Chris & Brenda's Solar Water Heating System

May 15 2014 update

Having now run our system for a few weeks, I thought I would provide an update and some observations. You may have noted in the early graphs some substantial short-cycling. With Gary's assistance, we have now settled that problem down. Here are some comments:

- The polycarbonate ¾" sight tube did not work out very well, as I could not seem to get rid of a small drippy leak at the compression fittings. That has been replaced with clear vinyl tubing from Lowes and is working very well
- Tank high limit has been increased to 155 degrees. I think we could easily go higher, but I would rather not subject the EPDM to higher sustained temperatures and as is my hunch is that the system is so far providing nearly 100% of our hot water use.
- Flow rate has been reduced to 2 gpm to help alleviate the short cycling
- We had a problem with the Cat5e wire I used to run the collector temperature sensor. Turns out it was copper clad aluminium conductors and resulted in unstable collector sensor readings. Replacing the cable with 24 ga shielded audio cable seems to have eliminated that problem.
- Overnight heat loss from the tank is about 3 degrees if no hot water is used and 10 degrees with heavy evening/morning hot water use.
- Most days we have good sun, the system recovers to tank high limit by between noon and 1:00.
- At least as far as summer is concerned, 80 ft^2 of collector seems too much, but that may turn out to be a good thing in winter. Time will tell.
- I need to install a cross-over valve at the electric hot water heater so that I can take it out of the system completely to see if the solar can provide 100% of daily demand.
- I switched from using MSExcel to using DatPlot to plot data so that I could easily pan and zoom the plots.

Plot for May 11, 2014