NET METERING ENROLLMENT APPLICATION

REFERENCE GUIDE

March 20, 2006
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Hydro Québec

SCOPE

The purpose of this Guide is to help you understand sections 2 to 9 of the Net Metering Enrollment Application.

SECTION DESCRIPTIONS

Section 2 – Specifications of the customer's electrical installation

Phases

Indicate whether you have single-phase or three-phase supply.

Rated voltage (AC)

Enter the rated voltage of your electrical installation. The regular voltages for connection to the Hydro-Québec distribution grid are as follows:

- Single-phase connection – 120/240 V
- Three-phase connection – 347/600 V

If your equipment's rated voltage differs from that of the grid, please specify.

Maximum capacity of service panel (AC)

Enter the capacity of the main circuit breaker on the service panel. If your installation includes one or more auxiliary service panels, state the capacity of the main circuit breaker.

Section 3 – Project

Brief description of project and site

Briefly describe the project, including the generating equipment and its location.

Total area of buildings (m^2)

Enter the total area (in square metres) of the buildings to be supplied. This information will enable us to estimate eligible generating capacity, especially in the case of a new building.

Type of heating

State the type of energy (oil, gas, electricity, etc.) used to heat the buildings. This information will enable us to estimate eligible generating capacity, especially in the case of a new building.

Planned commissioning date

Enter the date on which you plan to complete the project, or the current date if the facilities are ready for service.

Energy type

To be eligible for the net metering option, you must use a renewable energy source.
The eligible energy sources are as follows:

- Wind power
- Solar power
- Hydropower
- Geothermal power (for electricity generation only)
- Bioenergy (biogas or forest biomass)

State which type of energy you will use for the project. If you plan to use more than one energy source, please state all of them.

Rated capacity of the facility

Enter the rated capacity, that is, the maximum power the installation can generate, indicating kilowatts (kW) or kilovoltamperes (kVA). The capacity indicated should not take your load into account.

Rated capacity is the lower of these two values:

- Capacity of primary source (solar panels, wind turbines, hydropower turbines, etc.)
- Capacity of equipment used to tie into grid (generators or inverters)

Rated capacity must not exceed the lower of the following two values:

- 50 kW (20 kW in case of single-phase installation with E.12-07–compliant connection)
- Estimated power required to meet your needs

The capacity needed to meet your power needs can be roughly estimated using this equation:

$$\textit{Power needed (kW)} = \frac{\text{Annual consumption (kWh)}}{\text{8,760 (h) X } \textit{Utilization factor}}$$

Annual consumption

Enter the amount of power you use in a year, in kilowatthours (kWh). You'll find this information on your bill.

Utilization factor

Enter the ratio of actual annual output to output at rated capacity for an entire year, as a percentage.
The utilization factor takes into account resource availability, among other things. For a wind or solar power system, a utilization factor of 0.35 is good. An expert may provide a precise estimate of the utilization factor for a given site.

Example

Your home's annual consumption is 20,000 kWh. You want to install solar panels. Assuming a utilization factor of 0.35, the capacity required to meet your needs is calculated as follows:

20,000 kWh / (8,760 h × 0.35) = **6.52 kW**

So the facility's rated capacity must be 6.52 kW or under.

Connection standard

For the net metering rate option, the facility and equipment must comply with one of these Hydro-Québec standards:

- E.12-07, for facilities of 50 kW or under equipped with inverters certified to standards **CSA C22.2, No. 107.1-01** or **UL1741**
- E.12-05, for all other facilities

If the connection complies with standard E.12-05, Hydro-Québec requires an engineer to submit a detailed connection study for approval. Please call Hydro-Québec to obtain a connection study template.

Standards E.12-05 and E.12-07 can be downloaded from the Hydro-Québec Web site: www.hydroquebec.com/self-generation.

Details of project

Provide any particular project characteristics that are not indicated elsewhere on the form (additional protection, specific requirements, load controller to limit your power demand, etc.).

Supplier

Enter the name of the person or company that is supplying the generating equipment. May be an integrator who provides you with a turnkey installation.

Master electrician or engineer

Enter the name of the master electrician or engineer responsible for installing the generating equipment and testing the inverters.

Section 4 – Generating equipment

Generating equipment refers to all the machinery needed to convert raw energy into alternating current. It may be solar panels, wind turbines, hydropower turbines, etc. If you plan to use more than one piece of equipment, please enter the information for each one.

Manufacturer

Enter the name of the person or company that made the generating equipment.

Model

Enter the generating equipment model.

Rated capacity

Enter the equipment's rated capacity, as specified by the manufacturer, indicating kilowatts (kW) or kilovoltamperes (kVA).

Quantity

Enter the number of each type of generating equipment installed on the site. A solar power setup, for example, may consist of several identical photovoltaic panels.

Section 5 – Inverters

Complete this section if your generating system requires **inverters**. If you plan to use more than one piece of equipment, please enter the information for each one.

Manufacturer
Enter the name of the person or company that made the inverter.

Model
Enter the inverter model.

Ability to operate as backup power system?
Some generating systems can be used as backup systems in case of a power outage. Hydro-Québec needs to know if this is the case for yours, even if you decide not to use it in this manner.

Rated capacity
Enter the inverter's rated capacity as specified by the manufacturer, indicating kilowatts (kW) or kilovoltamperes (kVA).

Power factor at 100% of rated capacity
Enter the inverter's power factor when operating at rated capacity.

Power factor adjustable?
Indicate whether the inverter's power factor is adjustable.

Phases
Indicate whether the inverter is single-phase or three-phase.

Rated voltage (AC)
Enter the inverter's rated AC output voltage.

The rated voltages for connection to the distribution grid are as follows:

- Single-phase equipment – 120/240 V
- Three-phase equipment – 347/600 V

If the inverter's rated voltage differs from that of the grid, you will need to install a power transformer. Specify the inverter's voltage and complete Section **8, Transformers**.

Maximum short-circuit current (A)
This is the maximum current that the inverter can output if a fault (short-circuit) occurs on either the Hydro-Québec side or your side. Enter the maximum short-circuit current at the inverter output and state whether the current entered is a crest or effective value.

Certification
Indicate whether the inverters you will be using are certified to the following standards:

- CSA C22.2, No. 107.1-01
- UL1741

Attach proof of all certification obtained. A digital copy from the equipment manufacturer or supplier is acceptable.

Firmware version at time of certification and Current firmware version (if different)
The firmware has built-in protection functions, among other things. With the information in these two boxes, Hydro-Québec will be able to ensure that the firmware you specify on the form is indeed certified. Hydro-Québec must approve any change made since certification to ensure that the integrated protection will work properly.

Section 6 – Frequency and voltage protection

Enter the frequency and voltage protection settings.

Amplitude and Adjustment range
Specify the amplitude for each function. If they are adjustable, give the ranges.

Section 7 – Operation as backup power system

If there is a Hydro-Québec power outage, you can operate your installation as a backup power system if you have the right equipment. More specifically, you must be able to switch critical loads between the regular and backup power systems. A Hydro-Quebec–approved switching device is required to enable disconnection from the distribution grid upon the switchover to standalone mode (*Conditions of Electricity Service*).

Use as backup power system anticipated?
Indicate whether you plan to use your generating equipment as a backup power system.

Section 8 – Transformers

If the inverter's output voltage is not the same as the rated voltage of your service entrance, you may need to add transformers in order to connect to the Hydro-Quebec grid.

Installation of power transformers anticipated?
Indicate whether the generating facility comprises one or more power transformers.

For each transformer, provide the following information:

Power (kVA) and rated primary and secondary voltage (V)

Enter the rated capacity of each transformer. You'll find this information on the nameplate.

Enter the transformer's primary voltage (Hydro-Québec grid) and secondary voltage (your installation). You'll find this information on the nameplate.

Primary and secondary winding connection types

Enter the types of winding connections. Here are some possible types:

- Three-phase equipment – YY (with neutral grounding)*
- Single-phase equipment – LN-LN*

  *Y – Star connection; L – Line; N – Neutral.

The transformer connections will influence the type of grounding system. At the connection point, Hydro-Québec requires an effectively grounded neutral.

Section 9 – Schematic diagram of planned facility

Please provide a complete schematic of the facility, as follows:

- Single-line diagram of entire facility, including generating equipment and inverters
- Power transformer's winding connections, if applicable
- Transfer switch connection (for backup power), if applicable

Coordinated by Communication avec la clientèle
for Vice-présidence – Réseau de distribution

Ce document est également publié en français.

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