THE BAY AREA HOME ENERGY WORKBOOK

Dear Bay Area Neighbor, thank you for taking a closer look at your energy usage, and how you can save money.

We know that the more knowledgeable you are about energy in general or solar in particular, the more likely you are to make a good decision about your energy choices.

Please use this workbook to see how you can think differently about your energy usage.

We will help you uncover the alternatives you have. and show you how you can end your dependence on expensive utility power.

THE PRESENT

1. How much is your average monthly electricity bill ?.....$_____
   (Gas excluded)

2. Multiply by 12..... $_____

OK, great. Consider this number your ***annual electricity budget***.

THE FUTURE

Bay Area electricity rates have gone up by *an average of 6.75% per year over the last 30 years*. Those are PG&E's own numbers.

Below you will see how much you will spend in the next 10 or 20 years if rate increases continue. (Note: ten years go fast, twenty even faster).

3. For 10 years, multiply Line 1 by 187..... $_____

4. For 20 years, multiply Line 1 by 523..... $_____

Now you have numbers for how much you will spend on electricity over the next decade or two. ***You can consider it your utility debt.***

Of course, we may get saved by science, Maybe one day we'll make free energy from a teaspoon of seawater, but for the foreseeable future there's PG&E.

We should also remember that with all the people around the world demanding more energy, rates probably will continue to go up.

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DO YOU PLAN TO USE MORE ELECTRICITY?

Let's consider things you may add to your life that will make your electricity bill go up.

If you don't plan to get any of these, just skip this page.

Do you plan to:			Add to annual el. budget
Get an electric car?	Yes ☐	No ☐	$ 600.00
Install a hot tub?	Yes ☐	No ☐	$ 300.00
Install a swimming pool?	Yes ☐	No ☐	$1,000.00
Get air conditioning?	Yes ☐	No ☐	$ 500.00

Total.....$_____

If any of these things are in your near future, add them to your annual electricity budget.

Annual electricity budget.....$_____

Total planned increase.....$_____

New annual electricity budget.....$_____

New utility debt (multiply budget by 523).....$_____

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COMPARE UTILITY ENERGY TO SOLAR

Put your annual electricity budget

here: $_____

Use the table below to get a rough idea of how much solar you need.

And when we say rough, we mean rough. There are a whole number of factors that could influence the calculations and increase your solar cost, such as complicated roof situations, shading, additional electrical work, and so on.

Yet if you have a fairly typical house, with a fairly standard roof, this should be pretty close. (The table assumes a cash purchase).

Annual El. Budget	System size	10yr savings	20yr savings
$ 1,200	3.6 kilowatts	$ 3,115	$ 33,792
$ 1,500	4.3 kilowatts	$ 3,345	$ 41,487
$ 1,800	5.0 kilowatts	$ 5,285	$ 51,227
$ 2,400	5.9 kilowatts	$ 10,051	$ 71,475
$ 3,000	6.9 kilowatts	$ 14,837	$ 91,744
$ 4,200	8.8 kilowatts	$ 24,824	$ 132,695

The savings columns on the right show you your solar savings. Remember *your utility debt? The 10- and 20-year columns show by how much you reduced it.*

When you get solar, you will still be connected to the utility. If your solar system is disabled for whatever reason, you get power from the grid as if nothing happened.

You may agree that the table above shows why solar is hands-down the #1 choice to power your household.

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WAYS TO PAY FOR SOLAR

Most solar systems will be in the neighborhood of $17,000 to $50,000. If you didn't realize the size of your utility debt, this would sound like a lot. Now you know better.

First and foremost, you should own your solar PV system. Ownership gets you 30% of the system cost back over your Federal tax bill. You get $5,100 on a $17,000 system, and $15,000 on a $50,000 system — straight off your owed taxes. You can spread it out over five years if you like.

As always, ***cash*** *is king*. It gets you the lowest energy cost, because you don't pay interest. As a cash investment, your return on a solar system will be *15–20% or better, risk free*. Hard to beat.

Your second option is an ***equity line***. The interest will typically be in the 2.99–3.99% range. Deduct the interest from your State and Federal taxes for max savings.

Your third option is ***PACE financing***, which means you pay for your system over your property taxes. This type of financing is now available all across the Bay Area. *PACE financing does not consider your FICO credit score, and the amount borrowed does not count as debt. If you have equity in your house, you qualify. Period.*

Cash, equity line, and PACE financing all freeze your energy costs.

The last two options are ***leases and PPAs,*** offered by nationwide outfits like Solar City, Vivint, SunRun, Sungevity, and so on. Leases and PPAs do not give you the 30% Federal Tax Credit, and your payments will increase annually, usually by 3% or more.

To lower your energy payments, PACE financing is far superior. ***In our estimation, PACE financing has made leases and PPAs obsolete.***

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CAN YOUR HOUSE ACCOMMODATE SOLAR?

Let's consider the space you need for the systems we have discussed.

Solar works best when it faces somewhere between southeast and southwest.

This is the space you need to fit the systems we have looked at:

Annual El. Budget	System size	Panels	Roof Area
$ 1,200	3.6 kilowatts	11	198 sq.ft
$ 1,500	4.3 kilowatts	13	234 sq.ft
$ 1,800	5.0 kilowatts	15	270 sq.ft
$ 2,400	5.9 kilowatts	18	324 sq.ft
$ 3,000	6.9 kilowatts	21	378 sq.ft
$ 4,200	8.8 kilowatts	27	486 sq.ft

The roof area should be as shade-free as possible, but some shade can be handled without much problem.

As you can see, there is not much space needed. A 3.6 kW system fits in a 12' by 17' space. A 5.9 kilowatt system needs 17' by 19'. The panels can be grouped into two or more smaller arrays to use the available roof space.

The calculations are based on using solar panels that are highly efficient.

For large bills and small roofs, there are panels available that will fit in even less space.

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QUESTIONS TO PROSPECTIVE SOLAR INSTALLERS

Picking a solid solar installer can pose some challenges. You will notice that some salespeople will only talk about how much money you will save, and try to tell you that the actual solar system they plan to install doesn't really matter, because "solar panels are all the same." Nothing could be further from the truth.

Your solar energy system will sit out in the wind and rain for decades. The system needs to be bulletproof, and installed to exacting specifications. This is exactly what a good solar installer will provide. Make sure you ask a few pertinent questions before choosing, and you will be fine.

1. **Can you tell me the exact brand of solar panels you will install on my roof?**
   (Reason: many installers use inferior panels. Some of these have had recalls, or are known to fail over a short time in independent tests. Some of the larger companies have no idea what is in their warehouse at any given time. If you are told that it doesn't matter because the panels are under warranty, it does. Many homeowners have reported nightmare situations dealing with low end suppliers and materials. Don't go there. SUNPOWER solar panels are consistently rated number one for quality and performance).

2. **I have a non-standard roof (a steep roof or completely flat roof, or a roofing material other than composite shingle, i.e. concrete tile, ceramic tile, tar and gravel, metal roof, etc.). Do you work with this roof type?**
   (Reason: many installers only work on standard roofs with composition shingle roof materials. Don't let them waste your time—they will sign you up and shake your hand; the main office will disqualify you once they review your information).

3. **Please help me understand the degradation of your solar panels. What is the rate of light induced**

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degradation? What is the rate of annual degradation?
(Reason: You are getting solar to produce energy. If the panels you are offered degrade quickly, producing less energy over time, you will have to make up for the difference with expensive utility energy.

Most salespersons will not even know about light-induced degradation. It is a productivity drop of about 3–7% that happens in most mass-market solar panels after about 100 hours, or less than two weeks on your roof. SUNPOWER solar panels do not experience light induced degradation. Annual degradation is almost always around 1.2% per year, even when the salesperson tells you differently. SUNPOWER annual degradation is 0.2%, an order of magnitude less).

4. **Please explain to me the exact nature of your warranty. If the system has a problem, am I responsible for handling anything in any way?**
(Reason: Almost every warranty in the industry requires the homeowner to find, remove, and reinstall components that need warranty repair. Only SUNPOWER offers a replacement warranty, where a service technician comes to your door, takes care of the problem, and leaves without giving you a bill).

5. **What is your estimated project timeline?**
(Reason: many installers have very long installation timelines. For a residential installation, somewhere between 6–8 weeks is reasonable).

6. **Are your installers full-time employees of your company?**
(Reason: many installers use subcontractors and day laborers. You have no guarantee that these workers know what they are doing).

7. **Do you have contractors' liability insurance? Are all installers who will be working on my project fully covered?**
(Reason: if an installer uses non-employee labor, you could be stuck with a nasty surprise on your homeowners insurance if anything bad happens).

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