

"Water footprint" enters corporate vocabulary

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Water scarcity is now a critical issue to businesses, but how do you track the slippery stuff?

“Carbon footprint” is now a term used by consumers and business managers alike, although five years ago nobody talked about it much. Likewise, the term "water footprint" is now gaining broad acceptance amongst businesses.

What is a water footprint?

The average person in the UK (according to [Waterwise](#)) directly uses about 150 litres of water per day but behind this direct use there is an indirect use which is about 23 times higher, about 3400 litres per day. Of that 3400 litres, about 31% is embedded in industrial goods and 65% embedded in food, with the other 4% relating to drinking water and water used for domestic purposes.

The sum of the direct use and the indirect use of water is the water footprint.

Like the individual with a direct use of water and an indirect use of water, the business should begin with an evaluation of its direct and indirect uses of water. The direct uses of water are those such as water used for producing goods, manufacturing, and supporting activities - collectively referred to as the operational water footprint of the business. The indirect use of water is the water used in the business' supply chain, and is sometimes referred to as the supply chain water footprint of the business.

Why care about the business water footprint?

In business and industry, water has often been an issue which is overlooked. But now,

with increasing concern over climate change and resource scarcity, the topic of water has risen up the business agenda, often forming part of Corporate Social Responsibility and reflected in the Environmental Management System. Even small changes to temperature can cause dramatic changes in rainfall patterns, which in turn can wreak havoc with agriculture as more land needs to be irrigated.

Apart from negative PR, reputational and regulatory effects, water issues can affect business operations, through supply chain bottlenecks arising from water shortages.

Part of the increased awareness of water issues has come about through recognition of the problem of energy use and greenhouse gas emissions. Recognising that water has a lot of energy associated with it – energy used for pumping water, treating water, filtering water, chilling water, heating water – it is clear that unnecessary water use means unnecessary energy use.

Goods and services have water footprints

What are the water footprints of some typical goods? According to case studies carried out by the [Water Footprint Organisation](#), a cup of coffee has a water footprint of about 140 litres of water. A glass of beer has a footprint of about 75 litres of water. A slice of white bread has a water footprint of about 40 litres of water. These are goods that one can easily imagine require water to create them. How about some other goods, such a cotton shirt? A cotton shirt has a water footprint of about 2700 litres of water.

According to Waterwise, about one fifth of the world's freshwater withdrawals are for industrial uses, although in some countries, such as the UK, nearly half of freshwater is withdrawn for use in industry. For most goods and services these days, the water footprint extends far beyond the market in which they're being sold.

Save water, save money

People are accounting for carbon because of consumer pressure and legislation. Similar pressures are occurring in relation to water, as effects of water stress become obvious. TV images of wildfires sweeping parts of Australia and the south western US, for example, bring home the important effects of drought. Although businesses may not necessarily spend as much on water as they do on energy (although some industries, such as beverages, are clearly water intensive), water can be business critical input and also a sensitive area for stakeholder relations and expectations.

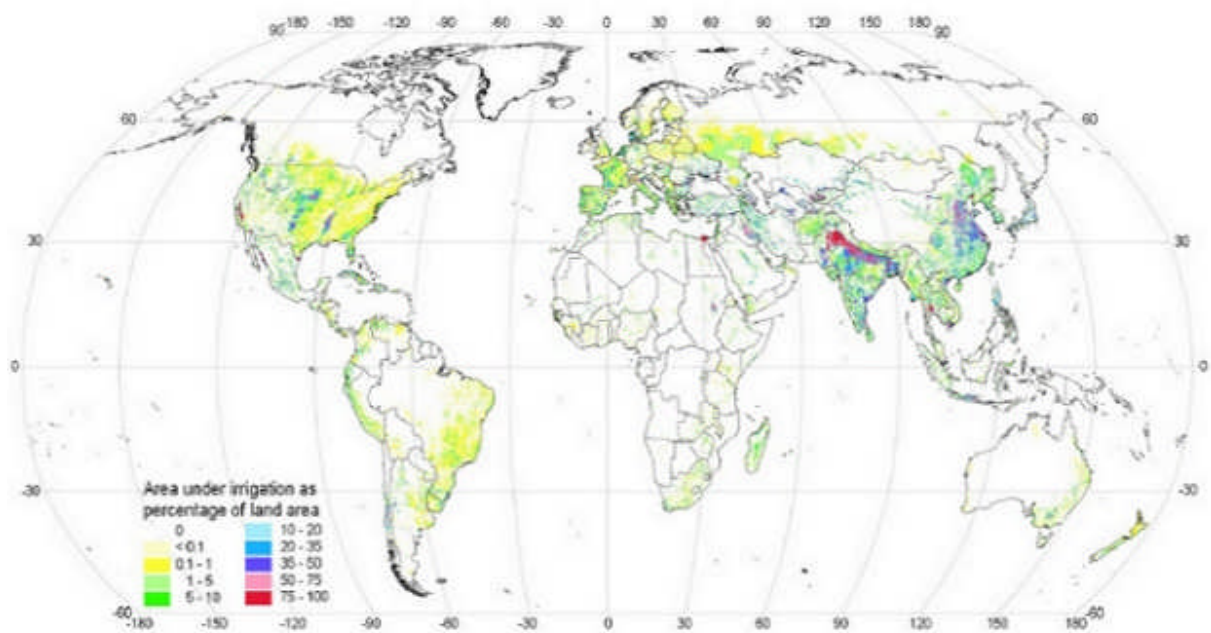
Customers are becoming increasingly sensitive to environmental matters and with news spreading fast on the internet it doesn't take much for the reputation of a business to be affected on account of poor water performance.

The move towards footprint labelling on goods raises the possibility for businesses to communicate in new ways with consumers on good water practice.

Investors and other stakeholders are also interested and in some regions there is significant legislation in place designed to protect water resources. The polluter pays principle is changing the way that water pollution incidents are viewed, with significant fines now being levied against offenders, carrying with it the potential for reputational damage.

Blue, green and grey water

There are different types of water embedded in products and these are usually referred to as blue, green and grey water. Blue water refers to surface and ground waters and is the water that is seen in rivers and lakes. Blue water is obvious – we know it when we see it. Green water, however, is not so obvious. It is the water held in the soil as moisture and cannot be extracted or piped away although it does evaporate from crop fields. Despite this, green water is essential for vegetation, whether it is natural or cultivated vegetation, and most of the crops grown in the world are grown using only green water, as illustrated by global maps of irrigated areas like this one:



[Global Map of Irrigation Areas: Percentage of 5-minute grid cell area that was equipped for irrigation around the year 2000 (Robinson projection), taken from University of Bonn, October 11-13, 2006, Conference on International Agricultural Research for Development]

Withdrawal of blue water is often associated with ecological harm, because the areas from which the blue water is taken may be sensitive to changes in water levels. The amount of grey water embedded in a product is the volume of water polluted as a result

of the production process. It relates to the amount of water that is required to dilute the polluted water so that water quality is returned to an acceptable standard.

Overall a water footprint consists of three types of water: blue, green and grey. Knowing the balance of these types in an overall footprint, as well as their distribution amongst the direct and indirect uses, tells us about the level of stress that a product or enterprise has placed on water resources.

Measure, monitor, audit and minimise

Since the business water footprint has two components (the operational and supply chain water footprints, each of which has three colour sub-components), it is logical that a water footprint reduction programme should have two key areas of focus. One part of the programme should focus on saving water in the operations run by the business and the other should focus on water used in the supply chain.

As with any programme aimed at resource efficiency, the main steps are to measure, monitor, audit, and minimise. Measurement will reveal peaks and troughs in water use bringing attention to areas of good and bad performance, which can become the foundation for resource efficiency measures. There are established ways of determining these components. For example, grey water components of a business unit would be determined by monitoring the levels of chemicals and other pollutants discharged from all points of the business. In many cases, however, data may not currently be available (as water footprinting is a new area for many businesses) and so extra effort needs to be made in monitoring and measuring. This is particularly so through extended supply chains, which can extend across large geographical regions.

Alongside monitoring, a water audit can identify specific actions to reduce the water footprint. These actions may include using water saving technologies, water conservation measures, and wastewater treatment.

There are many technologies and devices available for saving water and these range from simple measures for taps (eg electronic taps, taps with timers, both with aerators), showers (eg thermostatic taps with saving heads) and urinals (eg. individual photoelectric cells and maximum flush timer) through to techniques for making cleaning-in-place more water efficient. In areas of hard water, fitting a water softener can help reduce energy costs and reduce maintenance costs on equipment affected by hard water and scale. This is important for businesses in process industries, and in the healthcare, sports, laundry, bakery and hospitality sectors. Reducing water consumption can also reduce chemicals consumption. Top of the list of conservation measures is making sure there are no water leaks. Does someone in the business have responsibility for regular leak surveys, and have they been given the resources to fix leaks when they are detected?

Once a business has information about its water consumption, particularly on the water-hungry parts of the business, it can turn this into an action plan, prioritising short, medium and long term measures. This should include proposals with timescales and

return on investment analysis, detailing how the business water footprint will be reduced. While an effective water management programme is led from the top, employees play a crucial role in delivering the action plan. To make effective reductions in water consumption, the business should educate its employees on the roles they will play in the action plan, providing relevant training at every level.

It is important though for management to ensure that everyday business pressures do not undo good work in water saving. Take one recent example. The amount of water used to clean lorries driving from a factory was reduced when spray nozzles were attached to the hoses. Unfortunately, the drivers of the lorries were under time pressure to get to their next destination and so to reduce the time taken to clean each lorry they simply removed the spray nozzles. Management had not accounted for the fact that to save water and reduce water costs, there would have to be a change in the time allowed for tasks.

Water footprints through the supply chain

When it comes to reducing the indirect water footprint, the business will need to work with and influence suppliers. If necessary that may require changing to other suppliers who are more responsive to water conservation. The business may need to work with its suppliers to improve quality standards and to reduce the indirect water footprint by installing effluent treatment plants and engaging in water recycling. In some cases changes may need to be made to production techniques in order to save water and reduce amount of hazardous wastewater.

Overall, the business will need to transform its business model in order to incorporate the supply chain into its management processes. That means the business will need to know the water footprints (according to the different colours) through the supply chain. These days many suppliers are finding themselves on the end of a carbon scoring process. It may be just a matter of time before that process includes water scoring and both become a regular part of the commercial audit process.

Water consumption occurs upstream and well as downstream and so business water footprinting should take this into account. The water reduction strategy for the business may also involve a marketing plan for changing consumer behaviour.

Can I offset my water footprint?

As with any form of footprinting, concepts such as neutrality and offsetting soon get raised. Can a business become water neutral? Can its water use be offset? The water-neutral concept does show some similarity to the carbon-neutral or carbon-offset concept. The principle of the concept is that a business takes action to reduce its water footprint as much as possible and then contributes to some form of enterprise that will compensate for the remaining water footprint. There may also be compensation for pollution to water. There are many types of enterprise involved in water offsetting, ranging from water awareness campaigns through to funds for sustainable and fair use of freshwater resources.

The issue for any business considering water offsetting is to understand how to determine whether it has done all that it really can to reduce its direct and indirect water footprints and whether the compensation made for the residual footprint can be properly justified. If an offset is made, the offset should reflect the vulnerability of the region where the water footprint is located. It is worth noting that a water footprint in an area (or time) in which water is scarce would require a larger offset than in an area (or time) where water is abundant.

Water performance and strategic advantage

Businesses have an important role to play in turning water from a resource held in little regard into a resource that is rightly viewed as being precious. Footprinting provides businesses with a way of accounting for and safeguarding water supply (through source water protection) for the future.

The business may need to share research and compare best practice and benchmarking methodologies to understand all the factors that need to be considered within a local area. Assessing the water needs of the local environment including rainfall patterns, river basins, crop and plant species, will require an understanding of international variables including climatic, social and political, irrigation, population densities, demand-supply balance.

Defining the boundaries of a global water footprint for the business and measuring embedded water, water usage and water efficiency within global supply chains is going to become as important as measuring energy use. And the first step towards success is to begin measuring the business water footprint.

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