



Solar Water Heating in Nevada County

Interest in solar water heating systems has been “heating up” lately. Given the “potential benefits” to a home or business, it’s not hard to see why. Let’s take a look at these systems in a little more detail and learn why the phrase “potential benefits” was intentionally placed in quotes in the previous sentence.....

First, I always caution people not to take information they find on the internet at face value. Why? The internet is “world wide” and, in the case of solar water heating, it can get well below freezing at times here in Nevada County – it’s a much different climate than Pasadena, San Diego, or even the Central Valley! So, proper system selection and installation is crucial if you don’t want your system to fail under a hard freeze.

The price of a solar water heater that doesn’t require any form of freeze protection is much lower than those that do. Take, for example, an experience I had with a local customer that contacted Real Goods Trading Company in Colorado about the cost of solar. They recommended a \$1,800 unit to my customer. This looked like a much better deal when compared to my \$7,500 installation bid, so my potential customer made a point of calling me to tell me “your prices are WAY out of line!”

Of course the salesman didn’t happen to mention to my customer that the unit is not recommended for our climate. And my customer apparently didn’t realize there would be additional costs involved - like tax, shipping, structural calculations, permits, mounting jacks for the collector, roof flashings for the piping penetrations, interconnecting piping, high temperature pipe insulation, service valves, thermometers, an anti-scald valve, and several trips to the home with two workers before the system would actually save him any money. We actually need four people when it’s time to hoist the collector up onto the roof and set it on the roof jacks.

Of course my customer had no experience with solar water heating systems and has never installed a system so I guess I shouldn’t have been surprised. I’ve been working with this technology in depth for almost 30 years now so I realize it’s up to me to educate folks on the “finer points” of solar water heating. There have also been well-intentioned articles about solar water heating. One just last week in The Union said the price ranges from \$3,000 to \$6,000; based on a quick survey of several local suppliers (for a freeze-protected system suitable for an average Nevada County family) this price range covers just the cost of the equipment alone.

I’ve evaluated the energy & economics of different system types, worked in research and development of advanced systems, monitored the performance of systems, served on the board of the National Solar

Rating and Certification Corporation in Washington D.C. (also Chairing the Standards Committee), dealt with the nuts and bolts of installation, and repaired or serviced a wide variety of system types locally. These experiences have taught me that the “cheapest” alternative initially is typically the “most expensive” alternative over time. Planned obsolescence may be an integral part of the manufacturing of many goods in our world but it’s something we in the business of sustainability avoid like the plague.

Starting back in the early eighties I learned a lot about what works and what doesn’t. It was during those tax credit days that I witnessed a wide range of different types of systems being installed locally, most of which soon (or have since) failed beyond repair. To be fair, many were repaired but at very high cost because the collectors froze. Over the last four years we’ve been called upon to remove a number of collectors from roofs because the roofs needed to be redone and, because the customer’s solar storage tank had long since failed, they didn’t think it would be worthwhile to install a new one.

Next to freezing, which destroys the collector, most solar storage tanks last an average of about 13 years. That’s why most of the tanks we install are made of polypropylene (like the High Sierra tank made locally by Morley Manufacturing carrying a lifetime warranty) or stainless steel. They cost a little bit more than the glass-lined steel tanks found in cheap solar units but the savings in maintenance and replacement costs down the road make them cheaper in the long run.

We prefer to use the “drain back” style systems because the water drains from the collector back into the tank when the system isn’t collecting solar energy, assuring the collector won’t freeze (and the solar energy collected is well insulated from overnight heat loss). In cases where there isn’t room for the drain back tank we might use an antifreeze-based system. We prefer not to use antifreeze for a variety of reasons, not the least of which is that – like the antifreeze in your car – it needs to be flushed and changed periodically. We’ve seen what happens when it isn’t – it turns very acidic, seals fail and some systems, like the Solarhart, will quickly and completely fail and need to be replaced. These are maintenance costs we’d prefer to avoid for the homeowner. Although I suppose it does help the service side of our economy.

It’s also important that systems be properly installed as well. We’ve seen collectors mounted on wood “sleepers” on roofs - bad idea. A recent “find” wasn’t from the 1980’s, it was installed in the last year and by one of the best known local contractors! There was a roof fire that started under a collector that had leaves and pine needles trapped underneath back in the 1980’s – apparently this contractor wasn’t around at that time! Most systems we’ve serviced also have no temperature gauges or flow meters, making it difficult to tell if (or how well) the system is working. A few more dollars were also saved on these systems by not installing pipe unions or service valves, making the inevitable service call a lot more expensive. Many systems we’ve seen have standard domestic hot water pipe insulation on the solar piping which, over time, melted and sagged right off the pipe. So, when it’s time to get bids on a solar water heating system, be aware of the fact that the lowest bidder might be cutting some important corners (and maybe running a few stop signs too)!

Lastly, the actual savings provided by systems isn’t always properly represented by the solar energy factors (SEF’s) the systems are rated by, as evidenced by many side-by-side tests including my own. That’s why experience with the different system types in different climates is crucial if you want to get the most savings from your solar investment.

The economic benefits (example - over 30% return on investment when using propane backup) and

more on solar water heating has been covered in previous articles I've written for the Home Seller Showcase. Past articles related to this subject are archived here for your benefit – <http://www.TheEnergyGuy.com/Articles.html> - and include:

08-16-08 – Tax Incentives for Efficiency and Solar
07-05-08 - Benefits of Solar Water Heating
06-14-08 - Smart Choices to Reduce Energy Costs
04-19-08 - Solar Water Heating Choices
02-23-08 - The Resurrection of Solar Water Heating

Ray Darby is President of Sustainable Energy Group Inc., a Grass Valley company offering energy efficiency and solar services for residential and commercial buildings, from comparing the alternatives through installation and servicing of energy systems of all types. You can reach him at 530-273-4422, via email RayDarby@SustainableEnergyGroup.com, or visit their web site at www.SustainableEnergyGroup.com.

