Planet continued

Waste

Material efficiency is vital for the bioeconomy 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 has 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 110 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, metals, glass, textiles, sand and other non-usable materials.

On average, it takes 1.076kg 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 53% 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.

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. A modern 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, "testing 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 2019, and in its first month has achieved better than 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 with unburned particles from our coal boiler to create a pelletised fuel which we could use in the same boiler."

"There are other benefits too," he adds, "the new process prevents spills – the sludge yard is the cleanest it has been for years!"

Sludge consistency

50%
+34%

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 rates of 65.9% and 45% have clear upward potential. This, along with our raw material's biodegradability, positions us to work with stakeholders and smart regulatory guidance towards litter-free solutions.

Eventually, our packaging returns to the biological cycle – if not to the recycling loop, then it will either be combusted, emitting only the CO_2 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 – 90% 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 process. 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 7.1% 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 Cali 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 Cali mill in early 2019 and the recovered paper quality leading to increased rejects at our Forney 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 ink 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.

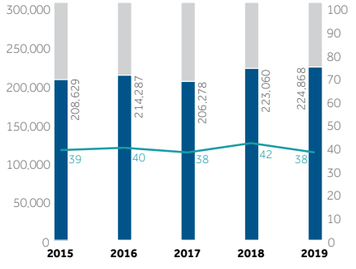
Work Towards Optimised Use of Raw Materials

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.

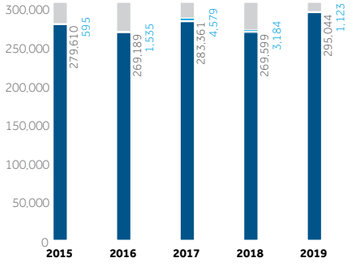
Non-hazardous wastes

European mills



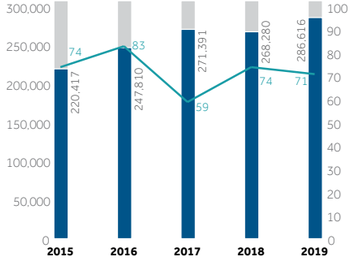
Key:
- Waste sent to landfill (tonnes)
- Specific (kg/tonne)

European mills



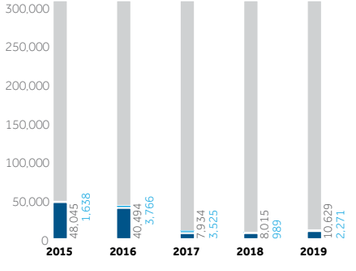
Key:
- Waste sent to recovery (tonnes)
- Waste sent to other (tonnes)

The Americas mills



Key:
- Waste sent to landfill (tonnes)
- Specific (kg/tonne)

The Americas mills



Key:
- Waste sent to recovery (tonnes)
- Waste sent to other (tonnes)

Back to Black – Reusing Ink Sustainably // Brazil

"We buy a lot of ink – over 178 tonnes," says Levy Neri Alves, Ink Room Manager at the SK Uberaba plant in South East Brazil, "but we found we weren't using all of it, so we had to look into that."

The plant prints over 135 million square metres of paper packaging per year, but every month three tonnes of ink were unaccounted for. Careful research revealed the culprit – ink wastage due to variations in colour.

"The inks are standardised colours when we receive them," says Levy Neri Alves, "but some inevitably become contaminated during the printing process." Wasted ink is a financial loss, but also an environmental one because recycling ink is a difficult and costly process, and usable only with some inks.

The Smurfit Kappa commitment to circularity and sustainability made reuse of inks an attractive idea. However, the discarded colours were non-standard, and combining them only produced a poorly-mixed dark colour.

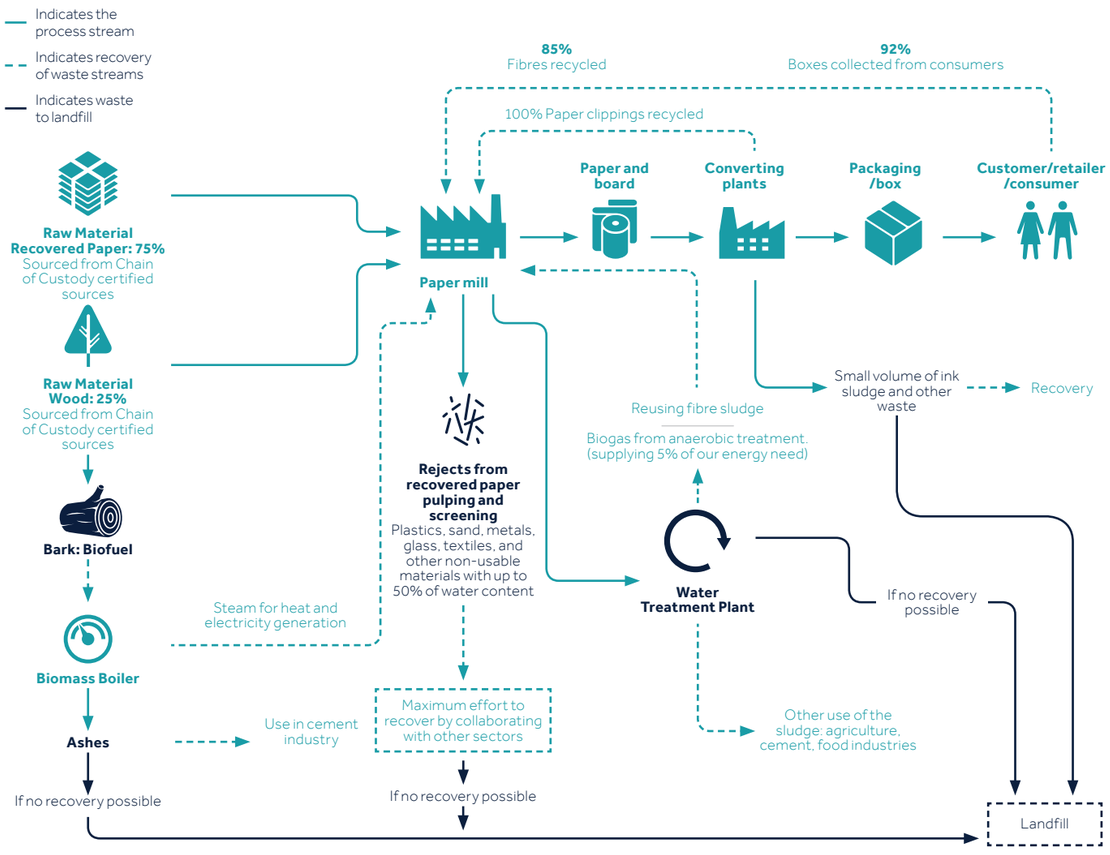
Over to Mr João and the Paint Preparers to create a new machine – a used ink mixer. Using an old barrel with a perforated compressed air tube across the bottom, the team used air bubbles to agitate the mixture into a near-black. It then needed only a small amount of additional 'new' ink to turn it a standardised shade of black. This ingenious device recycled available equipment, so it required no additional investment and took just a few days to build.

The clever, low-budget solution has reclaimed over 36 tonnes of ink a year, as well as reducing monthly waste from the plant by three tonnes.

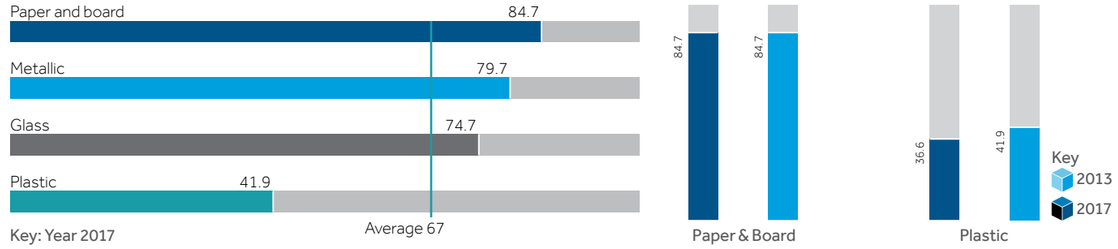
It also won an award from the 'Think Outside the Box' campaign, run annually in Brazil.

"Sustainability doesn't always need massive investment," says Levy Neri Alves. "Sometimes all you need is determination, creativity, and the ability to think outside the box!"

Production Waste Streams



Packaging Recycling Rate in 28 EU Countries (%) Source: Eurostat



In the Core of Circularity // Italy

As circular economy is at the heart of Smurfit Kappa's operations, and one example of that is how we participate in the recycling of old boxes to new ones.

With our expanding network of 17 recycling depots in Europe, we play our part in being a responsible producer of packaging. The latest addition to our recycling depots is Marlia, in Italy, which was acquired in 2019.

"Lucca in Tuscany has always been the heart of Italian paper production, so it's remarkable that ours is the first high-quality recycling depot in the area," says Stefano Mazzei, Manager of the SK Marlia recycling facility. The figures support his claim; 40% of Italian containerboard and 90% of Italian tissue paper is produced in the region, and the nearby plant of SK Ania covers 40% of Italian SK corrugated needs.

Location is just one of the reasons for SK's Italian Recycling Depot. This area also has the advantage that locally recovered paper can replace raw materials from far away, saving on fuel miles and overall CO_2 emissions. Furthermore, it gives a good synergy with the region in providing local employment.

SK Marlia was inaugurated in 2019, and, as Smurfit Kappa's 17th European recycling depot, shows our strong commitment to recycling and the circular economy. However, as Stefano says, "A recycling facility is always in a relationship with the local communities and institutions. We used a range of methods to raise awareness about recycling." These included:

- a cardboard Noah's Ark in the central square of the town hall (later recycled);
- school visits and presentations;
- plant employees, 21st local clean up day by cleaning a green area;
- recovery of white paper grades from hospitals and schools;
- sponsored the local Labour Festival on 1 May; and
- sponsored a balloon for the Montgolfier Bicentennial in September.

"We have worked closely with schools, the local council, supermarkets and businesses to collect used paper and board. This is transported to the SK Ania paper mill where it is used to produce new containerboard."

The information campaign was a huge success – by the end of the year 15,000 tonnes of paper had been recovered, with a target of 25-30,000 tonnes for 2020. As General Manager, Recycling Operations Italy, Luca Mannori says, "the new Marlia plant shows our commitment to the circular economy, and will ensure the availability of good-quality recovered paper to meet the needs of all our customers."

Recovered paper by the end of 2019 (tonnes)

15,000