

# Your solar guide to green power



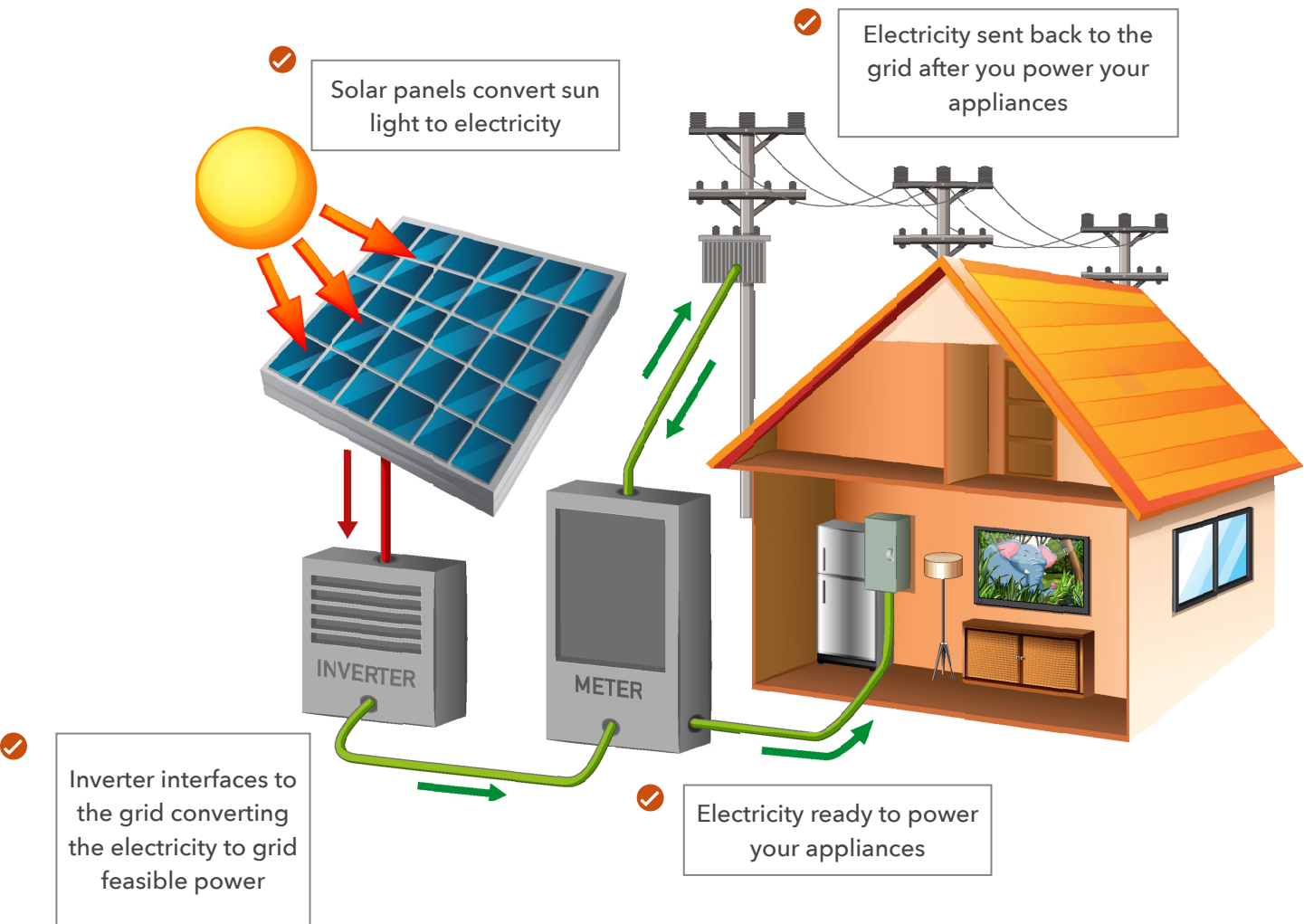
**Become a solar power expert!**

## Part One: Let's Talk Solar

- Overview: How Solar Works
- Net Metering
- SRECS

# How solar works

Power out of the thin air

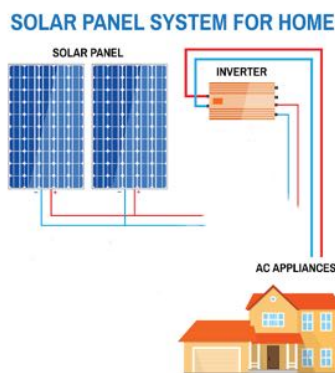


## Collecting sunlight with solar panels.

Solar panels convert sunlight to electricity. Imagine each panel as a battery that starts giving power when the sun hits the panel. Batteries give Direct Current (DC) electricity and so do solar panels. Once the sun is up the DC power starts flowing.



## The inverter.



Most, if not all, appliances in your home run on either 110 or 240 Alternating Current (AC). We therefore need to convert the DC into AC and that is what we need the inverter for. The inverter converts DC to AC and works as an interface between the solar panels and your AC electric system of your house and the grid.

## Electric energy for your house.

When the day begins and the sun hits the panels your appliances are now powered by the sun. You do not have to do anything but enjoy the free power. You are however still connected to the grid, so if it's a cloudy day and you are using more power than you produce, the grid will supply the difference.

## Pushing back to the grid.

On a sunny day when you are producing a lot of energy, the inverter pushes the left over electricity back to the grid. Think of it as a bucket of water that will overflow if you're not taking out enough water to stem the inflow of water. Your Net Meter will measure how much energy you have pushed back into the grid and your utility company will give you credits that you can use for times where you use more than you produce. Some utilities will even cut you a check.



## The Net Meter explained.

The Net Meter is a bi-directional energy meter installed in your house and can measure electricity in two directions. If you use more than you produce, the meter will run forward, and if you produce more than you use it will run backwards. Some utilities,

however, require two separate meters to be installed - one for inflow and one for outflow.

## **Net Metering**

While the Net meter measures what you use and produce, the utility also needs a mechanism to send you the credits for the excess production that's been send back into the grid. This billing mechanism is available in most states and is a good reason to make the money saving choice to go solar for many home owners. And there are more benefits from net metering. Your production will, first and foremost, be used by you, but your solar system also reduces the strain on the grid's distribution and transmission infrastructure. Next to that, the distribution losses will also be much less, as your energy is used in your house and your neighbors' houses and does not need to travel many miles from the nearest power plant. For more information see the [Solar Cost-Benefit Studies](#) page by SEIA.

## **Solar Renewable Energy Certificates or SREC's**

SREC's are a much overlooked benefit from owning a solar system, they are basically Green Energy trackers, tracking energy produced by solar systems. Your inverter keeps a record



of the energy you produce and transmits that directly to a database. This database maintains all the data of solar energy produced in the state. The database is a public/private partnership between state government and a private company that services the database and sends

the checks to the home owners. Depending on the size of your system, you will earn SREC's that will be bought by power plants. State laws called "Renewable Portfolio Standards" require fossil fuel power plants to produce a certain percentage of their energy using renewable energy systems. Your system is the answer to their renewable energy requirement, and depending on the state you are in you can get great financial benefits from your SREC's.

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## Part Two: How we help you on your way to solar savings

- What system type is right for your family?
- How to choose a trusted installer?
- How to evaluate and compare solar proposals?
- Belmont Solar Step Plan

# Part two: How we help you save



## What type of system is right for you?

There are three basic types of solar systems:

1. **Grid-tie**
2. **Grid-tie with battery backup**
3. **Off grid**

1. **Grid-tie** systems are the most basic and most frequently installed type of solar system. A grid-tie system generates power for your home or business, and, depending on the usage, the system will either be supplemented by the grid or will send energy back to the grid when generating more than your usage requires.

2. **Grid-tie with battery backup** systems will draw power stored in a battery to power up critical loads in the event of a grid blackout. In normal situations, the solar power is used to power the house and charge the solar battery. Leftover energy goes back to the grid. Or, if the house uses more power, it is supplied from the grid. This will keep the battery topped off and you and your family secure.



3. **Off-grid systems** are, as the name indicates, not connected to the grid, relying completely on the sun and the solar battery for your power needs. The system will be designed to meet those needs. Most of these systems are installed in small to mid-sized houses, cabins, and in remote locations where the utility cannot connect.

No matter where you are in your journey to a greener future, there will be a solution, as there is for everyone. More and more Americans are choosing the security of a battery backup system to keep their families safe. Belmont Solar started out with off-grid, as we have a lot of off-grid applications in our area. After eighteen years of installing solar, we have grown into a full-service solar business, designing and installing grid-tie, grid-tie with battery backup, and off-grid systems.

## **How to Choose a Trusted Solar Installer**

Finding the top solar panel company is important for your home or farm. In recent years, there's been a swell of companies trying to cash in on the popularity of solar. They are in it for the short-term profit and lack the experience needed for designing and installing systems in a variety of contexts. For your property, you want to choose a solar company that is committed to helping you find a system that's right for you.

- **Determining your solar needs**

Are you looking to power a remote location? Or do you want a system that meets your whole home's power needs? Determining the scope of your project will help you choose a solar provider that will meet your specific needs.

Top solar companies specialize in certain applications, like off-grid remote locations or on-grid home systems. They might also be better equipped to serve a single category of installation, focusing on home, business, or agriculture needs. Find a reputable company that has been installing systems like your project for years.

The best solar panel company can assist you in figuring out your specific solar needs. They will visit your property, evaluate potential locations for panels, and point out any potential issues that might affect the installation. Using your current electric bills,

they should also calculate the size of a system you'll need to meet your needs.

- **Keep it local**

Every state and municipality has different laws, regulations, and rebates for installing solar panels. Local solar companies have worked on homes and farms in your area, so they know the rules to follow and what rebates and tax incentives you may qualify for. They also know about your area's climate and weather patterns, so they will be able to get the most out of your new system. Another plus is that a local provider is easier to reach if there is ever a concern with your new solar system.

- **Ask questions**

For many, solar energy is still a relatively new and unknown technology. If you are going to depend on a solar system to meet your power needs for the next 20 years, you should know everything you can about the system and solar technology.

You should want a solar installer that is knowledgeable about solar technology, and is willing to share that knowledge with you. The best solar companies earn a certification from the North American Board of Certified Energy Practitioners® (**NABCEP**®), which requires a minimum of 58 hours of training and a rigorous examination.

A good solar installer should be able to explain to you how your new solar system works. This shouldn't be a sales pitch; instead, the installer will patiently explain how the system generates power and show you important controls and features of your system.

- **Why should you choose Belmont Solar?**

For the last 20 years, homeowners and farmers across south-central Pennsylvania have trusted Belmont Solar for their solar needs. We've installed hundreds of off-grid and hybrid solar systems of all sizes, including battery backup, and we can custom design a solar system for your home's needs. If you want a knowledgeable, top-quality solar company to introduce you to solar technology, **contact Belmont Solar** today.

## **How to evaluate and compare solar proposals**

Start off by making sure the proposals are of similar content. Your situation is determined by your energy usage, your quest for energy security (battery or no battery), financing or no financing, and physical restrictions of your location. If a proposal is too far off from your situation, review the communication between you and the installer.

Some tips:

1. The size of the system is given in Kilo Watt's or KW. An average system will be between 5 and 15 KW and is usually determined by your energy usage and the size of your roof.
2. Most home owners will try to eliminate their utility bill and offset their usage by 100 % and usually a little more. When you discuss your goals with the installers, make a list of these goals and use this list as a guide line in your conversations with them.
3. For many customers, the environmental impact is increasingly the motivation for going solar. Your proposal should clearly indicate the CO<sub>2</sub> reduction and in some cases will state the number of trees planted, cars taken off the road, or barrels of oil not consumed.
4. An important fact in the solar world is the payback time of your investment. This number includes your electricity savings, SREC's revenue, and federal and state incentives, and will give you an estimate on when you will start making money on the energy you produce. This involves predicting the cost of electricity, which we

know will increase. Assuming the increase will parallel inflation, we can look at historical inflation data to make a prediction.

5. The proposal should include a list of components and equipment needed, along with their brand names.
6. Your installer will include two types of warranties—warranties from the manufacturer, by component, and workmanship warranties from the installer.
7. The size, equipment, components, and type of system define the scope of the system. If considering multiple proposals, make sure the scope of each one is well defined and similar enough to the others to be realistically comparable.



8. Look for a summary and detailed analysis of financial facts. The best proposal is the proposal you can understand easily. Look carefully at the summarized financial analysis—the details of how your money is spent and how the returns are explained. The overall view should include pricing after discounts and incentives. Estimations of the payback period, the ROI (return on investment), and the savings over the productive life of the system (usually 25 years).



9. The proposal should have a clear overview of the steps of the project, detailing the installer's action items and your financial obligations by date.
10. The "fine print" is never the fun part of any agreement between parties, but remember that friends remain friends when they make good agreements and write down the details. A well-written agreement should be clear and easy to understand. Make sure the details are summarized, to provide an overview, but also spelled out precisely in the document. Avoiding fine print can lead to costly miscommunications for both the installer and the customer.

## **Belmont Solar's Process**

By following these steps, your project can proceed smoothly and easily, giving you great satisfaction in the end.

- ▶ **Pre-qualification:** In this stage, we explore with you what type of solar installation would best meet your needs. We do so by looking at your home, the orientation of the home in relation to the sun, trees on your property and around your home, your expectations concerning the investment, your expectations for energy security, and financing options.
- ▶ **Preliminary design:** With today's technology, we can zoom in to view your house from space and design a system that will come very close to the final design. This allows us to give you an insight into the amount of power you can install and the approximate costs of the system, without

leaving our office. **This service is free!** We want to invest in you as a customer just as much as you want to invest in us as professionals.

- ▶ **Site-assessment:** Luckily, although amazing technology exists, the human touch is still critically important. We need to assess the building structure, the state of the current electrical system, and other solar technical aspects for our final design.
- ▶ **Final design:** Once the site assessment is done, we can include the finishing touches in our quotation and give you a design and financial proposal that accurately represents your future installation.
- ▶ **Signed agreement:** The old saying is true– “Friends stay friends when they write things down.” We work together on producing a solid agreement, and once in agreement, we can move forward towards securing permitting and the actual installation.
- ▶ **Down payment of \$2,000:** This is your first commitment to us, to get us started with preparation and submission of the paperwork. Some people think of this as “red tape,” but rest assured; this is our responsibility, and we have the experience and connections to get this behind us quickly.
- ▶ **Permitting and utility interconnection:** Here is where we take care of the “red tape” for you. We approach the townships and your electrical utility. Expect some delay, depending on your region. Some regions are very quick to respond, but this could possibly take two to six weeks.

- ▶ **Sixty percent downpayment and start of installation:** This stage involves a substantial deposit on materials, and is the point at which we ask you to make a contribution towards that deposit. Once the deposit has been made, the excitement begins! You will see the Belmont Solar trucks pull up to your property, and installers will start the work.
- ▶ **Test and completion:** Once the installation is finished, we test and make sure all work is verified, operating correctly, and carefully inspected. In this stage, the company's owner, Ben Zook, will follow his **"PEN" principle: Performance, Education, and Neatness.** Once you are satisfied and happy, your system is ready to be turned on.
- ▶ **Final payment:** Once your system is ready, inspections are done, and the system is approved, final payment is due, as per the agreement.
- ▶ **Setting up monitoring and SREC's:** In this step we set you up with the software to monitor the system performance. Live and in realtime your app will show the hourly performance. Belmont Solar works together with SRECTRADE Inc. this is the company that acts as the intermediate between you and the state. They will take care of the selling of the SREC's and will transfer the credits to your bank account.
- ▶ **Free energy out of thin air:** If you could capture all the energy the sun gives us in one hour, you could power the entire earth for a year. Unfortunately, we are not there yet, but we do what we can to get us there. Renewables, including solar, wind, hydropower, biomass, and geothermal accounted for 13% of the total US energy used in 2019. You are now part of this movement and you can be proud of it!

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## Part Three: Become a Solar Power Expert

- Roof or Ground Mount?
- What are the best Solar Panels?
- How much do solar panels cost?
- PA Solar Incentives
- Should I buy or lease solar?
- Financing your solar installation

## Ground Mount Solar

If you take a drive through the rural areas of Pennsylvania and beyond, you will see more and more ground-mounted solar systems. These systems are becoming increasingly common because they have important advantages.



Of course the biggest advantage is location! If your home is not oriented south, the ground mount is the way to go to capture the sun's energy. An added benefit is being able to place it in the most optimal position, away from shade created by chimneys or trees. If you have plenty of unused land, you can opt for a larger system and generate even greater savings. Another advantage, beyond having more options in positioning and size, is that a ground-mounted system will also reduce costs when doing upgrades to your home, like replacing the roof.

Also, if you want to be on the edge of technology, you can install a pole mount solar system with a sun tracking option. This type of system keeps the orientation and angle in relation to the sun in an optimum position throughout the day .

## What are the best Solar Panels?

Much has changed in past 15 years. The most important factors to consider when deciding which panels are best for you, are the efficiency of the panels, the construction and warranty, the value for the money spent, and aesthetics.



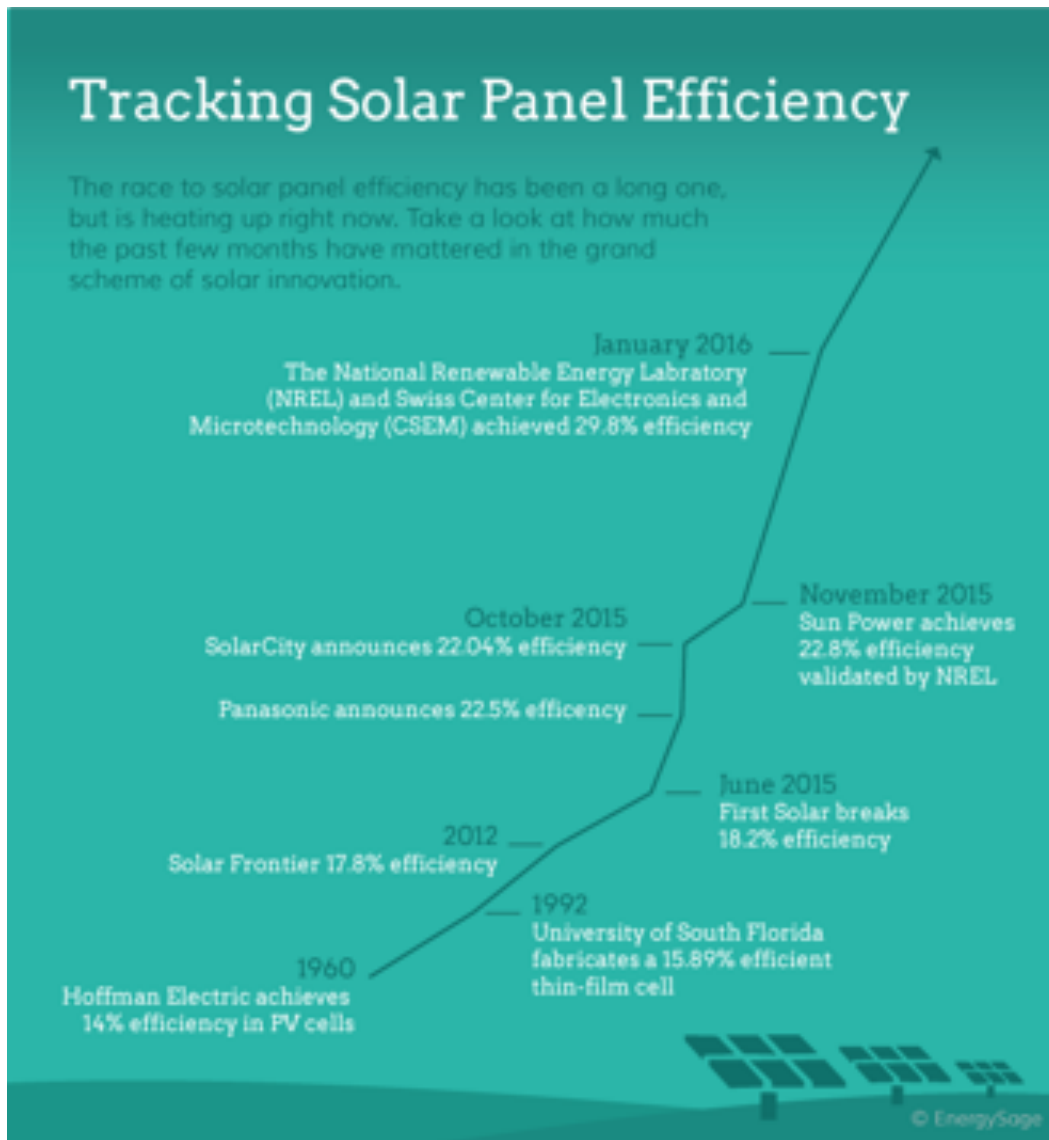
Customers differ in terms of which factors matter most to them. If you have limited roof space, then efficient power generation is an important factor. Maybe a major brand name offers you peace of mind. That's why we talk with you and help you find the right solution, sharing our experience with the different brands. As much as we like to see our customers, we do not want to come back for a "visit" because of needed repairs! For that reason, workmanship and warranties are important also.

## Solar Panel Efficiency:

Solar panel efficiency refers to how much electric power you will get from an hour of sunlight. The most important factor is the angle at which the sunlight strikes the panel. The amount of electrical power being created changes as the sun changes position in the sky over the course of the day.

Although we have no control over the sun's position, we do have control over the solar array's design. That is where the invaluable experience and proven expertise of the Belmont Solar team comes into play.

## Value for your money!



Solar panel efficiency more than doubled in the past decade



## **Innovation:**

Another factor is the continuing improvement in technology. Efficiency has more than doubled in the past 15 years. The chart above illustrates the great strides in efficiency in just the last few years. Increasing demand helps drive and finance advanced research and improves manufacturers' economy of scale.



These factors have had a huge impact on the cost of installing solar, decreasing your initial investment and making it pay off for you much more quickly. Developments are many and exciting! The good news can be simply stated. Over the past decade, solar panel efficiency has increased while the price of installed solar systems has decreased, dramatically.

## **Warranty and bottom line:**

Compared to most products, solar has better warranties, as most solar companies offer 25 years of coverage on their components. Where can you find a product with this much protection? In your search for the best panels, the bottom line is look for high efficiency to maximize your investment, and a good warranty to protect you from maintenance costs.



## **How much do solar panels cost?**

The average system size for a residential application is about 6 KW. For this amount of power, the average gross cost has fallen from \$50,000 to just \$18,000 in about the past decade. For 2022, the federal tax credit is at 26%. Subtract this from the purchase price, and you're looking at approximately \$14,000 for a residential solar system that can cover most of your electricity needs.

Solar is a financially wise investment. The returns are steady and not influenced by market changes. Solar's ability to avoid the politics and price volatility that increasingly characterize fossil fuel markets is a major advantage.

## **Incentives: Solar credits and tax credits**

Federal and state incentives are offered to state residents and businesses who choose to go solar. One of the largest financial incentives for installing solar in Pennsylvania is the federal Solar Investment Tax Credit (ITC). According to the Solar Energy Industries Association (SEIA), since the program's implementation in 2006, it has stimulated the growth of the U.S. solar industry by more than 10,000%! The program allows homeowners and business owners to deduct from their federal taxes 26% of the total cost of installing a new solar system. Depending on the size of the system, this credit can save you thousands of dollars off the cost of switching to solar.

Unfortunately, the federal solar tax credit is winding down. Installations completed in 2022 will qualify for the full 26%, while installations in 2023 will only receive 22%. If you wait until 2024 to switch to solar, you will not receive *any*

federal credits for a residential installation, while commercial systems will still qualify for a 10% deduction.

## **Solar Renewable Energy Certificates (Credits)**

Solar Renewable Energy Certificates (SRECs), also called “alternative energy credits,” will help customers finance, and wisely invest in, a solar system. SRECs are created for each 1,000 kilowatt hours (kWh) of electricity produced by a qualified alternative energy source. These



SRECs are measured by what is called the “production meter.” The production meter measures your full production, in other words, the number of kWh coming from your system. Many people incorrectly think that the production meter measures the power you have

pushed back into the grid. Your full production is the renewable energy you created and, therefore, that’s the number you will get credit for.

Your installation will be connected to the SREC market place through companies like [SRECTrade.com](https://www.srectrade.com) This is a fully automated process and will send you a bank transfer periodically. The value of SRECs is subject to supply and demand, just like any other market.

Find more information about Solar Renewable Energy Certificates by clicking [here](#).

### ***Should I buy or lease solar panels?***

To us that's an easy question. Although leasing seems great, with no initial investment, like with everything that sounds too good to be true, the downsides are big.

You love to see your meter run backward, but there are questions. The main questions people have before making the decision are:

***How will I finance? With cash upfront or a loan?*** Buying the system outright is the best way to maximize your financial returns. You, and not the leasing company, will take the 26 % tax credit (ITC). On average, a



system will cost between \$10,000 and \$30,000, so consider the savings. Every dollar saved goes straight to you. And if you don't have the upfront cash, consider the fact that the monthly loan payment is usually covered by the savings on your electric bill.

***How about maintenance?*** Solar panels are very durable and require little or no maintenance over a guaranteed lifespan of 25 years. And we

have your back. The unsurpassed Amish workmanship of Belmont Solar is guaranteed, making maintenance a nonissue.

***What about leasing or PPAs?*** Solar leases and PPAs (Power Purchase Agreements) are generally for 20 to 25 years. During those 25 years, there is a very good chance you need or want to move. The lease option is a disadvantage, as the buyer will need to take over the lease and must be credit worthy.

We at Belmont Solar see very few reasons to explore leasing, as leasing is only a good option if your credit score is below 650. You are in a contract with the lease supplier for the life of the system. The leasing company determines the monthly rate you will pay for the electricity.

Another negative effect is that the market value of the house decreases, because the next owner has to have an outstanding credit rating in order to take on the extra lease.

## **Financing your solar installation**

Solar power will save you a significant amount of money on your electricity bill and in most cases it eliminates your bill completely. These benefits are guaranteed for a period of 25 years or more. However, the upfront cost might scare you away. That would be unfortunate, because you have options. We will explain the options here.

***Solar loans:*** Solar loans are specifically designed for installing solar. The lenders offering solar loans know all about solar and specialize in helping people afford it. Belmont Solar has a relationship with a solar loan company, and we can help you with this important part of the installation process.

**Personal loans:** A personal loan is a great choice and worth exploring, especially if your relationship with your bank is good and you trust your bank's loan advisor. Such loans offer great flexibility in repayment terms, and you can shop around, as lenders compete more with each other for personal loans than they do for solar loans. The added advantage is that, once the loan is deposited in your bank account, you can pay cash and get a cash discount.

**Home equity loans:** The big benefit of choosing a home equity loan is that this type of loan often has a lower interest rate, reducing your monthly cost and bringing a faster Return on Investment (ROI). The payment terms of home equity loans can also be spread over a longer period of time, thus lowering the monthly cost even more. And just like the personal loan, having the money in hand gives you the option to pay cash and take that cash discount. The interest you pay on home equity loans can also be tax deductible. However, you do need to exceed the standard deduction to get this advantage. One drawback about a home equity loan is that you need to have built up a certain amount of equity in your home to qualify.

The option that is best for you depends on your financial situation and what feels comfortable to you. It is a personal choice. We at Belmont Solar can advise you in making the right decision. We encourage you to call us for advice, but you definitely should talk to your bank and your financial advisor as well. If you do require financing to make this wise investment, the sooner you get that help, the sooner you can enjoy the benefits of owning your system outright.

## **Please remember...**

Taxpayers who make the move to solar during 2022 can take advantage of the 26% tax credit for qualified expenditures on a solar system that provides electricity to their residence (owned and lived in by the taxpayer). For more information, visit this [webpage](#). For a personalized assessment of the credits and rebates you may qualify for, visit our website or give us a call. You are just a phone call away from enjoying all these incentives and adding a renewable energy source to your home or property. Call us today at 717-768-7796