

Planet continued

Climate change

The SDGs for climate change require us to lower customer carbon footprints and encourage production efficiency. Our customers and investors expect us to approach climate change strategically and inform them of our progress.

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

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

Progress In 2019

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

- **Investing in efficient energy generation**
 - Investing in highly efficient Combined Heat and Power (CHP) systems
 - Improving the efficiency of our existing boilers
- **Investing in efficient energy use**
 - Investing in technologies that reduce energy consumption
 - Re-engineering our processes and implementing smart energy efficient solutions
- **Investing in fossil CO₂ reductions**
 - Where possible, shifting to CO₂ neutral biofuels and other renewable solutions

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

Investing in Efficient Energy Generation // UK

“To start with, our old Combined Heat and Power plant (CHP) was outdated and, quite frankly, a bit past it,” says Kevin Bussey, Managing Director of our plant in Townsend Hook, South East UK.

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

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

A new CHP could similarly produce no more than was needed; 11MW, rather than the overcapacity of the old plant at 30MW. It could also produce both electricity and steam from natural gas, with 85% efficiency.

CO₂ emissions reduced

22%

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

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

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

Local Project, Global Expertise // Mexico

“We faced a big challenge, but also an opportunity”, says Alfredo Leal, Plant Manager at Smurfit Kappa Los Reyes Paper Mill in Mexico. “It was the combination of local resources and the Group’s global expertise that led to our success.”

Staff at SK Los Reyes Mill wanted to replace their 50-year-old boxboard machine with a rebuilt containerboard machine, to meet the paper needs of SK Mexico and improve integration with the corrugated division. The site already had a smaller containerboard machine, which would provide the workers with expertise for the new one.

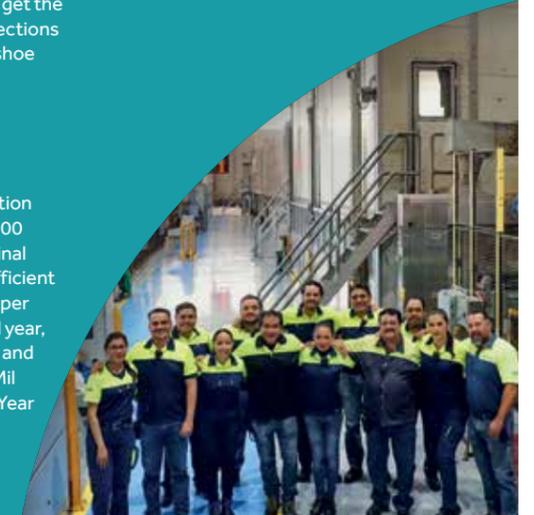
However, the team knew they could get better value from the new machine, and consulted with SK globally. The Paper Production Technology teams in Europe and the Americas, the Global Sourcing team, and colleagues from Colombia, Europe, and the US were invaluable.

All this led to the following design improvements:

- Stock preparation using the Smurfit Kappa blueprint, meaning less equipment used and energy saved
- Two fire tube boilers, saving fuel and steam during machine breaks
- Thermocompression systems, to get the most efficiency out of the dryer sections
- Tri-nip configuration, including a shoe press, improving dryness speed and efficiency
- Heating the closed hood via an energy-recovery system

These improvements led to a production design of 100,000 tonnes/year – 25,000 tonnes more than the machine’s original capacity. This, along with the more efficient boilers, led to a 13% reduction in CO₂ per tonne of paper in 2019. By the second year, with a better than expected ramp-up and good financial results, SK Los Reyes Mill was awarded Group Company of the Year in SK Mexico.

“The biggest success factor was opening ourselves to the Group’s global expertise, knowledge and support while working on a local project,” says Alfredo. “It shows the power of having a global network, and I want to thank everyone who has participated and supported us during this journey”



Energy Efficiency

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

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

- SK Townsend Hook, UK, continued to improve its energy efficiency due to the full year with the new, more efficient CHP as well as replacing fresh steam injections by heat recovery. This resulted in 6.1% CO₂ savings per produced tonne of paper
- SK Barbosa, Colombia, continued to reduce its CO₂ emissions by 4.2% per produced tonne of paper due to its continued improvements in energy efficiency in the paper machine
- SK Los Reyes, Mexico, the paper mill delivered a second full year with its new, 100,000 tonne capacity paper machine and supporting new boiler house, and continued to reduce its CO₂ emissions by 1.9% per produced tonne of paper
- Our Austrian and Colombian sites started to purchase all grid electricity with green certificates, resulting in reductions in Scope 2 CO₂ emissions
- The inclusion of the SK Parencio mill to the Group reporting after it’s first full year in the Group led to reductions in relative CO₂ emissions
- The divestiture of our Venezuelan operations also contributed to the overall CO₂ emission reductions

- We had a 7.1% increase of CO₂ emissions per produced tonne of paper in SK Saillat, France, due to the restart of the external CHP

Renewable Energy

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

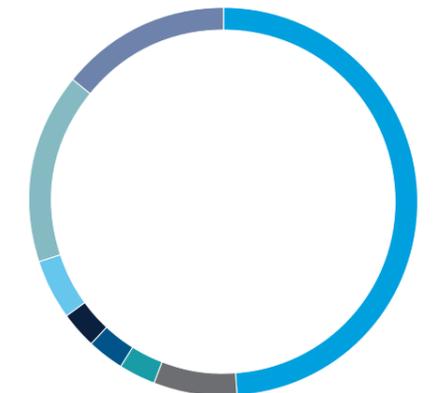
Working with our Customers

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

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

Our InnoTools suite of design software also shows customers the carbon footprint for each packaging unit and tracks its development over time.

Our packaging makes only 3% of the footprint in food product value chain



- Key:**
- Food supply (farm/sea) as prepared food leaving the factory – 49%
 - Primary packaging – 7%
 - Secondary & transport packaging – 3%
 - Factory to shop transport – 3%
 - Retail – 3%
 - Consumer shopping – 5%
 - Consumer cooling/freezing – 16%
 - Consumer cooking – 14%

Source: Incpen, 2008

Planet continued

Award-Winning Circular Energy // Sweden

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

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

As well as producing their own energy in a biomass boiler, the SK mill has two turbines which produce 55% of the mill’s electricity consumption. Even better, the mill has a unique and well-established partnership with the local energy corporation, where excess mill heat is used for district heating. This ensures that the local community uses the mill’s secondary heat, which would otherwise be wasted. The

local energy corporation has invested in the plant to make this process more efficient, installing a mill heat-switch and a system to extract waste heat from the recovery boiler chimney.

Piteå has severe winters, and heat from the SK plant supplies 95% of district heating, including 3,800 buildings, three indoor swimming pools and also de-ices the main pedestrian street. The partnership has also been looking into summer uses, and in 2021 will be running a pilot project using the energy to drive a kindergarten’s cooling system. If successful, this solution will be installed at other facilities such as schools and retirement homes, and the plant’s energy can be reused even more efficiently all year round.

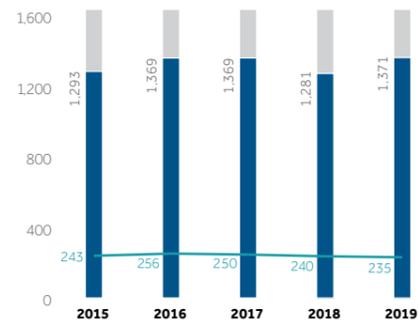
In 2018, SK Piteå made the 40-year partnership celebration an opportunity to inform people how it gives back to the community and environment. Historically, the plant’s location has sometimes been a bit unpopular – it’s a large industrial facility right in the middle of a tourist town. It also takes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

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

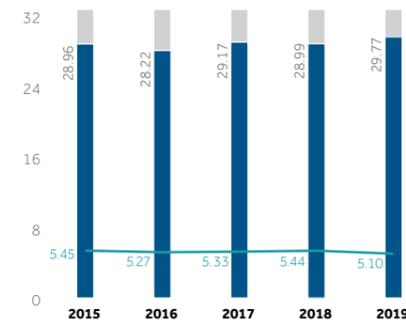
The 40-year district heating celebration was a huge success. “There’s a Swedish saying: ‘you can’t become a prophet in your home town,’” says Per Swärd. “But we proved that wrong when our partnership celebration led to us being given Piteå’s 2019 Business Sustainability Award.”



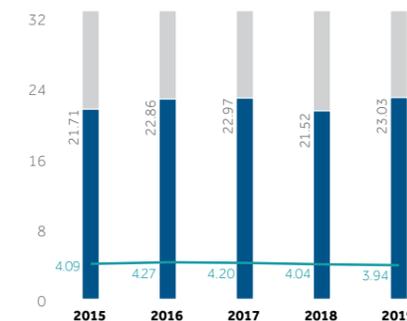
Direct Fossil (Scope 1) CO₂ Emission: European Mills



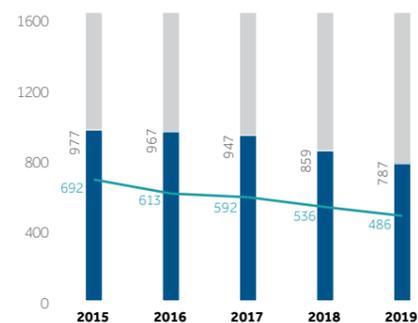
Biofuels: European Mills



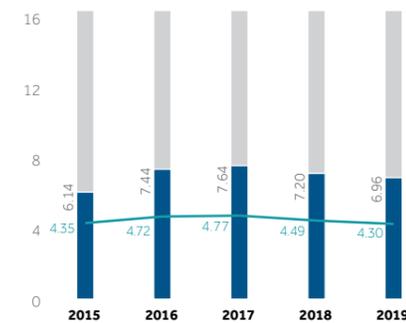
Fossil Fuels: European Mills



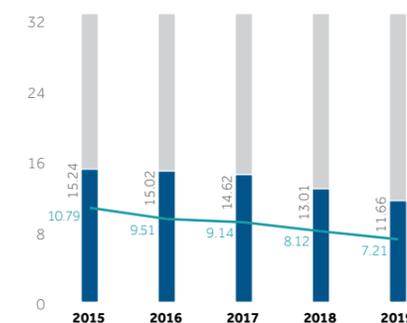
Direct Fossil (Scope 1) CO₂ Emission: The Americas Mills



Biofuels: The Americas Mills



Fossil Fuels: The Americas Mills



Key: Absolute – (kt) Absolute – (PJ) Specific – (kg/tonne) Specific – (GJ/tonne)

Emissions from Transport

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

This project covers all our European transport emissions – 77% of our business. The transport streams and scope of our reporting are described in the diagram below. In 2019, we started a similar pilot project in Colombia.

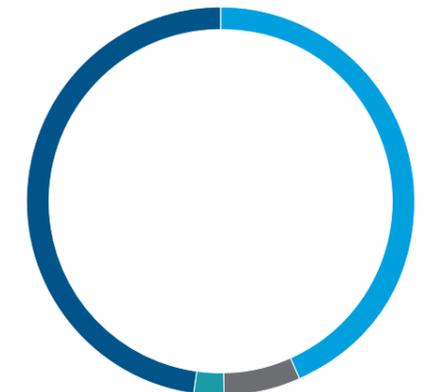
In the reported CO₂ emissions, we include the transport of wood, recovered paper and market pulp, as well as from transporting intermediate products such as reels of paper, corrugated and solid board sheets from paper mills to converting plants. In 2019, these were the equivalent of 353,000 tonnes of CO₂. We also report CO₂

emissions from delivering to customers – all road transport, representing CO₂ emissions of 105,000 tonnes. In 2019, the total of these transport-related emissions represented 458,000 tonnes of CO₂ equivalent.

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

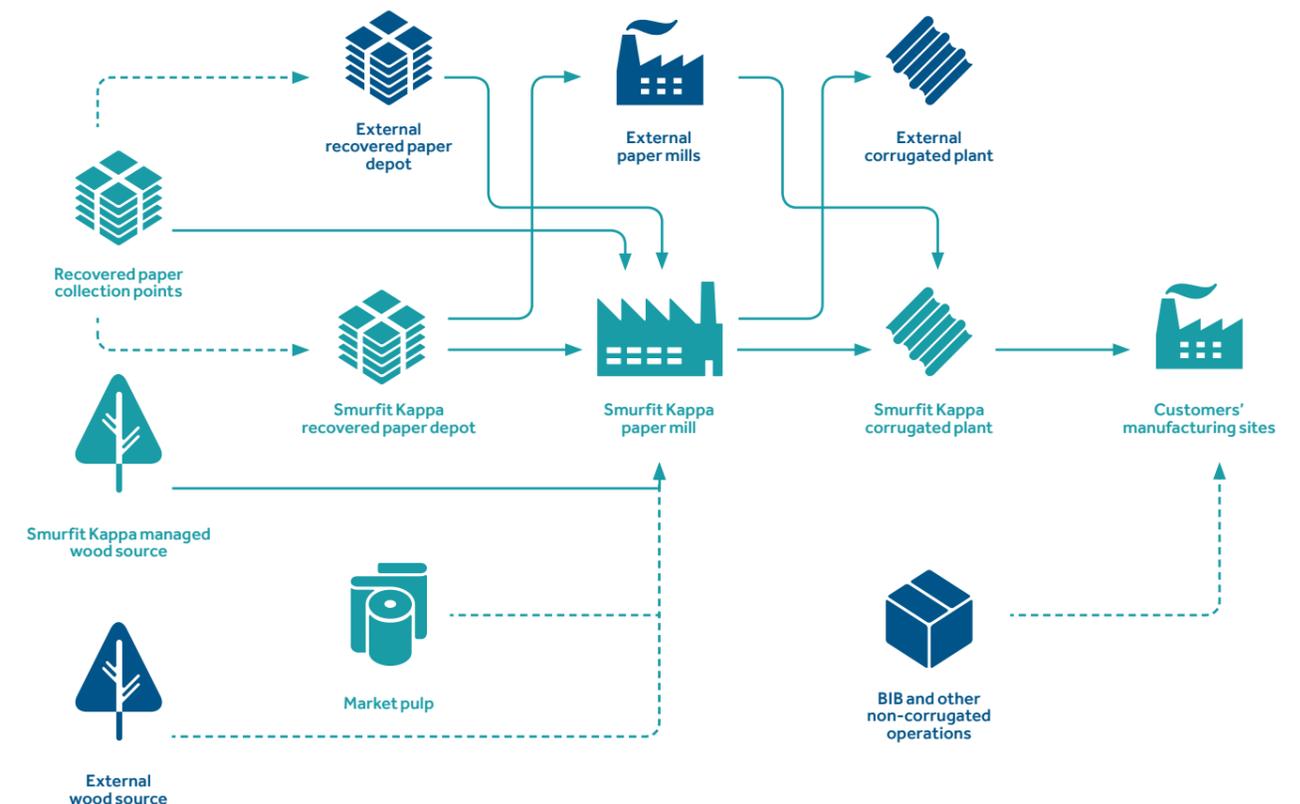
Our operating companies report transport data annually, and we aggregate this in a database where emission calculation is applied based on default CO₂ emission factors from the GLEC reference model (Global Logistics Emissions Council by Smart Freight Centre).

Direct Fuel Consumption, All Operations



Key:
 Natural gas – 43.6%
 Coal – 6.3%
 Other fossil fuels – 2.4%
 Bio fuels – 47.7%

Transport Streams



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

Source: Incpen, 2008