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# SOLAR ENERGY GUIDE

*Detailed Information on  
Solar Water Heating and  
Photovoltaic (PV) Systems*

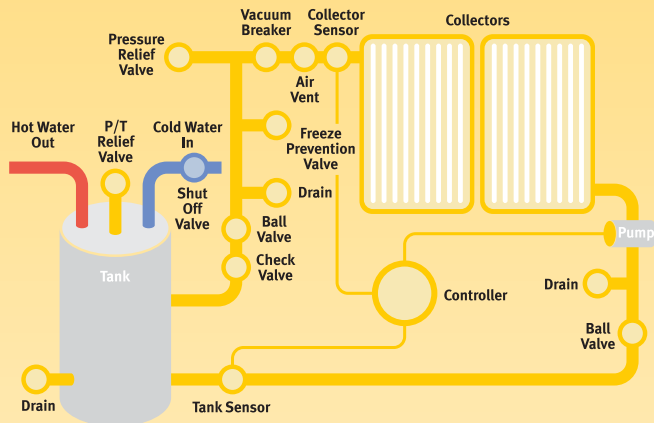


[ReliablyGreen.OUC.com](http://ReliablyGreen.OUC.com)



# Solar Water Heating Systems

Today's solar heaters, or solar thermal systems, provide environmentally friendly heat for water and swimming pools in residential, commercial and industrial applications.



The solar systems collect the sun's energy to heat air or a fluid. Two commonly used systems include active and passive systems. Active solar water heaters use pumps to circulate water or another fluid from the storage tanks through the collectors. Passive solar water heaters require no pumps or controls and combine the storage tank and collector in one unit.

The use of a solar energy system will benefit you by lowering your electric bills, insulating you from rising energy costs, providing you with tax credits and cash rebates, reducing fuel consumption and investing in renewable energy. When installed properly, solar water heaters are more economical over the life of the system than heating water with electricity, dedicated heat pumps, heat recovery units, natural gas or propane. Many systems include sleek, attractive, low-relief collectors that people often mistake for skylights. Properly designed and installed systems with glass-covered collectors should perform well for more than 20 years.

## SOLAR HOT WATER

- A** \$250 up-front credit for production meter installation.
- B** Production credit of \$0.03/kWh on your monthly bill.\*
- C** Low interest loan through the Orlando Federal Credit Union for residential customers only.

Rate (APR)	Term (months)
<b>0.00%</b>	<b>36</b>
<b>2.75%</b>	<b>60</b>
<b>4.00%</b>	<b>84</b>

\* The average 40 sq. ft. solar thermal system in Central Florida produces 2,700 kWh per year. Source: [pwatt.com](http://pwatt.com)

## IN YOUR HOME



Solar water heaters, sometimes called solar domestic hot-water systems, can be a good investment for your home. The average system takes up just 40 square feet of roof space and should save between 50 percent and 85 percent of the hot water portion of the monthly utility bill. Today's solar water heating systems are cost competitive when you consider your total energy costs over the entire life of the system. Most residential solar thermal systems cost between \$4,000 and \$5,000. An average 40-square-foot collector should be able to offset 10 percent to 15 percent of the energy for homes that consume about 2,000 kilowatt hours a month.

## IN YOUR BUSINESS

Commercial solar water heating systems can range in size from conventional sized systems that heat water for offices to systems designed for large industrial applications. Businesses should base solar decisions on life-cycle costs analyses, which include the cost of operating and maintaining a system throughout the anticipated service life. This is important since solar technologies can be expensive to purchase. However, they require minimal maintenance, no fuel and produce no emissions, which makes them a good long-term investment.

### SOLAR HOT WATER SYSTEM EXAMPLE <sup>1</sup>

Average Solar Hot Water System  
Cost \$4,000-\$5,000 - 40 sq. ft. collector

<b>Initial System cost</b> (40 sq. ft. collector)	<b>\$ 4,500</b>
<b>Federal Tax Credit</b> (30%) <sup>2</sup>	<b>\$ 1,350</b>
	<b>\$ 3,150</b>
<b>Est. Avg. Annual Solar Production</b>	<b>2,700/kWh</b>
<b>Solar Thermal Production Credit</b> <sup>3</sup>	<b>0.03/kWh</b>
<b>Electric Savings</b> <sup>4</sup>	<b>\$ 0.14/kWh</b>
<b>Total Savings</b>	<b>\$ 0.17/kWh</b>

### Annual Savings

$$2,700 \text{ kWh} \times (\$0.03 + \$0.14) = \$459$$

(credits) (energy savings)

<sup>1</sup> Annual savings examples are based on solar installations for residential customers.

<sup>2</sup> Availability of state rebates and federal tax credits should be verified prior to installation of a solar system.

<sup>3</sup> Production credits and electric rates are filed with the Florida Public Service Commission and are subject to change.

<sup>4</sup> Average estimated electric savings are based on avoided electric use that would have been above 1,000 kWh per month, including tax.

# Solar Photovoltaic Systems

Photovoltaics (PV) are arrays of solar cells that convert light into electricity. Producing electricity with PV emits no pollution, produces no greenhouse gases and uses no finite fossil-fuel resources.



Electricity produced from a PV system is measured in watts, while the amount of electricity produced over time by a PV system is measured in kilowatt hours.

Solar photovoltaic technologies have declined in price since they were

first introduced onto the market, driven by improved research and development, and most of all by steady increases in sales volume. Most home and business owners start small, since PV can be added in modular increments as your energy needs and investment capabilities grow. **It is important to focus on reducing your overall energy use through energy efficiency and solar water heating prior to sizing a solar PV system for your home or business.**

PV arrays can be mounted at a fixed angle facing south in an unshaded region of the roof or on a tracking device that follows the sun, allowing them to capture the most sunlight over the course of a day. Integrated PV cells are now available in a variety of shapes and sizes including triangular shaped panels as well as small roofing tiles.

## IN YOUR HOME



A one-kilowatt PV system will produce about 1,350 kilowatt hours (kWh) per year and has an expected lifetime of 30 years, giving a total production of 40,500 kWh.

To calculate a simple payback on your PV system, divide the total installed cost of your system by the monetary value of the energy produced from your system each year. Maintenance for a PV system also should be considered in your payback calculations and generally averages about one percent of the total system cost. For a typical Florida home, a 4,000 watt or a 4.0 kilowatt PV system should be able to offset around 22 percent of the energy for homes that consume about 2,000 kWh a month.

## IN YOUR BUSINESS

Businesses should base solar decisions on life-cycle costs analyses, which include the cost of operating and maintaining a system throughout the anticipated service life. This is important since solar technologies can be expensive to purchase. However, they require minimal maintenance and no fuel and produce no emissions, which make them a good long-term investment. A 4,000 square foot office building might require around 10,000 watts of PV to meet its daily energy needs.

## SOLAR ELECTRIC (PV)

- A** Net metering.
- B** Production credit of \$0.05/kWh on your monthly bill.\*
- C** Low interest loan through the Orlando Federal Credit Union for residential customers only.

Rate (APR)	Term (months)
2.00%	36
4.00%	60
4.75%	84
5.50%	120

\* The average 1 kilowatt PV system in Central Florida produces 1,350 kWh per year. Source: [pwwatt.com](http://pwwatt.com)

## PV SYSTEM EXAMPLE <sup>1</sup>

Average PV System Cost \$7-\$9/Watt

<b>Initial System Cost</b> (4 KW)	<b>\$ 32,000</b>
<b>Federal Tax Credit</b> (30%) <sup>2</sup>	<b>\$ 9,600</b>
<b>Net System Cost</b>	<b>\$ 22,400</b>
<b>Est. Avg. Annual Solar Production</b>	<b>5,400 KWH</b>
<b>Solar PV Production Credit</b> <sup>3</sup>	<b>\$ 0.05/KWH</b>
<b>Electric Savings</b> <sup>4</sup>	<b>\$ 0.14/KWH</b>
<b>Total Savings</b>	<b>\$ 0.19/KWH</b>

### Annual Savings

$$5,400 \text{ KWH} \times (\underset{\text{(credits)}}{\$0.05} + \underset{\text{(energy savings)}}{\$0.14}) = \mathbf{\$1,026}$$

<sup>1</sup> Annual savings examples are based on solar installations for residential customers.

<sup>2</sup> Availability of state rebates and federal tax credits should be verified prior to installation of a solar system.

<sup>3</sup> Production credits and electric rates are filed with the Florida Public Service Commission and are subject to change.

<sup>4</sup> Average estimated electric savings are based on avoided electric use that would have been above 1,000 kWh per month, including tax.

# How Does the Solar Program Work?

OUC's program is based on a production incentive (and net metering for PV systems). That means that a meter needs to be attached with your solar system so that it can measure the energy output. OUC then reads the meter every month and pays you per kilowatt hour generated. For PV, it's \$0.05 per kWh and for thermal it's \$0.03 per kWh. With a PV system, you generate your own electricity. Any excess electricity is purchased by OUC. Residential customers also can take advantage of low interest loans through the Orlando Federal Credit Union.

## Ready to Begin? Follow these 10 Steps for a Successful Solar Installation with OUC:

1. Download the Solar Information Packet at **ReliablyGreen.OUC.com** or request a Solar Information Packet by calling Residential Customer Service at **407.423.9018** (Orlando) and **407.957.7373** (St. Cloud).
2. Submit a request through OUC's Preferred Contractor Network (**www.ouc.com**) to obtain a site survey.
  - Ideally your roof should not require replacement within the next 8-10 years. Installations should be unshaded between 9 a.m. and 3 p.m. and face South or West.
  - Solar PV systems require 80-100 square feet of space per Kilowatt
  - Solar hot water systems require between 40 and 80 square feet of space depending on the amount of hot water usage
3. Obtain quotes from OUC's list of preferred contractors that are licensed to install solar systems in the State of Florida. Your quote should include parts, labor and any applicable rebates.
4. If you need financing, contact our banking partner, Orlando Federal Credit Union (OFCU) at 407.835.3500 option 1 for pre-approval for a zero or low interest loan for your residential solar system.
5. Fax, email or mail your solar system quote, and the completed Solar Service Agreement to OUC. If PV, please also attach an interconnection agreement and a 1-line-diagram and send it to:  
**OUC Conservation & Renewables**  
**100 West Anderson Street**  
**Orlando, Florida 32801**  
**tel: 407.236.9603/fax: 407.244.8762**  
**green@ouc.com**
6. Receive authorization from OUC to proceed with your installation if financing with the Orlando Federal Credit Union Loan. (Usually sent within 5 days of receipt of your quote).
7. Obtain any required permits for your solar installation from your local code jurisdiction.
8. For thermal, have your contractor pick up and install the BTU meter with your system. For PV, make sure your contractor installs a steel electric meter base.
9. Once your system has been installed, schedule your system inspection by calling or emailing the OUC Renewables Department. Thermal inspections and PV inspections are done separately. OUC will set the appropriate metering at the site once the PV system passes inspection.
10. If applicable, close on your solar loan through OFCU and payment will be made directly to the contractor. Start earning your solar production credit each month on your OUC bill!



Orlando Utilities Commission • 100 West Anderson Street • Orlando, FL 32801  
Tel: 407.423.9100 • Fax: 407.236.9616 • [www.ouc.com](http://www.ouc.com)

## OUC Preferred Contractor Network

OUC connects customers needing the assistance of home repair and service professionals with the members of our Preferred Contractor Network. The OUC Preferred Contractor Network features contact data for contractors categorized by specialty. Our program includes standards of conduct, a Code of Ethics and a customer feedback mechanism. It doesn't matter if your need is big or small, something you need today or something you're just thinking about. The home repair and service professionals of the OUC Preferred Contractor Network are just a click away. Visit **www.ouc.com** for more information.



## Want to Learn More?

**ReliablyGreen.OUC.com** contains great information on how to become green and save money. You can learn how we make our mark and what you can do to make yours. There are also guides on available credits, rebates and incentives. Be sure to visit the Event Guide to learn about upcoming Green events that OUC is involved with, and read our Daily Conservation Tip to learn things you might not have known. All of this and more is available at **ReliablyGreen.OUC.com**.

