Solar Thermal vs. Solar PV

You might say that solar power, one likely guide to our energy independence, is a two-headed creature. Solar Thermal and Solar PV both spend their fair share of time in the spotlight. But which one is better?

Based on the numbers, Solar Thermal technology is the easy winner.

Efficiency is much higher for a Solar Thermal System. You can use up to 94% of the sun's energy with a Solar Thermal collector. Whereas, using a PV collector, sunlight-to-electricity conversion rates at an average of only about 12% only. You can also look at it in terms of area. It is a rule of thumb that, at any given (sunny) time, the energy available from the sun is about 1kW per square meter. This is equivalent to 3400 BTU/hr/square meter. Therefore, if you can get 90% efficiency using a Solar Thermal collector, you would only need approximately 52 square meters to generate 100,000 BTU/hr, or the amount of heat generated by a typical gas furnace.

Why aren't we finding Solar Thermal projects everywhere? For one, heat is difficult to store without a thermal mass. Passive solar homes will likely incorporate thermal mass walls (i.e., concrete or other masonry) to store collected heat. Yet this can only be achieved via a passive solar design, starting at the home's conception. As you can imagine, it is difficult to add thermal walls and other passive solar collectors to an existing home. Therefore, when retrofitting a solar thermal system, you will have to use an active system, which uses a transfer fluid and a large water storage tank. Also, in the United States we are trained to think in terms of electricity only. Now that natural gas and electricity prices are rising at accelerated rates we are forced to look how the European and Asian markets have solved this problem for the last 40 years. In fact, the state of Hawaii is now mandating that all new commercial construction incorporates Solar Thermal. Over 98% of Israel uses Solar Thermal to heat its domestic hot water.

Another big advantage for solar thermal is that it is usable year round. A solar thermal space heating system will continue to heat your domestic hot water needs as well as also cool your building using an absorption chiller during the long summer months. The system would be at its most efficient just when you need it most.

Your average return on a Solar Thermal System will be within 3 to 8 years. With Solar PV you can expect a return of somewhere between 35 to 40 years. With Solar PV you can expect to take out about 1% to 2% of your energy spend. With Solar Thermal technology you can expect to take out somewhere between 20% to 80% depending on how the system is designed.

The Lowdown on Solar Thermal Savings

A Solar Thermal System will certainly save you money, but the amount of money saved is dependent on several factors. These include how your Solar Thermal System will be used, the size and type of system, local climate, and the system rating**.** As always, be sure to explore state and federal rebates and tax incentives for a Solar Thermal installation. These ever-increasing

incentives can cut your initial costs significantly and have you saving money quickly. Keep in mind that a Solar Thermal System can feasibly replace up to 80% of your energy needs for heating and cooling. If you are building new, you can include a Solar Thermal System in your mortgage and save additional money by scaling down the traditional hvac system that you would have to have in place for backup.

Solar Thermal Maintenance Leaves Little to Worry About

One of the many beneficial aspects of solar thermal systems is that they are relatively maintenance free. It is often hard to believe, but it is nonetheless true. This has made Solar Thermal Systems the most cost effective choice in residential, and commercial, solar energy systems. This is not to say that you can throw a system in your backyard and just forget about it (which would be hard to do anyway, as your utility bills continue to decline). There are some maintenance suggestions that should be kept in mind.

If you live in an area with yearly snowfall you will have to clean off the PV solar panels to get them to generate. But with Solar Thermal we use 94% of the sun's energy. The sun will melt snow off the glass fairly quickly, even if only a small portion of the glass is exposed to direct light. Additionally, many panels are set at angles of around 40 degrees and sometimes higher. Snow has a hard time accumulating on such steeply sloped collectors.

Solar thermal systems are advantageous because of their longevity and negligible maintenance requirements. As long as a system is installed properly, by a qualified solar thermal contractor, then you have very little to worry about. If you just want to play it safe, many solar thermal installers will schedule regular maintenance check-ups in order to keep everything in top working order. Even these visits will be sparse, perhaps every few years.

If you have any questions, we recommend you go to The Rabco Energy Solutions website: www.rabcosolutions.com or call them at 636-536-0386.