



E-cat Technology R & D

Water Purification and Desalination > 2 Projects <

Introduction

One of the best investments in our developing technologies is the potential of desalination, taking free water from the ocean, removing the salt, and selling it. Because we have technology that separates hydrogen and oxygen, it also separates impurities, creating instant desalination, at very low costs compared to other methods.

There is a rapidly dwindling fresh water supply in the world today. Roughly 1.5 billion people, more than 22% of the world's population, lack safe drinking water. According to an industry report, "the desalination market will generate expenditure in the region of \$95 billion by 2015."

Global conglomerates have quickly entered this high-profit industry. GE, Siemens and Dow Chemical each have a big stake in the business, with operating plants all over the world. Firms like T. Rowe Price, Vanguard, and Berkshire Hathaway are watching the desalination technology evolve because all of these companies use old costly methods. Current desalination can cost about three times more than traditional methods. It takes about 14 kilowatt-hours of energy to desalinate 1,000 gallons of seawater.

Project 1: Magnetic Water Treatment

This project treats the water with high strength magnetic fields, changing the structure and decreasing the surface tension. It makes the water "wetter" without the use of surfactants. Thus, the water becomes a better solvent, and nutrients as well as oxygen are more easily dissolved in it. It has yet to be

determined the exact changes that are made from a quantitative standpoint, and what effect if any this has on the hydrogen bond angle. However, from an empirical perspective, it has been proven to have beneficial effects on living systems.

Project 2: Reduced Pressure Water Desalination

Currently, water is boiled at room pressure to remove salt as well as undesirable dissolved solids from the water to make it safe for human consumption. This is extremely energy intensive, as it takes a substantial amount of energy to change the phase of water from a liquid to vapor. It has been a serious limitation to the access of clean water around the world.

This project proposes the distillation of water in a reduced pressure vessel at approximately 0.5-psi static pressure. At this amount, the water will boil at slightly higher than room temperature, which means that much less energy will be required to purify the same quantity of water. There are two methods for accomplishing this: In one method, two tanks are brought down to the required low static pressure, and a small amount of heat is placed on the evaporator tank. Optimally, there will be a differential of 10-20 degrees C between tanks. This can either be an elevated temperature on the evaporator tank, or a reduced temperature on the condenser tank. Another possibility is to place a heat exchanger between the two tanks for condensing the water vapor.

So what we need is a source of cheap, environmentally clean energy to do the desalination. One possibility is to use the Rossi E-Cat to provide the temperature differential. We do this by the use of a heat transfer oil through the reactor, routed to a heat exchange loop inside the evaporator tank. The tank is heated above the reduced boiling point by initially pumping it down with a vacuum pump so the boiling point is slightly above the ambient temperature. After vaporization, the water vapor is routed to a heat exchanger to chill it down, condensing it back into water. That water is then pumped into a holding tank. At 3.6 cents per kilowatt hour, it will cost 50.4 cents per 1000 gallons to operate, or .0126 cents per liter.

The other possibility is to use solar energy to accomplish the low-pressure distillation. Two water tanks are employed, one painted black for the evaporator side, and the other white for the condenser. The height of the tanks is variable, due to local ambient atmospheric pressure. At the top of a large mountain, for example, or high altitudes, a shorter standpipe will be required to get the correct pressure. The bottom of the tower is at atmospheric pressure, and to initially get the water up into the tower a vacuum pump is employed to raise the column to the top of the tank. The same is done for the condenser tower. Each system will work in pairs.

In operation, the black tank will be heated by solar energy, and the vapor travels through a ribbed heat exchanger, cooling it down and condensing it where it

goes into the condensate or receiving tank. As long as there is enough input energy to run the evaporator, the system will continue to function. Which system is used will depend upon availability of solar energy. In areas where sunny days are few, the E-Cat will be used out of necessity, as well as extremes of latitude. The limitation of the solar system is climate and weather. The E-Cat has no such limitation. It can also be used on board ship as well as in "closed ecologies" including many agricultural areas

It is clear that if you can vaporize water with low energy input, you have the ultimate solution to desalination. When the water vaporizes- the salt is left behind. A low energy input solution to the world's water crisis (and a 95 Billion dollar industry)

Contact:

Roger Green

E-Mail: ecoglobalfuels@earthlink.net