

How to make big profits from water desalination



By Associate Editor **David Stevenson** Aug 07, 2009

California has been fighting hard to avoid going bust recently. But it's short on something far more vital than money: fresh water. The Golden State is suffering its worst drought in recorded history. Water levels in groundwater basins and reservoirs are well below average, says California's Department of Water Resources. Court-ordered restrictions on deliveries have hit supplies from the two largest water systems. The outdated state water grid just can't keep up with growth in the state's population.

California needs a long-term solution to its fresh water problems, fast. It's not alone. Climate change, drought, growing populations and industrial demand are placing an ever-greater strain on the Earth's available fresh water. Water use has grown twice as fast as the world's population over the last century, so that more than a billion people already live in areas where water is short, says the United Nations Food and Agriculture Organisation. By 2025, 1.8 billion people will experience severe water scarcity, while two-thirds of the planet's population – 5.5 billion people – could be living under water 'stress' conditions.

The answer seems obvious – desalination. Around 97% of the earth's vast water reserves are too salty for human consumption. Of the 3% that is freshwater, 1.7% is locked in glaciers, with just 1% easily accessible in rivers, lakes or groundwater. So it makes sense to find a way to turn some of that salty water into something we can use. "Water is going to be very short until you have a new source. And the only new source is desalination," says Claude Lewis, Mayor of Carlsbad in southern California, which next year will open the largest desalination plant in the Western hemisphere, to turn 50 million gallons of seawater a day into fresh drinking water.

It's part of an international trend. Global desalination capacity has grown by 17% a year since 1990, says Global Water Intelligence, rising by 43% in 2006 and 2007 alone. An average of 800 new desalination plants have been built for each of the last five years, says Connor Boals at Circle of Blue, meaning that the world market could soon reach \$58bn a year. Already, some 14,380 desalination plants operate across the planet with a total contracted capacity of 62 million cubic metres per day.

Yet that only equals the annual rise in global freshwater demand. Even if all US desalination operations ran at full capacity, they'd still only create enough water to supply 0.4% of the nation's current needs. So there is little chance of overcapacity being an issue anytime soon. But it is by no means all plain sailing. The "plants are enormously expensive, use tremendous amounts of energy and have major environmental costs that are not always adequately addressed, including brine disposal" and damage to fish and the coastline, says Peter Gleick, president of the Pacific Institute.

But help is at hand. At the UCLA Henry Samueli School of Engineering & Applied Science, researchers are harnessing a popular desalination technique called reverse osmosis, a filtration process that forces water through a membrane to remove impurities, to find ways of cutting freshwater production costs. Meanwhile, one British firm is also tapping into the latest desalination technology – as shown in the box below.

The best bet in the sector

AIM-quoted **Modern Water** (LSE: MWG) is run by former head of Mid Kent Water Neil McDougall and water industry veteran Simon Humphrey. It owns a cutting-edge desalination technology called manipulated osmotic desalination (MOD). This process converts large volumes of seawater into drinking water relatively cheaply, saving on both capital and operating costs. What's more, it cuts energy use by desalination plants and lowers the consumption of, and so the need to dispose of, hazardous chemicals.



Furthermore, Modern owns a pre-treatment process for multi-stage flash (MSF) thermal desalination plants, which increases the plant's top temperature. In plain English, this raises output by up to 25%, cuts pollutants and extends plant shelf-life.

And the firm isn't limited to desalination. It owns a range of other technologies with complementary applications, such as using seawater for toilet flushing, which cuts the domestic need for freshwater by over 30%.

The company operates a small desalination plant in Gibraltar, which is doing better than forecast. It's also building a unit in Oman. With a £30m market cap, this tiny company, currently making no money, isn't without risk. But at the end of last year it had no debt and £27m in the bank. If its technologies meet expectations, Modern should get "a host of orders and may even receive partnership approaches from larger, wealthier companies", says Joanne Hart in Mail Online. "The next 12 months could revolutionise this business".