

WATER IN ACTION

Partnerships

Knowledge

Solutions

Assessing our water footprint

Climate change, rapid population growth and unsustainable practices are putting our water resources at risk.

Whether it is the fuel that makes our cars run or the packaging that keeps our food fresh, the products we use every day require a large amount of water to produce.

In a water stressed world, the water footprint of products will be a key environmental indicator in the drive towards an increased sustainable development.

For the first time, Borealis and the Swedish Royal Institute of Technology (KTH) have investigated the water footprint of plastics materials.



Besides the water we use for drinking, cooking or washing, we also need water to produce goods we daily use: from the farm to your cup the coffee you drank this morning required an average of 140 litres of water to make. Your cotton shirt may have taken another 2,700 litres while a single sheet of A4 paper would “weight” 10 litres.

On average, agriculture accounts for 70% of fresh water use, industry 20% and our domestic use 10%. Most research has therefore focused on our food and drink footprint, but little is known about industrial products or materials like plastics that are used in many applications and value chains.

Yet, like any industrial process, the production of petrochemicals and plastics requires water for cooling, processing and cleaning. To account for the water “embedded” in our goods, leading academics Professor A. Allan, Laureate of the 2008 Stockholm Water Prize, and Professor A. Hoekstra from Tweente University, developed the water footprint, which measures the amount of water used from raw material production to the manufacturing of the finished product.

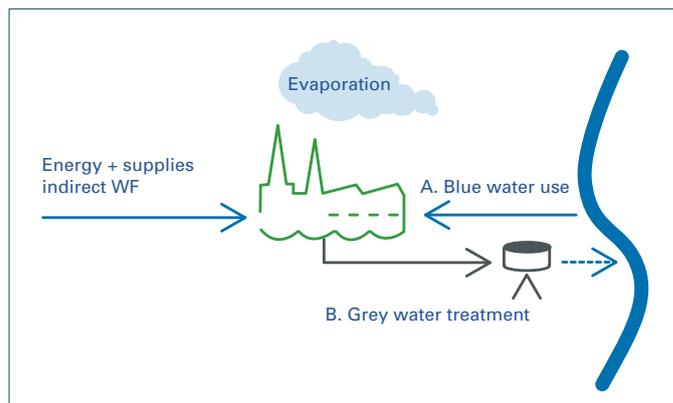
In 2008, Borealis piloted the concept to estimate the footprint of a domestic plumbing system with its key customer Uponor. This pilot pointed to the need for more robust methodologies and better assessment of water use for plastics manufacturing, notably for supplies and energy.

Measuring real water use

Unlike the usual abstraction measures, a water footprint reports the actual volume of fresh water removed from a local water body – a river, lake or groundwater table – and not returned to it at proper quality standards. This water will no longer be available for local eco-systems or other users. The total water footprint of a business is the combination of the direct water footprint of its operations along with the (indirect) footprint of its supplies and energy consumption (see graph).

To measure its exact direct water footprint, Borealis has been working with the Swedish Royal Institute of Technology (KTH). The direct water footprint was calculated on the basis of a detailed review of the water flow in manufacturing processes and at production sites.

This review concluded that Borealis’ direct water footprint was 17,900 million m³ in 2008. For products, one kilogram of polyolefin



was assessed to have a direct water footprint ranging from 1.2 to 6.5 litres per kg of finished product.

While the company’s direct water footprint remains limited, its indirect footprint from energy and feedstock consumption could increase up to 40 Mm³ with the use of more water-intensive feedstock (e.g. natural gas, which has a much lower footprint than oil refinery output) or energy sources for electricity (e.g. hydropower, which has a higher footprint than nuclear or coal). Data on energy sources and feedstock water footprint, still require further investigation.

Assessing the impact of a water footprint

While a carbon footprint has a global impact, a water footprint must be assessed at the local level; the footprint in a water- stressed environment would have a higher impact than in a water-rich environment.

To assess its impact, Borealis mapped its plants’ water footprint against the local water stress index and made projections up to the year 2025 using on-line systems like the WBCSD global water tool. With the assistance of local water experts, this assessment will help plan for future sustainable water management actions.

“Water footprinting” is part of Borealis’ and Borouge’s commitment to advance best practices in sustainable water management. It sets a key indicator for all industries to better assess environmental performance alongside energy and carbon footprint. Building upon this experience, Borealis and Borouge will work together to further apply “water footprinting” in their value chains and share the concept with industry partners.

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For more information on water footprint visit: www.waterfootprint.org

To learn more about the Water for the World visit: www.waterfortheworld.net

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