

Transitioning to Solar Power: A Residential Guide to Alternative Energy Technology

This guide will help prepare Irving residents to navigate and communicate with residential solar energy providers. The guide does not make recommendation or endorsements, but provides defined objectives and facts to help residents speak with solar providers and gather enough information to make an informed decision. It's possible that residents may work through this guide and conclude that solar is not their best option.

Considering solar energy?

There are many reasons for choosing solar power. Residents should understand the specific reasons before speaking with a residential solar adviser. By having a clear understanding, residents can make an informed decision tailored to them.

What are the expectations for a solar energy system?

Residents should also define their expectations before speaking with a potential provider. There will always be some compromises, but knowing their expectations should help when deciding on the best option. Some examples may include:

- To reduce residents' average electricity bill.
- To be off the grid.
- To be an environmental steward.
- To reduce a home's carbon footprint.
- To provide a return for producing excess electricity.

These are just some examples of the expectations residents may have when considering a solar energy system. No one system will be a perfect match for all consumers.

Home retention and ownership

This is an important aspect to consider when weighing energy efficiency options. Most of the financial justifications that will be presented will take about 15 to 30 years for a true payback. Residents should consider how long they anticipate living in their home to determine how a solar power system will be funded and financed. If a resident moves, being able to transfer the benefits of a solar system to the next owner may be a critical question. The financial model presented by a solar energy provider needs to make sense, based on how long a resident plans to live in the home.

Where to start?

Before talking to a solar energy provider, residents should take a careful look at their home and consider several important factors.

Are solar panels acceptable, according to the neighborhood Home Owners Association?

While Texas is an ideal location for residential solar panels, some HOAs may not allow solar installation or may have restrictions on the size or visibility of the system. If an HOA has restrictions or requires approval, residents should understand the regulations before speaking with a solar provider. Also, residents should double-check their homeowner's insurance policy with their agent.

Direction: orientation, sun exposure

The best exposure for efficient solar generation is south or southwest and at an angle that will allow rain and occasional snow to run off. If the location does not face south or southwest, it may be less efficient — affecting how much money a resident can save using solar energy.

Current electricity usage

“How much electricity is being used?” That's an important question because each home consumes electricity differently. Some factors of consumption include:

- The configuration and efficiency of the heating and air-conditioning systems.
- The water heater (gas or electric).
- The type, size and efficiency of the home's appliances.
- The home's insulation and window efficiency.
- The combined energy usage of the home's residents.

It isn't necessary to profile each of these elements, but part of considering a solar power system is to perform a home energy audit. Solar energy works well as part of a larger plan for energy efficiency.

The next task is to collect the electricity bills for the past two to three years and profile the electricity usage in kilowatt-hours (kWh).

Acquiring a multiyear profile will paint a better picture of the amount of electricity used. To do that, use the bills to create a table for kWh used each month. Then, average the usage for each month over the two- to three-year period, and also get an average of the total usage each year. Plotting the numbers on a chart can be useful for visual clarity, but a table will be sufficient when talking with a potential solar energy vendor.

For more information, visit SmartMeterTexas.com.

What types of solar power systems are available?

Many systems are available, and their configurations can be complex and confusing. The solar panels, often called photovoltaics (PVs), are the units that convert the sun's energy into electricity. For simplicity, these units are broken down into four categories: solar roof tiles, solar roof panels, non-roof solar panels and sun tracking systems.

Solar Roof Tiles appear similar to regular shingles on the roof of a house. The picture below shows one of these tile roofs. The advantage of this style is that it is less noticeable on a roof. However, the tiles must be installed as part of the roof, and can be significantly more expensive.



Solar Roof Panels are what come to mind for many residents when considering solar roof systems. The photo below illustrates a home with a solar roof system, including multiple solar panels.



The advantage of this system is that it uses the roof for support and can be sized to the available roof space and power requirements. The system also is the most common solar energy mechanism and helps the solar market stay competitive. Panels come in different sizes and power efficiencies. When speaking with a vendor, be aware that one vendor's panels may require more roof area than another's. This system requires that residents remove and reinstall solar panels when the roof needs to be replaced. In many locations, roofs can last for 25 years or more before needing to be replaced. But the weather in North Texas often requires more frequent roof replacements. Also, some solar panels may be more durable and able to withstand Irving's occasional extreme weather.

Non-roof Solar Panels are solar panels that are installed at a location other than a rooftop, like the one shown in the photo below. While the non-roof solar panels cover less surface area, they provide solar power without requiring roof installation.



Sun Tracking Solar Systems are usually limited to commercial installations. However, it's worth being aware of them should they become more adaptable to residential installations in the future. Sun tracking systems like the one shown below are the most efficient systems because they move and rotate to face the sun as it moves across the sky. Unfortunately, they are one of the more expensive solar options. The system also requires that residents have ample space for installation. For an up-close glimpse of a sun tracking system, visit the West Irving Library, 4444 W. Rochelle Road.



Additional equipment

Solar panels create electricity as direct current (DC). This type of electricity is found in household items, such as a battery to power a flashlight. In order to use this electricity in the home, residents will need a converter that changes DC power to an alternating current (AC), which is used to power a house.

If residents are producing more energy than necessary, they may be able to receive credit for excess electricity sent back to the electric grid. For more information, residents should contact a local electricity provider.

Are solar system batteries necessary?

Batteries are not needed for a functioning residential solar power system. However, if residents wish to be more energy independent, a battery will allow for excess electricity storage. The stored power can be used when the system is not producing electricity, such as during a cloudy day or at night. For residents who wish to charge their vehicles using the solar energy system, a battery may be a viable option. The

battery would allow residents to charge a car battery at night when the solar panels are not producing electricity. Some electricity providers offer lower-cost or free electricity during evenings or “off-peak” hours, so the economics of adding a battery to a solar power system should be examined carefully.

What should homeowners expect when talking with a residential solar energy provider?

Some say looking for a residential solar system is like shopping for a car. Homeowners will find different models, options, sizes, efficiencies and costs, along with financing, rebates and other financial options. It’s vital to have the basic information compiled, so residents can compare different options. Compiling a list of local providers from web searches, word of mouth, or other consumer sources is also helpful. It’s also worth checking with the Better Business Bureau for information on each provider. The more information that is gathered up front, the more a resident will be ready to compare available systems.

Are there economic incentives available for residential solar systems?

Numerous financial incentives are available. Each provider will have a combination of incentives, rebates and options. The incentives may be combined with financing options that may or may not include residents’ ability to select their own power provider. However, there are two incentives that should be included in each proposal:

- The U.S. government still provides renewable energy federal tax credits. The credits were renewed by Congress in late 2017, but they decrease over coming years. For more information, visit [EnergyStar.gov/about/federal_tax_credits/2017_renewable_energy_tax_credits](https://www.energystar.gov/about/federal_tax_credits/2017_renewable_energy_tax_credits).
- A residential solar power system adds value to a home. The state of Texas offers residents a Solar and Wind-Powered Device Exemption. This exemption allows homeowners to exclude from their property valuation the increased value from adding a residential solar energy system. Also, it prevents an increase in property taxes due to the new system. This is strictly for the added value created by the residential solar system.

Oncor, the electric delivery provider for the Irving area, also has a website listing potential incentives for adding solar systems, insulation or energy efficient heating and cooling systems. For more information, visit [TakeALoadOffTexas.com/residential](https://www.TakeALoadOffTexas.com/residential).

The Irving Green Advisory Board (GAB) hopes this guide will help residents create a picture of what they are looking for in a residential solar energy system. Compiling this information in detail can help to create a template for each provider to use when answering a resident’s questions. The GAB recommends that residents adequately research and speak with as many providers as possible before investing in a solar power system.