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# TISSUE WORLD MAGAZINE

The independent news provider for the global tissue business

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# BRAZIL

# IS THE LONG-AWAITED SURGE FINALLY SET TO HAPPEN?

### Plus ...

MarketIssues TW virtual conference... route map for a reshaped world

Technical Theme: Pulp Pulp Fact - 'less is more' in the search for cost, resource and energy efficiency **ExitIssues** The sustainable product transforming a company?

ConsumerSpeak "I was down to the last roll ... so I joined the bun fight in the aisles"

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#### ConsumerSpeak

"I refused to stockpile ... but then word swept through the office that a local supermarket has just had a delivery," Simon, a freelance journalist living in the UK, had to abandon his principles when he was down to the last roll at home, and so joined the 'bun fight' in the aisles.

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#### **ExitIssues**

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Cover: An image representing the potential of Brazil's 212.6 million population and how they could double the country's tissue market. Image by Contrast Creative, Manchester, UK.

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#### A SURGE IN BRAZIL? WE HAVE HEARD THE PREDICTION BEFORE, BUT JUST MAYBE THE TIME HAS COME.

Helen Morris Senior Editor, Tissue World Magazine

f we wanted to choose a 'Word of the Day' in this edition of TWM it would have to be this one ... double.

It refers to growth and potential growth, and what makes it so interesting for the industry is its contrast from the far more familiar descriptions and predictions usually employed ... slow, steady, surge, retraction, levelling off, and so on. It occurs tellingly from tissue business at opposite sides of the world, as we enter a pre-postpandemic period in which optimism about tissue's new future is strong.

Brazil – the world's sixth most populous country with a young population of 212.6m people, and the world's fifth-largest country by area – has all the requirements for seriously increased tissue take up. It's one of the BRICS, the impressive global co-operation of advancing nations along with Russia, India, China and South Africa. While some of those nations continue to surge, the story was a different one for others.

Brazil has seen two major depressions in the last ten years. The pandemic struck at the end of a decade of stagnant economic growth, increasing unemployment, poverty and inequality. Tourism slumped, and Brazilians have been earning less, spending less, and socialising less. For sure untapped potential is in abundance, but traditions, habits, depressions, politics ... all seemed to conspire to thwart development. But there is a new story emerging in our Country Report. Daniel Signori is Technical Director at Mili, one of Brazil's leading tissue manufacturers. His is a familiar story of opportunity seized in the wider distress of the pandemic, allied to a sound and dynamic business strategy. The result? Mili grew 18% in 2020 - and expects a 10% increase in 2021. Investment has followed, rather than attempted to predict, changes in consumer habits that are expected to stay for the long-term. And then Euromonitor's wider analysis states that given demographics, income, product availability and consumption culture, it would be a reasonable assessment that the market could double its present size. It's a firming up of emerging trends. As the surges of 2020 settled into the still rising but levelling off growth curves of this year, a significantly larger market became certain. But how much larger?

Euromonitor goes on: "Habit persistence remains a key component of future growth, meaning that once consumers are engaged with tissue there is an overwhelming tendency to continue purchasing. This is the area where the influence of the pandemic presents a huge opportunity beyond the windfall 6.5% value growth reported in 2020, namely, an opportunity to broaden the appeal and usage of tissue products beyond the confines of what came before." To look further ahead, PwC's list of the 10 countries that will dominate the world's economy in 2050 puts Brazil at fifth, behind China, India, the US, and Indonesia.

#### The route map for a reshaped world

The other 'double' comes from China. Tissue World's recent Virtual Conference 2021 hosted 24 speakers in six sessions exploring critical insights analysing how the tissue market is preparing itself for change and emergence from the pandemic.

Key topics included consolidation, sustainability, drivers for tissue business postpandemic, global influences and trends, risk and resilience, consumer behaviour, manufacturing process developments, fibre and energy, converting solutions, process automation and optimisation. Hampus Mörner, Senior Consultant at AFRY Management Consulting, addressed global pulp dynamics. Tissue is now the most important end-use segment for market pulp at 40% of the sector and is the predominant cost driver for tissue production. In terms of end-use almost 40% is in China, 25% in Europe and 10% in North America. This share will only continue to grow, with, he predicts, Chinese dominance: "In the next few years if all these projects in China are realised, domestic pulp production ... might double."

Our conference report is in *Marketlssues*.

# TISSUE WORLD VIRTUATION THE ROUTE MAP FOR

24 speakers - six sessions for all tissue industry members - world-class content designed for the international tissue industry,

n September, Tissue World hosted eight hours of critical insights over the course of two days, analysing how the tissue market is preparing itself for change and emergence from the pandemic.

Key topics included consolidation, sustainability, drivers for tissue business post pandemic, global influences and trends, risk and resilience, consumer behaviour, manufacturing process developments, fibre and energy, converting solutions, process automation and optimisation.

Tissue's route map is being refreshed. Here, we summarise key topics raised.

# Tissue World keynote speech: Key drivers for the tissue business post-pandemic

Esa Kaikkonen, Chief Executive, Metsä Tissue

The tissue business has been volatile during the last year and half. The first few months we saw high demand for our products, and then soon after a shift to negative demand due to lockdowns. Gradually the volatility is going away, and we start to see the return of a normal business environment. Now we face new challenges and opportunities. I won't touch on the high inflation that is applicable to all industries and which must be tackled by all of us as part of our commercial tactics. The key issues are:

### Consolidation is likely to take place in the tissue industry

The tissue industry is likely to consolidate in the coming years in our main European markets. The reason for this lies in our customer base. Take consumer tissues, in the past couple of decades the retail sector has been consolidating, driven for example by the brisk growth of hard discounters. For instance, the German retail sector is controlled by the four largest companies, claiming a combined market share of almost 90%. This consolidation amongst our customer base has happened in the past couple of decades and has meant lower margins for the industries that provide goods to them.

The German food retail market can currently be characterised by consolidation, market saturation, strong competition and low prices. This development in the central European region has left shrinking margins in our businesses, and it's been going on for far too long. Powerful retailers can negotiate cheaper offers from suppliers to keep the retail segment profit high.

While strong players are controlling the consumer retail segment, this same consolidation can't be said for the tissue business. In the future, and to be able to share the large retailers' business, the tissue industry is likely to consolidate. Currently the tissue market in Europe is fragmented, and a consolidation would have happened earlier if the interest rates were higher. The low interest rates have supported the trend of low margin business.

Even in other B2B industries we've seen intense investment activity - the same can't



be said for the tissue industry. This will eventually lead to a deterioration in the assets base, and the tissue business itself. The comparable operating results are also clearly lower in Europe than in the USA. I believe business owners will not tolerate these losses in Europe for much longer.

The tissue industry in Europe is fragmented, but to be able to serve large retailers effectively the industry is likely to consolidate. Larger producers could then deliver big volumes demanded by large retailers, reach higher efficiency and have more power in commercial negotiations. Currently the capacity of some 11 million tonnes is divided between about 140 companies, and the six largest producers account for 50% of the capacity.

# AL CONFERENCE 2021: A RESHAPED WORLD

Operating results in the European tissue industry are clearly lower than in North America – consolidation could help in improving the relatively weak profitability.

### Demand boosted by improved hygiene standards

Demand is expected to continue to be boosted from improved hygiene standards and the increased use of paper towels. During Covid-19, I'm truly convinced that improved hygiene standards will turn the market favourable for us in the coming months and years. It seems clear that tissue is the preferred way to fulfil the function of hand hygiene. This is likely the best opportunity for the industry post-pandemic.

Tissue market dynamics post-pandemic are likely to change, with increased remote working and changing travel habits shifting some consumption from the Professional to the Consumer segment. Hygiene standards have improved due to the pandemic, and this will boost consumption both in Professional and Consumer segments with the main drivers including increased hand washing, substitution of air dryers, consumer acceptance on new and innovative paper towels.

There are many opportunities to increase consumption at home if we are innovative. It is expected that more people will stay home than pre-pandemic, so more actions are needed here in order to grow.

#### Sustainable fresh fibre is a key to success

Graphic paper decline continues to reduce the availability of RCP and the pandemic has accelerated the decline with no prospects of bounce-back.

Today one third of our production is based on recycled fibres. This is a huge issue but also a great opportunity for the industry to increase the value of their offering.

Digitalisation continues to reduce the consumption of graphic papers. With the declined availability, increased collection rates and filler content of graphic papers, the quality of RCP has gone down. The only way forward is to digitalise processes that don't require physical movement of goods or people. This would mean less wood fibres in circulation. This will continue with elevated speed.

As the availability of recovered paper reduces and competition for the raw material tightens, tissue producers are the first ones to be left without RCP. This is due to the fact that the RCP paying capability in tissue is clearly lower than in packaging and fine paper grades (WLC, UWF). RCP prices have exceeded the paying capability of tissue producers already, making the use of virgin fibre more lucrative.

Locally sourced fresh fibre based on renewable, responsibly grown wood is the sustainable raw material alternative in tissue. Use of fresh fibre has also advantages in tissue manufacturing process in terms of sustainability and resource efficiency.

### Business is about to become even more local

Tightening legislative measures will lead to substantial carbon price increases as per the "Fit for 55" targets. Long distance hauling is neither economically nor environmentally viable anymore since carbon emissions will be priced also in transportation. Local production based on best available technology needs to be developed further to cut emissions. The younger generation consumers appreciate locally produced products and services – sustainability is of utmost importance.

Sustainability will be one of the main drivers in the market. I feel very optimistic for the tissue industry, we have a set a new hight at the bar with the production of hygiene papers. When consumers are outside, we are one of the industries that help with self-living ad hygiene. And at home, the penetration is pretty low in the European side, so we can really push forward our value by introducing new papers to replace the non wovens.

We are in a unique position because we are fully integrated with Metsä Group and we have invested in circular bio economy for the past 10 years. This gives the flesh on the bones because you do concrete actions. All our mills will be fossil free by 2030. By 2030 we aim to have a completely plastic free offering.

Retailers have also started to develop carbon calculators for consumers to evaluate their product's carbon footprints. Change is in the air.

TISSUE MARKET DYNAMICS POST-PANDEMIC ARE LIKELY TO CHANGE, WITH INCREASED REMOTE WORKING AND CHANGING TRAVEL HABITS SHIFTING SOME CONSUMPTION FROM THE PROFESSIONAL TO THE CONSUMER SEGMENT. HYGIENE STANDARDS HAVE IMPROVED DUE TO THE PANDEMIC, AND THIS WILL BOOST CONSUMPTION BOTH IN PROFESSIONAL AND CONSUMER SEGMENTS.

# What impact will carbon emissions have on the tissue industry?

Urban Lundberg, Senior Consultant, Fisher International

Extreme flooding and forest wildfires occurring around the globe are calling attention to the ever-growing issue of countries' carbon footprints and fuelling the momentum behind the movement to reduce emissions. As a result, many individual governments have implemented legislation or enforcement mechanisms to limit these emissions.

The European Commission recently adopted the 'Fit for 55' package that was created to achieve a 55% reduction in emissions by 2030. The proposals included in the package outline the EU's path towards its 2030 climate reduction to make the 2050 carbon neutrality objective attainable.

Although Europe is at the forefront of this movement, many other regions are increasing their efforts as well.

In the US, for example, President Biden has stated that energy and climate change are key initiatives within his campaign. Since being elected, the US has re-joined the Paris Climate Agreement and proposed a \$3.5 trillion infrastructure bill, including components that address climate change. The goal is to achieve carbon neutrality no later than 2050.

Furthermore, President Biden is considering an "enforcement mechanism" to limit carbon emissions. California currently operates the largest carbon regime in the US with its Emission Trading System (ETS) or "cap and trade" system.

China has also acted. The country's 2060 Carbon Neutrality Pledge - Guiding Opinions on Promoting Climate Change Financing – was announced by Chinese President Xi Jinping in September 2020. The goal of this is to peak emissions before 2030 and to achieve carbon neutrality by 2060.

Carbon emissions and the footprint they leave behind are impacting the global tissue market in many ways. Some of the most important areas that will be impacted are manufacturing footprint (location), inter and intra-regional trade, investments, and TM technologies.

The European tissue industry has lower carbon emissions than both Asia and North America, and the significant 'carbon spread' between countries is mainly driven by their different fuel uses. There is a 3X difference between the lowest and highest emitters in Europe, and this 'spread' is mainly caused by the huge differences in energy mix among countries.

Today the tissue industry is already a more local/regional business with relatively limited volumes of inter-regional tissue trade. The local/regional industry character is expected to further strengthen, which will make justifying long-distance shipments increasingly more difficult.

As an example, China and especially Indonesia are two of the main exporting countries of tissue to Europe. The carbon footprint for both these countries is considerably higher than for European producers. In addition, the emissions caused by the long-distance transportation need to be added.

In the near- and mid-terms, the tissue industry will develop into an even more local business than it already is today.



EU wide and national legislative initiatives to curtail carbon will increase in the near future. However, the strongest demand for change will likely come from retailers in the near-term and from end-users in the mid-term.

There will also be consequences within Europe where market proximity, cost position and carbon emission factors all need to be assessed and optimised for the most sustainable manufacturing footprint.

All future major mill capex decisions will need to be assessed, including an understanding of its carbon emission impact. This will undoubtedly over time lead to a changed European tissue manufacturing footprint.

Advanced tissue machines have considerably higher carbon emissions by weight when compared with conventional machines. However, to make a fair comparison we need to also look at product usage. Advanced TMs use approximately 20% less fibre than tissue from Conventional TMs.

Accordingly, there is a corresponding lower weight of a sheet/roll/case of tissue produced on Advanced TM's. A comparison of emission by product (used) would make the emissions more equal between the technologies, and the high carbon emissions created when producing tissue with Advanced Technology can and need to be compensated with lower fibre usage.

ADVANCED TISSUE MACHINES HAVE CONSIDERABLY HIGHER CARBON EMISSIONS BY WEIGHT WHEN COMPARED WITH CONVENTIONAL MACHINES. HOWEVER, TO MAKE A FAIR COMPARISON WE NEED TO ALSO LOOK AT PRODUCT USAGE. ADVANCED TMS USE 20% LESS FIBRE THAN TISSUE FROM CONVENTIONAL TMS. ACCORDINGLY, THERE IS A CORRESPONDING LOWER WEIGHT OF A SHEET/ROLL/CASE OF TISSUE PRODUCED ON ADVANCED TMS. A COMPARISON OF EMISSION BY PRODUCT (USED) WOULD MAKE THE EMISSIONS MORE EQUAL BETWEEN THE TECHNOLOGIES.

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# Global insights on pulp market dynamics

#### Hampus Mörner, Senior Consultant, AFRY Management Consulting

What can we expect in the immediate future for pulp prices?

Tissue has become the most important enduse segment for market pulp with almost 40% of global pulp demand attributed to the sector. This share will only continue to grow. Pulp is also the predominant cost driver for tissue production.

In 2020, pulp prices were flat for most of the year in both China and Europe. Pulp prices peaked in mid-2021 after having surpassed previous historical highs seen in 2018. There are many events behind this increase; economic recovery and pentup demand, for instance. The market was also spurred by speculative buying, both physical and non-physical. There was also a lot of re-stocking activity.

Prices eventually started to come down in China. In mature markets like Europe, which usually lags behind China, it remains to be seen what will happen and to what extent it will follow China. Compared to previous price cycles, this one was more aggressive and distinctive. Some volatility seems to have been in place more than usual.

Logistical constraints and rising/elevating freight rates have also hiked up prices, as well as the postponed maintenance shuts and other production curtailments at the beginning of 2021. Unplanned production downtime brings volatility and is foreseen

PROJECT PIPELINE IN CHEMICAL MARKET PULP

Million tons - Net capacity increase1

to grow; supply disruptions have had a major impact on prices historically.

We see the risk of supply disruptions picking up due to ageing assets especially in BSKP (equipment failures), continued market volatility (market downtime) and climate change, which can also negatively affect logging and logistics. In addition, the increasing scale of mills also brings some additional risk as any equipment failure means a higher level of absolute volumes lost than for a smaller mill.

With high investment activity, China's impact on the global fibre markets will only increase. China is and will continue to be a major factor for global pulp.

In terms of market pulp end use, almost 40% is in China, about 25% in Europe and 10% in North America.

Pulp capacity in China is mainly integrated to paper and paperboard production. In the next few years, domestic pulp production might double in theory if all paper and board projects in China demanding virgin fibre are realised. To meet this demand, traditional fibre sources may not be enough. Options for the pulp producers are, for instance 1) To gain shares from domestic fibre sources at the expense of other sectors than pulp; 2) To increase imports from close proximity countries such as Vietnam, Myanmar, Laos and Thailand, or



from traditional sources such as Australia; 3) Or to explore new frontiers such as Eastern Africa. Whatever strategy that is chosen, it is clear that China's appetite for fibre will continue to increase.

We have a period behind us with no significant market pulp supply additions globally, but looking forward, this is changing as the product pipeline is turning thick again. However, potential exits and swings are more of an uncertain factor. In 2021, the main projects include Bracell/ APRIL in Brazil and Arauco in Chile. For the coming two to three years, there are Lenzing and Suzano in Brazil, UPM in Uruguay and Metsä Fibre in Finland. The projects ahead with a less certain timeline include Eldorado in Brazil in, Paracel in Paraguay and KaiCell in Finland.

#### The pipeline of market pulp projects will turn relatively thick again from 2022. However, exits are more of an uncertain factor



Devie d	<b>6</b>	<b>6</b>	No.11	Cure de	March		
Period	Country	Company	Mill	Grade	Market capacity change, 1000t (est.)		
MAIN DECIDED PROJECTS							
2021	Brazil	Bracell; RGE/ APRIL	Lencois Paulista	DP, BHKP swing	1000-1250		
2021	Chile	Arauco	Bio-Bio	внкр	1550		
2022	Uruguay	UPM	Paso de los Toros	внкр	2100		
2023	Finland	Metsä Fibre	Kemi	BSKP, BHKP	1000		
2024	Brazil	Suzano	Ribas Rio Pardo	внкр	2300		
MAIN PLANNED PROJECTS							
2024	Brazil	Eldorado	Tres Lagoas	внкр	2300		
2024-25	Paraguay	Paracel	Concepción	внкр	1500		
2025	Finland	Kaicell	Paltamo	BSKP	600		

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# **NEWS IN BRIEF**

A roundup of news from across the global tissue industry. To get the very latest news go to www.tissueworldmagazine.com

#### ITALY

#### Cartiera Confalone boosts capacity with Toscotec investment

Cartiera Confalone has started-up a Toscotec-supplied AHEAD 2.2 tissue line at its plant in Montoro. It is equipped with TT NextPress, TT SYD Steel Yankee Dryer, and gas-fired TT Hood designed with multiple stages of energy recovery. It has a sheet trim width of 2,850 mm, a design speed of 2,200m/min and production capacity of over 35,000tpy. The tissue line will produce toilet tissue, napkins and towels using 100% pre-dried virgin pulp and converting broke.

#### **CHINA**

# Asia Symbol moves into tissue with TM investment

Asia Symbol (Guangdong) Paper has diversified into the tissue market after investing in an Andritz-supplied PrimeLineTM W 2000 at its site in Jiangmen.

The company previously produced printing and writing paper, and the start-up of the tissue machine marks their move into the global tissue business. Start-up is planned for the end of 2022 and the scope of supply will include an 18ft. PrimeDry Steel Yankee with a steam-heated PrimeDry Hood ST, stock preparation, automation and a PrimePress XT Evo shoe press.

#### Shenggang Paper boosts capacity

Shenggang Paper Co. has successfully started up its Baotuo-supplied BC1300-3600 Crescent tissue machine at its plant in Dezhou. TM5 has a design speed of 1300m/min, a paper width of 3.6m and an annual production capacity of 25,000 tonnes. Once fully up and running, Shenggang Paper's production capacity will exceed 100,000tpy.

#### UK

#### Sofidel UK to install Advantage ViscoNip press

Sofidel is to install a Valmet-supplied Advantage ViscoNip press and an Advantage ReDry on its TM1 at its plant in Baglan, UK. It will replace the existing suction press roll with the target to reduce energy consumption and CO2 emissions in line with the Italian company's sustainability strategy. Start-up is planned for the latter part of 2022.

#### **SWEDEN**

#### Sofidel signs a renewable gas supply agreement with Meva Energy to replace fossil gas production in its Kisa plant

Sofidel has signed a renewable gas supply agreement to replace fossil gas production in under two years at its Kisa plant, a move which will reduce its CO2 emissions by 8,500tpy. The 10-year agreement has been developed with Meva Energy and in collaboration with the Burner Solution group of Andritz and Örebro Gasteknik. Meva Energy will operate the thermochemical conversion plant with the capacity of generating at least 4,2 MW gas within the premises of the Kisa plant, and renewable syngas then delivered for 10 years. Luigi Lazzareschi, Chief Executive of Sofidel Group, said: "We believe in building an inclusive and sustainable future and in our commitment to minimise our impacts on natural capital and encourage the transition to a low-carbon economy we are increasingly focusing on renewable energy."

#### GERMANY

### Essity begins tissue production from wheat straw

Essity has begun tissue production based on pulp from wheat straw at its plant in Mannheim. The company said it is the first of its kind in Europe, and the first on a largescale tissue production in the world. It added that it is the first company in the tissue industry to use these agricultural leftovers at industrial scale. Magnus Groth, President and Chief Executive of Essity, said: "This type of innovation is the way forward to increase circularity and reduce our climate footprint.

"Using straw as a new raw material in pulp makes us less dependent on wood fibre and recycling fibre and is more resource and cost efficient, while our consumers can make more environmentally friendly choices."

The Mannheim plant is Essity's largest tissue plant in Europe with an annual production capacity of 283,000 tonnes of tissue. Annually, the company will regionally source 70,000 tonnes of straw that will become about 35,000 tonnes of pulp. The production of paper from straw pulp is part of Essity's work to increase circularity and achieve net zero emissions by 2050.

# Metsä Tissue targets professional tissue with Raubach investment

Metsä Tissue has responded to customer demand for increased professional hygiene products with the start-up of a tissue line at its plant in its Raubach. The company said the machine will produce folded tissue hand towels for the Western European region.

It has a production capacity of 14,000 tonnes of folded tissue paper hand towels per year. The line started in September 2021 and will be in full production by 2022.

Tobias Lüning, Senior Vice President Central Europe, Metsä Tissue, said: "Our products are a sustainable hygiene solution for everyday needs across the public spaces in Western Europe - from shopping centres, hotels and hospitals to office facilities. Tissue papers are the preferred choice of hand drying in public washrooms and our products offer an effective and sustainable means of taking care of hand hygiene."

#### FRANCE

#### ICT Group to double French production capacity with TM project

ICT France has announced plans to boost its tissue production capacity by 70,000tpy after revealing investment plans for a tissue machine. The continuous machine will be installed at the company's existing plant in Loire, an integrated greenfield facility that was established in 2011 and currently produces 70,000tpy. Riccardo Baccelli, Executive Director at ICT, told TWM: "By adding the second paper machine we will complete the original project for this site, that has always seen a two machine configuration."



Above: "Complex market demands imply the need to always think outside the box"; Körber's latest packaging innovation, the Casmatic Zephyrus

#### GLOBAL

# Körber targets e-commerce with Casmatic Zephyrus launch

Körber has launched Casmatic Zephyrus, which it said is a "flexible and modular packaging machine that helps customers develop their e-commerce business and transition to sustainable packaging". Casmatic Zephyrus consists of four modules that the company said can be integrated into existing packaging lines: the first module constructs the boxes, the second receives the tissue product for packaging from the cutting-off machine, followed by the pick and place module that inserts the product into the boxes, and finally the module that closes and glues them.

Francesco De Luca, General Manager Packaging Division Körber Business Area Tissue, said: "Complex market demands imply the need to always think outside the box. For this reason over the past few months Körber Business Area Tissue's R&D in Bologna has been working on a new machine that -for the first time in the tissue industry - uses Delta robots, a technology first used in the pharmaceutical field."

#### Buckman announces price hikes as of 1 October

Buckman has announced global price increases of 15 to 20% for all product offerings. The price increases will become effective as of 1 October, or as customer contracts allow. Price increases will vary depending on geographic region, solutions offered and the markets served. The company said that in some areas, increases may be higher where local conditions may necessitate additional adjustments.

It said: "In the last 12 months, the chemical industry has experienced dramatic

increases in global prices for primary feedstocks including crude oil, propylene, ethylene, natural gas, acrylonitrile, methanol, packaging, steel, aluminum and ammonia. Throughout the year we have witnessed significant global supply chain disruption, strong global demand and multiple natural disasters in North America that have and continue to put extreme upward pressure on raw material prices.

"These unexpected external events have escalated costs imposing an unsustainable strain."

### Archroma announces price increase across portfolio from 1 October

Archroma has increased the prices of its products by up to 0.25 USD per kg as of 01 October 2021. The adjustments will apply to all Archroma products globally. The company said the increase "is necessary to offset the ongoing exceptionally high freight and logistics costs".

Marcos Furrer, Chief Operating Officer at Archroma, said: "Archroma made every effort to absorb these increases. We have however reached a point where these adjustments are needed for us to be able to maintain our service levels."

#### USA

### Newcomer TPO Converting enters tissue market

TPO Converting has started-up its tissue converting facility in America after investing in a Maflex-supplied ARES rewinder. The scope of supply for the business includes an HELIO embosser/laminator, LADON Plus log saw and all the necessary downstream packaging equipment. The ARES rewinder will produce tissue, kitchen towel, jumbo bath, and hardwound towel on the same line once up and running. TPO Converting is a newly formed company based in southeastern USA. A spokeswoman for Maflex told TWM that TPO Converting had started up as a business in the past few months and will focus on converting tissue and towel products for the local region once fully up and running.

#### **CROATIA**

# Newcomer Astrabel to build Croatia's first tissue mill

Astrabel has invested in an Andritzsupplied PrimeLineCOMPACT S 1300 TM to be installed at its Belišće plant. Start-up is expected in 2023 and the turn-key project includes stock preparation, a tissue machine with air systems and rewinder, complete electrification, automation and pumps. The TM has a design speed of 1,300m/min and will produce a paper web that is 2.85m wide. It is equipped with a 15ft. PrimeDry Steel Yankee and a PrimeDry Hood COMBO.

#### POLAND

#### **GZP boosts capacity with TM investment**

Głuchołaskie Zakłady Papiernicze (GZP) has boosted its production capacity after starting up a Hergen-supplied Crescent Former HCF 920 Smart TM. PM2 has replaced the Głuchołazy-based plant's existing Fourdrinier to significantly improve paper quality, production capacity, and reduce energy consumption. Hergen's scope of supply included approach flow engineering, Crescent Former, felt section, suction press and pope reel.

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# BRAZIL TISSUE MOVES FROM TISSUE IMPORTER TO TISSUE EXPORTER

Those within the tissue industry know Brazil for its robust eucalyptus pulp production, which is generally used within the tissue segment due to its positive impacts on tissue properties. As a result, Brazil has started to invest in its domestic tissue business, affecting both tissue imports and exports.

Prazil's economy grew until about 2014 when it experienced a secular decline, which started to recover again in 2019 before it was negatively hit by the Covid-19 pandemic in 2020. Figure 1 shows the purchasing power parity adjusted GDP per capita over this interval along with Brazil's population growth. The country is the seventh most populated in the world, growing at about 0.65% in 2021. Thus, it should be poised for stronger tissue consumption growth if GDP per person continues growing.

Figure 2 shows Brazil's inflation and unemployment trends over the same time and as we can see, strong inflation began just as growth was declining around 2014. However, inflation returned to low rates in 2017, but unemployment continued to increase to about 14.5% in 2021. This trend would explain why the country's tissue consumption per capita has not increased as much as expected.

While early 2021 data suggests a recovery, Covid-19 continues to impact the country's economy, as shown in Figure 3. The average percent of population deaths spiked in early 2020 before levelling out to a rate higher than the global average. As we can see, the percent of the infected population that has recovered from Covid-19 began to stabilise at about

90% as the pandemic spread through the country. Although one data point does not make a trend, the large spike seen at the end of summer 2021 is concerning and suggests that the effects of Covid-19 on Brazil's economy warrant close attention.

The paper industry tends to think of Brazil as a major exporting power for eucalyptus market pulp. Cloned cultivars and plantation growth have resulted in a six to eight-year growing cycle for the trees. Tissue makers have found that eucalyptus pulp from Brazil or other sources results in excellent formation and tissue softness compared to all other hardwoods. Therefore, it is not surprising that Brazil has continued to add eucalyptus pulp lines to support exports throughout this analysis. As illustrated in Figure 4, 15 pulp lines were added or planned through 2024.

Eucalyptus now represents 24% of total global tissue furnish, as shown in Figure 5 — a major portion of which comes from Brazil.

Figure 6 shows the additions and deletions of tissue machines through the time frame discussed in this report. The chart shows the net addition of 11 new tissue machines presumably much larger than the machines being replaced, which are logical moves as Brazil is the source of a preferred tissue fibre.



**Bruce Janda** Senior Consultant, Fisher International

However, eucalyptus does not make up all of Brazil's tissue production, as seen in Figure 7. Almost a third of the tissue fibre comes from recovered paper. Some southern softwood is also used, presumably for strength and stretch properties in selected grades.

Brazil's tissue mills are generally integrated. However, most (60%) are integrated with fibre from recovered paper, which doesn't take advantage of the quality of the eucalyptus pulp. In addition, only 12% of tissue machines are directly integrated into a pulp mill. This appears to be missing a major opportunity for lowcost production by avoiding redrying and transporting eucalyptus pulps.

Figure 9 shows the relative production



in the second se

Figure 2: Brazil Inflation and Unemployment Trend

of finished tissue products. Consumer bath tissue makes up the largest portion of Brazil's production. However, the other categories have room to grow in Brazil's tissue consumption per capita to approach European levels.

Brazil tended to import more tissue than it exported up until about 2013. Figure 10 shows the top tissue suppliers, including most of Latin America, the United States, United Kingdom, and Mexico.

Figure 11 shows the country's tissue export trends as a mirror image. Tissue exports started to pick up in 2014 and currently run about 15 times higher than current imports. Most exports are directed at the other countries in Latin America.

The set of countries that have been recently importing Brazilian tissue provide a good comparison base for the competitiveness of the country's tissue industry. Figure 12 offers a comparison against the Latin American tissue importers that are also producers and the United States. The X-axis provides an average of the country's tissue machine technical age in years adjusted for machine rebuilds and improvements. The Y-axis is the average width of the country's tissue machines, while the size of the bubble represents the production capacity for each country.

Brazil has moderately newer machines, but they continue to be very narrow on average. Bolivia, Peru, and Uruguay all have significantly newer tissue machines but smaller capacities. The United States' tissue machines tend to be older but almost twice as wide as the Latin American sets.

Each country's relative cash cost of production is shown in Figure 13. Brazil's costs average lower than Uruguay, the United States, and Chile, but are slightly higher than other Latin American countries. Columbia, Argentina, Bolivia, and Peru appear to have higher degrees of virgin fibre integration that support lower costs than Brazil. The relatively narrow width of Brazil's machines also tends to increase production costs.

Carbon emissions of exported goods are expected to become a significant factor in trade costs or preferences. Figure 14 compares Brazilian carbon emissions versus the comparison set. Only Uruguay has lower carbon emissions per tonne than Brazil, which appears to be in part due to lower carbon emissions from Brazil's tissue mill electricity purchases.

Brazil has successfully transitioned from a net tissue importer to a net tissue exporter. New tissue machines have both built capacity and replaced old machines to improve industry viability. However, its machines continue to be narrow and have a higher cost than expected. As a result, Brazil's tissue exports appear to be a good fit for its immediate neighbours' needs, but not a world-wide tissue export powerhouse. This could change if Brazil adds more wide and fast machines to virgin pulp integrated sites. In addition, Brazil's tissue makers have not yet taken full advantage of the highquality eucalyptus furnish for premium product exports outside of Latin America.

Analysis of competitive position requires specifics on tissue producers and individual machines. This article presents a static summary of Brazil's tissue industry today. Fibre prices, exchange rates, and environmental regulations will change, providing some participants with advantages and others new challenges. In addition, Brazil's tissue mills will continue to change hands and consolidate, and neighbouring countries may invest in tissue-making capacity, affecting Brazil's imports and exports.







Figure 5: Brazil Tissue Imports Trend







Figure 6: Brazil Tissue Exports Trend



Figure 7: Brazil Tissue Furnish



Figure 9: Brazil Relative Tissue Machine Quality



Figure 11: Brazil Relative Production Cost Comparison







Figure 8: Brazil Tissue Products and Furnish



Figure 10: Brazil Water Consumption per Production Ton and Risk



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Figure 12: Brazil Relative Carbon Emissions Comparison



Figure 14: Brazil Relative Carbon Emissions Comparison



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# TRADING DOWN — SIZE WILL MATTER AS BRAZIL'S HUGE POTENTIAL REMAINS UNTAPPED

With the end of government aid packages helping consumers purchase basic household goods, the industry will need to establish new supply channels.



**By Ian Bell** Global Lead - Home and Technology, Euromonitor International

razil remains the epicentre of the Latin American tissue market, replacing Mexico as the largest value contributor to regional sales as far back as 2007. This single market accounted for roughly a quarter of regional value sales in 2020; a figure which continues to creep upwards annually from just shy of 20% in 2006. While all the metrics look positive, this belies a low per household expenditure level of USD29; way below Mexico (\$43) China (\$39) or even globally (\$38). The Brazilian market therefore continues to hold great potential, but after a decade of reporting on the tissue market, I'm still asking the same question: can this potential be realised?

In 2021 we expect the Brazilian market to finish the year at around the \$2 billion mark. This is significantly up on the 2019 (prepandemic) level of USD1.85 billion. Before we get into the influence of the pandemic in detail, this is potentially a defining moment for tissue for the coming decade, and it is worth considering the market potential in more detail. Given demographics, income, product availability and consumption culture, it is not unreasonable to surmise that brands should prepare for a market that is twice its current scale. Habit persistence remains a key component of future growth, meaning that once consumers are engaged with tissue there is an overwhelming tendency to continue purchasing. This is the area where the influence of the pandemic presents a huge opportunity beyond the windfall 6.5% value growth reported in 2020, namely, an opportunity to broaden the appeal and usage of tissue products beyond the confines of what came before.

#### Behaviour change

Consumer crisis behaviour during the pandemic was typical of what was witnessed as a global trend: Brazilian consumers opted for stockpiling as the crisis unfolded. This was seen in the form of 'panic-buying' of several products in order to stock them at home in case of an eventual lockdown. As a result, sales of toilet paper skyrocketed during Q2 2020, with many manufacturers reaching their sales targets for the year by Q3. Nevertheless, unlike other products, for which stockpiling helped to increase consumption, this was not the case for



Brazil - Retail Tissue



Source: Euromonitor International

toilet paper. Although stockpiling toilet paper did not lead to an increase in total usage per capita, retail consumption did increase due to all household members spending more time at home. After initial stockpiling, sales decreased due to running down domestic stocks, and the market normalised by Q4. While 2021 has been a further year of disruption, tissue sales are forecast to continue to grow at around 1% in value terms.

#### Social gatherings

While the core toilet paper category benefited from home seclusion others were not so fortunate. As consumers quarantined, social gatherings at home also reduced drastically. This negatively affected sales of napkins (paper tableware), as more limited household usage put the brakes on consumption. Despite an easing of Covid-19 restrictions, 2021 is yet to see a return to pre-pandemic lifestyles and this has been further compounded by economic uncertainty. Brazilian consumers are trading down and purchasing fewer premium products not just in paper tableware but across all retail tissue categories.

#### **Multifunctionality wins**

Although household gatherings were put on hold, the pandemic did bring with it an uptick in household cleaning frequency as well as range, shining a light on preventative health and hygiene. This caused paper towels to be even more widely used for increasingly diverse purposes, driving it to see the fastest growth in retail tissue. Versatility was much appreciated by consumers who often reported using paper towels as a direct substitute for napkins, being convenient, cost effective and helping to rationalise shopping journeys. While in other markets the rapid rise in demand improved the position of small and medium sized players, as well as encouraged away-from-home producers to branch out into retail, the situation in Brazil proved to be contrary.

#### Supply chain disruptions

Small players account for the largest share of value sales in retail tissue, highlighting the highly fragmented nature of the category. However, as panic-buying and stockpiling increased product demand drastically during Q2 2020, access to raw materials and packaging was more difficult, making it easier for larger players to fulfil new orders. Suzano, one of the largest cellulose and pulp suppliers, leveraged

#### Retail Value Sales, Real US\$ mn 2018 - 2025

2020 Constant Prices, 2020 Fixed Year Exchange Rate

Brazil - Retail Tissue

Retail Value Sales, Real Growth
 Passport Baseline

#### Driver effects

- GDP Per Capita
  Product Price
- Habit Persistence
- Population
- Socio-Economic Trends (Employment Rate; Share of Muslim Population)
- Market Environment
- per Capita; Passenger Cars in Use per Capita) Soft Drivers (- Competition; - Maturity of sector;

(Modern Grocery Retailers Selling Space

Competition; - Maturity of sect
 + Home Seclusion; + Promotion)

its capabilities and was less impacted by disruptions, therefore managing to increase the presence of its Mimmo brand. Also, the leading players Santher, Mili and Kimberly-Clark benefited from smaller players having more limited access to raw materials and packaging, therefore growing their value shares in a competitive category. However, after stockpiling ended, this generated an oversupply of retail tissue products, causing manufacturers to use their spare capacity for private label products.

#### **Channel shifts**

Despite overall distribution shares remaining largely unchanged in 2020, growth did vary across channels, and some factors helped to shift these dynamics. E-commerce, despite accounting for a low share of sales, nearly doubled its size and grew 10 times faster than the average across all retail channels in retail tissue during 2020. Thanks to large internet retailers such as Magazine Luiza, online retail tissue sales grew dramatically, and it became an important channel amongst more wealthy consumers. Meanwhile, supermarkets, hypermarkets and traditional grocery retailers grew aligned with the category average and remained the main distribution channels for retail tissue, especially when consumers stockpiled. However, convenience stores, despite accounting for a low share of value sales, also saw significant growth in 2020, as their location in residential neighbourhoods meant they were easily accessible to consumers. The growth of this channel, which is characterised by smaller outlets and is intended for smaller purchases, will require manufacturers to

#### Retail Value Sales, Real US\$ mn, 2020 - 2025 2020 Constant Prices, 2020 Fixed Year Exchange Rate



Source: Euromonitor International

adapt to offering smaller pack sizes.

22

#### **Trading down**

21

2018

In previous years, premium-positioned products such as two-ply toilet paper increased their mainstream reach, as they were becoming accessible beyond higher income households. However, with the economic crisis due to Covid-19 many consumers faced losing their jobs and relied on government aid to keep purchasing basic household goods, such as toilet paper. With the end to this aid, even stronger trading down is being seen in 2021, meaning that lower-income consumers in particular will rely on one-ply toilet paper due to affordability. Lower-income consumers usually also lack space at home to store large packages, making the option of buying in bulk to get better deals, harder. As a result, manufacturers will have to position themselves effectively and work with pack sizes that make them affordable to a broader base of consumers.

#### The shape of things to come

Although Brazil's experience during the height of the pandemic and in this latest phase is far from unique, the tissue market does emerge as an overall beneficiary of lifestyle changes. The big question for the industry remains, can the economy support consumers' changed relationship with tissue and reinvigorate categories that were left behind? Given the scale of economic disruption coming it is increasingly difficult to discern if this particular glass is half full or half empty, our forecast model concurs with this observation.

# IS COVID-19 THE TIPPING POINT FOR ACCELERATED GROWTH IN THE BRAZILIAN TISSUE MARKET?

With over 70% of production dedicated to the At-Home market, one of Brazil's leading tissue manufacturers Mili saw sales grow 18% in 2020 – and expects a 10% increase in 2021. Technical Director Daniel Signori talks to Senior Editor Helen Morris about going the extra mile.



Production boost: Mili now has three industrial units based in Curitiba-PR, Maceió-AL, and Três Barras-SC (pictured)

Brazil has always been the country with a vast - but untapped - opportunity for the tissue and towel market. It is the world's fifth-largest country by area, and the sixth most populous. It has all the demographics needed for a thriving tissue and towel market: a young population of 212.6m people living across 8.5m square kilometres of land, a love of socialising, and a consumption culture.

Yet even in the nine years since TWM last visited the country for our Brazilian Country Report, the reasons why the country's potential remains untapped across many of its geographical regions remain ever present. Over the course of the last decade Brazil has experienced a few major recession periods. And when the pandemic arrived after ten years of stagnant economic growth, it brought with it unemployment, a further increase in inequality and poverty, and a drop in the country's vital tourism trade. Brazilians have been earning less, DEMAND FOR HIGH-QUALITY TISSUE PRODUCTS IN BRAZIL WAS QUICKLY INCREASING, AND THE COMPANY WAS SEEING A BOOST IN 2-PLY TOILET PAPER SALES. MILI AND MANY OTHER BRAZILIAN TISSUE BUSINESSES WERE SEARCHING FOR HIGHER QUALITY, SOFTNESS AND BRIGHTNESS TO MATCH RAPIDLY CHANGING CONSUMER TRENDS, AND HEAVILY INVESTING TO KEEP UP WITH THE COMPETITION. THE INFLUENCE OF THE PANDEMIC HAS BOOSTED TISSUE INVESTMENTS EVEN FURTHER.

spending less, and socialising less. But does the start of 2022 mark the pivotal moment when Brazil can start to move forward from the "lost decade"?

If we look at tissue – always a sensitive indicator of a nation's economic health and at the case of Brazil's leading tissue manufacturer Mili, it could seem so. TWM first met Mili's Technical Director Daniel Signori in 2012 at the company's Três Barras facility in the Santa Catarina state. The business had just started an investment programme that added 70,000tpy to its overall production. Demand for highquality tissue products in Brazil was quickly increasing, and the company was seeing a boost in 2-ply toilet paper sales. Mili and many other Brazilian tissue businesses were searching for higher quality, softness and brightness to match rapidly changing



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The influence of the pandemic has boosted tissue investments even further. Yet, this time, these projects have been invested in response to changes in consumer habits that are expected to stay for the long-term. There has been a general increased awareness in hygiene brought on in the past year and a half and Mili's own growth strategy has been reinforced during that time:

"We were very agile when the pandemic broke," Signori says. "We took all the initial care needed, respecting all health and safety standards. We were able to keep all our three units operating despite the substantial growth in demand from stockpiling we saw in the first months of the pandemic. We also migrated our non-essential operations to home office and developed online meeting tools and databases for discussions in record time."

Signori emphasizes that Mili remains clear in its growth plans and the firm hold it has on its core business offerings. The company had just finished a series of investments when the pandemic broke. "Because of all these efforts we can say that Mili grew 18% in 2020, and we are 10% higher in 2021 when compared to 2020," he adds. "As a result, we have already announced further projects that are under studies for investments in diapers, sanitary pads and also in paper IN a near future. Generally, we see a lot of growth potential for sanitary pads, disposable diapers, moist wipes and toilet paper."

Mili now has three industrial units, Curitiba-PR, Maceió-AL, and Três Barras-SC, with seven paper machines producing 246,000tpy, converting lines, napkin lines and combiners, cotton swabs lines and moist wipes lines. From this total, 10% work with third-party brands and 10% in sales of jumbo rolls for Brazil and Latin America.

The business has no plans to diversify its product offering and will keep a tight hold of its current SKU's. It recently launched its newest premium line, triple sheet toilet paper, 3D two ply toilet paper, Grand Chef Kitchen Towel, and 40x40cm Bistro Napkin. "These areas will continue to be our target markets," he adds.

The business also has a partner company for the brand Mili Professional – an AfH brand - and it produces papers in jumbo rolls which are then converted and sold as AfH products. "This represent less than 10% of our total volume, 90% of our market is



Above: "Our perspective for an average market growth is of 6% per year," Daniel Signori, Technical Director, Mili

At-Home products and here we are mostly focused on investments and marketing."

Supporting a resilient growth model also means taking further strides in its environmental efforts: "Mili is Latin America's largest paper recycler of tissue products and we have a line called Bianco which includes kitchen towel, double sheet toilet paper and 60m single sheet toilet paper with 100% of its fibres recycled from office paper. Some 45% of our paper products are made from recycled fibres. Environmental, social and corporate governance, environmental seals, all of our efforts here reaffirm our position as a recycler of more than 8,000 tonnes of paper per month."

The immediate challenge he says is that the industry is currently experiencing "a very serious margin crisis" in the paper sector, which "spoils further negotiations". "In the private label market, there are many producers, and margins are very low due to the oversupply. The private label market tends to continue growing, but in Brazil it will be at a slower pace when compared to the American and European markets.

He adds that the sum of the effects of the dollar rate and the increase in the cellulose commodity, mean that the margins of Brazil's tissue sector are "at a very worrying level, practically preventing capital remuneration and therefore new investments in the sector". It will be a complex few years ahead. What can we expect for the Brazilian tissue market in the next few years?

If we look at the market during 2011-2017, gross sales in Brazil averaged a growth rate of 10%, and Signori adds that during this period a very large influence of regulatory frameworks and inspection of the adequacy of offices, clinics, restaurants, shopping malls and other facilities increased the consumption of AfH papers. "On the other hand, a cultural change can be observed in the at-home behaviour and habits since the beginning of the pandemic, and this has included an increase in the use of products such as paper kitchen towels in their cleaning routines."

He emphasises that Mili is prepared for the consumption growth in the next three years: "We expect complex years ahead due to excess supply, reduced income and therefore demand due to pandemic problems. In any case, our perspective for an average market growth is of 6% per year."

"The strengthening of relationships with the company's current customers, the improvement and expansion of services associated with logistics, sales monitoring, the training of our field staff and the strengthening of the Mili brand image are our main strategies to maintain growth levels in the next five years of our strategic planning." OR

# IPEL GEARING UP TO RIDE THE ECONOMIC AND INDUSTRIAL RECOVERY

The hard-hit AfH sector is now back to pre-pandemic sales levels. Private label is structuring and professionalising while exports are targeted across South and Central America. IPEL's Commercial Director Luciana Dobuchak talks to TWM.

s recently as 2014, Brazilian tissue producer Indaial Papel Embalagens (IPEL) was almost solely targeting the AfH market, with 93% of its production going to the sector. Back then, the then Managing Director Juliano Silva told TWM during our visit to the company's Indaial plant in Santa Catarina state that: "If we'd stayed just in that market, we would be dead now. And so we diversified, it was the only way to survive. We couldn't put all our eggs in one basket, and it's made us more flexible and able to adjust and react quickly

to any customer's needs."

Fast-forward to 2021, and the company's business strategy has paid off more than it could have hoped for. The diversification of its product offering means it has been able to weather the Covid storm, and it now produces 45-55% for the consumer and 55-45% for the AfH. Within consumer, 25% of production is for private label products and 75% own label, whilst in the AfH market, 50% is for private label and 50% for its own label.

Its agility to react to changing market

demands over the years has also secured its future. Recent investments in the last two years include two Automatic interfolding line (V and Z fold) and the Crescent Former TM, and the Indaial plant now houses three tissue machines (two Crescent Former and one Fourdrinier) all with a width of 2.7m. Full capacity is 60,000tpy.

Converting lines for the AfH market include two Automatic interfolding line (V and Z fold), five rewinders and three Vacuum Pump interfolding line (V fold), and the company produces hand towel (V, Z and



**Above:** IPEL's Indaial plant in Santa Catarina state plans to grow its AfH offering in the next year, reaching the country's economic and industrial recovery; Commercial Director Luciana Dobuchak.

roll) single and double sheet, toilet paper single and double sheet, and interleaved toilet paper single and double sheet for this market.

Three Fabio Perini Automatic Rewinders are dedicated to consumer products, and the company produces toilet paper (single, double, triple and quadruple sheet), kitchen towels and napkins for this market.

Juliano Silva left the company in 2017. IPEL's most recent management appointment saw Luciano de Liz Barbosa become the new Chief Executive two months ago. Here, IPEL's Commercial Director Luciana Dobuchak, who has worked at the company for 15 years, talks to TWM about how its business strategies have meant the company is well placed to move forward.

# TWM/1: How has your growth strategy changed during the past 18 months?

"At the beginning of the pandemic, the consumer sector was positively impacted and there was growth in sales. In the AfH market, there was a decrease in sales, reaching 20% of the budget. This change in scenario required us to strengthen the consumer sector as the AfH market didn't return. The increase in sales in the consumer sector in March and April 2020 then reversed and began to reduce because

whole. Since then it has been very difficult to pass the costs on through sales price

"AT THE BEGINNING OF THE PANDEMIC, THE CONSUMER SECTOR WAS POSITIVELY IMPACTED AND THERE WAS GROWTH IN SALES. IN THE AFH MARKET, THERE WAS A DECREASE IN SALES, REACHING 20% OF THE BUDGET. THIS CHANGE IN SCENARIO REQUIRED US TO STRENGTHEN THE CONSUMER SECTOR AS THE AFH MARKET DIDN'T RETURN. THE INCREASE IN SALES IN THE CONSUMER SECTOR IN MARCH AND APRIL 2020 THEN REVERSED AND BEGAN TO REDUCE BECAUSE ALL SUPERMARKETS AND CASH AND CARRIES WERE FULLY STOCKED. THIS REMAINED UNTIL THE MONTH OF OCTOBER WHEN SALES IN BOTH SECTORS STARTED TO MOVE AGAIN."

all supermarkets and cash and carries were fully stocked. This remained until the month of October when sales in both sectors started to move again. However, in February 2021, with new lockdowns in the majority of cities, sales again began to fall. It was necessary to open up to new customers, expand geographic regions, and seek different markets.

"In 2021, we also still had to deal with the absurd increase cost in cellulose, reaching levels above 70% by the month of September. This effected the business as a because the market was reactive and the purchasing power of the population and companies very compromised."

# TWM/2:What are your plans for growth in 2022?

"Yes, we have plans for growth through the investments we have made in the last 24 months. There is a forecast of growth in the consumer sector and prospects for new regions in both AfH and consumer segments. During the next year we plan to grow our AfH offering, reaching the country's economic and industrial recovery. The consumer sector will receive new investments only in 2023.

"Exporting is also one of the strategies that we will reinforce, mainly in South and Central America."

#### TWM/3: Are there plans to diversify your product offering?

"No. In the following year we will consolidate the investments, mainly in AfH. That remains our focus."

#### TWM/4: Are environmental tissue products a key growth area for the business and the Brazilian public?

"IPEL is FSC-certified, and the environment is our base in our actions. We have been caring for the whole process.

"The Brazilian public shows favourable to green consumption, but they are generally not willing to pay more for environmentally-friendly products."

#### TWM/5: Following the impact of Covid-19 on the AfH market, what projections do you have for this sector?

"We believe that an economic and industrial recovery in Brazil can increase the AfH segment. This quarter, we are already reaching pre-pandemic sales levels, which shows that the segment will grow. We had a big impact in Q2 and Q3 2020 and Q1 2021 because of lockdowns and closures in the majority of cities. IPEL is a specialist in private label, and we are seeing sales continue to grow in this sector following increased popularity for private label products."

# TWM/6: What new trends are you seeing in the Brazilian private label market?

"Private label in Brazil is structuring and professionalising itself, mainly in the retail/consumer segment. Supermarkets have invested efforts and reinforced their strategy to improve the quality of their products, matching the quality of the market leader closer.

Larger distributors for the AfH market are structuring their business based on



Product diversification: The company now produces 45-55% for the consumer and 55-45% for the AfH sector.

#### "PRIVATE LABEL IN BRAZIL IS STRUCTURING AND PROFESSIONALISING ITSELF, MAINLY IN THE RETAIL/CONSUMER SEGMENT. SUPERMARKETS HAVE INVESTED EFFORTS AND REINFORCED THEIR STRATEGY TO IMPROVE THE QUALITY OF THEIR PRODUCTS, MATCHING THE QUALITY OF THE MARKET LEADER CLOSER."

their brands, and on the formation of buying groups in partnership with other distributors to increase bargaining power."

#### TWM/7: Gross sales in the Brazilian tissue market averaged growth of 10% between 2011–2017. Do you forecast that to continue?

"In general, the purchasing power of the population has had many losses in recent years, and this has a great effect on the country's retail/consumer segment. In Brazil, consumption growth is always closely linked to the economic situation of the population, unemployment, and also the generation of income for the population who don't have formal jobs. The pandemic also brought about a decline in purchasing power, making consumers look for more economical solutions with more affordable prices.

"I don't believe that consumption will grow at the same level as in previous years. We should have grown based on sales prices but that hasn't been the case as it is balanced with average consumption." ConsumerSpeak

# I REFUSED TO STOCKPILE ... BUT THEN WORD SWEPT THROUGH THE OFFICE THAT A LOCAL SUPERMARKET HAS JUST HAD A DELIVERY

UK freelance journalist Simon Creasey had to abandon his principles when he was down to the last roll at home, and joined the 'bun fight' in the aisles.



A t the start of the pandemic I refused to get involved in the stockpiling of toilet rolls (a shortage of kitchen roll was never really going to be an issue because you can use tea towels, whereas the only replacement for toilet rolls is newspapers!) I seem to have been a lone figure, with the shelves of my local supermarkets emptied before they could be restocked last spring. One day at the Waitrose near my workplace word got out that they

have just received a delivery of toilet roll so half of the office ran down the stairs to stock up before they sold out – people were literally taking them off of the metal container on the shop floor before the shop assistant could put them on the shelves. As our household was down to the last roll at the time I also joined the bun fight and bought a large nine roll multipack of luxury own label toilet paper, but I've still got eight of the rolls as it just wasn't as good as my usual brand – Andrex Skin Kind, which features a prebiotic lotion. My mum and dad always bought Andrex and I've continued to be loyal to the brand and particularly to the Skin Kind product. I even take a couple of rolls of it with me when I go away on holiday as overseas toilet roll just doesn't cut the mustard. However, getting hold of a pack of it these days is challenging. Not because people are still stockpiling toilet paper, but because one of the trends accelerated by the pandemic was the large supermarket chains reducing the number of SKUs they sell. They were already undertaking range reviews and rationalising

the number of products they stocked prior to the pandemic and it's a pattern that has continued. As a result, whereas previously I could buy a four pack of Andrex Skin Kind from my local Morrisons, Tesco and Sainsbury's, now only the latter stocks four packs. My local Morrisons doesn't stock the product at all now and the Tesco only sells large multipacks. When you walk down the aisles of supermarkets it's noticeable that they are stocking smaller ranges of branded goods across all product categories and they're bulking out the shelves with their own label products, which for me just don't cut it. I'm sure some people would have switched to own label toilet roll during the pandemic through necessity rather than choice and some may have decided to stick to own label due to the price differential – a distant relative of mine went crazy at the start of the pandemic buying tens of packs of own label roll that he stored in the loft - he is still wading through them today! I remain loyal to Andrex Skin Kind - when I manage to get my hands on it.



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# implemented Tissue projects



# BRAZILIAN EUCALYPTUS AND PINE PLANTED WOOD PRODUCTION: "THE INNOVATION DRIVERS OF BRAZILIAN PULP INDUSTRY"

By Marco Martins, Msc Science Forest and Chemical Engineering — Klabin's Customer Technical Service Manager, and Rodrigo Fantini, Msc Industrial Engineering — Klabin's Customer Technical Service Specialist.



Marco Martins Customer Technical Service Manager, Klabin



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oday, discussions about carbon footprint, renewable, recycling, nonwood fibre alternatives (such as straws, bagasse, bamboo, reeds and grasses), water consumption, etc, could be considered market drivers to reinforce the business models that have been developed and implemented by Brazilian pulp producers for over forty years.

The Brazilian pulp and paper industry has been offering a pulp product that has in mind the importance of tissue-maker quality and performance perception (optimisation in bulk, softness and tensile strength), cost competitiveness, frontedge of forest and production technology, with an intense work and continuous investment covering all governance matters, in particular environmental and social issues (ESG). There is room for all kind of pulps (from non-wood to recycled) in the tissue paper fibre furnish composition, but it is essential to have in mind the sustainable principles and concept of global environmental demands. That is the reason for the historic success of eucalyptus and, more recently, pine pulps produced in Brazil.

#### Introduction

In the early 70's, Borregaard formerly open the international pulp markets to the eucalyptus wood planted on Brazilian soil. Historically, this raw material was developed and well known for its pulp characteristics by domestic producer Suzano at least twenty years earlier.

Companies, such as Klabin/Riocell/ Bacell, Aracruz, Suzano, Jari, VCP, Lwarcel, and Cenibra, were responsible for showing the benefits of this new fibre to the world's paper industry. In the beginning of this marketing strategy, the technical expertise was focused on optimising the performance of eucalyptus pulp for the printing and writing segments. Technical agreements with global tissue manufacturers have mainly reinforced the advantage of tactile softness and the substitution of long fibre in the tissue paper's fibre composition.

Five decades later and we can see the use of Brazilian eucalyptus fibre spread across a wide range of paper segments, as well as in pulp derivatives. Eucalyptus pulps correspond to almost one third of all global market pulp, and is still growing significantly in Latin America.

Figure 1 illustrates a comparison of market pulp capacity from 1990 to 2020 (Fastmarkets RISI, 2021). In line with this movement, it shows the eucalyptus expansion in Brazil, while Figure 2 shows the current Brazilian pulp production (IBÁ,2020 – Tree Brazilian Industry – Indústria Brasileira de Árvores).

## Is there a business and technical formula for the global acceptance?

There is. The answer could be represented by some strategic pillars, such as: innovation in tree breeding and forest management, Industry 4.0, R&D and product quality, ESG/sustainability, forest and products certifications, technical services and suppliers partnership. As a result, the papermaker has been receiving a very stable and homogeneous product on top of the agreed pulp quality properties.

#### Tree breeding and forest management

Based on productivity and competitiveness, Brazilian pulp producers have been working on evaluating each eucalyptus species (grandis, urophylla, dunnii, saligna, etc) on their behaviour in soil and climate, pest resistance, fibre morphology, and many other wood characteristics.

This long-term forest innovation process has as a base line the commitment to combine and align the eucalyptus wood properties with the best practices in forest management, industrial processes optimisation and paper application, which has resulted in clones responsible for improving more than double the productivity over the past 50 years, reaching figures closer to 50 m<sup>3</sup>/ha.year in the current market, and with a clear new path throughout this decade.

When analysing forest productivity in different countries and regions, due to scientific work and techniques, as well as soil and climate, Brazil is among the most competitive in the world.

Brazil's wood scientists work with a varietal mindset, searching for the best fibre and clones properties assemblage to optimise the papermaking operations. That is a rule to make homogeneous and very competitive eucalyptus forest plantation. As a consequence, the very balanced wood chips density in the target range allows a better control and uniformity of pulping conditions, such as: temperature, white liquor composition and kappa number (lignin correlation).

The cooking process stability is also important for the remaining bleaching, pulp sheet formation and drying operations. Therefore, despite the huge change in the daily production increase in recent years, the off-specs material was also substantially reduced to levels below 0.5% mainly due to the combination of wood quality supply, chips dimensions and pulping process control.

FSC (FSC-C001941), PEFC and other forest certifications confirmation the benefits of working in partnership and respecting neighbouring communities, sharing forest knowledge and bringing new logistics software to upgrade living standards, can reduce negative impacts of wood and product transportation. Moreover, they help maintain a balance with the natural and planted forest through mosaic pathways, protecting fauna and flora, preserving river springs and creating green corridors. Klabin Mosaic Strategy was the first company in the pulp and paper sector in the Southern Hemisphere to obtain FSC in 1998.

These are clear examples of an industry committed to sustainability at all stages of the supply chain.

### Industry 4.0, and more artificial intelligence to come ...

From the single mill line of 200,000tpy capacity in the 1970s to close to 1,400,000tpy in 2021, there is significant industrial advancement in all aspects covering equipment, technology, environmental legislation, and product application.

Nevertheless, there is no doubt that this production capacity increase could only be achieved with the technicians' continuous







BRAZIL'S WOOD SCIENTISTS WORK WITH A VARIETAL MINDSET, SEARCHING FOR THE BEST FIBRE AND CLONES PROPERTIES ASSEMBLAGE TO OPTIMISE THE PAPERMAKING OPERATIONS. AS A CONSEQUENCE, THE VERY BALANCED WOOD CHIPS DENSITY IN THE TARGET RANGE ALLOWS A BETTER CONTROL AND UNIFORMITY OF PULPING CONDITIONS, SUCH AS: TEMPERATURE, WHITE LIQUOR COMPOSITION AND KAPPA NUMBER (LIGNIN CORRELATION).



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Fibre Length [L] (mi	n) Coarseness (mg/100m)	Population (Million/g)
0.8 ± 0.1	7.0 ± 1.0	18 ± 2
Table 1: Tvi	nical Brazilian Eucalvptus Fiber Morpholoa	v – Fibre Lenath. coarseness and populati

Brightness	Dirtness (mm²/kg)	Intrinsic Viscosity (dm³/kg)
≥ 88.5	≤ 3.0	≥ 650

<sup>3</sup>Typical figures – mutual agreement defines minimum and maximum pulp properties

Eucalyptus pulp samples lab evaluation - PFI Refiner at 500 revolutions<sup>4</sup>

	Drainability (°SR)	Tensile Index (N.m/g)	Bulk (dm³∕kg)	Gurley permeabilit y (s/dL)
Average	24	35.7	1.72	2.0
Standard Deviation	1.3	2.1	0.05	0.8
Minimum	22	33.7	1.66	1.3
Maximum	25	38.6	1.77	3

 Table 2: Typical BEKP (bleached eucalyptus kraft pulp) properties for general tissue application<sup>3</sup>



learning, support of technology and process automation in all pulping, bleaching, recovery, causticising, energy and logistical processes. It is essential to outstanding the role of companies like Andritz, Voith, Valmet, Siemens and their partnerships with Brazilian professionals that could achieve this new level of capacity while improving the pulp quality profile and environmental performance.

In addition to production profile growth along the years, we could also see the elimination of elemental chlorine in the bleaching stages and anthraquinone in the pulping process; the introduction of

Figure 4: Klabin Technology Centre Source: Klabin (2021).

oxygen compounds as chemical agents, technologies to upgrade cooking and drying machines, as well as a permanent implementation of process control automation and artificial intelligence.

The introduction of a second reactor of oxygen delignification brought also more selectivity to remove the lignin components and a positive increase of the hemicellulose content. Moreover, enhancing the average pulp viscosity as well as improving the final product characteristics homogeneity. In terms of papermaking, there are positive gains noticed and measured in the Brazilian market pulps, such as very tight variation level of brightness, higher strength properties and a complete alignment with the paper reference specification.

#### **R&D and product quality**

In the last two decades of the 20th century, the Brazilian eucalyptus market pulp producers have concentrated their R&D on forest productivity, as well as developing technical articles and visits to demonstrate the paper benefits and correct applications of eucalyptus fibres in paper manufacturing.

Klabin/Riocell (partnership with Beloit) and Aracruz developed refining pilot plants to support many studies to check the pulp performance at different SEL (Specific Edge Loads) as well as the correct refiner settings to evaluate single pulps or blends of fibres. Later, Voith installed a complex tissue mill facility in São Paulo that has been very helpful to pulp and tissue producers.

In recent years, with new capacities and players in Brazil, there has been intense R&D work by the main pulp producers such as Klabin, Cenibra, Eldorado and Suzano, investing in lab equipment, pilot plants, technology centres and people-learning related to new paths of business innovation to the corporations.

The focus on nanotechnologies, such as MFC (microfibrillated cellulose), has been an important new target to cover potential demands of the packaging and tissue segments, and a reason why Klabin invested and installed a pilot plant with a 1,000 kg/day capacity.

There are already many studies/ investigations developed by some international institutes such as North Carolina State University and the University of Maine, covering the benefits of the MFC. New doors will potentially open to Klabin and the Brazilian market pulp competitors to develop new technical and commercial strategies on this field.

Klabin has been also conducting extensive research in the uses of lignin in their pilot plant, focusing on the development of sustainable technologies and applications such as resins, fibreboards, plywood and abrasives; in plastics, by increasing the percentage of renewable raw materials; and in carbon fibre, by replacing the use of fossil-based materials. The wide base of different wood species processed at the mills gives a great opportunity to be a future producer of both softwood and hardwood lignin in South America.

On top of that, since the beginning

of the 90's the Brazilian pulp industry has been working hard on a quality continuous programme based on improving process conditions to enhance product homogeneity at higher specification level. This has been characterised by many actions on implementing new quality systems (on top of ISO 9000 and 14000) and environmental requirements (ISO 50000, ISO 45000, SMETA, Ecolabel, EU Flower Label, Nordic Swan, LifeCycle, etc).

#### ESG – Environment, Sustainability, Governance

The current ESG's trend in the global industry could be considered a standard rule for the Brazilian market pulp industry in over 50 years, since the famous Borregaard's pollution episode in 1973.

In memory of Brazilian environmentalist Jose Lutzenberger's green environmental model and life concepts, the Brazilian pulp industry developed its own ESG business handbook so it could be ahead of the market when using technology to treat and to prevent in all fields (carbon footprint, water and wastewater reduction, greenhouse emissions, specific raw materials and energy, consumptions, etc), as well as implementing the circular economy business concept, among other management actions. On top of that, significant work is being done with all neighbourhood communities, creating and sharing values through social sustainability pillars. That is the main reason there is a growing industry in a market/consumer awareness that demands new environmental, social and governance attitudes and responsibilities along all product life cycle.

The Klabin Agenda 2030 (KSDG - Klabin Sustainable Development Goals) prioritises ESG themes aligned to the company's growth plan, and says: "The strategic goals enshrined in the KODS are the responsibility of all Klabin's areas and units and were designed to create value for all stakeholders (biodiversity, communities, employees, business partners) in line with the United Nations Sustainable Development Goals". In 2021, Klabin also launched a panel on its website with all the company's ESG KPIs, where it is possible to observe the evolution of the 23 goals (KODS) to be achieved by 2030.

#### **Customer technical services**

Technical services are not restricted to just technical assistance, but with the customer satisfaction cycle from performance to product development. That is the business strategy that over the decades has been managed by the Brazilian bleached eucalyptus market pulp companies to overcome initial technical restrictions to a new fibre in the late 1970's, selling not only a cost competitive product but adding value to the different paper segments.

Since the 1980s and 1990s, pulp manufacturers such as Riocell and Aracruz have had pilot refining plants in their facilities to evaluate the performance of fibres and establish co-relationships with the properties of the producers of papers using their pulps. "This example of refining pilot plant is equipped with a single disk refiner (12-inch diameter) with an automatic system to assure a positive pressure inside the refiner. The refiner can be operated at different rotational speeds. Pulp flow through the refiner is controlled by a positive displacement pump and can be changed to allow different of net energy application. It is possible to run both single and multiple-passes under nominal consistencies from 2.0 up to 6.0 % (MANFREDI, 2006)."

Klabin's technical services area has been consistently seeking actions that aim to make a difference in the pulp market with customers, carrying out customised technical workshops for customers, guided technical visits by cross-functional teams, shared development projects and the search for technical synergies.

#### Supplier's partnership

The importance of the supplier's chain partnership has been vital to our industry, involving raw materials/inputs, technology, process performance and innovation, among other fields. Nowadays, the refiners have disks designed to work with eucalyptus fibre (Figure 5 and Figure 6), reducing eventual problems with vessel elements and/or fibre cutting. This is thanks to some players and their expertise on disk refining design, such as Voith, Valmet, Andritz, AFT Finebar and Calpher, companies that have developed refining plates with low refining intensity.

The art of producing different papers has already involved adjusted formulas to control process conditions related to the specificity of the eucalyptus pulp raw material (disintegration time, consistency in the hydrapulper, join or separated refining, fibre composition proportion, pulp supplier characteristics, etc). For example, Valmet's tissue pilot plant in Sweden can carry out a series of setups referring to the newest technologies available and existing raw materials from pulp, and all this in a real way similar to industrial plants.

R&D programmes involving chemical suppliers develop chemical optimisation to operate with eucalyptus fibre in the papermaking operation, keeping the control of the wet and dry areas (zeta potential, conductivity, fines, dust, etc) as well as in the converting area of tissue makers. That is a result of an integration synergy from pulp producers and equipment/chemical suppliers, providing papermakers with the business support and technical expertise needed to make Brazilian eucalyptus pulp an important player in their fibre composition.

# Eucalyptus' future on tissue and other paper grades

The entire pulp and paper cycle synergism was obtained due to a global chain of supply, companies partnerships, and product development focused on customer feedback. This has enabled Brazilian eucalyptus players to produce a very homogeneous eucalyptus fibre as well as a top-quality pulp profile over the past 50 years.

Amongst the Brazilian pulp players, there are slight differences mainly associated with wood profile (age, climate, soil, region, species, clones, density, etc) and production technology (cooking mill process, chemicals, bleaching sequence, etc). However, lab pulp samples cross-check (benchmark studies) show that they are within a specific narrow range that enable papermakers to use most of their pulp in different fibre formulas without significant

THE KLABIN AGENDA 2030 (KSDG – KLABIN SUSTAINABLE DEVELOPMENT GOALS) PRIORITISES ESG THEMES ALIGNED TO THE COMPANY'S GROWTH PLAN. IN 2021, KLABIN ALSO LAUNCHED A PANEL ON ITS WEBSITE WITH ALL THE COMPANY'S ESG KPIS, WHERE IT IS POSSIBLE TO OBSERVE THE EVOLUTION OF THE 23 GOALS (KODS) TO BE ACHIEVED BY 2030.



Figure 5: Finebar Minisegments™ - ultra low intensity, Source: AFT(2021).

impact on their process.

The eucalyptus suppliers pulp properties differences are much narrower in the low drainability refining, which characterise the tissue production (Figure 7 and 8). Its combination with a very homogeneous fibre anatomic distribution and a product specification that mitigates the negative potential impacts that pulping and bleaching process variation bring and enhance papermaking stability. It is essential to mention that this statement doesn't take into consideration any future studies developed by one or more eucalyptus pulp suppliers that could launch a product with optimised characteristics into the tissue segment, such as softness or strength improvement. So far, the homogeneity properties obtained from the forest to the drying machine enable the use



Figure 6: Optimised refining disc to Eucalyptus fibre - PluralisTM Source: Voith (2021)

of one or another Brazilian pulp supplier with some slight process adjustments, whenever is necessary.

# From now on, what will come next in eucalyptus fibres?

By aiming to replace part or all of the use of long fibre, there is demand coming from the tissue market for a higher strength eucalyptus pulp, without losing tactile softness, and other paper segments looking for a significant reduction on refining energy. There are already some patents working with enzymes and starch, among other components, to increase the eucalyptus strength properties (mainly tensile), but with relative little success so far. It looks that the MFC (microfibrillated cellulose) and nanocellulose solutions could be the right path to cover this market, but still need to reduce cost and increase the technical information to be communicated to the tissue makers.

# The Brazilian contribution to the long fibre pulp development

The Puma project implemented by Klabin in 2016 aims to cover the main needs of the paper and absorbent hygienic products had as objective to offer complete fibre solutions: eucalyptus and pine pulp in bales as well as fluff pulp (reels). It currently produces around 1.15 million tonnes of eucalyptus and 0.45 million tonnes of pine market pulps to the tissue and other paper markets as well as fluff pulp to hygienic and absorbent products. We offer ECF (Elemental Chlorine Free) pulp grades to the tissue market. There are also some products under developments covering TCF (Total Chlorine Free/ semi-bleached), wire free bales (paper strapping), single use plastic substitution, MFC as a strength additive, as well as new techniques on tree breeding such as somatic embryogenesis, genomic wide selection, chromosomic duplication focusing on long-term wood productivity.

Klabin has been working on pine tree seedling for more than 70 years, reaching a high standard of fibre homogeneity to create a market pulp (brand name PineCel) that fulfills the quality requests of the packaging, fibrocement, specialties (filter, label, adhesive, decor, currency, etc) and tissue papers. Due to its fertile soils and

40

#### Bulk



Figure 7 and 8: Typical Brazilian Eucalyptus Pulp Producers Benchmarking – Physical properties Source: Klabin Quality Control Laboratory (2021)

#### Tensile Index

favourable climate, Brazil has a higher forest pine productivity compared to other countries/regions, as shown in Figure 9.

The main species planted by Klabin are loblolly and slash pines, and the business concept is focused on fulling the market pulp demand instead of wood application. As a consequence, there is very homogenous plantation and fibre morphology, enabling a market strategy quite similar to the radiate pine developed by the Chileans.

In our woodpulp market perspective, it is quite clear that the Brazilian pine could be in the same commercial and technical range reference in comparison with the radiata pulp producers, when we are considering business pillars, forest and fibre homogeneity, as well as pulp properties/ applications. In general terms, taking into consideration a comparative evaluation with the USA Southern Pine, the Brazilian Pine has a more homogeneous fibre anatomic distribution and a quite similar technical performance in the absorbent product segments, such as fluff pulp.

The current experience shows that the use of 20-30% of Brazilian pine in the tissue brings benefits to the paper production process (machine speed) as well as to paper strength properties (tensile, burst and tear index).

#### **Final comments**

Brazilian market pulp producers are completely committed to the long-term sustainability, competitiveness and innovation business drivers, not as a current trend, but as a historic way of seeing the consumer market since the 70's. Based on those principles, we have invested on continuous quality improvement, Industry 4.0, nanocellulose and lignin products, green energy, biomass, effluent and CO2 reduction, as well as capacity optimisation (debottlenecks) and expansion (greenfield mills).

At the same time, we are also focused on the short term, implementing internal and open innovation through domestic and international partnership covering a broad spectrum from the forest to the final product. As a result, in our opinion this decade should be characterised as a new path to our Brazilian industry, reinforcing its importance and leadership in the global tissue scenario as well as other paper segments and cellulose derivatives.

Fibre	Fibre Length [W] (mm)	Coarseness (mg/100m)	Population (million fibres/g)	Fibre Width (µm)	Cell Wall Thickness (µm)
Klabin PineCel	2.86	25.5	6.62	26.13	8.30
Pinus radiata	2.60	25.3	6.05	24.88	9.75

 Table 3: Randon pulp samples (2021)- Fibre morphology. Klabin long fibre x Radiata Pine

#### PFI refiner (4.000 revolution)

Fibre	Drainability (°SR)	Tensile Index (N.m/g)	Bulk (dm³∕kg)	Burst Index (kPa.m²/g)	Tear Index (mN.m²∕g)
Klabin PineCel	18	71	1.7	6.5	12.5
Pinus radiata	18	77	1.6	6.1	11.2

Table 4: Main physical-mechanical properties (2021). Klabin long fibre x Radiata Pine



Figure 9: Pinus productivity by key regions/countries. \* Except Klabin Source: IBÁ (2019)

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# PULP FACT .... 'LESS IS MORE' IN THE SEARCH FOR COST, RESOURCE AND ENERGY EFFICIENCY

The new business logic demands a comprehensive cost-effective audit of high-quality raw materials, base paper furnishes, advanced production processes and a steadily smaller load on the environment. By Tom Nickull, Vice President in charge of technical customer service, Metsä Fibre



Tom Nickull Vice President in charge of technical customer service, Metsä Fibre

Sustainability, high-quality and raw material savings - these are the crucial principles needed to help customers adopt cleaner, more sustainable and more cost-effective production processes.

Metsä Fibre's strategic objective is to produce high-quality products sustainably and to form partnerships that produce significant value to customers. The goal is to ensure that customers can use pulp as efficiently and sustainably as possible.

This means high-quality raw materials, base paper furnishes that are as costeffective as possible, advanced production processes and a steadily smaller load on the environment. Business logic has taken on a whole new direction over the years. In the past, the only goal was to maximise the volume of pulp sold, but now customers are helped to achieve cost, resource and energy efficiency. 'Less is more' really is an apt catchphrase in this respect. To fulfil our aims, we must provide a lot more than just raw material deliveries - customers are now seeking to save as much water, energy and raw materials as possible."

### Higher quality with fibre comparisons and simulation

Pulp comparisons and base paper structural simulations are the first steps

in technical added-value services. They are based on databases and simulation software used to compare different fibre pulp grades and their properties, as well as to assess the impact of changes on the properties of end products.

Tissue customers often look for softness, smoothness or strength for their products, such as kitchen towels. Based on these criteria, we work with the customer to find the best possible fibre combination. Simulation is usually followed by pulp refining audits and they provide a deeper analysis of fibre grades, resource efficiency and processes that save raw materials.

Simulations indicate the starting point for changes. Refining audits show everything that needs to be adjusted in the processes before the changes can be implemented on the production line. For example, an inefficient refining process that consumes a lot of energy can easily cause problems in other parts of the production process. This reduces the efficiency of



A steadily smaller load on the environment: Metsä Fibre's Äänekoski bioproduct mill



# **SPEED?** AHEAD.

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Wet pulp: Each fibre type requires a different kind of processing

machines, as well as material efficiency. Each fibre type requires a different kind of processing, and when this has been sorted out, everything else will also fall into place. Customers no longer have time for long test runs or unnecessary shutdowns.

Pulp refining is a process stage that rarely receives enough attention. Maximising the performance of pulp fibre is one of the basic tasks for Metsä Fibre.

For example, if refiner fillings are not replaced frequently enough or if the filling is not suitable for the fibre type, this has a direct impact on the resource and energy efficiency of production. It can lead to extra costs of as much as half a million euros annually.

# Audits shape the entire production process

The Fines Management Audit is the latest addition to Metsä Fibre's customer service range. It goes even deeper into the customers' production processes. In this service, we study water fractions and pulp fractions to determine how different fibres and fibre processing affect the customer's water balance and water quality. They have a very great impact on the entire process, material loss, emissions and even safety at work.

If the management of fines on a tissue

paper machine is inadequate, for example, dust and impurities will accumulate in the production process. This can cause various productivity problems and even dust explosions in the worst case. Fines also load wastewater.

### Detailed report with improvement proposals

Pulp and water balances are surveyed with extensive sampling. When these data are combined with simulation and refining data, fibre treatment and costs can be optimised more accurately and comprehensively.

The changes that are proposed are based on elaborate analyses. The customer receives a detailed report on the present state of its paper or paperboard machine along with proposals for improving it. Typical development proposals include enhancing the use of retention agents, improving the management of extractives, assessing or modifying the refining method or changing the type of fibre.

The potential savings are also important. For example, if the retention of fines can be enhanced by 20%, this leads to annual savings running into hundreds of thousands of euros. When customers are in better control of the production process, efficiency also improves as a result of fewer disruptions and longer maintenance intervals. This is a service that other pulp producers do not offer. Audits and development projects have been eye-opening to customers. Closedloop machines call for an improved retention of fines.

### Customers benefit from the fibre supplier's expertise

Technical customer service has given Metsä Fibre a more consultative role. It is not only the machines, chemicals and raw materials that must work well. We also need good personal chemistry because the customer ultimately decides whether to follow our recommendations. A responsible company image is really important in a consumer market such as tissue paper.

When should one consider expanding cooperation? Recurring downtime, as well as problems related to the efficiency, cleanliness and dust of machine lines are often good reasons. Customers can also turn to us if they want to develop new products or if the strength of their end product is not satisfactory, for whatever reason.

This article was written for TWM by Tom Nickull, Vice President in charge of technical customer service, Metsä Fibre. EI

# ECO TRENDS: THE SUSTAINABLE PRODUCT THAT CLAIMS TO HAVE TRANSFORMED AN ENTIRE COMPANY

After launching the first Brazilian toilet paper with a 100% sustainable life cycle in 2020, Copapa announces that this was just the beginning of its journey. Fernanda Accorsi, founder, Accorsi Marketing Solutions, reports for TWM.



Above: Carinho EcoGreen's launch in January 2020. Fernando Pinheiro, President of Copapa, addresses the audience,



**Fernanda Accorsi** Founder, Accorsi Marketing Solutions

Sustainability is a constant evolution. This was reaffirmed by Jairo Almeida, the industrial director of Brazilian tissue manufacturer Companhia Paduana de Papéis (Copapa), which launched its first 100% sustainable life cycle toilet paper SKU in Brazil in 2020.

Carinho EcoGreen was created to be unpretentious, although it carries with it great expectations of opening the doors of the industry to products with more ecologically responsible production and supply chains.

The use of the word unpretentious means

that Copapa understands the challenges that a sustainable product can face in Brazil. A company that decides to conduct this kind of innovation should be prepared to help customers in the transition to more conscious behaviour during the purchase process. Saying that, the adoption of such a product can naturally be slow, but in this case it was intensified by the global recession brought on by the Covid-19 pandemic, which directed shoppers in this category to lower-priced SKUs.

A force-majeure situation such as this can bring with it a scenario of short-term

CARINHO ECOGREEN WAS CREATED TO BE UNPRETENTIOUS, ALTHOUGH IT CARRIES WITH IT GREAT EXPECTATIONS OF OPENING THE DOORS OF THE INDUSTRY TO PRODUCTS WITH MORE ECOLOGICALLY RESPONSIBLE PRODUCTION AND SUPPLY CHAINS.



**Above:** Members of waste collection cooperatives, supported by Copapa, sorting waste materials.

uncertainties, but who says the company is only looking at the now? Even with so many adversities and changes felt in the customers' product basket, the Brazilian company announces that this is only the beginning of its journey.

### The commitment to generate a positive impact

Copapa occupies the 10th position on the Brazilian production rank, with an installed capacity of 58,000tpy. It was founded in 1960 and is located in the northwest of the state of Rio de Janeiro, where it has always exercised its regional protagonism, leveraging actions that sought to improve the region's infrastructure.

To celebrate its 60th anniversary, the company creates its Copapa 60+ programme, with which it reinforces its commitment to accelerate the transition to becoming a more sustainable company by uniting all its internal and external initiatives under this single and broad umbrella, contributing to more efficient management of all indicators.

Moreover, the creation of the programme was an opportunity to focus on its solutions and address the UN's sustainable development goals (SDGs) in an organised way, and to also ensure that sustainability was placed at the centre of their decisions. While some companies find excuses not to address sustainability, Copapa shows that any - and all - companies, regardless of their size, segment, investment capacity, COPAPA HAS COMMITTED ITSELF TO SEVERAL STRUCTURAL CHANGES IN TERMS OF GOVERNANCE, COMPANY, AND BRAND POSITIONING. IT HAS Rethought and acted to bring significant improvements to all stakeholders and the community.

and location, can renew themselves and innovate, if they commit to a strategic business positioning focused on social, economic, and environmental transformation.

During our conversation, Almeida says that for a national player such as Copapa, making big changes in its processes is challenging because it does not have the same financial strength and margins as a multinational, which can eventually revert these margins into secondary actions. Even so, Copapa has committed itself to several structural changes in terms of governance, company, and brand positioning. It has rethought and acted to bring significant improvements to all stakeholders and the community.

### Carinho EcoGreen — A product with a cause

Carinho EcoGreen's creation required many partnerships and a systemic look throughout its process. It was born from the company's aim to become a reference for sustainable products, and it materialised after 11 years and R\$57m (U\$10.4m) of investment in machinery and research. Together with its main suppliers, Copapa has accelerated the development of chemical products and inputs that have not yet been developed in the domestic market.

In terms of product, it is currently manufactured with 100% FSC-certified virgin fibres. When asked why the company didn't use recycled fibres, Almeida says that according to the LCA conducted by the company, virgin fibre allows for greater biodegradability (for now), and in the production process it consumes 70% less water and 50% less energy than recycled fibre, which still requires a high complexity in cleaning and purification processes in Brazil. Almeida says that future aims are to find ways of using recycled fibres.

The product's roll was designed in partnership with Incape, so that it dissolves more easily. Its glue is made from cassava starch so that it can absorb as much water as possible and thus dissolve more easily, facilitating the recycling and composting processes.

Both plastic packages were developed to be compostable or recyclable. The primary packaging that wraps the product

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was developed by BASF and Almeida says it is the first in the tissue industry that is produced from polylactic acid (PLA) obtained from renewable corn-based raw materials. It is, he says, 100% compostable, and becomes fertiliser in up to 180 days when disposed of together with organic waste in controlled composting processes.

The secondary packaging that ends up at the stores bear Braskem's "I'm Green" stamp, and the resin comes from sugar cane. To ensure the recycling ability of these packages, Copapa is associated with the NGO "Dê a Mão para o Futuro" and its Reverse Logistics Packaging programme, collecting these packages directly at the points of sale.

It is necessary to highlight the social returns that go hand in hand with so many metrics of environmental gains, starting with the construction of a sustainable culture among its employees, implementing workshops that emphasise good socio-environmental practices in the daily routine of each employee. In addition, we see the social benefits of the programmes carried out in collaboration with the waste collection cooperatives, which generate income for their members, as well as financial, environmental, and health education.

### A circular industrial manufacturing process

Almeida says the product is "not another greenwashing item in the market" since its production has reached certain important metrics: "The product itself is the result of several actions taken internally in the factory, as well as its gains. Water, energy, and effluent cycles have all been addressed, and the transformation demonstrates that by adopting circular economy measures in an industrial manufacturing process, we can also achieve significant economic gains."

Carinho EcoGreen is produced on a machine that does not use fossil fuel to dry the paper. Almeida explains: "Instead of a gas complement, our process uses steam generated from the biomass of the furniture industry", a by-product turned into feedstock. This process has reduced the company's greenhouse gas emissions by 90%, and has brought the company savings equivalent to \$20,800 a month.

Almeida adds that the remaining emissions (from production and distribution) are neutralised by the company with its "Parnapádua" Programme, which promotes the restoration of an



Above: Corn-based raw materials: Copapa's Jairo Almeida says Carinho EcoGreen's primary packaging is 100% compostable

Atlantic Forest area by planting nearly 5,000 seedlings of 30 native species of this biome. The project promises to regenerate the soil and recover the biodiversity of the area.

The industrial residues project was redesigned with the collaboration of the "Federal Norte Fluminense University". Today 100% of the paper fibre still generated, which is a residual byproduct, is destined for potteries in the region for the production of "red ceramics" that will be transformed into bricks for the construction sector. As an internal metric, all Copapa's construction works from now on are made with this brick.

As for the water cycle, the company closed its circuit to reuse this resource within its production process and adopted chemical products that guarantee the least impact to the environment (according to ABNT Brazilian norms).

#### This is the first step, not the definitive one

Every product is evolutionary, and Almeida states this point more than once: "This SKU is not our end, but our means." Despite the short time of launch and the challenges brought by the Covid-19 pandemic, the product today is already present in 1,200 points of sale, and the business also has a collaboration with the "Mundial" supermarket chain, a leader in the state of Rio de Janeiro.

There is still a great challenge in Brazil for the introduction of products like this on supermarket shelves due to the lack of openness on the part of retailers and of information on the part of consumers, who despite having a favourable discourse for more sustainable options, still do not show this priority in their final purchasing decision.

We still need to understand the best formula to communicate the benefits of a product like this so that the shopper can assimilate them more easily and then make a more informed purchase. Almeida mentions the possibility of working with the model of "nutritional tables" that we see in the food products, for example, and that would indicate factors such as CO2 reductions/energy gains/amount of plastic and chemical materials/social impact.

In just one year of life, Carinho EcoGreen already represents almost 2% of the company's portfolio. And now, with an adapted production process, a large part of its portfolio is already produced in a more ecologically responsible way. The product represents the first step, but certainly a step with no turning back. Copapa announces that this was just the beginning of its journey, and there are even more innovative products to be launched soon.



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