

INDUSTRIAL WATER **SOLUTIONS**

IS YOUR COMPANY POURING MILLIONS
DOWN THE DRAIN?



FOREWORD



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It is estimated that over 4 billion people will encounter water scarcity over the course of a year. Climate change, rapid urbanization and growth in population will create an increase in demand for this over stretched resource with industrial growth expected to escalate global demand for water by 50%, by 2030*.

Countries and cities that have thriving industrial sectors need to be aware of the impact this shortage will have on their businesses. With a decrease in available supply, priority will be given to local and regional inhabitants, closely followed by the agriculture sector. A depletion in resource will see a rise in tariffs, negatively impacting bottom lines, and more critically, a potential cease in operations.

Currently, 80% of the generated wastewater flows back into the environment without treatment or consideration for reuse. This not only has significant implications for our ecosystem and health, it creates a hefty compliance risk as well as operational cost since so much water is wasted rather than reused.

Governments, leaders and business alike are tightening environmental regulations to drive compliance and standardization across Asia to protect and restore

water-related ecosystems, such as wetlands, rivers, lakes and aquifers. These goals form an ambitious agenda that industrial manufacturers must adhere to and deliver on. However, this isn't just about mitigating risk. It's about creating a shift in the way we view wastewater – it's not just a waste, it's an opportunity.

Many industrial manufacturers recognize that water is important to their business, but few understand the direct relationship between the water they use for manufacturing and the efficiency, profitability and sustainability of their business.

At Arcadis, our industrial water experts help companies to unlock this concept, identify where water can be reused, recycled or reduced to deliver viable business results including elimination of waste, increased cost savings, optimized production efficiencies, and sustained water quality and quantity.

This process requires businesses to understand the true value of water. Not just as a precious resource, but its ability to impact bottom line performance. The way we view and use water is evolving, and we need to prepare and embrace this opportunity.

* UN-Habitat. (2016). World Cities Report 2016: Urbanization and development.

CASE STUDY

AUTOMOTIVE SECTOR

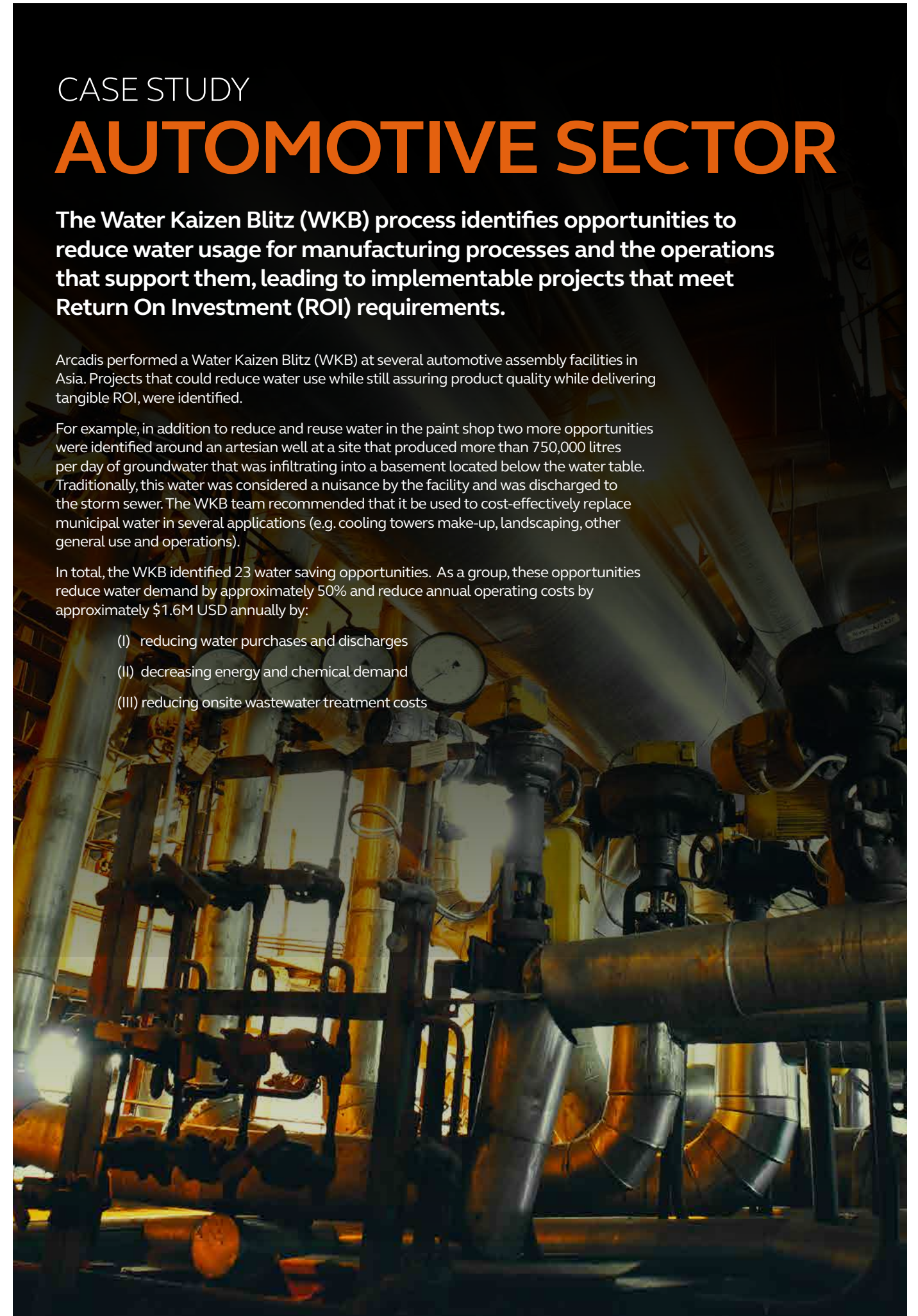
The Water Kaizen Blitz (WKB) process identifies opportunities to reduce water usage for manufacturing processes and the operations that support them, leading to implementable projects that meet Return On Investment (ROI) requirements.

Arcadis performed a Water Kaizen Blitz (WKB) at several automotive assembly facilities in Asia. Projects that could reduce water use while still assuring product quality while delivering tangible ROI, were identified.

For example, in addition to reduce and reuse water in the paint shop two more opportunities were identified around an artesian well at a site that produced more than 750,000 litres per day of groundwater that was infiltrating into a basement located below the water table. Traditionally, this water was considered a nuisance by the facility and was discharged to the storm sewer. The WKB team recommended that it be used to cost-effectively replace municipal water in several applications (e.g. cooling towers make-up, landscaping, other general use and operations).

In total, the WKB identified 23 water saving opportunities. As a group, these opportunities reduce water demand by approximately 50% and reduce annual operating costs by approximately \$1.6M USD annually by:

- (I) reducing water purchases and discharges
- (II) decreasing energy and chemical demand
- (III) reducing onsite wastewater treatment costs





IS YOUR COMPANY POURING MILLIONS DOWN THE DRAIN?

Water is a vital and seemingly cheap resource for industrial facilities. However, it is a mistake to think that its cost to your business is what appears on your water bill. Instead, businesses need to understand the many ways water interacts with their industrial processes because when you add together the costs associated with treating and moving it around a plant, water is not cheap.

“WE ACHIEVED SAVINGS OF \$3 MILLION PER YEAR AT ONE CHEMICAL FACILITY.”

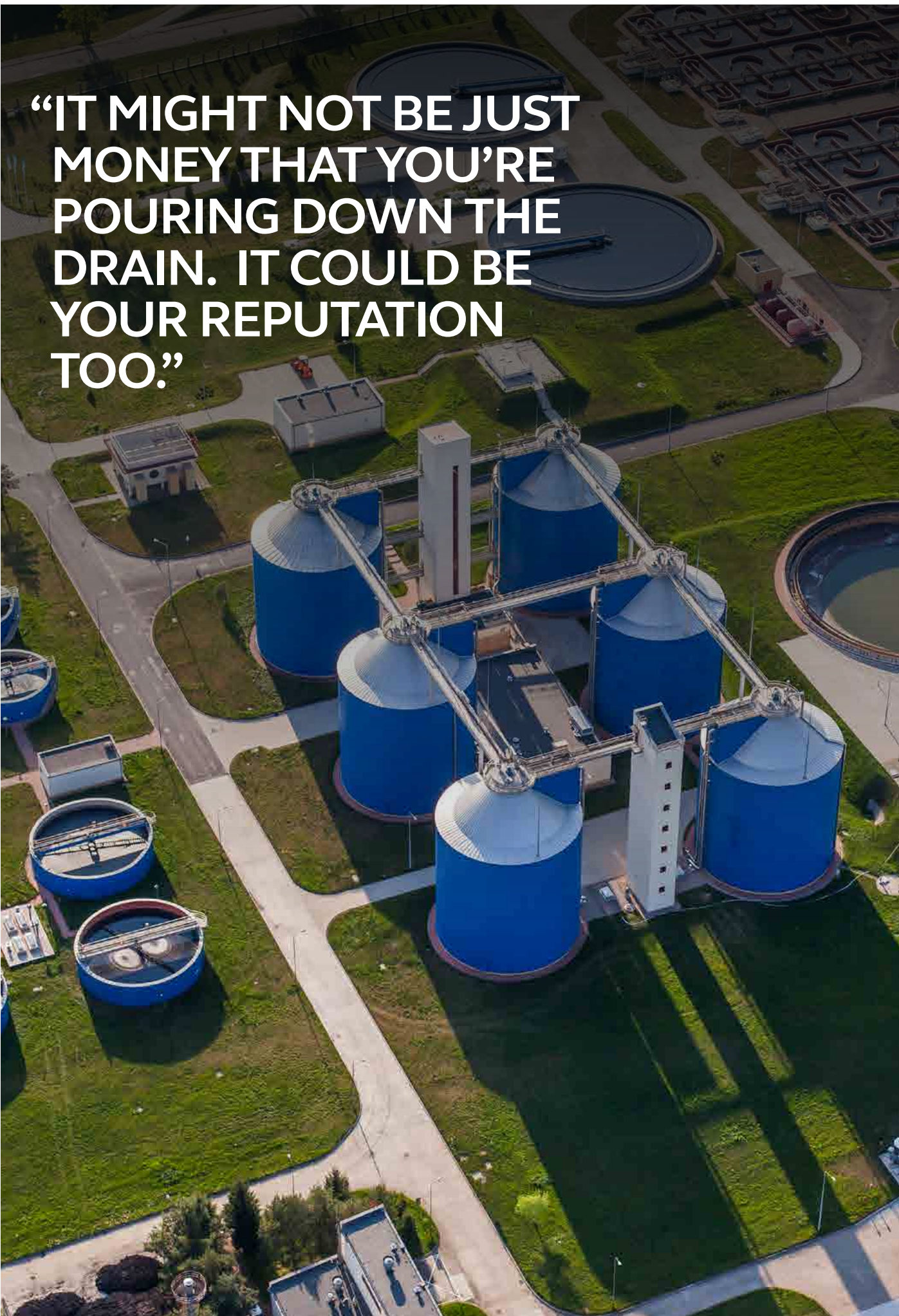
THE TRUE COST

Companies that investigate the true business costs of water can find that they are pouring millions of dollars down the drain.

This is illustrated by a study Arcadis carried out for a global chemical manufacturing company across its US production sites. We identified ways to reduce the annual water consumption in just one of this company's plants by 17% - more than 791,000m³ every year, enough water to fill 300 Olympic-size swimming pools.

When linked costs - such as lower energy bills - were taken into account, the measures we proposed saved this plant more than \$3 million a year. The cost of implementing them was just \$760,000.

Reduced water usage saves on the energy needed to pump, heat and cool it at different stages of the industrial process. It also cuts the amount of chemicals used in manufacturing processes, such as coolant, degreasers, and acids and it reduces both the chemicals and energy used for water purification prior to onsite use, as well as for onsite wastewater treatment.



“IT MIGHT NOT BE JUST MONEY THAT YOU’RE POURING DOWN THE DRAIN. IT COULD BE YOUR REPUTATION TOO.”

REDUCE, REUSE, RECYCLE

When you only use water once in your industrial process, you are allowing all of the money spent on energy and treatment chemicals to go down the drain.

To stop this happening, various measures to reduce, reuse and recycle water can be adopted, such as recycling boiler feed and cooling tower water, and reusing the water used for cleaning manufacturing equipment.

However, many companies never take such steps because simple water audits fail to take into account how this vital liquid affects every part of the business. This means the true cost of water isn’t identified, and the need to make the necessary investments isn’t spotted. Or worse, proposed water efficiency measures are rejected because they don’t make financial sense.

BLITZ YOUR WATER

The way we helped this chemical manufacturing company – and many of our clients – identify water efficiencies that can be financially justified is by employing a method known as Water Kaizen Blitz. The “blitz” part is a short intense dive into understanding how water is used onsite. At its heart is a collaborative approach that brings together people from every part of the business.

Carefully structured teams are created to include a mixture of onsite and non-site personnel. Onsite personnel will include maintenance staff, who have detailed knowledge of the facilities and the manufacturing operations. Non-site personnel will include experts in processes and technologies for reducing water use, including water treatment technologies.

At the US chemical plant, water and utilities cost data was collected to develop a “total cost of water” for the site. Three onsite teams were then given three days to carry out a Water Kaizen Blitz. By delving into every part of the plant’s operations, the teams were able to identify 12 project opportunities with a return on investment of less than two years, saving more than \$3 million a year.

It isn’t only large facilities like the US chemical plant that benefit from this technique. Smaller manufacturing sites can also make sizeable gains by delving deeply into their water usage.

For example, when identifying ways of reusing water with a pharmaceutical company in Ireland we generated annual savings of over \$167,000 for an investment of just under \$189,000, meaning the company saw a return on its investment in less than two years.

CORPORATE RISK

Many companies are waking up to the true cost of water, and not just in terms of how it affects manufacturing processes. Reputational and strategic risk associated with water use are increasingly being recognised as having tangible financial consequences for companies that fail to tackle them.

Water now frequently features in corporate risk assessments conducted for investors. In the bonds markets, models such as the UN’s Corporate Bonds Water Credit Risk Tool apply a shadow price for water to depict its true value over and above its purchase price.

The tool combines water risks with a company’s water use and financial figures, and evaluates how water stress would impact the company’s debt-to-income ratio, which in turn influences its bond rating. Even if your company isn’t seeking investment, in many countries water efficiency targets are now becoming legal regulatory obligations and failure to meet these targets typically result in financial penalties.

GUARDING A SCARCE RESOURCE

The wider context for all of this is that fresh water is becoming an increasingly scarce resource. In 2015, NASA’s satellite data revealed that a third of the world’s large aquifers are severely waterstressed and, according to the World Economic Forum, global water requirements in 2030 are projected to be 40% above sustainable water supplies.

The global population and developing nations are growing so fast that soon there may not be enough water to go around. And company shareholders and boards are starting to recognise the strategic risk associated with being seen as a business that wastes water.

It might not be just money that you’re pouring down the drain. It could be your reputation too.

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