Solar Electric Frequently Asked Questions

Many customers are wondering if solar electric (photovoltaic, PV) is right for them. There is no one answer, your situation and energy use is unique only to you. This FAQ is designed to increase customer awareness when considering and planning a solar system, and to answer some typical questions customers have after their system is installed.

CONSIDERING A SOLAR ELECTRIC SYSTEM

What is solar electric energy?
Solar energy takes advantage of the sun's rays to generate heat or electricity. It is an infinitely renewable resource and unique for its ability to generate energy in a quiet, clean, and consistent manner.

Who benefits most from solar power?
The most cost-effective installations are in homes with very large electric bills where energy use is in the higher tiered residential energy rates. However, many people install solar for environmental benefits. The payback is fastest for customers with larger bills, yet many solar users value environmental responsibility as much as cost benefits.

Will a rooftop solar electric system lower my bill?
Behavior is key to lowering one's bill. Some solar customers naturally take additional energy conservation measures and create new habits once their system is installed; others tend to use more because they view it as "free" energy. System orientation, shading and keeping the panels clean may also affect actual energy use.

A solar contractor came to my door and said they work with Roseville Electric, is that true?
There are many solar contractors doing business in the City of Roseville. If you choose to do business with a solar contractor, that contractor will "work with" Roseville Electric to submit the proper documentation for your project, but Roseville Electric does not partner with or endorse any particular contractor. Even with the help of a solar contractor, you are ultimately responsible to obtain the proper City of Roseville building permit and submit the required interconnection application and request for rebate paperwork to Roseville Electric. Failure to do so is a violation of Rule 21 and may result in the disconnection of your solar electric system from your electrical panel.

Which solar electric contractor should I use?
When selecting a solar electric contractor it is imperative to do your homework. The Contractors State License Board (www.cslb.ca.gov 800-321-2752) recommends you acquire at least 3 bids from 3 different contractors. In addition, the contractor must be registered on the Go Solar California website

(www.gosolarclalifornia.org) Be proactive – get recommendations from friends or neighbors that have solar and research companies online.

Why is it important to get multiple bids?
As with any major purchase, it's helpful to compare costs and information. Seeking information from multiple professionals can provide constructive advice, set realistic expectations, and help you fine-tune the design that will work best for your application.

What is Rule 21?
Rule 21 is the section of the City of Roseville Municipal code that refers to the interconnection of distributed generation in parallel to the Roseville Electric distribution grid. It discusses the terms and conditions by which a solar system is allowed to operate within city limits. Customers interested in installing a solar system are encouraged to read this document, and will sign the Interconnection Agreement to abide by these rules.

PLANNING FOR A SOLAR SYSTEM

How do I know if solar panels will work on my home or business?
Below are a few tips to consider. You should call at least 3 solar contractors or professional to discuss your particular site and options for adding solar to your location prior to investing in a solar system.

- Orientation: The typical installation should have a southern-facing roof with little or no shade. East and west facing roofs also are good choices, but their yearly output is typically not as large when facing these directions.
- Roof Angle: Most roofs, from flat to 60-degrees can accommodate photovoltaic panels, but an ideal roof slope to optimize energy production from your system would be 20 to 30%. While a solar electric system will produce power at a wide variety of slopes and orientations, it is important to try to maximize your output in relation to the size of the system.
- Shading: Shading photovoltaic panels dramatically reduces their effectiveness, so make sure the exposure is free of trees, buildings or obstructions that could shade the panels or drop debris on them.

Do I need to have an "ideal" exposure to have a solar energy system?
Although an "ideal" exposure increases the effectiveness of a solar electric power system, your home may still work for solar power without having such an "ideal" exposure. Seek advice from a professional solar designer or installer to ensure success.

How large of a system can I install?
You can install a system large enough to offset up to 100% of your previous 12 month electric usage, as measured in kilowatt hours. Some customers choose to offset a portion of the energy, others choose to offset most or all of their energy; this is entirely up to you.

How can I obtain my 12 months of energy usage for the solar contractor?
Business customers – contact Roseville Electric at 79-POWER for a billing history report.
Residential customers - go to the "Residential Solar Rebates" page www.roseville.ca.us/solar and click on the "Home Energy Analyzer" link under the Interconnection Application bullet point. Enter your account number (including the dash, XXXXXX-XXXXX) and click 'Submit.' Under the "My Personal Energy

Use" tab you will find a graph with the last 12 months of usage. Print this report; it is required to be submitted with your solar system application.

I have an existing solar system, can I install more and do I get the same rebates?
You can install more solar on an existing system if your home is still using energy from the electric utility. If you purchased a new home or have installed a small system and want to go larger you will be required to wait 12 months to determine your new energy use levels. The additional solar system must be designed to produce no more than 100% of last 12 months of energy used as billed by the utility. A permit and new interconnection is required for the addition and is eligible for the current rebate amount.

Is a Building Permit required?
Yes, a City of Roseville building permit is required to install a solar system or to modify an existing system. The system must pass a final permit inspection performed by the building department and Roseville Electric before approval for interconnection is issued or rebates are paid. For more information on permitting visit: www.roseville.ca.us/solar.

What is an Interconnection Agreement and how do I get one?
An interconnection Agreement is a legal document between the customer and Roseville Electric that gives permission to the customer to install a system to offset their energy use. The interconnect agreement addresses technical and practical aspects of connecting the solar generator to the grid. It is applied for prior to installing or modifying a solar electric system. And an approval to proceed is required prior to any work being done on the system. Final approval to interconnect is issued after the system has been installed, final documentation has been approved, the system has been inspected, and the customer has read and agreed to all of the terms and conditions of interconnection. To view the interconnection form and review all terms and conditions visit **www.roseville.ca.us/solar.**

Is an Interconnection Agreement required with Roseville Electric?
Yes, an interconnection agreement is required with Roseville Electric. This is separate from the building permit. Failure to obtain one is a violation of the City of Roseville municipal code and may result in daily fines and/or the disconnection of your solar electric system from your electrical panel or complete disconnection of your electric service. To complete the application for interconnection visit: www.roseville.ca.us/solar.

Who gets the rebates or tax incentives?
The Roseville Electric rebate can be directed to whomever the customer designates. The federal tax credit is available to the actual owner of the system. For more information on the federal tax credit, please refer to the Go Solar California website http://www.gosolarcalifornia.ca.gov/consumers/taxcredits.php or consult a tax professional.

FINANCING OPTIONS FOR A PV SYSTEM

What are the financing options for me to obtain a solar electric system?
There are three main options: (1) Purchase, (2) Lease, and (3) Power Purchase Agreement (PPA).

What is the difference between a solar lease and a power purchase agreement (PPA)?

A solar lease and PPA are similar in many ways, but have a few important differences.

- In a lease, the customer leases or "rents" the equipment and is entitled to the benefits of using the system. Some leasing companies will guarantee the minimum production of the system. If the system does not meet its production targets, the company may agree to compensate the property owner.
- In a PPA, the customer agrees to buy the power generated by the system at a set price per kWh. This price may be fixed over the length of the agreement or may include an "escalation schedule" where the price for the power generated increases at an agreed upon rate each year. The solar company estimates the production of the system installed at the residence, but only bills for the actual kilowatt hours (kWh) the system produces to offset your energy use.

Solar Lease	Solar Power Purchase Agreement (PPA)
You "lease" or "rent" the equipment and are entitled to the benefits of using the system, i.e. the free power that the system generates.	You agree to buy the power generated by the system at a set price per kWh. This price could be fixed over the length of your agreement or the terms could include an "escalation schedule" where the price that you are paying for the power generated would increase at agreed upon rates each year.
Some leasing companies will guarantee the minimum production of the system. If the system does not meet its production targets, the company agrees to compensate the property owner.	The solar company estimates the production of the system installed at your property, but you are only required to pay for the actual kilowatt hours (kWh) the system produces.
Residential lease terms are generally for 20 years, but some leases can be shorter ranging between 10-20 years. Commercial leases also can be customized. They generally range from 7 to 15 years.	Terms are generally for 20 years, but some PPAs can be shorter ranging between 10-20 years
You have the option to buy the solar system at any time during the lease term and/or at the end of the term. The purchase prices will be predefined in your contract.	same
The leasing company will monitor the system's performance for the duration of the lease. Because they own the system, they also are responsible for maintaining and repairing it, performing periodic maintenance, replacing inverters, etc.	same
Most companies offer free online, smartphone, or tablet programs to track your system's performance. Many property owners choose to monitor their systems to track metrics such as	same

energy produced, savings, SREC information, carbon avoided, etc. for their personal use or in the case of businesses, for marketing or other reporting purposes.	
The benefits of owning the system, such as purchase rebates, tax credits, the ability to take depreciation, or other incentives would belong to the leasing company.	
If you have a prepaid lease or PPA, many leasing companies will allow you to benefit from the sale of Solar Renewable Energy Credits (SRECs) either directly or through a reduction in the lease amount even though they are the owner of the system.	same
Similar to applying for a loan, you will need to demonstrate that you have a good credit rating (>660) to qualify.	same
Options for terminating the lease in the event you sell your property before the term ends are spelled out in the contact. These options generally include (1) transferring the remainder of the lease to the buyer or (2) you buying the system and selling it along with the property.	same
At the end of the lease term, you can either (1) buy the system at the price predetermined in your contract, (2) have the leasing company remove the system at no cost to you, or (3) leave the system in place and renew the lease.	same

Can someone explain the contract they are offering or tell me the best option for me?
It is important to read all contracts carefully and completely. Because each homeowner's situation is different, only you can discern which option is best for your circumstances.

UTILITY BILLING AND YOUR SOLAR SYSTEM

What is a net meter?

Net meters look very much like other electric meters with one notable exception – they are certified for accuracy when spinning both forwards and backwards recording both the power used from the utility and the surplus generation delivered back to the utility. A net meter is required to provide you with net metering which is a billing method that gives you credit for the excess electricity your solar electric system produces.

What is a net metering rate?

A Net Metering rate is a billing method for customers with solar, wind or solar/wind hybrid system that is connected behind the electric meter to offset electric energy. The net meter rate gives a credit for the excess electricity the solar electric system produces. For additional information visit section 14.24.051 of the City of Roseville municipal code, http://qcode.us/codes/roseville/

How does solar billing work?
Customers who install a solar electric system may be enrolled in monthly or annual billing.

- **Monthly billing** is available to all customers with a solar electric system. Customers receive a monthly utility bill for net energy consumption that is due and payable each month, just like you received prior to the solar system installation.
- **Annual billing** is available for residential customers and small businesses with a maximum yearly demand of 10kW or less. Customers receive a monthly utility bill showing the charges for all services, but they are eligible to delay payment of energy charges (kWh) to once every 12 months. All other charges, including the monthly electric basic service charge, and water, garbage and sewer, are due and payable every month. City of Roseville encourages customers to carefully read their bills and remain current to avoid a potentially large payment due at the end of 12 months. In fact, solar electric customers can continue to pay for energy charges monthly. Every month solar electric customers will see the "**Current Charges**" and the "**Amount Due**" on their monthly utility bill statement. **We encourage customers to pay the larger of the two to avoid a large amount due on the annual true-up bill.** If you prefer to be billed monthly for your net energy consumed please contact the Utility Billing office at 916-774-5300.
- The monthly utility statement will only show the net energy use, it will not show the amount produced by the PV system. This information you must obtain from your inverter or monitoring device.

I have solar but my electric bill still seems high - why is that?
Consider your system size; was it designed to offset a portion of your usage or 100% of your usage? Make sure the solar system is working by checking the inverter or having your solar contractor inspect the system.

You may review your historical energy use to verify the installed system has reduced your energy use by approximately the amount the PV system was designed to produce. If it is not, have your solar contractor inspect the system.

Solar is always most effective on a home or in a business where the building is energy efficient and the residents practice energy efficient behaviors. Behavior is often the key. Some solar customers naturally take on other energy conservation measures once their system is installed; others tend to use more because they view it as "free" energy. See our "Lower my Bill" page www.roseville.ca.us/lowermybill for hints and information.

What happens if I produce more energy than I use?
The majority of solar electric systems in the City of Roseville are too small to generate a significant amount of electricity to offset the total amount of electricity used during that same 12-month time period. Most solar electric customers will not have a credit at the end of the 12 months.

If a residential customer or small business customer with a maximum yearly demand of 10kW or less has a solar electric system that produces more energy than is used during the 12 month billing cycle, the customer will be sent a check for the surplus electricity produced. The compensation rate is paid for

each kWh over produced at the rate published in section 14.24.051 the municipal code http://qcode.us/codes/roseville/

Business customers with 10kW or larger maximum yearly demand are not eligible for surplus energy production payments.

USING YOUR SOLAR SYSTEM

What happens if we lose power, will my solar system still work?
If power from Roseville Electric is lost, your solar electric inverter will automatically disconnect from the electric panel; neither the utility power nor the solar electric system will be available to provide power to you during the outage. The solar electric system will remain disconnected until power has been restore by Roseville Electric, at which time it will automatically reconnect to your electric panel. If the solar electric system does not have battery back-up, there is no power flowing to be used during the power outage.

What happens with my solar electric system if I sell my house and move? Does the solar system stay with the house or can I remove and re-install it on my next house?
Most solar electric systems stay with the home to which they are attached. The cost to remove and reinstall a system is usually offset by the higher resale value of a home that produces some of its own electricity. If you have a lease or PPA agreement, check your contract or contact the financing company for the details on how this is handled.

What happens at night when the sun is down? Do I still get electricity? Does electricity get stored somewhere in my house?
At night a conventional solar electric system goes dormant; and during winter and overcast days the solar system produces less energy than it does during the summer and on clear, sunny days. During these low/no production times, you will get power from the electric utility grid. When the sun comes back out, the system resumes producing energy. Energy is only stored for later use if you have a battery system to store energy installed.

Does having solar on my roof mean I am "off the grid" and not connected to electricity from Roseville Electric?
No. Having solar on your roof does not mean you are "off the grid." To effectively go "off the grid," a home would not be tied to the electric utility, and would require massive battery banks, which can add 40% or more to the cost of a system, and ultra-low energy consumption appliances and energy-efficient lighting would need to be incorporated into the dwelling. Converting a conventional electric service to an "off the grid" service is very expensive.

How do I know if the system is producing?
The inverter's LED screen shows production data, or in some systems monitoring is seen on an indoor display or online. Ask your solar contractor what systems and options are available for energy production monitoring, and if there are any costs involved. And don't forget to routinely monitor the energy produced by your solar electric system after the system is installed!

MAINTAINING YOUR SOLAR SYSTEM

Is maintenance required on a solar system?
Solar systems are low maintenance requiring occasional cleaning, electrical system checks and inverter preventive maintenance checks. Having your system inspected every year or two is recommended. Some companies offer maintenance agreements, or may include maintenance in your contract. Ask your solar professional for guidance on maintaining your system.

Should I wash my solar system to keep it clean?
Exposure to the environment, pollen, dust and infrequent rain may create undesirable conditions for maximizing your solar systems out. When cleaned regularly they will produce the most energy. Frequency of washing should depend on location and weather conditions. Ask your solar professional for guidance on maintaining your system.

How long will the solar electric system last?
Most new solar electric systems have a 20 year warranty. The average system degrades in output by approximately 1% per year. For example, in 20 years, a 1,000 watt system will produce approximately 800 watts of electricity.

SOLAR TERMINOLOGY

- Annual kWh – the amount of energy (kWh) used or produced during a one year period. When sizing a PV system, the PV system production must be lower than the previous 12 months of energy use. Ask to see the CSI EPBB reports showing how many kWh the system is estimated to produce when considering solar and doing your cost analysis.
- Array – several solar modules tied together to form a single structure or group
- Azimuth – solar system position with respect to the cardinal directions of north, south, east, west, measured in degrees; all references with PV are based on true, not magnetic, azimuth. This is an important factor in solar system energy production.
- BIPV – Building Integrated Photovoltaics, PV that is part of the building construction rather than being added to the structure later, such as a solar roof tile.
- CEC AC watts – the system wattage rebates are based on, includes PTC, inverter efficiencies, and installation characteristics of the array.
- CO2 – Carbon Dioxide, a well-known Green House Gas, usually referred to when talking about your "Carbon Footprint".
- CSI – California Solar Initiative authorized by the California Public Utility Commission is the key component of the Go Solar California campaign for California and rebate program for the Investor Owned Utilities. Roseville Electric's rebate program is separate from the CSI program but is based on the key components and calculators offered.
- Electric Panel – the electrical distribution board where the main breaker and branch breakers that feed the home are located.
- Electric Utility – means Roseville Electric
- EPBB (Expected Performance Based Buy-down) – pays an upfront incentive for installing a business customers solar system of less than 10kW, or a residential solar system; payment is based on the CSI's CEC-AC watt rating.
- Grid-connected / Grid-tied – an energy producing PV system which is connected to the electric utility
- Inverter – a device that is installed to electronically convert Direct Current (DC) power into Alternating Current (AC) power required for your homes energy using equipment and for grid connected solar systems. These may be central inverters, string inverters, or micro inverters.

- Insolation – a measure of solar radiation energy, expressed in watt hours per square meter per day. Higher is better for solar system installation energy production.
- Interconnection – the link connecting the customer and Roseville Electric for electric power flow; an interconnection agreement with Roseville Electric is required by all solar customers.
- kWh – kilowatt-hours, describes the amount of energy a 1000 watt load operated for a period of one hour. This term is used when estimating energy use and a solar systems expected annual energy production.
- kW – kilowatt, a unit of power equal to 1000 watt load, which is the designation used for electrical demand. This is also used in sizing solar systems. The system size may be reflected in DC or AC watts.
- Module – is the solar panel
- Net Meter – is an electrical meter that allows power to flow both to and from the home; if the solar system produces more energy than the home needs, the meter will record backwards energy flow.
- PBI (Performance Based Incentives) – incentive payments for business solar systems 10kW CEC-AC watts or larger; paid on a quarterly basis for a given length of time for measured energy production.
- Power Purchase Agreement – is an agreement where the customer purchases energy at a set price per kWh, possibly with annual price escalations; the energy is this type of contract is generated and consumed on the customers site; and the PPA provider installs and maintains the PV system typically at no cost to the home owner.
- PTC DC watts – PVUSA Test Conditions, performance of solar module in real-word conditions as determined by the California Energy Commission (CEC)
- PV – Photovoltaic. Photo – light; Volt – electrical potential.
- Rule 21 – Interconnection Agreement, all customers installing a solar system must abide by these rules and regulations prior to connecting a solar system, and while the system is connected.
- Shading – PV cells are very sensitive to shading, even a small amount of shading may drastically reduce energy production, and even small objects like chimneys, telephone poles, vents may affect solar output. Ask your solar contractor about how to place cells to reduce shade on the array.
- Shading Analysis – is an essential step in PV system design. The solar contractor will use a shading analysis tool to evaluate the site for shading. Each array orientation must have a shading analysis report, and minimal shading is not allowed by Roseville Electric.
- Stand-Alone PV System – a PV system that is independent, not connected to, the electric utility grid. This type of system is more inclined to include batteries to store excess energy when it available and this energy may be used later when it is required.
- STC DC watts – Standard Test Condition, or nameplate rating of the solar module. Contractors often use this number as the system size.
- Tilt / Pitch – the solar tilt angle of installation of the solar system towards the sun, and one of the key elements to optimize energy production.