

13 | SOLAR ENERGY AND HEATING

EDMONTON'S GREEN HOME GUIDE

Solar Energy Makes Environmental Sense

Solar energy works in any climate and the fuel – sunshine – is free! Solar energy is sustainable and it doesn't produce greenhouse gas emissions.

Passive Solar Design

A house can have passive solar design features to reduce energy consumption. In this case, a house needs to have good solar access and orientation (for example, facing southeast to southwest) with no blockage of sunlight.

Passive solar design generally involves optimal sizing and orientation of high-quality windows, careful selection of building materials that retain heat and proper building orientation and solar access.

Modest levels of passive solar heating can reduce building heating requirements by 5 to 25% at little or no additional first cost and can be implemented for most small buildings in Edmonton's climate. More integrated passive solar design of a new building can deliver up to 50% reduction of heating energy.

This design strategy requires careful integration and optimization of passive solar elements within the home's design. It's therefore best suited to new homes and is more challenging to achieve by retrofitting.

Clean Energy with a Low Carbon Footprint: Solar Photovoltaic (PV) Systems

Installing renewable energy systems helps reduce Edmonton's reliance on fossil fuels. Solar energy systems generate clean energy with a very low carbon footprint, which contributes to Edmonton's climate change mitigation goals. Micro-generation (the generation of small amounts of power at the household or building level) makes Edmonton's energy system more resilient as it increases redundancy and diversity of energy sources. Promoting and encouraging solar can

also help create green jobs in Edmonton and diversify the economy.

Go Solar: Here's What to Look for

Solar panels can be installed on new or existing homes, although it's easier and cheaper to install them in new homes. In either case, consider what type of system you want: Water heating or photovoltaic (electricity-producing). Work with a qualified system designer to select the appropriate technology and system size for your home. CanSIA (the Canadian Solar Industries Association) provides guidance on selecting qualified solar energy service providers.

The most cost-effective option is to make sure the house is as energy-efficient as possible before adding solar. You should find out if energy efficiency improvements have been made to the home in combination with the solar installation.

If you're buying a newer home, look for a solar-ready house, which has had simple provisions made for adding solar panels. Making a home solar-ready costs about \$400 to \$900 depending on whether the home is solar-water-heating or solar-electricity-producing ready (or both). These provisions typically include roof space, utility room space and a pipe chase to

connect the roof and utility room. Even if you decide you won't install solar right away, at least your home will be set up for it.

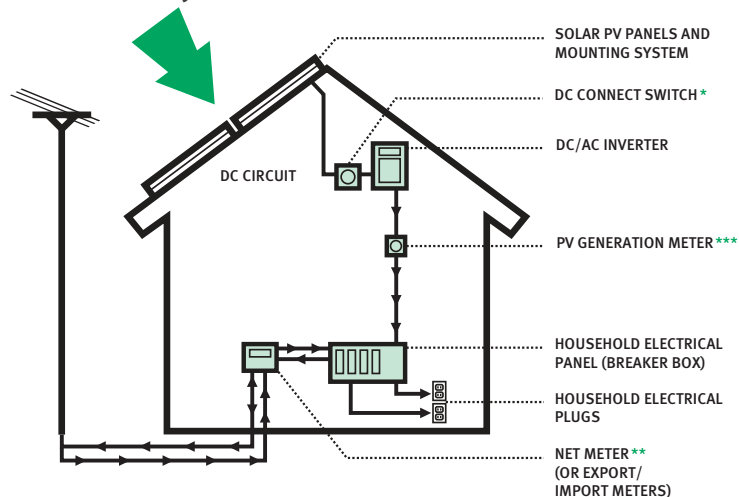
Shed New Light on Price Fluctuations

Using solar energy means you'll be less affected by fluctuations and long-term increases in the price of conventional energy such as natural gas and conventional electricity. Solar panels can potentially supply anywhere from a few per cent up to 100% of your electricity and hot water needs. Passive solar design can reduce heating energy demand by 25% or more in a well-designed, high-performance passive solar home.

Find Out More from the Solar Energy Society of Alberta

The Solar Energy Society of Alberta provides technical information, examples of installed systems and details on solar energy providers at: solaralberta.ca

Solar Home System



- * The DC Disconnect Switch allows for the system to be shut down for maintenance or in the event of a house fire
- ** The Net Meter measures power coming from the grid and power that the house is exporting to the grid
- *** The PV Generation Meter keeps track of how much power the PV system is generating





GREEN FACTS AND TIPS: SOLAR ENERGY

Sunny Edmonton Makes Perfect Solar Sense

Edmonton's winter climate is well-suited to solar energy. With 2,300 hours of sun in an average year, Edmonton is one of the sunniest cities in Canada. When systems are properly designed and sized to accommodate the climate, snow and ice don't have a major impact on solar energy production.

Solar energy systems can theoretically supply all the energy needs of a home although they're often sized to supply a portion of the energy demand based on affordability or the practicality for a given home. These systems can also contribute to a net-zero energy home (a home that uses zero net external energy on an annual basis).

Solar Water Heaters

Solar water heaters can be a cost-effective way to generate hot water for your home. Most solar water heaters require a well-insulated storage tank and almost all need a back-up or booster system such as a tankless water heater for cloudy days and times of increased demand.

Photovoltaic (PV) Panels

Photovoltaic (PV) panels are used to produce electricity as an alternative to getting all the power from the electrical utility grid. The capital costs for these systems have been dropping rapidly in the last several years. Additional information can be found at:

canmetenergy.nrcan.gc.ca/buildings-communities/energy-efficient-buildings/solar-photovoltaic/publications/2926

Grid-Connected Solar Energy Systems

Grid-connected solar energy systems tie the solar PV system to the electricity grid. This allows your house to consume the solar power generated on-site when it's available. When on-site solar power isn't available (or not meeting current demand for electricity), electricity is purchased from the grid. When the solar energy system is producing more energy than the home requires, you receive credit for sending the excess solar power to the electricity grid.

This is regulated under the Micro-Generation Regulation. More information can be found at:

www.auc.ab.ca/rule-development/micro-generation/Pages/default.aspx

Also, check out the application procedure and required permits:

edmonton.ca/SolarPermits

Off-Grid PV Systems

Off-grid PV systems operate independently of the electrical utility grid but require battery storage. Designing, permitting and installing an off-grid system can be very challenging. Also, sizing the system to meet the needs of a typical Edmonton family may not be economical without pursuing energy-demand strategies.

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