Water has always been a crucial resource in the papermaking process, which is why paper mills are usually located close to important water reservoirs. Over the past two decades, pulp and paper mills have been reducing their intake of freshwater dramatically, by 20% in total volume and by 47% when calculated as a specific value, per cubic metre per tonne of product.

Water consumption in the European paper industry is measured by adding up the water lost through evaporation during the production process as well as secondary waste treatment, water in solid residues and water in the products themselves. Water consumption by the European paper industry in 2012 was 298 million m³, or just 7.7% of the water it took to begin with.

Water use is not the same as water consumption: The forest industry uses large volumes of water, but only a small part of this water is “consumed”. Water bound up in products and waste counts as consumed. The remaining process water can be reused (more than 90%). It is important to remember the distinction between use and consumption when discussing water issues and the forest industry. Water is, however, a local issue and has to be regarded from a water catchment perspective.

A GROUND-BREAKING DISCOVERY:
Deep Eutectic Solvents

Some highly significant research and development within the industry has recently led to an exciting discovery that might eliminate the need for water in the papermaking process altogether. Deep eutectic solvents (DES), produced by plants, could open the way to producing pulp at low temperatures and at atmospheric pressure requiring a lot less energy and no water. Using DES, any type of biomass could be dissolved into lignin, cellulose and hemicellulose with minimal energy, emissions and residues. They could also be used to recover cellulose from waste.

Pure genius

In 2013 Borregaard commissioned a new biological purification plant which significantly reduces the mill’s emissions to water – and more. It also produces green energy in the form of bio-gas which replaces fossil fuel in part of the mill. This in turn will cut CO₂ emissions by 8,000 tonnes in 2014.

Recycled water as well as paper

Holmen Paper Madrid uses treated wastewater in its production process, which comes from a municipal waste treatment plant. Since September 2013, the municipal plant has been delivering high quality treated water to the mill. This makes the mill the first in Europe to manufacture printing paper using 100 per cent recovered paper and 100 per cent recovered water.
**Algae-bacteria breathes new life into wastewater**

The idea of using symbiotic algae-bacteria biomass to treat wastewater isn’t new, but it’s been attracting renewed interest in recent years. The ALBAQUA project, completed at the end of 2011, showed that it has a future. As the technology gets rolled out, it is expected to have an impact not just for the paper industry, but for many others. Benefits could include added value from the sale of excess sludge as raw material for biofuels or anaerobic digestion and reduced discharge costs due to improved effluent quality.

(Source: PTS)

**Bio-gas within hours**

At Saica paper mill in Spain, high-capacity anaerobic reactors from Voith Paper can transform organic materials into bio-gas within a few hours. This gas can then be used as an additional energy source for steam or power generation back in the mill.

More information at www.cepi.org/resourceefficiency