

Net-zero and Near Net-zero Homes in Jefferson County

119% Energy for house produced on site

Location: 450 35th St., Port Townsend (PT EcoVillage)

Contact: Viki Sonntag (vikis@ecopraxis.org)

Year Built: 2013

Living area: 916 sq ft heated; 1096 total

Solar Array: 4.5 KW generates ~ 5182 kWh annually

Layout: Single floor, open plan with one bedroom, large office to south, guest nook and grandkid's loft



Construction Details

- Passive solar design for both heat and light
- Structurally insulated panel construction with insulated on-grade slab foundation (6" of foam beneath slab)
- 6" thick wall panels, R25; 10" thick roof panels, R 40
- High efficiency windows and casings: U-Value of .15 to .17; SHGC of .44 on south windows
- Ductless heat pump
- Hybrid induction stove
- Average daily energy consumption 12.2 Kwh/day compared 18.1 kWh/day regional average

100% Energy for house produced on site



Location: In the Port Townsend EcoVillage, 335 37th St, Port Townsend 98368

Contact: Kees Kolff, kkolff@olympus.net

Year Built: 2012

Living area: 1200 sq ft heated space, 100 sq ft unheated entryway with community-shared laundry, 100 sq ft unheated sunroom. Currently houses 4 adults.

Solar Array: 6.8KW system on shop generates ~ 7600 KWh annually

Layout: Downstairs: 800 sq ft living, dining, kitchen, bedroom, study, full bathroom

Upstairs: 400 sq ft, vaulted ceiling, open loft, wet-bar, bathroom with shower and tub

Construction Details

- 12" thick double wall system with minimal thermal bridging, 18" roof trusses
- 2" spray foam + fiberglass gives R40 walls and R60 roof
- 6" foam under slab, R 24
- All windows triple pane
- Heat recovery ventilator transfers heat from exhaust air to incoming air that is preheated in sunroom and by travel through a Trombe Wall with 48 gallons of solar heated water.
- House heated with single 100 W oil filled electric towel rack + 50 gallons propane per year.
- Annual electricity use ~ 7,000 KWh per year over past 2 yrs., includes community laundry use by 5 families and small guest house.

94% Energy for house produced on site



Location: Castle Hill Neighborhood

Contact: sonja@l2020.org

Year Built: 1979

Solar Array: 6.3 kW produces approximately 7270 kWh annually

Layout: 1600 sq ft with 3 bedrooms on one level

Energy Efficiency Features:

- Dual Head Daiken Heat Pump Heating System
- Heat Pump Water Heater
- Solar array produces all but 434 kWh annually

More than 100% energy for ADU generated on site



Shop/ADU

Risley/Knecht, 1571 Anderson Lk. Rd.

Built in 2013

Shop: 700 sq. ft

ADU: 1100 sq. ft.

The shop is double wall construction, R-45 blown-in, for noise reduction. The ADU is standard construction and insulation. Our residence (partly visible at far left) is 1800 sq ft and was first permitted in 1995, standard insulation, but with a large thermal mass chimney that stores heat. It has an extra flue with two variable speed 180 CFM fans which move heat from the ceiling to the floor.

Distributed generation: 9.72 kW grid-tied solar. We weren't using all the electricity we were producing, so we leased an electric car and put 1300W of narrow spectrum LED lights in one of our greenhouses. Also, we generate all heating on site burning forest derived bio-fuels harvested sustainably. Because this is a heavily forested area and very windy, we obtain most of our heating fuel from blowdown on the property and wood scraps from the shop.

Distributed storage: Although we are grid tied, in the event of a power outage the electric car has 123 miles of stored automobility, and the freezer can stay frozen for at least 100 hr. In summer, the chimney in the residence keeps the house warm overnight, and the air compressor in the shop can hold enough air to fill a tire in an emergency.

75% Energy for house produced on site

Location: 1519 Corona St, Port Townsend 98368

Contact: Tom Engel engel249@gmail.com

Year Built: 2011

Living area: 1500 sq ft

Solar Array: 4560 W generates ~ 5250 kWh annually

Layout

Downstairs: living, dining, kitchen, bedroom, study, bathroom

Upstairs: bedroom, bathroom 2 open office areas, laundry, mechanical room



Construction Details

- Structurally insulated panel construction with high density foam
- 10" thick wall panels, R48; 12" thick roof panels, R 58
- 10" foam under slab, R40
- All south, west and east windows triple pane; north facing windows quadruple pane
- Energy recovery ventilator transfers heat from exhaust air to incoming air
- No furnace needed; house heated with single 1500 W oil filled electric radiator
- Annual heating energy ~ 2750 kWh