This Eurosif report has been compiled with research by INrate. It highlights critical water issues and describes the major environmental, social and governance (ESG) challenges currently facing water-dependent industries. It covers specific risks and opportunities for companies involved in water supply, water consumption, handling of water during industrial production, and water technologies such as water preparation and treatment.

CRITICAL WATER ISSUES FACING INDUSTRIES

Water Scarcity & Unequal Distribution of Current Supply

- In 2002, the United Nations Committee on Economic, Cultural and Social Rights declared access to water to be a basic human right. The World Health Organization defines this basic water requirement, essential for living, to be 20 litres per person per day. However, the average European uses around 200 litres of water a day, whereas individuals in developing countries have access to only 10 litres of water a day.1

- Only 3% of the Earth’s water resources are freshwater, of which two-thirds are locked in polar ice caps and glaciers, and they are already stressed beyond their limits. Around 20 states in Africa, the Middle East and in the Mediterranean area already suffer from water stress.2 60% of European cities overexploit their groundwater resources which supply around 65% of all drinking water in Europe.3 As a consequence of groundwater over-exploitation, 50% of wetlands have an "endangered status".4

- The agriculture sector has a high impact on the depletion of water resources. Agriculture accounts for two-thirds of water use worldwide and as much as 90% in many developing countries. Globally, industrial and domestic water-use make up 22% and 8% respectively (Graph 1). As much as 8% of food crops grow on farms that use groundwater faster than the aquifers are replenished.5

- Greater economic development and world population growth will increase water-use demand. While water scarcity is already an issue in many countries (Graph 2), it is assumed that additional water quantities of 5,600 km³ annually will be required to feed the world population in 2050. Global water scarcity is increasing, so that by 2025, 14 additional countries might be classified as water-scarce (i.e. having less than 1000 m³ per person per year).6

- Unequal distribution of water and the growing demand for freshwater resources, as well as in-country migration and further urbanisation heighten the risk of conflicts developing between states and sectors and the need for co-operation. Solutions are urgently needed in the 263 river basins which are shared by two or more states, and in which nearly half the territory and population of the world are located.7

Graph 1: Percentage of water use worldwide

Graph 2: Water scarcity in the world

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1 Muller 2006 / WHO 2003.
3 Defined when there is not enough water for all uses, whether agricultural, industrial or domestic. UNDP 2006: Human Development Report 2006.
4 EuroActiv 2008: EU News, Policy Positions & EU Actors online. EU freshwater policies.
5 IBD
7 FAO 2007: The state of food and agriculture. Paying farmers for environmental services. ISSN 0081-4539.
Drinking Water & Sanitation

- Worldwide, more than 2.6 billion people do not have access to an adequate sanitation infrastructure and 1.1 billion do not have access to a secure source of drinking water. The Millennium Development Goals aim at “halving, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.”

- In developing countries, purified bottled water is sometimes a necessary supplement to the incomplete or nonexistent supply of tap water. However, bottled water is often too expensive for underprivileged populations and is generally seen as having a critical environmental impact. This is largely due to transportation, packaging and refrigeration. The bottling of water by international companies could even be the reason for decreasing ground water levels, by drying up wells that provide drinking water for local populations.

Water Pollution

- In the European Union, 20% of all surface water is seriously threatened by pollution. Water quality is influenced by pollution which stems from urban and rural populations, industrial emissions and farming. Agriculture is a key source of diffuse pollution, but urban land, forestry, atmospheric deposition and rural dwellings can also be important sources.

- Discharges from wastewater treatment plants and industry cause point source pollution (i.e. from stationary locations or fixed facilities) by oxygen consuming substances, nutrients and hazardous substances. The adverse impacts depend very strongly upon the degree to which such discharges are treated before reaching waterways.

- Water pollution by chemicals is also of importance, especially from persistent organic pollutants like PCB’s (Polychlorinated Biphenyls) and certain pesticides, which have the potential to bioaccumulate and are found worldwide.

Climate Change

- With progressing climate change, not only will average temperatures increase and sea levels rise, but it is also very likely that precipitation will increase, causing the frequency of floods and droughts to increase. Consequent effects on the earth’s water regimes are various and substantial, and are of high social and economic importance.

- Several dry regions in temperate zones will increasingly suffer water shortage. With high probability, runoff and water availability in upper latitudes as well as in certain tropical regions will increase.

BUSINESS RISKS FOR WATER-DEPENDENT INDUSTRIES

Most sectors involve activities for which water is critical for some stage of production. However certain industries, by their very nature, involve activities that have a greater exposure to water related risks, such as: agriculture, mining, food and beverage, energy, forestry and various water treatment, water supply and sanitation industries.

Agriculture

- Irrigated areas may be affected by salinisation, waterlogging, desertification, erosion, etc. Downstream degradation of water quality by salts, agrochemicals and toxic leachates, is posing serious environmental problems. Salinisation, which is often associated with inadequate irrigation in areas with low rainfall and high evapotranspiration rates, leads to the loss of more than a million hectares of agricultural land annually, mostly in developing countries.

- Due to both climate change and increasing water withdrawals, it is likely that the area affected by severe water stress will increase and lead to increasing competition for available water resources.

- Higher temperatures and increased variability of precipitation caused by climate change could lead to increased irrigation water demand for food production, even if the total precipitation during the growing season remains the same. The highest increase in irrigation water demand is projected in the Mediterranean and some parts of central and Eastern Europe. This calls for developing sustainable land-use planning. Furthermore, irrigation requirements are likely to become substantial in countries where it now hardly exists (e.g. in Ireland).

Mining

- Mine development may disrupt and pollute surface water and groundwater systems. The effect of mine closure on water quality should also be examined closely (acid mine drainage).

- Resource extraction can affect the quality of surface water and groundwater through sedimentation, acid mine drainage, wastewater disposal or hydrocarbon spills. With high water consumption, extraction also puts pressure on natural resources.
Food and beverages

- The food and beverage industry relies heavily on water as an input for the production process as well as for final goods. Water scarcity or water pollution could lead to disruption of the production process, higher commodity costs and higher power costs for food and beverage companies. Furthermore, droughts leading to low crop yields are a major cause for rising world market prices for food.26

Energy

- The availability of water used for cooling is essential for the energy industry. Coal, hydropower and nuclear energy suppliers are all highly dependent on access to plentiful supplies of water, leaving water-short regions to contend with restrictions in their energy supply or rising energy prices, as well as the direct impact of droughts. Environmental and legislative risks occur due to hot water discharges and in cases where hydrological conditions (regarding quantity and quality of water resources) are not appropriate for the operations. During the heat wave in the summer of 2003, the impact of water risk was demonstrated when a quarter of France’s 58 nuclear power facilities had to shut down. Drought also reduced Nordic hydroelectric reservoirs, forcing them to restrict generation to ensure water supplies lasted. To compound the problem, the heat wave resulted in a 10% increase in energy demand.

Bioenergy production is a growing sector of high value biomass production. While biofuel and biogas production based on waste products (e.g. cellulose, manure etc.) is seen as sustainable, the production of biofuel based on energy crops such as palm oil, maize, sugar cane etc. may compete with food production and increase the competition for water, adding another driver to water scarcity.21

Forestry

- The pulping process uses large amounts of fresh water. Water pollution from pulp production represents a risk for companies in terms of reputation, legal controversies and fines. Recent examples of accidental pollution include liquid waste from two paper mills overwhelming a village in Inner Mongolia, China in April 2006.

Water Treatment, Water Supply and Sanitation Industries

- Water utilities supplying drinking water and sanitation are the most exposed to water related risks. Greater awareness of the impact of economic activity on the water environment has led to tighter regulation and stricter control by Governments. Infringement of regulations can lead to heavy fines or penalties, legal liability and damage to firms’ reputations and licences to operate. Water utilities providing drinking water to households are in a particularly sensitive position, and the private companies involved in this sector have faced many challenges, particularly in emerging markets. 22

BUSINESS OPPORTUNITIES FOR WATER-DEPENDENT INDUSTRIES

Given the challenges and risks presented in the previous section, important business opportunities arise in the context of sustainable water use. Such opportunities, including solutions for water efficiency, improved water infrastructure, water-efficient technologies and products, water supply and sanitation as well as wastewater management are presented below.

Offering Solutions to Improve Water Efficiency

- Improved water-efficiency may result in the expansion and replacement of water and wastewater treatment plants, as well as of desalination plants and independent water and power projects.23 Reverse osmosis technologies are highly energy intensive but falling prices for reverse osmosis membranes have made this type of desalination increasingly attractive.24 From a sustainable point of view, energy intensive desalination technologies are only recommended if they are powered by renewable energy (e.g. solar energy). Further possibilities include environmental management such as catchment/wetlands management, aquifer monitoring and small-scale (decentralised) water treatment/sanitation services for low income communities. Investments in water control infrastructure like water storage will be important rural development strategies to respond to climate change.25

- Examples of water preparation and wastewater treatment technologies include chemical water additives for cleaner paper production resulting in fewer wastewater and enzymes that improve the “cleaning power” of washing agents.

Water Supply and Sanitation Opportunities

- In recent years, there have been significant discussions about privatisation and liberalisation of publicly owned water supply systems. Taking into account the technical challenges and funding needs, private companies may play an important role in construction and support of new water infrastructures.26 In this case, strict guidelines controlled by public authorities would be required to ensure high quality and environmental standards. Further guidelines would be needed to guarantee water supply and affordable water prices for the local population.
The drinking water segment of the water business in Europe will attract investments of €137 billion over the next decade. This growing investment need will drive structural changes across the continent, creating significant opportunities for private businesses in the water and wastewater sector. This makes Europe the most valuable market in the world in terms of capital expenditure on water and wastewater.

In Eastern European countries, a shift towards greater water sanitation is clearly visible. Over the coming years, sales of residential water treatment equipment are likely to exceed $100 million. Annual growth rates are largely above 10% for most technologies.

Vast numbers of households in emerging markets remain without adequate access to water and sanitation services, offering important opportunities for companies in the sector. Investment in water preparation, sanitation and purification infrastructures are a priority to meet the Millennium Development Goals.

Using Water-Efficient Technology During Production Processes

The World Bank estimates that only about one-third of any irrigated water leads to higher production – the rest seeps away, evaporates or drains off the earth’s surface. Therefore, efficient irrigation technologies in agriculture are in high demand: drip irrigation or sprinklers can lead to considerable water savings of up to 40% compared to conventional irrigation.

The water intensive food industry offers great water-saving opportunities. Examples are companies using innovative food processing technologies that enable water savings, and companies that process or sell water-efficiently grown food products.

Irrigation water demand may be reduced by introducing crops more suitable to a changing climate. The production of organic food, which puts less pressure on water resources than conventional production, is also an alternative to conventional food production.

Offering Water-Efficient Products

In general, water-intensive industries in water-scarce countries have the opportunity to import products with high virtual water content rather than producing them domestically. By doing so, it allows real water savings, relieving the pressure on local water sources. The dependency between countries resulting from virtual water trade could be a stimulant for co-operation and peace, but also a reason for potential conflicts. The positive effects of virtual water trade may not occur if water prices do not reflect true costs, e.g. due to subsidies on water supply in certain countries.

Manufacturers of products with high water usage during application by the consumer (e.g. sanitary facilities) have also opportunities to reduce the water intensity of their products. In addition, household appliances provide options to reduce domestic wastewater, e.g. less wasteful washing machines.

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