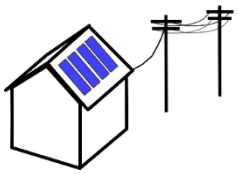
SOLAR POWER FOR YOUR HOME: IS YOUR HOME A GOOD CANDIDATE?

As an environmentally-conscious homeowner, you may have some questions about whether solar power is right for your home. This brochure will introduce you to a grid-tied solar system, its benefits and challenges, and the factors to consider when determining if solar power will work for you.

WHAT IS GRID-TIED SOLAR POWER?



Solar power is a form of clean, renewable energy that converts sunlight into electricity for your home. A grid-tied photovoltaic (PV) system connects electricity generated from PV panels, or solar panels, to BC Hydro's network. This means that your home will be powered by your solar panels when the sun is shining and by BC Hydro when the sky is overcast.

WHAT ARE THE BENEFITS OF SOLAR POWER?

There are numerous benefits to solar energy—both for the environment and your pocket. With a solar panel array, you can:

- Power your home with a clean, renewable energy source
- Reduce the cost of your hydro bill
- Invest in a long-lasting environmental upgrade to your home
- Increase the value of your home

WHAT ARE THE RISKS AND CHALLENGES OF SOLAR POWER?

As with any major home renovation or electrical installation, there are some challenges to consider. When deciding on a grid-tied system for your home, keep in mind:

- Panels will require maintenance and may need replacement
- Inverters will need to be replaced every 10 years
- Grid-tied systems are not exempt from power outages
- It may take around 20 years to recoup your investment at current rates

In addition, not all homes meet the criteria for an effective solar panel array. **To determine whether your home is a good candidate, see the requirements on the next page.**

HOW MUCH DOES A PHOTOVOLTAIC SYSTEM COST?

Using solar energy is a great way to help the environment and save on your monthly hydro bill. However, a PV system is a significant investment. Expect to spend approximately $20,000 on PV panels and inverters, plus mounting and installation costs.

WHAT FINANCING OPTIONS ARE AVAILABLE?

In order to help homeowners achieve their alternative energy goals, the Sunshine Coast Community Solar Association (SCCSA) has partnered with the Sunshine Coast Credit Union to offer financing options. To further help off-set costs, the SCCSA will host bulk buys for PV panels and barn-raising initiatives for installation.

For more information on the PV panel bulk buy, contact Joanna Zilsel:

Phone: 604.740.1051

Email: j_zilsel@dccnet.com

Website: sunshinecoastcommunitysolar.com

Note: Prior to installation, you will need approval from BC Hydro and a permit from the Sunshine Coast Regional District. You will also need to hire a licensed electrician to connect your PV system to the grid.

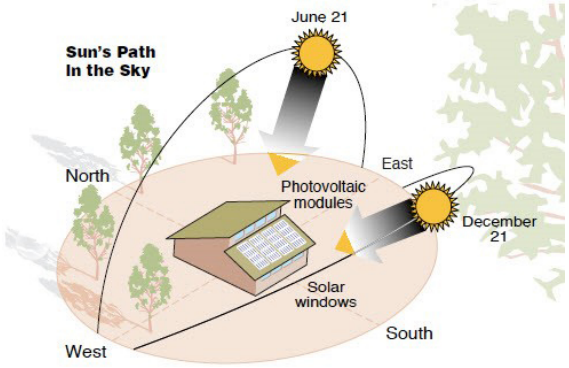
WHAT FACTORS SHOULD YOU CONSIDER?

Consider these key factors when evaluating whether solar power is appropriate for your home.

ROOF CONDITION

The roof of your house should be in excellent condition. If your roof is older and needs to be repaired or replaced, consider doing so prior to installing your PV system. Otherwise, the panels will need to be removed to add new roofing and then re-installed afterwards, which can be very costly. Since PV systems are designed to last a minimum of 20 years, you will want to ensure that your roof will last equally as long.

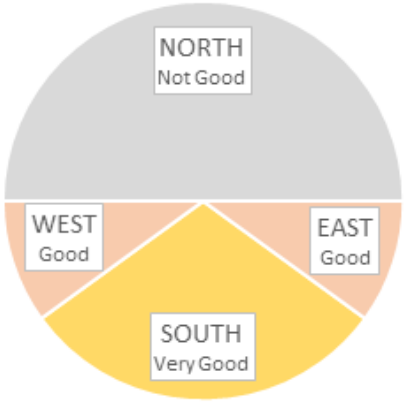
EXPOSURE TO SUNLIGHT



Access to sunlight is one of the most important factors to consider. Ideally, your roof should be shade-free during most—or all—of the day. Even a small amount of shading from nearby objects such as chimneys, trees, or buildings can significantly impact power output. Since the trajectory of the sun varies throughout the year, consider whether sunlight is obstructed during different seasons.

ROOF ORIENTATION

The direction your PV system faces also affects its performance. North America's sun follows a southern path, which means a south-facing roof is the best orientation; however, roofs facing east or west are usually also acceptable. Northern exposures are not recommended because the system will produce much less power when facing this direction.



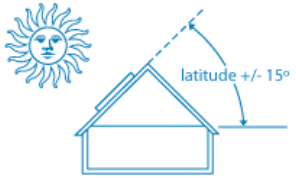
AVAILABLE ROOF SPACE

The amount of roof space you will need depends on how many panels are required for your home's energy needs. According to BC Hydro, a 1 kW solar PV array would require about 7 to 8 square meters of south-facing free space. Under optimal conditions, this array will generate approximately 1,200 kWh per year.[1]

[1] *Solar Power & Heating For Your Home.* Retrieved February 27, 2016 from https://www.bchydro.com/powersmart/residential/building-and-renovating/switch-to-solar-energy.html

ROOF ANGLE/TILT

The angle or tilt of your roof is less important, but can affect the way the panels are mounted. Most residential PV systems are mounted directly onto sloped roofs, since normal roof pitch is generally a good mounting angle. For the Sunshine Coast, an appropriate angle would be in the range of 35-75 degrees (latitude plus or minus 15 degrees).



If your roof is flat, panels can be installed using a fixed mount or adjustable tracking mount instead. Other less common options include pole-mounted or ground-mounted systems, which can be used if your roof faces north or has too little space.

IS YOUR HOME A GOOD CANDIDATE?

To determine whether solar power is appropriate for your home, answer the following questions:

- ☐ Do you own your home and expect to live there for at least 20 years?
- ☐ Will your roof be in good condition for at least 20 years (without repairs)?
- ☐ Is your roof mostly free from shade during daylight hours?
- ☐ Does part of your roof face south, east, or west?
- ☐ Do you have at least 7 square metres of free space on that part of the roof?

If you answered **yes** to all of the above, your home is a good candidate for solar power.

SOLAR POWER FOR YOUR HOME: HOW WILL YOUR SYSTEM WORK?

A photovoltaic (PV) or solar system is a great way to use renewable energy to power your home. This document provides an overview of how a PV panel system works to convert sunlight into electricity. It also covers how that electricity travels from the PV panels to your appliances. Lastly, it discusses how you can measure your energy output and savings.

HOW DOES A GRID-TIED SOLAR POWER SYSTEM WORK?

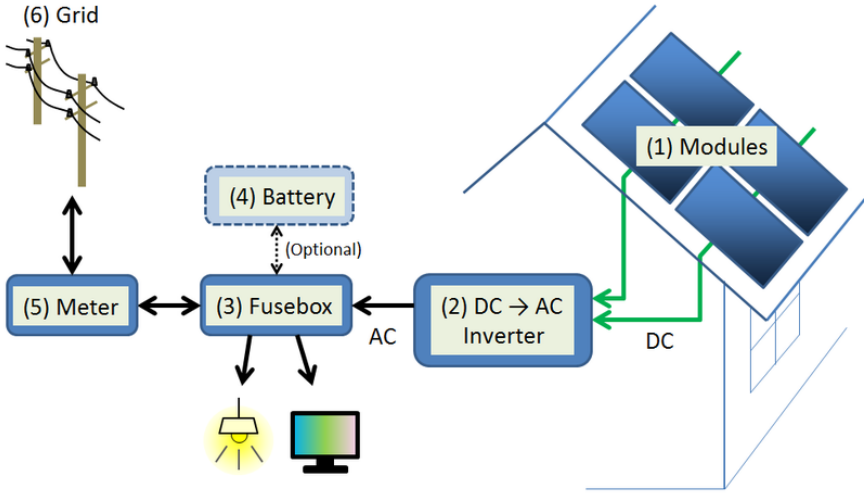


Figure 1. Schematic Diagram of a Grid-Tied Solar System

A **solar collector module** or **PV panel** is a flat rectangular enclosure containing solar cells (devices made of semiconducting material—usually crystalline silicon—that collect energy from sunlight) that is constructed of aluminum framing, a tempered glass top, and fire-resistant backing. The cells generate electricity as sunlight passes through them, creating an energy differential similar to a household battery. The multiple cells in each panel combine to produce approximately 30 volts. Each PV panel is connected to its own **micro-inverter** before connecting to the **electrical meter** and **utility grid** (see **Figure 1**).

Once the PV panels or modules are installed in an array on your roof, they will begin collecting energy for your home and transferring it through their connected micro-inverters. The micro-inverter is a device that converts direct current from a PV panel to alternating current. Modern grid-tied solar systems use a micro-inverter for each PV panel. Each micro-inverter can only transmit as much electricity as the lowest producing panel to which it is connected. This set-up greatly aids efficient energy generation when panels are partially shaded, damaged, or defective.

The electrical meter is an instrument that measures the total amount of electrical energy consumed by your home. When connected to a grid-tied solar system, an electrical meter is also used to measure the electrical energy being added to the grid, offsetting your home's electricity bills. Your new grid-tied solar power system will have a computer program you can use to monitor your panels' efficiency, and check how much electricity your solar power system is producing for your home versus consumption of electricity from the conventional grid.

POWER OUTAGES AND GRID-TIED SOLAR POWER SYSTEMS

It is important to understand that your grid-tied system will not be operational in the event of a BC Hydro power outage due to an automatic shutdown feature. The automatic shutdown feature is in place to protect BC Hydro workers from risk of electrocution. Grid-tied solar power systems can be configured with a battery to store energy in the case of an outage.