Homeowner Owned Rooftop Solar System – Payback Period Example

The net cost of our 22-panel 5.34 kW solar system was $14,767.

Original 16 Solar Panels (2013)	$16,259
Additional 6 Solar Panels (2014)	$4,837
Total Cost of Solar Panel System	$21,096
Less 30% Federal Tax Incentive	-$6,329
Net Cost of Solar Panel System	**$14,767**

A payback period is the length of time it takes an investment to recover its initial cost either in profits or savings. For a homeowner with owned rooftop solar panels, the payback period is however long it takes electricity savings to equal the cost of the system.

If you did not take into account rising electricity rates or any of the many variables that affect electric bills, and assuming that we did not pay another dime to PG&E our payback period would have been: $14,767 system cost divided $1,742 average annual electricity cost before solar = 8 years and 6 months.

After looking at five years of net energy metering bills, 21 PG&E rate schedules, and our system's energy production data, I realized I would need a supercomputer to calculate accurately what we would have paid for electricity if we did not have solar panels.

Undaunted I decided to take a stab at a payback period anyway. Electricity price increases, a torrential downpour, and additional work-at-home occupants affected our payback period, which at this point, I estimate to be about 7 years so we are already 71% of the way there.

Increasing Electricity Rates

Where we live, the average residential price for a kWh of electricity has increased 20.30% in the five years since we installed our solar panels or 4.06% a year. Using the 4.06% increase should get us in the ballpark. Based on just increasing electricity rates our payback period reduces to just over 7 years 1 ½ months, all other things being equal. In the future, electricity rates could increase at a faster rate or could even decrease (although that seems highly unlikely).

Year	$/Yr. (estimated)	% Increase	Ave. $/Mo.
2013	$1,812.27	4.06%	$151.02
2014	$1,885.85	4.06%	$157.15
2015	$1,962.41	4.06%	$163.53
2016	$2,042.08	4.06%	$170.17
2017	$2,124.99	4.06%	$177.08
2018	$2,211.27	4.06%	$184.27
2019	$2,301.05	4.06%	$191.75
2020 (1.5 months)	$287.63	4.06%	$199.54
Total (estimated)	**$14,627.54**	**32.48%**	

Electricity Usage

From March 2013 through March 2018, we paid PG&E $644.77. By now with the price increases, our monthly electric bill would have been about $184.27 if we did not have solar panels so $644.77 represents about 3 and ½ months of electricity. That increases our payback period to 7 years and 5 months.

Unexpected Circumstances

Early in 2017, our parched town received a deluge of rain causing some water to accumulate on the dirt floor of the storage room on the garage level of our home. Drying out the storage room required running a dehumidifier and heater 24/7 for about three months consuming an enormous amount of electricity. I estimated that we saved at least $1,000 because we were generating our own electricity during the peak demand times when electricity is most expensive. That reduces the payback period by about 5 months so the payback period is looking more like 7 years.

We also now have four people living and working out of our home instead of two so we are using incrementally more electricity, which will likely reduce our payback period even more.