

There are three main types of solar panels



Residential solar panels (for example: [GOAL ZERO NOMAD 7 PLUS](#)) though all silicon-based, come in three types and have their own pros and cons.

Polycrystalline panels are the simplest to manufacture and therefore the cheapest, although they can suffer in high-temperature climates and are slightly less efficient than their monocrystalline counterparts (although typically not enough for the average homeowner to worry about). These guys are bright blue and really stand out, as opposed to monocrystalline panels, which are uniformly black. Monocrystalline panels are longer-lasting, the most efficient, and perform better in low-light conditions, which makes them a little more expensive.

Thin-film panels, while growing in popularity, are the least efficient of all and require more soft costs. That said, they are light and flexible enough to be transformed into individual solar-powered roof shingles — so cool, and very much an indication of what to expect from solar in the future.

Most people share their solar energy with their utility companies — but you can keep it all to yourself.

Net-metering is the most popular and cost-effective way to store electricity. It hooks your solar panels back into the power grid, so if your home needs more energy than your solar array can manage, it will automatically pull it in. On the flip side, when your system produces more than you are using, the excess flows back out in the grid — spinning your utility billing meter backward as it goes.

The other option is off-grid, where your electricity is all stored in a large battery bank on your property. The average US home uses 911kWh per month — about 40 batteries worth, which can add upward of \$16,000 to your whole setup. That said, storing your energy off-grid means you can have electricity in even the remotest areas, or when the grid fails in a power outage.

You can score a pretty sweet deal on solar right now.

The federal government and various states and municipalities have a ton of subsidies to help transition communities into energy independence and reduce greenhouse gases. One of the most well-known incentives is the the Solar Investment Tax Credit (ITC), a federal 30 percent renewable energy tax credit, which has been extended by Congress through 2019.

Dr. Lombardo sees an even brighter future for solar: “Prices for PV are dropping, and at the same time, energy costs are increasing. When more utilities install smart meters, they’ll implement time-of-use pricing, which means electricity will cost more during peak demand times like late afternoon. A PV array is a great way to reduce your energy bill, since PV will generate much, if not all, of your electricity during those peak hours.”

Be sure to check your specific area for other types of incentives that can range from rebates to tax breaks to low-interest loans. The NC Clean Energy Technology Center has a nifty search tool for incentives by your ZIP code.

The Bottom Line

Adding solar energy to your home is a great — but massive — investment, so it’s important to pick powerful and efficient panels from a reliable manufacturer.

Take Action

Do the math. If you’re planning on moving before you recoup your initial investment, solar panels don’t make a lot of financial sense. You can use a solar savings calculator to estimate your return, or crunch the numbers yourself to determine your monthly savings. First, divide the monthly output hours of your system by the kilowatt-hours you use per month to find what percentage of your bill solar would cover. (You can find your

kilowatt-hours on your electric bill.) Then, multiply your electric bill by that percentage to see how much you could save a month — although assume it will typically be less since you won't always have perfect solar conditions.

Consider your roof. Since the bulk of the bill comes in the form of soft costs, make sure your roof has 15–25 years of lifetime left. If your roof needs to be replaced sooner than that, you could be saddled with removing, then re-installing, your panels. And before any of that, contact the company that installed your roof to check if adding solar panels may void its warranty.

Shop around for an installer. “A good installer will perform a complete financial analysis, including payback period,” adds Dr. Lombardo. “They will also investigate local, state, and federal incentives, help the customer complete the necessary paperwork to obtain those incentives, and factor those into the financial analysis.” Hobson agrees: “It’s worth noting that there are many quality solar panels, regardless of their technology type. However, consumers should think beyond the panel to find an installer with a positive track record for residential projects.” And the best way to find the right installer for your home is to get several personalized quotes. [Click here to customize your search to fit your needs.](#)