



Solar Power - A Smart Investment These Days

An article I wrote in the 10-11-08 Home Seller Showcase touched on the economics of solar briefly, so this week I'd like to expand on subject a little. As of the time of this writing (11-18-08) the rebate from PG&E is still \$1.90/watt but it's poised to drop to \$1.55/watt in the near future (if it hasn't already at the time you're reading this). We simply won't know for sure until we've received the approval of the applications we're sending to PG&E next week (they currently have a 24 day turnaround time). This used to give us folks in the solar installation business a lot of grief – and a brief upswing in business from people wanting to get the higher rebate before it drops. But now, with the recent boost in incentives from the Federal government, there's a little less stress because the tax credit more than makes up for the rebate drop. At any rate, let's take a look at the economic results for a home power system in the table below, keeping in mind that specific numbers will vary from project to project:

Electricity Bill (\$/year)	Number of Solar Panels @ 210 watts	% Electricity Cost Covered	Economic Rate of Return	Years to Positive Net Cash Flow	Net Cost after Incentives (Rebate & Tax Credit)
\$1,200	17	76%	11.8%	9	\$15,840
\$1,200	22	95%	11.1%	10	\$21,647
\$2,400	24	77%	15.5%	2	\$23,264
\$2,400	33	98%	14.0%	5	\$33,451
\$3,600	28	74%	18.6%	0	\$26,968
\$3,600	42	98%	16.1%	1	\$42,403

The table shows that homeowners with the highest electricity bills clearly benefit the most. It also shows that systems designed to cover around 75% of your annual electricity costs are generally more cost effective than those covering closer to 100% (still smaller systems are even more cost effective). In all cases, the rate of return provided by a solar electric system is way better than you could expect from the stock market these days!

In the case of a home with a \$2,400 per year (\$200/month average) electricity bill, for example, you will reach a point where the savings exceed the costs within just two years with 24 solar panels. This is what I mean by “Years to Positive Net Cash Flow”.

The “net cash flow” for any given year is the annual savings (which increase each year with electric rates), minus the loan payment, plus the tax effect of the loan (aka, the mortgage interest deduction - another special credit reserved for solar investments). Here’s how it looks for the \$2,400 electric bill with 24 solar panels over 20 years:

Net Cash Flow Details

Year	Electric Bill Savings	Loan Payment	Tax Effect: Loan	Net
2009	\$1,843	\$ (2,509)	\$511	\$ (155)
2010	\$1,953	\$ (2,509)	\$490	\$ (65)
2011	\$2,071	\$ (2,509)	\$468	\$29
2012	\$2,195	\$ (2,509)	\$444	\$129
2013	\$2,327	\$ (2,509)	\$418	\$235
2014	\$2,466	\$ (2,509)	\$390	\$347
2015	\$2,614	\$ (2,509)	\$360	\$465
2016	\$2,771	\$ (2,509)	\$328	\$590
2017	\$2,937	\$ (2,509)	\$294	\$722
2018	\$3,113	\$ (2,509)	\$257	\$861
2019	\$3,300	\$ (2,509)	\$218	\$1,009
2020	\$3,498	\$ (2,509)	\$176	\$1,165
2021	\$3,708	\$ (2,509)	\$130	\$1,329
2022	\$3,931	\$ (2,509)	\$82	\$1,503
2023	\$4,166	\$ (2,509)	\$30	\$1,687
2024	\$4,416	\$0	\$0	\$4,416
2025	\$4,681	\$0	\$0	\$4,681
2026	\$4,962	\$0	\$0	\$4,962
2027	\$5,260	\$0	\$0	\$5,260
2028	\$5,576	\$0	\$0	\$5,576
2029	\$5,910	\$0	\$0	\$5,910

The examples in the table above assume a 15 year equity loan at a fixed rate of 7%. Can you imagine any other investment where it would make sense to borrow the money you’re going to invest? And, if you did, would you expect the high rate of return solar provides?

In the case where it takes many years to reach positive net cash flow, people will often say “What if we decide to sell our home in 2 years?” The answer is that history has shown that, as energy costs rise, the value of energy-saving features are more highly valued at resale. The value of a solar PV investment at resale is much higher than, say, a kitchen or bath remodel, in terms of the percent of value a resale relative to the initial cost.

Past studies of the market value of energy-efficient homes have concluded that, for every dollar saved on energy, the value of the home increases by \$11-\$21. A study published in the Appraiser Journal puts the increase in the value of the home at \$20 per \$1 of energy saved. Using the 24 panel example saving \$1,843 in the first year, this system would increase the value of the home about \$36,860; not bad for a solar power system with a net installed cost of \$23,264!

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