



The ABCs of Solar Energy

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In 1447, Leonardo DaVinci predicted a solar industrialization. Today, industry experts estimate that nearly 100,000 systems have been installed in the USA in the past ten years alone. Although it has taken over 500 years, DaVinci's green revolution is clearly sprouting.

To harness the sun's energy, photovoltaic modules convert sunlight into electrical energy. The main components of a solar power system are the module, inverter and wiring. With this system in place, direct current (DC) power can travel through an inverter and become alternating current (AC) power, a form which can be used in most homes and buildings.

Conventional silicon cell photovoltaic panels have a useful life of over 20 years and require little maintenance (installed on an angle, panels are naturally washed by rainfall). These "box type" panels require a rigid structure in order to be mounted and often account for over 50% of the total cost of an installed solar energy system. Another technology is thin film, which is less expensive and easier to install because it has almost no weight and can be adhered directly to the roof. Although thin film is far less efficient than conventional photovoltaic modules, the key to selecting a photovoltaic system is its return on investment.

At peak, solar modules can produce up to 20 watts per square foot. In the Northern hemisphere, panels should face south for optimal sun exposure. In addition to creating useable energy, photovoltaic panels lower utility bills by adding supplemental insulation. To top it off, solar paneling extends the useful life of the roofing by shielding it from ultraviolet lighting. While solar power reduces energy costs dramatically, it generally does not eliminate electric bills altogether. In some cases, when the electrical load in a building is minimized (during the work day and evening), it is possible that the electrical meter will run backwards. When this happens, the utility company pays the panel owner for the power generated on their home or building.

With the rebates and tax credits currently offered by local utility companies as well as state and federal governments, the return on investment period for solar paneling can be as short as five years. There are Solar Renewable Energy Credits (SRECs) as well as a 30% federal income tax credit available to homeowners who retrofit existing buildings with renewable energy equipment. Other rebates and incentives are available through local utility companies and individual state programs, such as the NJ Pay For Performance Program.

Once the original solar investment has been paid off, all continued energy cost savings are directed towards pure profit. While some invest in solar power to save money, others hope to cut their carbon footprint. Whatever the intention, green is the new black and DaVinci's solar industrialization prediction is finally becoming a reality.