IPS Integrated Power Systems
Solar & Back-Up Power

2021
Residential Solar Grid-Tie Catalogue

Fall Issue

Generating Electricity for a Sustainable World

Grid-Tie System in Kelowna, BC

Integrated Power Systems 25+ Serving Western Canada Since 1993

BBB ACCREDITED BUSINESS A+

www.ipwr.net

#101-2387 Dominion Rd West Kelowna, BC Canada V1Z 2Y4
Phone: 250-769-2843 Toll Free: 1-866-607-7640

What We Will Do For You

About Us:

- Over 25 years experience in the alternative energy business
- We will complete and submit the utility application for you with all the necessary drawings
- We have and work out of a fully stocked warehouse - not a garage or backyard
- We are fully insured and have Worksafe BC coverage
- All our systems meet the current BC electrical code
- We use Licensed Electricians who will provide the permit needed
- All our systems are complete!
  If ordering from an on-line store, be aware that the system may not meet the current BC electrical code & that all parts may not be included
- For shingle roofs, we use Kinetic Racking with Flashing to protect against leaks...using L-feet & a sealant is not an adequate alternative!
- We have lots of options available for metal roofs
- We manufacture both Ground and Top of Pole Mounts in our warehouse
- All the **pictures** in our catalogues are from **our installations**. Like what you see... call us and let our team of professionals install a quality system for you

A properly designed Grid-Tie System will have a positive effect on your utility bill!

Generating your own power with a solar PV system is now an affordable option.

Solar PV prices have now dropped to a level that payback for your system could be realized in as little as 8 years depending on system size, southern exposure and utility price increases.

With BC Hydro & Fortis Power adopting the two tiered rate schedule, it makes sense to include solar in your energy plan. Smart Meters are Grid-Tie ready.

Most systems are mounted flush on the roof. This requires good southern exposure and enough roof space available for the panels. Each kilowatt of solar PV requires approximately 100 square feet of space.

A solar electric system can last upwards of 30 years with little or no maintenance.
A Grid-Tie system will add value to your home if or when you should decide to sell.

Today's systems are approximately 95% efficient with almost all the power generated being utilized in your home and any excess being sent to the grid.

Micro hydro and Wind systems are available. They are not listed in our catalogue as each is site specific. Please call for an assessment.

Commercial Grid-Tie systems available. Call for a free consultation.

What is Grid-Tie & How Does the Billing Work?

The Basics of a Grid-Tie System

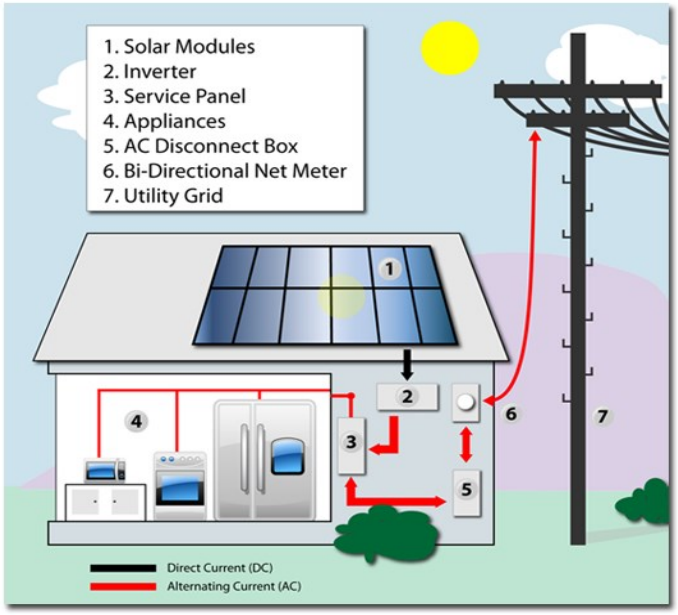
1. Solar Modules
Solar modules convert sunlight into DC electricity.

2. Inverter
The DC electricity is sent to an inverter which converts it into AC electricity. This is identical to the electricity you receive from the utility company.

3. Service Panel
The service panel receives the AC electricity from the inverter and then distributes it to any loads in your home.

4. Appliances
Regular home appliances

5. AC Disconnect Box
A utility company required disconnect box.



6. Bi-Directional Net Meter
When excess power is produced by the solar panels, the power will flow into the grid through your electric meter. You are now "*legally spinning your electric meter backwards*". Smart meters are Grid-Tie ready.

7. Utility Grid
The utility grid automatically provides electricity when needed - at night and during the day when your demand exceeds your solar production.

Every watt-hour your system delivers is a watt-hour you don't have to buy from your utility company!

And How Does The Billing Work?

Both BC Hydro and Fortis BC calculate net metering based on 2 time frames:

1. Billing Periods
During a billing period, if your system produces more energy than you use, then a kW credit will carry through to the next billing period. Let's say you produce 2600kW and use 1600kW in a billing period. You will not be charged for power usage and a credit of 1000kW will carry forward to the next billing period. Then maybe the weather turns ugly and you produce only 500kW but use 2500kW. With the credit applied, you would be billed for 1000kW.

2. Annual Reconciliation
Once a year, on the anniversary date of your Grid-Tie system start-up, the utility company will add up how many kW's your system produced and subtract your energy usage. If you have a credit and depending on the utility company, you may be issued a check.

Sizing your Grid-Tie System

Now that you know the basics, the next decision is “How big should I go?”

The following formula will give you an approximate system wattage so that you can get an idea of cost and components needed for your system. Work with our experienced team at IPS to design a system which fits within your budget and can be expanded as needed.

1. How much electricity do you use each month?
   Look at your electric bills from the past year and find the average number of kWh per month then divide by 30 (days in a month).
2. How many peak sun hours do you get per day? Most of Southern BC receives 3.5 hours on an annual average. Outside this area, refer to sun hours/day page.
3. What % of your home/business power usage will be supplied by renewable energy from your system?

This will give you your minimum system size (MSS) in watts.

For example:

$$\frac{1500 \text{ kWh/mo}}{30 \text{ days}} = 50 \text{ kWh/day} \qquad \frac{50 \text{ kWh/day}}{3.5 \text{ sun hours}} = 14.29 \times 1000 = 14290 \text{ watts}$$

14290 watts x 50% (your production) = 7145 watts (minimum system size)
If you want to produce 75% of your electricity, use 75; etc.

The MSS is the number of watts per hour your system needs to produce during peak sun hours in order to meet your needs. You can use this number to figure out the appropriate system size.

Note: These figures are approximate and do not take into account variable efficiency ratings of the solar panels or inverters.

System Size (in watts)	Monthly Output Capability (based on 3.5 sun hrs/day)
5000	525 kWh
7600	798 kWh
10,000	1050 kWh

3.5 hrs is the average annual full sun hours per day
Full sun hours = 1000 watts per m2 per hour

Vernon, BC

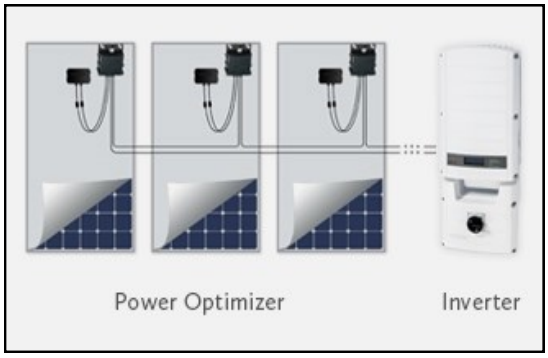
Please Note: In the following Grid-Tie systems, the solar array wattage is only an approximation as the solar panel wattage can change with availability.

Grid-Tie Systems

The following systems feature the 25 year warranty **SolarEdge Power Optimizers**, highly efficient PV Inverters and a Web Portal for module-level monitoring and fault detection. The Power Optimizer is a DC/DC converter which is connected to each PV module. This increases the energy output from PV systems by constantly tracking the maximum power point (MPPT) of each module individually. A power optimizer is equipped with the unique SafeDC™ feature which automatically shuts down the modules' DC voltage whenever the inverter or grid power is shut down.

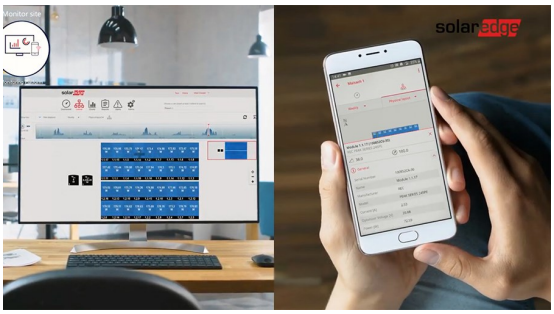
The **SolarEdge PV Inverter** is specifically designed to work with the SolarEdge Power Optimizers. Because MPPT and voltage management are handled separately for each module by the power optimizer, the inverter is only responsible for DC to AC inversion. Consequently, it is a less complicated, more cost effective, more reliable solar inverter with a standard 12 year warranty, extendable to 20 or 25 years. These are 240/120 volt systems unless otherwise noted.

All systems include flush mount roof racking.



SE 5000
6,480 watt Solar Array
1 Solar Edge 5,000 watt Inverter
On Shingle Roof:
GT9110 $12,331.03

SE 6000
8,640 watt Solar Array
1 Solar Edge 6000 watt Inverter
On Shingle Roof:
GT9111 $14,919.39



SE 7600
10,080 watt Solar Array
1 Solar Edge 7,600 watt Inverter
On Shingle Roof:
GT9112 $17,433.62

SolarEdge includes web based monitoring.

SE 10,000
12,960 watt Solar Array
1 Solar Edge 10,000 watt Inverter
On Shingle Roof:
GT9116 $22,353.68

SE 11,400
15,840 watt Solar Array
1 Solar Edge 11,400 watt Inverter
On Shingle Roof:
GT9117 $26,228.17

Call for pricing for metal or other types of roofing.

Prices do not include the electrical permit or installation.

All our systems meet the current BC electrical code.

Grid-Tie Systems

Micro-Inverters Systems

All systems are expandable and include flush mount roof racking

GT9150
4320 watt 12 panel Solar Array
120/240 volt system
On Shingle Roof:
$8099.39

GT9151
5760 watt 16 panel Solar Array
120/240 volt system
On Shingle Roof:
$10,545.77

GT9152
7,200 watt 20 panel Solar Array
120/240 volt system
On Shingle Roof:
$12,626.99

GT9153
8640 watt 24 panel Solar Array
120/240 volt system
On Shingle Roof:
14,296.54

GT9154
10,080 watt 28 panel Solar Array
120/240 volt system
On Shingle Roof:
$16,586.95

GT9155
11,520 watt 32 panel Solar Array
120/240 volt system
On Shingle Roof:
$18,899.71

GT9156
12,960 watt 36 panel Solar Array
120/240 volt system
On Shingle Roof:
$21,252.66

GT9157
14,400 watt 40 panel Solar Array
120/240 volt system
On Shingle Roof:
$23,420.23

Call for pricing for metal or other types of roofing.

Prices do not include the electrical permit or installation.

hoymiles

Warrantees

2 Year Installation Services Warranty for Solar Grid-Tie Systems

At IPS Integrated Power Systems Inc, we offer a 2 year warranty on the installation services relating to your new solar Grid-Tie system. If a problem with your system occurs during this period, we will come and fix it at no cost to you.

Standard manufacturers terms of warranty apply to the products used in each system.

Warranty Period	10 years	12 years	20 years	25 years	Optional Extended Warranty
SolarEdge Inverters		✓			✓
SolarEdge Optimizers				✓	
Yingli Solar Panels				✓	
APSystems Micro Inverters	✓				✓
Hoymiles Micro Inverters		✓			✓
Hanwha Solar Panels				✓	
Kinetic Racking			✓		

Supplying, installing and using solar power since 1993

Grid-Tie system we installed at our IPS office/ warehouse on Dominion Rd in West Kelowna.

See our Grid-Tie system in real time at www.ipwr.net

Sun Hours Per Day

Several factors influence how much sun power your solar panels will be exposed to:

When you will be using your system - summer, winter, or year-round.
Typical local weather conditions.
Fixed mountings vs. trackers.
Location and angle of PV array.

We have provided the following chart which shows ratings that reflect the number of hours of full sunlight available to generate electricity. Your solar array's power generation capacity is dependant on the angle of the rays as they hit the modules. Peak power occurs when the rays are at right angles to the modules.
If you use your system primarily in the summer, use the summer value: if you are using your system year-round, especially for a critical application, use the winter value. Using the chart, you should be able to determine a reasonable estimate of the sun's availability in your area.

Province, City	Summer Avg.	Winter Avg.	Yr Round Avg.
Alberta, Edmonton	4.95	2.13	3.75
Alberta, Suffield	5.19	2.75	4.10
British Columbia, Kamloops	4.48	1.46	3.29
British Columbia, Prince George	4.13	1.33	3.14
British Columbia, Vancouver	4.23	1.33	3.14
Manitoba, The Pas	5.02	2.02	3.56
Manitoba, Winnipeg	5.23	2.77	4.02
New Brunswick, Fredericton	4.23	2.54	3.56
Newfoundland, Goose Bay	4.65	2.02	3.33
Newfoundland, St. Johns	3.89	1.83	3.15
Northwest Territory, Fort Smith	5.16	0.88	3.29
Northwest Territory, Norman Wells	5.04	0.06	2.89
Nova Scotia, Halifax	4.02	2.16	3.38
Ontario, Ottawa	4.63	2.35	3.70
Ontario, Toronto	3.98	2.13	3.44
Prince Edward Island, Charlottetown	4.31	2.29	3.56
Quebec, Montreal	4.21	2.29	3.50
Quebec, Sept-Isles	4.29	2.33	3.50
Saskatchewan, Swift Current	5.25	2.77	4.23
Yukon, Whitehorse	4.81	0.69	3.10

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