The textile industry is making a positive contribution to the Millennium Development Goals (MDG) through creating jobs that help eradicate poverty in the developing world and empower women, but it also has to start addressing questions connected to the MDG targets of managing the world's water resources better. This article highlights recent developments that can make important contributions to this effort.

Ideas to help manufacturers use less water

We have seen high volumes of communication from companies in the textile industry in recent years on reducing carbon emissions, but not so much about reducing water use. It takes a lot of water to make performance textiles and outdoor and sports apparel, and it always has. Unfortunately, water shortages and water poverty are pressing issues in the twenty-first century and this industry will be unable to keep presenting its sustainability credentials without taking steps to protect water resources and use them responsibly.

According to the United Nations' World Water Assessment Programme, almost 900 million people across the globe have to live without access to clean drinking water at the moment and a total of 2.6 billion people do not have access to basic sanitation. About 1.5 million children under the age of five die each year because of water- and sanitation-related disease. To raise awareness of the issues surrounding access to water, the UN launched a campaign for "a decade of action" under the title Water For Life. We are already halfway through it.

The Millennium Development Goals (MDGs), the eight development improvements that the international community has committed to achieving by 2015, includes one, Goal 7, that seeks to ensure environmental sustainability. Within that, there are specific references to water; target 7C is to halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation. The UN is now confident that more than 90% of the people of the world will have access to clean drinking water, but the latest indications are that "huge efforts" are still required to meet the sanitation target. Between 1990 and 2006 the proportion of people in the world without improved sanitation decreased by only 8%. Taking into account population growth, an estimated 2.4 billion people will be without basic sanitation by 2015.

Thirsty consumer

This has clear implications for the global textile industry. A crucially important contributor to achieving other MDGs, notably eradicating extreme poverty and hunger and empowering women, the textile sector is a very thirsty consumer of water and, through poor infrastructure and practice in some developing countries, a source of contamination of water supplies. Water is used as a solvent in many pretreatment and finishing processes, such as washing, scouring, bleaching, dyeing, rinsing and finishing. The contaminated water must then be handled and treated prior to disposal or recycling.

The results of a joint project run by Huntsman Textile Effects and Genencor, a division of Danish biotechnology company Danisco, suggest that, on average, an estimated 100–150 litres of water are needed to process each kilo of textile material. The project found that a new bleaching system the companies have developed could help textile manufacturers save water and reduce their carbon emissions.

The bleaching system, called Gentle Power Bleach, was introduced to the textile pretreatment market in March 2009. Unlike conventional bleaching systems, the new system is based on enzyme technology, an innovation by Genencor called PrimaGreen EcoWhite. The enzyme technology allows bleaching systems to perform at much lower temperatures than previously and at neutral pH levels. Historically, the textile bleaching process



A young Sudanese boy carries water home for his family in a plastic container. It's time for the industry to address water issues surrounding textile production.

UN Photo/Tim McKulka





A warping machine in operation at The Yeh Group's factory. The company says it can use the DryDye method to dye any of its 4,500 polyester fabrics.

The Yeh Group

requires temperatures of 95°C. Gentle Power Bleach allows this to be lowered to 65 degrees.

Tests to assess its impact on the environment were carried out by research provider Quantis International. On completing the analysis, the US director of Quantis, Jon Dettling, said: "Although the cotton pretreatment processing parameters will differ across the globe, we found a substantial advantage for Gentle Power Bleach among each of the many environmental impact categories that we tracked."

He went on to say that if the new system were used on the roughly 26 million tonnes of cotton produced across the world, a 2007–2008 statistic, the savings in freshwater consumption globally could be in the range of 10 trillion litres of water a year, which is more than 1,000 litres annually for each person on earth. Another eye-opening comparison the companies came up with is that switching global cotton bleaching to Gentle Power Bleach would save enough water to fill the Hoover Dam Reservoir two-and-a-half times.

"This result depends strongly on the available information regarding cotton irrigation, but nevertheless illustrates the large potential benefits of the technology," Mr Dettling added. "Significant reductions in global greenhouse gas emissions are another benefit of this process. It is estimated that it has the potential to reduce global carbon emissions by 10–30 million tonnes annually."

Huntsman Textile Effects president, Paul Hulme, commented: "Both companies [Huntsman and Genencor] see this technology as a critical step towards a more sustainable textile processing industry. Our vision is much aligned with the one from Genencor, and that is that we need alternative solutions today to tackle the critical challenges that future generations will face if we don't act now."

The companies pointed out that the new bleaching system is ISO 14044 compliant, and has undergone peer review. Additional benefits of the system are that the bleaching technology could apply to all fibres that are temperature and pH sensitive, results in fabrics that have a permanently soft and natural handle, causes lower damage and weight loss to the fabric during pretreatment. The results of the Quantis International tests were validated in production using existing production sites and processes.

Dye another way

Another idea, this time from Thai fabric and finished garment manufacturer The Yeh Group, involves ways in which the textile industry may be able to improve its water performance at the dyeing stage. The company has announced plans to introduce DryDye fabrics that use an exclusive waterless dyeing process, an innovation that the company says can save



A textile factory helping to bring empowerment to women in Puerto Cortés, Honduras.

UN Photo/Mark Garten

millions of litres of fresh water annually.

The Yeh Group believes it will be the first textile mill to implement a new process developed by its partner DyeCoo Textile Systems, a Dutch firm, and will bring to market products made under the new system in the fourth quarter of 2010 under the name DryDye fabrics. The Yeh Group has exclusive rights to the technology at the moment.

The new process uses supercritical fluid carbon dioxide instead of water for dyeing textile materials. It uses only nominal amounts of carbon dioxide, nearly all of which is recycled.

The fabrics will have the same dye qualities and durability as current, conventionally-dyed fabrics, The Yeh Group says.

Supercritical fluids have been used in various extraction processes for decades and are the mainstay of extracting caffeine from coffee and tea, for example. They have also been used for many years by the dry-cleaning industry.

DryDye fabrics will be available to consumers in early 2011 through select brand customers of the group. The initial brands adopting and marketing DryDye fabrics will be announced in the coming weeks.

Former marketing director of activated carbon-enhanced yarns and fibres Cocona, Jon Erb, has been working with The Yeh Group and has been helping the company present the DryDye concept to the market since the summer. He says: "There is a real net gain here; millions of litres of fresh water are used in dyeing in every textile factory in the world. So there's a saving on that, and also because with DryDye there is no effluent. It also uses up to 50% less energy and is quicker and more efficient. It's really a remarkable advancement and I can't think of anything that has done more to contribute to the greening of the industry."

Adidas is its biggest customer, with Mizuno, Puma and The North Face also among the early adopters of The Yeh Group's new idea. The company has a library of around 6,000 fabrics, Mr Erb says, 4,500 of them different types of polyester. He says it can apply the DryDye idea to any of its polyester fabrics; it has invested in enough technology from DyeCoo to be able to offer the capacity and flexibility to do this.

He believes this is a good illustration of the group's commitment to becoming a competitor at a world level in terms of clean and innovative production. "Mill migration happens," he explains, "as brands keep moving their business to places where labour is cheaper. But The Yeh Group has been smart enough to look at how they will still compete when cheaper places come on stream. This is a smart way for them to go. The fabrics have an amazing soft touch and even drape a bit like cotton, and the colours are just as good as you will see anywhere. You would never know from looking that they have carried out the dyeing process using different technology."

