MENLO SPARK

Climate Neutral for a Healthy, Prosperous Menlo Park

A CASE FOR SOLAR IN MENLO PARK

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*Solar panels are becoming increasingly common in Menlo Park, covering the rooftops of more than 250 homes and buildings and generating more than 4 Megawatts of power.[1] You can generate your own renewable power easily by harvesting the abundant sun in this area.[2] Installing solar panels can be an easy way (*except for certain circumstances*)[3] to lower your energy bills, make your home more environmentally friendly, and reduce your carbon footprint.*

CLEAN ENERGY CAN BRING US TO NET ZERO ENERGY

Clean energy, including solar, will soon be integrated into new buildings – by 2020 all new residential buildings within California will be required to be Net Zero Energy and by 2030 all new commercial buildings.[4] Net Zero Energy is the concept that a building produces as much energy as it consumes on an annual basis. This is accomplished with the right combination of efficient building materials, lighting, appliances, and heating and cooling equipment matched to a renewable energy system. Whether you use solar panels to reach Net Zero Energy or not, the benefits can be substantial.

THE RIGHT SIZE SOLAR SYSTEM

Any commercial solar company will determine the right size solar system for you based on a site assessment of your home and a review your energy use history (e.g. looking at past PG&E bills). A good way to start finding out how much solar potential you have and how many panels you need is with a free assessment tool like Google's new ***Project Sunroof*** *that computes how much sunlight hits your roof in a year.[5] Project Sunroof also helps you find out how many panels you need based on how much energy you consume. For example, the average home in Menlo Park consumes roughly 500 kW-hours per month,[6] which can be met by a 4.2 kW solar installation. [7] Make sure to think about any upcoming changes in power needs. For instance, if you're considering purchasing an electric car – which we highly recommend – you may be able to use up to 2.5 kW more of solar generating capacity. Here again, a commercial solar company can help you tailor your system to a specific EV model and your driving needs. Similarly, replacing a gas furnace with an electric heat pump will increase electrical use.*

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[1] *Statistics for Menlo Park can be downloaded from the CA Solar Initiative; total installed = 2.5 MW http://californiasolarstatistics.ca.gov; Facebook alone generates roughly 1.5 MW of power (not accounted for through CSI), according to a personal communication from Lauren Swezey at Facebook, 3/20/15.*

[2] *Menlo Park beats the national average daily amount of sun – our average is 6 kWh/m^2/day.*

[3] Installing solar can be challenging if your monthly bill is lower than $40; If you are a renter; If you have more shade than sunshine exposure; If you have a history of bad credit (unless you are going to pay for it outright);

[4] *The 2013 Integrated Energy Policy Report (see page 36) discusses upcoming California Building standards that will require Net Zero Energy buildings.*

[5] *https://www.google.com/get/sunroof*

[6] *www.smcenergywatch.com*

[7] *Calculation from www.solar-estimate.org/?page=solar-calculator Another calculator (FYI, Menlo Park is in climate zone 3): http://nzen.info/energycalc.php*

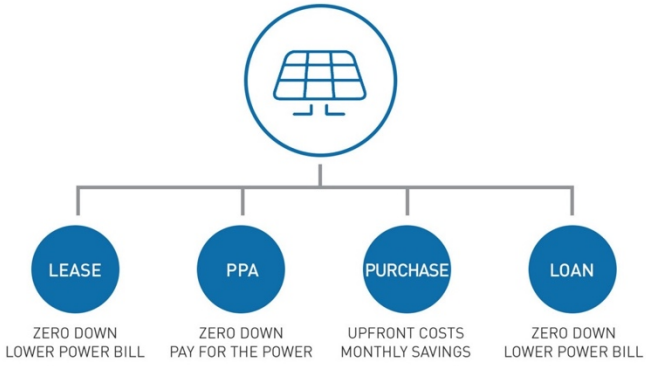
WHAT TYPE OF SOLAR SYSTEM SHOULD I USE?

There are numerous manufacturers that can meet the needs of most homes seeking installations with different PV panels types and configurations. For example, if your sunny roof space is small, you can use higher efficiency panels to get the most output from limited space. Energy production of rooftop solar arrays will vary with the amount of shade from trees and other sources, the angle and orientation of the roof,[8] size of roof and solar array, and other minor factors. Because solar array designs and costs can vary significantly, it's best to get multiple quotes for a new PV system and opt for a vendor that can guarantee the solar output.[9] The easiest and least expensive way to assemble a residential PV system is to mount panels in fixed racks that face south, west or even east.[10] Some manufactures also make "Building-integrated photovoltaics" like solar tiles that are well camouflaged and are compatible with any architecture.

COSTS AND FINANCING OPTIONS

The cost of solar has been cut in half over the past few years, dropping to about $3 per Watt or less, and many loan, lease and incentive programs can further offset costs.[11] There are four options to finance solar power: lease, power purchase agreement, outright purchase, or purchase with a loan.

Source: ClearPath.org



*You can **lease** solar panels for $0 down – just like a car lease. You pay a monthly fee for your panels, often more than offset by the decrease in your power bill, netting you savings each month. Also like a car lease, you have the option to purchase at the end of the lease*

*A **power purchase agreement** (PPA) is like a lease, with zero upfront costs. Instead of purchasing the solar panels, a PPA lets you purchase the power that the panels on your roof generate at a set rate, usually lower than the rate you pay the power company. Then you pay two power bills, but their sum is often much lower than your old utility bill.*

*You can **purchase** your system upfront, resulting in dramatically lower power bills (e.g. you'll pay a small service "line" fee of roughly $5, plus any gas used and additional electrical power used if you exceed the power that your solar panels generated). The initial investment might be expensive, but most systems pay for themselves within 6-10 years.*

*Purchased solar panels can be financed with **loans**, including "Property Assessed Clean Energy" (PACE) loans, which are paid back through your property tax bill. This program allows homeowners to finance many energy efficient upgrades and improvements including new roofing and water savings in addition to solar panels.[12]*

Determining which approach is best requires careful consideration. If you have enough federal income tax liability to take advantage of the tax credits, or you are considering selling your home, then purchasing solar panels either for cash or with a loan makes the best financial sense. On the other hand, if your income is tax free or you don't have funds for the purchase or the ability to borrow, and you have no plans to sell your home, $0-down lease deals or PPAs could be the best way to go. See the table below for more factors and insight on these choices.

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[8] *Tilting the panels off the roof 10-35 degrees may be helpful for flat roofs, but for most roofs that are not flat is not necessary. The same gain can be achieved with good aesthetics by adding another panel or two.*

[9] *Note that some vendors will guarantee a specific amount of annual energy production from the panels they install and reimburse the difference at a specified rate for any shortfall in production over the warranty lifetime of the panels.*
This article has a good step by step guide to comparing quotes: http://www.mydomino.com/blog/how-to-compare-solar-quotes-in-4-easy-steps/

[10] *For more information, see: www.solarpaneltilt.com*

[11] *www.clearpath.org/en/youmatter/solar-helps-americans-save.html*

[12] *The HERO Program - Renovate America is approved for residential use in Menlo Park. See: www.heroprogram.com*

HOW EXACTLY DOES THE UTILITY BILLING WORK?

The way you pay your utility bills changes when you own a solar electric system. The utility will put in a "net meter" that measures how much energy is being produced compared to how much is being used. For example, if more energy is used than is produced by the PV system, the meter may read a positive number, indicating that you owe money to the utility. Some months are much sunnier than others, such that your system may produce more energy than you need, which you will see on a monthly report from the utility that shows how much power your panels produce. Your monthly bill will include your gas use plus a minimal line fee for electric service. Your annual electric use will be analyzed every Spring to determine whether you owe money or will receive credit for extra power generated and added back to the power grid. This means that if you produce as much as you consume over the course of the year, you will owe no money regardless of the individual months that you used more than your solar electric system produced.

INCENTIVE PROGRAMS AND FINANCIAL ASSISTANCE

*Solar incentive programs are winding down as solar gets more affordable, but there are still a few incentive programs available. First, there is a **30% federal tax credit** available through 2019, for all home solar systems that are installed and operational by that date.[13] PG&E also provides a **New Solar Homes Partnership** rebate that applies if you are building a new home and if that solar home is also highly energy efficient.[14] It offers a $1.25 per watt rebate, which cuts the cost by roughly one quarter.*

*For low-income families, a nonprofit, called **GRID Alternatives**, provides solar power through a program similar to Habitat for Humanity in style.[15] Local businesses can sponsor projects so that they are entirely free, lowering that household's energy bill by around 80%.*

*For households with low power bills that want to purchase systems, **SunWork** is another nonprofit that offers solar power for a third below conventional cost, using trained volunteers to help install systems on low energy use households (with electric bills that average $100 or less).[16] SunWork has no income restrictions.*

UNDERSTANDING INSTALLATION

Solar panels should only be installed by a team led by a licensed professional. Check online reviews to find out if your service provider has a good reputation.[17] While south facing roofs can be ideal to generate solar power efficiently, east and west roof exposure can also be effective. In Menlo Park, west facing arrays can be a big afternoon producer of electricity because Menlo is often overcast in the morning. This can work especially well with a time of day net metering plan that pays back a premium to the consumer putting energy back into the grid at peak afternoon time.[18]

Some solar companies may not install panels on certain clay, wood shake or metal roofs. However, with appropriate site preparation and mounting systems, solar panels can be installed on virtually any roof. It is important to find a solar installer who takes all factors into account, has a good track record, and guarantees the system's production.

Solar systems last a long time and if your roof is near the end of its life, you may want to replace the roof of the solar area prior to installing solar.

WHAT KIND OF BUILDING PERMITS DO YOU REQUIRE?

Solar installations require building permits. The permit requirements are important to consider before completing an installation. For example, Menlo Park requires that a three-foot clearance around your roof.[19] Fortunately Menlo Park does not charge significant fees to issue a permit for rooftop solar.[20] Most solar companies take care of this paperwork as part of the installation.

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[13] *This is an uncapped tax credit, not a rebate. You can change your withholding to get the credit even before the system is installed or get it later if you wait and just file it with your taxes in April.*

[14] *www.gosolarcalifornia.org/about/nshp.php?WT.mc_id=Vanity_nshp*

[15] *If you qualify as a homeowner who has good sun exposure to a sturdy roof in good condition; and with an income level no higher than $72,400 for two people or $90,500 for four people, please contact Menlo Spark or GRID Alternatives to be matched with a sponsor for free solar panels. See more at: http://www.gridalternatives.org*

[16] *http://sunwork.org*

[17] *Websites with reviews: solarreviews.com or diamondcertified.org*

[18] *PG&E proposed moving its peak price period to 4 PM through 9 PM starting in 2016, likely due to the influx of solar power meeting sunny mid day needs.*

[19] *However, solar on non-conditioned space, such as a garage, can be built right to the edge.*

BUY | LOAN	vs.	LEASE | PPA
Consider when you…		
…have electric bills of $40-$500/month		*…have electric bills higher than $120-$500 per month*
…are primarily interested in maximizing the Return on Investment (ROI) of installing a solar panel system		*…are primarily interested in using electricity generated from renewable resources and less concerned about maximizing the financial benefits of installing a solar panel system*
…can benefit from reducing the amount of federal taxes that you pay and have a tax liability that is larger than the amount of credits you could receive		*…don't pay enough in federal taxes to benefit from the federal tax credits resulting from an investment in solar PV*
…have the cash or can borrow it to pay for the solar PV system		*…don't want to make a cash investment to buy the solar PV system outright*
…are planning to sell your home in a few years (Note: The solar PV system would increase the value of your home)		*…don't want the responsibility for maintenance or repairs of your solar PV system*
Cost		
Cost of a solar power system can range from $4,000 to $30,000 before any rebates and incentives. *Federal tax credits reduce the amount you owe in taxes, reducing the cost of solar by 30%.*		*You can get a solar system starting from no money down*
System Management		
You own the system and are responsible for maintaining it, though PV systems are very durable and require little maintenance. Some recommend yearly cleaning for a 4% performance improvement . Most panels carry a 25-year performance warranty. Most vendors provide free tracking service of your system performance.		*The solar leasing company owns and maintains the solar PV system.* *Most solar leasing companies offer free online or mobile apps to help you track the performance of your PV system.*
Terms		
Solar loans and Home Equity loans are available for 5-20 year terms, with interest rates ranging from 4-8% for credit scores higher than 700. PACE loans do not require a credit score.		*Solar Leases and PPAs are generally for a 20 year term.*
Return on Investment		
You get free electricity for years to come once the ROI has been reached.		*You can save between 10-50% over the prices you pay your utility for electricity.*
Gotchas		
PV systems can require some maintenance and occasional repairs over the years to maintain optimal performance. *Pricing can vary widely among vendors; make sure to obtain several different quotes.*		*Solar Leases and PPA's complicate the selling of homes, as well as the refinancing of homes that require jumbo loans.* *the Performance Guarantees and make competitive comparisons.*

Solar panels are a great way to save on your energy help the environment at the same time.

We hope this factsheet was helpful to you.

For more information, see www.menlospark.org

[20] *2015 permit fees are only $5 from the City of Menlo Park Building Department, winning an award for the easiest city to install solar. (see: http://completesolar.com/solar-rankings)) However, the Menlo Park Fire Protection district charges an additional permitting fee of $378.00.*