

# RESIDENTIAL WELCOME KIT

## KOKOSING RESIDENTIAL SOLAR

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Congratulations! Changing your energy habits is a big decision. We are happy that you've decided to install solar, and we're very happy that you've selected Kokosing Solar as your energy partner. You won't be disappointed.

As you know, investing in solar can be a win win decision. In addition to reducing your electric bill, you're making a responsible statement of environmental stewardship.

We are here to make sure your solar experience is a good one. We believe that your solar energy system should work reliably for years, just like the power you expect from the electric company. We will do what it takes to earn and keep your trust.

Please familiarize yourself with this Residential Solar Welcome Kit. It is meant to comfortably guide you through the pre and post solar installation processes.

From contract details to technical, warranty, and service details, this reference guide should get you ready for life with solar. If you happen to have any questions at any time, please feel free to contact us.



## System Details

### Solar Photovoltaic Modules

Your Solar Photovoltaic (PV) modules are a power source (well, the sun is actually). Photovoltaic cells convert solar radiation into usable direct current (DC) electricity. Any time solar radiation is present, the PV cells create a voltage potential. PV modules consist of many PV cells wired together for a usable voltage. When everything is in place, things really start to flow.

On a given sunny day, solar radiation is roughly 1,000 watts per square meter, but this source depends upon your location, atmospheric conditions, Earth's position relative to the sun, and obstructions that might serve to create shade.

As mentioned before, PV module performance is affected by the intensity of sunlight, temperature, and shading.

**Maintenance:** Keep nearby trees trimmed to the extent desirable so they don't shade the PV array. Be sure to remove leaves and debris from the PV modules. Dirt and dust accumulation on the PV modules will reduce power production slightly. Customers who wash their solar modules typically notice about a 1-2% increase in power immediately following the wash, but washing is not necessary. Normal rain and wind should be sufficient to remove dust and debris. Remember to always value safety first! Please also review the PV module owner's manual to familiarize yourself with your PV modules' maintenance instructions and warranty documentation.

### PV Module Racking

PV module racking serves to keep your PV modules in place, wherever they might be installed. There are many PV array mounting methods. Kokosing Solar works with each customer to determine which method is best while balancing cost, site, performance, and customer preference considerations.



The ideal tilt angle in your region for fixed PV arrays is 30 to 35 degrees from horizontal. However, tilt angles of between 10 degrees and 50 degrees are acceptable as performance will not be reduced by more than about 5-10% in these cases. The ideal azimuth angle for fixed PV arrays is 180 degrees (true south), and again, deviations in azimuth angle may be acceptable when well-defined in advance.

## **Combiner Box**

The combiner box consolidates the interconnection of all solar strings and communication equipment into a single enclosure.

## **Inverters**

Inverters are an essential component of any solar panel system. They change DC electricity from the PV array into AC electricity which can be used by your home and/or sold back to the utility company should you have a production surplus at any time.

## **PV kWh Meter**

Your PV kWh meter is a utility grade device that records PV system energy production over time (in kWh). This allows you to accurately record production and, if desired, sell Solar Renewable Energy Credits (SRECs).

## **Disconnect**

The disconnect is a common requirement for utility connection. It allows for a quick system shut down in the event of a local power issue. However, this disconnect is rarely necessary, because inverters will shut down automatically when any key electrical variable is outside of their normal operating range. So, if the utility power goes down, your inverter will shut down accordingly. It can be thought of as a nice bit of insurance in the event of a utility situation requiring local maintenance.



## **Load Center**

The inverter(s) feed electricity into your existing load center. This will supply some of your home's electricity needs and/or provide power back to the utility should you have a surplus. This relationship changes all of the time and is based upon instantaneous inverter power production and required building loads. Your load center is where power is drawn and fed. It is like a gateway for your electrical activities.

## **Utility kWh Meter**

With utility interactive (also called net metering) solar electric systems, electricity flows in and out of your home based upon supply and demand as described above. The meter measures the amount of electricity you use, but with net metering, it can also spin "backwards" when the solar electricity you produce is not being used at the time by your home.

## **Utility**

The utility company is just as you've always known it. The utility company will continue to be an integral part of your daily energy mix. You will establish a net-metering agreement with your utility company, and you will most likely continue to use utility electricity often.



## Monitoring System

Monitoring the performance of your system is a great way to ensure proper operation. To do this, log on to your monitoring portal via the internet or the monitoring app from your smartphone.

Some of the highlighted features of your monitoring portal include:

- Visualization of your system's technical and financial performance, including interactive charts and site layout
- View your PV production daily, weekly, monthly, and yearly to compare your system performance
- Data presented at the module-level, string-level, and system level
- Comprehensive site-level reporting and analysis tools with an option to schedule automatic reports and export reports

Compare this data with the included Solar Pathfinder Report. Seasonal and weather variances are expected, but a significant variance from these trends might indicate an issue.

Your Project Manager or Sales Consultant will walk you through setting up online monitoring for your new PV system.



## Helpful Hints

### Energy Reduction Tips

If you are interested in ways to further reduce your electric bill, there are many resources available:

[www.energystar.gov](http://www.energystar.gov) – Find EnergyStar-rated products. Learn how to improve your home's efficiency.

<http://apps1.eere.energy.gov/consumer/> - A federal consumer's guide to energy efficiency and renewable energy.

<http://www.pickocc.org/smartenergy/energyefficiency.shtml> – An Ohio consumer's guide to energy efficiency and renewable energy.

**Energy Audit:** If you are interested, you can consult a local home energy auditor. There are local energy auditors near you.

[http://www.energysavers.gov/your\\_home/energy\\_audits/index.cfm/mytopic=11160](http://www.energysavers.gov/your_home/energy_audits/index.cfm/mytopic=11160)

### USEFUL LINKS

- Please obtain a W-9 form from [www.irs.gov/pub/irs-pdf/fw9.pdf](http://www.irs.gov/pub/irs-pdf/fw9.pdf) and discuss with your tax professional.
- PUCO applicable codes for Interconnection and net metering: <http://codes.ohio.gov/oac/4901:1-22>



## 2023 Service & Maintenance Rates

The following rates will be applicable for any service work performed by Kokosing Solar. If any part of the service procedure is determined to be covered under either a Kokosing Solar warranty or a manufacturer's equipment warranty, Kokosing Solar will perform all work within the allowances of the warranty. When the warranty allowances are exhausted, Kokosing Solar will follow the guidelines listed below to calculate any invoice due. Depending on the reported issue, either a PV Technician or Electrician will be deployed. Only upon prior approval, if the situation warrants will a Master Electrician be deployed for a service call. Any outstanding invoices will incur a 1.5% late fee per day unless prior arrangements have been made.

### Onsite Rates:

Solar Electrician	\$175.00 (2 hr. min.)
Solar Operations Technician	\$125.00 (2 hr. min.)

Overnight Travel	\$200 per day, per person
Materials	Material cost + 15%
Emergency Service	\$750 base fee plus labor and travel (rates above)

Nights, Weekends, and Overtime – Rates are double the applicable rate and subject to availability.

### Engineering Services:

Structural Engineer	\$325.00 per hour for evaluations, onsite physical review (2 hour minimum)
Electrical Engineer	\$325.00 per hour evaluations, onsite physical review (2 hour minimum)





## **Service & Warranty**

Your system should provide you with years of trouble free service and abundant clean energy from the sun. Photovoltaic systems are virtually maintenance free. While we do not expect you to have any maintenance difficulties we value satisfied customers and stand ready to give you the highest quality service.

### **Ongoing Service and Maintenance expectations**

Please read the owner's manual to familiarize yourself with the system in order to perform basic maintenance and troubleshooting. In the unlikely event that a problem arises, please contact the equipment manufacturer and/or Kokosing Solar at [solarservice@kokosing.biz](mailto:solarservice@kokosing.biz) or 877-OWN-SOLAR.

### **Kokosing Solar Warranty**

Kokosing Solar warrants the installation workmanship at no charge for a period of twenty years from the date of commissioning. All equipment shall be installed according to manufacturer's recommendations in a professional and workman like manner. All warranties are void should tampering and or modification of equipment occur by unauthorized servicers. Kokosing Solar will provide service and maintenance on the system at no charge if the deficiency is found to be of poor workmanship.

### **Manufacturer Warranty**

Please refer to the owner's manuals provided with the system for manufacturer warranty coverages. Kokosing Solar will perform all work on the system within the allowances of the manufacturer's warranty. Kokosing Solar will make a good faith effort to remain within allowances of the manufacturer, however, when the manufacturer's warranty allowance is exhausted Kokosing Solar will follow guidelines and rates set forth in the Kokosing Solar 2022 Service and Maintenance Rates (Rev. 4/5/22) section through the completion of the service procedure.

### **Preventative Maintenance Program**

Contact Kokosing Solar to review maintenance options following the commissioning of the solar system.



## **Bi-Directional Meter**

A bi-directional meter measures the flow of electricity in two directions. It measures how much energy you've consumed and how much solar energy you've fed back into the grid.

### **When do I turn on my solar system?**

It is the policy of Kokosing Solar to advise you to wait until your meter is installed by your utility before you begin the operation of your solar system to avoid any excess generation fees. Kokosing Solar will not be responsible for any fees charged a customer by their utility for operating a system prior to the bi-directional meter placement.

### **Why do I have to wait for the bi-directional meter to be installed?**

Some standard meters may include a feature that prevents it from turning backward and registering reverse power flow. In this case, even though your facility should reduce the amount of electricity you need to purchase, the electricity your facility generates in excess of your current consumption would not be measured or subtracted from your overall electrical energy use.

Unfortunately, turning your solar energy system on before the bidirectional meter is installed can lead to extremely large utility bills. In the case that your solar system is on and the bidirectional meter is not yet installed, you could be charged for the energy your solar system produces.

### **Kokosing Solar's Role**

Requests for bi-directional meter exchanges are emailed to your utility company by Kokosing Solar following installation and inspection of your system.

Typically, the utility company will install the bidirectional meter anywhere from a week to a month post notification. Unfortunately, your solar company does not have control over when the utility will replace your meter. Additionally, your solar installer and you, the homeowner, are not always notified by the utility that the meter has been swapped! This can leave you waiting and checking your meter regularly, in anticipating of turning on your new solar array!



## Bi-Directional Meter, ctd.

(ctd.) At Kokosing Solar, we will be persistent in trying to make this happen! If it takes an unusually long time (over a month) we will file a case with the Public Utilities Commission of Ohio (or your state's Public Utilities Commission) to have them intervene and help accelerate the process.

## The Solar Homeowners Role

Be vigilant! Check on your meter! Because the utility company might not notify you or your installer about the meter swap, it's possible that they install it while you aren't looking. For the first month, go ahead and check on your meter every once in awhile to see if it has been switched out.



## Fine Print About Net Metering & Meter Exchanges Following Installation

Be aware, as a net-metering customer, you are required to report yearly excess generation credits that total \$600 or more to the IRS as miscellaneous income and your utility is required to report this information to you and to the IRS.

Please note that you are responsible for operating the facility safely, in accordance with the terms of the Application/Agreement and the manufacturer's instructions. You also are to perform regular maintenance and inspections in accordance with accepted practices and the manufacturer's instructions.

**What your bi-directional meter will look like**