

IPS Integrated Power Systems

Back-up and Solar Power Systems

Generating Electricity for a Sustainable World



Solar Grid-Tie Catalogue

2016



IPS Integrated Power Systems
#101 - 2387 Dominion Road
West Kelowna, BC Canada V1Z 2Y4

Phone: 250-769-2843
Toll Free: 1-866-607-7640
Website: www.ipwr.net



What We Will Do For You

About Us:

- 22 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 WCB coverage
- All our systems meet the BC 2015 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 BC 2015 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 can 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 both major utility companies, BC Hydro & Fortis Power, adopting the two tiered rate schedule it makes sense to include solar in your energy plan.

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. This type of system will add value to your home if 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.

What is Grid-Tie?

The Basics of a Grid-Tie System

1. Solar Panels

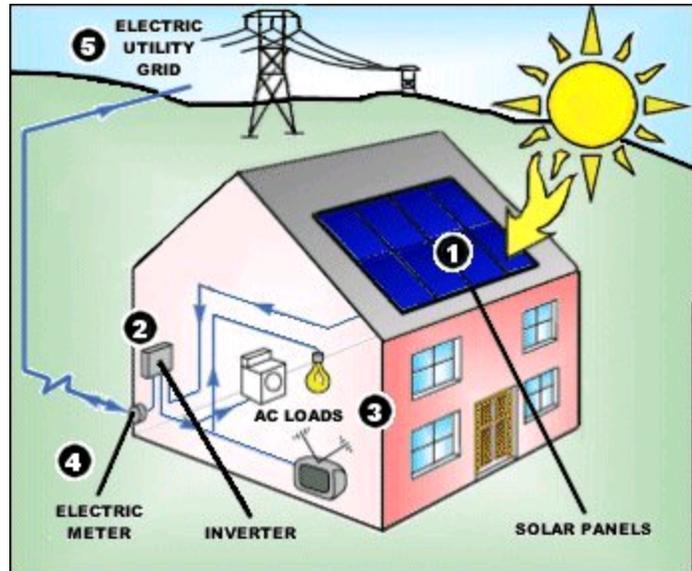
Solar Panels mounted on the roof or ground convert sunlight into DC power.

2. Inverter

This power is sent to an inverter which converts it into AC power - identical to that being sent to you from the utility company.

3. Electrical Panel

Power travels from the inverter to your electrical service box. The power from the electrical panel will be distributed to any electrical loads in your home.



4. Utility 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” and are in essence, providing power to your neighbor.

5. 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!



Lumby, BC



Vernon, BC

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 chart on page 7.
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:

$$\frac{1500 \text{ kWh/mo}}{30 \text{ days}} = 50 \text{ kWh/day}$$

$$\frac{50 \text{ kWh/day}}{3.5 \text{ sun hours}} = 14.29 \times 1000 = 14290 \text{ watts}$$

$$14290 \text{ watts} \times 50\% \text{ (your production)} = 7145 \text{ watts (minimum system size)}$$

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



Grid-Tie Systems

The following systems feature the **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. Each 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. Power Optimizers have a 25 yr warranty.

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. All systems include flush mount roof racking. These are 240/120 volt systems unless otherwise noted.

SE 5000 with 5830 watt Solar Array GT9110

22 265 watt Solar Panels
1 Solar Edge 5000 watt Inverter
Flush Mount Roof Racking
Shingle Roof: \$12,817.84
Metal Roof: \$12,210.64



SE 7600 with 8480 watt Solar Array GT9112

32 265 watt Solar Panels
1 Solar Edge 7600 watt Inverter
Flush Mount Roof Racking
Shingle Roof: \$17,548.75
Metal Roof: \$16,684.75

**Designed for future compatibility with lithium energy storage



SE 10,000 with 10,600 watt Solar Array GT9116

40 265 watt Solar Panels
1 Solar Edge 10000 watt Inverter
Flush Mount Roof Racking
Shingle Roof: \$22,050.93
Metal Roof: \$20,970.93

Curious about your energy production?

SolarEdge includes web based monitoring.



All our systems meet the BC 2015 electrical code.

Grid-Tie Systems

APsystems: Leading the Industry in Solar Micro-inverter Technology

The **APsystems Micro-inverter Solution** integrates grid-tied micro-inverters with intelligent networking and monitoring systems to ensure maximum efficiency of your solar array and to optimize solar harvest.

This system combines APsystems Micro-inverters with a state-of-the-art communications unit, the APsystems Communicator (ECU), and advanced monitoring software, the APsystems Monitor (EMA), to bring you the most powerful, economical, reliable, intelligent and safe solar solution on the market today.

APS 3500 with 3710 watt Solar Array GT9119

14 265 watt Solar Panels
7 APsystems 500 watt Micro-inverters
1 ECU Communicator
Flush Mount Roof Racking
Shingle Roof: \$9,625.45
Metal Roof: \$9,239.05



APS 7000 with 7420 watt Solar Array GT9121

28 265 watt Solar Panels
14 APsystems 500 watt Micro-inverters
1 ECU Communicator
Flush Mount Roof Racking
Shingle Roof: \$17,320.26
Metal Roof: \$16,564.26



APS 10,500 with 11,130 watt Solar Array GT9123

42 265 watt Solar Panels
21 APsystems 500 watt Micro-inverters
1 ECU Communicator
Flush Mount Roof Racking
Shingle Roof: \$25,227.83
Metal Roof: \$24,093.83

All our systems meet the BC 2015 electrical code.

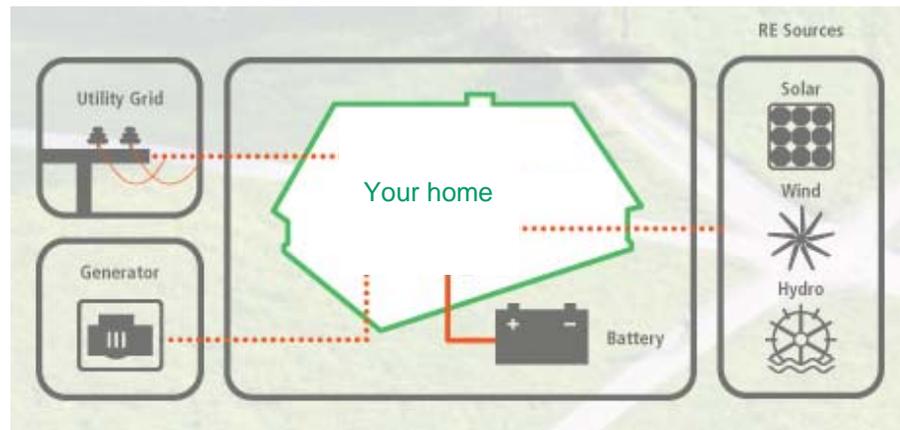
Grid-Tie System with Backup Power

This system is ideal for homes that are connected to the grid, and want to incorporate a renewable energy (RE) system with **backup power**. A grid-tie system allows any excess energy that is generated to be sold back to the utility company, and allows the grid to act as an additional energy source to charge the systems batteries.

If the grid should fail, the inverter will automatically supply energy from the batteries and the RE sources, to support your homes electrical needs.

While this is the most expensive of the grid-tie systems, you can rest assured that your most valuable electrical loads, such as a freezer full of food, will continue to run as if the power failure never occurred.

Grid-Tie System with Backup Power



This type of system is designed and ideal for areas that have frequent and/or long power outages.

Grid-Tie with Battery Backup

Powered by Outback Radian

Available in 2 sizes: 4000 watt or 8000 watt Inverter

There are so many variables to consider with this type of system:
size of loads
run time needed

Solar & Batteries will be designed to suit your needs.



Grid-Tie with Battery Back-up installed on the Arena in 2009
Nakusp, BC



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