

ROSE & THORN HOME INSPECTION

March 2018

SOLAR POWER IS THE CONVERSION OF SUNLIGHT INTO ELECTRICITY, EITHER DIRECTLY USING PHOTOVOLTAICS (PV), OR INDIRECTLY USING CONCENTRATED SOLAR POWER (CSP). CONCENTRATED SOLAR POWER SYSTEMS USE LENSES OR MIRRORS AND TRACKING SYSTEMS TO FOCUS A LARGE AREA OF SUNLIGHT INTO A SMALL BEAM. PHOTOVOLTAICS CONVERT LIGHT INTO AN ELECTRIC CURRENT USING THE PHOTOVOLTAIC EFFECT. (WIKIPEDIA)

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Solar Power.

What is solar power, and how will it help me! Energy from the sun in the form radiant light and heat can be used to produce electrical power to your home, and it can be used to heat water to provide your home with a supply of hot water.

If you are considering a solar electric system, you need to first answer these questions:

- Does my home have clear and unobstructed access to sunlight for most or all of the day, throughout the year?
- Do I have a large enough roof or area to accommodate the system I need?
- Does my community have any covenants in place that prohibit solar panels?
- Is it worth the investment?

If you have enough sunlight, space, and money to invest in a solar electric system, and if there are no legal issues, you are ready to go. But before you go off and buy just any system, consider these three things:

1. The Right Contractor Matters

Your solar electric system or Photovoltaic (PV) system needs to be sized, sited, installed, and maintained correctly to achieve optimal performance. It is best to have a professional solar contractor install your system. Make sure your contractor is properly licensed or certified to work with PV systems, and check to see how many years of experience the company has. If you are interested in an off-grid system, be sure company representatives have previously installed a stand-alone system. (The same is true for on-grid systems as well.)

2. Size Matters

When planning your solar electric system, you'll have to figure out how big the system needs to be to meet your electricity needs. First, make sure you are already being as energy-efficient as possible; this means less energy needs to be generated and lower monthly bills! Next, think about how much energy you need your PV system to produce. The more energy you need, the larger your system could be.

3. Orientation and Tilt Matters

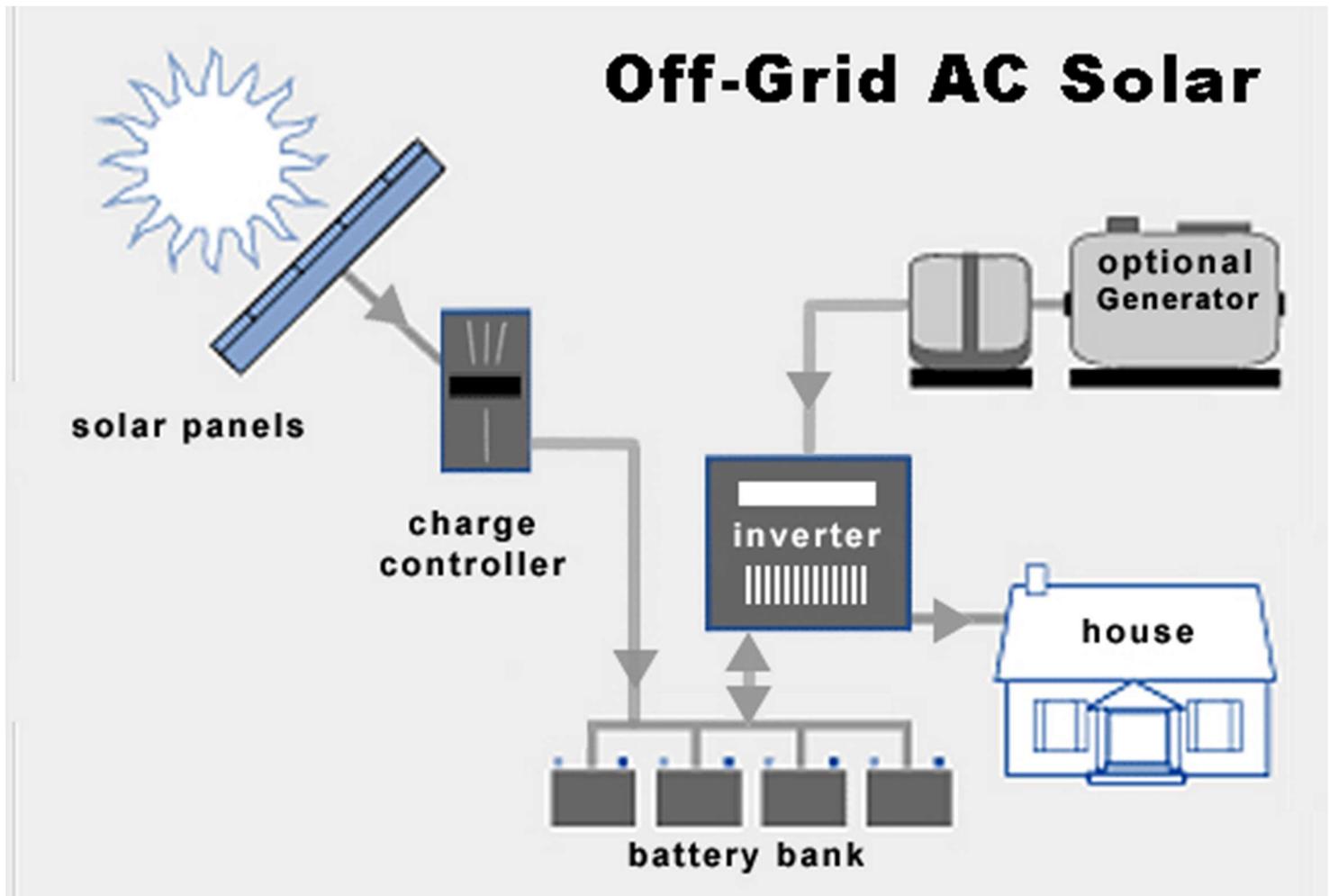
PV modules need to be oriented to gather the maximum amount of daily and seasonal sunlight. Typically, in the northern hemisphere, this means the optimal placement is true south. However, you can face your PV modules up to 45 degrees east or west of true south without significantly decreasing performance. If you are planning to mount your modules on the roof, consider roof angle and condition, landscape features that could inhibit direct sunlight, and local weather conditions that may affect electricity production.

Electricity from the Sun.

Solar power is a way to eliminate or greatly reduce your electricity costs. You could go off grid, grid tied, or grid tied with battery backup. What does each of these offer?

Off grid:

Running all your electrical requirements from solar panels and battery systems that are recharged by the sun. When the grid fails, this will have no effect on your power supply.



Space!

When planning for either the off grid or grid tied battery back-up systems, be sure to understand the size of the battery pack.

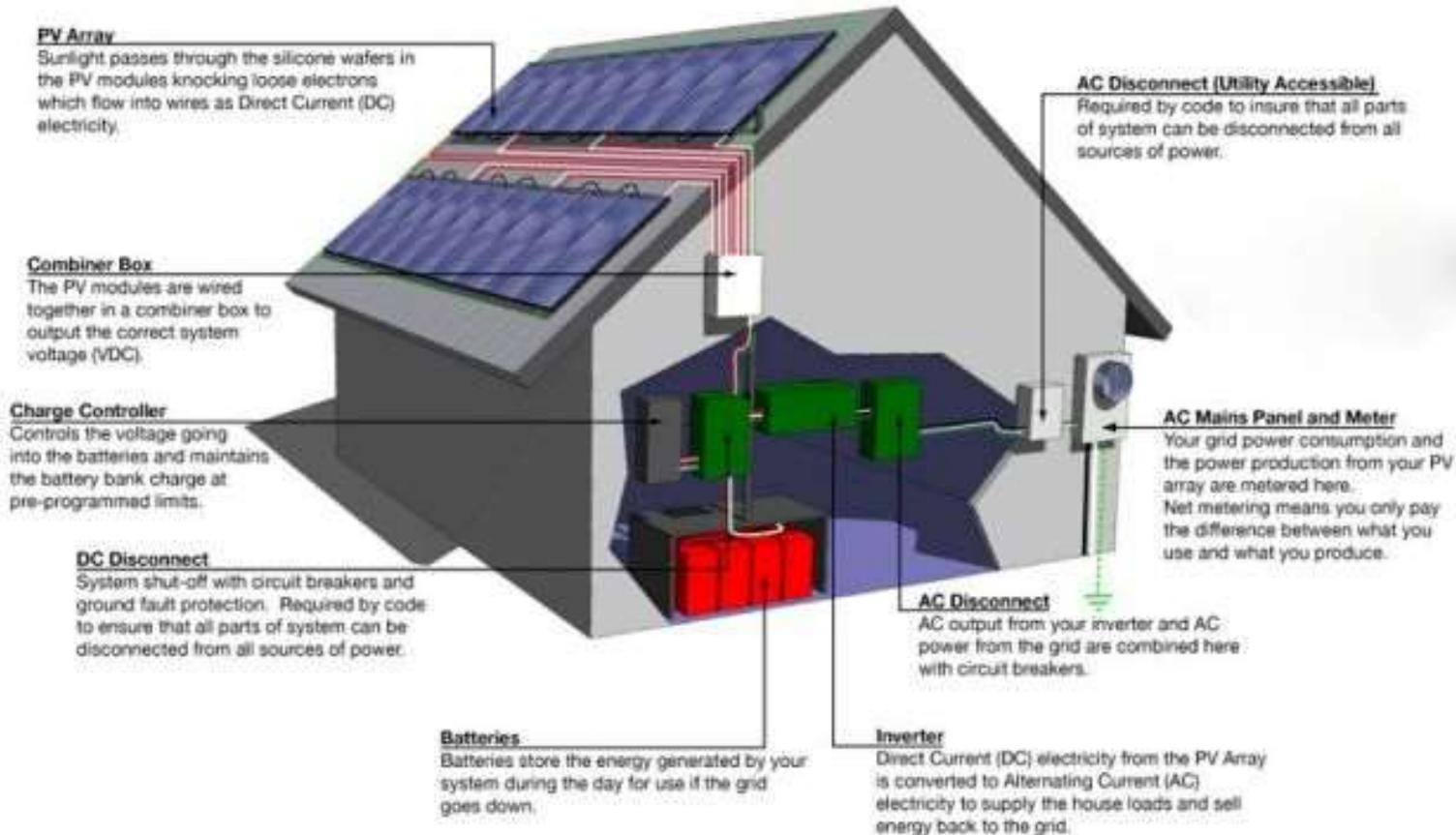
Lead acid batteries can be quite large and heavy, space will be needed around and above for maintenance.

Wall space will be needed for all the 'magic' boxes – the charge controllers, inverter, disconnect(s), etc.

If planning using Tesla battery(s), one weighs 276 lbs. a sound wall will be needed to support it.

Grid tied battery backup:

Still connected to the grid, using battery and solar energy to supply almost all your electrical needs. Your meter may spin backwards during peak hours of sun, this is called net metering. When the grid fails you will have some power, but will have to run a generator to top up your battery supply as needed (cloudy day etc.)



Grid-Tie System with Battery Back-Up

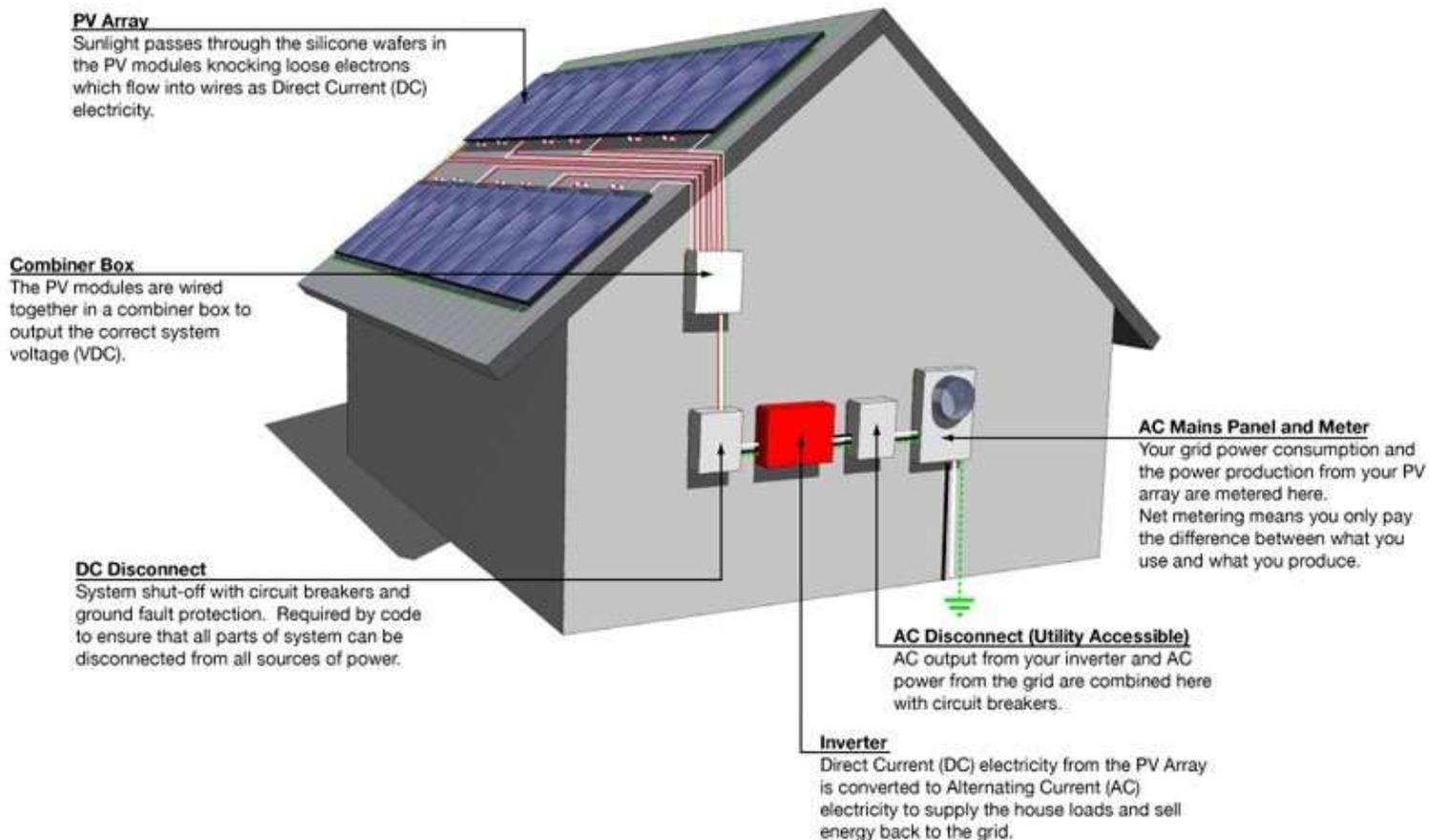
WAPA and net metering:

There is no more capacity for net metering in the Virgin Islands. Grid tied battery back-up systems being installed now do not have net metering are sized with the capacity to charge the batteries and power the home during peak sunlight hours. Then using a combination of grid and battery power to supply the home with power during the night, or cloudy days. This will cut your electrical bill significantly, but not eliminate it or generate a credit with WAPA as happened in the past.

Configuring the system size will be a fine balance of your power usage, and solar input.

Grid tied:

Solar cells provide power to the home during daylight hours, you may not need to pull any power from the grid. However, during the night you will use grid power. When the grid fails you will not have any electrical power.



Reducing your energy needs:

Reducing energy use in your home saves you money, increases our energy security, and reduces the pollution that is emitted from non-renewable sources of energy. If you are planning to install a small renewable energy system to make your own electricity, such as a solar electric system or small wind turbine, reducing your electricity loads is the first step—saving you money by allowing you to purchase a smaller system.

There are many ways you can reduce electricity use in your home:

- Appliances and electronics -- Purchase energy-efficient products and operate them efficiently. Use an advanced power strip to reduce "vampire loads"--electricity that is wasted when electronics are not in use.
- Lighting -- Purchase energy-efficient products, operate them efficiently, and incorporate more daylighting into your home using energy-efficient windows and skylights.
- Electric space cooling -- Purchase energy-efficient electric systems and operate them efficiently. Incorporate passive cooling design concepts into your home, which include using energy-efficient windows.
- Electric water heating -- Purchase an energy-efficient electric water heater and operate it efficiently. Or select an energy-efficient water heater that doesn't use electricity.

More on reducing your energy needs in another newsletter.