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Using smarter technology to solve global water shortages

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By Philip Smith

A specific approach introduced into an Italian village has helped to reduce water loss and save energy

Only 3 per cent of the earth's vast water reserves are fresh. Two-thirds of that is frozen. This means water management is a massive global challenge.

More than a billion people live in areas of water scarcity, with close to 700 million having no reliable access to clean, safe water year-round. In fact, two-thirds of the world population faces water scarcity for at least one month every year.

Startling statistics, but what may surprise many is that this is not just a problem in poor or developing nations. Even in the rich industrialised west, water – or lack of it – is a cause of concern for many.

Ageing water supplies

For example, people living in Oliena had faced an intermittent water supply. But Oliena is not some remote desert village or an isolated community in the forests. It is in Sardinia, Italy, and was the site for a pilot project run by Hitachi as part of its water management programme.

This was a region heavily dependent on water for farming and craft work, so an irregular and unreliable supply was causing real hardship. The problem was that Oliena's water infrastructure was abandoned for a period of time, and water loss was high.



Hitachi was asked to assess what was happening, why and to find a solution. Under the auspices of Aulos – the division of Hitachi dedicated to the preservation of water resources and energy saving – it set up a specific method to identify and eliminate the main causes of inefficiencies in their water networks.

The key lay in addressing the causes. “Infrastructure networks are in a constant state of flux,” explains Giacomo Meroni, general manager of Hitachi Drives & Automation.

“No sooner is one weakness addressed than another arises. We had to look for the original causes and suggest actions to address those inefficiencies, to improve the overall infrastructure. If you just look for the leaks and repair them, they will soon return. Only when the networks have been brought back to a good level of efficiency could we turn to leak detection.”



Cards on the table: the Oliena project was completed midway through 2016 CREDIT: ALAMY

The programme focused on pressure management and air control to achieve leak prevention, in a way that was also energy efficient.

Leaks are a common problem in Italy, according to Mr Meroni. “Official data shows that Italy loses 38 per cent of its water through leaks, but in some parts of the country we have infrastructure where leaks reach 60 per cent,” he says.

The challenge is that as these vast, creaking, complex infrastructure systems will never see zero leakage; the goal is to reduce this significantly, and stabilise the network, rather than eradicate that wastage.

Leading by example

The Oliena project, which was completed mid-2016, saw water loss reduce by more than 50 per cent. There was also an additional by-product benefit.

“These networks use pumping stations, which in turn use a lot of energy,” says Mr Meroni. “If water is being lost or wasted, more needs to be pumped. By addressing the causes and the water loss, so reducing the amount that needs to be pumped, you also save energy.”

The €200,000 cost of setting up the Oliena water management system was recouped in a year. Such was the success that the Oliena model is now on a list of Italian Best Practices for 2017 and will be replicated across 30 towns in Sardinia, followed by a further 100 in 2018 and another 100 in 2019.