

*Notes to help use & understand*

# Sunny Money

## Understanding the Values You Input *(top section of Sunny Money)*

**My annual electricity usage (kWh):** use an estimate of your future needs or actual past usage. You can find past annual usage on your electricity bill (paper or online) or get it from utility company.

**Your Expected Price of Electricity (\$/kWh):** enter your best guess for where you think electricity prices may be headed. Try different sets of electricity prices to get a sense of how they matter. For example, how much do electricity prices need to go up for solar to look like a good deal to you? Here's a source you may find helpful: [http://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.cfm?t=epmt\\_5\\_6\\_a](http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a) (Your bill includes some fixed costs that won't go away with solar, so you may want to lower the price you find here by a cent or two per kWh.)

**Percent of my electricity I'd like to get from solar:** use any value you desire, but Sunny Money isn't designed to handle values above 100% (not generally advised for residential scale systems)

**Financing Terms** *(Complete section ONLY if you plan to finance):* If you plan to finance any of the cost of your system, complete this section. Be sure the data you enter in this section includes all costs. Closing costs and related fees should be included as part of "initial payment." Do NOT consider the Federal Tax Credit in this section. It will be calculated and automatically deducted for all systems. (Sunny Money is designed for residential installations in PA)

**For new system I expect to pay (\$/installed Watt):** use actual quote from an installer (divide total price by total watts) or make an estimate appropriate for your installation design and site

**Expected REC Selling Price** *(Complete section ONLY if you plan to sell RECs)--* Renewable Energy Credits (RECs) are designed to encourage investment in solar and all solar owners who register their grid-tie systems are entitled to offer their RECs for sale. A Renewable Energy Credit is an electronic certificate that gives value to the generation attributes of the electricity. When an owner sells Renewable Energy Credits, the buyer becomes the one who has paid extra for the special generation attributes of solar (e.g., no emissions) and is the one who can claim to use solar electricity. For more information, see PA AEPS (<http://paaeps.com/credit/>) RECs are sold on the open market and their price is set by supply and demand. No one can say with certainty what future values will be. To get an idea, here's a source you may find helpful (there are many others as well): <http://markets.flettexchange.com/pennsylvania-srec/>

## Understanding Your Results (*bottom section of Sunny Money*)

**Solar electricity needed:** your annual usage times the percent you want to get from solar (PA has 50 kW max on residential systems for net metering, so capped at generation from a 50 kW system)

**DC power rating of array :** calculation is based on average generation of 1,200 kWh per year per installed Watt. (This average value is on the low side to allow for some degradation over system life.) DC power rating is capped at 50 kW because PA has 50 kW max on residential systems for net metering.

**Roughly, area needed for array:** estimate based on 75 ft<sup>2</sup> per installed kW. (For example, Sharp 240 modules at 64.57' x 39.37' = 0.073557 ft<sup>2</sup>/W). Additional area may be needed for required clearance and accommodation of site specific features.

**Installation Cost (\$):** based on cost "you expect to pay" per kW and DC power rating

**Federal Tax Credit:** [Federal Residential Renewable Energy Tax Credit](#), 30%

**Maintenance:** calculated at \$0.02 per Wdc per NREL convention (consistent with PVWatts)

**Total Cost:** calculated as [MAX of EITHER full finance cost (initial + (payment amount x number of payments) OR installation cost] – federal tax credit + maintenance

**Environmental Impact:** data from <http://www.epa.gov/cleanenergy/energy-resources/refs.html>

**Average power bill savings per year (\$):** based on average expected price of electricity and solar electricity needed (generated) per year

**Power bill savings over 25-yr system life (\$):** annual savings times 25 years

**Expected RECs per year:** 1 REC per 1,000 kWh generated from solar

**Average annual REC net income (after Fed tax):** number of RECs x average expected selling price x (1 – fed tax rate). Sunny Money assumes a Fed Tax rate of 28%.

**Return on Investment:** this is how much your system benefits you financially each year divided by how much it cost. It is calculated as (average annual electricity savings + average annual REC income)/Total Cost. Solar is a very low risk investment. This ROI value can be used to compare to other types of very low risk investments, such as money market accounts, CDS and some annuities.

**Cost of your solar electricity (\$/kWh):** how much your solar system costs you divided by how much electricity it generates. So, (Total Cost – REC income) / (total amount of electricity generated over 25-year life of system).

**Simple Payback Period (years):** how long it will take for power bill savings and REC income (if you sell RECs) to pay off your Total Cost. Calculated as (system cost / (power bill savings + REC income)).

**Years of free electricity (after payback):** once you've recovered your initial cost, the solar system will keep generating electricity. Sunny Money assumes a system life of 25 years, though systems will often continue to produce longer.

**Things Sunny Money does NOT take into account:** time value of money and state and local taxes. Expected increase in home value can be expected but are difficult to quantify, so also not included in this version of Sunny Money. For additional info, see <http://www.appraisalinstitute.org/solar-electric-systems-positively-impact-home-values-appraisal-institute/>