Mat-Su Valley Solar Tour

October 6, 2012

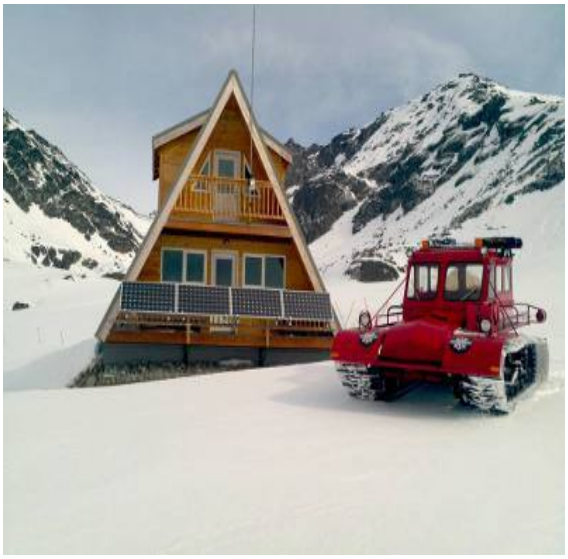
Please respect the open hours set by the homes and businesses

9:00 am – 11:00 am	Hatcher Pass area Gold Cord Mine (off grid, PV) - Trimble Cabin
11:00 am – 2:00 pm	Lazy Mountain area (off grid, PV, wind) - Sykes home; Post home; Buffalo Mine Road (off grid, PV, wind) - Praetorius home Nancy Lake area (solar thermal, ground source heat pump) - Renfro home
2:00 pm – 3:15 pm	Parks Highway, Mile 35 (grid tie PV) - Northstar Electric 5.1kw PV
3:30 pm - 4:30 pm	Palmer-Wasilla Highway (grid tie PV) - Valley Recycling Center 4.3kw PV
4:30 pm – 6:00 pm	Between Parks and PW Hwys (grid tie PV, Solar Thermal) - Bowers home (grid tie PV, solar thermal) - Agate Inn (PV and solar thermal)

9:00 am to 11:00 am

Trimble Cabin - Gold Cord Mine, Hatcher Pass 360-0868

Directions: From Palmer take the Glenn Hwy North and turn left on Palmer Fishhook Road. Continue on Palmer-Fishhook Road approximately 20 miles to the large public parking lot adjacent to Hatcher Pass Lodge. The gate at the North end of the parking lot will be locked. Call 360-0868 and let Fred know that you are in the parking lot. If road conditions permit, Fred will come down and open the gate and allow passage up to the Gold Cord Mine property. If road conditions do not allow, visitors will have to park in the parking lot and walk for 1.5 miles on the road up to the cabin. The cabin is located at 4,000' in the cirque above Independence Mine State Historic Park near the end of the dirt road that switchbacks up the hill to the Gold Cord Mine beyond Independence Mine. Proceed beyond the historic buildings of the Gold Cord Mine for 1/4 mile to the Trimble A-Frame cabin in the center of the valley.



This off-grid cabin is one of the highest regularly occupied buildings in Alaska. The PV system was designed and installed by the owner in 2011 and is powered by a 720 watt four panel solar array consisting of 180 watt mono-crystalline panels, 24 volt AGM battery bank and a 1,500 watt sinewave inverter. The solar charge controller is programmed to divert excess solar power to a 600 watt electric resistance heater that is estimated to supply approximately 25% of the cabin's annual space heating load. The cabin is wired for both 115 VAC and 24 VDC to allow operation without the inverter being used to power small loads. A Pentametric battery monitor along with custom software developed by the owner/installer is used to monitor and log system operation. The system is currently providing for 100% of the cabin's day-to-day electrical loads year round. Bottom line is that off-grid PV works in Alaska, even in the winter at high elevations!

11:00 am to 2:00 pm

Sykes Home - T and T Lane, Palmer 745-6962

Directions: From Palmer take the Old Glenn Hwy past cemetery, cross Matanuska River Bridge, then about ¾ mile get into left turn lane and turn left onto Clark-Wolverine Road. Go ¾ to the "T". Take a right onto Huntley Road. Proceed ¾ mile and take left at Koppenburg Road. Travel ½ mile on Koppenburg and take a right onto unmarked "T&T Lane". It is the main road. Do not continue going on the narrow drive on Koppenburg. Follow T&T Lane up into hayfields along fence. Do

not make any turns. Go to the end of the road, roughly ¾ mile. Keep going along the fence and the road will eventually curve left. House is light brown, 2-story stucco.

Off grid straw bale home with solar tracker PV system.
This unique home is one of the highest in the community, up on Lazy Mountain in Palmer. Totally off grid and proud of it. A very unique home incorporating more sustainable features than I thought existed!

Custom windows bring the world inside.

Lazy House Energy Efficiency

Renewable Fuels

8 solar panels on tracker

Efficient Charge controller

Wind turbine

Battery Bank for storage

Structure/Passive Aspects

House orientation allows sun in winter, protects in summer

Greenhouse can open into house for heat

Straw Bales R57 Insulation

Windows Argon Filled

Columns Beams Local Beatle Kill timbers (unprocessed wood)

Appliances

Icebox instead of fridge, freeze "blue ice" in freezer--Quiet House

No Clothes Dryer--clothesline

No Dishwasher

No Disposal—Composting

High Tech Freezer

Energy Savers (electric)

Compact Fluorescents & LED"s

Power strips on all warm-up appliances, TV's, stereo etc.

No electric Clocks

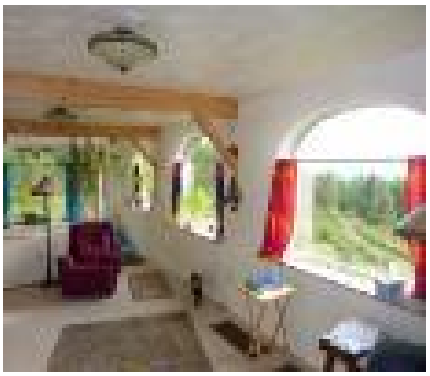
Laptop instead of regular PC

Turn off lights when not in use

Energy Savers (non-electric)

Fewer flushes

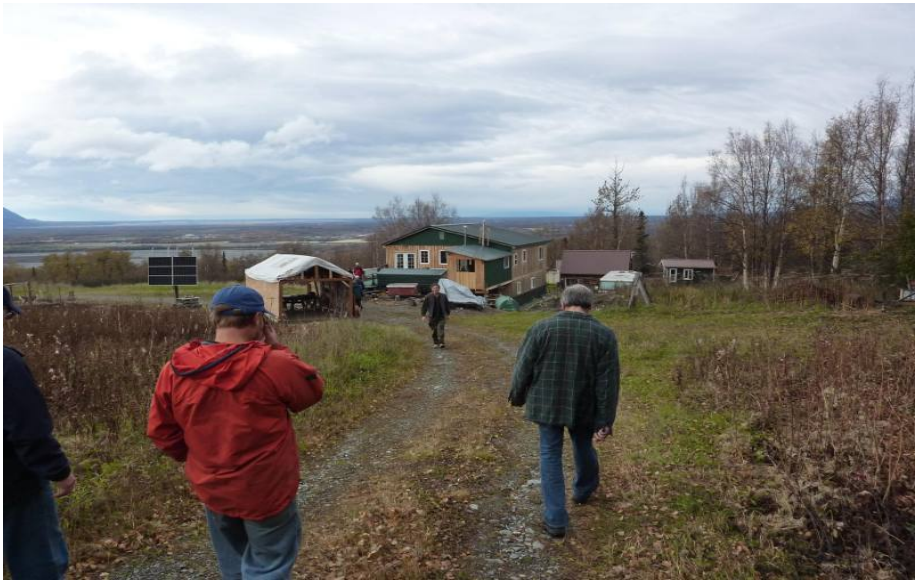
Save water in jugs from dishwater run



11:00 am to 2:00 pm

Post Home - T and T Lane, Palmer 242-1411

Directions: From the Sykes home follow the drive back down the hill a short distance. The Post Home is on the right.



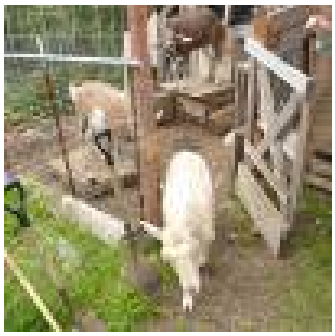
Home was built in 2008-2010. Walls are 9 inches thick with foam and fiberglass insulation. Roof is R50 blown in fiberglass. Off the power grid: Electricity supplied by 6 solar panels with az and elevation tracking. Generator backup for winter operation (uses approx. 25 gallons of gas per month in winter). Heat supplied by wood stove (approx. 3 cords per year) and fuel oil drip furnace (approx. 400 gallons per yr). Hot water supplied by tankless propane heater (approx. 100 lbs per year)

11:00 am to 2:00 pm

Praetorius & Culhane Home - Oceanview Road, Palmer (Buffalo Mine Road area) 745-4747

Directions: From Palmer go north on the Glenn Highway, 3.5 miles past Fishhook, past Soapstone. Turn left on Buffalo Mine Road. Go 3.5 miles on buffalo Mine Road (past Moose Wallow Ave) to Murphy Road. Go 1.5 miles (past Ridgerunner Circle) to Oceanview Road. Turn right on Oceanview Road and their house is the first on the left (look for metal gate and split rail fence).





Pete and Alys have both a wind turbine and solar panels at their home. They raise horses and goats, and have a huge garden with small greenhouse and a 20x32' high tunnel. They have just completed a composting facility to handle the animal waste.

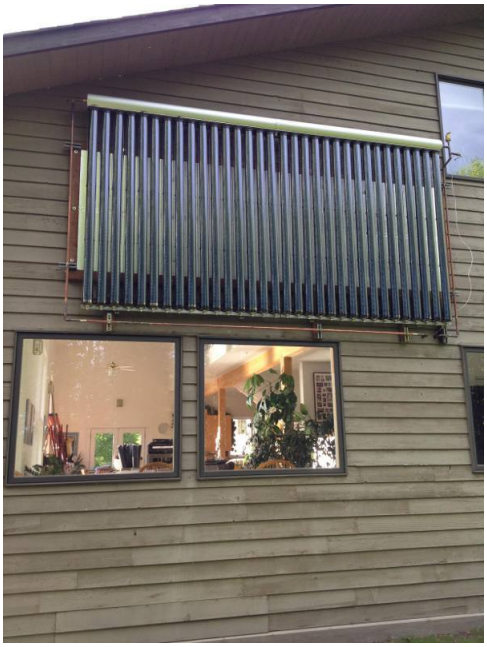
This small neighborhood has 13 full-time residents and several recreational cabins. Of the full-time residents, nearly all rely on some level of solar power.

11:00 am to 2:00 pm

Renfro Home - 22109 Bren Bear Court on Nancy Lake

Directions: Take a hard left on the parks Highway at mile 66.5 at the Polaris shop. Take the third right on Bren Bear Court. Take the first driveway on the right.

Chuck Renfro's system has a 32 evacuated tube solar collector. An 80 gallon Oventrop dual exchanger solar tank. The tank is powered not only by solar but with a ground source heat pump system and electric resistance element for backup. Chuck's strategy is to dump excess solar heat into his 360 gallons of heat storage. A future addition will additionally dump excessive heat into the source field of his GSHP system.



2:00 pm to 3:15 pm

Northstar Electric Co. - 5956 E Shop Circle, Palmer (Parks Hwy at Hyer Rd) 357-5222 360-5159

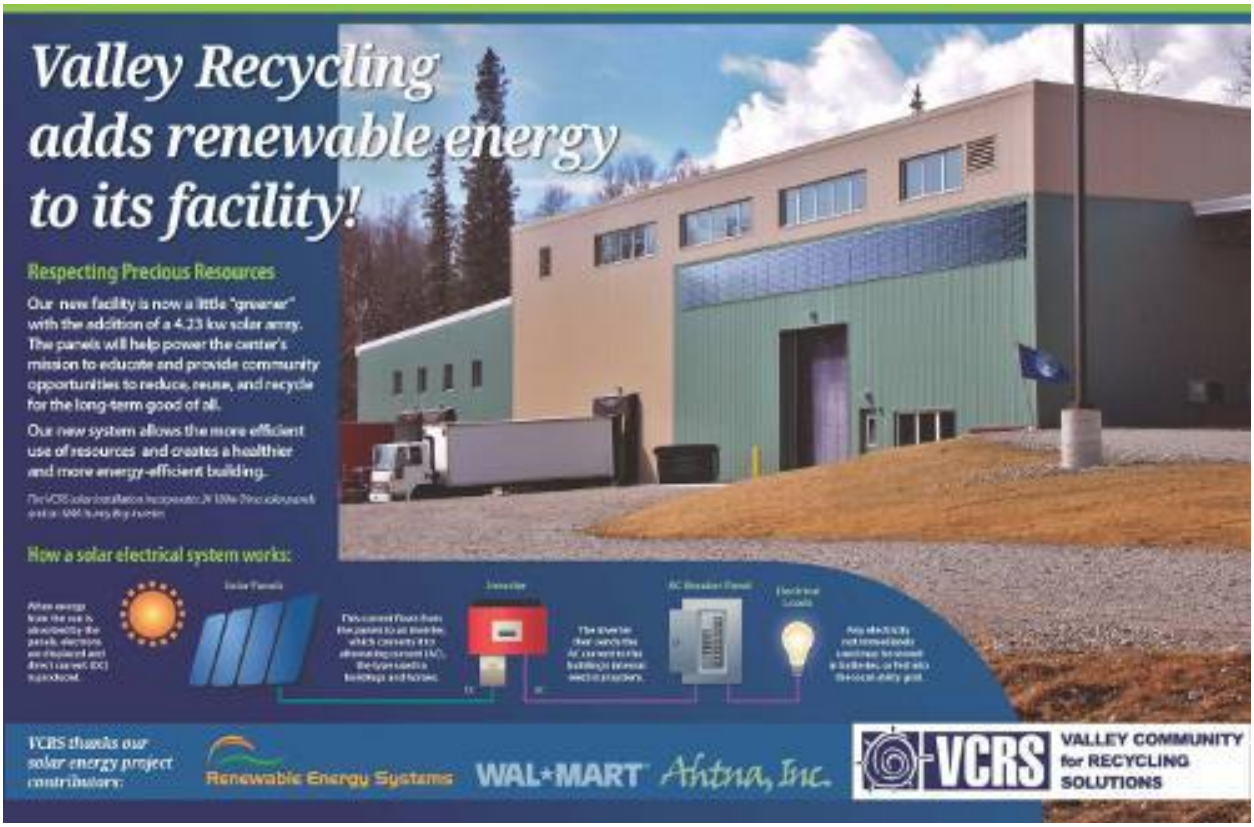
Directions: Take the Parks Highway Hyer Road exit. Turn on to Hyer Road and pass the Harley Store. Take the first right on to E. Blue Lupine (highway access road). Follow Blue Lupine east and turn left on E. Updraft Road. Then turn right on E. Shop Circle.

A new 3,500sf Office and Warehouse for Northstar Electric. The Office section has 2x6 with 2x2 furring to create a super-insulated shell and the Warehouse is 2x8. The Office is designed as a white or reflective box to minimize cooling and the Warehouse is designed as a black or absorbant box to ease the heating load. The electrical and mechanical components in the project are also highly energy-efficient. The building provides significant energy savings compared to a building that meets current code. Total gas savings are approximately 35%, total electric savings could be as much as 50% and total cost savings are approximately 40%. The owners have installed a 5.17kw Photovoltaic array that offsets much of their electrical load.

3:30 pm to 4:30 pm

Valley Recycling for Community Solutions – 49th State St., Palmer-Wasilla Hwy 745-5544

Directions: From the stop light on the Palmer-Wasilla Highway, turn south on to 49th State Street. (49th State Street is located between Trunk Road and Palmer.) Travel toward the Mat-Su Central Landfill. Turn right just before entering the landfill scales. The Recycling Center is on the left just past the animal shelter.



A 23,611sf super-efficient building shell for the new Matanuska-Susitna Borough valley recycling center. Sustainable features on the project include: siting for sun, use of natural contours, high levels of insulation (R45 walls and roof), recycled materials, indoor air quality design, low VOC finishes, natural daylighting, energy efficient mechanical and electrical systems. The project is designed to use 50% less energy than a code-standard building, saving 60% gas use, 79% exterior lighting, 50% interior lighting, 50% ventilations fans and 20% hot water heating. The $3.65 million project is pursuing a LEED Gold certification level. Renewable Energy Solutions installed a 4.23kw solar array spring that helps to offset the facilities electric use.

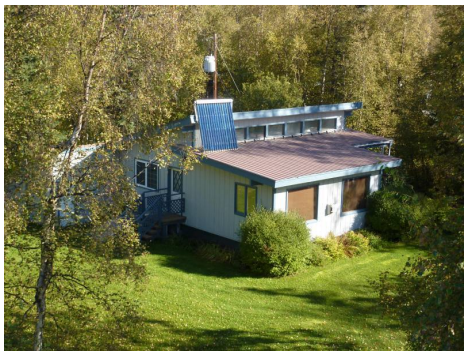
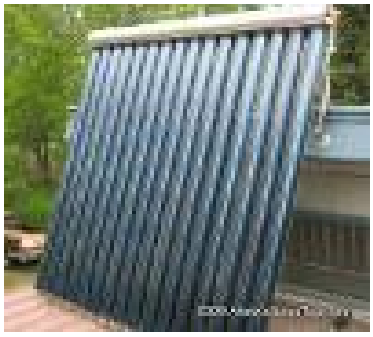
4:30 pm to 6:00 pm

Agate Inn and Bowers Home - 4725 Begich Circle, Wasilla 373-2290

Directions: The Agate Inn is located off Begich Drive between the Palmer-Wasilla Hwy and Parks Highway, one mile east of Seward Meridian Road.

From North Star Electric (2.3 miles): Follow E. Blue Lupine (Parks Highway access road) west toward Wasilla. Cross Hyer Road and proceed to the top of the hill. Turn right on to Hay Street. At the end of Hay Street turn left on to Dimond Way. Take the second right on to Begich Drive. Follow Begich Drive up the hill and around the curve to the last road on the right, Begich Circle (just before the Palmer-Wasilla Hwy). Go to the end of Begich Circle and take the last drive on the right. Park in the parking lot to the left of the driveway.

From Wasilla or Palmer via the Palmer-Wasilla Highway: Turn on to Begich Drive. Begich Drive is located one mile east of Seward Meridian Road, across from the Valley Special Event Store. The Agate Inn sign is on the corner. Turn immediately left on to Begich Circle. Go to the end of Begich Circle and take the last drive on the right. Park in the parking lot to the left of the driveway.

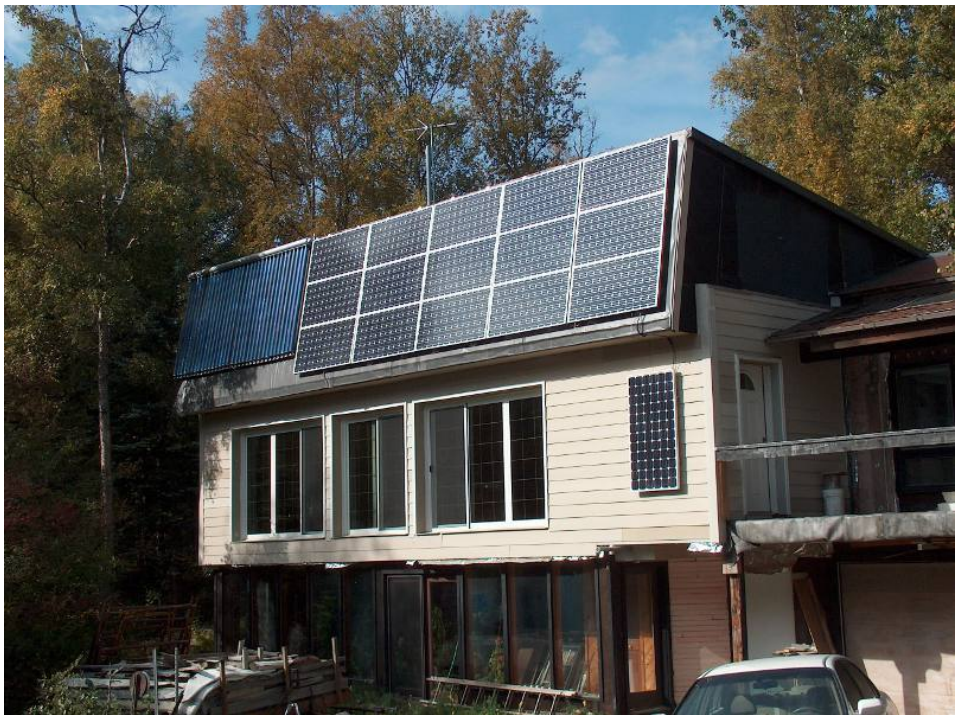




Solar Thermal: Agate Inn Cottage
Solar Heating with 16 Sunda evacuated tubes, 40 gallon indirect heat exchange tank, and Delta Sol controller and Laing Pump. This system eliminates half of the space heating and hot water expense for this building.

Solar Electric: Agate Inn Meeting Room and Guest House.

In the reindeer pen is a 1500 watt solar array on a Wattsun dual axis tracker feeding an Outback 24 volt, 3.5 kw sine wave Inverter and charge controller. Energy storage consists of 18 - 12 volt AGM (Absorbed Glass Mat) lead acid batteries. Installed by owner and George Menard of Invertech Alaska. Automatic wind park switch is on order and grid tie to MEA is pending.

All the Agate Inn buildings are undergoing upgrades with exterior insulation wrap systems ("remote wall type"), LED lighting and energy efficient appliances. Additional solar thermal and solar electric systems are scheduled for installation in 2013.
The Bowers' home is located on the far side of the Agate Inn.



Originally built in the late 1970s with 2 x 6 construction, the home is being remodeled. The roof was raised to add solar thermal and PV systems and to attain R70 ceiling. A six inch exterior insulation wrap of all exterior walls provides R50 or more. All windows were replaced with triple pane fiberglass that average R7.

Since 2007, half the home was supplied with a 1,500 watt solar PV system on dual axis tracker. Excess solar is stored in 12, L16 deep cycled lead acid batteries, 24 volt system. Each battery is 6 volt, 390 amp hours each. The system has an Outback grid-tie FX inverter/charger, 3.5 kw, 24 VDC. The system takes power from the grid when no solar is available or when batteries fall below 24.2 volts. The system has supplied 1,500 kw per year from solar. The dual axis tracker is ¼ mile from the home and is the weak link in the system. Mat-Su Valley winds force placing the tracker in parked mode much of September through May.

In August, 2011 sixteen 180 watt panels, 2.8 kw with eight Enphase 240 VAC, back of panel mounted inverters were installed on the home. The new system is grid tied to MEA and part of the new net metering system regulations.

The solar thermal hot water system consists of a roof mounted, 32 tube vacuum system that stores hot water in a 2,000 gallon R60 plus insulated tank. The system was activated in August, 2011. Ultimately it will be used to input or use hot water for two different sources. The goal is for the natural gas boiler to become redundant.

The solar PV and the solar thermal systems are mounted at 80 degrees facing true south.