



[Home/Current News](#)

[Previous Issues](#)

[PDF Library](#)

[Features](#)

[Equipment Spotlight](#)

[Featured Products](#)

[New Product Showcase](#)

[Advertisements](#)

[Classifieds](#)

[Place a Classified Ad](#)

[Request a Quote](#)

[Information Resources](#)

[Events Calendar](#)

[National Organizations](#)

[Regional Organizations](#)

[Auto Organizations](#)

[General Links](#)

[Add a Link](#)

[SEARCH Our Site](#)

[Contact Us](#)

[ADVERTISE in AR](#)

[Subscribe](#)

[Renew Subscription](#)

[Update Subscription](#)



[Like](#)

You this Page Yesterday

American Recycler has 224223 fans



Jake

[www.bidonscrap.com](http://www.bidonscrap.com)  
480.367.1300 titanium Government Liquidation

[f](#) Share 4

JULY 2010

## Solar saves water supplies and wallets

by Mike Breslin [✉](#)

There is a serious global shortage of potable water. Not just in equatorial countries where populations are rising, but in the arid southwestern United States. Even in rain-rich areas, water tables are dropping due to increased consumption, and what remains is being contaminated by salts from water conditioning, chemicals from fertilizers, industrial effluences and landfills.



The far horizon vineyard in California saved valuable vine growing land by floating photovoltaic panels on a one-acre pond. The panels also had the unexpected benefit of blocking 80 percent of evaporation of the water that was caused by the sun and wind.

Of a world population of roughly 6.1 billion, the World Health Organization estimates that more than one billion people lack access to potable water – five billion die each year from diseases caused by water shortages, poor drinking water, inadequate sanitation and dirty living conditions.

“Water is going to become more and more of a crisis in the United States, partially because water infrastructure is degrading quickly. Water treatment facilities and pipes are badly neglected, and it's only going to get worse in my lifetime. Businesses and technologies that address this problem are only going to do well in the next 25 years,” said Tom Rooney, CEO of SPG Solar. SPG is a solar integration company that has built over 1,500 solar systems in 8 western states, many serving water supply and wastewater interests.

**EQUIPMENT FINANCING DONE RIGHT**  
**DADE**  
Capital Corp.  
**800-823-9688**

Ads by Google

[Cheap Solar Panels](#)

15% Off Home Solar Power Systems Free Evaluation. Sign Up Now!  
[www.1BOG.org](http://www.1BOG.org)

[Free Solar Power](#)

30% Off Entire Systems You Get Free Electric - See How  
[www.energyentech.com](http://www.energyentech.com)

[Prices for Solar Panels](#)

Get Solar Panel quotes from Multiple companies. It's Free!  
[www.solar-panels-prices](http://www.solar-panels-prices)

[Siemens Solar Energy](#)

Highly efficient, solid & reliable Solar Energy solutions - Siemens!  
[www.usa.siemens.com/s](http://www.usa.siemens.com/s)





Michael

Karim

Solar energy and recycling are both green industries, but are growing more compatible and synergistic with each passing year. The many vexing problems of water conservation, treatment, purification, desalination and pumping are finding new and intriguing solar powered solutions.

SPG, for example, accidentally discovered an unexpected water conservation benefit of a solar electric installation in California that is drawing delegations from as far away as Australia and Israel to study the phenomena. It's called "floatovoltaics."

The story began several years ago when SPG engineered a solar system for the Far Niente winery – one of Napa Valley's most prestigious. Far Niente wanted solar to power their vineyard operation and be green, but were reluctant to give up valuable vine growing space. SPG proposed a novel, first-of-its-kind solution – use pontoons to float 994 photovoltaic panels on a 1-acre spring-fed pond to create 207 kW of power adjacent to a land installation of 271 kW.

"We know how much land we saved, but after several years other benefits emerged that are incredibly interesting," said Rooney. Panels float on water which is a natural heat sink and they remained cooler than land-mounted panels for an unexpected increase in electricity production. The winery found they no longer had to put chemicals in the pond to control algae – saving in labor and cash, and keeping chemicals out of the water. They also had much more water than ever before for irrigation. And in California, water is a precious commodity.



WorldWater's Mobile MaxPure freshwater system supplies drinking water for an orphanage in the town of Bon Repos outside of Port au Prince in the aftermath of the Haiti earthquake. The solar powered system was the only option when the electricity failed.

“We figured it had to be due to sun shading, but went further and had academics study it. It turned out that evaporation in that geography is huge. Seven to eight vertical feet of water evaporate every year. The panels block about 80 percent of the evaporation on the surface they cover because they shade it from the sun. But the panels also block wind from blowing on the surface, and physically cap the surface so it’s not exposed to air,” Rooney explained.

Southern California is in the midst of an unprecedented water crisis that that is burdening many farmers and growers with ever higher water prices, or even outright unavailability that is closing farms and uprooting vines and orchards.

California has thousands of water district retention ponds and reservoirs that prohibit recreational activities such as swimming, boating and fishing. Floating solar panels on portions of these waters have the potential to generate clean electricity while annually conserving millions of acre-feet of water.

SPG has patented the technology and invested nearly a million dollars over the past year in developing the next generation of floatovoltaics. “We are now talking to large water districts like Los Angeles. EPA is coming out with new standards for major water suppliers on how much chlorine can be put into water because it creates bromates and other chemicals that are carcinogenic. EPA water standards have already changed in the last two years and places like Los Angeles may be forced into multimillion dollar third-stage treatment facilities because of the chlorine,” said Rooney.

Solar energy is a hot topic and heavily featured in the media, but should be understood in the context of overall American energy consumption. According to the United States Energy Information Administration, all renewable sources, including solar, represent only 7.3 percent of the States’ energy consumption and of that figure wind represents 71 percent. Solar accounts for less than one percent and has reached its current market share only because of generous taxpayer funded state rebate programs, mandated state renewable energy targets and federal investment tax credits.

But all that subsidization appears to be a wise investment. It has driven competition to technology advancements and economies of scale that may soon make solar energy as competitive as many other energy sources with the benefit of being non-polluting.

Solar energy is growing at an impressive rate. According to the Solar Energy Industries Association (SEIA), at the end of 2009 the total installed utility-scale capacity including solar thermal-electric, and photovoltaics was 517 megawatts. “We expect to see more than 200 megawatts of utility-scale

projects installed in 2010. Most interesting are the 100-plus projects in the pipeline, many with utility power purchase agreements (PPAs) in place, totaling 17 gigawatts.” said Monique Harris, director of communications for SEIA.

Tom Rooney sees the cost of solar dropping every day. “The price of solar panels has come down dramatically. From a year and a half ago, totally installed, it’s down from about \$7.50 to \$8.00 dollars per watt to \$4.00 to \$5.00 dollars per watt depending on the application. Rooney believes that over the next five years incentives will go to zero and the cost of solar will drop to a point where it does not need incentives. “I’m not saying that solar will replace every form of electricity, but I think it will become a mainstay of domestic energy production.”

Whether for household use, industrial processes, wastewater treatment or irrigation, water requires a tremendous amount of electricity to power pumps and is the single largest expense for most water and wastewater jurisdictions.

It happens that solar energy, perhaps better than any other type of power generation, is particularly suited to water conservation and recycling for several reasons.

Solar electric production reaches its zenith during the hottest part of the day when many utilities charge the highest rates. Last year the Valley Center Municipal Water District in San Diego County, California completed a 1.1 megawatt solar system. Installed by WorldWater & Solar Technologies, Inc. it will offset 20 percent of the electricity needed by their largest pumping station. In addition, if the grid fails they can independently operate two or three 350 hp pumps on solar alone – a huge benefit during emergencies.

Solar electricity can pump, purify, treat and desalinate water while the sun shines and store it until sunset in tanks or reservoirs. Water pumped to higher elevation ponds or reservoirs during the day can be released as pumped storage and drive turbines to generate electricity. Purified water can be dispensed via gravity for drinking at anytime.

A number of municipal water treatment authorities around the country have adopted solar energy to recycle wastewater and reduce electric costs. One of the largest municipal systems is a one megawatt photovoltaic plant nearing completion in Colorado for the City of Boulder’s wastewater treatment facility.

Comprised of 4,452 solar panels, it is capable of producing 1,552,000 kilowatt hours of electricity each year – 15 to 20 percent of the need. Developed by EyeOn Energy, Ltd. under a power purchase agreement, it will reduce the city’s electricity costs by an estimated \$43,000 annually. Alex

Kramarchuk, EyeOn's president noted: "We bookend the entire solar process and package the PPA. Many investors are unaware about solar as an asset class."

Solar has also found a niche for off-grid purification of contaminated, brackish and salt water in developing countries, and in disaster situations. WorldWater, a Princeton, New Jersey based company, has pioneered its Mobile Max Systems. These small, portable, solar units are easily transported and can be operational within 30 minutes after arriving on site. Four cube-like units fit into a standard 40-foot container. An unfolding solar panel array provides power to operate an on-board water purification system to handle contaminated water and can produce up to 30,000 gallons of drinking water per day. A battery bank runs lights, power tools, computers and satellite phones. Other on-board filtration systems process brackish or seawater.

The prototype technology was first used after hurricane Katrina where it purified contaminated water for the entire town of Waveland, Mississippi for over seven months. Improved units have been used around the States, in Iraq, Afghanistan, Darfur and Ethiopia. "We had two machines in Haiti after the 2008 hurricanes providing drinking water for victims through the French Red Cross and other aid groups. They were still operating there when the earthquake happened. We shipped another unit after the earthquake and have another on the way," said Mickey Ingles, WorldWater's vice president of operations.

With predicted shortages of fresh water for drinking and irrigation in the western states, it is likely that solar will play an increasing role in generating electricity to recycle seawater into freshwater at desalination plants. According to the International Desalination Association, there are over 13,000 desalination plants worldwide producing over 12 billion gallons of fresh water per day. But there are only a handful of small plants in the United States due to the current high costs of energy needed for desalination and the general availability of inexpensive fresh water.

But things are changing. Southern California currently imports over 90 percent of its water, primarily from the Colorado River and northern California. Despite aggressive conservation measures, shortages are occurring most severely in agriculture. Several pilot and small desalination plants are currently operating on the west coast and mega plants capable of producing up to 50 million gallons per day are under development.

While the intermittency of solar electric generation is problematic for grid operators, it will be of less concern to desalination. It can help plants cut peak rate prices from utilities as well as power pumped storage to hopefully deliver affordable water.

Tom Rooney at SPG Solar had a parting prediction. "I believe you are going to see the confluence of three major technologies over the next ten years: solar becoming so economically competitive that it's mainstream; battery technology advancing so solar energy can be stored and dispensed day or night; smart grid technology that breaks down the exchange of electricity like the Internet. We will morph from massive utility plants with huge transmission lines to millions of nodes of clean electrical production with the capability of trading electrons back and forth using a smart grid."

## Enjoying the articles here?

877-777-0737 • Fax 419-931-0740 • 900 W South Boundary, Bldg. 6 Perrysburg, OH 43551

© Copyright American Recycler. All rights reserved. Any reproduction of content requires written permission.

[See Terms and Conditions for Advertisements and Privacy Issues.](#)