



solar...



by **John Michel**
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basking in the benefits

For centuries man has tried to harness the sun's energy. In fact, the first solar cell was created well over a hundred years ago. Albert Einstein won a Nobel Prize for his theories explaining the photoelectric effect in the early 1900's. You may wonder why, with so much history behind it, we all don't have solar panels on our roofs. As with all technology, time and research have changed solar collectors from large pieces suitable only for commercial applications into smaller, more compact and efficient panels that are more practical for the average homeowner and small business. Even with that, it wasn't until recently that the word *affordable* could be used in the same sentence.

Solar energy is the cleanest, most cost-effective energy source in the world.

HOW DOES IT WORK?

The basis of a Solar PV System is the Solar Cell, which is made up of semiconductor materials. These materials absorb sunlight and, through a phenomenon called "photoelectric effect", travel through a circuit built into the PV cell to form electrical current. Although the output of a single PV cell is small, many cells are interconnected to form solar panels or modules to produce a more significant amount of energy. If even more power is needed, solar panels can be connected to form PV arrays. The electric current is then transferred to your home by way of an inverter and used to handle your home's electricity needs.

WHY SOLAR?

Solar energy is the cleanest, most cost-effective energy source in the world. It produces no air pollution or hazardous waste. The energy source, sunlight, is free and readily available.

Today's systems are known as *Solar Photovoltaic Systems* or *Solar PV* for short. These systems use solar panels to convert sunlight into electricity which can be used in the home or business.

Even if you have an all-electric home, the electricity you purchase from a utility is usually being generated using fossil or nuclear fuels. Using solar PV systems to power our buildings can cut down on the amount of fossil fuels extracted from the earth and our reliance on foreign fuels. The impact to the environment is significant.

WHY SOLAR IS IMPORTANT TO YOU

Solar PV systems are highly reliable. Almost every satellite that circles the earth is powered by PV because of its reliability and very low maintenance requirement. What happens when the power goes out with traditional systems? No electricity means no TV, radio, stove, microwave. And what does it mean for a business? Lost production time and impact to the bottom line. PV systems don't rely on "the grid" for power. Even on the cloudiest days, a PV system will still generate at least 25 percent of its maximum output.

Costs are up front. With very little maintenance and no cost for the fuel, installing the system in the first place is where it

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Serving the Central Pennsylvania region, Haller Enterprises, Inc. provides a full range of plumbing, heating, cooling, electrical and water conditioning services for residential, commercial and remodeling projects. Haller's commitment to fast, reliable service over the years has contributed to the company's growth and high levels of customer satisfaction.

Renewable energy solutions are nothing new to Haller Enterprises, who has been installing geothermal systems for decades. With solar products gaining ground in the market, Haller is ready for your call with a well-rounded group of solutions for all your renewable energy needs.

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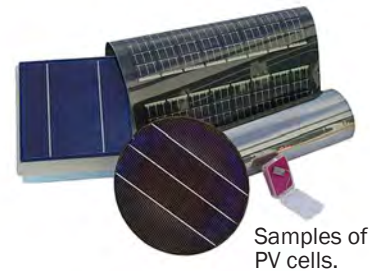




A well-designed PV system needs clear and unobstructed access to the sun's rays for most or all of the day, throughout the year. Usually, the best location for a PV system in the U.S. is a south-facing roof.



Electronic circuit fabricated on a flexible plastic substrate.



Samples of PV cells.



Did you know?

Federal Tax credits are currently available for 30% of the cost of your solar equipment plus installation.

hits your wallet. Costs have reduced significantly over the last 20 years as technology improves and systems become smaller.

PV has virtually no environmental impact. If you're looking to go green, this is one of the best ways to do it. PV systems are quiet and clean. Not only are you cutting down on the amount of atmospheric emissions that you produce, you are decreasing the amount that needs to be produced on your behalf.

Energy savings is a strong motivator. The primary savings achieved with Solar PV is a significant savings on your monthly utility bills. The location of your home and number of cells has an impact on the amount of energy produced. If your system is tied into the "grid", you may actually end up selling power back to the utility. If you include a battery system for storage, complete independence may be achieved.

Rebates and incentives. Now back to the word *affordable*. As with most technologies, the benefits may be great but if the average person can't afford to purchase it, implementation will be slow. There are now several rebate and incentive programs that are bringing PV systems to an affordable level.

- Federal Tax credits are available for 30% of the cost of the equipment plus installation through 2016.
- The *PA Sunshine Solar Program* is offering rebates up to 35% of the project cost for homeowners implementing Solar PV and up to \$2,000 for Solar Thermal systems. Rebates for small businesses are also available. Rebates will continue until the funding has been depleted.
- Utility Rebates—PPL Electric Utilities offers a residential rebate up to \$5,000 based on the number of watts. (May not be used in conjunction with *PA Sunshine Solar Program*.)

- *Keystone HELP Energy Efficiency Loan Program* provides loans with low monthly payments for Solar PV and Solar Thermal installations.
- Net-Metering—When your system generates more power than you need, the excess can go into the utility grid and you may receive retail value from the utility company.
- Alternative Energy Credits—As energy is produced by the PV system, alternative energy credits can be earned and sold on the open market. AEC values vary and are earned for every 1,000 kWh generated.

As you evaluate and improve your home's overall energy efficiency, consider looking into solar power. Do a



little homework and ask a lot of questions. Haller Enterprises can help walk you through the process. If you determine that solar power is right for you,

today's rebates and incentives make it the best time to buy.

R&A

Go Green Save Money

Enjoy a comfortable home and save money, too!
Install an **Energy-Efficient or Renewable Energy System**
and reap the benefits of
Federal Tax Credits*, Utility Rebates* and Lower Utility Bills.



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