

Understand your Inverter

Your inverter is continually showing information during the daylight hours. Here are examples of the things you may see and what they mean (most useful are in bold):

“**E-today 3.86kWh**” - Energy generated at this point in time today in kilowatt hours.

“Mode MPP” – **Maximum Photovoltaic Power** the standard mode for our inverters.

“Gridtype - 208V” – nominal voltage of the electric line to the grid.

“L1 120V L2 120V” – voltage of the array (e.g., 2 strings of panels, each line 120 V).

“**Pac 3200W**” (3.2 kW) – **Power AC** The power your system is supplying to the grid at this point in time. **PAC IS THE MOST IMPORTANT SPOT READING YOU GET FROM THE INVERTER FOR MONITORING PURPOSES.** (See below.)

“Vpv 380V” – the maximum voltage of your system.

“**E-total 724.4kWh**” – the amount your system has produced since it was activated.

Also important for monitoring your electricity bills.

“h-total 512h” – the number of daylight hours your system has logged.

One other readout may be: CO2 saved (i.e., not produced) This "feel good" measure is based on an industry-agreed standard for fossil fuel production of electricity.

Checking System Efficiency

System efficiency depends on a lot of things both physical (clouds, temperature, snow, etc.) and technical (panel/film quality and tilt, wiring quality and length (distance from roof to inverter to meter, inverter quality, etc.) No installer will give you a benchmark for measuring the efficiency of your system. There are too many variables.

Panels have a higher efficiency than thin film generally speaking, but need to be angled to the south at around 30° for maximum efficiency. Thin film doesn't depend as much on the angle, but thin film on a roof that tilts to the south might produce more than on one that slants north. Summer heat may affect thin film less than panels. The following wikipedia page has a chart, somewhat dated, that will give you an idea of the range of efficiencies within and among various solar cell forms if you are really interested.
http://en.wikipedia.org/wiki/Solar_cell#Record_efficiencies

You can use the calculator at www.pvwatts.org to get a general idea of what to expect in terms of production for our location and your individual system size. Whatever the details of your installation might be, you are the person who is best knows when you and your roof are having a good solar day.

Here's how to check your system:

On a bright sunny day, sometime between 11:00 a.m. and 2:00 p.m., write down your inverter PAC reading. Then, divide that PAC by your system size.

Example: Your PAC reading at 12:15 next Sunday is 1835 (1.835 Kw) and your system size is 2.6 Kw Your system's efficiency at that point in time is $1.835/2.6 = 70.5\%$

That's pretty good. Anything above 60% would generally be considered acceptable for fixed panels. Be aware however, that some of your neighbors have had readings of over 80%. If yours runs 50% or below over a few samplings, you probably need to have your installer take a look at it. A squirrel may have knocked a connection loose, the snow may have shorted something out, or something else is not working right.

Thin film systems might have slightly lower parameters. We don't have enough detailed reporting or experience from thin film system owners at this point. If a few thin film users could send us this kind of info for their systems, it would be very helpful for the other members of the cooperative in the long run.

Monitoring your Electric Bill

According to Pepco, their metering technology does not have the capacity to log the production of individual PV systems. You may be able to see your meter numbers go down if you check the meter every few hours on a sunny day, but the only time you will see some impact is when you get your bill from Pepco.

If you know what your Pepco billing cycle dates are each month, you can start looking at your inverter on that date each month and writing down the "E-Total" figure. From month to month, you can compare the post-installation energy usage with the previous year's usage history for that month. There should be a rough correlation between the energy you have produced during any given month, and the difference between this year's usage and last year's usage for that same month. As is the case with monitoring the efficiency of your system, monitoring the effect of your system on your electricity bill is not an exact science. If you're not satisfied with the effect of your system production on you bill, check with coop members to determine if you need to take any additional steps with Pepco.