Water in the Spotlight: Water Footprint on the Industrial Agenda

After "energy" and "carbon footprint, "industrial water" is now the new focus. More than just a resource, the availability of water is a global issue and not exclusively a raw material needed in production of goods. Dominique Huret, Cape Decision, studied the role played by industry in water resources and has identified some relevant initiatives.

by DOMINIQUE HURET

So well named, our blue planet is covered by 72% of water, but one must keep in mind that 97.5% comes in salt form (seas and oceans), leaving only 2.5% fresh water. And again, most of this water is not directly accessible because it is stored in solid form in the poles and mountain glaciers or in deep groundwater. In total only 0.3% of the volume of water on our planet can be used for human consumption. These few facts highlight the obvious: water is a scarce and valuable resource.

In addition, water is unevenly distributed on the surface of our planet: often wasted in our part of the world while, in short supply for many developing countries, especially in Africa. As specified at the World Water Forum in March 2012, access to safe drinking water has improved significantly since 1990, but the challenges remain enormous. Water has become a priority for sustainable development and rational use a priority for both consumers and businesses.

In his book dedicated to water, Antoine Frérot, then CEO of Veolia Water, noted that "the current problem, that will arise more acutely in the future, is less the scarcity of resources itself as the uncontrolled growth of uses. The demand for water rises continuously. Three factors are involved: the extension of irrigation, the population growth and changing lifestyles. Today is not different than the past, producing food takes the heaviest load on nature. During the last century, agricultural water withdrawals have increased fivefold in the world. Modernization requires more intense intakes of resources and each point of economic growth constitutes more points of growth of water consumption. In the end, water consumption grows faster than population. According to the United Nations between 1900 and 1995, the consumption of fresh water has increased six fold, while over the same period the population has only triple".[1]

The water problem is global, because the water is not limited to tap water or rivers water. The products that we consume daily need water in the manufacturing process and it is a sine qua non for agricultural products.

The Germans are the largest consumer of orange juice. A few years ago, the Wuppertal Institute conducted a study on the juice coming from Brazil. The result are scary: to produce one ton of concentrate juice, it takes one hundred liters of oil for the concentration process, the freezing and transport. But it also takes a very heavy toll on water. Each glass orange juice requires no less than 22 glasses of water to reconstitute the juice and bottle it![2]

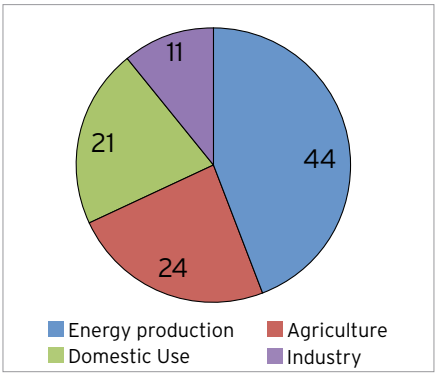
The Framework Directive (WFD), adopted on 23 October 2000 by the European Parliament and the Council of Europe registered water in a primarily European environment. This Directive establishes a framework for a comprehensive EU policy on water. It aims to prevent and reduce water pollution, promote a sustainable use, protect the envi-ronent, improve the status of aquatic ecosystems and mitigate the effects of floods and droughts.

According to Veolia CEO Frérot, this Directive constitutes a turning point

in European water policy whose scope has probably not been fully understood so far. Instead of an environmental policy focused on controlling the use and discharge, the focus is now set on an environmental quality approach. In promising the good condition of EU waters for 2015, the European Union is committed to the Sisyphus work of reclaiming and preserving water resources.

In practice, the Directive requires Member States concrete results, not only means. It set a strict timetable: 2015 or 2025, depending on the state of the environment, countries and their date of entry into the European Union. So for instance, Belgium should achieve by 2015 a good ecological and chemical status of its rivers. That means managing waters by river basin with always complex cross-border issues. Most European rivers flow through several countries. The Meuse basin concern five countries: Germany, Belgium, France, Luxembourg and the Netherlands, which doesn't make alignment easy...

Use of water resources in Europe
Source: European Agency for the Environment March 2009



Producing energy is by far the most water intensive with 44% of the global intakes followed by agriculture 24% then, 21% for domestic use and 11% for industries.

The "water" resource in the industry is essential, as illustrated by its different purposes. It may be a component of the product, a solubilizing or even a dispersing agent. The water serves as a means to cool, condense and produce steam. Water is used to clean products and or equipment and pipes. As for energy, rational use of water is to reduce and improve the use of this precious and expensive resource. Manufacturing companies are large consumers of water but they do not wait to incorporate these constraints in their industrial process.

Substantial savings are made possible with alternative water sources drilling or rainwater collection, efficient equipment, recycling and leaks avoidance. Finally, waste water can also contribute: first by its own value but mainly as pollution reducers of the load of water discharged into the natural environment. It is obvious that the price of the water we consume, will increase in the coming years and as such many companies are looking at their consumption to assess the potential savings.

To support manufacturers in their efforts, "new skill and expertise" in terms of energy were added to the existing business. These have led to specialization or added expertise to existing skills profiles: audit of water distribution pipes, circuit optimization, collection of rainwater for various uses, anti-waste campaign enforcement, and economic design of production facilities.

Indeed, the savings are to achieve both upstream and downstream: the supply of course, but also in the release. For today, in most European countries, the tax on industrial wastewater is calculated on the amount of water discharged but also the pollution load. This pollutant load unit is based on chemical and physio-chemical parameters (pH, COD, BOD): it is the basis for calculating the tax on discharges of industrial wastewater. Two methods of calculating the pollutant load unit (PCU) coexist: the complete formula where the PCU is based on qualitative and quantitative parameters and then the simplified formula, where each sector has determine coefficients as a set package.

After an awareness of the scarcity of water, the first step for any responsible "industry" is an accurate knowledge of its consumption. A diagnosis should follow to identify leaks and waste with the key to saving equipment monitoring implementation of best practices.

Undeniably the food industry is very sensitive to these issues. PepsiCo has made good water management a major strategic development. The company focus on innovation to reduce its water consumption: its snacks plants could become water self-sufficient by 2018 through a technology capturing water naturally produced during the processing of potatoes.

United Biscuits reported in its annual report that it halved its water consumption since 2007. Modernization of production lines with the introduction of recycling and filtration for reuse of wash water has allowed the food producer to save one billion cubic meters of water per year The EFBW, the European Federation of Bottled Waters has announced a 10% reduction in consumption of industrial waters of ore for the period 2007-2011. Producing one liter of bottled water requires now average 1.63 liters extra water intake. An international initiative for the development of the ISO 14046 standard on water footprint, is about to come out. It is managed in France by the French Association for Standardization[3] with the support of Safège a subsidiary of Suez Environnement.

This virtuous spiral and this new legal framework will enable companies to keep their water bills under control in the future as long as it is not watered down...

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(1) L'eau. Pour une culture de la responsabilité Antoine Frérot (Editions Autrement 2009)

(2) Suren Erkman, "Vers une écologie industrielle" (Éditions Charles Léopold Mayer, 2004).

(3) AFNOR is a member of the International Organization for Standardization (ISO), where it represents France

What are the different water footprints?

The water footprint of a good or service is the total volume of fresh water needed for its production, throughout its manufacturing process. This volume is divided into three parts corresponding to the water consumed, evaporated or polluted (Hoekstra, 2003).

The green water footprint is the volume of rainwater stored in the soil as moisture, and necessary for the growth of crops (in the form of evaporation of water).

The blue water footprint is the volume of fresh water resources captured in the "blue water" (surface and groundwater), for domestic, industrial or agricultural (in the latter case, it is the water used in irrigation).

The grey water footprint is the volume of polluted water during the production process. This is the volume of water required to dilute pollutants for the water quality to meet the standards acceptable proportions.

The water footprint of production is geographically explicit: it indicates not only the volume of water used, but also the place of use.

Source WWF – 2011 - La Belgique et son empreinte eau -