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## **Solar Panels and Wind Generators can power water purification**

**SAN RAFAEL, CA -- (January 14, 2008)--** Spectra Watermakers latest water treatment products are innovative and efficient. Grounded in Spectra's proven and robust technology, the addition of solar and wind power, coupled with automatic back-flush pre-filtration, makes these portable and self contained units ideal for disaster relief, village level water supply and treatment, or "off the grid" desalination and purification. These small plants come in several configurations and can produce from 3,000 to 15,000 liters of pure potable water per day depending on the water source. For sea water or brackish water, reverse osmosis is employed and for contaminated fresh water, ultra-filtration membranes purify the water. The modular construction facilitates ease of handling, maintenance, and placement.

For this new product line, Spectra is collaborating with Trunz Water Systems in Switzerland. Trunz is an ISO certified metal fabrication and water treatment systems company known throughout Europe for its high quality manufacturing processes. Trunz builds the stainless steel housings and its proprietary automatic back flushing pre-filtration system. Spectra's energy efficient reverse osmosis plant is used in the desalination products. Spectra markets a range of water treatment products which include higher volume fresh water ultra-filtration systems.

Spectra has been manufacturing reverse osmosis (R/O) desalination systems for more than ten years primarily in the marine industry for onboard use in various types of vessels, particularly in smaller vessels where ease of use, dependability, and most importantly, energy efficiency is paramount. Spectra's patented high efficiency hydraulically powered **Clark Pump** is the key which makes this possible, therefore enabling these products to be well suited for the application of photovoltaics as the source of electrical power to operate.

The **Clark Pump** is an energy recovery and pressure amplification innovation. It is powered by a flow of relatively low pressure (about 80 to 100 PSI) water from a separate, low power consumption pump, ultimately delivering the feed water at a pressure in the range of 800 PSI from the Clark Pump to the R/O membrane.

The "Solar Cube" is a solar and wind powered desalination unit. The photovoltaic cells will generate up to 1240 watts, 24 volt dc, and the wind generator will produce up to 1000 watts, 24 volt dc. The system requires about 900 watts to operate, leaving upwards of 1kw in excess power to operate emergency equipment or provide a source of electricity for other uses via an inverter/charger. This unit can also be plugged into the grid or a generator for its power. The

package is made up of three modules which slide into a framework. All of the materials used for the casing and all of the components inside are of marine grade non corroding materials. The *prefilter module* houses the pre-filtration system which includes one 100 micron and two 25 micron self cleaning filters, expansion tanks for the flushing cycle, and the backwashing and feed water pump controls. A submersible well pump delivers source water to this module. The center *electrical module* houses the 800 amp hour battery bank, the inverter/charger, the controls for the solar panels and wind generator, and the face panel of this module has receptacles for 24 volt output, 110 or 220 volt input and out put, the master switch, and the switch for the submersible pump. Inside the *(R/O) module* are the Clark Pump, the R/O membranes, a 5 micron filter, the feed and injection pumps, and a product water tank for the membrane back flush cycle. The face panel for the R/O module has the injection speed rheostat and the meters which indicate system pressure, boost pressure, feed flow, product flow, and filter pressure differential. The whole unit, excluding the wind generator, is about five feet square and weighs 3000 pounds.

These units can process a broad sampling of source water anywhere from surface water, to contaminated and brackish ground water, to sea water. The system is very efficient (watts per gallon), with a high consistent recovery rate of around 30%, and high quality product water (less than 170 mg/l from sea water). The feed pressure to the membrane is manually controlled to optimize the output and water quality, compensating for the variations in salinity and temperature.

The applications for these products are numerous and intriguing. Designed for durability and efficiency, the Solar Cube uses renewable energy to make clean water and in the event of a natural disaster Solar Cubes could be deployed to save lives. In remote villages without infrastructure, it could be a source of clean potable water and electricity. For those who would live on a desert island, the solar Cube could make it possible.