A greener, bluer planet

For many years, our operations have been designed on a circular economy model. This means seeking closed loop solutions, maximising resource efficiency and minimising waste, including CO₂ emissions. It also means supplying packaging that avoids waste and litter.

Key Principles

We replace the natural resources we need, use virgin resources in the best possible way and reuse or recycle all side streams we can. This circular approach increases resource productivity, adding to our competitiveness.

Our circular business model starts with renewable, sustainable primary raw materials. Our well-established and integrated approach to producer responsibility and paper recycling means that 75% of our raw materials are recycled fibre. We use organic by-products as biofuel, circulate our process waters as much as we can, wherever possible, and we collaborate with local organisations to find alternative uses for the rejects we receive with our recovered paper deliveries, that we cannot use in our processes.

In our product development phase, we work towards synergies within the whole value chain. For example, by using mono-material solutions, this creates efficiencies in our customers’ packaging lines, and in addition improves the recyclability of the packaging after use.

Forests themselves are a closed loop system, fundamental for local climate and water systems. When managed sustainably, they also provide raw materials for industry and employment.

Key Achievements in 2019

We made significant progress in reducing our relative CO₂ emissions; since we reduced fossil CO₂ emission intensity by 32.9% compared with our baseline year 2005. Key contributors to this progress were the investment in efficient Combined Heat and Power energy production at our Townsend Hook paper mill and the new, energy-efficient paper machine at our Los Reyes paper mill, supported by new boilers.

A total of 92.1% of our packaging solutions delivered to customers globally were Chain of Custody certified, providing assurance about the sustainable origin of the raw material used.

Investments in best practice water treatment reached €79 million since 2005, and we achieved a reduction of 35% in the water discharge COD in the same period.

Achieving our target to reduce waste sent to landfill proved more challenging than anticipated. This is partly due to the lack of availability of regional partners with which we can collaborate to find alternative recovery applications for the waste resulting from cleaning the recovered papers that form 75% of our raw material.

Delivering for SDGs

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Delivering for SDGs

Smurfit Kappa Impacts

As an energy-intensive manufacturing business that uses natural resources, Smurfit Kappa has a direct impact on clean water resources, affordable and renewable energy, and forest biodiversity and ecosystems. Through our efforts to reduce the climate impact of our operations as well as our products that can help our customers reduce the climate impacts in their supply chain, we can contribute to the global climate action. Supplying our customers with renewable, recyclable and biodegradable packaging solutions that help protect their products from damage and help inform consumers of their contents, we are part of the responsible consumption and production chains. We have set targets in all these areas.

Smurfit Kappa Supports

Smurfit Kappa supports local communities through its paper recycling operations, and part of the infrastructures for sustainable communities. Our products can help reduce microplastics from entering water bodies and harming water ecosystems, and our Better Planet Packaging Initiative helps raise awareness in this area.
Responding to our Stakeholders

Climate change

We are tackling our CO2 emissions by improving our energy efficiency, as well as moving from fossil fuel to bio-based energy wherever possible. In addition, we are improving resource efficiency when producing paper products and optimising the use of raw material residual streams, such as blast furnace slag to drive down our energy use.

The circular economy is an opportunity for our business as we seek to use resources efficiently, especially in energy production and the creation of innovative packaging solutions. We collect sustainability data in innovation and product design, develop supportive tools and services, and create fact-based solutions for customers.

Our commitments

Commitment #1: A 40% relative reduction in Scope 1 and 2 fossil fuel-based CO2 emissions in our mill system compared with 2005 levels by 2025.

Progress made: Since 2005, we reached 32% reduction.

Commitment #2: Collaboration with customers to determine carbon footprints of the packaging life cycle.

Progress made: Our suite of tools that help to determine the carbon footprint of our customers’ packaging were used, on average, 11,000 times a day.

Commitment #3: Assessment of energy usage reduction opportunities in converting operations in selected countries by 2020.

Progress made: Project is ongoing.

Forest

Promoting sustainable forest management involves managing supplies of sustainable, renewable fibre, while protecting biodiversity and ecosystems as well as creating employment in rural areas. Wood fibres can be cycled up to eight times when producing both recycled and virgin fibres in production, our ambition is to deliver fibre-for-purpose packaging with the best overall environmental footprint for each package, and communicating about the sustainable origin of fibres in a transparent way.

Our commitments

Commitment #1: All fibre produced and purchased is CoC certified under FSC, PEFC or SFI (Sustainable Forest Initiative).

Progress made: We continued to produce and purchase 98.8% of our fibres under fibre origin management systems that are CoC certified in 2019. This is within our margin of 2% variation.

Commitment #2: Over 90% of our packaging is labelled as CoC certified under FSC, PEFC, or SFI.

Progress made: We reached 92.6% in 2019.

Commitment #3: All production sites using FSC, PEFC and/or SFI CoC standards.

Progress made: Very nearly all acquired forests to comply with the CoC Management system certification within three years from acquisition.

Water

Over 90% of the water we use is returned to nature in good condition, and there is entitled to the air during the process or is bound to the product. We focus our efforts on further improving the quality of water we use and understand the risks associated with water availability, and use water very efficiently.

This strategy positions us well to deliver a positive change to our processes and the environment.

Our commitments

Commitment #1: Reduce the organic content of water returned to the environment from our mills (COD) by 60% compared with 2005 levels by 2025.

Progress made: Since 2005, we reached a 15% reduction.

Commitment #2: Perform environmental impact assessments of the water use of our paper mills (COD, BOD and TOC) and develop water usage measurements by 2020.

Progress made: During 2019 and the first quarter of 2020, 30 water basins were assessed. The project will be finished by the end of 2020.

Waste

We believe the circular economy is the business model for the future, and that we have an important role to play in it. Our products are designed to prevent loss and damage to both the consumer and the environment. We believe the circular economy is the business model for the future, and that we have an important role to play in it. Our products are designed to prevent loss and damage to both the consumer and the environment.

Our commitments

Commitment #1: Decrease the waste sent to landfill by 30% per tonne of product produced by our mill system compared with 2013 levels by 2030.

Progress made: Since 2013, we reached a 17% reduction.

Commitment #2: Increase the recycling of paper and cardboard industry to keep our raw materials in the recycling loop.

Progress made: Project is ongoing.

To produce high quality bananas for the market, they must be ‘bagged’ during growth. A cover is placed over the ripening bananas.

This protects them from insects and from damage caused by friction within the bunch, or the transport of the fruit. The banana bags also create an ideal microclimate in which the bananas ripen faster and become better quality. Typically, these bags are made from plastic.

A producer of organic bananas for the European market wanted to take its sustainable farming one step further and remove all plastic from the farming process. It looked for a solution that would deliver the same or better results, and not cause more plastic waste.

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The UN’s 2030 Agenda for Sustainable Development calls for action via 17 Sustainable Development Goals, and both the Paris Climate Accord and the EU set tough carbon targets. By 2030, the Paris Accord aims to limit climate change to under 2°C and the EU commits to reducing CO2 emissions by 80% compared with 1990 levels by 2050. Achieving these targets is a shift from linear to circular economic models, creating an era of opportunity and innovation for new solutions.

At the same time, all parts of society need to set common targets. Smart Kappas will place to make these targets reality.

Ciralityx has been our business model since our inception, so we are in the lead as the circular economy gains mainstream. In 2020, our operations in 33 countries and 335 production units in Europe and the Americas, influence the whole packaged goods value chain. We share positive change from sustainable raw material sourcing to minimising operational impact and shrinking our customer’s environmental footprint.

Our environmental sustainability strategy is in line with our Climate Change, Forest, Water and Waste. These strategic priorities cover the most material environmental aspects in accordance with our business and stakeholders’ expectations. They cover biodiversity, the circular economy, climate change awareness, energy use and emissions, litter on land and oceans, responsible forestry, water quality and circularity as well as waste to landfill.

Risks and Challenges: Limits of Resources

Our challenge is to squeeze value within natural resource limits, maximising resource productivity while minimising our environmental footprint.

Climate Change

Climate change is one of the greatest challenges facing society. Emissions continue to rise, ecosystems, biodiversity, economic development and communities within will be impacted. Our stakeholders are increasingly looking for low-carbon solutions and, therefore it is our priority to adapt and create a more circular approach to packaging.

Climate change has the potential to impact our business operations in a variety of ways. Extreme weather patterns will affect our operations and supply chain, potentially impacting forests, water, weather, carbon regulation and taxation, and energy availability and affordability.

Forests play an important role in environmental restoration. We therefore need to promote healthy forests and manage these resources sustainably.

Extreme weather patterns will affect local water systems. Drought, flooding and local rescues on water usage may limit our access to water, so we have been conducting water risk assessments at our paper mills.

Furthermore, paper manufacturing is energy intensive, with a risk of carbon leakage. Emission policies are not consistently applied. We recognise that climate change will only be slowed or stopped by a global low-carbon economy, and as we do 77% of our business in Europe, we fully support the EU Energy Union initiative in delivering innovative, efficient products and technologies to tackle climate change. However, to retain global competitiveness, there must be safeguards against ‘carbon leakage’ – it’s a moral issue to address with weaker carbon policies.
The Forest Fitted Industry 2050 Roadmap to a low carbon bio-economy shows a CO₂ reduction of 60%-65%, compared with 1990 levels, is possible for our sector, based on available and emerging technologies. To reach an induction of 80% by 2050, breakthrough technologies must be available by 2030.

**Scarce Resources**

Our stakeholders expect Smurfit Kappa to use sustainable raw materials, especially forests and fibrous raw material. Halting deforestation is a particular concern for businesses supplying consumer goods and food and to tackle this issue their supply chains. Smurfit Kappa commits to only sourcing sustainable wood and fibres.

To decrease fossil CO₂ emissions we must shift to renewable energy. However, government incentives encouraging use of biomass for energy could lead to increased competition and higher raw material costs, pushing packaging all competitive disadvantage.

Packaging recyclability and biodegradability are popular topics. For example, in 2019, the EU launched its Single Use Plastics Directive, which prohibits some non-renewable processed resources. Paper and paper-based packaging are involved in both cycles and move between them.

**Part of the Bioeconomy**

Wood-based fibres are the starting point of our biological and technical cycles of the circular economy (see diagram below). The biological cycle is called bioeconomy, and covers production and maximal value capture of renewable biological resources, including their reuse, recycling and sustainable return through biodegradation. The technical cycle covers the circularity of mainly non-renewable processed resources. Paper and paper-based packaging are involved in both cycles and move between them.

**Opportunities: Embedding Circularity**

A part of circularity is knowing the source of our raw materials and returning them to the production cycle. We depend on natural resources, so we aim to make our operations restorative by minimizing waste and improving efficiency. We source natural materials responsibly, replacing and reusing resources and working with our partners to deliver better circular outcomes.

Using renewable wood fibres makes us apart of the biological and technical cycles of the circular economy (see diagram below). The biological cycle is called bioeconomy, and covers production and maximal value capture of renewable biological resources, including their reuse, recycling and sustainable return through biodegradation. The technical cycle covers the circularity of mainly non-renewable processed resources. Paper and paper-based packaging are involved in both cycles and move between them.

**Using**

A total of 79% of our raw materials is recycled fibre. The remaining 21% comes from sustainably managed forests through Chain of Custody certified supply chains. Paper-based packaging has the highest recycling rates of any packaging wood fibre can be recycled eight times, before being used for energy or biodegraded. Trees sequester atmospheric carbon, which remains sequestered in our fibres. Forests also contribute to the water cycle by regulating climate and purifying water. They also supply local industry and provide employment.

Smurfit Kappa participates in sustainable forest management through its own forests and plantations, and by sourcing from sustainably managed forests.

**Closing Loops**

We aim to use all our production by-products ourselves, or by finding synergies with neighbour communities. Paper clippings from corrugating and converting operations are returned to our paper mills. Organic by-products wood bark, dust and black liquor are used as biofuel. We work with local organisations which can use other materials, for example some water treatment sludges become soil improvers in road construction, and waste ash can be used in the cement industry.

We recycle our process waters several times, and we offer water-based packaging solutions of corrugated board and paper, facilitating recycling.

**Reducing Leakage**

We also recover paper packaging from our customers. Paper-based packaging collection rates were higher than for any other packaging material at 11.3% in 2017. Material leakage happens when unused products are not being recycled but end up in landfill for litter. Paper benefits from being relatively easy for consumers to recycle. We work with municipalities and retailers to collect discarded paper packaging for recycling, and the demand for this is constantly increasing. Our fit-for-purpose packaging avoids over-packaging and waste, and we offer mono-material packaging solutions.

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**Part of the Bioeconomy**

Wood-based fibres are the starting point of our circular business model. The virgin fibres used by the paper industry are mostly from the removal of young trees to support forest growth, or as wood chips from sawmills, both of which are fully renewable, sustainable and reusable.

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Increasing our energy efficiency lowers costs and reduces climate impact. We aim to minimise energy use, but also to move from fossil fuels to renewable sources, including biomass. This makes us an efficient resource user of wood, residual streams and energy.

Our circular approach also makes us an efficient user of wood fines and by-products. For energy, we only use wood biomass that has no higher value purpose and we reuse by-products, such as black liquor, as fuel. This uses resources at their highest value, in line with the waste hierarchy.

Progress in 2019

To tackle climate change, we are using less fossil fuel and emitting less CO₂, promoting renewable sources and closing loops to make circularity in our production process. There are three parts to this:

• Investing in efficient energy generation
• Investing in highly efficient Combined Heat and Power (CHP) systems
• Improving the efficiency of our existing boilers

Investing in Efficient Energy Use

• Investing in technologies that reduce CO₂ emissions
• Re-engineering our processes and implementing smart energy efficiency solutions
• Investing in fossil CO₂ reductions

Where possible, shifting to CO₂ neutral biofuels and other renewable solutions.

Between 2005 and 2019, we achieved a 32.9% reduction of relative CO₂ emissions for our mills. We published an new target in 2018, and aim for a 40% reduction of relative CO₂ emissions in comparison with the 2005 baseline by 2030.

Investing in Efficient Energy Generation // UK

"To start with, our old Combined Heat and Power plant (CHP) was outdated and, quite frankly, a bit past it," says Kevin Bussey, Managing Director of our plant in Townsend Hook, South East UK.

"We did it since the ’90s, and it was far too big, but selling excess power to the National Grid was typical for that era. We do things more efficiently now.

The Townsend Hook Mill produced 226,000 tonnes of paper in 2019, supplying the UK and Irish market and complementing the heavier weights of paper from SK’s 335k m³ mill. The new CHP plant was part of a major overhaul at the site which replaced two old paper machines with a new one with 17% lower energy consumption. This new machine would make lighter weight paper, more suitable for modern, sustainable needs, and lighter weighted packaging.

A new CHP could similarly produce no more than was needed. 11MW, rather than the oversupply of the old plant at 10MW. It could also produce both electricity and steam from natural gas, with 85% efficiency.

Investing in Efficient Energy Generation // UK

"In line with the Group’s global targets of reducing CO₂ emissions by 40% per tonne of paper by 2030, we were keen to replace the old CHP. A combination of the energy contract coming to an end in 2018, and needing an Environmental Agency permit to install the new paper machine, gave us an ideal opportunity," says Kevin.

However, this improvement was a real test of SK’s commitment to reducing carbon emissions. The whole project commenced in 2015, and the new CHP started in 2018. During that time, including new machines and decommissioning old ones required a significant investment, and led to 1.5 years of zero production for the site.

"It was worth it though," explains Kevin. "In total, the CO₂ emissions from the site were reduced by 22% from 2012, and now we produce paper, which will be used more efficiently, and for which there is greater demand."

Energy Efficiency

We cannot achieve our CO₂ emission reduction without progress in energy efficiency. From 2005 to 2019, we achieved a 17% improvement in paper mill efficiency by investing in more efficient energy generation and energy reduction technologies.

The 2019 key events that resulted in a 32.9% reduction of relative CO₂ emissions compared with 2005 were:

• SK Townsend Hook, UK, continued to improve its energy efficiency due to the full year with the new, more efficient CHP as well as replacing fresh steam injections by heat recovery. This resulted in 6.9% CO₂ savings per produced tonne of paper
• SK Barboza, Colombia, continued to reduce its CO₂ emissions by 4.2% per produced tonne of paper due to its continued improvements in energy efficiency in the paper machine
• SK Los Reyes, Mexico, the paper mill delivered a second full year with its new, 100,000 tonne capacity paper machine and supporting new boiler house, and continued to reduce its CO₂ emissions by 1.9% per produced tonne of paper
• Our Austrian and Colombian sites started to purchase all grid electricity with green certificates, resulting in reductions in Scope 2 CO₂ emissions
• The installation of the SK Los Reyes mill to the Group reporting after its first full year in the Grouped tons reductions in relative CO₂ emissions
• The divestiture of our Venezuelan operations also contributed to the overall CO₂ emission reductions

Investing in Efficient Energy Generation // UK

• We had a 7.6% increase of CO₂ emissions per produced tonne of paper in SK Skaft, France, due to threat of the external CHP

Renewable Energy

To be able to reach our CO₂ target, we plan to move from fossil to renewable fuels wherever possible. During 2019, our paper mills used 51.4% biofuels, compared with 37.9% in 2005. In 2018, the Pfalz mill in Sweden, already effectively biofuel-based, also changed its internal wood yard transport to biofuels. The addition of the Paroon mill in the Netherlands mid-2018 further helps us to shift to bio-based fuels.

Working with our Customers

Using a suite of tools, including Paper to Box and Pack Expert, we work with customers to determine their packaging in carbon footprint.

These tools provide CO₂ emissions data and other information to optimise solutions. On average in 2019, Paper to Box reduced 10,000 tonnes per day and Pack Expert 1,300 tonnes per day. Use of Pack Expert continued to grow from 2018, due to expanded use in the Americas and increased customer interest in using our research-based expertise. As we have achieved a 32.9% reduction of CO₂ emissions, these tools help us take this data for our customers’ benefit.

Our InnoTools suite of design software also shows customers the carbon footprint for each packaging unit and tracks its development over time.
**Award-Winning Circular Energy // Sweden**

“People talk about recycling, but in Piteå we recycle heat,” says Per Swärd CEO of the Smurfit Kappa Piteå Kraftliner mill in Northern Sweden.

“Many mills are looking into working with district heating providers, but we’ve been doing it for 42 years.”

As well as producing its own energy in a biomass boiler, the SK mill has two turbines which produce 55% of the mill’s electricity, doing it for 42 years.

In 2018, SK Piteå made the 40-year partnership celebration an opportunity to inform people how it gives back to the community and environment. Historically, the plant’s location has sometimes been a bit unpopular – it’s a large industrial facility right in the middle of a tourist town. It also takes up prime riverfront estate because originally the mill needed to be on the river for wood transport.

The upside of the location is that it enables efficient distribution of district heating, giving sustainable green energy to the community.

The 40-year district heating celebration was a huge success. “There’s a Swedish saying, ‘you can’t become a prophet in your home town,’” says Per Swärd. “But we proved that wrong when our partnership celebration led to us being given Piteå’s 2013 Business Sustainability Award.”

**Transport Streams**

The transport streams shown with bold arrows represent transports included in the calculations.

**Direct Fuel Consumption, All Operations**

**Emissions from Transport**

In 2017, we started a project to calculate emissions in our transport-related supply chain decisions. This focuses on three improvements: maximising efficiency through payload optimisation and reducing empty mileage; developing a good mix of road, rail and water transport; and using less carbon-intensive fuel technologies. Data management was essential, so in 2018 we piloted all European project including emission data in logistics decision-making.

This project covers all our European transport emissions – 77% of our business. The transport streams and scope of our reporting are described in the diagram below. In 2018, we started a similar pilot project in Colombia.

In the reported CO2 emissions, we include the transport of wood, recovered paper and market pulp, as well as from transporting intermediate products such as reels of paper, corrugated and solidboard sheets from paper mills to converting plants. In 2019, these were the equivalent of 353,000 tonnes of CO2. We also report CO2 from delivering to customers – all road transport, representing 45,000 tonnes, and water and rail 6,000 tonnes. In 2019, the total of these transport-related emissions represented 468,000 tonnes of CO2 equivalent.

Whilst CO2 emission calculation for paper reel transport between our own mills and converting plants is accurate (representing 75% of the total volume), we also have a good estimate for emissions when reels of paper are supplied to our corrugated plants by third parties. While corrugated transport is mainly by road over shorter distances, for all remaining transport we operate a modal mix of 4% rail, 7% water and 89% road transportation, based on shipped volume.

Our operating companies report transport data annually, and we aggregate this in a database where emission calculation is applied based on default CO2 emission factors from the GLEC reference model (Global Logistics Emissions Council by Smart Freight Centre).
Wood fibres are our main raw material, making up most of the bioeconomy. Smurfit Kappa sustainably manages its own eucalyptus and pine plantations in Colombia, as well as smaller forests in France and Spain. We use certified Chain of Custody wood for pulp from European suppliers in Austria, the Baltic countries, France, Germany, Spain, and Sweden.

Our Commitment to Sustainable Fibre

We aim to source virgin fibres from certifiably well-managed forests, or at least of non-controversial origin, or Chair of Custody certified recycled fibres. All materials must be delivered through a third-party-verified Chair of Custody certified supply chain. We accept Forest Stewardship Council (FSC®), Programme for Endorsement of Forest Certification (PEFC)®, and Sustainable Forestry Initiative® (SFI)® certified wood, and the Chair of Custody systems at our mills and plants also cover recycled-fibre sourcing.

Products delivered to our customers must meet the commitments we make in our policy statements (Forestry Policy, Code of Business Conduct, Social Citizenship). Most are covered by the Chain of Custody certification standards, which concern all fibre and fibre-based products we use or manufacture, whatever their origin or form.

A total of 58% of the wood we use for virgin paper or pulp comes from forests certified under the FSC, PEFC and/or SFI schemes. The remaining 42% of non-certified or non-assessed is through our FSC and PEFC Chain of Custody system, and verified by a third party. Our forests in Spain to increase FSC-certified wood supplies have started to have a positive impact on the Spanish-certified wood volumes. We also have an increase in FSC-certified wood supplies in Sweden. Annually, Smurfit Kappa’s recycling operations handle some 5.2 million tonnes of recovered paper, in Europe, and 2 million tonnes in the Americas.

Our 67,100 ha of forests and plantations in Colombia include:
- 42,000 ha of commercial plantations, of which 6,000 ha are partnerships with private landowners.
- 22,000 ha of protected natural forest.
- 3,300 ha of infructescence.

In our commercial plantations, 58% of the land is pine, 35% eucalyptus, 6% is being replanted, and 2% is dedicated to research. Our Colombian forest management programmes have been certified by FSC since 2005.

Key:
- Recycled pulp produced internally – 60.4%
- Wood pulp produced internally – 17.1%
- Market virgin pulp – 0.9%
- Virgin paper purchased – 6.2%
- Recycled paper purchased – 13.5%

Share of packaging products sold as CoC certified 2015–2019

From paper to packaging, we use our own research centre as well as third-party research institutes.

Protecting and promoting natural habitats is important to our approach, so in Colombia we use our own research centres as well as third-party institutions. Since 2000, we have worked with four local universities: Cauca, Nacional, Valle and Quindío – studying the flora and fauna in and around our forests.

In 2019, there were no violations of the rights of indigenous people, and livelihoods are often dependent on forests. In 2019, there were no violations of the rights of indigenous people, and livelihoods are often dependent on forests.
Chain of Custody: proven trail for sustainable fibres

Transparency throughout the supply chain is vital to delivering our sustainability commitments. We are committed to maintaining robust monitoring and third-party auditing of our supply chain, ensuring sourced fibre complies with our sustainability principles.

Below, five dedicated Smurfit Kappa employees explain what happens at each stage of a Chain of Custody certified supply chain.

**Five of our dedicated employees outline the important part they play in the Chain of Custody journey**

**Responsible Sourcing at Paper Mills**

“We are committed to securing our wood from sustainably managed forests, mainly from non-arboreal regions, either from certified forests or from controlled sources. When a timber load enters the paper mill, our resource planning systems are in place to check the status of certification and prevent any unidentified fibres from being put into production. Once we know fibres are okay to use, a documented information trail of the raw material follows it throughout the paper-making process. From certification documentation to origin controls and independent third-party audits, our processes ensure transparency. As a forest engineer in the paper industry and as a father, I am passionate about the benefits of certified forestry – not just environmental, but social and economic.”

Jose Nehil Zuluaga Trujillo, Harvest Technician of Forestry, who works in Smurfit Kappa’s own Colombian FSC® certified forest plantations.

**Sustainable Forest Management**

“Certified forests mean that we apply specific procedures to protect and manage the forest and forest ecosystems sustainably, as well as to maintain the safety of our operations in the forest. This is how important it is to our customers, but certified plantations also act as a source of employment for the surrounding communities that we are committed to supporting.”

Ernst Kastner, Wood Purchasing Manager at Smurfit Kappa Nettingsdorf paper mill in Austria.

**Paper Recovery**

“Our principal raw material is recovered paper and cardboard which we receive from Smurfit Kappa’s recycling operations (post-consumer waste), as well as clippings which have received from our corrugated operations (pre-consumer waste). Material sources and specifications are stipulated and compliance is closely monitored – a key requirement to help demonstrate appropriate Chain of Custody. For me personally, our approach to Chain of Custody means we are demonstrating our impact on the depletion of natural resources that makes me proud to work at Smurfit Kappa.”

Mark Webster, Compliance & Environmental Manager at Smurfit Kappa SSP’s recycled paper mill in the UK.

**Transforming Paper into Packaging**

“Our plant doesn’t work with non-certified material. For a start, it’s all traced and tracked throughout our order system. My colleagues and I also receive annual in-house FSC training to ensure we know and understand the materials we work with; so, customers can rest assured the people behind our products know what they’re working with. Our training and day-to-day work within the parameters of our Chain of Custody system has raised our awareness of the importance of certified material; it has a massive impact on both the environment and society.”

Dave Senior, Conversion Shift Manager at Smurfit Kappa Weston Super Mare corrugated plant in the UK.

**The Final Packaging Product**

“Product delivered? Have a look at the paperwork that came with it. All of our customers receive a dispatch note and an invoice with our certified ‘stamp of proof’ clearly marked – their guarantee that our product originates from a sustainable source, verified throughout the supply chain. What’s more, all of our products are fully recyclable so you can have peace of mind that the paper from your packaging can be recovered and reused again and again. Selling certified, sustainable products gives the whole of our Company great pride – and it sets us apart.”

Peter De Knop, Key Account Manager for Smurfit Kappa Benelux.
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 m³ of water in 2019, of which 125 million m³ was discharged in good condition, 34 million m³ of water in 2019, of which 49 million m³ for the CEO Water Mandate. Used for processing and 49 million m³ for stewardship by becoming a signatory to good water management practices. In 2018, water sustainably – many of our stakeholders, we have a common interest in our water intake. Nevertheless, we always use 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 9% 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.

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**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 39% relative to production, on 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 through 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 Pira paper mill in Brazil continued to improve its water treatment after a pair 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 improvements in COD discharge on site level.

In 2019, water intake of all our operations was 134 Mm³, in comparison with 113 Mm³ in 2018. For 2019, compared with 2018, the average water intake by our paper and board mills increased to 18.0 m³ per tonne of paper produced from intake by our paper and board mills increased to 13.4 m³ in 2019, compared with 2018.

**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 recycled – 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 municipality water treatment facility takes place at SK Nettingsdorf, in Austria.

**Process Water Discharges**

- **COD (Chemical Oxygen Demand):** European Mills
- **BOD (Biochemical Oxygen Demand):** European Mills
- **TSS (Total Suspended Solids):** European Mills
- **Precipitated paper:** in Brazil continued to improve its water treatment after a pair of its aerobic reactor in 2017.

**Key:**
- Absolute – (t/annum)
- Specific – (kg/tonne)
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 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.

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 1.076kg 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.

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 73.6% recycling rates (lower than our 84.7% recycling rate in the graph on page 40), in the US and in Latin America, recycling is less than 25% and 46% have clear upward potential. This, along with our raw material's bioavailability, positions us to work with stakeholders and our smart regulatory partners towards litter-free solutions.

Eventually, our packaging returns to the biological cycle – not to the recycling loop, then 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 – 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 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 7.3% reduction in 2019 against our baseline year 2013. This is a slight increase in comparison with 2018, where 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 presses 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 Foment 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 definitions, we believe it is conservatively reported in this report.

Our hazardous waste figure decreased from 10,660 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 pulp production.

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

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 untreated 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!"

The Americas mills

Non-hazardous wastes

European mills

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

The Americas mills

European 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 13.5 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 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 re-use 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 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 38 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!”

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 pay 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.

Luca 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 Mazzini, 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 CO2 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 extra 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 16,000 tonnes of paper had been recovered, with a target of 25-30,000 tonnes for 2020. As General Manager, Recycling Operations Italy, Luca Marini 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