
| Rated Current (Amps) - each unit of inverter | | | | Inv 7 |
| Rated Power Factor (%) - each unit of inverter | | | | Inv 8 |
| Rated Efficiency (%) - each unit of inverter | | | | Inv 9 |
| Rated Frequency (Hz) | | | | Inv 10 |
| Fault Contribution | At 100% (rated) power generation by the inverter | | | Inv 11 |
| (Amps) -Each unit | At a level of rated power below 50% (40%, 25%, etc.) | | | Inv 12 |
| Is your Inverter Certified to CSA C22.2 No 107.1? (Yes or No) | | | | Inv 13 |
| Total Number of Inverters units | | | | Inv 14 |
| Total inverter capacity (kW) = Total number of inverter units X Rated Real Power | | | | Inv 15 |

Inverter Information Attachment Inv1.1: Inverter embedded protection scheme

| Unit(s) | Document title and/or number | Revision number | Date |
|---------|------------------------------|-----------------|------|
| | | | |
| | | | |
| | | | |

Inverter Information Attachment Inv1.2: Harmonics current spectrum

(Please include both rated power generation by the inverter and 50% power generation by the inverter in one file.)

| Unit(s) | Document title and/or number | Revision number | Date |
|---------|------------------------------|-----------------|------|
| | | | |
| | | | |
| | | | |

Inverter Information Attachment Inv1.3: Inverter data sheet

| Unit(s) | Document title and/or number | Revision number | Date |
|---------|------------------------------|-----------------|------|
| | | | |
| | | | |
| | | | |

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| Energy Storage** | |
|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Will this site be using energy storage? | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| What is the type of energy storage? (if other, please type in) | Inv 16 |
| Does energy storage use AC/DC bi-directional (charge/discharge) Power Conversion Unit (PCU)? (If 'No' skip to Inv22) | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Group designation (use default unit designation or type in new name) | |
| Storage technology (e.g., Battery type) | Inv 17 |
| Rated AC voltage (kV) | Inv 18 |
| Rated Current (Amp) | Inv 19 |
| Rated frequency (Hz) | Inv 20 |
| Power at peak charge (kW) | Inv 21 |
| Power at peak discharge (kW) | Inv 22 |
| Total stored energy (kWh) | Inv 23 |
| Fault Contribution (Amps) | Inv 24 |

| <input type="checkbox"/> Power Conversion Unit (PCU) attachment Inv1.4: PCU data sheet | | | |
|----------------------------------------------------------------------------------------|------------------------------|-----------------|------|
| Unit(s) | Document title and/or number | Revision number | Date |
| | | | |
| | | | |
| | | | |

Please include a brief description of your energy storage control scheme (Additional Documentation may be needed if the energy storage uses its own power conversion unit)**:

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Synchronous generator

| Synchronous generator information** | | | | |
|---------------------------------------------------------------------------------------------|--|--|--|-----|
| Unit Designation (use default unit designation or type in new name) | | | | |
| Manufacturer (optional) | | | | S1 |
| Model (optional) | | | | S2 |
| Rated apparent power (kVA) | | | | S3 |
| Rated real power (kW) | | | | S4 |
| Rated Power Factor (%) (specify if "lagging (over-excited) or, leading (under-excited)") | | | | S5 |
| Rated voltage (kV) | | | | S6 |
| Rated Amperes | | | | S7 |
| Number of Phases | | | | S8 |
| Number of Poles | | | | S9 |
| Rated Speed (rpm) | | | | S10 |
| Rated Frequency (Hz) | | | | S11 |
| Amortisseur (damper) windings (connected, not connected or not installed) | | | | S12 |
| Connection (delta or wye) | | | | S13 |
| Type of Grounding (ungrounded, resistive, reactive or solidly grounded) | | | | S14 |
| Grounding Impedance (ohms) | | | | S15 |
| Inertia Constant of Generator H_G (MW-sec / MVA) | | | | S16 |
| Generator Moment of Inertia J_G or WR_G^2 ($kg \cdot m^2$) | | | | S17 |
| Inertia constant of turbine + generator H_{GT} (MW-sec/MVA) | | | | S18 |
| Turbine + Generator Moment of Inertia J_G or WR_G^2 ($kg \cdot m^2$) | | | | S19 |

| Impedances in per-unit (unless specified) on the machine base kV and base MVA** | | | | |
|---------------------------------------------------------------------------------|--|--|--|-----|
| Base kVA | | | | S20 |
| D-axis synchronous reactance (unsaturated) X_{di} (pu) | | | | S21 |
| D-axis transient reactance (unsaturated) X'_{di} (pu) | | | | S22 |
| D-axis sub-transient reactance (unsaturated) X''_{di} (pu) | | | | S23 |
| Q-axis synchronous reactance (unsaturated) X_{qi} (pu) | | | | S24 |
| Q-axis transient reactance (unsaturated) X'_{qi} (pu) | | | | S25 |
| Q-axis sub-transient reactance (unsaturated) X''_{qi} (pu) | | | | S26 |
| Negative sequence reactance (unsaturated) X_{2i} (pu) | | | | S27 |
| Zero sequence reactance (unsaturated) X_{0i} (pu) | | | | S28 |
| Leakage reactance (unsaturated) X_{lm} (pu) | | | | S29 |
| Zero sequence resistance R_0 (pu) | | | | S30 |
| Negative sequence resistance R_2 (pu) | | | | S31 |

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| Time constants** | | | | |
|------------------------------------------------------------------|--|--|--|-----|
| D-axis transient open circuit time constant T'_{do} (sec) | | | | S32 |
| D-axis sub-transient open circuit time constant T''_{do} (sec) | | | | S33 |
| Q-axis transient open circuit time constant T'_{qo} (sec) | | | | S34 |
| Q-axis sub-transient open circuit time constant T''_{qo} (sec) | | | | S35 |

| Other parameters | | | | |
|--------------------------------------------------------|--|--|--|-----|
| Saturation Factor at $E_t = 1.0\text{pu } S_{G1.0}$ | | | | S36 |
| Saturation Factor at $E_t = 1.2\text{pu } S_{G1.2}$ | | | | S37 |
| Damping Coefficient (pu torque/pu speed dev) kD^{**} | | | | S38 |

| <input type="checkbox"/> Synchronous attachment s1.1 Generator capability curve (kvars versus kw) | | | | |
|---------------------------------------------------------------------------------------------------|------------------------------|-----------------|------|--|
| Unit(s) | Document title and/or number | Revision number | Date | |
| | | | | |
| | | | | |
| | | | | |

| <input type="checkbox"/> Synchronous attachment s1.2 Characteristic curves (Open circuit saturation curve and Short circuit curve on one graph) | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------|------|--|
| Unit(s) | Document title and/or number | Revision number | Date | |
| | | | | |
| | | | | |
| | | | | |

| <input type="checkbox"/> Synchronous attachment s1.3 V-curves (please include if available) | | | | |
|---------------------------------------------------------------------------------------------|------------------------------|-----------------|------|--|
| Unit(s) | Document title and/or number | Revision number | Date | |
| | | | | |
| | | | | |
| | | | | |

| <input type="checkbox"/> Synchronous attachment s1.4 Exciter and PSS control block diagram with data sheet (IEEE or PTI PSS/E v29 format)** | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------|------|--|
| Unit(s) | Document title and/or number | Revision number | Date | |
| | | | | |
| | | | | |
| | | | | |

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| 4. Transformer (Step Up) information interfacing with BC Hydro ¹ ** | | | |
|----------------------------------------------------------------------------------|--------------|--|------|
| Step-up transformer designation as shown on the SLD | | | 4.1 |
| Step-up transformer base capacity (kVA) | | | 4.2 |
| Step-up transformer maximum capacity (kVA), if different from the above capacity | | | 4.3 |
| Step-up transformer line-to-line voltages (kV) | H.V. | | 4.4 |
| | L.V. | | 4.5 |
| Step-up transformer configuration (delta, wye grounded, etc.) | H.V. winding | | 4.6 |
| | L.V. winding | | 4.7 |
| Step-up transformer impedances (specified in % of transformer base) | Z% | | 4.8 |
| | X/R | | 4.9 |
| H.V. Neutral grounding impedance (ohms) ² | R | | 4.10 |
| | X | | 4.11 |
| L.V. Neutral grounding impedance (ohms) | R | | 4.12 |
| | X | | 4.13 |

Note 1: If there are more transformers at the generator side of the BC Hydro interfacing step up transformer(s), please include all the above information for each transformer on the SLD.

Note 2: BC Hydro chooses the H.V. neutral grounding impedance values. However please feel free to let us know your preference.

| 5. Main circuit breaker with protection relay function information | | | |
|------------------------------------------------------------------------------|------------------------------|-----------------------------|------|
| Circuit Breaker Unit Designation (Name) | | | 5.1 |
| Interrupting Media (oil, air, SF6, etc.) | | | 5.2 |
| Rated maximum voltage (kV) | | | 5.3 |
| Rated Frequency (Hz) | | | 5.4 |
| Basic impulse level (BIL) (kV) | | | 5.5 |
| Rated continuous current (A) | | | 5.6 |
| Momentary (1/2 cycle) current withstand capability (kA crest) | | | 5.7 |
| Rated symmetrical short circuit interrupting capability (kA RMS symmetrical) | | | 5.8 |
| Interrupting time (cycles) | | | 5.9 |
| Out-of-phase switching capability (kA RMS symmetrical) | | | 5.10 |
| Auto-Reclose capability | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 5.11 |
| Protection relay manufacturer and model information** | | | 5.12 |
| Ground Overcurrent setting tcc and range | | | 5.13 |
| Phase Overcurrent setting tcc and range | | | 5.14 |
| Over frequency setting range | | | 5.15 |
| Under frequency setting range | | | 5.16 |
| Over voltage setting range | | | 5.17 |
| Under voltage setting range | | | 5.18 |
| Synchronizing check | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 5.19 |
| Reverse power | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 5.20 |
| Direct Transfer Trip (DTT) interface capability | <input type="checkbox"/> Yes | <input type="checkbox"/> No | 5.21 |
| Other available IEEE/ANSI protection function # | | | 5.22 |

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6. Line information**

| | Line segment 1 | Line segment 2 | Line segment 3 | |
|-----------------------------------|----------------|----------------|----------------|-----|
| Line Construction Type | | | | 6.1 |
| Line Length (km) | | | | 6.2 |
| Phase conductors: size and type | | | | 6.3 |
| Neutral conductors: size and type | | | | 6.4 |

Conductor Impedances**

| | | | | |
|----------------------------------------|--|--|--|------|
| Positive Sequence Resistance R1 (ohms) | | | | 6.5 |
| Zero Sequence Resistance R0 (ohms) | | | | 6.6 |
| Positive Sequence Reactance X1 (ohms) | | | | 6.7 |
| Zero Sequence Reactance X0 (ohms) | | | | 6.8 |
| Positive Sequence Charging Y1 (µMHO) | | | | 6.9 |
| Zero Sequence Charging Y0 (µMHO) | | | | 6.10 |

Overhead line characteristics (not required for cables)

| | Line segment 1 | Line segment 2 | Line segment 3 | |
|-------------------------------------------------------------------------|----------------|----------------|----------------|------|
| Conductor name (for example waxwing, linnet, etc.) | | | | 6.11 |
| Line Clearances to Ground (Maximum) meters | | | | 6.12 |
| Line Clearances to Ground (Minimum) meters | | | | 6.13 |
| Maximum Pole Height meters | | | | 6.14 |
| Minimum Pole Height meters | | | | 6.15 |
| Conductor Phase Spacing, A-B | | | | 6.16 |
| Conductor Phase Spacing, B-C | | | | 6.17 |
| Conductor Phase Spacing, C-A | | | | 6.18 |
| Average conductor height above ground for the lowest conductor (meters) | | | | 6.19 |
| Length of skywire (if any) (meters) | | | | 6.20 |
| Geometric Mean Radius @ 60 Hz (GMR) (meters) | | | | 6.21 |

7. Engineer of Record declaration**

The Engineer of Record declares that the data submitted herein is accurate and meets the requirements of this the latest 35 kV and Below Interconnection Requirements for Power Generators.

| | | |
|-----------------------------------------------------------------|-----------------------------------------------|------|
| Seal of Professional Engineer registered in British Columbia | Signature | Date |
| | Print name | |
| | Affiliated with and Permit to Practice Number | |
| | | |
| | | |