

A greener, bluer planet

At the heart of our Better Planet commitments is our desire to reduce our environmental footprint, on land and water, and to make a positive environmental impact. Our operations embody a circular business model. This means seeking closed-loop solutions, maximising resource efficiency, minimising waste and reducing CO₂ emissions. It also means supplying packaging that protects our customers' products and avoids packaging waste and litter. Our sustainable forestry and fibre sourcing policy requires regular monitoring and the protection of ecosystems and biodiversity. Our ambition is to achieve at least net zero CO₂ emissions by 2050.

In this section our priorities are:

Climate change



p42

Our approach to climate change starts with a circular business model. We are tackling our CO₂ emissions by improving our energy efficiency, as well as moving from fossil fuels to low-carbon, renewable and bio-based energy. We use our InnoTools to help our customers achieve their climate targets.

43.7%

reduction in relative CO₂ emissions from our paper and board mills since 2005

Forest



p50

77% of our fibres are recycled supporting a resource efficient circular economy. Promoting sustainable forest management involves managing supplies of sustainable, renewable fibre, while protecting biodiversity and ecosystems as well as creating employment in rural areas.

Target achieved:

95.5%

of our packaging was sold as CoC certified in 2023

Water



p56

Over 90% of the water we use is returned to nature in good condition, and the rest evaporates to the air during the process or is bound in the product. We focus our efforts on further improving the quality of water we discharge, decreasing our water intake and understanding the risks associated with water availability and use in the areas where we operate.

35.7%

reduction in relative COD discharge since 2005 and a 1.8% reduction in water usage intensity year on year

Waste



p60

Our packaging is produced efficiently and is 'right-weighted' to optimise resource use and minimise waste, and it is made from 100% renewable and recyclable fibres. Once fibres are depleted they are typically used for energy generation or in agriculture. We continually seek alternative uses for the rejects from our paper manufacturing processes.

Target achieved:

35.8%

reduction in relative waste sent to landfill from our paper and board mills since 2013



Planet continued



Planet

Key Principles

We operate a circular business model using mostly post-consumer recycled raw material. The virgin fibre raw material we use is renewable and from a sustainable origin. We reuse or recycle side streams and we use renewable energy and strive for energy efficiency where we can. This circular approach increases resource productivity, adding to our competitiveness.

Our circular business model starts with sustainable primary raw materials. Our integrated approach to producer responsibility and paper recycling means that 77% of our raw material is recycled fibre. We use organic by-products as biofuel, circulate our process water as many times as we can before treating it and returning it to the water system. 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 designing mono-material packaging solutions, we create efficiencies in our customers' packaging lines and we improve 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 a renewable source of raw materials for industry, function as a carbon storage and provide employment.

The COP 28 at the end of 2023, took stock of the world's efforts to address climate change and deliver on the Paris Agreement. The parties of the conference agreed that progress across all areas of climate action were too slow. This echoes the Sixth Assessment Report and related working group reports of the Intergovernmental Panel on Climate Change ('IPCC') which confirmed a 'code red for humanity', demonstrating society is not doing enough to deliver on its commitments and evidencing the rapid change in our environment due to the impact of climate change.

The UN's 2030 Agenda for Sustainable Development calls for action via 17 Sustainable Development Goals, and both the Paris Agreement and the EU have set tough carbon targets. By 2030, the Paris Agreement aims to limit climate change to under 2°C, and the European Commission during 2020 set ambitious targets for reducing net EU emissions by at least 55% by 2030 compared to 1990 levels.

Achieving these requires a shift from linear to circular economic models, creating an era of opportunity and a need for innovation. At the same time, all parts of society need to set common targets. With its net zero ambition, Smurfit Kappa is well placed to make these targets a reality and the SBTi validation of our target evidences the robustness of our climate strategy.

We support the recommendations of TCFD, and have disclosed under this framework since 2020. Our TCFD disclosure in full is available in our 2023 Annual Report (pages 78-95) and should be read in conjunction with our CDP Climate Change Response made by the Group in 2023. Further information can be found on our website: www.smurfitkappa.com.



Our progress and evolution of reporting consistent with the TCFD recommendations included but was not limited to:

- the completion in 2023 of an updated climate scenario analysis taking into account aspects of the Sixth Assessment Report (‘AR6’) from the IPCC;
- the successful trial of the Hyflexpower project in our Saillat site in France, a concept project which successfully used 100% Hydrogen;
- Board training on climate scenario analysis;
- the progression of our multi-year water risk assessment process, which will help us develop our understanding of the risks specific to water and also improve our water stewardship;
- increasing the understanding across our business of climate risks and opportunities; and
- a summary of our Transition Plan, which sets out our strategy, the strength of which is demonstrated through: delivering today, having independently validated interim targets for 2030 in line with the Paris Agreement, and our long-term ambition of at least net zero by 2050.

We expect that certain aspects of our disclosure will further develop and evolve over time.

Circularity has been a key part of our business model since our inception, so we are well positioned as the circular economy goes mainstream.

Our operational footprint is significant, in 36 countries, and 355 production sites in Europe, the Americas and Africa, and influences the entire packaged goods value chain at a large scale. We drive positive change from sustainable and responsible raw material sourcing to minimising operational impact and lowering our customers’ environmental footprints.

Our environmental sustainability strategy is divided into four main areas: Climate Change, Forest, Water and Waste. These priorities cover the most material environmental aspects in accordance with our business and stakeholders’ expectations.

Risks and Opportunities

The Group completed a double materiality assessment during 2023 (see pages 22-25 of this report) which confirmed that there are four key material topics for the Group related to the Planet:

- climate change continues to be an increasingly material topic for the Group due to the energy intensive manufacturing nature of our business;
- biodiversity and sustainable use of forests is at the core of our business;
- waste and waste prevention both from our own products but also in our manufacturing; and
- water plays a fundamental part in paper manufacturing and is becoming a scarce resource.

Our challenge is to create value within natural resource limits, maximising resource productivity while minimising our environmental footprint. We work with a renewable, recyclable and actually recycled, biodegradable material that also gives us opportunities in our path towards a sustainable future.

Climate change requires an immediate reaction from all businesses. Smurfit Kappa uses external platforms, standards and frameworks such as TCFD and SBTi to help guide its work towards a net zero emission business. In 2023, we continued to work on our climate-related risk register, and completed a new climate scenario analysis taking into account aspects of the latest AR6 report from the IPCC. Some of our key risks were published in our Annual Report 2023 on pages 89-91.

Biodiversity is emerging as its own individual theme next to sustainable management and use of forests as a source for renewable raw materials. Smurfit Kappa has a responsible approach to its raw materials with the circular economy at the core of its business. The use of 77% recycled fibres supports our strong sustainable fibre and forest management policy and we are looking into our global impact on biodiversity, also outside our forest operations.

At Smurfit Kappa, we understand the importance of developing a greater understanding of our nature-based risks and opportunities and in January 2024 the Group was announced as one of the early adopters of the Taskforce for Nature related Financial Disclosures (‘TNFD’) at the World Economic Forum.

Waste and waste prevention has become a focal point in our industry. For Smurfit Kappa this is not only a matter of the waste management related to our products but we have also set targets for landfill reduction from our operations as well.

Paper manufacturing requires water and this makes it a material issue for us. Water reduction is a major topic for many of our stakeholders and when our operations return water back to nature, it is important for us to demonstrate good water stewardship. In 2023, we launched the second round of water risk assessments throughout our operations to fully understand the impact to us and by us.



Smurfit Kappa exceeded all our expectations in terms of delivering value, showing commitment to delivering our objectives, driving innovation, cost transformation and sustainability.

Sherif Eskander
Chief Procurement Officer, PepsiCo Europe

Our Progress Against Targets (versus the baseline)

CO₂ Emissions Reduction (%) (2005)

2023	43.7
2022	43.9
2021	41.3

Water Intake Reduction (%)

2023	1.8
2022	2.1
2021	6.2

Packaging Sold as CoC Certified (%)

2023	95.5
2022	94.3
2021	93.4

Waste to Landfill Reduction (%) (2013)

2023	35.8
2022	24.0
2021	29.2

Chemical Oxygen Demand Reduction (%) (2005)

2023	35.7
2022	36.9
2021	38.5

Planet continued

Climate Change

Climate change is one of the greatest challenges facing society, and is an important consideration in all that we do:

- Our stakeholders are looking for low-carbon packaging. We are creating packaging that is circular by nature and increasingly low-carbon.
- Climate change has the potential to impact our business operations in a variety of ways. Extreme weather patterns may affect our operations and supply chain, potentially impacting forests, water, carbon regulation and taxation, and energy availability and affordability. Drought, flooding and local restrictions on water usage may limit our access to water, so we continue to conduct water risk assessments at our paper and board mills.
- Forests play an important role in environmental resilience, especially in mitigating the impacts of climate change. We promote healthy forests and manage these resources sustainably.

Paper manufacturing is energy intensive, with a risk of carbon leakage if 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 generate 75% of our revenues in Europe, we have both a climate and a financial imperative to support the delivery of the EU Green Deal. However, to retain global competitiveness, there must be safeguards against 'carbon leakage' – firms moving to areas with weaker carbon policies.

The Forest Fibre Industry 2050 Roadmap to a low-carbon bioeconomy shows a CO₂ reduction of 50%-60%, compared with 1990 levels, is possible for our sector, based on available and emerging technologies. To reach a reduction of 80% or more by 2050, breakthrough technologies must be available by 2030. We play our part as a leader in this area, for example by testing new technologies, such as the hydrogen project in our Saillat paper mill in France.

Scarce Resources

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

Packaging recycling and recyclability remain of high interest for our stakeholders. Paper-based packaging leads in having well-functioning recycling infrastructures. In Europe, paper-based packaging has 91.4% collection rates and 82.5% recycling rates. In 2023, Smurfit Kappa achieved a level of 100% collection rate of which 88% was recycled in its own mill system.

The EU Green Deal's emphasis on removing litter and plastic waste remains a risk to all packaging products. The European Commission published its proposal for the updated Packaging and Packaging Waste Regulation in November 2022 with ambitions to reduce packaging waste through reuse targets for packaging. We believe that the reuse targets should not overshadow the need for fit-for-purpose packaging with science-based benefits to the environment. This is supported by the evidence collected by FEFCO in its three studies on reuse and recycling. The studies showcase multiple hot spots that impact the final environmental footprint of packaging solutions and demonstrate that the standardisation required in reuse systems may be counter-productive for the environment. The FEFCO Life Cycle Assessment ('LCA') study evidences that reuse requires a high return rate before reuse meets the climate impact benefits of the recyclable alternatives. The important role of sustainable and circular packaging as a method to transport, protect and store goods and its role in preventing waste must remain the key focus of regulatory changes which should not create a situation where packaging waste overrules the benefits of packaging.

Water scarcity remains a concern. Freshwater resources are not evenly distributed globally, and human activity is still degrading its quality. Our current water risk assessments and other measures confirmed that our mills' water use has no impact on water availability to neighbouring areas.

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 minimising 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 a part of the biological and technical cycles of the circular economy. The biological cycle is called bioeconomy, and covers production and maximum 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.

Part of the Bioeconomy

We also recover paper-based packaging from our customers, making our packaging production part of our product's end-of-life. For us, material efficiency means that we are recycling our fibres as long as possible, practically producing new packaging from old packaging. As a natural, organic raw material, wood fibres do however lose their quality after being recycled. Ensuring sustainably sourced wood fibres are used as part of our packaging solutions means our renewable, recyclable raw material can be sustained into the future.

We exist in both the bioeconomy and technical cycles of the circular economy, making us an efficient user of a sustainable, renewable raw material.

The virgin fibres used by the paper industry are mostly from the removal of young trees to support forest growth, or as by-products from sawmills, both of which are fully renewable, sustainable and reusable.



Since 2005, we have invested €1.1 billion in energy-efficient generation technologies and energy recovery solutions. These investments have helped us to reduce our energy consumption and promote sustainable practices.

Ken Bowles

Group Chief Financial Officer, Smurfit Kappa

A total of 77% of our raw material is recycled fibre – the remaining 23% comes from sustainably managed forests through CoC certified supply chains. Paper-based packaging has the highest recycling rate of any packaging. Trees capture 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 100% FSC or PEFC certified forests and plantations, and by only sourcing fibres from sustainably managed forests.

Closing Loops

We continually work towards material efficiency, and aim to use all our production by-products ourselves, or by finding synergies with neighbours and local communities. Paper clippings from corrugating and converting operations are returned to our paper and board mills. Organic by-products – wood bark, dust and black liquor – are used as biofuel. We work with local organisations that 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 also seek alternative ways to treat our rejects from the fibre recovery processes, one of them being pelletising the plastic waste for alternative fuels.

We recycle our process waters several times, and invest in best-practice water treatment. Biogases from this become fuel for our Combined Heat and Power ('CHP') plants. At some sites we work with local communities, sending our effluent to local municipal water treatment plants, where it can replace necessary nutrients.

Reducing Leakage

In Europe, paper-based packaging collection rates were higher than any other packaging material at 91.4% in 2021. Material leakage happens when used products are not being recycled but end up in landfill or as 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 of corrugated board and paper, facilitating recycling. Eventually it returns to the biological cycle, and if it doesn't return to the recycling loop, it can either be combusted, releasing only the amount of CO₂ it captured while growing, or it degrades naturally, reducing the environmental footprint of the leakage.

Working with Life Cycle Assessments

The aim of the circular economy and waste hierarchy is to be a resource efficient and environmentally sound choice hierarchy. Our stakeholders, especially customers and regulators, are interested in LCAs to better understand the impacts of our packaging solutions. Smurfit Kappa participates in various LCA projects: as members of Cepi, we take part in the EU Product Environmental Footprint development work, we are an active member in FEFCO projects both by supplying data for industry LCA studies and by working in a study to understand the corrugated packaging LCA. We also participate in our customers' LCA studies and use our data and tools for our own LCA calculations. All these LCA projects deliver valuable information that is being further used for our product and service development throughout our supply chain.



Planet continued

Responding to our Stakeholders

	What We Believe	What Our Stakeholders Expect of Us	Our Commitments
Climate Change	<p>We are tackling our CO₂ emissions by improving our energy efficiency, as well as moving from fossil fuels to low-carbon, renewable and bio-based energy. In addition, we are improving resource efficiency when producing paper products and optimising the use of raw material residual streams, such as black liquor, in bioenergy production. 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 on innovation and product design, develop supportive tools and services, and create packaging solutions for customers that lower their carbon footprint.</p>	<p>Paper manufacturing is energy intensive, and our stakeholders, notably customers and investors, expect us to approach climate change responsibly and provide detailed progress reports. However, we can make a significant impact in the value chain through smart packaging solutions that can significantly cut our customers' emissions.</p>	<p>Commitment #1: A 55% reduction by 2030 in Scope 1 and 2 fossil-fuel based CO₂ emissions per tonne of paper produced in our paper and board mills compared with 2005 levels. To reach at least net zero by 2050 across all 3 Scopes.</p> <p>Our SBTi target: Reduction of our Scope 1 and 2 greenhouse gas ('GHG') emissions by 37.7% per tonne of saleable production by 2030 from 2019 base year.</p> <p>Commitment #2: Collaboration with customers to determine carbon footprints of the packaging life cycle.</p>
Forest	<p>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 recycled at least 8 times and up to 25 times (according to a 2021 study by the Technische Universität Graz in Austria) when producing paper-based packaging. Using both recycled and virgin fibres in production, we deliver fit-for-purpose packaging with the best overall environmental footprint. We communicate transparently about the sustainable origin of our fibres. We recognise the importance of protecting and preserving biodiversity and protecting nature. From responsible sourcing to conservation initiatives, we are dedicated to working with nature.</p>	<p>As growing consumption raises pressure on resources, our stakeholders increasingly place value on sustainable consumption, integrity of origin, recycling and avoiding packaging waste. Sustainable forest management and use of recycled fibres are at the core of the expectations for paper-based products.</p>	<p>Commitment #1: All fibre produced and purchased is CoC certified under FSC, PEFC or Sustainable Forestry Initiative ('SFI').</p> <p>Commitment #2: At least 95% of our packaging is CoC certified under FSC, PEFC or SFI by 2025.</p> <p>Commitment #3: All production sites have FSC, PEFC and/or SFI certified CoC management systems in place.</p>
Water	<p>Over 90% of the water we use is returned to nature in good condition, and the rest evaporates to the air during the process or is bound in the product. We focus our efforts on further improving the quality of water we discharge, decreasing our water intake and understanding the risks associated with water availability and use in the areas where we operate. This strategy positions us well to deliver a positive change to our processes and protecting the water ecosystems surrounding our operations.</p>	<p>Stakeholders are increasingly requesting information about our responsible water stewardship covering our paper and packaging production as well as our supply chains. Our key water footprint consists of paper manufacturing and forest and plantation management.</p>	<p>Commitment #1: A 60% reduction by 2025 in the organic content of water (COD) per tonne of paper produced which is returned to the environment from our paper and board mills compared with 2005 levels.</p> <p>Commitment #2: Perform environmental impact assessments of the water use in our paper and board mills (where relevant) and develop water usage measurements.</p> <p>Commitment #3: At least 1% relative reduction annually of water intake by our global paper and board mills with 2020 as reference year.</p>
Waste	<p>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 the consumer goods they protect. Our packaging is produced efficiently and is 'right-weighted' to optimise resource use and minimise waste, and it is made from 100% renewable and recyclable fibres. Once fibres are depleted they are typically used for energy generation or in agriculture.</p>	<p>Reducing and eliminating our customers' product and packaging waste are material issues for our stakeholders, and many of our customers have stated objectives to reduce waste.</p>	<p>Commitment #1: A 30% reduction by 2025 in the waste sent to landfill per tonne of paper produced in our paper and board mills compared with 2013 levels.</p>

Status key:

● On track to achieve target

● Improvement needed

● Significant improvement needed

Progress Made in 2023

Progress made:

Since 2005, we have reached 43.7% reduction.

In 2021, Smurfit Kappa had its CO₂ target approved by the SBTi. Since 2019, we have reached a 15.7% reduction.

Progress made:

Our suite of tools that help to determine the carbon footprint of our customers' packaging were used over 164,000 times in 2023.

[Read more on pages 42-49](#)

Progress made:

In 2023, we continued to produce and purchase 99.9% of our fibres under fibre-origin management systems that are CoC certified. This is within our margin of 1% variation.

Progress made:

95.5% packaging solutions sold as CoC certified in 2023, target achieved.

Progress made:

All our production sites are FSC certified and where relevant PEFC and/or SFI certified.

[Read more on pages 50-55](#)

Progress made:

Since 2005, we reached a 35.7% reduction, a slight decline from 2022, further explained on page 58.

Progress made:

In 2023, we finalised the new methodology for our second phase of the water risk assessment and we assessed five sites during the year, in addition we finalized the water basin risk assessment for all our paper mill operations.

Progress made:

In 2023, we reached a 1.8% reduction of water intake at our paper and board mills compared with 2022.

[Read more on pages 56-59](#)

Progress made:

Since 2013, we reached a 35.8% reduction, achieving the target two years ahead.

[Read more on pages 60-65](#)

Status

Delivering for SDGs

As an energy intensive manufacturing business that uses natural resources, Smurfit Kappa has a direct impact on affordable and renewable energy. 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 global climate action.

Smurfit Kappa contributes to the realisation of the following SDG and targets:

7.2, 7.3 and 7.A
12.6
13.1, 13.3



As a paper-based packaging company that uses recycled and virgin fibres as its key raw material, Smurfit Kappa has a direct impact on ending deforestation and supporting forest biodiversity and ecosystems.

Smurfit Kappa's forestry and sustainable fibre sourcing actions impact the following SDGs and targets:

12.2, 12.4, 12.5 and 12.6
13.1
15.1, 15.2, 15.3, 15.5 and 15.8



Water is a critical element in pulping wood and recovered paper fibres and formation of paper. With returning the water back to nature, Smurfit Kappa has a direct impact on clean water resources.

Smurfit Kappa's water management practices impact the following SDGs and targets:

6.1, 6.2, 6.3, 6.4 and 6.6
12.2, 12.4 and 12.6



As a paper-based packaging company that uses recycled fibres as its key raw material, that produces packaging solutions that are recyclable and recycled, and that helps to reduce the waste of packaged goods, Smurfit Kappa has a direct impact on responsible consumption and production.

Smurfit Kappa's circular business model and packaging design impact the following SDG and targets:

12.2, 12.3, 12.4, 12.5 and 12.6



Scope

- This priority area covers energy use, climate change and GHG emissions. Our reporting covers our operations from gate-to-gate.
- All CO₂ emissions from our paper and board mills relate to the production of paper and board.
- Only paper and board production is taken into account, given its fossil CO₂ emissions are 80% compared with our converting operations and its subsequent contribution to fossil fuel CO₂ emissions.
- Our SBTi target includes the emissions of all our operations. The level of the ambition is in line with a well-below 2°C trajectory. The target boundary includes biogenic emissions and removals from bioenergy feedstocks.
- The logistics emission methodology reporting complies with the Global Logistics Emissions Council (GLEC) framework model and requirements. We work in line with the requirements from the GLEC framework and to anticipate the future requirements of the forthcoming ISO14083.

- This priority covers forest management, biodiversity, fibre sourcing and the communication of how we use sustainable fibres through certified CoC.
- Our reporting encompasses all of our own operations and products.

- This priority area covers the water intake and discharge to and from our processes. The data covers all Smurfit Kappa paper and board mills discharging water produced through the production process directly to water bodies. Mills that have their process water treated externally are not included.
- Only paper and board production is taken into account because this contributes to 95% of all organic discharges and 98% of total water intake.
- Our target is set against COD in water which is an indicator of the organic content in water per produced tonne of paper.
- As a processor and not a consumer of water, we focus our efforts on further improving the quality of water we discharge, and understanding the risks associated with water availability and use in the areas where we operate.

- This priority area covers non-hazardous waste (recovered and landfilled) and hazardous waste generated from Smurfit Kappa's manufacturing processes.
- Our target is set against non-hazardous waste sent to landfill from our paper and board mills per produced tonne of paper.
- The amount of hazardous waste produced in our production processes is very low and depends on local activities such as construction or change of light bulbs on site. Therefore we have no set target for hazardous waste.

Planet continued

Climate change

Minimising energy use and moving from fossil fuels to low-carbon, renewable sources of energy are core elements of our climate change strategy. The strength of our approach is demonstrated through delivering today (as evidenced in this report), setting independently validated interim targets for 2030 in line with the Paris Agreement, and our long-term ambition of achieving at least net zero by 2050.



Highlights in 2023

43.7%

reduction in relative CO₂ emissions since 2005

15.7%

reduction in SBTi CO₂ emissions since 2019

0.9%

Our Cali mill (Colombia) decreased its CO₂ emissions by 0.9%, due to a shift to greener electricity based on hydro power

9.4%

The new heat recovery system in our Morava mill (Czech Republic) delivered a 9.4% energy reduction

2.1%

The energy efficiency improvements in our Verzuolo mill (Italy) delivered a reduction of 2.1% of CO₂ emissions



Delivering for our SDGs



Climate change is a reality and one of the greatest challenges facing society. The challenge of achieving the Paris Agreement and the UN 2030 SDGs will require strong and concerted action to deliver on the increasing levels of commitments across all sections of society. We align our climate change strategy with the UN 2030 SDGs 7 (affordable and clean energy), 12 (responsible consumption and production) and 13 (climate action), which are related to climate change.

Our decarbonisation strategy is focused on minimising energy use and moving from fossil fuels to low-carbon, renewable sources. We also focus on increasing the efficiency of our own production systems, lowering our customers' carbon footprints and decreasing CO₂ emissions in our supply chain, through actions such as transport optimisation. These core elements are all aimed at reducing our fossil emissions in line with the Paris Agreement, reaching at least net zero by 2050.

In line with our climate change strategy, we are committed to at least net zero by 2050, and have set interim targets on reducing our Scope 1 and 2 CO₂ emissions per produced tonne of paper from our paper and board mills by 55% by 2030.

In 2021, our CO₂ emissions target was validated by the SBTi as being in line with the objectives of the Paris Agreement and well below 2°C ambition level. Our SBTi baseline is 2019 and has a related intensity target reduction of 37.7% by 2030 for all our Scope 1 and 2 CO₂ emissions of all our operations. The actions we are taking to deliver on our interim CO₂ emissions target of 55% specific reduction per tonne of paper produced by 2030 complements our validated SBTi target. Our TCFD disclosure table can be found on page 137 of this report and the complete disclosure in our Annual Report 2023 on pages 78-95.

In line with the efficient resource use-hierarchy, we only use wood biomass for which no higher value-added purpose exists as fuel and we also use residual products of wood, such as black liquor, to generate energy.

The key focus of our energy efficiency investments is to deliver CO₂ emission reductions; however, we support the EU general energy efficiency target with our target to improve our energy efficiency at least by 1% annually in our global paper mill network.

SBTi Reduction Target (2019 baseline)

15.7%

Packaging is estimated to represent only 3% of the carbon footprint in the food product value chain (%)



● Packaging	3%
● Manufacturing	6%
● Transport	5%
● Retail & Hospitality	9%
● Consumer	11%
● Post-consumer	0.5%
● Imports Production	32%
● Domestic Ingredients	34%

Source: Data from analysis by WGAP 2020 UK.

Our Strategy

Our ambition is to have at least net zero emissions by 2050 across all 3 Scopes, with a 55% reduction in fossil fuel emissions intensity for Scope 1 and 2 by 2030.

The strength of our approach is demonstrated through our:

- History of delivery
- Continued delivery today
- SBTi approval for interim targets
- Collaboration across the value chain
- Trialling emerging technology today
- Climate targets are part of management incentives

Our Approach – Timelines

Short-term

Acting now with continued year-on-year reductions using best available technology and continuous improvement.

Medium-term

Strategic investment projects to replace high emitting assets, continuous improvement, availing of best available technology, collaboration across the value chain, all leading us to achieve our 55% reduction target.

Long-term

Through collaborative projects, executing controlled trials of new/emerging technology today to understand the feasibility and cost of large-scale implementation beyond 2030.

These plans are expected to be financed by a combination of both operational expenditure and capital expenditure.

Scope 1 and 2 Emissions

In December 2021, our target to reduce our Scope 1 and 2 emissions was validated by the SBTi. In our approach to tackle climate change, we are using less fossil fuel and emitting less CO₂, promoting renewable sources and closing loops to create circularity in our production process.

There are four parts to our CO₂ reduction programme:

A

Investing in Fossil CO₂ Reductions

Shifting to low or zero carbon fuels including CO₂ neutral energy sources:

- Use of biofuels; and
- Electrification.

Research and development into new and emerging technologies with controlled trials:

- Green hydrogen, geo-thermal and heat pump technology.

B

Greening of Electricity Supply

C

Reducing Energy Use

- Investing in technologies that reduce energy consumption; and
- Re-engineering our processes and implementing smart energy-efficient solutions.

D

Investing in Efficient Energy-generation

- Investing in highly efficient CHP systems*; and
- Improving the efficiency of our existing boilers.

* The hydrogen trials in our Saillat paper mill should facilitate the move from current energy efficiency outcomes to low or no carbon outcomes via the retro-fitting existing CHP assets.

Scope 3 Emissions

There are three elements to our Scope 3 emissions strategy:

A

Supplier Engagement

Reviewing SBTi commitment from strategic suppliers:

- Expand beyond strategic suppliers in time.

Sustainable and Responsible Sourcing programme.

B

Transport

- Modal shift: CO₂ reduction by shifting transport from road to lower emission transport models.
- Operational efficiency: CO₂ reduction by optimising transport operations, sources and destinations.
- Fuel efficiency: CO₂ reduction by leveraging new technology, alternative fuels, engine efficiency.

C

Customers Engagement

Better Planet Packaging programme delivering lower CO₂ solutions for customers through:

- Material design;
- Packaging design; and
- Supply chain optimisation.

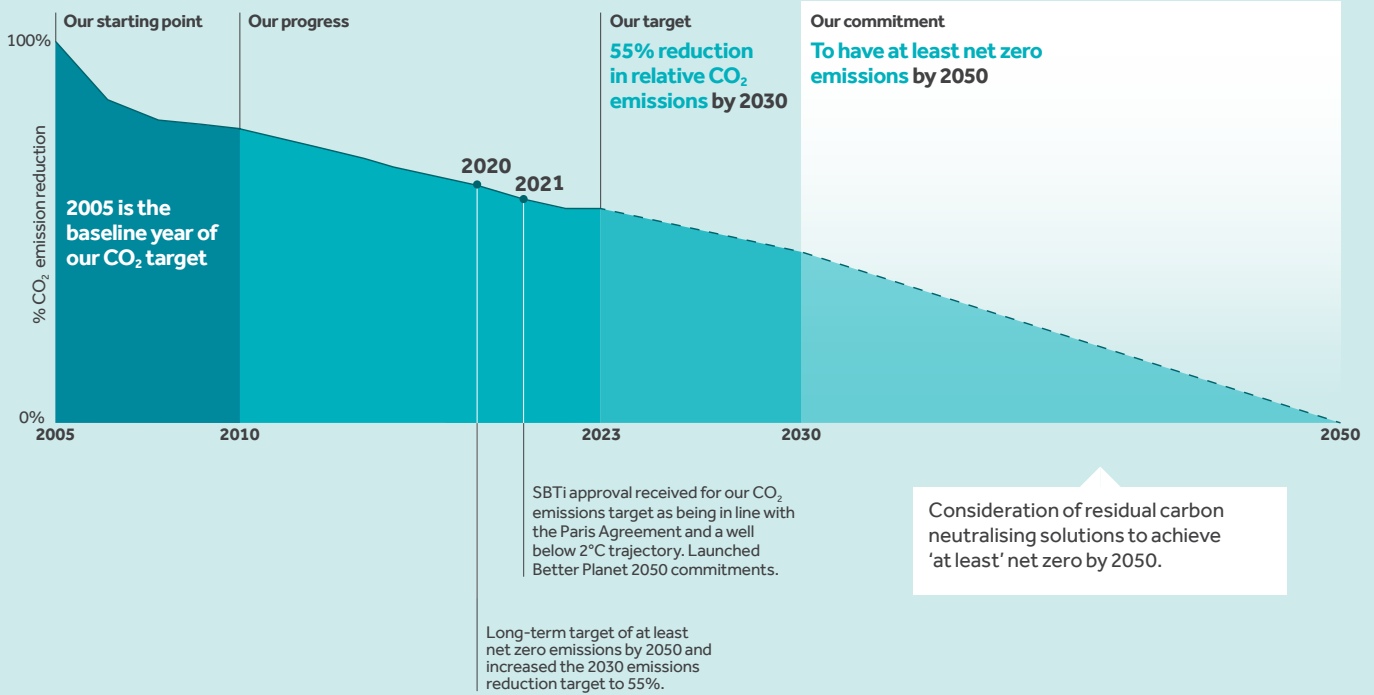
These three elements are supported by our end-to-end approach to circularity.

Residual Emissions

While the Group is focused on its impact on emissions reductions across its value chain, with significant scope well into the future, we acknowledge that as we approach 2050 we may have residual emissions which we cannot eliminate. In the event that this occurs the Group would consider neutralising these emissions through appropriate and credible solutions.

Planet continued

Our Net Zero Transition Plan



2010
Set target of 20% reduction in relative CO₂ emissions by 2020 (2005 baseline).

2013
2020 target of 20% reduction achieved with a 21% reduction by the end of 2013.

2014
New relative emissions reduction target of 25% reduction set for 2020.

2018
2020 target of 25% reduction achieved and more ambitious relative emissions reduction target of 40% by 2030 set.

2019
Approval of €134 million new recovery boiler in Nettingsdorf (Austria).

2020
Long-term target of at least net zero emissions by 2050 and increased the 2030 emissions reduction target to 55%.

2021
SBTi approval received for our CO₂ emissions target as being in line with the Paris Agreement and a well below 2°C trajectory. Launched Better Planet 2050 commitments.

2022
43.9% reduction in CO₂ emissions. Successfully trialled hydrogen project at our Saillat paper mill (France). Announced a major investment in our Cali paper mill (Colombia) of almost US\$100 million in a sustainable biomass boiler.

2023
Significant investment in our Hoya paper mill and board manufacturing plant (Germany). A CO₂ emissions reduction of 5,500 tonnes per annum is expected.

2024
Review of our third party validation.

2024-2030
Approximately 60 projects identified to implement until 2030 in order to achieve our 55% CO₂ emissions reduction target.

2025
Contribution from a state-of-the-art sustainable biomass boiler at our paper mill in Cali, Colombia which will reduce our global Scope 1 and Scope 2 CO₂ emissions by approximately 6%.

Beyond 2030
Scaling new and emerging technologies, as they become available.

Acting Today Across our Value-chain

Scope	Time Horizon*	Action today
Scope 1 and 2	Short-term	<ul style="list-style-type: none"> – In 2023, we achieved a reduction of 43.7% in CO₂ emissions intensity for our paper and board mills. – Continuous improvement of our operations through the implementation of best operational practices, insulation of pipes, LED lights, monitoring and improving processes, using data, reuse of residual steam to reduce the need for fresh steam, using biogas from water treatment plants, efficiency improvement in operations and energy efficiency. – In early 2023, announced installation of 12,000 solar panels adjacent to our Sangüesa Mill in Spain which will reduce CO₂ emissions by over 3,200 tonnes. – In July 2023, inaugurated the Group's first box plant in Africa (Morocco) which included 1,500 solar panels – In 2023, start up of new water treatment plant in our paper mill in Belgrade, Serbia. First of its kind in the country. The €5 million investment in the state-of-the-art plant enables it to purify water to the highest standards before it can be returned to the environment and also reduces electricity usage and CO₂ emissions. – In 2023, start up of €27 million state-of-the-art waste management and recovery facility at our Nervión paper mill in Spain, sees the mill adopt a fully circular production process involving the biggest landfill reduction project Smurfit Kappa has undertaken to date to support the delivery of its 2025 sustainability commitments; in addition eliminating approximately 450,000 km per year in road transport – In 2023, start up of Evaporator project in Cali, Colombia which is an important part of the Group's Biomass boiler project preparation due in 2025. – Using Digital Twin technology in our Townsend Hook mill to reduce steam consumption by approximately 5%. – Nettingsdorf Biomass investment of €134 million completed in 2020 and now achieving its full run-rate of 40,000 tonnes of emissions reduction. – Invested €11.5 million in our Zülpich paper mill. A major redesign of the multi-fuel boiler provides a more sustainable fuel source for generating steam and electricity and reduces CO₂ emissions by 55,000 tonnes. – Optimising starch use in our Hoya mill which requires less steam and energy to dry. – Water treatment plant investments in Colombia and Brazil which will help improve our COD (water) and capitalise on biogas from plants (CO₂). – Greening of energy supply in the Netherlands and UK.
Scope 1 and 2	Medium-term	<ul style="list-style-type: none"> – Approximately 60 projects identified between now and 2030 to deliver our interim target, reducing our emissions by 55% by 2030, including: <ul style="list-style-type: none"> – Investing almost US\$100 million in a sustainable biomass boiler in our paper mill in Cali, Colombia which will reduce our global Scope 1 and Scope 2 CO₂ emissions by approximately 6%, planned to be operational by the middle of 2025. – Controlled trialling of new/emerging technology and feasibility of large-scale implementation: <ul style="list-style-type: none"> – Build on learnings from Digital Twin pilot in Townsend Hook Mill (UK); and – Collaborative heat pump project in Morava paper mill (Czech Republic).
Scope 1 and 2	Longer-term	<ul style="list-style-type: none"> – Controlled trialling of new/emerging technology today for the future: <ul style="list-style-type: none"> – In 2023 The Hyflexpower consortium and SKG successfully completed the second stage of the Hyflexpower hydrogen project, the first in the world for a paper mill and a truly collaborative project including suppliers, academia and government support; and – Geo-thermal being explored in our paper mills in the Netherlands and Germany.
Scope 3	Short-term	<ul style="list-style-type: none"> – Customers: We have hundreds of examples where a collaborative approach has delivered a lower carbon, circular solution, an example, by working together with a customer in Switzerland, we reduced the CO₂ emissions in transport by switching from road to rail delivery. This reduced the transport emissions by approximately 600 tonnes of CO₂. – Customers: Developing products such as TopClip and Click-to-Lock which reduces the carbon footprint of our customers' packaging by over 30%. A number of customer examples are outlined in the Annual Report on pages 10-15 and in this report on pages 6-9. – Continued progress in our understanding of the Group's Scope 3 inventory. – Engagement with suppliers: In our Sustainable and Responsible Sourcing programme, we audit our suppliers on their energy reduction programmes and participation in commonly accepted best practice and certification schemes such as SBTi commitments and validation.
Scope 3	Medium-term	<ul style="list-style-type: none"> – Reviewing additional SBTi commitments, including Forest Land and Agriculture ('FLAG') targets – Considering Scope 3 targets. – Internal: Trialled electric delivery vehicles in Germany and the Netherlands, biofuel trucks in Ireland and continue to explore other opportunities in transport.

* Time-horizons are defined by when we believe they could be scaled, so we are actively exploring and trialling them now but their scalability could be now (short-term), 3-10 years (medium-term) or 10-30 years (long-term).

Planet continued

Progress in 2023

We focus on long-term ambition, coupled with action today and we are pleased to report a reduction of relative CO₂ emissions from our mills in 2023 of 43.7% against our 2005 baseline.

The progress against our 2030 SBTi target of a 37.7% reduction for all our operations was 15.7% against our 2019 baseline, please note the baseline and scope of the SBTi reporting is different to our 55% Group target.

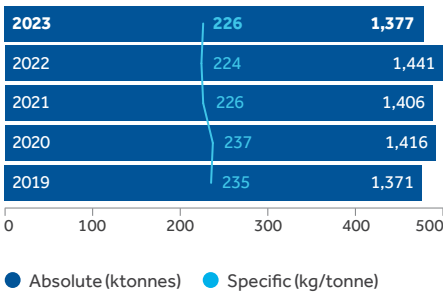
Our global CO₂ emission reduction programme currently covers 100% of our operations with a focus on the paper and board operations that represent 10% of global operations but emit over 80% of our CO₂ emissions.

In 2020, we finalised an evaluation of a suitable CO₂ emission target for our corrugated operations. Our conclusion is that the current approach to encourage energy reduction and positive climate-related activities are sufficient as the average share of a corrugated site to the Group CO₂ emissions is below 0.5%.

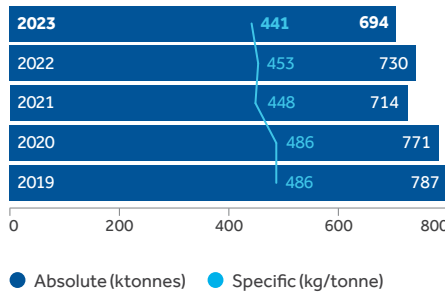
Energy Efficiency

Further progress in energy efficiency is key in achieving our CO₂ emission reduction targets. Since 2005 we have invested €1.1 billion in more energy-efficient generation technologies that reduce the use of energy and technologies that recover energy. Examples of this are investments in CHP generation and heat exchangers. These investments have improved overall energy efficiency in our paper mill system by 18%.

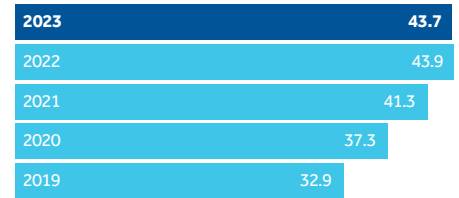
Direct Fossil (Scope 1) CO₂ Emissions: European Mills



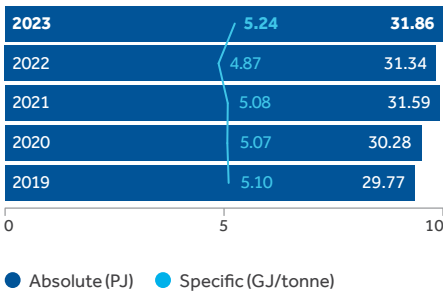
Direct Fossil (Scope 1) CO₂ Emissions: The Americas Mills



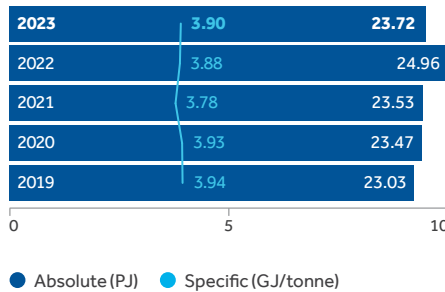
CO₂ Emission Reduction (%) (2005 baseline)



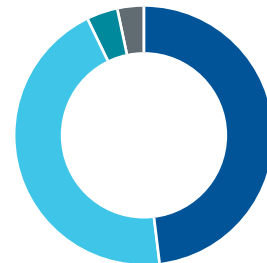
Biofuels: European Mills



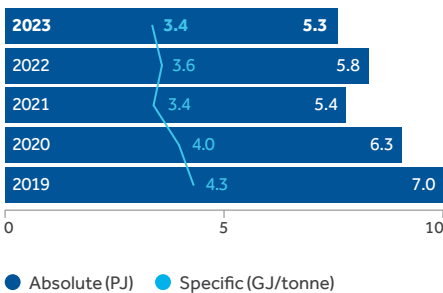
Fossil Fuels: European Mills



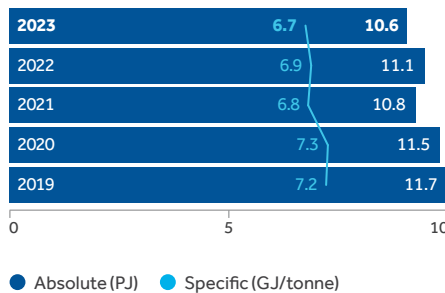
Direct Fuel Consumption: All operations (%)



Biofuels: The Americas Mills



Fossil Fuels: The Americas Mills



During 2023, Smurfit Kappa Group delivered a 43.7% reduction of relative CO₂ emissions compared with 2005, some of the key actions are listed below:

- Our Cali mill (Colombia) decreased its emissions by 0.9%, due to improved electricity supply based on hydro power.
- The new heat recovery installed in our Morava mill (Czech Republic) delivered a 9.4% reduction after a full year of implementation.
- The energy efficiency improvements in the paper machine in our Verzuolo mill (Italy) delivered a reduction of 2.1% of CO₂ emissions.

These projects are an illustration of our focus on reducing energy, key from both a financial and sustainability perspective for our paper and board mills.

The slight increase of our relative CO₂ emissions compared to 2022 is due to increased commercial stops taken in 2023.

Renewable Energy

To reach our CO₂ emission reduction target, we are moving from fossil to low-carbon, renewable fuels. During 2023, our paper and board mills used 52% biofuels, compared with 35% in 2005 and 48% for all operations in 2023.

Specific to bioenergy, our Nettingsdorf mill in Austria and Piteå mill in Sweden are examples of biofuel-based energy production. Our 2025 boiler project in Cali will add to this.

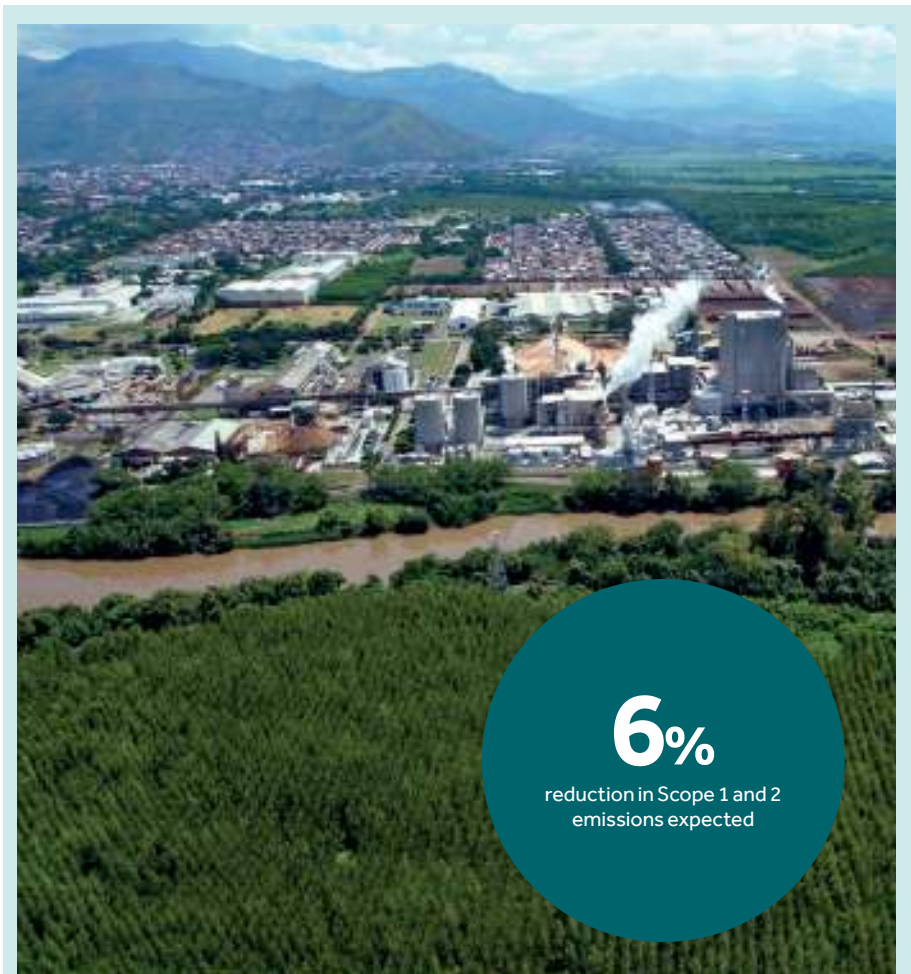
As part of our sourcing strategy for grid electricity, we are shifting to CO₂ neutral energy. Our operations in the Netherlands and the UK moved to purchasing CO₂ neutral energy from the national grid in 2020. In addition our operations in Colombia, Austria, and Chile have also moved to purchasing CO₂ neutral energy.

Working with our Customers

Using a suite of tools, including Innobook, Pack Expert, Paper to Box and SupplySmart we work with customers to determine their packaging's carbon footprint. These tools provide CO₂ emissions data and other information to optimise solutions.

In 2023, our tools were used over 164,000 times. Our InnoTools suite of design software also shows customers the carbon footprint for each packaging unit and tracks its development over time. The impact of our Group CO₂ emission reductions are reflected in our InnoTools and also in the CO₂ footprints of our customers.

We continue to develop our BPPROGRESS tool, a unique tool to help our customers visualise the sustainability performance of their entire portfolio. Using BPPROGRESS we can track the carbon footprint of the total packaging portfolio delivered to a particular customer over time.



Case study

Colombia Redesigning the energy transition in Colombia

Our commitment to driving down emissions and how we achieve this across the Group's operations is well demonstrated at our paper mill in Cali, Colombia.

With the US\$100 million investment announced in October 2022, we started the project to transition to a sustainable biomass boiler, and as a result, when completed, reducing Scope 1 and Scope 2 CO₂ emissions by approximately 6% of Smurfit Kappa's total emissions. The project is expected to startup in 2025 with progress made in 2023 with the completion of the evaporator project.

When making paper from fresh wood, we gain by-products such as black liquor and bark. The biomass boiler creates steam with energy generated from these by-products. A step in the energy recovery process is to use an evaporator system that then helps to generate electricity from steam. With increasing production capacity, we needed to ensure the supply of this steam could match the electricity demand. To support this capacity requirement, we invested in a new evaporation line to improve the energy system's capabilities, designed for the expanded capacity, and to ensure a resilient and sustainable operation for years to come.

The overall objective is to renew the mill's energy system allowing for flexibility and to support the needs of the paper machines. Rafael Concepcion, Paper & Production Technology Specialist at Smurfit Kappa the Americas, explains: "With a focus on innovation and environmental responsibility, we've crafted an updated system that embraces flexibility in the paper mill. The benefits cascade through our operations, addressing the immediate demand for increased paper production, expanding the outer capacity of our pulp plant, fortifying the mill's productivity, and securing a path for long-term operational excellence."

Planet continued

Scope 3 Emissions

In 2021, the initial Scope 3 estimates for the Group had been estimated at 30-39% of our total emissions. This estimate was delivered as a result of our 2021 SBTi submission. Seven categories were considered as contributing to this initial assessment.

Following on from our SBTi submission and also through continued stakeholder engagement, we commenced a more detailed assessment in 2022, which has continued in 2023 and into 2024. This review has been supported by GHG training on best-practice GHG inventory capture and expert third party support.

As a result of this review we now believe our Scope 3 to be higher than our initial estimates. The 3 main reasons for this change are the:

1. Updating of emission factors
2. Reduction of the Group's absolute Scope 1 and 2 emissions
3. Addition of extra categories

The updated Scope 3 emissions inventory is now undergoing an internal operational review both to get comfortable with the mechanics behind the inventory and also to understand where best to focus our efforts. As this internal review is ongoing we are not in a position to report on the specifics of our updated Scope 3 inventory as they are not finalised. We expect this is something we will report for 2024.

We are also developing our approach to our suppliers by engaging with them to evaluate their maturity on the topic of climate change. For the more mature suppliers we are also evaluating how to include their primary data into our Scope 3 reporting.

Upstream and Downstream Transportation and Distribution

Smurfit Kappa is committed to continuously optimising and decarbonising its transportation operation. Therefore, a wide range of initiatives are followed with focus on:

1. **Modal shift:** CO₂ reduction by shifting transport from road to lower emission transport modes. Smurfit Kappa is making use of, and continuously develops, multi-modal transportation, leveraging rail, water and a wide range of multi-modal transport solutions. Access to rail or waterway transportation is part of our logistics infrastructure investments.
2. **Operational efficiency:** CO₂ reduction by optimising transport operations, increasing load-fill and tonnage per unit, reducing empty mileage, back-loading of trucks to reduce truck movements, supply-chain network optimisation to reducing transport distances between sources and destinations.
3. **Fuel efficiency:** CO₂ reduction by leveraging new technology, alternative fuels, engine efficiency. As Smurfit Kappa mainly operates transportation with third-party transport providers the strategy is to mutually set targets and monitoring progress with our external transport partners.

In 2023, our transport emission reporting covered all our operating countries. The total transported volume was estimated to be 30 million tonnes. This equates to 660,500 tonnes of CO₂ equivalent using the GLEC framework. Of this, the upstream value chain (see the scope description on the next page) represents 485,200 tonnes of CO₂ equivalent and the downstream transport represents 175,300 tonnes of CO₂ equivalent.

The transportation of corrugated packaging is mainly by road over shorter distances. For all remaining transport we operate a modal mix of 4.6% rail, 6.9% water and 88.5% road-based transportation. The modal mix is calculated based on shipped volume per mode. Including corrugated transport the total modal mix is at 3.5% rail, 5.3% water and 91.2% road-based transportation.



Case study

Ireland Driving towards sustainable supply chains with Pernod Ricard

To achieve a more sustainable future, companies worldwide are exploring innovative ways to reduce their carbon footprint.

In partnership with Irish Distillers, part of the Pernod Ricard Group, Smurfit Kappa Ireland has embarked on a transformative journey alongside Toner Transport and Logistics to pioneer sustainable practices in logistics. At the forefront of this collaboration is an innovative initiative to reduce carbon emissions by adopting Compressed Natural Gas ('CNG') vehicles and driving sustainability through our supply chain.

In Ireland, the transport sector accounts for a substantial amount of the country's energy use, so by recognising this challenge we worked collaboratively to implement the use of CNG, delivered through the national gas network. CNG has emerged as a practical and cleaner alternative, especially for commercial vehicles where electric solutions may not be feasible. CNG vehicles produce significantly fewer carbon emissions compared to diesel engines,

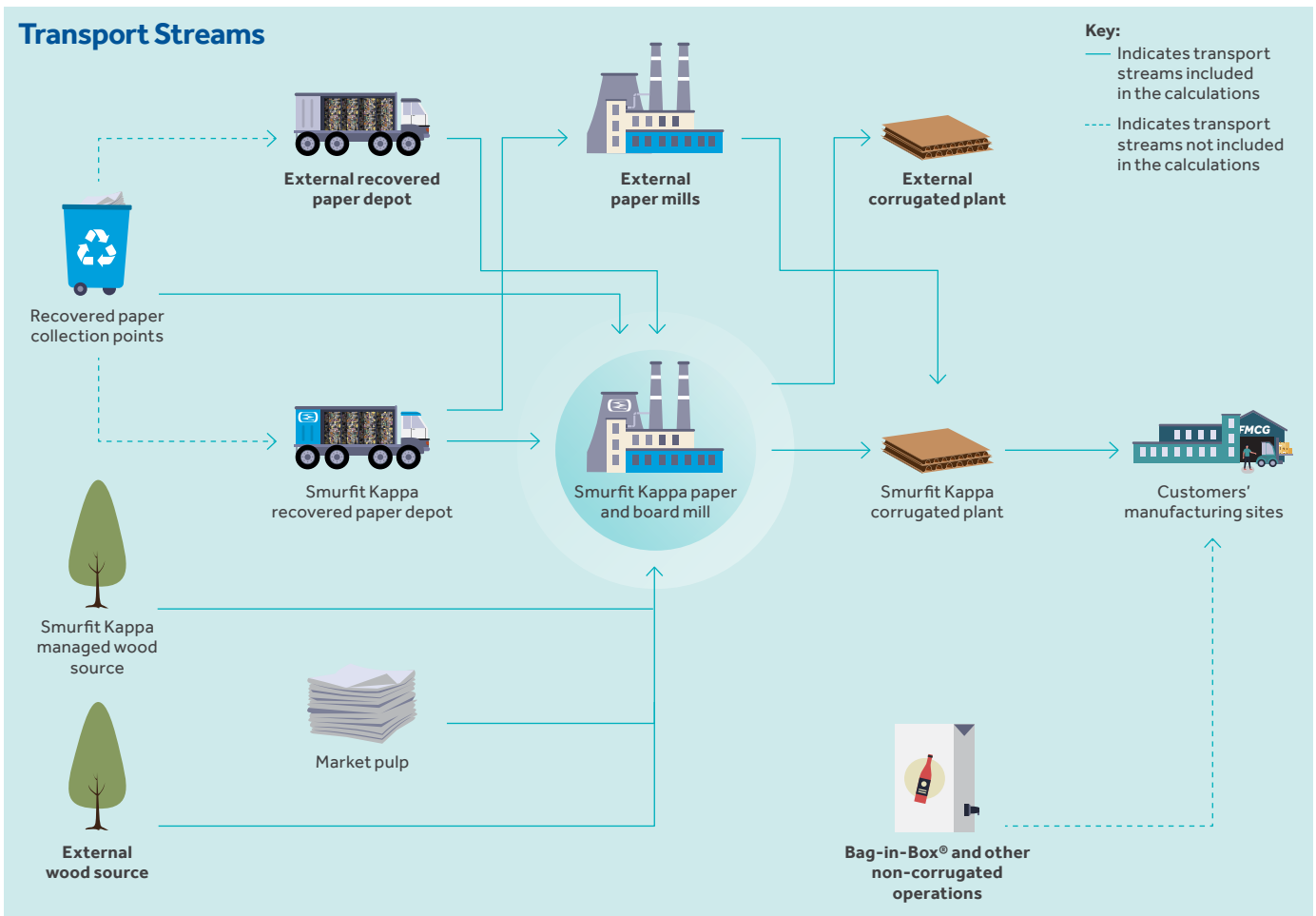
making them an important component in the journey towards a more sustainable low-carbon future.

We recognise the strategic advantage of integrating sustainable practices into our supply chain management and we use a new CNG truck for our daily deliveries to Irish Distillers. With this new investment, we see a 10% reduction in CO₂ emissions when operating on 100% CNG. Additionally, CNG is often more cost-effective than diesel and vehicles can operate at lower noise levels, causing less disruption in urban areas.

10%

reduction in CO₂ emissions when operating on 100% CNG





Scope Statement

The current scope is structured in the following main flows, and transport streams included are outlined in the diagram above.

1. Transport of wood and wood chips to paper mills
2. Transport of recovered paper to paper mills
3. Transport of market pulp and external wood to paper mills
4. Transport of paper reels and solidboard sheets from internal paper mills to internal or external corrugated plants
5. Transport of paper reels from external paper mills to corrugated plants
6. Corrugated boxes from corrugated plants to Smurfit Kappa customers

Our disclosure here on the total transported volume was estimated to be 30 million tonnes and does not include the following categories:

- **Goods flows:** All material and goods flows beyond the main flows expressed above are out of scope, like transport of raw chemicals, starch, or any other commodity supplies. The magnitude of these remaining raw materials will be estimated going forward.
- **Warehousing:** Any external warehousing operation is currently out of scope. The scope for external European warehouses is calculated at 1.5 million tonnes of paper transport from paper mills to corrugated plants where external warehouse activity applies. This amounts to 22% of flow 4* and 6% of the reported volume.

We have included emissions in our transport-related supply chain decisions since 2017. Our strategy focuses on three opportunities to decrease transport emissions: maximising efficiency through payload optimisation and reducing empty mileage; developing a good modal mix of road, rail and water transport; and using less carbon-intensive fuel technologies.

* We continually improve in our transport emission reporting and expect to capture the complete flow 4 as our assessment evolves.

Planet continued

Forest

Natural fibres are our main raw material, of which 77% is primarily post-consumer recycled fibres. We produce our packaging solutions to meet our customers' performance requirements, which means using recycled, virgin or a combination of both fibres in our packaging design. We source all our fibrous raw materials sustainably as CoC certified, including our recycled fibres. Our sustainable forestry and fibre sourcing policy requires regular monitoring of the protection of ecosystems and biodiversity.



Highlights in 2023

95.5%

achieved our 2025 target to supply at least 95% of our packaging as CoC certified

20 years

of FSC certified forest management in Colombia

TNFD

early adopters decision made at Board level in November 2023 and announced in January 2024



Delivering for our SDGs

<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	<p>13 CLIMATE ACTION</p>	<p>15 LIFE ON LAND</p>
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Our raw material is renewable, recyclable, recycled and biodegradable. This makes us part of the circular and bioeconomy, which we have explained in more detail on pages 38-39. We need virgin fibres for their performance properties for applications such as food contact, moisture resistance and other technical properties required for our sustainable packaging solutions. As fibres can be recycled up to 25 times, we also need fresh virgin wood fibres to sustain a healthy fibre-recycling system.

The virgin fibres we use are primarily made of wood for pulp from certified sustainably managed forests. Smurfit Kappa sustainably manages its own eucalyptus and pine plantations in Colombia which have been FSC certified since 2003. Our forestry operations in Spain and France support small forest owners in managing their forests, certified by FSC and/or PEFC. In Europe, Smurfit Kappa buys most of the virgin fibres it needs from suppliers in: Austria, the Baltic countries, France, Germany, Spain and Sweden.

To further report on our commitment to protecting ecosystems and biodiversity, we have committed to adopting the Taskforce on Nature-related Financial Disclosures recommendations as an early adopter.

Our Commitment to Sustainable Fibre

Products delivered to our customers must meet the commitments we make in our policy statements: Forestry Policy, Code of Conduct, Social Citizenship. These policies can be found at our website smurfitkappa.com.

We source virgin fibres from certifiably well-managed forests, or at least of non-controversial origin, or certified recycled fibres. All materials must be delivered through a third-party verified CoC certified supply chain. We accept FSC, PEFC and SFI certified wood, and the CoC systems at our mills and plants also cover recycled fibre consumption.

We regard these certification schemes as the best available means to conserve forests and their biodiversity.

Sustainable Forest Management certification schemes require regular monitoring of the protection of ecosystems and biodiversity. This is being monitored annually at our sites as part of the forest certification audits and auditing by independent third parties applies to our suppliers through the certified CoC.

In summary:

- All of the wood we use to produce virgin paper or pulp comes, at least, from sustainable non-controversial origin;
- in 2023, 56% of this wood is from sustainably managed forests certified under the FSC, PEFC and/or SFI schemes;
- and the remaining 44% is from FSC Controlled Wood sources, risk-assessed through our FSC and PEFC CoC system and verified by a third party; and
- 16% of the wood we use originates from our own forests and plantations in Colombia which are FSC certified.

Our objective is to increase certified wood supplies, however this is limited by low availability of certified wood at competitive prices in the regions where we can economically source our wood supplies.

The administrative effort to achieve certified CoC status means that it is often not economically feasible for small forest holders to certify their forest holdings, further limiting the availability of certified wood supplies. However, efforts to increase FSC certified supplies have started to have positive impacts on the certified wood volumes in Spain, where we support forest owners, all smallholders, in achieving the FSC certification of their forests. Also, in Sweden volumes could be increased through finding better agreements with forest owners in the region.

Annually, Smurfit Kappa's recycling operations handle approximately 7.7 million tonnes of recovered paper bringing valuable fibres back into the paper-based packaging production loop. All recycled fibre we use is certified CoC.

Chain of Custody

Smurfit Kappa does not source fibre from high deforestation-risk areas, including High Conservation Value areas. Through supply chain transparency we ensure our sustainability commitments and fibre origins. We use robust monitoring and third-party auditing of our wood and fibre supply chain. The best practice to deliver our commitments is through CoC certification.

Our complete paper mill system has been CoC certified under FSC and PEFC schemes in Europe since 2010, and under FSC, PEFC and/or SFI schemes in the Americas since 2015. At the end of 2023, 93% of our paper was produced as CoC certified, according to FSC, PEFC or SFI standards. The remaining 7% are from non-controversial fibres in accordance with FSC Controlled Wood standard, and managed through the mills' CoC certified risk assessment systems.

We have a target to deliver over 95% of our packaging solutions as CoC certified to our customers by 2025 which was achieved in 2023.

Share of Packaging Products Sold as CoC Certified 2019-2023

2023	95.5
2022	94.3
2021	93.4
2020	93.8
2019	92.1

Our Certified Raw Materials (%)

Total fibres/source	76.5	23.5
Packaging sold as certified	95.5	4.5
Paper produced as certified	92.8	7.2
Certified fibres	89.9	10.1

- Recycled ● Virgin
- Certified ● FSC Controlled wood

CoC: Proven Trail for Sustainable Fibres

Transparency throughout the supply chain is vital to delivering our sustainability commitments. Robust monitoring and third-party auditing of our supply chain is ensuring sourced fibre complies with our sustainability principles.

Our manufacturing sites are CoC certified, and over 99.5% of our paper and pulp are sourced through CoC certified supply chains. Our commitment is to deliver over 95% of our sold packaging products as CoC certified.

Our definition of sustainable forest management is focused on optimising the forest's benefits: supplying wood fibre for our business, providing jobs and income for communities and maintaining healthy forest

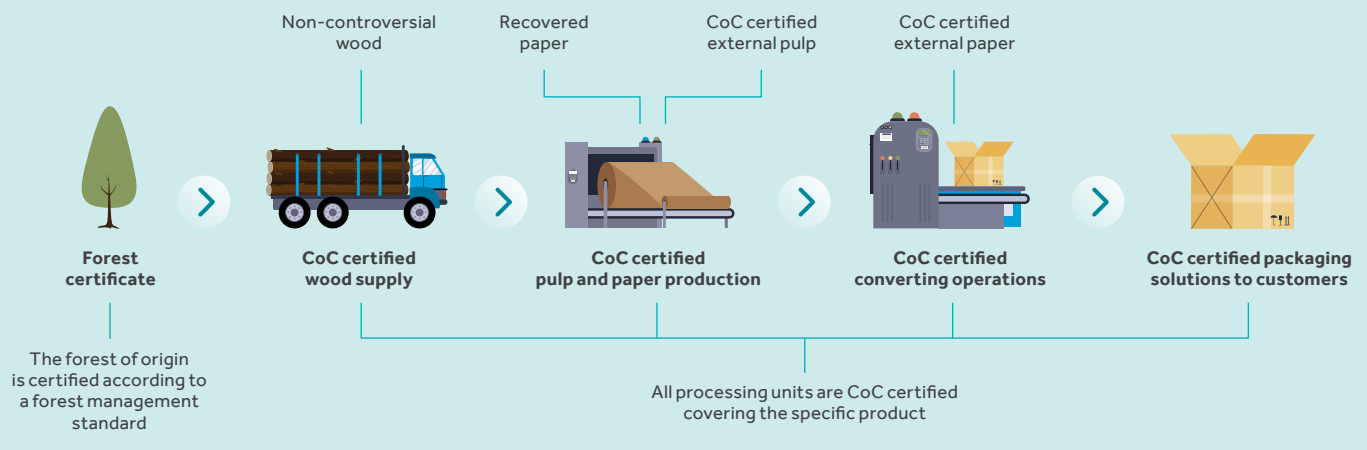
ecosystems that support biodiversity, protect water bodies and supply non-wood forest products. Production of sustainable paper-based packaging starts in the forest. The forest owners commit to manage their forests and plantations according to sustainable forest-management criteria. They obtain a certification after an independent, third-party audit and follow a regular audit scheme where their forest management practices are evaluated.

The forest certification related CoC management systems start from the harvest of the trees. Each operation and entity processing the material has its own CoC system, which covers storage and use of the material, production and shipping of products, documentation of material and product flows

and communication to customers through invoices and delivery notes. In the Smurfit Kappa system, the paper production and converting operations have their own CoC certificates.

Each product carrying a forest certification scheme on-product label carries a licence number that can be further traced back to the supplier, producer and the country of origin of the raw material.

A small amount of fibres used in CoC certified products may come from non-certified forests. Evidence of these 'non-controversial' sources is required to comply with the minimum standard of sustainable forest management. Smurfit Kappa requires this portion to comply with the FSC Controlled Wood standard.



Planet continued



Case study

Global Pilot testing EU Deforestation Information System

The EU is committed to stopping deforestation and it has introduced new legislation, the EU Deforestation Regulation ('EUDR') to deliver on its ambitions, building on the efforts that the EU Timber Regulation ('EUTR') started.

Safeguarding healthy, growing forests is a strategic interest for Smurfit Kappa and the pulp and paper industry. SKG is participating in many working groups to ensure that both the enforcement of the regulation as well as the practical implementation of it are properly understood by our industry.

The EUDR makes it mandatory for all companies involved in the value chains of products and produce to ensure that their supplies are deforestation-free. This means registering the geolocation of the sourcing site of the commodity, having a Due Diligence System ('DDS') in place and processing DDS statements for their partners in the value chain.

There are three key differences from the EUTR: a sourcing geolocation is required for every batch of raw material; everybody in the supply chain is obliged to have a DDS in place; and a wider selection of commodities linked to deforestation are included, covering cattle, cocoa, coffee, palm oil, rubber, soy and wood.

Smurfit Kappa has been actively involved in the industry preparation for this new regulation, sharing the experience of its extensive chain of

custody experience through:

1. Being part of CEPI EUDR taskforce;
2. Being part of the project of FAO and Preferred by Nature to create a Geospatial Data Sharing Protocol to boost supply chain transparency and reduce impact;
3. Participating in the testing of the EU information system. Smurfit Kappa participated in a pilot test together with 100 other companies. Together with other selected CEPI EU DR taskforce members, the Group gave feedback to the EU commission; and
4. Participating in a pilot test of a global forestry certification scheme's block chain solution to transfer relevant information along the supply chain.

The EUDR requirements become mandatory on 30 December 2024. Smurfit Kappa sees it as important to proactively contribute to these developments to achieve a well-functioning implementation of the EUDR for the Company but also for the wider stakeholder base.

Smurfit Kappa has implemented a Due Diligence System ('DDS') that further ensures that all of the related Group sustainability and sustainable fibre sourcing policies are implemented at local and central purchasing level. The wood fibre risk assessment procedure, together with the Wood Fibre Risk Assessment platform, facilitates greater teamwork and standardises local purchasing processes. The implementation of the DDS has been third-party verified by 'Preferred by Nature' and the verification process consists of both overall group and on-site gap assessments. The audit reports are being used to further strengthen our related policies/procedures and the implementation of our sustainable fibre sourcing policy requirements.

Although we source most of our wood from Europe, in 2023, we sourced wood fibres from 38 different countries of origin, of which, the following are classified as potential high-risk countries: Argentina, Brazil, Chile, China, Indonesia, Mozambique, Paraguay, Romania, Swaziland, Ukraine. In Colombia, we only source from our own FSC certified plantations. Fibres sourced from the other ten countries require additional due diligence before purchasing to ensure our sourcing policy requirements are followed.

Forest and Plantation Management

All of Smurfit Kappa's own forest plantations are based in Colombia, France and Spain, of which Colombia represents over 99%. All our plantations are certified, either to FSC or PEFC standards.

France and Spain

In Europe, we offer forest management services through our wood supply companies in Spain and France, where we own and manage approximately 500 hectares of forest. In both, we follow local best practice for forest management, as certified by PEFC. Our wood-handling operations are CoC certified to FSC and PEFC standards.

Colombia

Almost all the virgin wood fibre our Colombian plants need is supplied by 67,500 ha of certified forests and plantations, which we own and manage. We use nature conservation programmes with the best sustainable development principles, promoting responsible use of natural resources along with economic development and social inclusiveness in collaboration with NGOs and other third-party organisations.

We also conform to comprehensive legal, technical and environmental regulations, subject to annual review.

Our 67,500 ha of forests and plantations in Colombia include:

- 41,700 ha of commercial plantations, of which a small part is partnerships with private landowners;
- 22,700 ha of protected natural forest; and
- 3,100 ha for infrastructure.

In our commercial plantations, 56.8% of the land is pine, 37.9% eucalyptus, 3.6% is being replanted and 1.7% is dedicated to research. Our Colombian forest management programmes have been certified by the FSC since 2003.

Biodiversity and Ecosystem Conservation

A third of our Colombian forest land is dedicated to protecting forest sustainability, helping maintain the area's rich biodiversity and preserving watersheds, habitats and ecosystems.

The other two thirds are commercial plantations. To maintain forest biodiversity and sustainability, our principles for this land are to:

- Conserve them, by protecting and promoting species, diversity, sustaining ecosystems, and protecting water sources and habitats;
- Identify appropriate species and practices that increase plantation yields whilst protecting the environment; and
- Develop research programmes to preserve and enhance soil productivity.

Fibres for paper are efficiently produced on our commercial plantations. We use carefully selected areas for plantations, avoiding valuable ecosystems and protected forest areas. Protecting and promoting natural habitats is important to our approach, so in Colombia we use our own research centre as well as

third-party institutions. Since 2009, we have worked with four local universities – Cauca, Nacional, Valle and Quindío – studying the flora and fauna populations in and around our forests.

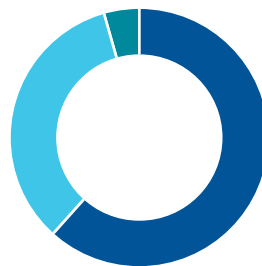
The objective of the Smurfit Kappa Natural Forest Studies is to understand the biodiversity in different ecosystems within our natural forests and its evolution in time. In phase one of the studies we have established a group of 13 units totalling 7,990 ha and representing three hillsides of the Andean mountains, four water basins and four Holdridge Life Zones. The classification of the units also considers the degree of intervention by humans.

At the end of 2023, we have finalised the inventory of 12 of the 13 forest units and will complete the inventory of the last forest unit in 2024. Each inventory is carried out onsite identifying species (flora and fauna) which will then be classified to threatened and non-threatened species following the IUCN, CITES and Colombia Ministry of Environment and Sustainable Development ('MADS') classifications. If any of the three classifications indicates that the species are threatened, they will be listed as that.

We have commenced with the planning of the phase 2 of the Natural Forest Studies and aim to begin the second phase in 2025. Phase 2 maintains the established methodology and we will repeat the inventories on each of 13 forest units. In time, we will have multiple inventories per forest unit which will enable analysis and comparison of changes in these units.

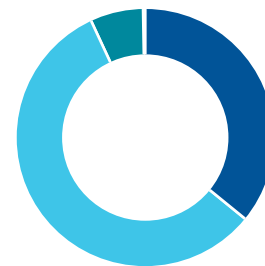
The Natural Forest Studies has already established that the Andean Bear that was believed to have completely disappeared from the region has found a living habitat in our natural forests.

Land use in Colombia (ha)



Commercial plantations	42k
Protected natural forest	23k
Infrastructure	3k

Biodiversity in our Colombian Forests



Flora (trees)	808
Birds	508
Mammals	97
Amphibians	1

Planet continued

In addition to the Natural Forest Studies, our Colombian Forest Operations have a Forest Health Programme that focuses on scientific research and application of integrated pest management with emphasis on biological control in our commercial forest plantations. The company has committed to integrated pest management and to keep plantations and forests healthy. The Programme uses natural enemies of the pests such as friendly insects that eat harmful insects in our forests to protect them. In addition we study the tree regeneration for the commercial forest plantations. A specific study focuses on the Podocarpus family of pines, the only national pines species in Colombia. On Eucalyptus, research studies have supported the nursery in developing trees for commercial plantations that thrive in more challenging climatic conditions.

In addition to our ongoing research we collaborate with our communities to establish synergies and support the health of Colombian forests. One of the examples of this collaboration is with the local coffee farmers where coproduction of coffee in our forest plantations establish natural support for commercial habitats and pest control.

Working with Local Indigenous Communities in Colombia

Smurfit Kappa is a proud member of every community in which it operates, abiding by local laws and striving for best practice in everything we do.

The Company began operating in Colombia in 1944 where it now has a number of operations including containerboard mills, corrugated and sack plants and recovered fibre operations. The Company began lawfully acquiring farms over 50 years ago from legitimate property titleholders and now owns and manages 67,500 hectares of forestry including natural forests in Colombia. Smurfit Kappa in Colombia currently employs approximately 6,800 people and also supports a number of indirect jobs.

The Colombian operations actively support, on a continuous basis, the development of sustainable local communities through education, income generation, job creation, environmental management and by being a good corporate citizen.

Our forest management activities in Colombia are independently audited each year and must demonstrate compliance with the 10 FSC principles which set out the essential elements of environmentally appropriate, socially beneficial and economically viable forest management. FSC principle 3 relates to the respect of indigenous peoples' rights among them the free, prior and informed consent. The last FSC forest management certification audit was conducted by an independent third party auditor in July 2023 with no major observations arising from any of the 10 principles. These forests have now been certified for 20 years, starting in 2003.

Engaging in the Communities

The Company has been involved in many voluntary community-oriented programmes which benefit the many communities that we co-exist with in Colombia. In the 2022 Sustainable Development Report we provided many examples of the collaboration, training, education, support and work we completed with the local indigenous communities, much of which remains ongoing. These included initiatives with: the Yanaconas indigenous community in the Cauca municipality; the local Nasa ethnic Cerro Tijeres Reservation in the Suarez municipality; the Kurak Chak in the Cauca region; and the Nuestra Señora Candelaria de la Montaña indigenous reserve, which is part of the Emberá Chami ethnic community, located in the Riosucio municipality (see page 54 of the 2022 Sustainable Development Report).

In addition, in Colombia and throughout the other countries in which we operate, we are involved in many initiatives in our communities, giving to others through volunteering our time, effort and expertise, as well as through financial and other donations. Some examples of these are outlined in our Open Communities brochure which is available on our website www.smurfitkappa.com. FSC forest management certification requires active collaboration with communities of which we speak in the case story on the next page.

Forest Growth and Carbon Sequestration

Colombia

Every year the trees in our plantations sequester carbon from the atmosphere and store it in the growing stock.

Our plantations in Colombia have been established on land that has been in low-productivity use. Since the start of our forestry operations in Colombia, we have established sustainably managed tree stock which has increased the CO₂ sequestration capacity and carbon stock to a total current storage of over 9 million tonnes of CO₂ equivalent ('eq'). In 2023, the biomass on our plantations sequestered in total a little over one million tonnes of CO₂ eq from the atmosphere, a figure similar to the CO₂ eq in the wood we harvested. In total we have stored approximately 9 million tonnes of CO₂ eq from the atmosphere in our growing trees inventory which remains at this level year on year.

To calculate this, we use a methodology, developed in collaboration with the Ministry of Agriculture and Rural Development ('MADR'), National Centre of Coffee Research ('CENICAFE'), and several forestry companies to quantify the growth and carbon sequestration capabilities of commercial pines and eucalyptus species grown under tropical conditions.

Europe

The forested land area in Europe has been in steady growth since 1950's. The land area has grown during this time by approximately 30% and between 2005-2015 by 44,000km² (FAO), an equivalent of over 1,500 football fields. Smurfit Kappa owns approximately 500 hectares of forest in Europe, and we source a large proportion of our timber used at our virgin paper mills from forest owners whose forest holdings are located in boreal or hemiboreal forests.

Sustainable forest management benefits carbon sequestration and carbon storage in boreal forests. According to a recent study*, the carbon storage in intensively managed boreal forests grows faster than in those that are less managed. The study shows that the carbon sinks in the sustainably managed forests in Nordic Countries grew by 35% during 1990-2017, whereas in other, less managed boreal forests, it remained about the same. This means that supporting sustainable forest management is a means to mitigate climate change.

9 million

tonnes of CO₂ eq from the atmosphere in our growing tree inventory

* Höberg P. et al. Sustainable boreal forest management – challenges and opportunities for climate change mitigation.

In total, Smurfit Kappa has invested approximately US\$10 million locally in Colombia in the last three years on sustainable agricultural and forestry production, maintenance of public roads, infrastructure development, economic reactivation, and other social initiatives which benefit local communities. In the last five years, we have also invested over US\$55 million in the upkeep of our forests across all our forestry.

Peaceful Co-existence

There are many communities, including indigenous communities, that live and work in the areas in which we operate in Colombia as noted above. Smurfit Kappa is very proud of the peaceful co-existence and ongoing collaboration that we have had with these communities throughout our time in the region.

As a result, the events which started in July 2021 with unlawful invasions of our land and significant damage to our forestry, including natural protected forests, were entirely unexpected. We continue to report any such unlawful acts to the local authorities. The lives, health, safety and integrity of all our employees and neighbouring communities are fundamental values of Smurfit Kappa, and therefore we continue to seek an end to such unlawful invasions, and a return to peaceful co-existence with all local communities.

The Company had openly sought engagement with the Misak community since the first invasions in July 2021. We were pleased to be able to report last year that in late 2022 members of the Misak community had agreed to take part in an independently mediated dialogue process. Following a number of meetings in 2022, this dialogue continued throughout 2023. The process remains ongoing in 2024 with a meeting conducted in recent weeks and a further meeting scheduled. In addition, there were also various other meetings and conversations with relevant stakeholders from community groups, the Company and government officials which were also attended by members of the Misak community. We believe that these meetings and the ongoing engagement have been positive and constructive, and we hope that collaborative initiatives can be established which are agreeable to all stakeholders.

We continue to strive for peaceful co-existence to be restored in the region within the framework of the law and respect for the constitution and the UN declaration of the Rights of Indigenous People. We maintain our commitment to contribute positively to the communities we operate in, and supporting the development of all these communities, including the indigenous communities, through our forestry activity and social initiatives.



Case study

Colombia Celebrating 20 years of certified sustainable forest management in Colombia

Forests are one of world's most important ecosystems and at the same time a source of food, shelter, medicine and employment.

We want to take care of biodiversity in forests and manage our valuable resource with respect. Therefore, 20 years ago Smurfit Kappa Colombia Forest Operations decided to look for voluntary sustainable forest management certification through the FSC standard for its forest plantations.

The FSC forest management standard stands for environmentally, socially and economically sustainable forest management. This means that the Forest Operations team has an annually updated long-term plan for its forest management. The plan considers aspects such as biodiversity, ecosystem and species conservation, environmentally and socially sound work practices, and includes the active participation of our local stakeholders in the decision making. Each year an independent third-party auditor evaluates the forest management practices against the FSC standard and where needed, the Forest Operations team are provided with actions to be implemented to maintain the certification.

Everybody at the Forest Operations undergoes training to understand the FSC standard requirements and how to implement them in day-to-day work. The training also includes an understanding of what a FSC certification means for their organisation. Smurfit Kappa employees are proud of the extra steps we take to comply with the certification. "Certified forests mean that we apply specific procedures to protect the natural tropical forest and manage the forest plantations as well as maintain the safety of our workers in the forest. While this is important to our customers, it is also important to us, as certified plantations are an important source of employment for our surrounding communities," explains Jose Nehil Zuluaga Trujillo, Harvest Technician.

"Engaging with our stakeholders in our processes is equally important," adds Claudia Marcela Zapata, Head of Forest Research. "It starts with having our forest management plans made publicly available, so anyone has access to them and can come back to us with questions and comments. Another important aspect is to respect the rights of indigenous people. At Smurfit Kappa Colombia we engage with local indigenous groups through dialogue and collaborative projects."

Adriana Marin works as Planning Process Engineer for the Colombian Forest Operations and is in charge of the implementation of the FSC certified forest management. For her taking the extra step to implement a voluntary sustainability standard is personal. "Every morning when I see my little son leaving for school, I think how important it is to work for something that preserves nature for the next generations."

Protecting nature for future generations is the reason why at Smurfit Kappa Colombia Forestry Operations, we are pleased to celebrate 20 years of FSC forest certification.

Planet continued

Water

Water is critical in the paper-making process. Without water, we cannot produce the paper we need for our packaging solutions. We are mainly a processor of water and not a significant net consumer of water. Our primary focus is on the quality of the water we emit back into the water system.



Highlights in 2023

35.7%

reduction in Chemical Oxygen Demand intensity since 2005

1.8%

annual water intensity reduction in 2023

€5 million

start up of Belgrade water treatment plant



Delivering for our SDGs

6 CLEAN WATER AND SANITATION

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Smurfit Kappa is mainly a processor of water, as illustrated in the diagram on page 57. Our global operations used 132 million m³ of water in 2023. Almost all of that – 129 million m³ – was used by our 35 paper and board mills and the remainder is used predominantly by the 242 packaging operations.

Of the 129 million m³ used by the paper and board mills, 121 million m³ was discharged in good condition and almost 8 million m³ evaporated into the air and will return as rainfall or is bound in the product. 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, 81 million m³ was used for processing and 40 million m³ for cooling.

Water treatment forms an important part of our approach to the bioeconomy. We use bacteria to clean the water, and the resultant biogas fuels our on-site CHP 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 through promoting certified sustainable forest management. 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 section on pages 53-54).

Committed to Sustainable Water Stewardship

We assess water related risks at our paper mills and in 2023 we increased the scope of the assessment to cover our other operations, something which we expect to progress in 2024. In 2022 and 2023, the water risk assessments were developed to align with the recommendations of the TCFD. The water risk assessments focus on four main types of risks:

- physical risk, including local water scarcity and mill equipment;
- operational risk;
- regulatory risk; and
- reputational risk.



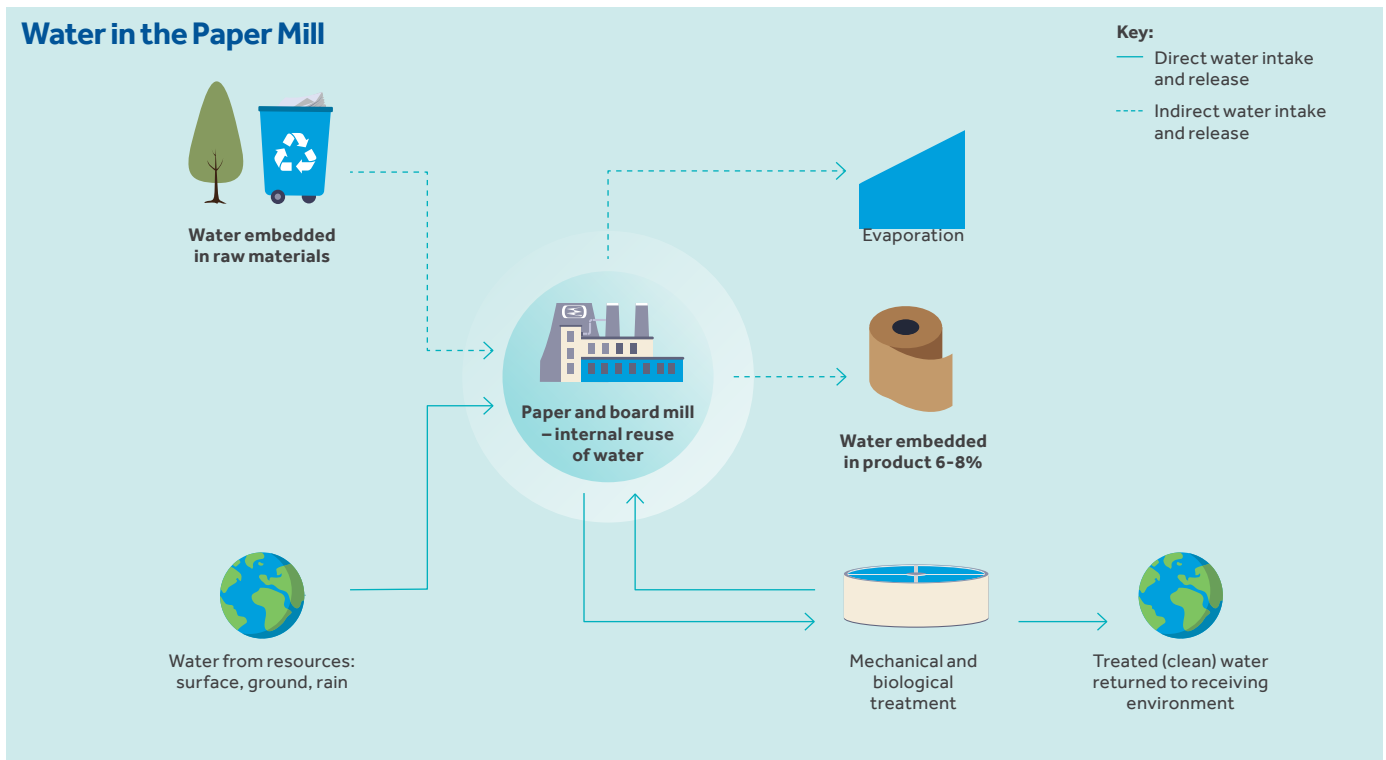
This is a day that represents a turning point for the sustainable development of our country. By 2025, all companies have a deadline for introducing waste water treatment plants.

Prime Minister of Serbia, Ana Brnabic speaking at the opening ceremony of our water treatment plant investment

In 2023, we repeated a global risk assessment that is based on the geo-locations of our sites. We used the Aqueduct and the Weather Research and Forecasting Model (“WRF”) tools to map water scarcity risks. This location based risk mapping will be followed by individual risk assessments at our sites.

We divide the water related risks in two categories to understand the overall risks at each site. The first category is a combination of basin based risk and operational risk. The second category is how the site mitigates these risks. The majority of the risk mitigation is operational.

To align with TCFD disclosure recommendations, basin risk is also assessed for future climate scenarios. The scenarios dataset is based on a combination of the most relevant climate scenarios (Representative Concentration Pathways – RCP) and socio-economic scenarios (Shared Socioeconomic Pathways – SSP). To achieve this, the risk scores for the year are added with projected changes based on climate impact ensemble projections that account for climate (e.g., temperature, precipitation, wind) and socio-economic variables (e.g., population, GDP, technological developments), and represent the consequences and effects of climate and socio-economic changes on water resources.



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.

In 2023, we assessed five paper mills, located in the Netherlands, Italy, Spain, and UK. All assessments to date confirmed that our mills' water use has no impact on water availability to neighbouring areas. Only 9.4% of our paper and board production, and just 3% of our water intake, takes place in areas of water scarcity.

Nevertheless, we always use water sustainably. In addition, with new estimates from climate scenarios, we see an increase in global water scarcity risks. As a result, the updated geo-location based WRA results indicate a general trend for the overall risk score to increase in both medium and long term.

Our products need to meet hygiene standards, and our paper-making technologies require good quality water. Together with our neighbours and stakeholders, we have a common interest in good water stewardship and we will use these findings to build individual site water stewardship strategies. To manage possible changes in our mill environments, the assessments will be repeated every five years.

Our paper mills engage with their stakeholders in multiple ways. Six of our paper mills – Forney (USA), Los Reyes and Monterrey (Mexico), Nervión (Spain), Nettingsdorf (Austria) and SSK (UK) – discharge their water to the municipality water treatment system and our Morava mill (Czech Republic) shares its water treatment plant with the local municipality. With its new water treatment plant our Belgrade paper mill shows an industrial example in Serbia as the country moves to European standard in its water legislation. This collaboration benefits all participants as the water discharge from paper mills helps to balance the nutrition needs for municipality water treatment and thus reduce the need for additional water treatment nutrients needed by the municipality. Depending on location, we participate in water-body management and cross-industry collaboration, for example, our Roermond paper mill (Netherlands) receives the phosphorus it needs for water treatment from a neighbouring baby food plant where it is a by-product of their processes.

Since 2018, we are a signatory to the CEO Water Mandate.

Focus on Better Water Use and Water Quality

For the vast majority of our operations, availability of 'fresh' water is not a concern for the foreseeable future. Nevertheless, we believe that a responsible approach to water is crucial.

Smurfit Kappa strives to continuously improve its water management, with a current focus on improved water use and water quality. Improved water efficiency in our paper mills means improved production efficiency. Therefore, we monitor closely the opportunities arising from best practices to improve our efficiency. We therefore continually implement best practice in our mills' water treatment. Since September 2023, all of our paper and board was produced at mills with best practice water treatment systems. This includes decreasing the organic content (COD) of process water through anaerobic and aerobic treatments before returning it to public water bodies.

Since 2005, we have invested €157 million in best-practice water treatment systems. Future investment plans include building best practice water treatment for the remaining operations.

For us, the water quality, and especially water discharge quality, is important. The best measurement is the COD for which we have a 60% reduction target by 2025 against the 2005 baseline. Since 2020, we have had a target to reduce the water intake by our paper and board mills by 1% annually per produced tonne of paper.

Our COD target is a good measurement also in terms, of understanding how our water-efficiency strategy works, as the COD impacts both paper production as well as effluent.

Planet continued

Progress in 2023

Water Quality

In 2023, we saw a slight increase in our COD emissions year on year, which was due to some operating issues at our water treatment plants.

Between 2005 and 2023, the COD content of processed water returned to the environment has decreased by 35.7% relative to production, compared with 36.9% in 2022. We saw a slight backtracking against our target in 2023, mainly due to the following:

- Commercial and maintenance stops at many of our paper mills had a negative impact to the COD discharge as the discharges typically momentarily increase at the restart.

However, the startup of the new water treatment plant at our Belgrade mill in Serbia had a positive impact to the COD discharge target.

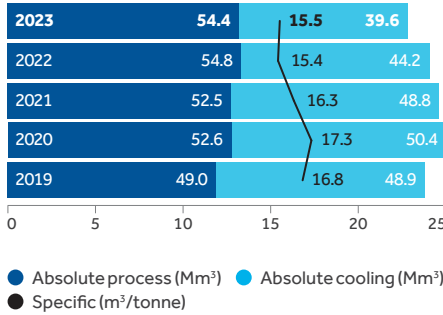
Water Use

In 2023, the water intake of all our operations was 132 million m³. The average water intake by our paper and board mills decreased to 16.9 m³ per tonne of paper produced, from 17.2 m³ in 2022.

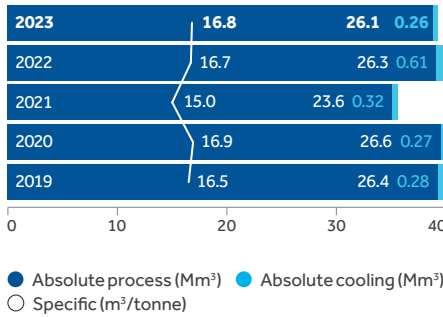
In 2023, we achieved a 1.8% reduction in comparison with 2022. Whilst the specific water intake trend has been decreasing, the key contributors to the target in 2023 were our Nettingsdorf mill in Austria, our Cali mill in Colombia, our Parenco mill in The Netherlands, our Sangüesa mill in Spain and our Piteå mill in Sweden.

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 m³ water is used per tonne of paper. We discharge 3-7 m³ of water – about the same amount as the intake per tonne of paper. Depending on the specific local location, 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 of it to our process, after treating it in our water treatment plants. Our Smurfit Kappa Zülpich (Germany) and Bento (Brazil) mills operate closed water loop systems.

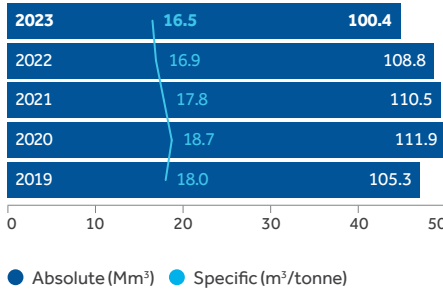
Water Released: European Mills



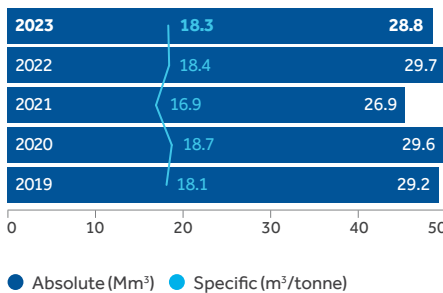
Water Released: The Americas Mills



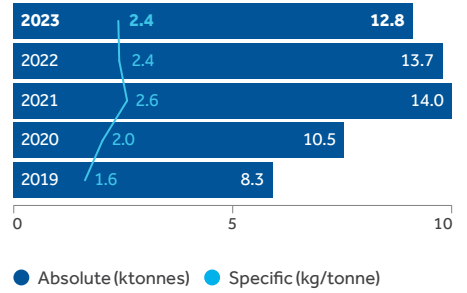
Water Intake: European Mills



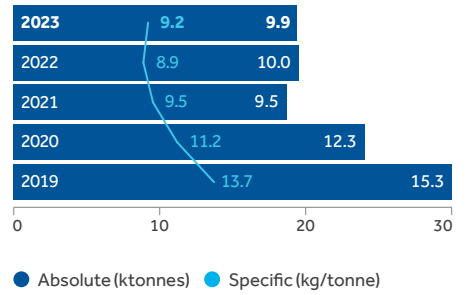
Water Intake: The Americas Mills



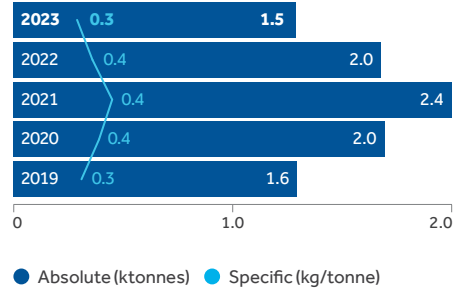
Process Water Discharges* Chemical Oxygen Demand (COD): European Mills



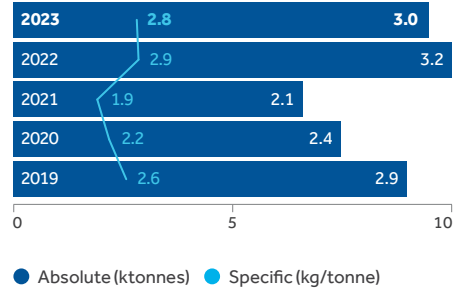
Process Water Discharges* COD: The Americas Mills



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

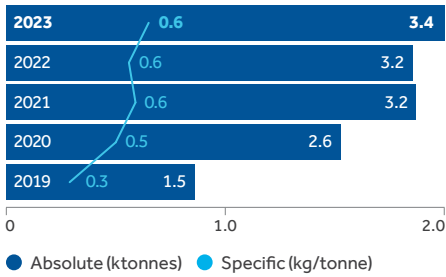


Process Water Discharges* TSS: The Americas Mills

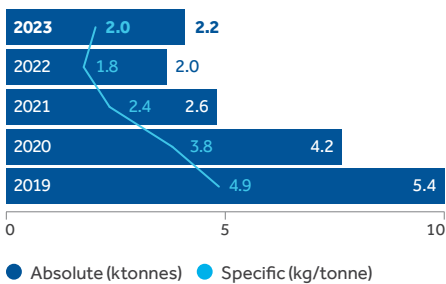


* Figures of mills releasing to the environment (mills that release water to the external water treatments plants are not reported).

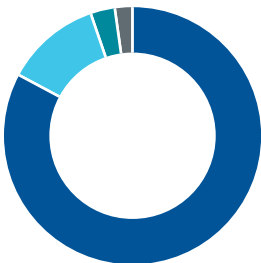
Process Water Discharges* Biochemical Oxygen Demand ('BOD'): European Mills



Process Water Discharges* BOD: The Americas Mills

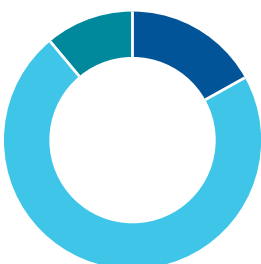


Water Sources – All Operations (%)



Surface	82.8%
Ground	12.1%
Grid	2.9%
Other	2.1%

Water Discharge – All Operations (%)



To sea	17.4%
To river	71.8%
To third party	10.8%

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



Case study

**Serbia
Pioneering industrial water treatment plant in Serbia**

Smurfit Kappa acquired its Belgrade paper mill in 2019. The mill not only supplies paper to our packaging operations but is also an important paper recycling facility in the region.

An important aspect of becoming part of the Smurfit Kappa family, was to meet the Group's sustainability standards. One important commitment to sustainable water stewardship for Smurfit Kappa is that all its paper mills have a best practice water treatment in place. For Smurfit Kappa Belgrade this meant a €5 million investment in a state-of-the-art water treatment plant.

Serbia has only recently introduced a legislation for water pollution which mandates all industrial water users to invest in water treatment by 2025. Smurfit Kappa Belgrade opened its water treatment plant in September, giving an example for the Serbian industry. Speaking at the opening ceremony, Prime Minister of Serbia, Ana Brnabić, said: "Today is an important day for environmental protection in Belgrade and throughout Serbia. This is a day that represents a turning point for the sustainable development of our country. Smurfit Kappa did this two years ahead of schedule by building the first industrial biological plant. This is an example of how all business people in Serbia should join the policy of sustainable development".

The water treatment plant enables the mill to purify water to the highest standards before it can be returned to the environment. "The project was however not only about building the state-of-the-art water treatment plant," explains Marko Andjelković, Production Process Engineer. "We started by optimising the water usage at the mill and will continue to do so now that the water treatment plant is running." Purified water can also be partially reused in the process, further reducing water consumption by up to 90%.

The water treatment plant has three stages: first the water runs in a settler from where it will be directed to an anaerobic treatment after which an aerobic treatment finalises the cleaning of the water. Only after all these stages, can the water be released back to the river.



We could see the improved water quality already in the third quarter of the year, the COD amounts in our effluent water had decreased by over 40% from the second quarter. The whole personnel at the mill is very proud to be part of such a project for a sustainable future.

Marko Andjelković
Production Process Engineer, Smurfit Kappa Belgrade

Planet continued

Waste

Efficiency of material usage is vital for the bioeconomy and circular economy. We continually find alternative ways to reuse, recycle and recover, to avoid the linear economy where products end their life cycle at landfill.



Highlights in 2023

35.8%

reduction in waste sent to landfill from our paper mills per tonne of paper since 2013

BP2050

waste target achieved early

€27 million

start up of Nervión Lime Kiln project



Delivering for our SDGs



We are fully committed to the end of life management of our product. We are a key actor in the circular economy and one of the largest recyclers of paper in Europe, as well as many of our regions in the Americas.

Our packaging solutions help prevent waste, especially in food products' supply chains, by protecting products from damage or spoilage. After use, at the end of its life, paper-based packaging becomes a valuable raw material. Paper-based packaging has the highest recycling rate of all packaging materials, supported by advanced recycling systems.

As the graphs on page 63 shows, 91.4% of old, corrugated packaging is being collected for recycling and the industry is currently able to recycle 82.5% of its weight as recycled fibres. At Smurfit Kappa globally, we collect the equivalent of 100% of our products back after their use, and in total 88% returns back to our own paper mills.

Smurfit Kappa also participates in its product end-of-life management. Our 43 recycling depots collect recovered paper and paper-based packaging, returning it back to our paper mills, where the fibres will be recycled. It is in our interest that the products are recycled back to the paper-making process. In addition, our packaging reduces its own impact by being 'right-weighted', using the minimum necessary material, and we are committed to offering sustainable packaging concepts to all our customers. Read more about the circular aspects of our products on page 97.

The end of life of our product is part of our material sourcing strategy and we collect used boxes to make new boxes from them. Our key raw material is recycled fibre and, globally, we use 77% of recycled fibres and only 23% virgin. Our other raw materials have been explained in the tables on pages 114-115.

We generate under 102 kg of non-hazardous waste per tonne of paper and board, 55% of which is recovered. A large part of the non-hazardous waste we generate is due to the fact that we are a significant player in the paper recycling business. The recovered paper bales sent to us by recycling companies often contain unwanted plastic, metals, glass, textiles, sand and other non-usable materials; 45% has to be sent to landfill. On average, it takes 1,072 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 44% to the weight of subsequent waste.

To minimise landfill, we reuse our own waste as far as possible. Currently, approximately 55% is recovered, and we aim to reduce the amount of waste sent to landfill by 30% per tonne of paper by 2025, which was achieved in 2023.

Our converting operations send paper clippings back to our mills, delivering high-quality recycled fibre. Recovered paper from our corrugating and converting operations comes with minimal auxiliary materials, decreasing waste from the recycled fibre pulping process, further evidencing our circular approach to production.

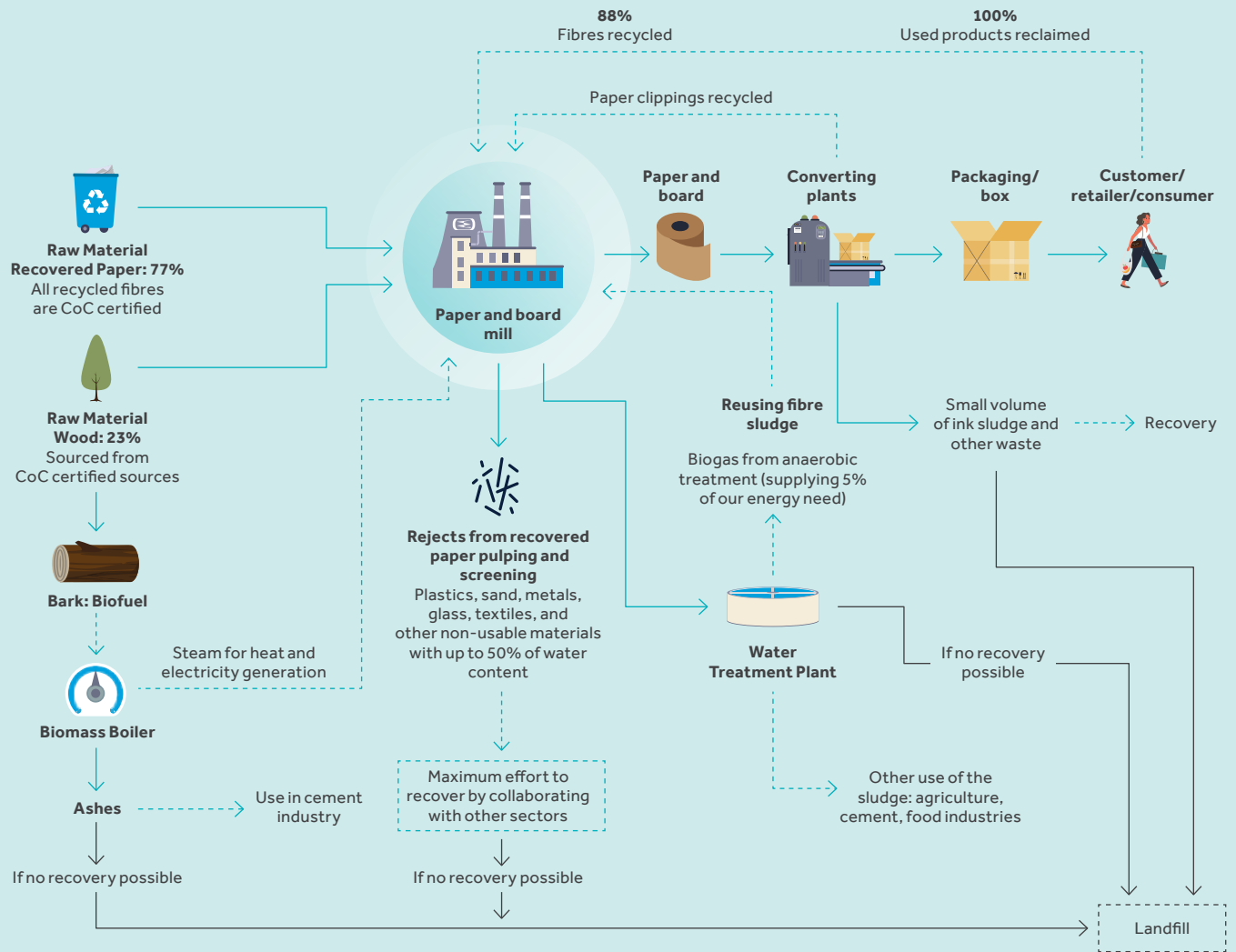
Our production waste streams and collaboration with other industries to use our side streams are described in the diagram on page 61.



We are delighted about the installation of this industry-leading system (in Nervión) which will help our mill to become more sustainable and environmentally friendly.

Javier Rivas
COO of Paper & Board Europe, Smurfit Kappa

Production Waste Streams



Key:
 — Indicates the process stream
 — Indicates waste to landfill
 - - - Indicates recovery of waste streams

Planet continued



Case study

Italy Reimagining waste at Verzuolo

Acquired by Smurfit Kappa in 2021, our Verzuolo mill is located close to the port of Savona in northwest Italy.

It is a world-class recycled containerboard mill providing security of supply for our customer base, with a focus on sustainability, cost efficiencies, and innovation.

The Verzuolo mill also embarked on its current reject handling journey in 2021, by initiating a start-up style industrial research project that focuses on a unique and innovative approach. Rejects are the non-fibrous materials that we receive with recovered paper. These often contain plastic, and we wanted to find an alternative way to handle the plastic rejects instead of sending them to landfill. This initiative marked the first trial of its kind in Italy, with the creation of pellets made from recovered waste plastic for upcycling and reuse.

Of the rejects currently generated, 937 tonnes are directed outside of the Verzuolo mill for energy recovery, and 485 tonnes of secondary raw materials are directed to the production of manufactured goods, such as pallets and waterproofing sheaths for the building industry. This is a deliberate move away from conventional landfill and contributes to the circular economy. The key element of this project lies in its treatment of low-density plastics, which are repurposed into black pellets, offering an environmentally friendly, closed loop alternative. At the same time, we gain a higher yield of fibres that are attached to the plastic rejects.



We are pleased to take a proactive approach and create a new stream for waste management and environmental stewardship. Since last year, this project has already achieved a 29% reduction in waste by recovering low-density plastic from the pulper. This means we are capturing non paper-based materials from within the collected recycled bales and repurposing these rejects.

Raffaele Marinucci
General Manager of SK Verzuolo



Work Against Litter

The creation of litter and the need to reduce packaging waste continue to be global megatrends.

Our industry’s products are the world’s most recycled packaging materials. While the paper industry in Europe generally achieves 70.5% recycling rates (lower than paper-based packaging’s 82.5% recycling rate in the graph on page 63), in the US and in Latin America recycling rates of 66% and 46.2% have clear upward potential. This, along with our raw material’s biodegradability, positions us to work with stakeholders 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 CO₂ that the wood captured while growing, or will degrade naturally with an even smaller environmental footprint than effectively all other packaging solutions.

Work Towards Optimised Use of Raw Materials

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 to support product design for recyclability and calls for the development of optimised collection systems and appropriate recycling infrastructures. The 4evergreen initiative brings together the whole paper-based packaging value chain, from suppliers to packaging customers such as fast moving consumer goods businesses, to find solutions to current and future challenges in collaboration.



Recovering used papers and recycling it into new papers is recycling in ‘optima forma’. We make sure the waste paper materials will not end up in waste but become a raw material, not for a lower level product but for the same product.

Stakeholder response



Circularity of Packaging in 27 EU Countries (%)

Paper and cardboard packaging



Metallic packaging



Glass packaging



Plastic packaging



● Used ● Recycling ● Recovery
Source: Eurostat
Year: 2021

Packaging Recycling Rate in 27 EU Countries (%)

Paper and board



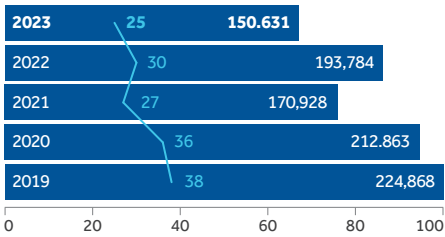
Plastic



● 2014 ● 2021
Source: Eurostat

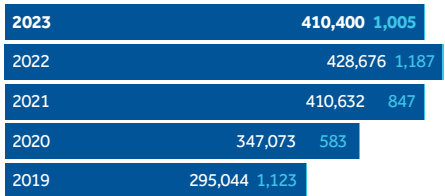
Planet continued

Non-hazardous Waste: European Mills



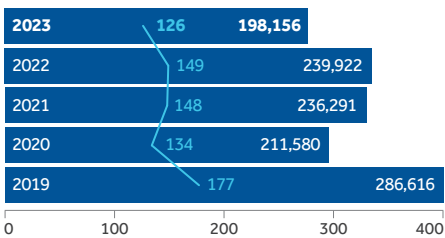
● Waste sent to landfill (tonnes)
● Specific (kg/tonne)

Non-hazardous Waste: European Mills



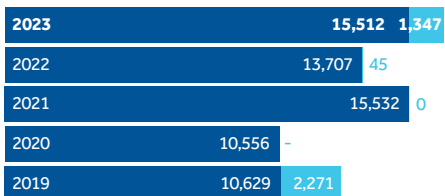
● Waste sent to recovery (tonnes)
● Waste sent to other (tonnes)

Non-hazardous Waste: The Americas Mills



● Waste sent to landfill (tonnes)
● Specific (kg/tonne)

Non-hazardous Waste: The Americas Mills



● Waste sent to recovery (tonnes)
● Waste sent to other (tonnes)

Progress in 2023

Our starting point is the non-hazardous waste from our paper and board mills that are sent to landfill. After a Group-wide assessment in 2015, we set a target to reduce this by 30% per tonne of paper by 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.

In 2023, we reached a reduction of 35.8% of waste sent to landfill (24% in 2022) from our paper mills per tonne of paper since 2013, achieving our target two years ahead of schedule.

The main contributors to the reduction of waste sent to landfill were:

- the installation of the lime kiln at our Nervión paper mill in Spain.
- the overall mill improvement project at our Cerro Gordo paper mill in Mexico leading to less sludge generated at the water treatment plant
- our Townsend Hook mill in the UK disposed a large amount of waste in 2022 after a fire and this impacted the result year-on-year 2022 and 2023

Around 1% of our waste is classified as hazardous, with it mostly coming from maintenance, 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 12,815 tonnes in 2022 to 12,604 tonnes in 2023. The annual amount varies due to maintenance, product additives and hazardous waste tanks taking over a year to fill.





Case study

Mexico Continued progress towards our waste target

Waste water treatment is an essential activity for our responsible water stewardship, however the process generates sludge from the biological water treatment which has historically ended up in landfill. Our SK Monterrey and SK Cerro Gordo paper mills in Mexico have developed initiatives to deliver better environmental outcomes for the sludge.

After investigating options at the Monterrey mill, composting was found to be a successful alternative, and the mill started to look for a suitable implementation method. The team from the Monterrey mill became familiar with a supplier for composting and checked that the operation had all the required permits. The development of the initiative lasted almost an entire year, after which, successful results paved the way for the implementation of the sludge being composted by the end of 2021. This not only facilitated the production of organic fertiliser, but also enabled the Monterrey mill to reach a 61% reduction of the waste sent to landfill.

Julio Rodriguez, General Manager of SK Monterrey comments: "This initiative has required a higher level of consciousness about the proper waste separation process, since it is imperative for the composting process that the sludge is received completely free of any other material."

In parallel, our Cerro Gordo mill is currently implementing various improvement projects, focused not only on the production process but also on the water treatment plant. Prior to these projects, the productivity of a paper machine had been increasing for several years, reaching levels considerably higher than the original design. As the water treatment plant capacity was determined by the original conditions of the paper machine, the large increase in productivity was causing fibre spills that ended up in the treatment plant, where it was removed from the water by the press filter, resulting in the generation of sludge.

A complete reengineering of the process was completed, including the effluent of the treatment plant. With this new engineering solution, the spills of fibre were eliminated and, in the case a spill happens, it is sent back to the paper machine, instead of being sent to the treatment plant, considerably reducing the amount of sludge. Along with other improvements, there is a 28% reduction in waste.



This initiative has required a higher level of consciousness about the proper waste separation process, since it is imperative for the composting process that the sludge is received completely free of any other material.

Julio Rodriguez
General Manager of SK Monterrey