Volume 5, Issue 1
Special Issue

Spring 2005

Olympic RE News

Olympic Energy Systems, Inc. 907 - 19th Street Port Townsend, WA 98368 (360) 379-2536

Renewable Energy

Solar
Wind
Micro Hydro
Geothermal
Biomass/fuels
Efficiency

Hydro System Specs

- 140 Feet of HEAD
  Buried Pipeline (750 feet)
- 50 - 150+ gpm FLOW
  Run of the River
- 1,500 Watt Output
  Outputs to electric heaters, displacing 250 gallons/year fuel oil usage
- 12 Year Payback
  Cost Avoidance basis
- 20+ Year Service Life
  Civil Works last longer, to 50 years

Inside this issue:

North Cascades Hydro :
Small but Clean and Dependable

A Skagit County farm receives a USDA Rural Development Grant to adopt clean renewable hydro power to improve energy use efficiency.

With long term plans for green houses, composting, rock crushing, wood finishing, educational facilities, and trout processing, the William C. Porter Farm Company will need energy. Finding the energy requires only a glance out the window, where two streams are capable of providing over 200 Kilowatts of power. A near term goal of reducing the consumption of fuel oil for heating the farm's main house has indeed been achieved. A 1500 Watt hydroelectric system powers electric radiator heaters continuously in winter, allowing an annual savings of over 250 gallons of fuel oil and 2000 KWh of electricity. Olympic Energy Systems, Inc. of Port Townsend developed the small hydro system, a standalone, battery-based, pelton-wheel turbine system capable of generating over 1500 Watts. The tailrace sources water to an existing trout pond. A Rural Development Grant from the USDA financed a portion of the system cost. More important than paying for itself through avoiding the purchase of utility power and fuel oil, the system reduces greenhouse gas emissions and directly eases the US reliance on imported oil.

Hardware Specifications

APM 3600 Pelton Turbine/Gen
Dyno L-16 Lead-Acid Batteries
48 Volt System Voltage (Battery)
Trace 4048 Inverter (DC to AC)
Trace C40 (Load) Controller
Air Diversion Load (for excess)
4 inch PVC Schedule 40 Penstock
4 inch PVC Shut Off Valves (2)
16x16x6 inch PVC Catch Basin (Tailrace Well)
6 inch PVC Pipeline (Tailrace)
Wood Diversion Intake (existing)
Underground Feeder Cable
Shut Off Switches w/ Breakers
Wood Powerhouse on treated skids
Dedicated AC Receptacle in house
Aerial Transmission Line

Basic construction took place in January 2005. If run all year, which is feasible, the entire system can pay back in 10 years, while saving thousands of gallons of fuel oil. Another advantage of a standalone hydroelectric system is security – against utility power outages and against utility price hikes.

The Porter Farm is fortunate to have a fairly continuous flow of water from the source stream, with rainfall affecting flow on an average basis rather than directly. The system can run autonomously for several days or weeks or even months. Maintenance consists of checking battery water levels every few months and changing the generator brushes every few years—your own power plant.

News and Announcements

WHAT	WHEN	WHERE
Port Townsend Energy Group	1st/3rd Wednesdays 6:30	TBA in PT
Jefferson County Fair	August 2005	Fairgrounds in PT
Northwest RE Festival	September 2005	Walla Walla, WA

WHO WE ARE—Olympic Energy Systems, Inc.

Olympic Energy Systems, Inc. was founded by an electrical engineer in 2001 as a renewable energy consulting firm specializing in solar photovoltaic design. The company can assist in the application of a variety of alternative and clean energy technologies—solar, wind, micro-hydro, fuels, energy efficiency and energy management. Company goals are common to all clients:

Optimum Performance

Positive Economic Return

True Sustainability

Company operations are located in Port Townsend, Washington and primarily serve the North Olympic Peninsula and other portions of the state. Olympic Energy Systems uses local licensed contractors for installation. Fees are paid only upon successful project completion, which reduces the inherent risks of high tech solar to the clients.

The founder, Jonathan Clemens, relocated from Texas, where he was involved in renewable energy activities. Serving on the board of the Texas Solar Energy Society (TxSES) proved a valuable experience for him. TxSES and the Texas Renewable Energy Industries Association (TREIA) hosts the annual Renewable Energy Roundup and Sustainability Fair in Fredericksburg, TX, where Jonathan has spoken about the Economics of Renewable Energy.

FREE Site, Cost, and Economic Assessments

For more information, contact:

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Jonathan with Chris Stafford, an architect member of Green Homes USA

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BOOK REVIEW—"American Statesman" © 1883 {not a misprint}

When Thomas Jefferson traveled, he walked, rode a horse, or sailed on a ship. The dozens of trips between his home state of Virginia and the nation's capital (originally in Philadelphia) during his presidency, the trips as Minister to France, the trips as Governor to Richmond, and the cross county hikes to the House of Burgesses consumed only renewable energy and not a drop of petroleum oil.

Editor John T. Morse Jr. portrays Jefferson's life story, written works, and philosophical beliefs in "American Statesman". One reads numerous quotes from a time when the record was usually written first-hand by the person of historical interest, in logs, diaries, letters, and published articles and pamphlets.

"The greatest service which can be rendered to any country is, to add a useful plant to its culture, especially a bread grain; next in value to bread is [olive] oil." *Thomas Jefferson*

States rights, a "living" Constitution, natural philosophy, family agriculture, public education, and utility are some of the concepts TJ embraced. His lifetime accomplishments are not on a short list:

Disestablishment of the state church in Virginia
Prohibition of the importation of slaves (1778)
Drafting of the Declaration of Independence
Importation of olive plants from Marseilles into South Caroline and Georgia
Louisiana Purchase (1803)

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H_2O <==> $2H^+ + 2e^- + O$ (with 1.229 volts...where do we find them volts? Hmm. Try looking up.)

In 1803, we expended 1 calorie of energy to produce 10 calories of food. In 2003, we (in the "developed countries") expend 10 calories of energy to produce 1 calorie of food!

Would Jefferson be impressed?

Check out the great workshops at Solar Energy International's website:
www.sei.org

The San Juan Series occurs in Spring and Fall annually.

Amtrak—it may take awhile, but it gets you there energy efficiently

Amtrak began service on May 1, 1971, under the official name of National Railroad Passenger Corporation, growing from 25 to 19,700 employees by 2004. Amtrak serves over 500 stations in 46 states, operates over 22,000 route miles (650 owned) and up to 300 trains per day, handling more than 25 million passengers a year. Amtrak trains run every minute of the year. Subsidies support 40-50% of its operating costs.

The editor (and founder of OES) rode Amtrak to his hometown of Sandusky, Ohio in December 2004. The *Empire Builder* runs daily between Seattle and Chicago in comfort, grace, and style, while saving fuel on a per person basis in comparison to flying the same distance. You see the country, rest, read books, meet people, and eat fresh prepared food, served with real silverware, unseen on airplanes for years. Mmm.

About everyone has heard about the taxpayer subsidies to Amtrak, having ranged in recent years from $500M to $1.2 B per year. The US subsidizes oil and natural gas drilling ($Billions), highway building ($Billions), and air travel and security ($Billions). The US taxpayer subsidizes the enormous energy consumption of cars, trucks, and airplanes, paying the fewest dollars to the most energy efficient transportation system in the country—Amtrak. The future of train travel will be secure as long as energy is not secure. Hmm.

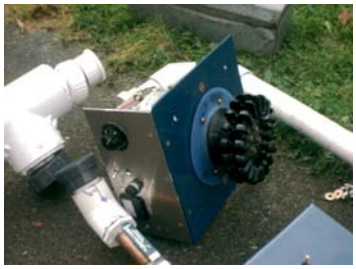
See next page for snapshots of the construction...

Two can travel round trip cross country with a Sleeper room for about $1000—on Amtrak!

N. Cascades Hydro Electric Project Construction Winter 2004 – Spring 2005

Water Intake at a height of 140 above the powerhouse. Large debris is kept out of the intake by a cover, by a diversion wall, and by the momentum in the flow to the side. The housing acts as a settling tank for sand, silt, and other sediment.

Penstock approach to the Powerhouse; depth varies 2 to 4 feet. Thrust Block.



APM 3600 Pelton Wheel Turbine/Generator Sub-assembly. The turbine was built by Alternative Power & Machine of Grants Pass, Oregon.

Using a back hoe is not the only way to dig, for sometimes is still done by hand.

Tailrace Well—a standard 16x16x6 inch PVC Catch Basin. Installed under the Powerhouse, concrete is later poured inside the well, up to the point of exit to the 6 inch line.

Shut Off Valve on the Penstock, about 45 feet from the Powerhouse. The pipeline still needs to be buried.

Connection to the main water line.
Note the thrust block cable, which counters a force of over 600 pounds.

Turbine installed—it's wet because of expected leaks, later fixed with a little silicone gel. The piping moves150 gallons per minute at 50 psi.

The equipment rack is nearing completion, awaiting a trip to the hardware store for more metal flexible tubing for the wiring to the Air Diversion Load on the far wall.

Outflow side of the Powerhouse. The turbine assembly is ready for installation.

The mounting frame for the turbine assembly. Below is the Tailrace Well. Literally, the design required fitting a square "peg" into a round hole.

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The solution on the horizon

JOIN THE
AMERICAN SOLAR ENERGY SOCIETY
WWW.ASES.ORG

Odds and Ends (when finishing, it's just the beginning…)

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Lewis & Clark Expedition (1805)
Governor of Virginia (war)
Minister to France
Secretary of State (US) under President Washington
President (3rd US, 2 terms)
Establishment of the University of Virginia

Political parties sprang from the early years of the USA, with the issue of Federal (National) versus State involvement in governance underlying the natural division that formed only after the business of government had begun. The political dissension between Alexander Hamilton (1st Secretary of the Treasury) and Thomas Jefferson (1st Secretary of State) stemmed from different ideas as to the role and extent of the Federal and State governments. Hamilton supported a strong federal or national organization, while Jefferson supported state governance with minimal or loose federal involvement, reflecting the different interpretations of the US Constitution amongst these two. **Can anything be learned from reading about Thomas Jefferson?** Such reading is actually a study of history, and in history lies lessons that can be used in the here and now.

Of note, state debt as a result of the Revolutionary War plagued the nation in the 1780's, when Hamilton successfully worked for the nation to assume the state debt. The mechanisms instilled to handle the debt essentially led to a steady growth in the size of the national government. In the 2000's the USA faces an enormous national debt, perhaps brought on by the size of the national government. In its role as protector of commerce, the federal government has changed from an agent in negotiating treaties with other countries in the 1700's to an agent of democratization and NOT negotiating treaties with other countries in the 2000's. What is the commercial prize? Oil imports, of the kind that does not grow on trees. Yes, the nation has changed since Jefferson.

North Olympic Peninsula News

March 2005 marked the first gathering of the yet-to-be-named-but-called-for-now Port Townsend Energy Group.

OES submitted a paper on its RCM Cost Model to the ISIS and ASES sponsored Solar World Conference 2005 in Orlando, Florida, hoping to attend this summer.

OES will join the local community on Earth Day weekend April 23 and 24, demonstrating its solar-energized electric bicycle and solar-powered electrolyzer for producing hydrogen. OES will be handing out a phone number—for a good time, call

1 800 USA RAIL

Port Townsend in **Jefferson** County in the State of Washington