

Open-House 1 hr Tours
9am – 5pm

1 Commercial
1 Grid-Direct Homes
2 Grid-Tied Homes
2 Off-Grid Homes

10th Annual
Alaska Solar Tour
WASILLA
August 11, 2018
Tour Schedule

Timothy Oliver

Tour starts at 9am- TBA
World's largest grassroots solar event is coming to town
Map of sites coming soon at www.AlaskaSolarTour.org

Welcome to the WASILLA Alaska Solar Tour!!! You are invited to join the largest grassroots solar event in the USA... **to be Inspired!!!** ...and to see first-hand how **many folks in Wasilla, AK** are **harnessing the power of the sun and other renewable energies, saving money, creating jobs, and changing the world by living sustainably.**

The **tour is FREE** & no registration is required. Please get a car load of friends and drive around on this **guided tour**, and limit your visit to the time slot listed for privacy of the site owners and in appreciation for opening their doors to us. Please also be respectful of private property and stay within designated parking & walking areas.

This **educational service** is brought to you by **members of our community, Alaska Solar Tour (AST), American Solar Energy Society (ASES),** and company sponsorships listed below.

It's AST's 10th Anniversary with ASES 23rd Annual National Solar Tour.

To learn more check out the resource page in the back and or go to www.AlaskaSolarTour.org



Public Etiquette

If you will be attending the **2018 Homer Alaska Solar Tour**, please read the tour etiquette for the Public's Expectations and Responsibilities below. Please remember we have been cordially invited into local homes & businesses, so please be careful, respectful, and responsible:

Please only visit Tour sites during the tour day and hours specified by the local host.

Please, if the site indicates "Outside viewing only" please do not go onto the property.

Please follow all laws, park safely & legally, and treat persons and property respectfully.

Please do not bring others who may not be able to behave in a proper manner (kids welcome).

Please do not smoke or litter on the tour sites. Remove footwear if asked when entering a home.

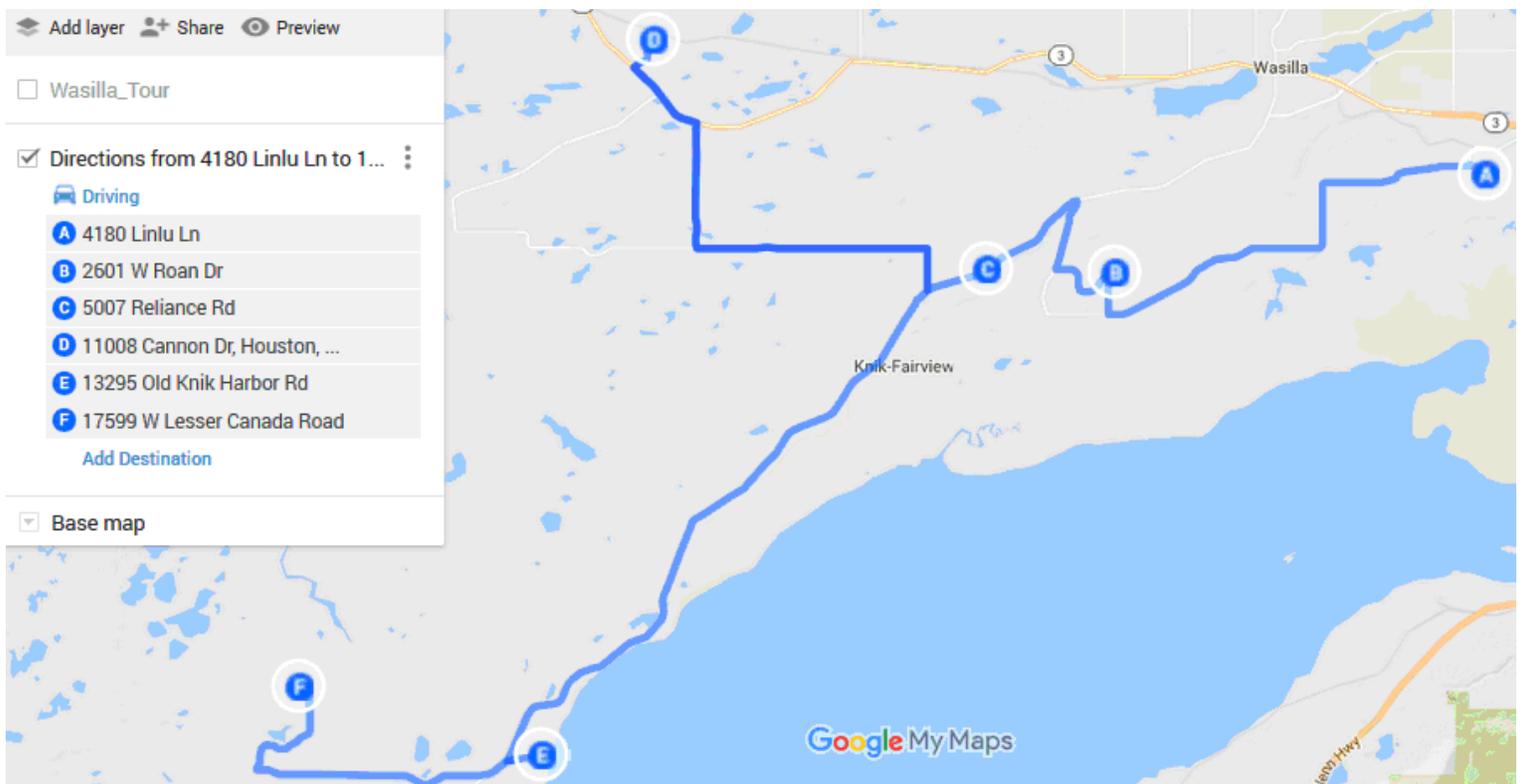
Please be careful. Anyone accessing sites on the roof, or by ladder, stairs, stepladder, stool, or other method does so solely at their own risk. Visitors assume full responsibility for their behavior or actions. Tour hosts or related parties will not be held liable for any injury, fatality, damage or property loss that may occur.

Please expect guides, installers, and representatives who staff tour sites to answer questions to the best of their ability & conduct the tour in a manner appropriate to our educational mission.

Please be assured in the event of inclement weather the tour will still go on, though individual property owners may opt to limit access to site areas or close entirely, in which case we wouldn't be able to warn you.

Please remember neither, community members, installers, Alaska Solar Tour, or ASES, nor any sponsor endorses specific technologies, companies, products, or methods presented during this tour, even though they might offer suggestions to questions.

Please enjoy yourself, and contact us with any questions or comments. Triena 907-830-0775



2018 Wasilla Alaska Solar Tour Schedule

Please start at the first one on this guided tour, as each place is only open about an hour or so. Visit them all or just a few, it's up to you. Each site will only be open during the time slot listed though the tour itself is 9am-5pm. Site hosts and company installers will be there to answer your questions and show you their pride and joy. Please read the **AST Public Etiquette Rules** for the Tour, follow them, learn lots, and have maga amounts of fun.

Join us for coffee and sweets at 845am at the 1st site, and 1pm at the 4th site & 5pm at 7th site for Refreshments

⚙️ **A. 900-1000am 3.54kW Grid-Tied Home**

4180 E Linlu Ln (Subdivision behind Walmart) *-Coffee & Sweets*

- Designed & Installed by Renewable Energy Systems of Alaska 2017
- 3.54kW Roof-mount Solar System - Grid Tied
- 12 – 285W Canadian Solar Mono Panels on Iron Ridge solar racks
- 12 -Enphase IQ6+ micro inverters
- 3:12 Pitch -East/West facing, 6 on each side
- Produces \$710/yr, approx \$60/mo avg (~\$24,500 in 20yrs at current rates)
- Payback approx 11.5 years



⚙️ **B. 1020-1120pm Grid-Direct Multi-Array Home**

2601 Roan Dr. (off KGB and Fairview Lp)

- Design & Installed by Arctic Solar Ventures Corporation
- 5.3kW E-W-S rooftop arrays (grid-direct with net-metering)
- Integrated with gas generator for home backup.
- Provides 50% of annual load.
- Client saves \$20,000 over 10 years.



⚙️ **C. 1140-1240pm REAP Grantee Business**

5007 Reliance Rd (off of KGB rd & Foothills Blvd)

Refreshments Served

- Designed & Installed by Arctic Solar Ventures Corporation
- 5.9kW Commercial Rooftop Array Solar System
- grid-direct with net-metering
- USDA REAP grant awardee
- Provides 20% of annual load.
- System payback is 3 years.
- Saves client \$30,000 over 10 years.



1245-115pm * LUNCH w/ speaker Stephen Trimble

5007 Reliance Rd (Stay n Join us for Lite-Lunch *or brown bag* it to hear a presentation by Stephen Trimble at ASV)

PRESENTATIONS:

Solar Energy Storage basics



⚙️ **D. 130-230pm OFF-GRID 3Bdrm 3Bth Home**

11008 Cannon Dr Houston (Near Gorilla Fireworks)

- Designed & Installed by 907 Solar
- Schneider 48v 6kW inverter
- Ten 250W Roof-mount Solar Panels
- Diesel Generator for Solar Backup
- 8 AGM sealed batteries



⚙️ **E. 300-400pm Residential 4+kW Grid-Tied**

13295 Old Knik Harbor Rd (off KGB rd & Porcupine Rd)

- Designed & Installed by Renewable Energy Systems of Alaska 2018
- 4.72kW Solar System - Grid Tied
- 14 -300W Canadian Solar Mono Panels on Iron Ridge solar racks
- 14 Enphase IQ6+ Micro Inverters
- 12:12 Pitch, SE Facing Panels, multiple surfaces
- Produces \$825/yr, Approx \$70/mo avg (~\$30K in 20yrs @ current rate)
- Payback approx. 11 years



⚙️ **F. 415-515pm OFF-GRID Home**

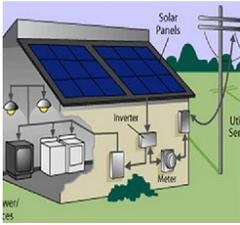
17599 W Lesser Canada Drive (Off KGB Rd & Point McKenzie Rd)

Refreshments Served

- Designed & Installed by 907 Solar
- Magnum 48v 4.4kW Inverter
- Six 300W Panel Pole-mount
- Diesel generator with auto-start for solar backup
- 8 Trojan Flooded Batteries



Clean Energy Economy



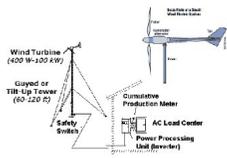
Photovoltaic systems (PV system) use solar panels to convert sunlight into electricity. A system is made up of one or more solar photo-voltaic (PV) panels, an AC/DC power converter (also known as an inverter), a racking system that holds the solar panels, and the interconnections and mounting for the other components. A small PV system may provide energy to a single consumer, or to an isolated device like a lamp or a weather instrument. Large grid-connected PV systems can provide the energy needed by many customers.



Solar thermal energy (STE) is an innovative technology for harnessing solar energy for thermal energy (heat). Solar thermal collectors are classified by the United States Energy Information Administration as low-, medium-, or high-temperature collectors. Low-temperature collectors are flat plates generally used to heat swimming pools. Medium-temperature collectors are also usually flat plates but are used for heating water or air for residential and commercial use. High-temperature collectors concentrate sunlight using mirrors or lenses and are generally used for electric power production.



Geothermal energy is thermal energy generated and stored in the Earth. Thermal energy is the energy that determines the temperature of matter. Geothermal energy has been used for bathing since Paleolithic times and for space heating since ancient Roman times, but it is now better known for electricity generation. Worldwide, about 10,715 megawatts (MW) of geothermal power is online in 24 countries.



Small wind turbines are wind turbines may be as small as a fifty watt generator for boat, caravan, or miniature refrigeration unit. Small units often have direct drive generators, direct current output, lifetime bearings and use a vane to point into the wind. Larger, more costly turbines generally have geared power trains, alternating current output and are actively pointed into the wind. Direct drive generators are also used on some large wind turbines.



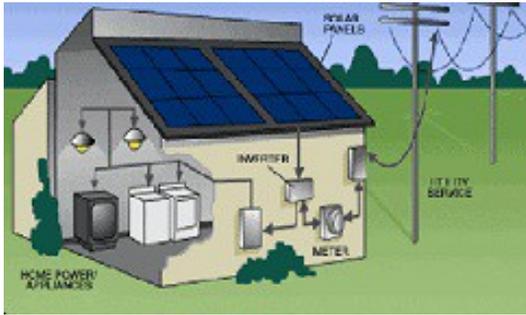
Micro hydro is a type of hydroelectric power that typically produce up to 100 kW of electricity using the natural flow of water. These installations can provide power to an isolated home or small community, or are sometimes connected to electric power networks. There are many of these installations around the world, particularly in developing nations as they can provide an economical source of energy without the purchase of fuel. Micro hydro is frequently accomplished with a pelton wheel for high head, low flow water supply. The installation is often just a small dammed pool, at the top of a waterfall, with several hundred feet of pipe leading to a small generator housing.



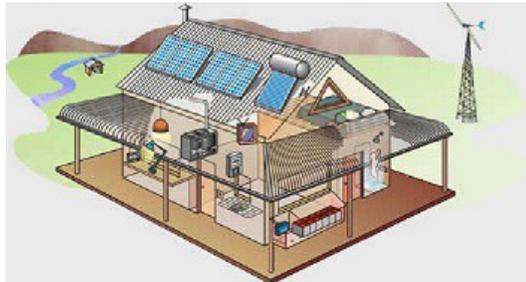
Anaerobic digestion is a series of processes in which microorganisms break down biodegradable material in the absence of oxygen. It is used for industrial or domestic purposes to manage waste and/or to release energy. Anaerobic digestion is widely used as a source of renewable energy. This biogas can be used directly as cooking fuel, in combined heat and power gas engines or up-graded to natural gas-quality biomethane. The use of biogas as a fuel helps to replace Fossil fuels. The nutrient-rich digestate also produced can be used as fertilizer

(Courtesy of 2012 Fairbanks Solar Tour)

Stand Alone VS Grid-Tie PV Systems



To harness this free clean energy of the earth you need storage and there are two distinct ideas about it, although there are many variations and configurations. In a cabin, remote lodge, or frontier community the solution is batteries with a gas generator as back up. This system is independent from any other utility or power sources and thus called “stand alone”. This configuration has many advantages but is primarily set back by initial costs.



The other primary configuration is being connected to the grid. Grid-tie systems use the utility as the energy storage for excess generated power as credits on their accounts. These systems are much cheaper than stand alone systems but if the grid goes down so do you (to protect line-men repairing them). In either configuration combining technologies like wind, and sun are called hybrid power systems.

Solar Thermal (Hot Water) Systems

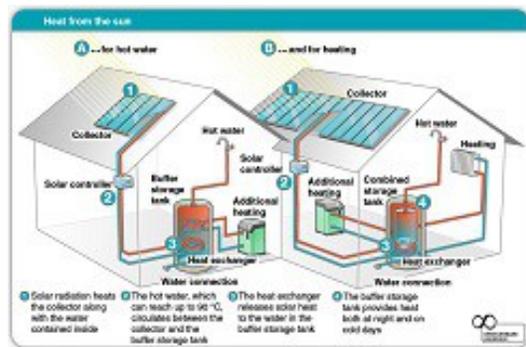
Thermal Solar Collectors turn the sun’s radiation into heat and then transfer that heat to air or water. This process is facilitated by a hot water **solar collector**. There are multiple types of solar thermal collectors:



- **Evacuated tube collectors** are the most efficient but most costly type of hot water solar collectors. These collectors have glass or metal tubes with a vacuum, allowing them to operate well in colder climates.
- **Batch solar water heaters**, also called integral collector-storage systems, have storage tanks or tubes inside an insulated box, the south side of which is glazed to capture the sun’s energy.
- A **flat plate collector** is a box covered by glass or plastic with a metal absorber plate on the bottom. The glazing, or coating, on the absorber plate helps to better absorb and retain heat.
- **Unglazed flat plate collectors**, typically made from rubber, are primarily used for heating pools.

- **Air collectors** are used primarily for space heating in the home.

(Courtesy of <https://solartribune.com> Photo Credit: Erneuerbare Energien)



In Alaska solar hot water is usually build with closed loop convection system with the sun preheating a fluid (glycol). The system uses it to transfer the heat to a storage tank of potable water. This reduces the energy demand on your mechanical heating unit to bring the water to temperature.

Using the sun to heat water has many practical applications in Alaska. The most common and cost effective use of solar hot water heating is in heating water for domestic or commercial use, cutting your costs in this area by up to 60%. It is even possible (through thoughtful design and sufficient storage capacity) to completely heat your home all year

long with solar heat captured in the summer time. Some heating systems are also con-figured to using tubes in the floor for radiant energy with solar as a pre-heating source.

(Courtesy of 2012 Fairbanks Solar Tour)

Wasilla Alaska Solar Tour SPONSORS



Alaska Solar Tour
14371 W. Hollywood Rd
info @alaskasolartour.org
907-830-0775 www.alaskasolartour.org

Alaska Solar Tour (AST) is a local project created by Alaska Center for Appropriate Technology, a local non-profit educational corporation created in 1993 in Wasilla, AK. Phil St. John and Andy Baker, members of ACAT read about ASES National Solar tour and set out to join with AST first tour in 2009. It is now our 10th year anniversary doing it. We have helped 9 different communities and many many sites over the years. A couple hundred people visit them every year. You can read about past solar tours in our Archived Files on each community page, from a 2 panel remote cabin, to a 3 bedroom urban electric solar-direct net-meter home with an electric car and electric car plug in. This year for our 10th year Anniversary we hope to have more communities and many more sites, and add a few new things to our website, like an interactive forum, and a self fillout form for those wanting to share their system without being on a physical tour whether its a remote cabin or just shy. Please check us out at www.AlaskaSolarTour.org



Alaska Center for Appropriate Technology
643 S Lower Rd, Palmer, AK
info @acat.org
www.acat.org

The Alaska Center for Appropriate Technology (ACAT) is a 501(c)(3) non-profit educational corporation chartered in 1993 to promote research and education for Alaskans in sustainable economic development. ACAT is committed to promoting technological advances that can provide both rural and urban communities with diverse, sustainable economies to support future generations. To make educated choices about their future, people need to know what alternatives are available, and the implications of those alternatives. ACAT continually strives to demonstrate how appropriate technology can be applied to promote sustainability, diversify Alaska's economy, and protect the environment.



National Solar Tour
National Company
crixham@ases.org
www.ases.org/national-solar-tour/

National Solar Tour the largest grassroots solar event in the nation, involving about 150,000 participants and 5,000 solar energy sites nationwide.

It offers the opportunity to informally tour innovative green homes and buildings, and see how solar energy can be used efficiently. The tour hopes to inspire people across the nation to make sustainable energy choices that reduce costs, support energy independence, protect against power outages, and reduce carbon emissions. This is a chance to see affordable and practical technologies, in your neighborhood, that benefit the environment and are part of the solution to our nation's energy problems. If you are considering solar energy, please consider visiting a business or resident participating in the National Solar Tour to learn more.



American Solar Energy Society
National Company
info @ases.org
www.ases.org

Established in 1954, ASES is a 501(c)(3) non-profit that advocates for sustainable living and 100% renewable energy by sharing information, events and resource to cultivate community and power progress. We integrate the perspectives of science, industry, policy and citizens. We believe knowledge and community are a powerful combination for change. Our members look to us to sustain the culture required to achieve a 100% renewable energy future. Through our programs, Solar Today Magazine, ASES Solar Conferences, and ASES National Solar Tour, we engage individuals, businesses, and partnering groups to advance these possibilities.



Solar United Neighbors
National Company
info@solarunitedneighbors.org
www.SolarUnitedNeighbors.org

"Solar brings people together," said Anya Schoolman, Solar United Neighbors Executive Director. "We're excited to partner with ASES to expand the reach of this great opportunity to learn about solar." ASES is the nation's leading association of renewable energy professionals and advocates. Solar United Neighbors helps people go solar, join together, and fight for their energy rights. It helps thousands of people go solar every year through bulk purchases known as "solar co-ops" as well as through a paid membership programs. Members receive on-going support for their solar system, discounts to businesses that have solar, and join a community of solar supporters to ensure their investment in solar is protected.

Wasilla Alaska Solar Tour **INSTALLER SPONSORS**



Arctic Solar Ventures Corp **
2000 W Int'l Airport Rd #B3
company @arcticsolarventures.com
907-268-4188 www.arcticsolarventures.com

Arctic Solar Ventures (ASV) founded by lifelong Alaskan, Stephen Trimble in 2015, specializes in grid-direct solar photovoltaic (PV) systems and solid-state battery storage for homes, businesses, and utilities. ASV has built 500kW of grid-direct solar PV systems and was named a Top Solar Contractor in the United States by Solar Power World Magazine in 2018.

ASV is a Certified B-Corp (Triple Bottom-Line business) and a Co-Owner of the Amicus Solar Cooperative.



Renewable Energy Systems of AK **
145 W Dimond Blvd, Anchorage
info @arcticak.com
907-561-7941 www.renewablealaska.com

Renewable Energy Systems of Alaska had its start-up back in 1998. Since then a new owner took over in 2014, continuing its success in Anchorage & expanding to Fairbanks. RES has established itself as the first solar store front in Alaska that stocks everything it sells, including off-grid equipment & grid-tied equipment. As our own contractor we perform & install either system from start to finish; from the simplest to the most complex; residential or commercial.

We have multiple service vehicles at both locations, trained & certified solar installers, on staff electricians, sales & design staff. We stock off-grid inverters, batteries, RV products, grid-tie inverters, solar panel mounting solutions, wind turbines, & virtually everything necessary for any renewable energy application. We are doing our part supporting the industry, between the two stores; and minimizing our carbon footprint using over 40kW of solar panels on our own buildings; which also saves on our electrical energy expenses! RES is the Go-To business in Alaska for every aspect of any renewable energy project you may have!

** These companies help supply the yummy foods that you enjoy during this tour. Please remember to thank them. Thank you.



907 Solar **
17599 W Lesser Canada Dr, Big Lake
coley@907solar.com
(907) 302 2372 www.907solar.com

907 Solar is a Renewable Energy company located in Wasilla. The Owner, Coley Foster has a 2 year Renewable Energy Degree from UAA, and has been designing & installing power systems for 6 years after retiring from the Army. He opened a shop in Wasilla in 2017, conveniently located near customers. All of our staff & installers live Off-Grid, so we have real life experience using what we sell. We can design & install any size off-grid and grid-tie system. One of our grid-tie systems is the 5th largest connected to MEA! We stock a full line of off-grid and grid-tie inverters, solar panels, batteries, charge controllers, generators, and much more. We are able to assist you with any type system from Weekend Cabin to full size commercial grid-tie.



Susitna Energy
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907-337-1300 www.susitnaenergy.com

Susitna Energy Systems is dedicated to the idea of energy independence, not just for our nation as a whole but for each and every Alaskan community and individual. We strive each day to find the best renewable energy and off-grid solutions for our customers as well as offer reliable and affordable heating alternatives. In an ever changing economy we understand that our customers need to feel confident that they are getting the best value for their investment, so it is our goal to help them make the best decisions possible by providing them with the knowledge necessary to make informed decisions. We not only sell these products, but because some of our staff live and work off-grid, Susitna Energy Systems is uniquely qualified to offer real world advice and share real experiences that we have faced when challenged by the divergent climate here in Alaska.

RESOURCES

Alaska Center for Energy and Power
Alaska Energy Authority
Alaska Housing Finance Corporation
Cold Climate Housing Research Center
Renewable Energy Alaska Project
RIC AHFC
The Alaska Center
USDA -Energy
US Dept Energy -NREL

www.uaf.edu/acep
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