Planet continued

Water

Water is a critical element in pulping wood and recovered-paper fibres, in the formation of paper and in drying it with steam-driven dryers. Without water, we cannot produce paper.

Our 34 paper and board operations used 134 million m^3 of water in 2019, of which 125 million m^3 was discharged in good condition, making us a processor of water rather than a consumer. We also reuse water several times, after which it is processed in our water treatment facilities and returned to public water bodies. Of the water discharged, 75 million m^3 was used for processing and 49 million m^3 for cooling. Since 2014, we have carried out water risk assessments across all our paper mills. Our products need to meet hygiene standards, and our paper-making technologies require good-quality water. This means that with our neighbours and stakeholders, we have a common interest in good water stewardship.

Only 12% of our paper and board production is in areas of water scarcity, representing 3% of our water intake. Nevertheless, we always use water sustainably – many of our stakeholders are concerned with local quality and expect good water management practices. In 2018, we showed our commitment to water stewardship by becoming a signatory to the CEO Water Mandate.

Water treatment is part of the bioeconomy. We use bacteria to clean the water, and the resultant biogas fuels our Combined Heat and Power plants. The water-cleaning sludges can be used for other water treatment processes, or in agriculture.

We also support forests in maintaining nature's water cycles. For example, preserving water bodies linked to commercial forests is an indicator of sustainable forest management, while allocating protected forest land, as we do in Colombia, further supports natural water ecosystems (see Forest chapter).

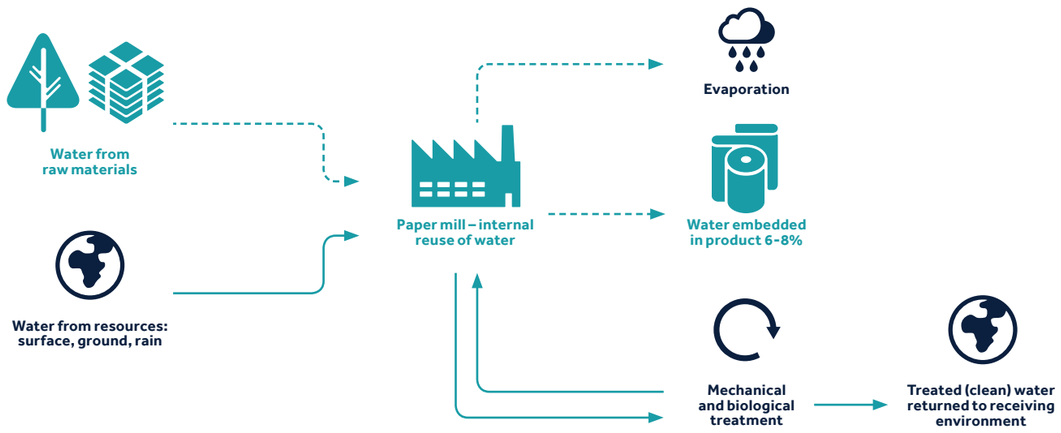
Committed to Sustainable Water Stewardship

We aim to further improve our discharged water quality, and know the risks associated with water availability and use. We therefore continually implement best practice in our mills' water treatment. In 2019, over 98% of paper and board was produced at mills with best practice water treatment systems. This involves decreasing the organic content of process water through anaerobic and aerobic treatments before returning it to public water bodies.

Since 2014, we have investigated the environmental impact of our paper mills as well as water-related risks. During 2019 and early 2020, we finalised our in-depth assessments at 10 paper mills not previously assessed, the remaining four paper mills in Brazil and Serbia will be assessed during of 2020. All assessments confirmed that our mills' water use has no impact on water availability to neighbouring areas. We will use these findings to build individual site water stewardship strategies.

Water risk assessments focus on three categories – physical risk, including local water scarcity and mill equipment, regulatory risk, and reputational risk. Each assessment comprises a supporting desk study and an on-site audit of each category, including interviews with key stakeholders. Since 2018, the mills have included these assessments in their ISO 14001:2015 certification risk assessments.

Water in the Paper Mill



"One More Time!" – Reusing Treated Water // Argentina

"Corrugated packaging production uses quite a lot of water, and we always try to reduce demand on local sources," says Pablo Leon, Plant Manager at the Smurfit Kappa Coronel Suárez corrugated plant in Argentina.

"But we were using over 1,600 m^3 of water per month, so the Process Control and Maintenance team set themselves the challenge of reducing fresh water consumption by 30%, to reduce the strain on the environment."

Even for a corrugating plant of Coronel Suárez's capacity, 1,600 m^3 is a lot of fresh water, but an investigation soon found a culprit. The liquid ring vacuum pump – part of the water treatment system, ironically enough – had the highest consumption of fresh water. It needed fresh water because, after treatment, particles of the filtrating volcanic earth (expanded perlite) were present in the treated water. Whilst these were environmentally neutral, they had an abrading effect on the delicate pump. As Pablo says, "Our treated water has always been the best quality, but it wasn't good enough for our pump!"

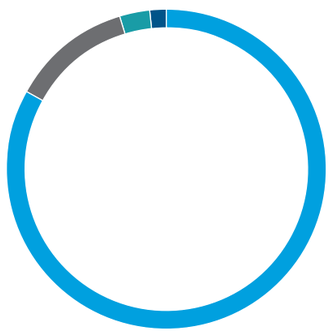
However, a synergy with different projects became available. The Process Control department had been improving the quality of the treated water so it could be used in different parts of the production process. "In order to hang onto our water, it has been treated to a standard beyond what was legally required," comments Pablo, "So, we thought, perhaps it would now be good enough for our pump."

It was – the pump now uses no fresh water, and using treated water on the pump's seal has led to a reduction of 61% in general fresh water use – more than twice the target. "We get our money's worth out of our treated water," says Pablo, "Using it one more time before returning it to the environment."

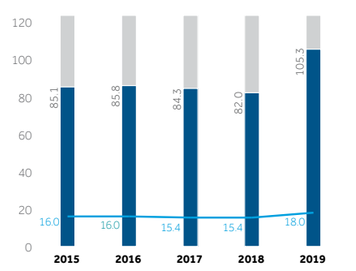
Water reduction achievement

61%

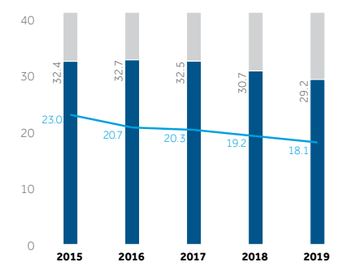
Water Sources – All Operations



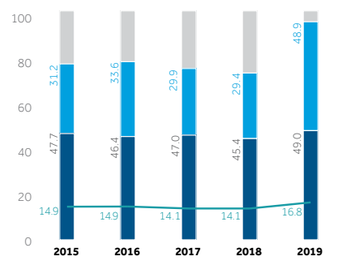
Water Intake: European Mills



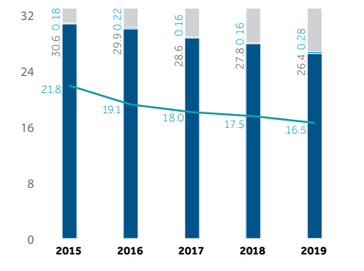
Water Intake: the Americas Mills



Water Released: European Mills



Water Released: the Americas Mills



Planet continued

Progress in 2019
Between 2005 and 2019, the Chemical Oxygen Demand (COD) content of processed water returned to the environment has decreased by 35% relative to production, in comparison with 33% in 2018. This result is mainly due to the improvement of the water treatment plant at our Piteå paper mill in Sweden. The mill had experienced problems in its water treatment in 2018, and the situation has since stabilised.

The Cali paper mill in Colombia improved efficiency of its water treatment plant from multiple initiatives. These included changes made to reduce the presence of foam, stabilising clarifier and eventually installing a new sludge press that also reduces the volume of solids entering to the water treatment plant.

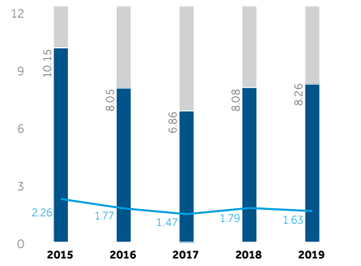
The Pirapetinga paper mill in Brazil continued to improve its water treatment after a repair of its aerobic reactor in 2017.

Our paper mills, in Barbosa in Colombia and Uberaba in Brazil, had issues with their water treatment plants resulting in disimprovements in COD discharge on site level.

In 2019, water intake of all our operations was 134 Mm^3, in comparison with 113 Mm^3 in 2018. For 2019, compared with 2018, the average water intake by our paper and board mills increased to 18.0 m^3 per tonne of paper produced from 16.3 m^3, an 11% increase, mainly due as a result of the addition of the SK Parenco paper mill in the Netherlands to our Group reporting after its full year in the Group.

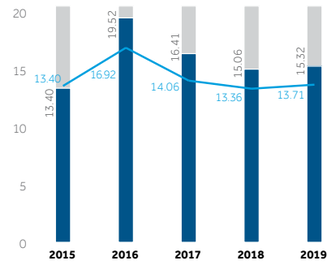
Our paper mills recycle water at a high rate. At the headbox of a paper machine, the pulp consistency is around 1% in the water mix. Initially, 75-125 m^3 water is used per tonne of paper. We discharge 3-7m^3 water – about the same amount as the intake per tonne of paper. We recycle 10-40 times the amount of water needed in the paper-making process, and reuse this in the paper machine before returning part to our process after treating it in our water treatment plants. Our Zülpich (Germany) and Bento (Brazil) mills operate closed water loop systems.

Process Water Discharges* COD (Chemical Oxygen Demand): European Mills



Key:
Absolute – **(ktonnes)** Specific – **(kg/tonne)**

Process Water discharges* COD: The Americas Mills



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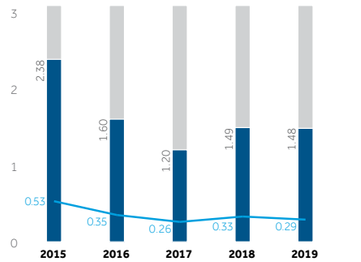
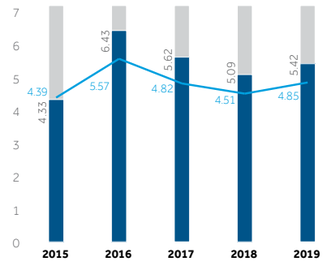
Absolute – **(ktonnes)** Specific – **(kg/tonne)**

Process Water Discharges* BOD (Biochemical Oxygen Demand): European Mills



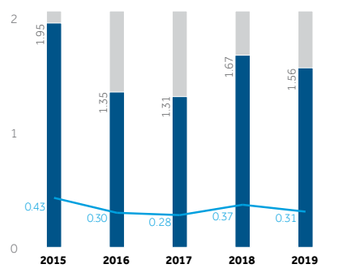
Key:
Absolute – **(ktonnes)** Specific – **(kg/tonne)**

Process Water Discharges* BOD: The Americas Mills



Key:
Absolute – **(ktonnes)** Specific – **(kg/tonne)**

Process Water Discharges* TSS (Total Suspended Solids): European Mills



Key:
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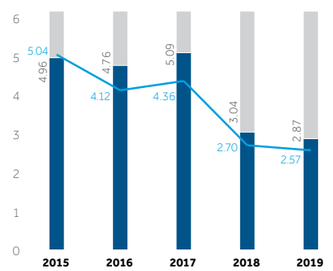
Process Water Discharges* TSS: The Americas Mills



Key:
Absolute – **(ktonnes)** Specific – **(kg/tonne)**

*** Figures of mills releasing to the environment (mills that released water to external water treatment plants are not reported).**

Sharing the benefits of water treatment // Spain

Clean and accessible water cannot be taken for granted and, along with its neighbours and stakeholders, Smurfit Kappa has a common interest in good water stewardship. Achieving good-quality water discharge from our operations is a vital part of our water management strategy.

Paper mills use a huge amount of water, which is recirculated many times during the paper manufacturing process. Eventually, the water quality becomes too poor, so it needs to be treated and returned to nature. Over 90% of water is returned – the rest is either bound to the product or evaporated.

Smurfit Kappa Nervión works closely with the municipality water treatment facility – so closely that the municipality water treatment plant is right next to the paper mill, and Nervión sends its pre-treated water effluent directly to it.

"Before releasing water to nature, it is usually treated biologically," explains Pilar Veiga, Quality and Environmental Manager of SK Nervión. "This means that bacteria are used in the water treatment plant. These bacteria are chosen based on the impurities that need to be removed from the water, which supply some of their nutrient needs.

"However, our paper mill effluent naturally has all the other nutrients the bacteria need. Therefore, our effluent helps the municipality water treatment work better and more cost-efficiently," says Pilar.

As water treatment is a finely-balanced biological process which we all benefit from, it is important to find these synergies with neighbours. "While we have this collaboration with our municipality, it means that we also talk a lot with them and that enhances the relationship as well," Pilar says. "It's a win-win for everybody."

A similar collaboration with the municipal water treatment facility takes place at SK Nettingsdorf, in Austria.

"While we have this collaboration with our municipality, it means that we also talk a lot with them and that enhances the relationship as well."

Pilar Veiga
Quality and Environmental Manager
SK Nervión