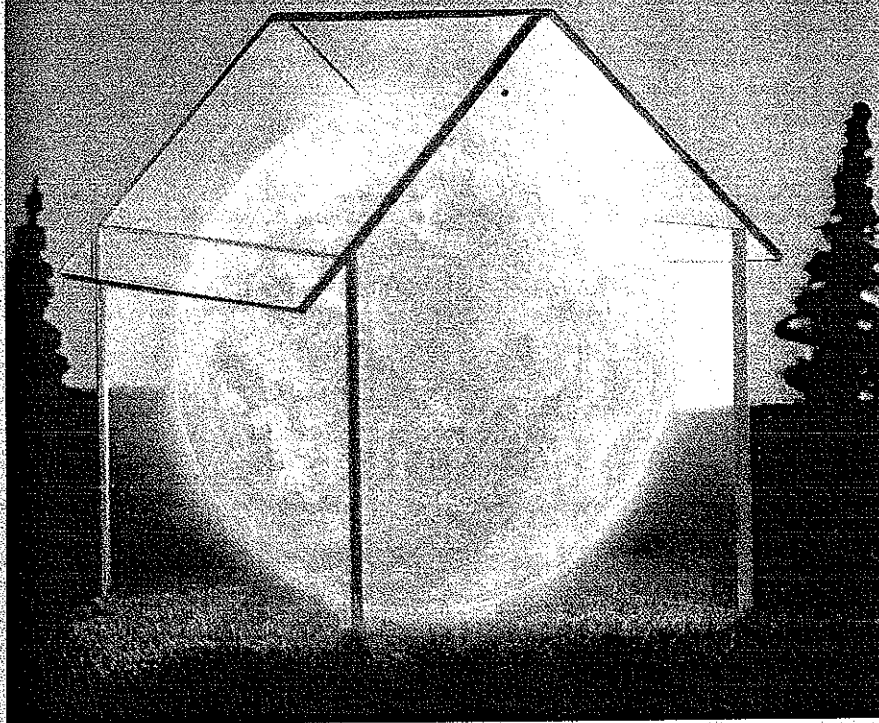


# Soak Up the Sun

Considering solar? Critical questions you need to ask.



**S**OLAR PANELS—also called photovoltaic (PV) cells—can reduce your monthly electric bill by 50 percent. No wonder rooftop solar capacity almost doubled from the beginning of 2013 to the end of 2014, according to the Energy Information Administration. Despite that growth, solar provides only a little more than 1 percent of total electric-generating capacity in the U.S. Going solar isn't a slam dunk for everyone.

## Does my house have to be situated in a very sunny spot?

The more sunshine you have, the more power your system can produce. But the

amount you can save on your bills also depends on the price you pay for electricity and the available credits and other incentives from federal, state, and local governments. Most panels are placed facing south, where they get the most exposure. Ideally, your solar panels shouldn't be shaded by chimneys, trees, or anything else on the rooftop. That includes trees that could grow tall enough to shade the rooftop panels.

## About how much power can I expect to get?

Most systems can provide 25 to 100 percent of a homeowner's electricity needs. Solar installers will be able to collect

information about the amount of electricity you use, how much you pay for it, and what you'll save if you opt for different-sized systems.

## Is it possible to save up power to use at night or during a power outage?

Disconnecting from the grid isn't really practical yet. Though they are fairly pricey right now, you can have batteries installed along with the solar panels that allow you to store power generated during the day for use at night or at a later date. Tesla got a lot of attention when the company announced its Powerwall rechargeable lithium-ion batteries earlier this year. The company says the batteries will start shipping this year and will cost \$3,000 to \$3,500 before installation. Other companies are introducing similar products, including Daimler AG with its Mercedes-Benz energy-storage units that also use lithium-ion batteries.

## My area is prone to storms. Can hail and lightning damage solar panels?

Better-quality solar panels have impact-resistant, tempered glass that can take a beating without damage. But that doesn't mean you'll have warranty coverage if a hailstone ruins a panel. Amend your homeowners insurance so that the cost to repair or replace solar equipment is covered for fire, impact, and other damage. And make sure that the cost to repair or replace your system doesn't exceed the current coverage limits on your policy.

## Will panels damage my roof?

Properly installed panels should not cause any damage to your roof. In fact, the panels tend to protect the roofing materials they cover by shielding them from precipitation, light, and heat.

That said, a roof's working life can range anywhere from 15 to 30 years, and a PV system's service life can be upward of 25 years. So install the PV system on a roof with at least as long an expected life as that of the solar components. If

you have sufficient land, you can have a ground-mount system installed out of view of the house. (Such systems usually cost a bit more to install because wires need to be buried.)

### Aren't these systems crazy expensive?

Buying a system outright will probably save you the most money over time, but it requires a large up-front investment. The typical installation costs about \$15,000 to \$21,000 in the U.S., according to the Solar Energy Industries Association.

If you install a system before Dec. 31, 2016, you're eligible for a federal tax credit equal to 30 percent of the amount you spend. So if you spend \$18,000, you can slice \$5,400 off of the federal taxes you owe. Some states and local governments provide additional incentives. State-by-state information on discounts is available at dsireusa.org. And ask your municipal office whether there are any local perks. If your home is assessed at a higher value based on your installation, you may be able to dodge a property tax increase, for example.

Solar panels are usually warranted to last 20 to 25 years, and the systems often pay for themselves after five to 10 years, so you have the potential for free electricity for the rest of their lifetime.

### I can't afford to purchase a system. Is leasing cheaper?

Initially, yes, but you're likely to pay more over the life of a 20-year contract than if you buy. Though solar is available in all 50 states, leasing firms don't operate in all areas. You can often have a system installed free and repay the company through a monthly fee.

Leasing contracts usually include an "escalation schedule" that specifies how much your payments will go up over time. So be aware that your fee might not be fixed over the lifetime of the lease, but that should be clearly spelled out in the contract. Note that the leasing company keeps all of the tax credits and discounts. Make sure your contract spells out who is responsible for maintenance

and for repairs to the system and to your roof. Usually, it's the leasing company, not you, that's responsible for repairs to the solar system because it is the owner.

You can compare leasing and buying deals free at EnergySage. The site, which is paid a fee by the solar companies if you buy or sign up for a leasing deal through it, will obtain quotes on your behalf from several vendors. EnergySage requires them to standardize comparison data so that you get "apples to apples" quotes.

After you decide whether buying or leasing is right for you, solicit quotes from several contractors on your own to be sure you've found the best deal. Get at least three references from your top choices and contact those customers to find out whether they were satisfied with the work that was done. Also ask whether the project came in on budget and on schedule.

### What if I want to sell my house before the solar lease is up?

If you need to terminate your lease because you're selling your house, you may be able to transfer the remaining lease to the buyer or buy the PV system from your leasing company and include it in the sale of your property.

### What about maintenance?

With few or no moving parts, panels usually need little attention. The one exception is the inverter that changes the direct current from the system to alternating current. The inverter, which can conk out after about 15 years, costs around \$1,000 to \$1,500 to replace. That's usually about 10 percent of the cost of a rooftop solar system.

### What should I look for in a PV installer?

The North American Board of Certified Energy Practitioners (nabcep.org) and the Solar Energy Industries Association (seia.org) maintain state-by-state lists of contractors and solar installers. Beyond that, an installer should have general liability and workers' compensation insurance,

along with a contractor's license for the region in which you live. Find out whether the installer will obtain all of the necessary permits. If the installer will use a subcontractor to do the work, verify that the subcontractor is properly certified, insured, and licensed.

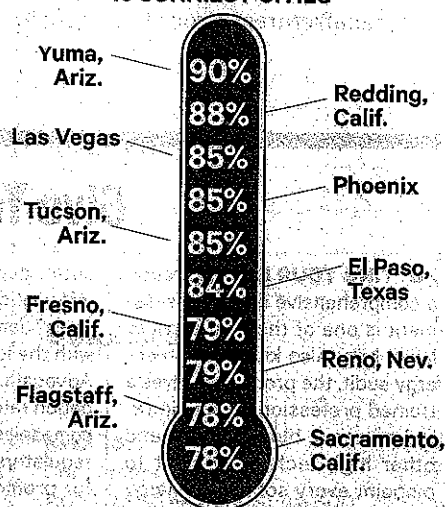
Ideally, a structural engineer as well as a roofer should assess the roof's condition as well as how much weight it can handle. That includes the panels and racking, and the potential weight of any snow that might normally fall on the roof.

Before installing a rooftop solar system, contact the manufacturer of your roofing and ask for written approval of the solar installation to make sure that the roofing warranty will not be voided. You should still do that even if you're installing a new roof. Another thing to consider: The fire classifications for the roof assembly and the solar system should be the same. (For roofer referrals, check the National Roofing Contractors Association's website, at nrca.net.)

## Where to Catch the Most Rays

Percentage of time the sun is shining over the course of a year

### 10 SUNNIEST CITIES



Data from the National Oceanic and Atmospheric Administration, based on many years of observations through 2004. (It has since stopped collecting sunshine data.)