THE SOLAR DEBATE
Will solar panels save you money?
NO: Panels aren't a good investment at today's electric prices

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Homeowners who are considering installing solar photovoltaic panels on their roofs are probably thinking about the environment, but also their wallet. When confronted with cost estimates, tax credits, state rebates and data on solar panel electric production, many customers are baffled.

And that still omits two critical factors: the interest rate on the money borrowed (or the lost interest if you are paying for the panels out of savings) and the price of the utility-generated electricity that the solar power would replace.

Because most of the costs are paid up-front and the benefits flow in over 25 to 30 years, it is important to account for the fact that a dollar saved tomorrow is not worth as much as a dollar saved today. The best way to factor in the timing of costs and benefits is to calculate a "levelized" cost per kilowatt-hour, which is roughly equivalent to paying for the system with a mortgage that lasts the life of the panels and in each year dividing the annual mortgage payment by the amount of electricity the panels produce to get the cost per kilowatt-hour. Thus, a typical $12,000 system (after state rebates and federal tax credit) might have a mortgage payment of $1,000 per year and generate about 3,400 kilowatt-hours of electricity per year. Dividing the annual cost by the annual output would give 29.4 cents per kilowatt-hour.

For the typical home solar PV systems I have studied, this cost - after rebates and tax credits - is 27 cents to 32 cents per kilowatt-hour (adjusted for inflation).

Some PV sellers calculate a much-lower number by assuming that you can borrow money for free. Statements such as "it pays for itself in 12 years, and after that the electricity is free" make the same mistake. The major expenses at the front end come with interest costs that will not be covered in those first 12 years. When you are talking about a 25-to-30-year investment, those interest expenses really matter.

So, will you save money on your electric bill by producing your own solar power at a cost of 27 to 32 cents per kilowatt-hour? That depends on the price of power.

A Pacific Gas and Electric customer faces a steeply increasing price as the household consumes more power over a month, starting at 12-cents-per-kilowatt-hour for usage up to a baseline quantity and

running up through five rate tiers to 36 cents per kilowatt-hour for power used above three times the baseline.

At those rates, the largest PG&E residential consumers could indeed save money, because the solar power would replace electricity from the utility that costs them 32 to 36 cents per kilowatt-hour. Smaller users, however, would be replacing power that only costs them 12 or 13 cents. Probably about 10 percent of PG&E residential customers, the very heaviest users, would save money by installing solar panels (though they would likely save more by improving the energy efficiency of the house). The other 90 percent would not benefit financially at current electricity rates.

Yet the rates are going to change over time. The average price may increase if the price of natural gas rises faster than inflation or a greater share of the power comes from more-expensive alternative-energy sources. But alternative energy - wind power, geothermal and even solar - is going to get cheaper as technology advances. In addition, that steep rate structure is likely to become flatter, significantly lowering the 36 cent top price that the largest users now face, and eliminating the savings from solar panels that those households would enjoy under current rates.

Some solar PV analyses count both the electricity savings and the increased property value, but that's double counting: you don't get the savings if you sell the house. Nor does the extra value appreciate over time, like when you add a bedroom. It depreciates, like when you replace your furnace.

Installing solar PV reduces greenhouse gases and other pollutants, makes an environmental statement, and some people think the panels look pretty cool. All fine reasons to buy them, but if you are looking for big savings on electricity, you are very likely to be disappointed.

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