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Can Solar Desalination Slake the World's Thirst?

Turning saltwater fresh with sunlight could help an increasingly thirsty world

By [EarthTalk](#) | September 21, 2015 |

Dear EarthTalk: What exactly is solar desalination and how can it help an increasingly thirsty world? — *Maryann Dell'Amore, Howard, MN*

Solar desalination is a technique used to remove salt from water via a specially designed still that uses solar energy to boil seawater and capture the resulting steam, which is in turn cooled and condensed into pristine freshwater. Salt and other impurities are left behind in the still.

Less than one percent of the world's desalination is powered by renewable energy sources today, but that could all change soon if companies like California-based WaterFX have anything to say about it. Its Aqua4 “concentrated solar still” (CSS) uses a concentrated solar thermal collector to compress heat, create steam and distill water at 30 times the efficiency of natural evaporation. It can produce 65,000 gallons of freshwater per day—and it can desalinate a wide range of water sources, not just seawater.

To wit, the company will start employing solar desalination to treat some 1.6 billion gallons of salt-laden irrigation drainage from California's drought-stricken, agriculturally-rich Central Valley next year. Crops extract nearly pure water from soil, leaving behind salt and other potentially toxic minerals like selenium that naturally occur in the water. These excess minerals must be drained from the soil, or crop productivity plunges. By treating this drainage, WaterFX can prevent about percent of farmland in California from being retired every year to make room for storage for untreated drainage water. It will also prevent the drainage from contaminating fresh waterways and endangering wildlife. According to California's State Water Resources Control Board, approximately 9,493 miles of rivers and streams and some 513,130 acres of lakes and reservoirs are listed as being impaired by irrigated agricultural water.

“If we don't start removing the salts now, at least 10 percent of all current farmland in production in California will have to be retired, and in many scenarios this number could be up to 30 to 40 percent, especially on the west side of the Valley where the salinity is very high,” says WaterFX's Matthew Stuber. “Water in the drainage areas will contaminate groundwater and natural surface waterways at an accelerated pace, eventually polluting sources of drinking water and the natural environment. Once that is released into the environment, you severely damage the natural habitat and wildlife.”

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Solar desalination plant on the island of Funafuti in the Tuvalu islands.

Credit: [Nick Hobgood, FlickrCC](#)

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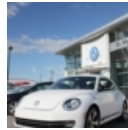
Another large-scale solar desalination project is currently under construction in Saudi Arabia and scheduled for completion in early 2017. The plant is slated to produce 60,000 cubic meters of water per day for Al Khafji City in North Eastern Saudi Arabia, ensuring a constant water supply to the arid region throughout the year. According to Abengoa, the Spanish renewable energy company building the pioneering facility, the incorporation of solar would significantly reduce operating costs, as Saudi Arabia currently burns 1.5 million barrels of oil per day at its desalination plants, which provide 50-70 percent of its drinking water. Total desalination demand in Saudi Arabia and neighboring countries is expected to reach 110 million cubic meters a day by 2030.

With freshwater supplies at a premium already in many parts of the world as a result of climate change, there has never been a better time for solar desalination to come of age. Whether or not this emerging technology can go mainstream sooner than later may mean the difference between a peaceful future and one wracked by conflict over access to ever-dwindling supplies of freshwater.

CONTACTS: WaterFX, www.waterfx.co ; California's State Water Resources Control Board, www.swrcb.ca.gov; Abengoa, www.abengoa.com.

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