**Waste**

Material efficiency is vital for the bioecology and circular economy. We continually find alternative ways to reuse, recycle and recover, to end the linear economy where products end their life cycle at landfill.

Our packaging solutions help prevent this by protecting products from damage or spoilage. After use, any paper-based packaging becomes a valuable raw material — it is the highest recycling rate of all packaging materials, supported by improved recycling systems. In addition, our packaging reduces its own impact by being ‘right-weighted,’ using the minimum necessary material. However, whilst our products are recyclable, we generate 10,000 kg of non-hazardous waste per tonne of paper and board, 62% of which is sent to landfill.

This is because the recovered paper bales sent to us by recycling companies often contain unwanted plastic, metal, glass, textiles, sand and other non-usable materials.

On average, it takes 1.076 kg of recovered paper to produce one tonne of paper and board. To reuse as much as possible, we separate unwanted elements using water, some of which is retained by the non-usable materials and can contribute as much as 5% to the weight of subsequent waste.

To minimise landfill, we reuse our own waste as far as possible. Currently, approximately 37% is recovered, and we aim to reduce the amount of waste sent to landfill by 30% per tonne of paper by 2020, compared with 2013.

Work Against Litter

Since 2018, litter reduction has been a global megatrend. Our products are the world’s most recycled packaging materials. While the paper industry in Europe generally achieves 71.6% recycling rates (lower than our 84.7% recycling rate in the graph on page 40) in the US and in Latin America, recycling drops to 65.9% and 46% have clear upward potential. This, along with our raw material biodegradability, positions us to work with stakeholders and smart regulatory guidance towards litter-free solutions.

Eventually, our packaging returns to the biological cycle — not to the recycling loop, than it will either be combusted, emitting only the CO2 that the wood captured while growing, or will degrade naturally with an even smaller environmental footprint than many other packaging solutions.

**Progress in 2019**

Our starting point was paper mill waste sent to landfill — 30% of our total waste. After a Group-wide assessment in 2015, we set a target to reduce this by 30% per tonne of paper by 2020, but in 2018 this was adjusted to 2025.

Most waste is reject material from the recovered paper pulping and screening processes. Other sources include sludge from our water treatment facilities, calcium carbonate residue from lime kilns and ash from biomass boilers.

We continued to have challenges with implementing our target to reduce waste sent to landfill and remained at 7.7% reduction in 2019 against our baseline year 2013. This is a slight decrease in comparison with 2018, when we were at 7.6% reduction. However, we believe that we are able to turn the trend and expect the results from our investment in the sludge press at our Catriló mill in Colombia to show in 2020. The further increase of waste sent to landfill was mainly due to the heavy rains impacting the sludge at our Catriló mill early 2019 and the recovered paper quality leading to increased rejects at our Fomerry mill. 2019 also saw multiple positive events as we improved the recovered paper quality on many sites, leading to less rejects as well as optimised processes to gain better yields of fibre recovery.

Around 1% of our waste is classified as hazardous — mostly from maintenance, plus sludge from printing and converting operations and per operation, the amount is small. Our hazardous waste assessment showed the key issue is correct waste classification. Due to local and national lack of clarity in hazardous waste definition, we believe it is conservatively reported in this report.

Our hazardous waste figure decreased from 10,600 tonnes in 2018 to 9,700 tonnes in 2019. The annual amount varies due to maintenance, product additives and hazardous waste tanks taking over a year to fill.

**Work Towards Optimised Use of Raw Materials**

Our converting operations send paper clippings back to our mills, delivering high-quality recovered fibre. Recycled paper from our corrugating and converting operations comes with minimal auxiliary materials, decreasing waste from the recovered fibre pulping process.

We continually collaborate with other industries to use our side streams, including agriculture, cement and pharmaceutical. In 2019, we joined the 4evergreen initiative that aims at supporting product design for recyclability and calls for the development of optimised collection systems and appropriate recycling infrastructures.

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**From Landfill to Circular Use // Colombia**

“We talk a lot about sludge,” says Alfredo Marin, Technical Director of the SK Cali plant in Colombia, “in particular the sludge from our water treatment plant – it is our main output to landfill.”

The sludge is residue from the mill process effluent and the raw water treatment plant. “The sludge from the raw water treatment is too wet with only 3% solid, it’s a huge weight to send to landfill,” says Alfredo.

Initially, it was dewatered using an old screw press, but this only increased the solid content to 16%, so the mill’s management committed resources to solving the issue. “Several possible solutions were explored,” says Alfredo, including initial filtration of river water to reduce solids such as grit, or high-tech solutions like centrifuges and membranes. But none guaranteed total separation at low cost.

Even the simplest idea — improve the screw press — was problematic. Ammonium screw press can usually achieve 30% solids, but not for the particular composition of the Cali mill’s sludge, especially with seasonal variations caused by rainfall.

“So we worked with a supplier with expertise in this area,” explains Alfredo, “landing in a smaller pilot plant at 10% of the capacity that would eventually be needed. We were able to overcome problems on a smaller scale and by the end of its run the pilot plant managed 50% sludge consistency even during the rainy season.”

Following this, the main screw press was installed in December 2015, and in its first month has achieved 50% consistency. “But it doesn’t stop there,” says Alfredo. “Following the Group’s ambition to move into circular systems, we have also been researching uses for the compressed sludge, like burning it in our lime kiln or combining it to create a pelletised fuel which we could use in the same boiler.”

“Here are other benefits too,” he adds. “The new process prevents spills – the sludge yard is the cleanest it has been for years!”

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**Supporting Data**

**Supplementary Information**

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**Planet continued**

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<th>Waste sent to other (tonnes)</th>
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