

Wizards of Oz

Australia is currently fighting huge bush fires, but it has been battling hot, dry summers for many years, and the drought that accompanies them. Ajay Nair and Steffi Johnson look at what the UK can learn

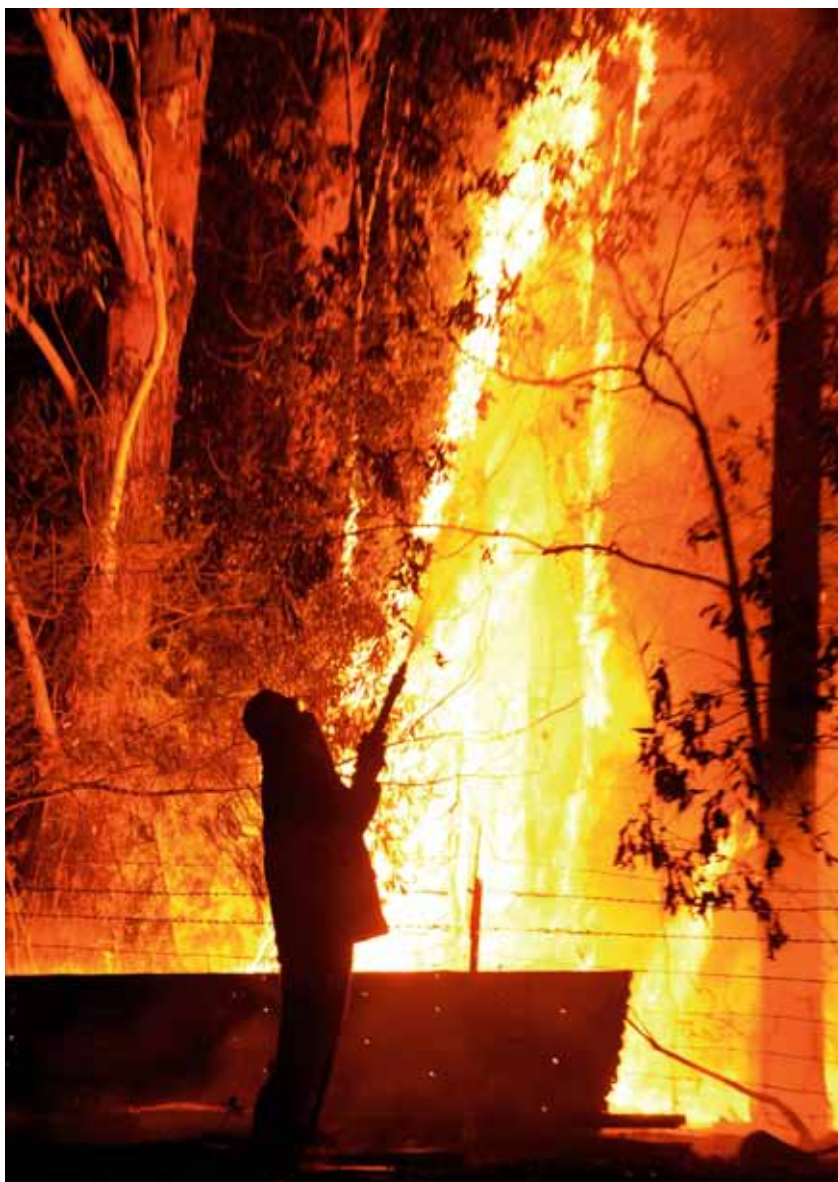
It's a hard sell persuading people to cut their consumption of water when the UK has recently had biblical levels of rainfall. But nonetheless it is something we should do. British weather is predicted to become more extreme (both drought and flood) and there is strong evidence that long-term water shortages are still lurking and remain a real threat. Plus there are other drivers, such as reducing energy and chemical use, and lowering bills.

We have a window now to react in a measured fashion and make sustainable long-term changes rather than short-term knee-jerk solutions driven by the immediacy of drought. The Australian experience is instructive, where the combination of education, incentives, reform and alternative sources have succeeded in making significant reductions in both the domestic and commercial sectors.

Education was the key to the successful implementation of its demand management programmes, which combined water conservation measures, water pricing reforms and the use of alternative water sources. Supported by state governments, Australia's water companies introduced short-term solutions such as temporary water restrictions but also long-term demand management programmes. Some even introduced permanent restrictions such as limited irrigation times and constraints on how potable water is used for outdoor activities.

However, the water companies went a step further by creating the feeling of "we are all in this together". They raised awareness through regular media coverage, showing the falling levels of Australia's major supply reservoirs and the seriousness of water shortages. Additionally, water wise websites provided consumers with practical advice on how to "slow the flow" and ran community and school education programmes, such as Sydney Water's "Every Drop Counts". There were also community events and free gadgets such as a four-minute shower timer.

State subsidies also enabled water companies to undertake water audits for many households, public institutions and businesses and to retrofit reduction solutions. A national water efficiency labelling standard and rebates for buying water-efficient appliances and fittings was introduced, encouraging higher uptakes in residential homes. A high level of water efficiency is



now mandatory for new Australian developments and on resale existing buildings have to be retrofitted with water-efficient fixtures and fittings.

In terms of pricing reforms, many Australian water companies moved to volume-based charges for residential sectors and made metering universal. Water bills now show historic usage providing a self-monitoring tool and customer education.

A severe heatwave in Australia has led to wild fires that consumed hundreds of thousands of hectares of land in one week

2027

The year by which
Singapore plans to
be self-sufficient in
water

Supply of ideas

Twenty-five per cent of UK utilities believe demand for water will outstrip supply by 2030, according to a recent Oracle Utilities commissioned report. This urgent situation demands innovation, and in multiple areas:

- **Raising awareness.** The industry and other influential players such as government need to get more creative in laying it bare to consumers how much water they waste on a daily basis. Thames Water did a good job with its targeted advertising campaign over the summer, which encouraged consumers to save water to help resolve the British drought. The more creative, the better.
- **Tariff structures.** Under the current volume-based billing model, encouraging consumers to conserve means the volume of water able to be billed declines, while the fixed costs of delivering that water do not. This gives water utilities even less ability to reliably manage their ageing networks. Regulators need to be convinced of the need for tariff levels that recognise the life cycle costs of the assets water firms must build and maintain. A change in the regulatory approach to tariffs would both change the way in which the public thinks about water (thereby encouraging conservation) and allow water utilities to make much-needed investments in their networks and infrastructure.
- **Network management.** Completely replacing the entire water network is not feasible. However, the sector could deploy better analytic technologies able to deliver a deeper insight into the network's condition so that water can be better managed and conserved. In fact, just under 30 per cent of UK respondents in the Oracle Utilities study highlighted network metering and management technologies as the most promising for delivering adequate water supplies. For example, by placing network meters

at various intervals in the supply chain, water utilities can assess the performance of individual sections, helping to minimise the impact of the fault, quickly resolve it, and prioritise areas for development.

Singapore is shaping up to offer a best practice example the UK could learn from. The country, which has to import water from neighbouring Malaysia because it has insufficient water of its own, plans to become totally self-sufficient in water supply by 2027.

It has implemented an innovative water network made up of various modern water management solutions including network sensors, remote-controlled valves, remote-controlled pressure, real-time quality monitoring and exceptional storage capabilities.

• **Reuse and recycle.** Widespread desalination remains largely out of the question here in the UK, given that it is still costly and energy intensive, particularly in light of austerity and carbon budgets. But better use could be made of wastewater. Israel is leading the way in this space. British Water and Israel's research and development agency, signed an agreement just over a year ago enabling them to draw on each other's knowledge and work together on international tenders and research projects.

Traditionally, the water industry has not been renowned for being innovative. In fairness, it has not needed to be. Yet today, in the face of growing challenges, the water industry is opening its doors to new ideas. According to our survey, over half of UK water utilities regularly evaluate and adopt new technologies – almost double the global average.. There is still some way to go, but this approach has set us on the right path to delivering a future where there will be water for all.

Rodger Smith, senior vice president and general manager, Oracle Utilities

Last but not least, using alternative water sources such as rainwater, greywater and localised and centralised wastewater and storm water recycling has become accepted practice. There has been government funding to install rainwater tanks in existing residential buildings for outdoor irrigation and new residential buildings are now required to use rainwater indoors for toilet flushing and laundry.

Can these demand reduction measures be applied in the UK? Yes, but the many factors influencing water demand must be taken into account. These include:

Demographic and socio-economic characteristics. Residential water usage varies by geographic and demographic area, residential type, household size, income and lifestyle. But social behaviour is difficult to judge, and measures that work for one region or

Water metering and pricing. Universal metering can lead to a more targeted water pricing structure because it can monitor the water use of different customer groups and evaluate savings from different demand measures over the long term. Australian studies show that there is an immediate reduction in demand once water metering or new pricing structures are introduced but a steady increase in demand over the long term.

Water efficient fixtures and appliances. The quality and availability of water-efficient fixtures and appliances has improved significantly. There is almost universal adoption of dual flush toilet technology in non-domestic premises, plus higher water efficiency washing machines and dishwashers. However, efficiency labelling is variable and can be confusing. We need a mandatory national water efficiency labelling scheme to provide consumers with clear standardised information about the water efficiency of new fixtures and appliances.

We also need financial incentives encouraging people refurbishing their homes to choose more water-efficient fixtures. Subsidised water-efficiency products should be more widely available and better promoted.

Alternative water sources. Butts for garden watering are commonplace. Higher savings can be achieved by applying alternative sources for indoor use such as toilet flushing and laundry. But currently, alternative sources have higher installation and maintenance costs, so are generally reserved for new developments. The cost-benefit of using alternative sources also depends on local conditions, including rainfall, roof catchment area or distance to centralised or localised wastewater recycling facilities.

The impact of these influences can be readily estimated by microcomponent modelling. It has been

successfully applied in Australia to make cost-effective decisions on long-term demand management programmes. The effect of demographic patterns, such as population shifts, falling household occupancy and the increased market share of efficient fixtures and appliances, can be estimated with detailed surveys and available census information. The impact of changes in water pricing is also immediately visible by the change in customer consumption and pricing. Other factors such as lifestyle, customer age, income and standard of living are not yet well understood and their impact occurs over a longer time frame.

Public and residential water conservation measures play an important part in implementing an integrated water cycle management programme and securing water for the future. However, it has to be recognised

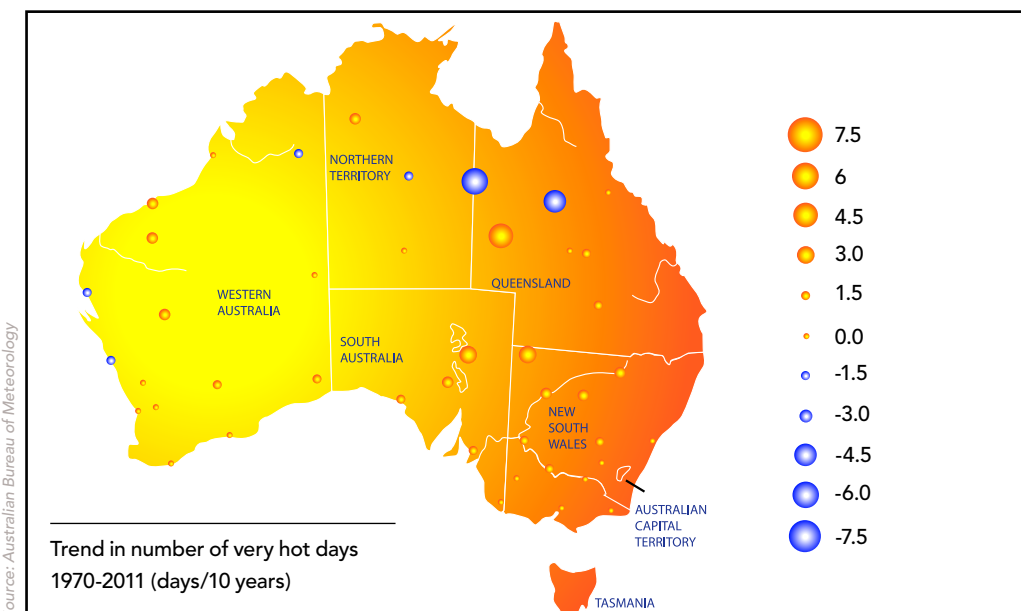
that they have a finite scope for reducing water. Care should be taken when making assumptions regarding the initial uptake and long-term retention of these measures and programme costs. Monitoring programmes to evaluate the success of introduced conservation measures have recently been started and can provide initial figures, but to get long-term figures we need to apply further modelling techniques. These need to take account of climate correction when determining baseline demands, as well as the impact of conservation measures when implementing multiple demand management measures.

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"Water companies managed to create the feeling that we are all in this together"

residential group may not be as successful in another. To identify the best cost-benefit measures for different UK demographic and socioeconomic areas would require detailed regional studies.

Education. Conservation measures fail without clear explanations of why we need to save water and how savings can be achieved. Although a wide range of educational tools are used here, including community and school education, public events, leaflets, media releases, water saving websites and home audits, they need to be continually improved so the issues remain on the public radar and consumers share the challenge of reducing water usage.



Drought in Australia is declared when rainfall over a three-month period is in the lowest 10 per cent of amounts having been recorded for that region in the past. This definition takes into account that low rainfall is a relative term and rainfall deficiencies need to be compared to typical rainfall patterns, including seasonal variations.