

Resources

Websites: There are hundreds, but these will set you in the right direction...

Clallam County PUD Utility Services Dept.:

Your Partner in Energy Conservation delivers energy efficiency and conservation programs, incentives and educational outreach. Visit us at 104 Hooker Road in Carlsborg, www.ClallamPUD.net or call: (360) 565-3249.

U.S. DOE: Energy Efficiency & Renewable Energy

These consumer education websites provide a wealth of information on energy efficiency and renewable energy.

www.EnergySavers.gov www.EnergyStar.gov

Solar Capacity Maps

These websites feature maps that illustrate the average daily total solar energy available within a defined area.

- www.NREL.gov/gis/solar.html
- www.Energy.gov/maps/solar-energy-potential
- www.GlobalSolarAtlas.info

Washington State University's (WSU) RESIP Program

An new Washington State renewable energy production incentive program administered by WSU. (See *Credits and Incentives* on reverse side). www.Energy.WSU.edu/RenewableEnergySystemIncentiveProgram.aspx

Solar Washington

This local chapter of the American Solar Energy Society is a non-profit association of PV equipment manufacturers, vendors, professionals, students, and enthusiasts offering solar education outreach. www.SolarWA.org

American Solar Energy Society

ASES promotes national efforts to increase the use of solar energy, energy efficiency and other sustainable technologies in the U.S. through outreach activities such as their SOLAR TODAY magazine, National Solar Conference and National Solar Tour. www.ASES.org

June 2018

Going Solar in Clallam County

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Solar electric systems generate safe, pollution-free renewable energy. Working in tandem with a fully-weatherized, energy efficient home featuring high-efficiency appliances and energy-conserving occupants, photo voltaic (PV) systems can help lower your utility bills, reduce your environmental impact *and* deliver production credits to your utility account and incentive checks to your mailbox.

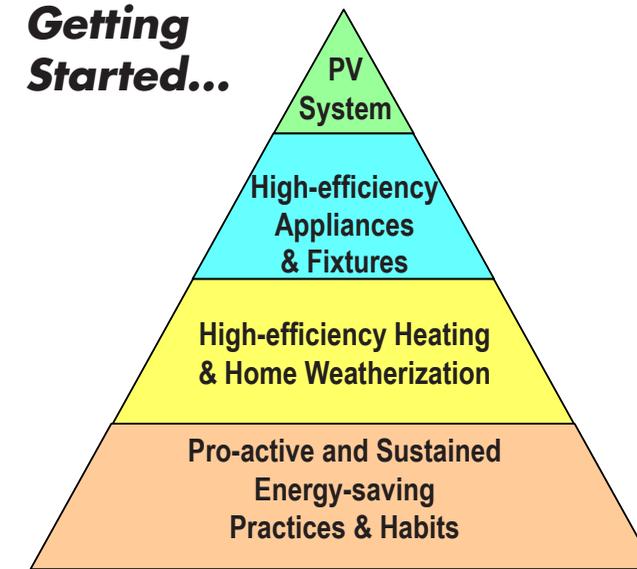
Energy efficiency and conservation measures are the keys that open the door to cost-effective solar energy production. That's because, on average, it's 100% - 250% cheaper to save a Watt of energy through conservation than it is to replace that Watt with solar power. As such, PV systems only make financial sense/cents after air sealing, maximizing insulation, duct-sealing, installing high efficiency appliances, lighting, heating systems, windows, etc..

"You've got to eat your energy-saving vegetables before you can enjoy your solar energy dessert."
PUD Utility Services Advisor

As your partner in conservation, your PUD offers many energy efficiency incentives, programs and informational materials to lower your utility bill while making your home more comfortable year round.

Whether you're exploring *the possibility* of installing a PV system, or about to take the leap, this guide can help you with *Going Solar in Clallam County*.

Getting Started...



Step 1: Make your home as energy efficient as possible by implementing all feasible energy efficiency measures and regularly practicing energy conservation. This will help to ensure maximum return on your investment. Your PUD offers a variety of programs to assist you in this effort, so please contact us *before* getting started.

Step 2: Consider your site's sun exposure. Optimal orientation for PV panels is true South without obstructions. Even minimal shading (e.g., power line shadows) can significantly impact energy production.

Step 3: Evaluate your roof's condition. PV systems are designed to last a minimum of 20 - 25 years. So if your roof needs replacing within the next 5 - 10, replace it first. Note: be sure to explore available solar roofing options, i.e., PV systems that are integrated into roofing materials.

Step 4: Get a site assessment from a certified installer to ensure that your site can support a PV system.

Step 5: Obtain bids from several PV installers; check references. Bids may vary widely. When comparing bids, be sure to compare apples to apples, i.e., systems of the same capacity, composition and warranties.

Step 6: Select a bid and request the installer's help in obtaining utility net-metering and production incentives as well as federal tax incentives.



www.ClallamPUD.net

Terms to Know:

AC Disconnect: a safety device which isolates the PV system's inverter from the grid. Required for all grid-tied systems within the PUD's service area.

DC/AC Inverter: converts the PV array's power to AC.

DC Disconnect: a manual safety device used to cut-off power generated by the PV system during maintenance.

Kilowatt (kW): 1,000 Watts of electrical energy; the unit of energy used by most electric utilities.

Net Meter: a bidirectional meter which shows: 1) PUD energy delivered **to** your premises and 2) energy **from** your premises received by your PUD, indicating "net" energy usage. *Required for our Net-metering Program.*

Photovoltaic (PV): having the ability to convert the sun's energy to electrical energy (DC).

Production Meter: measures the energy generated by your PV system. *Required for RESIP.*

PV Cell: a semiconductor material (*similar to computer chips*) which converts sunlight to electricity (DC) with an efficiency of 10% - 15%. There are (3) main types:

- **Monocrystalline Cell:** cut from a single silicon crystal, the most expensive to produce, offering the greatest efficiency. Rigid, and usually encased in metal-framed glass.
- **Polycrystalline Cell:** cut from a silicon block consisting of many crystals. Less efficient and less expensive than monocrystalline cells, usually encased in metal-framed glass.
- **Amorphous Cell:** created by placing a thin film of non-crystalline silicon onto a variety of surfaces, even flexible ones. This least efficient and least costly PV cell type suffers from declining power output during the first few months after installation, eventually stabilizing. Be sure that price quotes for this panel type are *post-stabilization*.

PV Panel: multiple PV cells linked together, framed. Most are warrantied to produce energy at 80% of their original output when their warranty expires.

PV Array/System: multiple interconnected PV panels. Rooftop arrays are most common, but arrays can also be mounted on poles, verandas, the ground, etc..

Costs, Credits & Incentives



PV System Costs

PV system costs vary due to factors including PV panel type, production and inverter capacity, labor, permit fees, racking, wiring, etc.. Since 2016, new installations in our service area have averaged 7.5 kilowatts (kW), at ~\$4,000/kW, or ~\$28,000 - \$32,000 for a 7 - 8 kW system.

Note: taking advantage of applicable credits/incentives may significantly decrease system costs and pay-back periods.

Credits & Incentives ([details: www.ClallamPUD.net](http://www.ClallamPUD.net))

Net-metering with Wholesale Rate Buy-back

After a PUD Serviceman approves and activates your PV system at the conclusion of our Interconnection Application process, unused electricity generated by your PV system will flow into our grid, and will be credited to your PUD account at the *wholesale* rate (\$0.0385/kWh at time of print).

Renewable Energy System Incentive Program (RESIP)

Through 2021, PUD customers with approved solar, wind and/or biomass energy generation systems may apply for annual incentives ranging from \$0.02 - \$0.21 per kilowatt hour (*up to \$5,000 annually, for up to 8 years*), depending upon the year WSU certifies the system, eligibility for the "Made in Washington Bonus," and available funding.

Federal Tax Credit:

30% for systems placed in service by 12/31/19
26% for systems placed in service 1/1/20 - 12/31/20
22% for systems placed in service 1/1/21 - 12/31/21

Frequently Asked Questions



1) Does "Solar" really work on the Peninsula?

Yes! Because our long summer days compensate for our cloudy winters, the Peninsula averages 3.5 hours of full sun per day -- *or about 70% of Southern California's solar potential*. In fact, the Peninsula has one of the highest percentages of PV systems per capita in the country.

2) How much roof space does a PV system need?

It's roughly a 1:10 ratio; i.e., it takes about 100 ft² of roof area to install a 1,000 watt (1 kW) PV system.

3) I don't have a south-facing roof. Am I out of luck?

Pole and/or ground-mounted PV systems may be an option for you, though these systems are more expensive due to additional labor and materials costs.

4) What's involved in a site assessment?

A certified PV installer will: 1) inspect your site to assess its orientation and solar potential; 2) inspect your home's electrical system to identify how to best install the system; and 3) answer all your questions.

5) How big a PV system do I need?

If your goal is to significantly offset energy costs while minimizing your PV system investment, first identify your annual energy usage by reviewing your last 12 months of utility bills. (*Tip: use our Residential Appliance Energy Usage Guide to itemize energy costs.*) To minimize the size of your PV investment while maximizing overall savings, make your home as energy efficient as possible and practice energy conservation 24/7. Then, size your PV system accordingly.

6) How much energy will my PV system produce?

On the Peninsula, every 1 kW of PV panels generates about 1,000 - 1,200 kilowatt hours (kWh) per year.

7) Do grid-tied PV systems need maintenance?

Since a standard PV system is comprised of PV panels that have a sturdy tempered glass surface (naturally sheds water and dust) mounted 4" - 8" above the roof to prevent debris from building up underneath, they're nearly maintenance free. However, PV systems with solar trackers that optimize energy production have a motor that requires maintenance.

8) Will my system provide power during an outage?

A PV system's DC/AC inverter has a built-in safety to shut down the system if a power outage occurs, preventing the system from sending energy into the grid and endangering crews working to restore power.

9) Should I invest in batteries for my PV system?

If you'd like a back-up power source during outages, an efficient generator will likely serve you better. Battery banks must be replaced every few years, making them both expensive and short-lived. Most power outages in our area occur during winter storms when days are short, severely limiting a PV system's ability to recharge battery banks when they're needed most.

10) What's "Passive" Solar?

Designing buildings such that windows, walls, floors &/or roof store and distribute the sun's heat in winter and minimize it in the summer.