



Alternative Energy Sources

Previously we talked about reducing energy demand, using techniques such as increasing your home's insulation and using energy-efficient appliances. This is the quickest and most efficient way to save money and reduce your energy demands.

But unless you live the life of a devout monk (or nun) you are still going to need sources of energy for heating, lighting, cooking, washing and other tasks.

Most San Juan County residents are connected to the grid and are unlikely to go off the grid, given the low cost of OPALCO supplied electricity, and that most of it is supplied from non-polluting sources. People who rely on solar, wind or hydro energy are usually in locations where electricity is not available (Waldron for example) or where the distance (and therefore the cost to hook up) from the grid is far enough to make alternative energy cost-effective. As the cost of hook-ups increases and the cost of alternative energy decreases though there may soon be a point where it is truly cost-effective to be off-grid.

Most people are familiar with Solar PV (Photovoltaic) power where power is supplied by solar panels that produce electricity when exposed to sun. PV's only produce electricity during the day, and at low voltages. If you are off-grid you need to store what you produce in expensive deep-cycle batteries, and in most cases invert it to 120v AC for household use. The cost of an inverter, batteries and wiring is a significant portion of the system cost. There are though currently several tax incentives for solar systems that can help reduce the cost - call OPALCO for more details or visit www.dsireusa.org.

Many people are simplifying their systems though by hooking them into the grid and not using batteries. When the sun shines the excess electricity flows into the grid, turning their meter backwards, thus reducing their cost. At night or

in bad weather the house draws current when needed from the grid. Thus the grid acts like a large battery. If you have a large PV system you can also enter into a contract with OPALCO and they'll buy your electricity at a generous price.

Wind turbines have become more efficient and cost-effective over the last few years. Small turbines capable of powering a small cabin or RV can be had for \$1,000 and up. The wind however is less reliable around here than the sun. Newer turbines such as the Skystream [www.windenergy.com] have larger blades (12 ft diameter) and start producing energy at lower speeds than smaller models. However they need to be placed at least 20 ft above any trees within a 100 ft radius of the mounting pole. Placing them above the turbulence makes them more efficient and prolongs alternator life.

Winds are erratic in the county but a turbine might work well in some of the more exposed islands, and higher up on exposed slopes where Anabatic and Katabatic winds flow. There used to be some concern about birds being killed when they hit the blades, but recent turbines which spin at much lower speeds and avoiding migration routes has all but eliminated this problem.

Tidal power systems are generally not suited for individual use, though as you may have read there are plans to bring some large tidal systems into county waters.

Micro-hydro turbines use the power of falling water to create electricity, much as a wind turbine would. You can use a large volume of water falling a short distance, or a small quantity falling a

large distance. In both cases creeks - or suitable dams - are lacking in the islands, although there are a few systems in use.

Probably the most effective systems here would be solar hot water heating for water, and burning biomass for heat (and hot water too). Solar hot water heating uses tubes mounted on your roof which either heat the water directly, or heat coolant which heats the water via a heat exchanger (this is more suitable for climates that freeze in winter). Home Power magazine [www.homepower.com] recently featured a Burlington homeowner who gets 100% of his hot water in summer, and 40% in winter, from a solar water heater. Lopez CLT have been promoting this recently as it is much more cost-effective than many other forms of energy production, and relatively simple to install.

Biomass covers burning any form of organic matter to produce heat, hot water or electricity. Many island homes have wood burning stoves, but mostly older less efficient models. Newer European designs are often much more efficient which translates into less wood burned. Pellet stoves can be very efficient and use waste wood, but pellets are more expensive than on the mainland, and most pellet stoves need electricity to operate the auger that loads the stove. Fireplace inserts are available that allow the burning of pellets in a conventional stove without the need for power.

In Europe there are systems that burn forest slash and elephant grass (a fast growing woody grass similar to bamboo) to create electricity using steam and also create income for local farmers who grow the grass under contract.