

TECHNOLOGY

Science of supply and demand

JANICE WARMAN *talks to British entrepreneurs who are developing innovative solutions to address water shortages around the world and reduce water consumption at home*



This summer Dr Stuart Downward, lecturer in geography and environmental science at Kingston University and a specialist in water resources, was in drought-hit Cyprus when a mobile desalination unit arrived on a boat and set up on the beach. It was a British company, Subsea Infrastructure, which supplies emergency desalination services wherever there is a water crisis, whether it's Libya, South Africa, or as in this case, the Mediterranean.

The global desalination industry is expected to grow by 140 per cent by 2015, when spending on it should reach \$56.4 billion. The world water market is worth £300 billion. And the arrival of that boat is indicative of the potential for British companies to benefit from the world water crisis.

The British householder drying out his sodden carpets after this summer's flooding may be surprised to hear that he might one day suffer a shortage of water. Yet we each use 150 litres of water a day – the equivalent of a Peugeot 205 full of water delivered to your house each morning. Half of it is flushed away. One-third is used in showers and baths. That's beside the water seeping into the ground from antiquated Victorian pipes. And if we include water that is 'embedded' in everything we consume – from food to cars – that rises to 3,400 litres per person.

So we need high-tech solutions to help us cut water consumption. There are no subsidies for water efficiency – no grants and no reduction of VAT – but still there are opportunities for British companies, like Twyford, which is producing low-flush toilets, using four litres instead of 15 per flush; and Kohler Mira, which is making aerated showers that insert a droplet of air into every one of water, reducing consumption by 70 per cent. (Both are now foreign owned; both manufacture in Britain).

Much of what is produced is low-tech – nothing could be simpler than a shower-timer. And should Britain follow the lead of New York – which has replaced every toilet system in the city with low-flush

CRYSTAL CLEAR
Desalinated water is pumped into a reservoir in southern Spain

toilets – and Australia, where its citizens can simply ring up and request a 'retrofit' of their showers and toilets, the potential for cutting consumption and making money is huge.

In fact the move towards conservation is now an unstoppable tide-race. Raven Housing Trust, near Redhill in Surrey, is using rainwater harvesting, low-flush toilets, low-flow taps and showers to produce a water consumption rate of just 80 litres a day (half the normal amount) in its new flats, which are the first in Britain built to the highest level of eco-friendliness according to the Code for Sustainable Homes.

The privatised water industry has cleaned up its act and its water supplies. There are now fish, seals, dolphins and even the occasional whale in the Thames, which 30 years ago was a dead river. Now that Boris Johnson is mayor of London, he has given the go-ahead to a desalination project on the Thames, which had been blocked by his predecessor, Ken Livingstone.

'Until now there has not been much of an incentive to get involved,' says Shirley Morgan-Knott, director of SRI and sustainability research at UBS. 'Water companies have encouraged us to use as much as possible and charge us for it. Now there are two stories – one is enhancing supply and one is reducing demand.'

'It's not an easy area to invest in. We recommend having a diversified portfolio. It's not an industry – it crosses several industries from heavy construction to speciality chemicals to utilities, to advanced industrial equipment.'

These include desalination (an industry poised for massive growth), filtration and treatment, infrastructure, irrigation, pumps and valves, water metering, water analysis, and water productivity, which (controversially) includes fertilisers that will ensure there is more 'crop per drop'.

Many smaller innovators are bought up by the utilities, and there are few 'pure play' water companies, says Morgan-Knott. They include Ecobeta, which manufactures and installs retro-fit technology

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'When the well's dry, we know the worth of water'

BENJAMIN FRANKLIN

for toilet-flushing systems that can go into existing buildings. It has a contract with Essex and Suffolk Water and SouthWest Water.

Ecoplay is a Doncaster-based micro-grey water recycling system, which recycles bath and shower water for use in toilet flushing, a system used by Laing Homes.

Meter Mimic, made by C&G Management, is a wireless meter that can be retro-fitted in water pipes in around 15 minutes.

Emma Howard Boyd, head of socially responsible investment at Jupiter Asset Management, likes Itron, a US company whose portfolio of products includes leak detection systems. 'Twenty per cent of household claims are linked to water damage,' she points out.

Dr Colin Hayes, director of the Centre of Water and Environmental Management at Swansea University, says that there aren't huge numbers of new technologies. But what creates a climate 'where technology has to be proven to work' and thereby encourages the creation of new companies are plenty of new directives and guidelines: the Water Framework Directive from the Department for the Environment, Food and Rural Affairs; the World Health Organisation's latest edition of the Drinking Water Guidelines; and the next stage of the European Water Directive – all of which demand better quality water and less waste.

But the universities have a role to play here: there is €50 billion in EU funding available over the next seven years for research projects. One of the companies that has benefited from university-funded research is AIM-listed Modern Water, which has a portfolio of companies including Surrey Acquatechnology, whose low-cost desalination method (researched, as its name suggests, at Surrey University) involves drawing salt water through a membrane at low pressure. Modern Water's first project in Gibraltar is ahead of schedule and should reduce energy costs associated with desalination by 30 per cent, says Neil MacDougall, chief executive. It will also install a new plant in Oman.

Water technology companies to watch

AIM-listed

Modern Water

www.modernwater.co.uk

Hydro International

www.hydro-international.biz

Nature Technology Solutions

www.naturetechsolutions.com

FTSE-listed

Severn Trent Services

(part of Severn Water plc)
www.severntrentservices.com

Nasdaq-listed

Itron

www.itron.com

Unlisted

Aquabio

www.aquabio.co.uk

Ecobeta

www.ecobeta.com

Ecoplay

www.ecoplay-system.com

C&G Management

(which makes Meter Mimic)
www.cgm-ltd.com

Modern Water owns majority shares in two other companies. Poseidon Water has developed systems based on the use of seawater for the treatment of wastewater – enabling the saving of some 30 per cent of fresh water in environmentally sensitive, coastal and water-stressed areas such as the Mediterranean, Florida and Australia. Cymtox Technology monitors acute water toxicity on a continuous, real-time basis, rather like a modern-day canary. It can identify one-thousandth of a lethal dose of cyanide in three seconds, whereas conventional products take up to two hours to do the same.

Nature Technology, which is also listed on AIM, treats waste water for the oil, shipping and offshore industries. It specialises in small footprint solutions, says its chairman Richard Eldridge, treating polluted water on oil rigs (which cuts out the cost of transporting it to shore – and the resultant carbon footprint) and providing municipal waste systems on Gibraltar and elsewhere. The company has just won a contract to supply a treatment system to an oilfield in Kazakhstan. It also treats water polluted by making olive and palm oil.

Martin Lagod, of Firelake Capital Management in Palo Alto, California, invests in cutting-edge water technology, particularly in desalination and purification. 'A lot of this is still in the labs,' he says. 'Primarily university and government labs. We see a rate of change that is stunning and predict that these companies will radically reduce the cost of desalination and the cost of drinking water. Technology will allow us to make more efficient use of the existing water supply. We have a lot of water – but we waste a lot of it. It's a global issue that needs a radical change in the order of cost and magnitude.'

In the US, Dean Kamen's new method for water purification is one example. Kamen, creator of the Segway scooter, has invented a method of purifying water which can be powered by a small generator which runs off decomposing cow dung.

It has been successfully trialled in Africa and now has a backer; if it succeeds, it will revolutionise the supply of pure water to the world.

Sir Nicholas Stern said in his 2006 report on climate change that most people's direct experience of the climate change would be mediated by their experience of water. He warned that floods caused by rising sea levels could displace up to 100 million people; melting glaciers could cause water shortages for one in six people; and droughts may create tens or even hundreds of millions of 'climate refugees'.

China and India, whose infrastructure is poor and polluted, represent a huge growth opportunity for British water technology companies. Dr Ian Pallett, technical director of British Water, the lead organisation for the UK water and wastewater industry, introduced six companies to the region this month at a conference in Shanghai, including the AIM-listed Hydro International (which treats stormwater and waste water), Severn Trent Services and Aquabio (which treats waste water).

'The UK is among the leading nations alongside France, Australia, Singapore and the US doing research and development in water technology,' says Pallett.

The results of that research is still to bear full fruit – but the water technology industry in Britain is one to watch. As Benjamin Franklin said: 'When the well's dry, we know the worth of water.' ●