

SOLAR ELECTRIC

2019 Renewable Energy Programs

Technology Fact Sheet

As a public utility founded on principles of local control, energy conservation, and renewable energy, it is natural for Emerald to support the development of small-scale solar power systems where it is beneficial to all our customer-owners. Emerald offers this incentive program to help Emerald customers with interest in harnessing the power of the sun for their home or business.

What is a solar electric system?

At Emerald, a solar electric system 25 kilowatt (kW) or less in size is considered small-scale. These systems produce electricity usable throughout your home or business offsetting the amount of power purchased from Emerald. When your solar electric system produces more than your home consumes, the surplus is returned to the electric grid and you may receive a credit from Emerald.

Do solar energy systems work in Oregon?

Even the Southern Willamette Valley receives as much sunshine as the average U.S. city. While the solar resource is not as abundant as in the US southwest, many Oregonians are investing in solar electric systems.

Solar systems work best on south- or southwest-facing roofs. The more sun that is available year-round the better, so it is important to minimize shading from trees, buildings, chimneys or gables.



How much do solar energy systems cost?

Solar electric systems range in price depending on a variety of factors including the installation site, system configuration, and contractor. Typically, installed cost is measured in terms of the system capacity. For example, systems can cost from \$3 to \$6 per installed Watt of solar capacity. Incentives and tax credits may cover a portion of the total cost.

Are there solar electric incentives?

Emerald discontinued solar electric incentive in 2019 to evaluate future priorities for program funding. New opportunities will be announced after they're finalized.

What are the benefits? How much savings can you expect?

With a solar electric system, energy production is proportional to system size and solar access. Therefore, it is important to understand what kind of resource you have on your property. In Emerald's service area, a 1 kW solar electric system, optimally oriented with minimal shade, will produce about 1,140 kilowatt-hours (kWh) per year. A typical 3 kW system will supply about 3,420 kWh annually, or 20% of an average customer's annual electricity needs. At current electric retail rates, the value of the energy produced by this average sized system is about \$267 per year. Improving your home's energy efficiency will reduce your energy use so your solar system will meet a higher percentage of your needs. Emerald can provide customized savings estimates based on your home's energy usage and the expected output from a proposed solar electric system.

What equipment makes up a solar energy system?

In most applications, solar electric systems utilize panels mounted on your roof. Photovoltaic panels require about 100 ft² of area for each kW installed. A solar electric system includes an inverter to change the direct current (DC) electricity produced by the panels into alternating current (AC) electricity used by your home or business. The inverter is a little bigger than a briefcase and installed near your breaker panel or outdoors in a shaded location. There are also small inverters, or micro-inverters, that mount on each individual panel.

What is Emerald PUD Net-Metering?

Qualified solar electric systems will be interconnected with Emerald and will be net-metered. Net metering is available to facilities with rated capacities of 25 kW or less. Interconnecting the system lowers the overall cost of the facility because it avoids costly battery storage.

When a solar electric system generates energy, the home uses it first. By using solar electricity, a home reduces the need to purchase energy from Emerald.

When a solar electric system makes more energy than the home is using (on peak summer production days, for example), the surplus energy spills onto the distribution grid for other customers to use. Emerald will install a bi-directional meter that will “spin backwards” during those periods where a customer-generator is producing more electricity than they are consuming. Emerald allows the customer-generator to “bank” any surplus electricity produced for use in lower production months. In some cases, an Emerald customer-generator may have excess banked usage at the end of the year. Emerald donates the value of any unused banked credits to its low-income billing assistance program, Helping Hands. Emerald does not provide cash payments for surplus net metering credits.

- ✓ Call or email Emerald to discuss general characteristics of solar electric systems, your goals for installing a solar electric system, and details about our incentive program. Consider the characteristics of your home or business. What are your budget, roof life, and sun exposure? While there are many great incentives available for customers wishing to go solar, will additional financing be required too?
- ✓ Working from Emerald’s list of registered solar professionals, get bids from multiple contractors. If you are applying for Oregon Department of Energy Tax Credits, then contractor must be listed with them too.
- ✓ Select a contractor and complete the Emerald Application for Generation Interconnection and Customer Incentive provided by your installer. After Emerald receives the completed Application, you and your contractor will receive written pre-approval to proceed with the installation.
- ✓ If you would prefer to have your incentive paid to your contractor and have the contractor deduct it from your upfront installation cost, then specify designation on your Application.
- ✓ Sign and return to Emerald the Net Metering Agreement required for all grid-tied solar electric systems.
- ✓ Your selected installer completes the installation of your system. Typical time for completion ranges significantly based on contractor schedules, but can be up to six to ten weeks.
- ✓ Your system will undergo building and electrical inspections by appropriate jurisdiction. In addition, Emerald will provide a final inspection to ensure the installation meets utility specifications and customer expectations.
- ✓ Emerald releases the incentive once the contractor provides final invoices.

For More Information

Solar Estimate

Find solar installers, estimate costs, benefits and rebates
www.solar-estimate.org

Oregon Department of Energy

www.oregon.gov/ENERGY
 1-800-221-8035

Energy Star

www.energystar.gov

Lane County Land Management Office

www.lanecounty.org/PW_LMD
 (541) 682-3823

Calculating Your Energy Usage

When you generate some of the electricity you use, utility meter readings will not match your total home energy usage. In addition, the utility meter cannot measure how much electricity is generated by your solar electric system. It can only measure the amount of electricity that is sent to or received from your home or business.

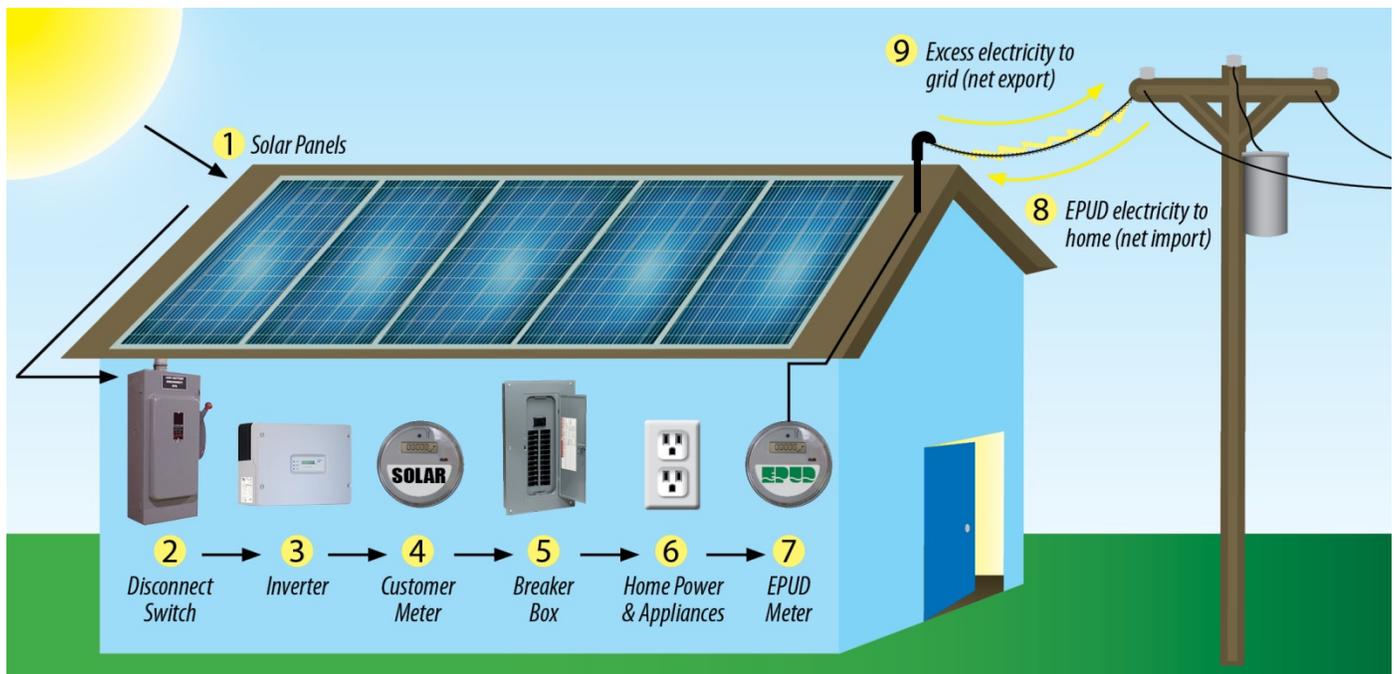
Solar Generation Meter Reading Beginning of Period Matching Bill:	_____	
Solar Generation Meter Reading Ending of Period Matching Bill:	- _____	
Total Solar Electricity Generation:	=	
Energy Consumption Shown on Emerald Bill:	+ _____	
Net Metering Credit Available from Emerald:	- _____	
Total Monthly Energy Usage:	=	

Information Shown on Your Emerald Bi-directional Meter

The display on the bidirectional meter cycles through three different data readings. Like the odometer on your car, these values accumulate from the time of the meter’s installation:

- DL = kilowatt-hours delivered to your home by Emerald
- RC = kilowatt-hours received from your home by Emerald
- NT = net difference between delivered and received kilowatt-hours





Solar Electric System Components

1. **Solar photovoltaic (PV) panels** generate electricity from the sun.
2. Electricity produced by the solar panels passes through a **solar disconnect switch**. This switch is used by your contractor to safely isolate components of the system when maintenance is needed.
3. The electricity passes through an **inverter** where it changes from direct current (DC) power produced by the panels to alternating current (AC) power which is able to be used in the home or business.
4. The electricity passes through the solar system's dedicated **customer generation meter** which records the total generation of the system. This is information for the customer-generator that Emerald does not have access to.
5. The electricity then flows into the **breaker box** and out into the various outlets for use in the home or business. Every kilowatt-hour generated and used at the electric panel reduces your need for power from your utility.
6. The **electricity using devices** (light bulbs, water heaters, space heating, etc.) in a home or business will use solar power when available. When solar is unavailable, these devices will pull power from Emerald.
7. A "bidirectional" **EPUD meter** provided by Emerald will measure the forward and backward flows of electricity. When your home or business requires more electricity than your solar system can provide, Emerald delivers energy at your meter. When your home or business produces more power than it needs, surplus electricity is received by Emerald. The values on this meter will not match the value on the generation meter.
8. If you use more electricity than your system generates, then you'll purchase additional electricity from Emerald to make up the difference. In this case, you're a "**net importer**" of electricity.
9. If you don't use all the electricity that your solar panels generate, the excess electricity spills out onto the electric grid through the bidirectional utility meter making you a "**net exporter**" of electricity.