

TWM

TISSUE WORLD MAGAZINE

The independent news
provider for the global
tissue business

GERMANY

IS THE PANDEMIC CHANGING THE CLASSIC MATURE MARKET?

Longer term trends may see production moving to smaller scale, local to consumers, on a transport efficient personal care model.

Plus ...

MarketIssues

Consumer behaviour is changing dramatically – but which trends will last?

ExitIssues

TM orders on an unprecedented scale

Converting: Technical Theme

Leading companies outline their advances in technology

Distribution: Special Feature

Why multi-tasking LGV beats automated mobile robots

ConsumerSpeak

'A really rather amazing product. I mean, it's come all the way from being a tree.'

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'A project that could change the course of the tissue industry's future' - Donato Giorgio, Essity's President Global Supply Chain, discusses integrated wheat straw production in Mannheim, Germany

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Cover: An infographic representing transformation and opportunities such as the circular economy which are currently underway in German's mature tissue market. Image by Contrast Creative, Manchester, UK.



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HOW THE 'NEXT NORMAL' TISSUE LANDSCAPE BEGINS TO TAKE SHAPE

Helen Morris

Senior Editor, Tissue World Magazine

We need look no further for a classic example of a mature tissue market than Germany. A tissue pioneer, these days year-on-year registering slow but steady growth, its consumers demanding quality, and demanding quality from its private label trailblazers who now have 87% of the home market.

It is home to many leading tissue companies trading in various sectors across the world, all built on a steadily dynamic national economy which leads in the EU and ranks fifth in the world.

Then came the pandemic.

The upheavals of 2020 and 2021 have dipped and spiked on tissue performance charts everywhere - reported thoroughly in these pages – and Germany has been no exception.

A 2% value CAGR 2006-2019 suddenly became a 12% spike in total retail sales. Very high levels of household penetration meant that the standard consumer reaction to the new reality ... home seclusion, fear of the unknown, supply anxiety, stockpiling ... had a more pronounced effect. Tissue – 12% more of it than for decades – became an agent of security.

This edition of TWM explores the question everyone wants answered: what will the new consumer market look like?

It is beginning to come clearer. We get an extensive idea from in-depth Country Report analyses, and interviews with leading company executives.

Strong incentives are driving change - sustainability, energy sources, integration, e-commerce, digitalisation, circularity, advanced training of personnel – and more. And also emerging new trends: the move towards localisation, the need for tissue production to be more similar to personal care production, smaller scale, local, affordable and energy efficient; organic growth involving a move towards producing closely to where customers are located, minimising transportation costs.

We hear of the concept of the agile sprint, the rapid flexible response to need which has been well rehearsed during the pandemic response. Being the most sustainable and agile first-class partner for personal and professional hygiene solutions.

We hear of new attempts to explore and increase the use of agricultural waste – in this case wheat straw – at a Mannheim mill. A source explored before in China and North America, but here uniquely is the first integrated modern tissue plant to convert straw pulp onsite, and on a scale of 35,000tpy. The wheat straw has been sourced from agricultural land.

One of the most traditional tissue markets, already changing the story with private label, is innovation hungry.

How quickly the industry has had to change

Executives at leading converting machinery suppliers highlight achieved - and expected - advances ahead in TWM's annual Converting: Technical Theme.

The past year has shown how quickly consumption of certain products has been affected globally by external factors. How many tissue producers with lines dedicated to AfH products were forced to stop them or limit production?

The fiscal year that ended 4 October 2020 saw a growth of 22.3% in the turnover of private label toilet paper compared to 14.4% for national brands: functionality and cost are key drivers.

Already underway is another pandemic-inspired trend towards 'all in one lines,' a real swing line capable of converting toilet paper, kitchen towel and AfH products quickly and easily, not just within smaller to medium sized operations, but with the potential for big volume too.

HAS THE PANDEMIC CHANGED CUSTOMER BEHAVIOUR PERMANENTLY IN TISSUE?

As we start to emerge from Covid-19, many aspects of people's lives are being transformed. McKinsey & Company's Oskar Lingqvist, Gregory Vainberg, Daniel Nordigarden and Emily Roeper discuss how ways to serve customers are changing fundamentally, and what this means for tissue companies in the post-pandemic world.



Oskar Lingqvist
Senior Partner



Gregory Vainberg
Senior Partner



Daniel Nordigarden
Partner



Emily Roeper
Analyst

Covid-19 resulted in a shock to consumer demand that sets it apart from past downturns because of the speed and scale of the decline. The pandemic has had a dramatic impact on global consumer behaviour across many areas of life that goes beyond the well-documented switch to remote work, virtual learning, telemedicine, and the associated significant reduction in travel. We are seeing a real shift in purchasing behaviours in the context of digital engagement and brand loyalty:

- Step-change increase in online shopping. In the US, online spending has seen unprecedented growth with a 35% year-on-year rise over the 12 months to January 2021 (via credit and debit card spend). In particular, online shopping for groceries has increased more than 40%, driving strong acceleration of e-commerce shipments. This trend is the same in all major countries.
- Shift from brand loyalty to value. Three quarters of Americans claim to have changed their shopping behaviour since Covid-19 began; of these, around 40% say they have switched brands. A similar pattern has been recorded in Europe with 27% of consumers having tried new brands since the onset of the pandemic and with over 80% intending to stick with the change. In both regions, value is the main driver for switching.

THREE QUARTERS OF AMERICANS CLAIM TO HAVE CHANGED THEIR SHOPPING BEHAVIOUR SINCE COVID-19 BEGAN; OF THESE, AROUND 40% SAY THEY HAVE SWITCHED BRANDS. A SIMILAR PATTERN HAS BEEN RECORDED IN EUROPE WITH 27% OF CONSUMERS HAVING TRIED NEW BRANDS SINCE THE ONSET OF THE PANDEMIC AND WITH OVER 80% INTENDING TO STICK WITH THE CHANGE. IN BOTH REGIONS, VALUE IS THE MAIN DRIVER FOR SWITCHING.

These far-reaching changes have taken place at a never-before-seen speed equivalent to a "decade of change in days". Moreover, these behavioural shifts have been reflected in tissue demand and increased volatility with a dramatic shift from AfH to At-Home consumption, along with intensified price sensitivity and an expansion in online shopping for both AfH and consumer tissue. The question now becomes: what behavioural changes will stick and how should tissue players seek to accommodate consumer needs in the post-pandemic period?

Turning a new page in Tissue: The Route Map for a Reshaped World

Tissue's route map is being refreshed and rethought. Consumers and economies are looking to turn a page and look to a new landscape.

Tissue World Magazine launches a **2-day virtual conference** for the international tissue industry with **8 hours** of critical insights into the future of the global tissue industry.

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- **Senior Management Symposium** debating the Key Drivers for Tissues Business Post Pandemic, Global Influences and Trends, Risk and Resilience and Consumer behaviour.
- **Technical Panels** on Manufacturing Process, Fibre and Energy, Converting, Process Automation and Optimisation.



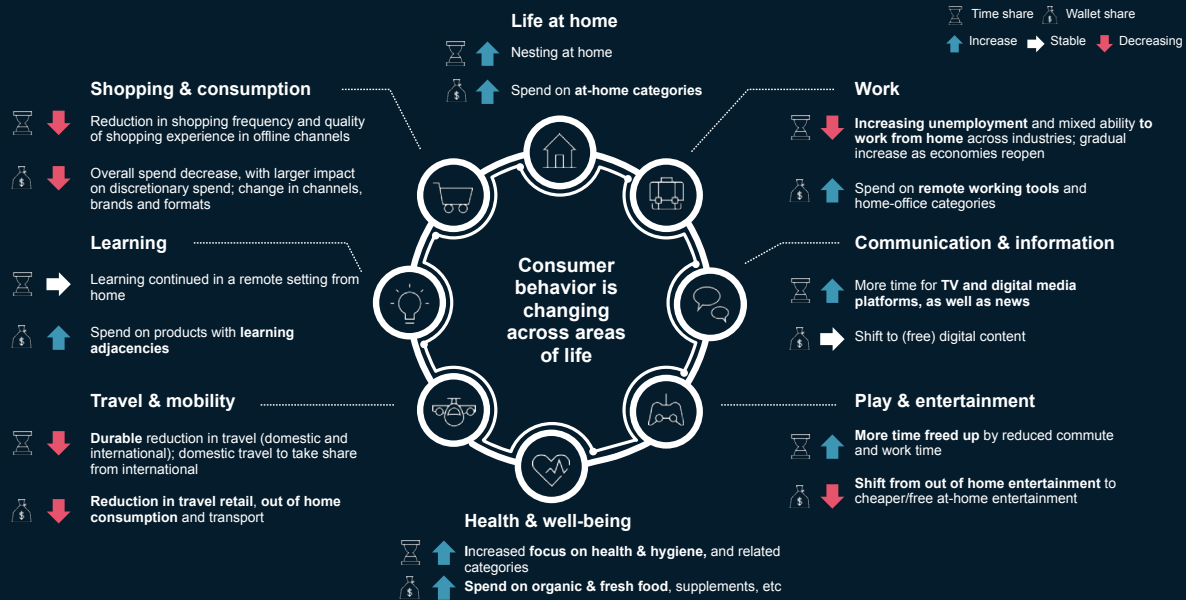
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Changing consumer behaviour in a post-pandemic world

As we begin to emerge from the pandemic, with a recovery in spend spurred by increased consumer optimism, we are seeing behaviour trends that first appeared during lockdown combine with the acceleration of some pre-existing trends—especially when it comes to digital “stickiness” (Exhibit 1 – above).

Three significant trends in consumer behaviour are likely to be most significant for the global tissue industry:

- Online shopping shift with a value focus. The pandemic has accelerated the adoption of online shopping across segments, notably in groceries. This behaviour is expected to retain a high degree of “stickiness” post-pandemic. The consequences of this behaviour shift mean there will be fewer opportunities for in-person engagement as fewer purchases are made in-store and reduced “touch and feel”. We do expect the increased shopping-basket spend (that is, spend on each shopping occasion) to decline compared with the Covid-19 period. Additionally, consumer behaviour typified by trading down to lower-priced brands and a reduction in overall discretionary spend is likely to persist in the post-pandemic world. The value focus of consumer is expected to further fuel private label tissue demand and need for lower cost products. Online will impact pack sizes

but also areas such as making sure the tissue products can be shipped directly in its own packaging with no need of secondary packaging (i.e., ship-ready packaging).

- Health and well-being growing in importance. Consumer health and conscious-living trends are real, and likely to accelerate beyond the pandemic, with two implications that could have a direct impact on tissue consumption and type of products demanded. First, an increased focus on food safety and hygiene is driving general higher consumption of tissue products (e.g., higher demand for bath and towel tissue). Second, consumers are increasingly concerned about the environmental impact, and also have expectations regarding the circularity of the products they buy, including tissue products. In particular, Gen Z and millennial consumers cite “purpose” and increasing preference for quality

and organic products as key reasons to change their shopping behaviour.

- Life at home versus travel and mobility. As the pandemic led many consumers to home-based remote working or distance learning, a new phenomenon emerged recasting the home as the new coffee shop, restaurant, and entertainment venue. This trend saw consumers spending more on home improvements plus a surge in all things digital: for example, online shopping, streaming movies versus visiting the cinema, and purchasing fitness apps instead of going to the gym. For the tissue sector, the direct consequence is of course the strong shift from AfH consumption to At-Home consumption during lockdown. As the market readjusts to a more normal state with a return to leisure travel, in-person dining, and education, some of this disruption will fade. Nevertheless, the new trend of home nesting is likely to

AS THE PANDEMIC LED MANY CONSUMERS TO HOME-BASED REMOTE WORKING OR DISTANCE LEARNING, A NEW PHENOMENON EMERGED RECASTING THE HOME AS THE NEW COFFEE SHOP, RESTAURANT, AND ENTERTAINMENT VENUE. THIS TREND SAW CONSUMERS SPENDING MORE ON HOME IMPROVEMENTS PLUS A SURGE IN ALL THINGS DIGITAL. FOR THE TISSUE SECTOR, THE DIRECT CONSEQUENCE IS OF COURSE THE STRONG SHIFT FROM AFH CONSUMPTION TO AT-HOME CONSUMPTION DURING LOCKDOWN.



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stick, continuing to bolster At-Home demand. That said, how persistent this trend will be remains to be seen, and it will be influenced by employer policies. The question is whether 'Away-from-Home' will ever return to pre-pandemic levels.

Implications for tissue companies

To successfully manage through an immediate future characterized by changing consumer behaviour, we see implications for the tissue industry across four areas:

- Focus on cost reduction and value. Tissue players need to further enhance productivity; the Next Normal will require tissue companies to be even fitter, flatter, and faster. This is in order to make sure their organisations are more flexible, responsive and entrepreneurial. Core capabilities should include the ability to manage agile sprints, in order to accelerate innovation, to develop next-generation design, to use data and analytics to improve operating performance, and to build intelligent, resilient supply chains. These skills and processes will be required to safeguard value in relation to pricing and inflation adjustments.
- Drive for sustainability. Consumers are demanding that retailers and brand owners become more focused on creating and supporting sustainable products. As a consequence, tissue players will need to think about their entire footprint, including supply chain, production with usage of recycled materials, and packaging.
- Look to strengthen customer relationships to maintain shelf space. With new consumer groups changing brands based on their personal values, it will be important to anchor tissue brand-building activity around being relevance-led, while ensuring that the operating model is geared towards

WITH NEW CONSUMER GROUPS CHANGING BRANDS BASED ON THEIR PERSONAL VALUES, IT WILL BE IMPORTANT TO ANCHOR TISSUE BRAND-BUILDING ACTIVITY AROUND BEING RELEVANCE-LED, WHILE ENSURING THAT THE OPERATING MODEL IS GEARED TOWARDS BEING CLOSE TO LOCAL CUSTOMERS. DOING SO BY TAKING A DATA-DRIVEN MARKETING APPROACH AND WORKING CLOSELY WITH KEY CUSTOMERS WILL HELP TO DRIVE FURTHER AWARENESS WITHIN CURRENT AND FUTURE MARKETS.

being close to local customers. Doing so by taking a data-driven marketing approach and working closely with key customers will help to drive further awareness within current and future markets.

- Develop new partnerships. With the emergence of e-commerce and changing customer preferences it will be vital for tissue players to address what partners they need—in particular, how to work with the large e-commerce retailers as consumers move online and how to balance this demand with potential direct-to-consumer sales and marketing.

Three strategic questions

To get started and be prepared for the Next Normal of consumer behaviour, we suggest three strategic questions that tissue players need to ask:

1. How will we address market growth opportunities post-Covid-19? With high stickiness of online shopping behaviour among consumers, it will be important for tissue companies to address this key trend and adapt their product offering accordingly (for example, with optimised pack sizes and ship-ready packaging). Other growth areas will also be available given the health and wellness trend, brand-changing behaviour, and consumer focus on sustainability. At the same

time, companies should consider how to pursue higher-growth markets in developing regions.

2. What channel/go-to-market changes do we need in order to succeed? Will the importance of retail decline and will e-commerce become the new norm, or should a true omnichannel go-to-market model be considered? Here, it is important to think through all aspects of how to reach the market (including direct-to-consumer) and how to partner with retailers and emerging e-retailers to meet their ambitions for private-label tissue sales.
3. What changes are needed to our organisation and capabilities in order to capture growth and value? To pursue growth and value-creating opportunities in market, tissue manufacturers will need to be much faster and more agile with product innovation and their supply-chain setup. This could also include a different go-to-market setup typically structured along geographies and/or large retail customers.

Tissue companies have the possibility both to capture new growth and create value in the Next Normal, given changes in the consumer-goods model. However, to succeed they will need a proactive attitude to addressing changing consumer behaviour, combined with the right strategic approach toward customers.

This article was written for TWM by McKinsey & Company's Oskar Lingqvist, a senior partner in Stockholm, Gregory Vainberg, a senior partner in Montreal, Daniel Nordin, a partner in Detroit, and Emily Roeper, an Analyst in Waltham.

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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

AMERICA

ST Paper invests in an Andritz-supplied TM at Duluth

ST Paper has invested in an Andritz-supplied PrimeLine™ W 2000 high-speed tissue machine at its plant in Duluth, Minnesota. Start-up is planned for the end of 2022 and the machine has a design speed of 2,000m/min and a working width of 5.65m. It will produce a range of bath, napkin and towel grades.

The scope of supply includes the approach flow equipment with double dilution capability for excellent fibre preparation, a fully cantilevered PrimePress XT Evo shoe press for gentle dewatering, a 16 ft. PrimeDry Steel Yankee with head insulation, steam and condensate systems, a high-performance Yankee hood and process air systems for energy-efficient drying.

ST Paper acquired Verso Corporation's idled Duluth mill in May 2021 with the intention to converting the mill's production from specialty paper grades to tissue.

The company has already converted two fine paper machines into tissue machines at its Franklin, Virginia facility.

GP confirms plans for northeast Wisconsin hub

Georgia-Pacific (GP) has confirmed it plans to open a warehouse and distribution centre in the Green Bay, Wisconsin area.

A spokesman for the business told TWM that plans were in place but added that as the project was still in the beginning stages the business couldn't comment further at this time.

It is understood that the site will cover approximately 1.1 million square feet.

The GP contact said more information would be available in the coming months.

Clearwater Paper to exit AfH business with Neenah closure

Clearwater Paper Corporation has announced its official exit from the AfH market by the end of July 2021 with the indefinite closure of its 54,000tpy Neenah, Wisconsin facility.

The facility's 290 employees will be impacted by the closure, which will see the shutting down of the site's three tissue

machines and ten converting lines.

Arsen Kitch, President and Chief Executive, said: "Despite the best efforts of our dedicated employees, our Neenah location and assets cannot cost effectively compete in the markets that we serve.

"This was a difficult decision, because it affects our people, their families and the Neenah community."

A spokesperson for the company told TWM that it will continue to produce all four categories of retail tissue products and service its retail customers from its other locations.

The company and the union will be meeting this week, working closely to assist the impacted colleagues where possible.

Clearwater Paper acquired the Neenah mill in 2010, producing private brand tissue products for commercial and retail customers.

GUATEMALA

GrandBay Group boosts capacity

GrandBay Group has invested in a Toscotec-supplied AHEAD 2.2L tissue line to be installed at its subsidiary Papelera Internacional's plant in Rio Hondo Zacapa.

Start-up of PM7 is scheduled for late 2022 and once up and running will have a sheet trim width of 5.5m, a design speed

of 2,200m/min, and an annual production capacity of over 60,000 tonnes.

It features a TT NextPress new generation shoe press, a third-generation design TT SYD with heads insulation patented system and diesel oil-fired TT Hood-Duo system.

The scope of supply also includes the stock preparation system, fibre recovery system, and Toscotec's patented TT SAF (Short Approach Flow) equipped with a double dilution system.

TURKEY

Eczacibasi boosts global capacity with investment

Eczacibasi Consumer Products has invested in a Valmet Advantage DCT 200TS tissue line to be supplied at its Manisa plant. The scope of supply includes a complete tissue production line featuring Valmet stock preparation systems, an OptiFlo headbox, Advantage ViscoNip press with BlackBelt and Yankee cast cylinder with Advantage AirCap hood as well as a Focus rewinder. It will have a width of 5.6m and a design speed of 2,200m/min and will provide high-quality facial, napkin, toilet and towel grades for the consumer and commercial markets. The investment will help Eczacibasi's growth in the global tissue business.

TWM's Virtual Conference – Your route map to the future

Tissue World Magazine is to offer an exclusive platform and opportunity for the industry's leading professionals to launch tissue's continuing development in the years ahead. The two-day Virtual Conference will take place on 22-23 September, 2021.

The indispensable value of tissue has been proved again and again since the pandemic began. Our products have become essential purchases for consumers seeking safety and quality.

The industry has responded with energy and expertise to the new challenges. Under the theme 'Turning a new page in tissue: The route map for a reshaped world,' TWM's Virtual Conference will invite top executives to share and advance the

experiences learned in the last two years as a launch pad for their vision for 2022 and beyond.

Esa Kaikkonen, Metsä Tissue and Metsä Group CEO, has been confirmed as the keynote speaker.

As an advanced taster, our Operations Report on page 29 hears from Tobias Lüning, Metsä Tissue's Vice President Supply Chain Western Europe, Country Manager Germany, on how Metsä Tissue is dispensing a cleaner, safer service for Germany's health-conscious public.

TWM will keep you up-to-date on the latest for this free-to-attend virtual event. Find out more and book your free place at -

www.tissueworldmagazine.com/tissueworldvirtualconference

ITALY

Lucart boosts packaging and converting capacity with Körber investments

Lucart has invested in eight Körber-supplied Casmatic CMB270 packaging lines and a Perini MyLine converting line.

The packaging lines will increase production of the Italian company's primary and secondary packaging facilities and are designed to reach production speeds of up to 27 bags per minute, packing in a high range of formats.

According to the machinery supplier, they also allow energy savings of 60% due to the TOSS longitudinal sealing system and have been designed to wrap small packaging even at high production speeds.

It added that Casmatic CMB270 lines are also equipped with a patented Revolver system that the supplier said "significantly improves the production speed for bundles with single rolls and packages."

They also respond to Industry 4.0 as they are equipped with ALL-IN-ONE technology which Körber said integrates the converting and packaging processes, maximising the result without the need for human intervention.

UK

Northwood responds to increased AfH and consumer demand with investment

UK-based Northwood Hygiene Products has boosted its AfH product offering with a multi-million-pound investment in a Gambini-supplied converting line and an additional 14,500m² DC warehouse.

The £3.65m converting line has a capacity of around 13,000 tonnes per year and will be based at the company's Telford site where it will run industrial rolls using 3.42-metre-wide jumbo reels from Northwood's Chesterfield-based mill.

Some £400,000 has also been spent on additional offices, pallet racking and

IT equipment.

More than £1m has also been invested in fully automated packaging and palletising equipment on the company's roll towel and toilet tissue converting line.

Pete Foy, Operations Director, said: "In such uncertain times, and in a market which has seen unprecedented suppression of sales, Northwood is proud to have continued its aggressive investment programme."

ICT boosts consumer tissue capacity across Europe with 50-acre plant

European tissue manufacturer ICT UK has invested in a 50-acre tissue plant in Deeside, Wales.

Construction of the integrated tissue production and conversion facility – which the company said is the first of its kind in the UK in more than 15 years – is expected to begin early next year.

The Welsh Government has provided £5m towards the new 700,000 sq ft facility following an initial £10m investment in the Northern Gateway site in March.

It will be equipped with the latest technology and produce consumer tissue products marketed through retailer private labels and ICT's own brand FOXY to the UK and Irish markets.

Lucca headquartered ICT Group has been operating in the consumer tissue business since 1978.

It has manufacturing sites in Italy, France, Spain and Poland.

RUSSIA

Syassky expands into Fold sector

Syassky Pulp & Paper Mill has diversified its product offering into the interfolded products market after investing in a Körber-supplied MTC ITF automatic towel interfolding line.

Already active in the Roll sector, the company expanded its product portfolio

after seeing an increased demand for high-quality disposable tissue products following the outbreak of the pandemic.

Irina Mozhaeva, Syassky PPM's Chairman, said: "It is not just a purchase of new equipment for us. This is a strategic investment in the development of our production."

"We plan to expand our presence in the AfH market, an important part of which is folded products."

The MTC ITF line will produce V-folded Hand Towels and can be tailor-made for the customer.

SOUTH KOREA

Mirae Paper boosts high-quality capacity with Steel Yankee

Mirae Paper has invested in a Toscotec-supplied TT SYD Steel Yankee Dryer to be delivered to its Jeonju paper mill.

It will replace PM2's existing cast-iron cylinder and is scheduled for start-up in the second half of 2022.

Yeong Rok Lee, Mirae Paper's Production Manager, said: "The Steel Yankee on PM3 has been operating efficiently for over eight years, allowing us to reduce our thermal energy consumption by a significant amount."

"We expect the new Yankee on PM2 to be as reliable and to deliver even higher performances."

"We consider the Yankee dryer to be the core component of our tissue machine's drying capacity."

Toscotec said the third-generation design "benefits from an ideal ratio of the weight, width and pitch of the internal ribs and the optimisation of the shell thickness".

UKRAINE

JCS Kochavinska Paper Factory doubles capacity with €4m Hermes line

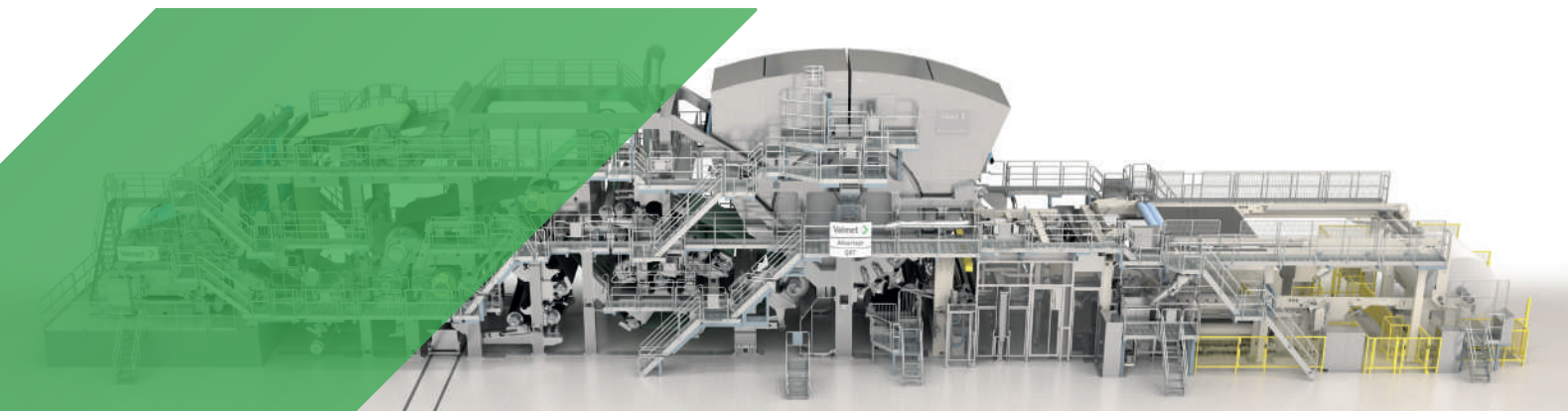
Ukraine-based JCS Kochavinska Paper Factory has diversified into virgin tissue paper production after investing €4m in a Maflex-supplied Hermes line.

The scope of supply includes a turn-key solution 600m/min consumer converting line and a packaging line, complete with the Heracle automatic change embossing technology.

According to the machinery supplier, JCS Kochavinska made the investment so it could enter the top-quality virgin tissue paper market, having previously just

MIRAE PAPER HAS INVESTED IN A TOSCOTEC-SUPPLIED TT SYD STEEL YANKEE DRYER TO BE DELIVERED TO ITS JEONJU PAPER MILL. IT WILL REPLACE PM2'S EXISTING CAST-IRON CYLINDER AND IS SCHEDULED FOR START-UP IN THE SECOND HALF OF 2022. YEONG ROK LEE, MIRAE PAPER'S PRODUCTION MANAGER, SAID: "THE STEEL YANKEE ON PM3 HAS BEEN OPERATING EFFICIENTLY FOR OVER EIGHT YEARS, ALLOWING US TO REDUCE OUR THERMAL ENERGY CONSUMPTION BY A SIGNIFICANT AMOUNT."

Going forward in tissue with essential flexibility



To go forward and keep ahead of the game in the demanding world of tissue production you have to be able to move fast. Flexibility is now a necessity as switching grades and qualities has become the new reality in tissue production. Utilizing hybrid technology, Valmet's new range of Advantage NTT, QRT and eTAD tissue machines now have flexibility built in at their very heart and will allow you to swing between plain, textured and structured tissue products.

As well as unique flexibility, the Advantage NTT, QRT and eTAD range also gives excellent softness and high bulk using less energy and fiber per roll. Valmet Hybrids - for maximum flexibility in tissue making. Read more at valmet.com/hybrid



produced and converted recycled paper.

Overall, the investment will double the converting company's annual production capacity.

JCS Kochavinska is one of the Ukraine's largest tissue producers and produces AfH, At-Home and private label tissue products, exporting globally.

GLOBAL

STAX responds to customer demand with DIVERSA launch

STAX Technologies has launched its latest machinery innovation DIVERSA, a high-speed bundler and completely distinctive case packer in one machine. As the single line doesn't require extra space and time for complex operations of switching the modules, a simple adjustment will turn the case packer into a bundler, and vice versa.

As a result, the supplier said that the case packing capacity is almost doubled whilst achieving speeds of more than 25 cases per minute. Mladen Starčević, STAX Business Development Director, told TWM: "The launch of DIVERSA marks a new era of packaging. Following current market needs, production speeds have become imperative when choosing equipment from the manufacturer.

"Due to online sales expansion, the demand for smaller transportation packages has also increased, resulting in the need for faster production rates of cases and bundles."

Solenis acquired for \$5.25bn by Platinum Equity

Clayton, Dubilier & Rice (CD&R) has sold its speciality chemicals business Solenis to USA-based private equity company Platinum Equity. The transaction is expected to close for a value of \$5.25bn by the end of 2021. CD&R and Solenis management currently collectively own 51% of the business, and chemical company BASF holds the remaining 49%. Both CD&R and BASF will fully exit Solenis as part of the transaction. Solenis' global footprint covers 120 countries and five continents, with 41 manufacturing facilities.

Andritz launches two tissue machines

Andritz has introduced two high-speed tissue machines with 2,200m/min design speed for maximum capacity.

The PrimeLineTM S 2200 with 2.6 to 2.85m width at reel, and the PrimeLineTM W 2200 with 5.4 to 5.6m width at reel

"FOLLOWING CURRENT MARKET NEEDS, PRODUCTION SPEEDS HAVE BECOME IMPERATIVE WHEN CHOOSING EQUIPMENT FROM THE MANUFACTURER. DUE TO ONLINE SALES EXPANSION, THE DEMAND FOR SMALLER TRANSPORTATION PACKAGED HAS ALSO INCREASED, RESULTING IN THE NEED FOR FASTER PRODUCTION RATES OF CASES AND BUNDLES."

feature Metris, the company's digital offering which enable remote assistance during commissioning and start-up.

Günter Offenbacher, Andritz Sales Director for Tissue and Drying, said: "With the new high-speed machines, we can offer an innovative concept for dry-crepe tissue machines with high production efficiency for every customer need.

"Our comprehensive product portfolio ranges from high-performance machines with speeds of up to 2,200m/min down to efficient compact solutions for smaller production capacities."

Key components that can be installed include the PrimePress XT shoe press for gentle dewatering and high nip-loads, the PrimeDry Steel Yankee for energy-efficient drying, and the PrimeDry Hood ST for steam-heated drying instead of using more expensive gas heating.

Toscotec targets tissue market with TT NextPress launch

Toscotec has launched the new generation of its shoe press TT NextPress.

Following R&D projects in cooperation with Voith, the supplier said the TT NextPress "delivers a stable after-press dryness rate of more than 47% on a tissue line operating above 2,000 mpm speed".

"This dryness level ensures a substantial reduction of energy consumption, as the Yankee and the hoods use significantly less thermal energy to complete the paper drying process," it said.

A new shoe shape has been introduced to enhance the nip width and increase the peak pressure at the nip outlet, reshaping the outward pressure into a steeper curve.

Machine operators can also now visualise on the DCS (Distributed Control System) the nip pressure of TT NextPress in real time.

Toscotec has also designed multiple independent pressure zones, up to 14 in total, of which 12 are located on the edges.

It said this design ensures a perfect fit between the shoe and the Yankee deformation, and maximises the clothing lifetime.

ACE targets efficiency and safe dust removal with DM7000-TX launch

Electrostatics & Dust Removal company ACE has launched its latest series of DM7000-TX dust removal equipped with original HS-X model dedusting heads.

The patent-pending technical developments have a tight control on dust electrostatic charges, according to the supplier.

Chief Executive Daniele Barbui said: "Accumulation of even small quantities of dust in the production process and on converting lines is the most frequent cause of fires.

"In order to provide a high-safety and healthy working place for workers as well as the safety of the machines, it is crucial to remove dust from specific parts of the machinery.

"The DM7000-TX removes dust through pipes by preventing the formation of a large number of sediments, which in turn creates potentially explosive electrostatic charges."

PCMC launches tissue rewinder Paragon

PCMC has launched Paragon, its latest rewinder with a patent-pending centre surface design the supplier said produces "superior caliber, bulk and diameter flexibility". Log winding takes place in a new concept nest comprising of a winding drum, winding belt, compound-motion rider roll and centre drives. Andrew Green, PCMC Vice President – Tissue and Folding, said many of Paragon's subsystems are enhanced technology taken from the company's Forte rewinder.

"For example, Paragon provides enhanced web handling and grade changes are mainly recipe-driven," he said.

"Specially designed tools guide fast calibrations. Like the Forte rewinder, Paragon has an intentional open access design, resulting in superior accessibility."

He added that the rewinder is a "completely new method of tissue rewinding ... it is radical only in the sense that we made the wind nest as simple as possible.

"Usually when you increase a machine's



Destination Future

They're out there.
Futura and Plusline,
traveling together,
turning vision into reality.
Bringing their customers
unprecedented integrated solutions,
advanced technology and even more
efficient service support.

speed you sacrifice ease of use, but we know customers want both. With Paragon we created a machine capable of higher speeds and which is easier to operate."

Paragon also has Industry 4.0 tools and includes a new Smart Touch human machine interface.

Elettric80 targets advanced safety standards with SmartDect launch

Elettric80 has launched SmartDect, an ultra-wideband (UWB) technology fitted onto its AGVs and LGVs which it said enhances their safety in tissue manufacturing and distribution. The supplier said that the short-range RF technology can detect the location of people, vehicles, and objects "with unrivalled precision".

Andrea Pongolini, Elettric80 Executive Vice President Sales, said: "UWB technology uses very short radio pulses, sent every couple of milliseconds as a pattern across a wide frequency spectrum.

"The receiving device onboard the vehicles analyses the incoming pattern and translates it into data which is used to accurately sense the location of people, objects and other vehicles in operation."

Pongolini added that the company has worked to continually upgrade its vehicles with the latest positioning, protective and controls technology exceeding that of established international standards.

CANADA

Kruger Products invests \$25m in AI at Sherbrooke plant

Kruger Products has announced a \$25m artificial intelligence (AI) project which will be installed at its Sherbrooke, QC, tissue plant.

The investment will implement a digital twin of the site's supply chain using real-time data augmented with AI capabilities to boost the plant's operational efficiency.

Sherbrooke is equipped with Canada's largest and most advanced TAD tissue machine, which is supported by AI-ready systems and infrastructure.

By leveraging AI, Kruger Products said it will be able to optimise its entire supply chain, from the procurement of raw materials to customer delivery.

It will also pave the way for a future roll out across Kruger Products' manufacturing infrastructure.

Dino Bianco, Chief Executive of Kruger Products, said: "After investing \$575m to



Contract signing (l-r): Youssef Abdel Hamid Abdel Aziz El Bishry, CEO of Saudi Paper Group, and Alessandro Mennucci, CEO of Toscotec.

build the most advanced tissue plant in Canada, Kruger Products is proud to push innovation even further with this \$25M ground-breaking AI project, bringing total investments to \$600m for the plant.

"Using AI to boost efficiency will also improve our overall performance in terms of sustainability and help us serve our customers and consumers even more efficiently."

The company said that the use of AI will result in improvements across the supply chain, from raw material procurement to production planning, equipment maintenance, logistics and risk management. It added that other benefits include a better environmental footprint due to lower GHG emissions, increased energy efficiency and reduced waste.

BANGLADESH

Meghna Pulp & Paper Mills boosts capacity

Meghna Pulp & Paper Mills has invested in a Recard-supplied tissue and MG paper production plant. Installation and start-up are scheduled for September 2022 and the turnkey plant includes three preparation lines for pulp where waste paper can also be used as raw material.

The paper machine with fourdrinier formation section is designed to reach a max operating speed of 1,000mpm and a production rate of 70tpd. A rewinder suitable for both crepe papers and smooth papers like the MG completes the plant.

SAUDI ARABIA

Saudi Paper Group boosts premium capacity

Saudi Paper Group (SPG) has invested in a Toscotec-supplied AHEAD 2.2S tissue line at its Dammam paper mill.

PM2 will produce premium quality tissue from virgin pulp and start-up is scheduled for the fourth quarter of 2022.

The AHEAD 2.2S line has a sheet trim width of 2.8m, a maximum operating speed of 2,100mpm, and a production capacity of 30,000tpy.

It is equipped with TT NextPress new shoe press design, a third-generation design TT SYD Steel Yankee Dryer with patented deckle head insulation, and high efficiency TT Hood.

The supply includes the stock preparation system and Toscotec's patented TT SAF® (Short Approach Flow) featuring a double dilution system that reduces electrical consumption to a minimum.

Youssef Abdel Hamid Abdel Aziz El Bishry, Chief Executive of Saudi Paper Group, said the TM will increase its production capacity from 100,000 to 130,000 tonnes per year.

"It is a strategic expansion for our group, and we believe in the importance of equipping ourselves with leading-edge technology that will allow us to achieve our production targets with optimal performance and energy efficiency, delivering the highest quality to our customers."

A TISSUE POWERHOUSE OF CAREFUL EXPANSION, SLOW GROWTH, AND LEADING COMPANIES SUPPLYING A DEMANDING HOME CONSUMER MARKET AND A GLOBAL INDUSTRY

Cost and quality improvements the focus for the country which helped pioneer pulp and paper, and continues that role today.

Germany is a manufacturing and technological powerhouse known for its precision manufacturing technology. The country played a vital role in developing pulp and paper technology at the birth of the industry. This role has continued into the 21st century as Germany is home to many companies supplying tissue production and converting technologies all over the world.

Germany has Europe's largest economy and ranks fifth in the world, along with being the second-most populous nation (after Russia). The German population trend is displayed in Figure 1 and shows (line) about 81 million people in 2007, dropping slightly to 80.4 million in 2011 before climbing to about 83 million in 2020. The World Factbook shows an estimated population growth of -0.215% in 2021. This is probably difficult to estimate as the Covid-19 pandemic has slowed birth rates and immigration in many countries. Figure 1 also shows the Real GDP/capita trend (2010 base) (bar) with general slow growth up to 2020 as the pandemic struck. Initial indicators show an uptick in activity in 2021.

Germany has seen consumer inflation cycling from a high of 2.8% in 2008 to lows

of 0.2% in 2009 as the Great Recession hit, which can be seen in Figure 2. Current inflation appears to be dropping from 1.8% to 0.3% as the pandemic hit. However, it is too soon to tell how the recovery period will unfold. Figure 2 (line) also shows the significant downward trend in unemployment from about 8.6% in 2007 to 3.5% in 2019. There was a slight uptick in 2020 but there have been good indicators in 2021 so far.

Germany is running about 235.6 active Covid-19 cases per 1 million population as of mid-July 2021. This compares well against most of the region, as shown in the heat map in Figure 3. The new waves of Delta and possibly Lambda variants moving through the world's populations make it impossible to predict potential demand or supply effects through the end of 2021 as the unvaccinated have increased risk and vaccinated see mild or asymptomatic illnesses.

Germany has been careful with tissue machine expansions through the study period of 2007 to 2024 (announced). Figure 4 shows that there have been two new machines installed and two removed, with no further changes expected through 2024. These new machines are expected to be



Bruce Janda
Senior Consultant, Fisher International

larger than the machines removed for a net capacity increase.

Germany's tissue business is active in trade, with imports slightly exceeding exports over the past 13 years. Figure 5 shows the imports trend and top eight producing countries. Most of this trade is centred on neighbouring producing countries of Austria, France, Italy, Netherlands, Poland, Slovakia, Switzerland, and Sweden. The top producers and the export list are used to develop the Tissue Making comparison set used in the later sections of this report.

Germany's tissue exports are shown in Figure 6. Many of the same countries on

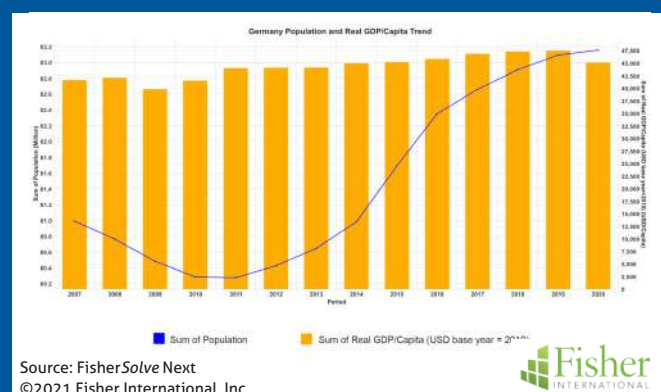


Figure 1: Germany Population and Real GDP/Capita Trend

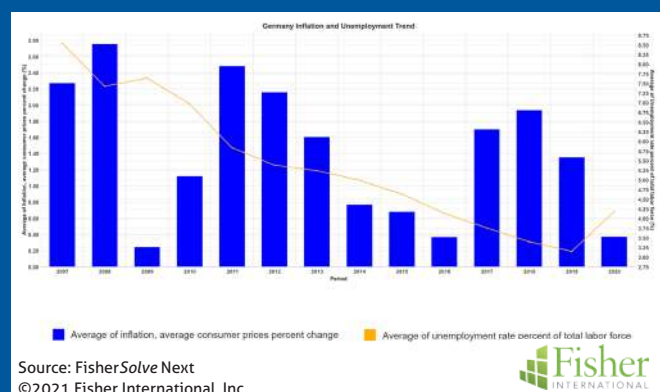


Figure 2: Germany Inflation and Unemployment Trend

the import producer list are seen here, indicating that most of this trade goes two ways. The top eight countries also include Belgium, Spain, and the United Kingdom.

Germany's tissue fibre sources include about 33% recovered fibre as integrated paper recovery or pulp substitutes. Over a quarter of the furnish is imported eucalyptus, complementing the 40% northern pulps.

The overall tissue furnish is further broken down by finished product in Figure 8. The eucalyptus fibre is a significant component of Bath and Facial Tissue in both the commercial and consumer channels, and also shows up in Consumer Towels. Recycled fibres are used in the most significant percentages in Commercial and Consumer Bath and Towel. BCTMP is used in both Commercial and Consumer towels in smaller amounts, presumably for improved bulk, absorbency, and wet strength retention.

The top tissue trade partners identified in the import/export analysis provide a comparison point tissue machine quality and efficiency analysis. Figure 9 shows the relative position of Germany's tissue machines in terms of average technical age and machine speed. The size of the

bubble indicates the relative production capacity of each country's tissue machine fleet. Germany is in a good position with the fastest machines and third-best technical age after Spain and Poland. Note that these numbers are averages and there are machines in each country that are significantly better and worse than the averages shown. Germany, Spain, Poland, Belgium, and the United Kingdom operate some advanced technology tissue machines. This subset is somewhat newer than the conventional machines and consists of TAD and more recent textured or structured processes. German consumers are known for their focus on tissue strength and ply count with three and 4-ply products every day on store shelves.

Figure 10 rates the same sets of tissue machines on average water use and site water risk. The water risks shown are small compared to other regions, but Austria stands out as very low risk and Belgium relatively high for this set. Germany's average water use per tonne of tissue production is the lowest, which is a good position for reporting lower environmental impact. Austria's high average water use is similar to North America, where freshwater is abundant in local mill areas.

The average total cost to manufacture a tonne of tissue in each of the countries is shown in Figure 11. This includes the variable costs of raw fibre material, pulps, chemicals, energy, labour, overhead, and any credits. Germany is in the lower half of the production cost per tonne, behind Austria, Netherlands, and Poland. However, this is a relatively flat cost curve compared to other everyday situations. Germany has relatively high labour costs, like the Netherlands and France. Energy costs in the United Kingdom are the highest of the group. There are no raw materials fibre costs in Belgium, indicating that there are no integrated tissue mills using recovered paper or wood pulp.

The European Union is considering carbon taxes on production and imports based on carbon dioxide emissions. Figure 12 shows the average carbon emissions per ton of tissue for each country. Germany sits near the middle of the group, but the differences are much wider than the cost curve in Figure 11. Poland sticks out as very high due to the high carbon content of purchased electricity from coal. This may become an issue for Poland's exports to regions with a carbon tax regime.

Conversely, France continues to show

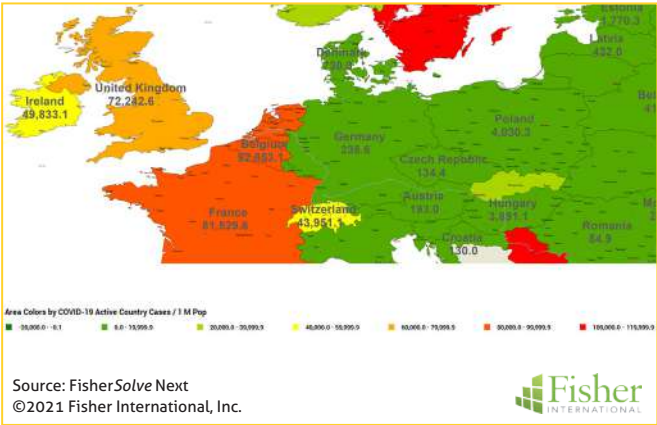


Figure 3: Germany Regional Active Covid-19 July 21, 2021



Figure 4: Germany Tissue PM Line Changes

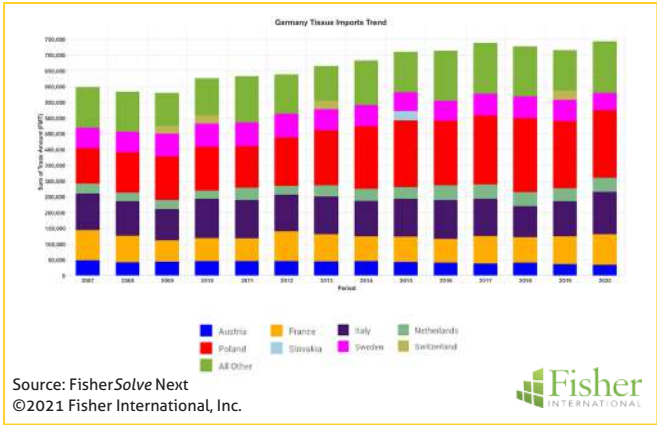


Figure 5: Germany Tissue Imports Trend

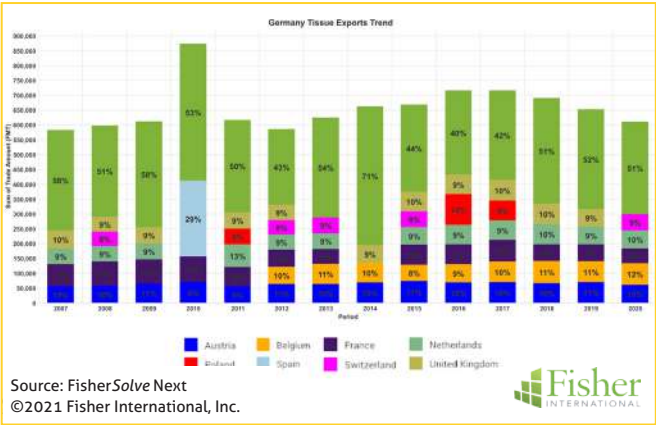


Figure 6: Germany Tissue Exports Trend

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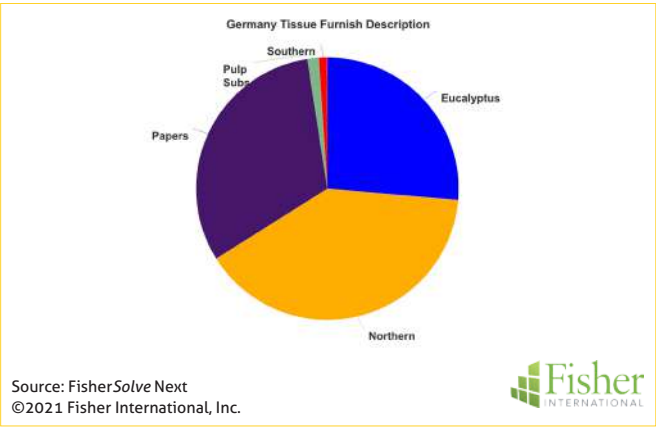


Figure 7: Germany Tissue Furnish

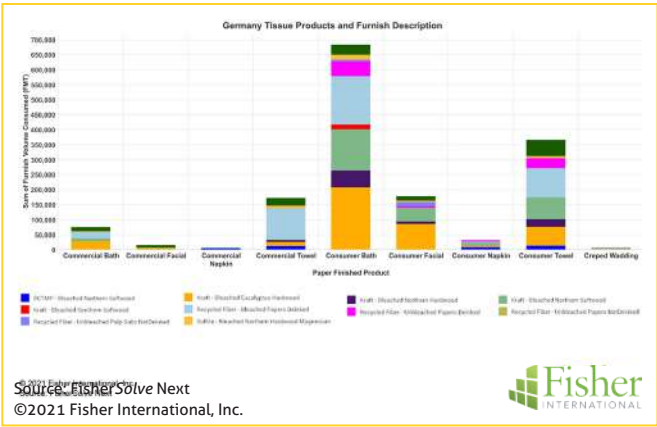


Figure 8: Germany Tissue Products and Furnish



Figure 9: Germany Relative Tissue Machine Quality



Figure 10: Germany Water Consumption per Production Ton and Risk

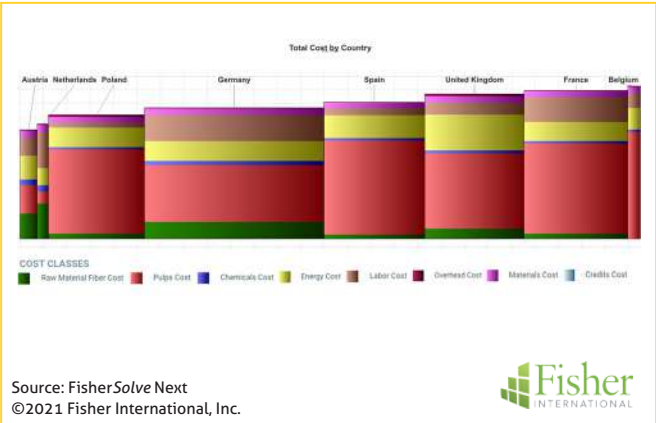


Figure 11: Germany Relative Production Cost Comparison

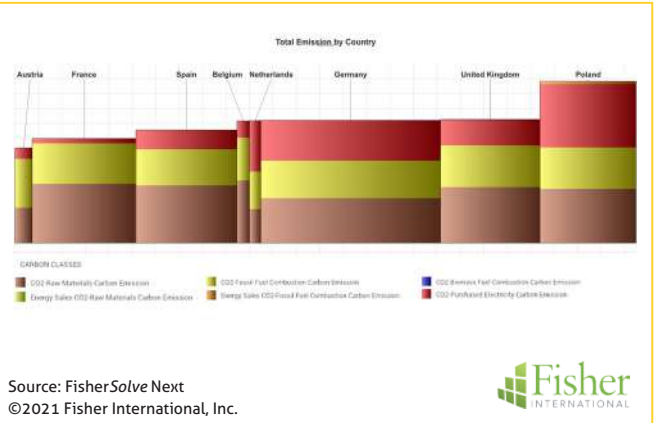


Figure 12: Germany Relative Carbon Emissions Comparison

purchased electricity carbon due to nuclear energy. Carbon emissions produced on site appear to be relatively consistent across the set.

Germany's tissue business continues in a slow-growth stage with replacements focused on cost and quality improvements. Nevertheless, the country is an active tissue trader with its neighbours and is currently positioned at the average of the trade group for environmental concerns in terms of water consumption and carbon emissions.

Analysis of competitive position

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

A MARKET TRANSFORMED BY 12% SPIKE IN TOTAL RETAIL TISSUE SALES

Fear of the unknown, lockdown, panic buying and a determined new hygiene regimen sharply redirected this classic mature European tissue market as consumers searched for a measure of control where they could.



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

The German tissue market is representative of many mature Western markets: a decade or two of low, relatively unimpressive but steady growth rates, typical of markets that boast very high household penetration levels. Throw a pandemic into the equation, consumers looking to tissue as an agent of hygiene, extended periods of home seclusion and supply fears leading to domestic stockpiling, and we see a market transformed.

German retail tissue had barely been able to muster a 2% value CAGR (2006-2019) and in 2020 this morphed into a 12% spike in total retail tissue sales. Once again, the experience of German consumers is fairly similar to the bulk of Western Europe where a retail boom had its own counterpoint in

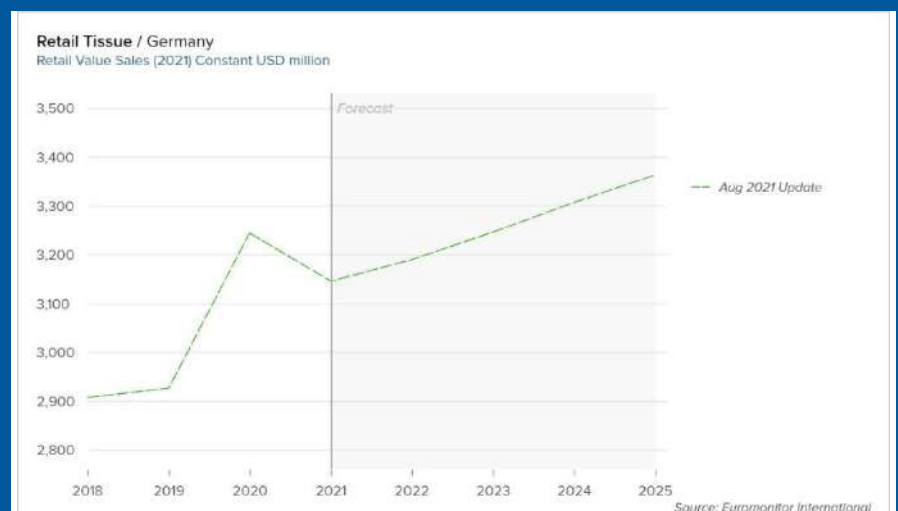
the collapse of the AfH market as lifestyles changed beyond all recognition.

Toilet paper — a pandemic barometer


Of the core retail tissue categories, toilet paper experienced the most rapid growth in 2020 with a 16% increase in value, associated with the prevalence of stay-at-home policies and stockpiling behaviour. Indeed, toilet paper proved an international curiosity in 2020, apparent consumer 'fear of the unknown' and an attempt to have a semblance of control led many German consumers to panic buy copious quantities of toilet paper, resulting in these products becoming out of stock.

One school of thought suggests that images from Australia, a country which does have supply chain weakness due to the

GERMAN RETAIL TISSUE HAD BARELY BEEN ABLE TO MUSTER A 2% VALUE CAGR (2006-2019) AND IN 2020 THIS MORPHED INTO A 12% SPIKE IN TOTAL RETAIL TISSUE SALES. ONCE AGAIN, THE EXPERIENCE OF GERMAN CONSUMERS IS FAIRLY SIMILAR TO THE BULK OF WESTERN EUROPE WHERE A RETAIL BOOM HAD ITS OWN COUNTERPOINT IN THE COLLAPSE OF THE AFH MARKET AS LIFESTYLES CHANGED BEYOND ALL RECOGNITION.



Source: Euromonitor International



It's not what we make.
It's why we make it.

We support individual freedom and social growth
to increase people's health and well-being,
by spreading the culture of personal hygiene
through unique products.



Gambini

beyond tissue

number of imported products, appears to have sparked global concern. Irrespective of government attempts to reassure the public that there were no supply shortages, the stockpiling continued to such an extent that retailers had to put a cap on the amount of toilet paper that consumers could purchase at any one time.

Comfort in the face of adversity

While the pandemic continued, this did little to dampen prevailing key buying factors which have tended to cluster around comfort. This was reflected in the strong performance of non-recycled toilet paper in 2020. While consumers are becoming more environmentally conscious, recycled toilet paper is still perceived to lack the softness of non-recycled products. This demand for comfort also remained a key driver for innovation in facial tissues.

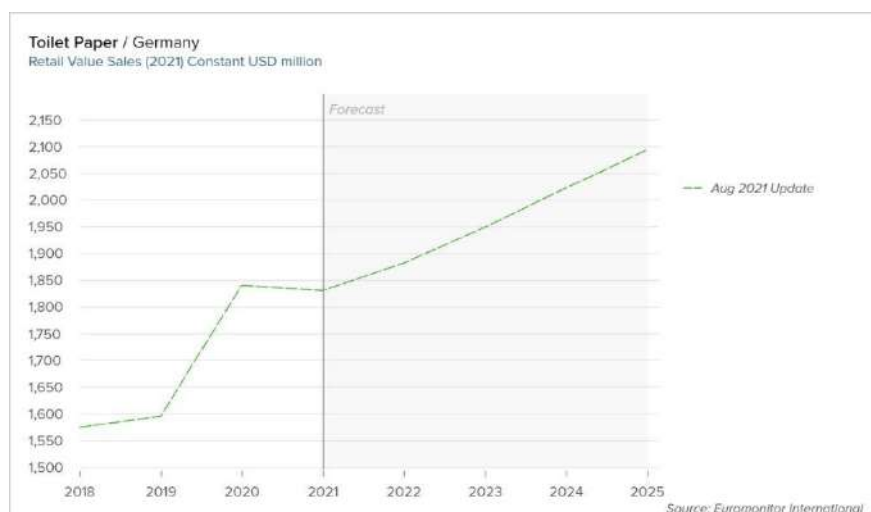
For instance, Kimberly-Clark launched Kleenex Natural Fresh with decongestant natural extracts of eucalyptus and mint. In response, Essity is offering a soft and sensitive range of pocket handkerchiefs under its leading Tempo brand with an almond and aloe vera balm in addition to extra softness. With private label dominating sales of retail tissue in Germany it is necessary for the leading brands to provide innovations which can help add value.

Private label remains dominant

Private label has the undisputed reign in the retail tissue landscape in Germany, with the top-of-mind brands among consumers typically being private label, be it Kokett from Aldi Group or Floralis from Lidl & Schwarz Stiftung & Co. As a basic commodity product, German consumers already commonly purchase private label retail tissue as part of their retail shopping and consider the quality to be comparable to brands.

During the pandemic, private label ranges from grocery retailers managed to strengthen their share due to the more concentrated visits to grocery stores. Meanwhile, Essity remained the leading branded manufacturer with its Zewa and Tempo brands.

In fact, Essity also managed to increase its value share in 2020 during the pandemic, because its Zewa and Tempo brands tend to be non-private label retail tissue brands carried by various retailers in addition to grocery retailers' own private label products.



Source: Euromonitor International

Rise of e-commerce

Prior to the Covid-19 outbreak, e-commerce in Germany - although growing - was still lagging far behind many European countries such as the UK; in 2020, just 2% of retail value was taken by e-commerce in Germany, with this figure three times higher in the UK, for example. It is notable, and a peculiarity of German retail and local attitudes that despite the pandemic there was no drive to e-commerce in tissue and leading German retailers did not take the opportunity to scale delivery services as was the case in many other European countries. It is safe to say that, at least for retail tissue products, e-commerce is unlikely to be a major player any time soon.

How sticky?

The future for retail tissue products in Germany remains on the whole positive, with stable value growth projected from 2022 as a decline is expected in 2021 to

stabilise the surge in value share during 2020. Furthermore, it is likely that work policies will be more flexible in future, resulting in more time spent at home on the whole ensuring increased usage of tissue products, particularly toilet paper, thereby supporting volume and value growth over the forecast period.

For the most part growth will be built on a combination of these new prevailing lifestyle patterns as well as habit persistence. Consumers using tissue products today will continue to do so tomorrow and the use of retail tissue as habit is trending towards higher levels of tissue usage overall, meaning in spite of the spike in 2021, the overall retail tissue market will grow medium term and from a higher base. There is still much to be positive about for mature markets as we move out of the pandemic.

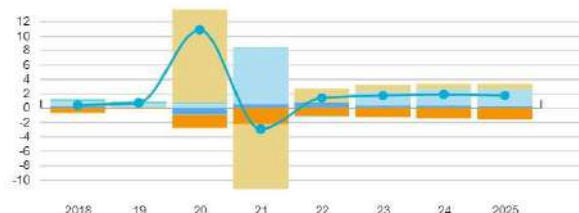
Retail Value Sales, Real US\$ mn 2018 - 2025 , Y-on-Y Growth %
2020 Constant Prices, 2020 Fixed Year Exchange Rate

Germany - Retail Tissue

Retail Value Sales, Real Growth
○ Passport Baseline

Driver effects

- GDP Per Capita
- Product Price
- Habit Persistence
- Population
- Socio-Economic Trends (Employment Ratio)
- Market Environment (Modern Grocery Retailers Selling Space per Capita; Passenger Cars in Use per Capita)
- Soft Drivers (- Availability; - Maturity of sector; - Promotion; + Home Seclusion; + Stockpiling)



Source: Euromonitor International

'A PROJECT THAT COULD CHANGE THE COURSE OF THE TISSUE INDUSTRY'S FUTURE'

The circular economy, tissue from wheat straw, a dual strategy of private label and brands: TWM Senior Editor Helen Morris interviewed Donato Giorgio, President Global Supply Chain and member of the Executive Management Team, Essity.



One of a kind: Essity's integrated modern tissue plant in Mannheim will use wheat straw to produce 35,000tpy of tissue

Donato Giorgio's enthusiasm for his job shines through the computer screen during our interview for TWM's Germany Country Report. The Global Supply Chain President of Essity – consumer tissue's second global player – is discussing at length his determination and excitement to help bring the circular economy to the tissue industry, and just how the company will achieve that by using agricultural by-products to produce tissue at its Mannheim plant in Germany. "This is the future, and we believe this is what the world needs," Italian-born, Germany-based Giorgio says. "A few years ago I went to Essity's board of directors to say: 'We're putting several ideas together for something that's never been done before in the tissue industry... we will need an industrial plant... and I will need €40m. Actually, it may be more than €40m, and it may only start-up in two years' time. But it will be the greatest thing we as an industry do in the next five years – so give us a chance.' And they supported it.

'IN THE FUTURE, WE BELIEVE THERE NEEDS TO BE A TISSUE PROCESS PRODUCTION THAT IS MORE SIMILAR TO PERSONAL CARE PRODUCTION: A SMALL, AFFORDABLE, ENERGY-EFFICIENT MANUFACTURING FLOW. THIS STILL NEEDS TO BE INVENTED, AND ESSITY NEEDS TO DO IT.'

This tells you that Essity has the courage to lead change."

Announced in May 2019, Essity has invested SEK 400m in its integrated tissue plant in Mannheim. It is one of a kind, and that ambitious initiative is currently being started up at the time of going to print with an initial run of 35,000tpy. It will produce pulp based on alternative fibre taken from plant-based agricultural by-products. In Mannheim's case, that by-product is wheat straw.

What gives the process wider significance is its localised potential. If the initiative is rolled out globally, other by-products

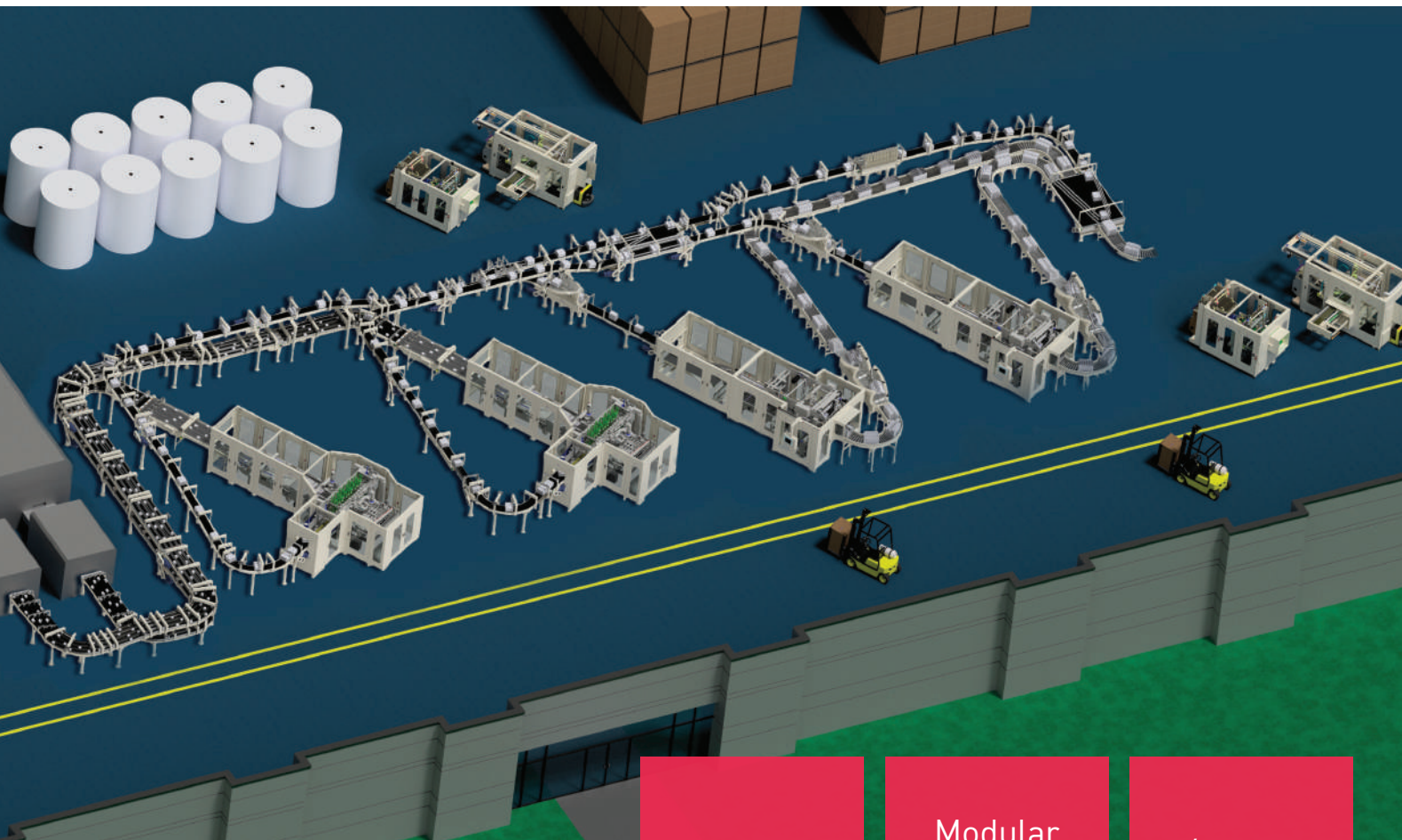
located close to sites could be involved.

Essity has secured the rights to a new proprietary technology to produce what it says is a sustainable alternative pulp from wheat straw, and the process is expected to reduce the use of water, energy and chemicals, while the by-product of the integrated pulping process can also be refined and used as a substitute for oil-based chemicals.

The final tissue product will be marketed in Germany under Essity's Zewa brand, and Giorgio says it will be of the same quality as conventional wood-based pulp tissue products – and available to consumers

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World-class **packaging machines** for the tissue industry.



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Machinery

Modular
Packaging
Machines

24/7 Service
World-wide

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- Single-Roll Wrappers
- Casepackers
- Bundlers
- Baggers
- Product Diverters
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at the same cost. It is, he adds, a project that could change the course of the tissue industry's future.

Giorgio has spent 11 years with Essity, having started his career as a Process Engineer at Procter & Gamble (P&G) in Italy over 20 years ago, and then working at P&G in Germany, Italy and the USA. "Europe really needs to step up and support innovation. As an industry, we need to work on something that gives the consumer a high-value experience, but which is also working on the affordability of the process in terms of capital, energy and water," he says.

When he started his career, he says standard toilet paper was 2ply, Essity's Lotus was 3ply, and any developments and innovation back then meant tissue products just became 4ply or 5ply. "If someone in the world doesn't come up with something new, in 20 years we'll have a 10ply toilet paper! If you look around the world at the increased rate of use of hygiene in regions such as China, Africa, Latin America, hygiene use is still rapidly increasing. But as an industry, we just can't carry on producing tissue with the same type of raw material with the same type of technology as we currently do. There is simply not enough supply for demand. When countries like China arrive at even half of the consumption per capita of Europe and the US, it is not manageable. It's not manageable in terms of energy and

"WE WILL TAKE AGRICULTURAL WASTE, MAKE PULP THAT GOES DIRECTLY TO THE MACHINE TO PRODUCE HIGH QUALITY TISSUE. THE LIGNIN CAN BE USED TO REPLACE PLASTIC AND IT CAN BE USED IN THE MINING INDUSTRY, IN THE FOOD INDUSTRY, OR USE POLYMERS FOR MAKING FILM ... SO THE TISSUE FACTORY OF THE FUTURE WILL BE LIKE A POD."

water and capital."

His own personal mission alongside Essity's is to make tissue products more readily available, with enough raw material to meet growing demand: "Parts of the world now are missing easy access to hygiene, and they need €500m for a small tissue plant and then a massive infrastructure of electricity and water. And of course, these are high-density populations, but many countries just can't build supporting mills. So in the future, we believe there needs to be a tissue process production that is more similar to personal care production: a small, affordable, energy-efficient manufacturing flow. This still needs to be invented, and Essity needs to do it."

At Mannheim, the company partnered with an American start-up company and combined this new technology of processing straw together with its knowledge of integrated papermaking and recycling to create "something that doesn't exist in the world," Giorgio says. "I am extremely excited about it. It's a really true innovation, something that has never

been done before. Mannheim will show the world that there is an alternative way to produce tissue. Development needs to meet need, and while virgin fibre isn't wrong if it's taken from certified sources, the world will still need an alternative source of agricultural waste, especially to meet the increasing consumption demand in China."

Mannheim is starting with straw because that region along with Poland is "full of straw". "But we can use this with any kind of agricultural waste. When we move eventually to Latin America, we'll use the local cultural waste there."

"Everyone is speaking these days about electrical cars, but you can live in Africa or China without an electrical car. However, people will always need hygiene. When we have evolved hygiene production to the circular economy, then we will have given the biggest possible contribution to the planet."

The potential is made even clearer with a glance at Essity's global footprint: 17,000 employees in the company's global supply chain and 4.2m tonnes of capacity spread



An alternative fibre: the final wheat straw tissue product will be marketed in Germany under Essity's Zewa brand

across 54 production sites in 19 countries.

Germany will remain a crucial sector for the business with its three consumer tissue sites in Mannheim, Neuss and Witzendhausen, as well as a dedicated AfH plant in Kostheim. The country's 580,000 tonnes of capacities are produced on 11 PMs, 53 converting lines and by 2,300 employees in tissue production.

A significant change of strategy for Essity's European division was announced in the company's half year results on 16 July. The creation of a Consumer Tissue Private Label Europe division is underway in its Consumer Tissue business area and will consist of 1,700 employees and seven production facilities, one in Belgium, two in France, three in Italy and Germany's Witzendhausen plant. The division is expected to be up and running by the end of 2021.

Georgio says the move will further consolidate the company's presence in the marketplace. "What we have managed compared to our competitors, starting six years ago with the 'Tissue Roadmap' – actually, starting with SCA 30 years ago – is creating value out of tissue. We had a very scattered footprint. With the Roadmap we made a lot of right steps to make sure we are homogeneous, with a well-defined footprint."

Part of that consolidation has also included the realignment of some of Essity's production, with the closing of some factories and shutting down of capacity across Europe. "We wanted very well invested and productive factories, some of which were designed for innovation," he adds.

Heading into 2022, he adds that the new private label division and realignment of production will create a division that is "self-sufficient, and well equipped to win in the private label market." Seven plants will be dedicated to the so-called pure product label for tissue, which are stocked mostly in discount supermarkets. "To be winners in these areas is different from being winners in the area of the brands," he says. "Our division will have a big impact in countries like Germany where you have the big discounters. We are very proud and excited about this because it's another innovative and novel way for Essity in creating value in tissue."

He adds the business has been very successful in the last year with the dual strategy of private label and brands at 60/40, and the new private label division will make it 50/50 private label and brands:



Donato Giorgio: "We deeply believe the tissue industry needs to be disrupted."

"This is another step to better serve the customers for their specific needs and create value and not destroy value. In the future there's space for private label and brands."

Private label "became big in Germany and across the world because if you are a commoditised, non-innovative industry, of course private label is the right thing. But when you bring in innovation, branded is the right thing. It brings a lot of consumer and customer-relevant insights and innovation power. So we see big opportunities for branded in tissue in the future, starting from sustainability for a circular economy as well as for customer and consumer convenience."

The world of tissue, he emphasises, needs innovation in many areas, starting from sustainability: "Consumers are very positively sensitive on this, especially the young generation who want to buy something that is in-line with the circular economy, but that equally doesn't cut quality or cost more money."

At Mannheim, he says the company will do something "fantastic for the planet", that will also produce a high-quality tissue product which won't cost more. "We will take agricultural waste, make pulp that goes directly to the machine to produce high quality tissue. The lignin can be used to replace plastic and it can be used in the mining industry, in the food industry, or use polymers for making film ... so the tissue

factory of the future will be like a pod. You don't waste anything. You take one tonne of agricultural waste. You don't waste anything. You take one tonne of agricultural waste and you make tissue, and eventually you can even make the packaging for it. It is bio based, biodegradable, compostable and recyclable. We deeply believe the tissue industry needs to be disrupted, and this is a real circular economy. It's the role of Essity in tissue."

On 16 July, the business also announced the step to become carbon neutral by 2050: "This means we are committed to evolve this industry to the circular economy. We are disrupting linear manufacturing and make it circular. We are also projecting intense work on paper machines to re-use the CO2 load of the PM process."

"I have been in the tissue industry for more than 20 years and Mannheim is the single biggest new thing I have seen. We are starting as we speak, the first unique plant in the world that produces high-quality tissue out of agricultural waste. I am incredibly proud of this, and it will be one of the main contributions I leave with my own personal footprint for the planet. This has never been done before in the world, which tells you a lot about our determination to bring the circular economy to tissue. The proof will be in the pudding, as the British say."

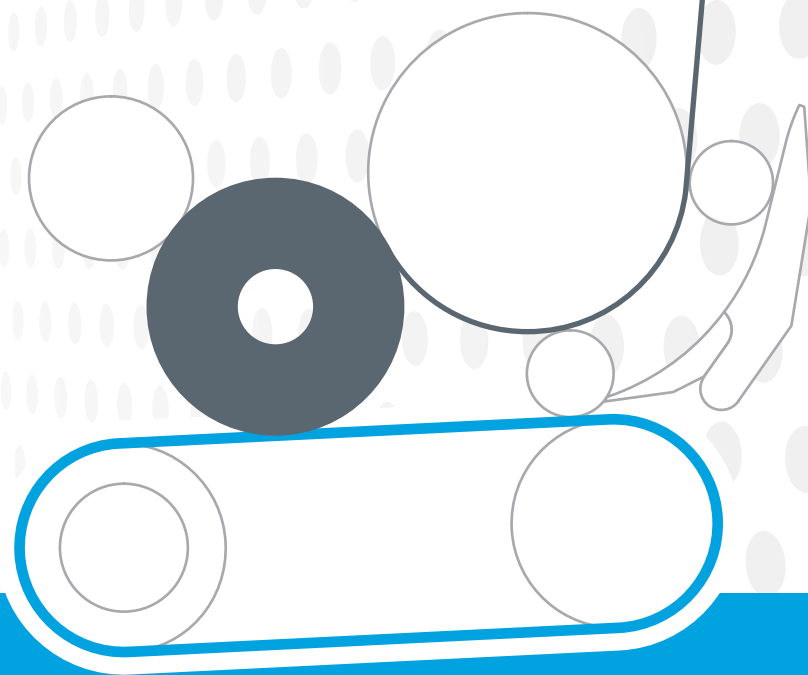
And with that, Donato Giorgio comes full circle.

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HOW THE PANDEMIC RAISED THE DEMAND FOR SUSTAINABLE AND INNOVATIVE HYGIENE PRODUCTS, AND MAY HELP POWER FUTURE TISSUE GROWTH

WEPA didn't just think outside the box when the Covid-19 crisis hit, it created new boxes, says CEO Martin Krengel. Report by TWM Senior Editor Helen Morris.

'Perform & Transform' was the title given to WEPA's strategy programme – it is also a response to challenges such as the extraordinary demands of the Covid pandemic. Given the European tissue giant's proven status in the industry, 'Perform & Transform' was in fact a continuation of an ethos already ingrained in its DNA ... geared up even further.

As Europe's entire retail business was impacted, and panic buying, especially in Germany, challenged the supply chain, WEPA was – as Chief Executive Martin Krengel puts it – able to "assert ourselves as a reliable partner and successfully fulfil the demand of our customers. We will keep working to pursue our vision to be the most sustainable and agile first-class partner for personal and professional hygiene solutions."

WEPA operates through two European business units, WEPA Consumer and WEPA Professional. It has five production sites in Germany, three in France, two in Italy, and one site in Poland, the Netherlands and also the United Kingdom. Headquartered in Arnsberg, Germany, it has a total of 21 paper machines and more than 90 automatic processing machines for rolled and folded tissue paper. It claims a market share of 25% in Germany and around 8% in Europe. Some 80% of its revenue is generated by its Consumer business unit and 20% by its Professional business unit.

The full title of the strategy programme is 'Perform & Transform – WEPA 2023', attesting to the vision. So towards 2023 where will the transformation be?

In Consumer, growth will be organic, but also through investments in profitable markets. One example: in the UK investment is going into a paper machine to meet the growing demand.

In Professional, investment will go into equipment and machinery especially in the plants at Swalmen in the Netherlands with new converting lines and Piechowice



WEPA's Arnsberg headquarters: The company claims a market share of 25% in Germany and around 8% in Europe.

in Poland with a new paper machine. Investment even in difficult times towards higher penetration in home markets and growth in new strategic markets such as Central and Eastern Europe, the UK and France.

Product offering will be diversified: "In our Professional business unit we want to go beyond the paper category and expand also in adjacent categories. The launch of hand hygiene products mark a first step. Furthermore, we want to strengthen our service offering."

"Proximity to our customers has proved essential: we reacted towards increased hygiene needs in new application areas outside the washroom, for example by launching a low-cost dispenser made fully out of cardboard."

"We are also convinced that in the future, new usage occasions for hygiene paper will play a role, such as for the disinfection of shopping trolleys."

"The launch of our hand disinfection range is a reply to the increased hygiene demands of our customers."

"Diversification also plays an important

role in our newly founded business unit 'New Business Areas' which is led by Andreas Krengel, Member of the Management Board of the WEPA Group from the third generation of the entrepreneurial family. It also plays an important role at WEPA Ventures, the corporate venturing arm of the WEPA Group through which the business coordinates cooperation with start-ups. WEPA Ventures invests in start-ups that focus their business model on sustainable hygiene solutions and/or offer solutions in the area of alternative raw materials and sustainable packaging. In addition, it also builds its own start-ups."

Sustainability will play an essential role, says Krengel: "We are the number one player for recycling qualities in Europe with more than 35 years of experience and we have further invested into the technology of recycled paper fibre preparation. Recycled fibres are ideal for the production of hygiene papers, as the products cannot be returned to the cycle after use."

Hybrid and recycling strategies will be advanced across Europe. In Consumer, the "mach m!t" recycling brand is

well established in Germany, and the recycling brand "Feel Good" is newly launched in the UK.

"Our approach is to inform consumers about the high qualities in recycling paper and the positive environmental impacts of these products."

"Additionally, we convince more and more consumers of our hybrid paper, for example the products of the brand "Comprami" in Italy: a mix of recycled fibres and cellulose. More and more retailers are listing hybrid products in their assortment.

"In Germany the share of recycled products is about 20%. If we take a look at consumers who buy WEPA products, we see that already around 50% of them buy environmental-friendly toilet paper: 27% buy 100% recycled paper and 25% choose our hybrid paper. We are optimistic that these numbers will grow further due to the fact that sustainability plays an increasingly important role for consumers in Germany and across Europe, and that nowadays consumers can hardly tell the difference between a pulp and a recycled product."

In terms of tissue sectors, Germany is a unique market: high private label development and use, dipped only because of panic buying at the height of the pandemic, and yet a strong preference and loyalty for brands.

Krengel outlines WEPA's portfolio: "In the AfH market, in the last two years we have developed away from being a private label and brand manufacturer, towards a clear brand focus. Our brands "Satino by WEPA" and "BlackSatino" will play an essential role in driving our growth objectives and our brands play leading roles in sustainability. For example, "BlackSatino" is the only hygiene paper brand in Europe used in the Professional sector which has been awarded with the Cradle-to-Cradle silver category."

These brands are aimed towards growth beyond the home markets in DACH (Germany, Austria and Switzerland) and BNL (the Benelux countries of Belgium, the Netherlands and Luxembourg) towards other countries in Western and Eastern Europe.

"We want to strengthen our service offering. For example, we are starting to take back used hand towels also in Germany and use these as a source of fibres to create new hygiene paper."

"In the Consumer market we're present in the main European countries at most of the retailers. As number three in the market, we are one of the top suppliers in the European hygiene paper market and a reliable partner



WEPA Group CEO Martin Krengel, left, and his son Andreas Krengel, CSO, and who leads "New Business Areas"

for the retailers. Besides the supply of standard assortments, we are also aiming to implement and enlarge a sustainable assortment at our customers. A clear goal is to bring our hybrid and recycling strategy forward in each region. Our recycling brand "mach m!" is very well known in the German market. Our UK recycling brand "Feel Good" shows consumers that ecology and comfort isn't a contradiction, and in Italy for example, we offer hybrid products of our brand "Comprami".

"Besides our recycling and hybrid brands, we consider ourselves experts in the production of private label products. Due to the pandemic-related panic buying in Germany last year, the private label share decreased for the first time for many years. We see this as a one-time effect due to the fact that private label products were temporarily sold out in shops and we expect further growth in the private label business in Germany as well as in other European countries in the upcoming years."

"The growth strategy for WEPA Professional focusses on the growth of our brands "BlackSatino" and "Satino by WEPA". The brand strategy will allow us to serve our clients in the future with the most sustainable and most hygiene-oriented product portfolio and hence support our customers and end-customers in pursuing their ambitious targets towards hygiene and sustainability. Some product and service concepts can only be offered under a strong branded offering, such as our hand towel return service."

A cross-sector recovery from the pandemic, he is convinced, is a certainty,

but the timeline is likely to differ sector to sector: "With the recent re-openings, we also see a surge in demand coming from HoReCa and tourism-oriented clients. However, business travel will need some more time to come back to pre-pandemic levels."

"Home-office regimes are also likely to continue in the future which will lead to a softer demand situation from office clients."

"A further factor driving market growth for hand towels is the fact that it has been proven to be the most hygienic way to dry hands. This has led many authorities, organisations and washroom operators to dismantle hot air dryers and replace them with paper hand towel dispensers. Our end user research has shown that paper hand towels are by far the most preferred option to dry hands: 94% of end users prefer hand towels over cotton or hot air dryers."

The key challenges and opportunities, then, going into 2022? "Currently, the commodity price situation causes challenges for all tissue mills. Especially in situations like these, great partnerships between manufacturers and retailers are important to overcome the obstacles together. We understand that sustainability, delivery reliability and high product quality are important to our customers. In the end, it's not just the lowest price."

"Sustainability and innovation are two of the main aspects we focus on as a company and we continue to focus primarily on recycled paper and recycling processes. We see significant growth potential here and will continue to invest in sustainable concepts and innovations."

DISPENSING A CLEANER, SAFER SERVICE FOR GERMANY'S HEALTH-CONSCIOUS PUBLIC

Metsä Tissue divested its napkin business in 2020 and has realigned its focus on tissue. Tobias Lüning, Vice President Supply Chain Western Europe, Country Manager Germany, spoke to TWM.



Finding new markets: Metsä Tissue's Raubach plant, and inset, Tobias Lüning, Vice President Supply Chain Western Europe, Country Manager Germany.

Tissue companies' responses to the new demands made of them by the pandemic crisis have taken many forms. Some predictable and well known, some not so predictable. In Metsä Tissue's case its Katrin dispensers have been providing paper towels across Germany and beyond as hot-air hand dryers have been replaced to reduce the spread of viruses and bacteria. Another source of company growth was not so predictable. One of its key products is greaseproof papers, and the pandemic has changed that market too. The lockdown meant many more people spending more time at home, and a subsequent increase in home-cooking and baking, and a nice upturn on the sales graph. It is a boom the company expects will continue.

That transition out of the worst of the pandemic, and its wildly varying effects on the tissue industry, is the next chapter in the story. How, and when, will it settle, and especially in this pioneering, mature market which is already at 86% private label and is as innovative as it ever.

Tobias Lüning is looking to the future. Metsä Tissue owns brands including Lambi, Serla, Mola, Tinto and SAGA in the consumer market, and in the professional

market it operates under the Katrin brand. It also manufactures private label products for customers, foremost in Germany.

It has three mills in Germany with multiple paper machines and converting lines producing over 200,000tpy of tissue paper and 35,000tpy of greaseproof paper. Following an increase in customer demand for professional tissue paper products, the company's latest investment was at its Raubach mill where it invested €10m in a converting line that is about to start-up in the second half of 2021. It will produce 16,000tpy of folded hand towel converting line and according to Lüning strengthens the company's market position, especially in Western Europe.

He adds that a bigger share of production is for the consumer market, as well as the professional market. "Our consumer business in Germany is mostly the private label business whereas in the professional business our Katrin brand has an important role."

At the start of 2020, Metsä Tissue divested its napkin business to Keeper Group to focus on tissue, and its business plans have not changed since: "We still see a growing demand for high-quality tissue

and greaseproof paper, and we are focusing on those categories."

The transaction includes the real estate, machinery, equipment and warehouses at the Stotzheim mill in Germany as well as the Fasana and Mondial brands. At the time, the business said that the napkin business had "not reached profitability targets lately, and napkins are not part of our core offering anymore". The move "supported Metsä Tissue's strategy, and enables us to focus on our core business, producing high-quality tissue and greaseproof papers close to our customers".

Following the outbreak of Covid-19, Lüning says it has "certainly made a big impact". "I can only repeat what our Chief Executive Esa Kaikkonen has said, and that Covid-19 has offered us many new growth opportunities – especially in hand hygiene. Since spring last year, public facilities and toilets all around Europe have been fitted with Katrin paper towel dispensers in place of hot-air hand dryers that disperse viruses and bacteria. The use of tissue paper has also increased in healthcare."

For the use of papers outside of the home, it is a waiting game for when the situation will continue to improve and for

societies to open up. Sales are expected to start to return closer to normal from this summer onwards.

The pandemic has also changed the greaseproof papers market, where demand initially plunged in professional use because of restaurant lockdowns, but the increase in home cooking and baking boosted demand overall.

Lüning says the plan for 2022 is to grow organically in Germany, supported by strategic investment such as the new folded hand towel line. "We will also continue to follow our strategy to sell our products close to our customers and mills. Minimising transportation and producing closely where our customers are located is an important part of our sustainability roadmap," he adds.

There are also plans to further diversify its product offering. "A narrower product offering improves the availability of tissue paper deliveries in exceptional circumstances, and we have taken a number of actions to focus our offering during the pandemic."

"We respond to consumers' needs with products that are produced and transported efficiently and sustainably. Good availability, high-quality products and sustainable production gives us benefits throughout the whole value chain."

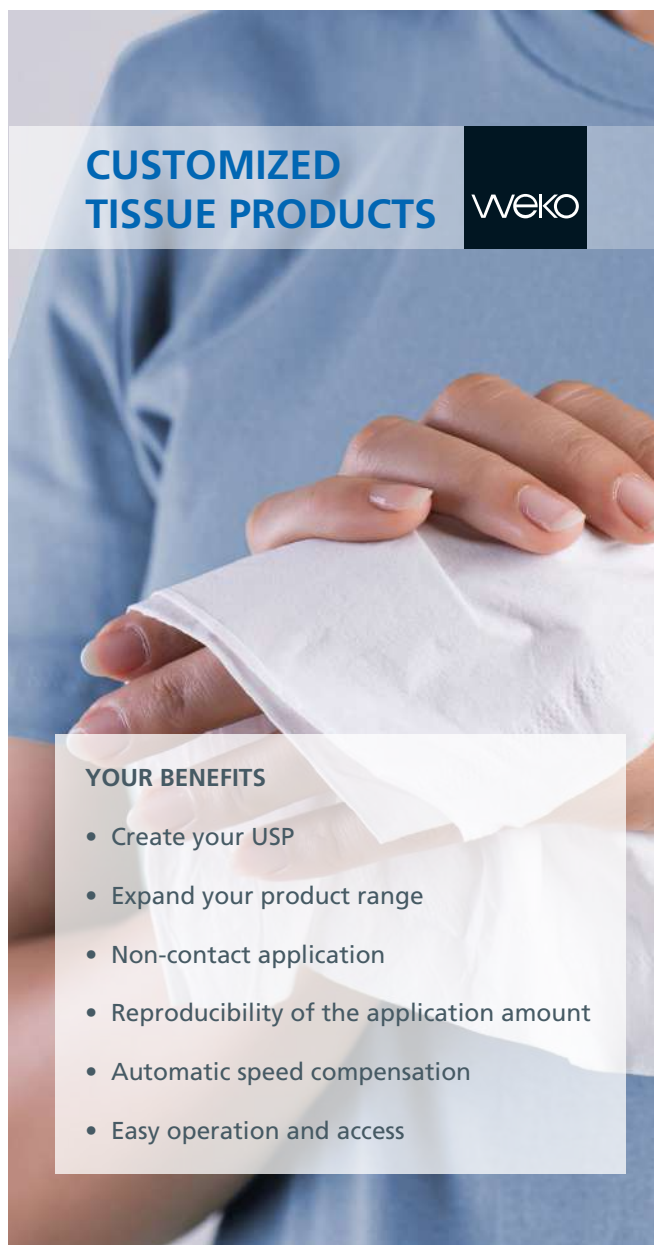
Metsä Tissue's competitive edge also lies in environmental tissue products: "A unique, sustainable value chain extending from the wood raw material all the way to end products is key. Our main raw material for tissue papers is sustainable and renewable fresh fibre. Fresh fibre is the fresh wood fibre, which is generated by thinning forests to ensure healthy forest growth or as a by-product of producing wood products. Fresh fibre is a sustainable and naturally pure and hygienic raw material and when it comes to its environmental impact, its use saves energy and water because the fibres require less processing in the mill."

Additionally, the business also uses recycled paper in its products: "Recycled fibre is an important raw material for us. However, newspaper subscriptions and the use of office paper, for instance, are declining continuously due to digitalisation, meaning that the volume of recycled paper is decreasing and recycled fibres are transported to the mills across increasingly long distances. In the long run, this is not sustainable."

He says that while many consumers believe that recycled fibre-based products are "more ecological" than fresh fibre-based products, as recycled paper comes from various sources it always requires cleaning, which is water- and energy-intensive. "The amount of waste generated during the production of fresh fibre-based products is considerably smaller than that generated during the production of recycled fibre-based products."

Across the German marketplace, private label still dominates the consumer/retail market. "We expect this will not change in the near future. The percentage of private label products continues to increase and is now above 86% of the market, even though 2020 was a bit of an exception due to Covid-19 as we have seen more brand sales due to supply constraints as well as more brand products from outside the German market being imported."

The business, he adds, is well prepared to supply the German market with its consumer portfolio in private label products serving all major German retail chains, and the continued growth of its Katrin brand in the professional/AfH market: "This will also be a key focus for us in the next years. Our aim continues to be to make everyday life cleaner and our vision is to be the preferred partner in developing sustainable business. The cornerstones of our strategy are to operate close to customers and providing them with local services by offering them the hygiene solutions of the future, based on the sustainable use of renewable northern wood."



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HANDY FOR OIL SPILLS, WASPS, BEES, SPIDERS, THE DOG ... OH, AND YES, FOR WHAT IT WAS ACTUALLY DESIGNED TO DO IN THE FIRST PLACE

Callum John is a writer who lives in England. He has contributed to various publications during a long career. He is also a gardener, a cook, a walker, an odd-job man, a raconteur, and many other worthwhile things.



With sincere apologies to Elizabeth Barrett Browning*, as a consumer of tissue let me ask: "How do I use thee? Let me count the ways."

There are all the obvious ways, obviously, but I'd like to start off by paying tribute to the dexterity of this really rather amazing product. I mean, it has come all the way from being a tree, having chain-sawed and chopped up a few in my time, I can assure you is hard and not on first impressions the most likely object in the world destined to make a nice soft hanky. (For the many who are not well up on English slang terms ... that's a handkerchief.)

I have a vague idea about what goes on during this transformation. Things like long and short fibres, eucalyptus may also be involved, and bamboo, there's something called pulp, and a 'mash' which looks a bit like mashed potato which has had too much water added but is mashed wood fibre, and there is a lot of machinery and a lot of technology, and somewhere along the way a little design can be embossed on and a nice whiff of lavender may be added. Or sandalwood. But essentially it's wood. How many facial tissues can be made from one tree, I wonder?

LIKE WIPING THE OVERFLOW OIL OFF THE SMALL CHAIN-OIL TANK ON THE CHAIN SAW. I DON'T HAVE A MOTORBIKE, BUT I IMAGINE TISSUE COMES IN HANDY (MORE SLANG ... COMFORTABLY FITTING INTO THE HAND FOR GENERALLY USEFUL ACTIVITY) THERE TOO.

Apologies for this essentially layperson's concept of the manufacturing process, but I do appreciate the end product. It's about contradictions ... soft and strong, dry and moist, resilient but easily scrunched up and disposable. It can be gentle and scented for a polite dabbing of the face. It can be tough and multi-layered enough to take on the less aesthetic functions.

It is, I believe, good at removing a woman's make-up at the end of the day. And with men, men like wiping off the 2-stroke engine oil which we (I) have spilled onto the hot carburettor while filling up the sump on the sit-on petrol lawn mower.

Like wiping the overflow oil off the small chain-oil tank on the chain saw. I don't have a motorbike, but I imagine tissue comes in handy (more slang ... comfortably fitting into the hand for generally useful activity) there too. And also, when we come in from a walk and it's been raining and the dog is looking a bit miserable as his face is wet. He appreciates – mainly because he loves the attention - having his face wiped with a kitchen towel or two. Also, when a spider climbs into the bath, a gentle scoop with a tissue and she (I think) is popped out the window.

Likewise with wasps. We are very rural, and when a wasp buzzes in a tissue ... facial, kitchen, toilet, whichever happens to be within reach ... folded in half or quarters and with a gentle scoop he (I think in this case) is popped out the window.

I blow my nose with a tissue which, surprisingly given the size of my nose, is not a man's size but a more moderate family utility size. I wipe the perspiration off my sunglass lenses, and I haven't even mentioned the kitchen yet. In there, they're irreplaceable (I don't prefer kitchen cloths) for mopping up any number of spillages; for holding the handle on the over-heated copper pan or iron griddle; for resting my spatula on as I haven't got round to buying one of those rests yet.

The basic kitchen towel can be folded for table napkins. How folded is interesting ... it's in half rectangular for basic meals, in half triangle for something a little more special, and in half triangle with beautifully floral scented design to make the social statement one wants to make, when one wants to make it. Amid all this multi-usage, I don't really give much thought to sustainability and environmental production and the kitemarks ... only because I assume that has been taken care of. I should be more attentive, I suppose, but I'm aware the industry is very keen on all that important stuff.

We buy white, I can tell you that, other than the beautifully floral scented napkins, and across brands. Sometimes famous names and sometimes plain packaged supermarket own brands. Variety, as you can see, is the spice of life.

**Elizabeth Barrett Browning: English poet who wrote the acclaimed sonnet "How do I love thee? Let me count the ways."*

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Marco Calcagni
Sales and Marketing Director, OMET



Andrew Green
Vice President of Tissue and Nonwovens, PCMC

TWM/1: What new technical developments and machinery launches have you made in the past year, and what does 2022 hold?

Christian Zagnoni, Chief Technical Officer of Futura and Plusline: "For Futura, the acquisition of Plusline towards the end of 2020 represents the continuation of our strategic plan dedicated to the progressive improvement of what we offer. This is not only about the integration of companies but heralds a new era of the integration of packaging within converting."

"Further technical developments include: Camallo – the first automatic system for loading and exchanging coreboard reels; the JOI embosser, which has been taken to a new level of automation and performance



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in its latest incarnation; automatic adjustment of the Sferica rewinder is yet another step to optimise output without manual intervention; and automatic blade-changing on the log saw including bevel measurement brings new levels of safety and efficiency."

Carlo Berti, Sales & Marketing Director, Gambini: "I clearly remember our pledge last year not to use empty words like 'innovation' or 'flexibility' in this kind of interview. This time, we commit to not talking about what we do, but why we do it. Indeed, the most significant launch we made in 2020 is not a technical development or a machinery – it is the company's new vision and mission. That's the most important thing we can supply to our customers: not just the best converting lines – of course we do it, as well! – but the reason why we get up in the morning.

"As we consider ourselves a part of the well-being industry – not just the tissue or paper one – our purpose is to empower people to feel safe, healthy and free. We make it by spreading the culture of hygiene, a target we strive to achieve through the products our customers can make with our technology: unique and, let me tell you, extremely powerful, if you want to go beyond tissue!"

Çınar Ulusoy, General Manager, Innovative Converting Machinery (ICM): "In 2020, we launched our new 2,800mm wide VENUS V-Fold production line, which also includes PE packaging and facial tissue box filling machines. In 2021, we are introducing cardboard parcel filling and PE Bundling machines as secondary packing machines for the previously mentioned production line and existing ZENITH Z-Fold production lines.

"In 2022, we are preparing to launch our new toilet tissue and kitchen towel rewinder with 700mpm rewinding speed. This new rewinder is going to include many new features that were never before seen in the industry."

Çınar Ulusoy

IN 2021, WE ARE INTRODUCING CARDBOARD PARCEL FILLING AND PE BUNDLING MACHINES AS SECONDARY PACKING MACHINES FOR THE PREVIOUSLY MENTIONED PRODUCTION LINE AND EXISTING ZENITH Z-FOLD PRODUCTION LINES. IN 2022, WE ARE PREPARING TO LAUNCH OUR NEW TOILET TISSUE AND KITCHEN TOWEL REWINDER WITH 700MPM REWINDING SPEED. THIS NEW REWINDER IS GOING TO INCLUDE MANY NEW FEATURES THAT WERE NEVER BEFORE SEEN IN THE INDUSTRY.

Mauro Luna

KÖRBER IS THE ONLY TRULY INTEGRATED AND GLOBAL PROVIDER OF ADVANCED SOLUTIONS FOR THE TISSUE SECTOR. WE OFFER THE INDUSTRY'S MOST COMPREHENSIVE PORTFOLIO OF TISSUE TECHNOLOGY TO SUPPORT YOU ACROSS THE ENTIRE VALUE CHAIN – FROM ROLL TO FOLD, FROM CONVERTING TO PACKAGING. THIS INCLUDES ADVANCED DIGITAL SERVICES AND ENGRAVING TECHNOLOGIES AS WELL AS UNIQUE SUPPLY CHAIN CONCEPTS.

Mauro Luna, Chief Sales and Marketing Officer, Körber: "Körber is the only truly integrated and global provider of advanced solutions for the tissue sector. We offer the industry's most comprehensive portfolio of tissue technology to support you across the entire value chain – from roll to fold, from converting to packaging. This includes advanced digital services and engraving technologies as well as unique supply chain concepts.

"This is why our technical developments and machinery launches have different development areas for each specific area. For example, Solid +, the only roll with no core or central hole, has been a patented technology on the market for over 20 years, but last year we launched it very successfully in China.

"A few weeks ago we launched a real breakthrough innovation at a global level: Warm-up Contactless, the first hot embossing system that uses induction.

"Conventional hot embossing systems have some disadvantages such as safety, energy expenditure and long heating times. With Warm-up Contactless, which can be used without modifying the rollers, it is possible to increase the volume of the product up to 20%. It is an eco-sustainable process that reduces heating times by a third, saving over 60% of energy. It also makes the system safer because it eliminates the passage of liquids at high temperatures and pressure peaks on

the line. The system is designed not to interfere with the operator's work such as web thread up and rolls changeover.

"Among the other decisive launches for the Roll Area is Proxima S6, which is ideal for the AfH sector. The setting of the machine is completely automatic and makes it possible to change the product in less than 10 minutes, including changing the core diameter, guaranteeing maximum safety for the operator who can control the operations via the HMI panel.

"For the Pack area we have developed a "green" solution that can easily adapt to current systems and existing plants, ensuring concrete benefits from an economic point of view as well.

"Bioplastics and biodegradable plastics are only partial solutions, but the global scarcity of materials and high costs prevent their full implementation. Extensive research and development has led Körber and partner companies to use recycled and virgin paper which is 100% biodegradable and FSC-certified.

"The TIP (Technical Improvement Programme) Bio Pack kit allows the perfect transition from polymer to paper, through a simple command on the operator panel that ensures efficiency, quality, and constant performance.

"Compatible with all current machine formats and configurations, with any type of paper including reels combined with bioplastics, Bio Pack is the perfect solution to optimise tissue product packaging operations.

"For the Fold area, MTC MyFold lines complete the portfolio of single and multipanel interfolders with extremely competitive solutions for the market that provide high performance in the category and high product quality standards."

Alberto Carlini, Area Sales Manager, Maflex: "2020's key phrase was "turn-key solution". In a year so deeply marked by the difficulty of travelling around and being able to meet, we are proud of the

Enrico Ruglioni

WE HAVE SEEN GREATER INTEREST FOR PRINTED PRODUCTS; AFTER VARIOUS TWO COLOUR PRINTERS INSTALLED AT CUSTOMER'S SITES, MAXIMA IS GOING TO DELIVER A FOUR COLOUR PRINTER TO BE INTEGRATED IN A THIRD PARTY CONVERTING LINE. ONCE AGAIN, THE WELL PROVEN SOLUTIONS DEVELOPED BY OUR TECHNICAL TEAM FOR MAKING PRINTING PROCESS SO EASY AND AUTOMATIC HAVE BEEN APPRECIATED BY THE END USER BEATING COMPETITION OF ALL OTHER MACHINE SUPPLIERS.

fact that many customers were confident in giving Maflex the full responsibility of their projects, from rewinder through downstream packaging. Thanks to strategic partnerships with packaging OEMs, we were able to deliver two complete projects (converting + packaging), allowing our customers to focus on more productive aspects of their business. Another major turn-key project will be delivered in the first quarter of 2022.

"Continuing the focus on turnkey solutions, Maflex launched a complete line for the production of wet wipes. This includes all the necessary downstream packaging, stuffing, filling, etc. Other significant accomplishments of the past year were start-ups of the HERACLE QUICK CHANGE and the HYBRID SOLID rewinder."

Enrico Ruglioni, European Sales Director, Maxima: "Maxima has been active in various aspects to support customers in meeting market developments. These include:

- Coreless Rolls for Consumer and AfH products have been requested by various tissue producers both in North America and in Europe; at Maxima we have developed complete lines, which can quickly switch from Cored to Coreless products so that end user can follow the trend and anticipate some applications;
- New rewinder UNITECH to improve quality of finished goods both for mid-range performance (PRIME line, which will be shown during next open house in October) and for high level

speed up to 700mpm and higher. This new concept is called BULKTECH and the results are almost perfect winding without damaging the embossing pattern from the beginning to the end of the winding. BULKTECH has also proven to be very successful for TAD products and end users have appreciated how the simplified mechanical and electrical applications allow all operators to reach very fast maximum productivity. Combined with BULKTECH, Maxima has also developed a new system capable of self-adjusting the winded products by measuring the thickness of the paper, so that passing from hard to very soft roll is fully controlled and automatic;

- We have seen greater interest for printed products; after various two colour printers installed at customer's sites, Maxima is going to deliver a four colour printer to be integrated in a third party converting line. Once again, the well proven solutions developed by our technical team for making printing process so easy and automatic have been appreciated by the end user beating competition of all other machine suppliers."

Marco Calcagni, Sales and Marketing Director, OMET: "In the past year we have launched the MF Line, a new revolutionary multi-folding machine that can produce all types of napkins made of different materials and types of fold and embossing. It's a multi-fold machine and is

a combination of our technology for folding but dedicated to napkins. In particular, it's dedicated to personalised napkins because it can be combined with our digital solution for printing and also combined with traditional flexo solutions. This digital printing configuration allows maximum flexibility in producing customised products with no set-up waste.

"The MF Line is available in single or double lane configuration and offers napkins production with different types of fold with quick job changes that come directly from the operator control panel due to its new vacuum/mechanical folding head technology. It can also fold napkins in a variety of ways.

"It is a really important development for us because it's fully electronic and motorised and can change the napkins with a different type of fold without any mechanical intervention, everything is done by the control panel. We also have the opportunity to connect with Smart solutions – Industry 4.0 can be connected across all of our machines and we have also developed intelligent software to give to the customer.

"Other developments have included producing a folded product that has a special material, for example disposable masks, or a particular folded product for house cleaning such as dust removal. We have also developed the solution for IBT (Improved Bonding Technology) and that can now be used in our machines, offering a solution to avoid embossing. This means the cost for our customer is significantly reduced and that the bonding of the two or three ply comes together without using embossing, thus reducing the cost for our customer.

"We have also developed a product that we will launch in the next couple of months. It is a new variable folding napkin solution where the system to interfold the napkins one to the other is now possible with different sized napkins. This means it's not dedicated to just one size.

"We also have a machine called the XV Line for extra volume for napkins, and this is for the jumbo roll market. It has the capability to produce 25,000 napkins per minute and is a very big innovation that we will deliver next year. It really is a revolution in the napkin market because it's a fully mechanical machine with the highest capability in the market today.

"We have also developed for the interfolding product for facial tissue and hand towel. For kitchen towel, we have our

Marco Calcagni

WE HAVE ALSO DEVELOPED A PRODUCT THAT WE WILL LAUNCH IN THE NEXT COUPLE OF MONTHS. IT IS A NEW VARIABLE FOLDING NAPKIN SOLUTION WHERE THE SYSTEM TO INTERFOLD THE NAPKINS ONE TO THE OTHER IS NOW POSSIBLE WITH DIFFERENT SIZED NAPKINS. THIS MEANS IT'S NOT DEDICATED TO JUST ONE SIZE.

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new interfolding machine ASV Line, which can now produce at a speed of 300 metres per minute, with very high capability."

Andrew Green, Vice President of Tissue and Nonwovens, PCMC: "Our challenge was to optimise our tissue converting and packaging machine portfolio, continuing to produce innovation in all areas. While we have perfected our AMICA UNICA lines with consumer and AfH geometry and broadened our FORTE offerings, we are extremely excited about customer response to PARAGON, our new flagship rewinder for consumer tissue and towel. PARAGON has exceeded our expectations for ease of use, productivity, and product quality."

"Equally exciting is SmartTouch™, our game-changing human-machine interface (HMI) that provides intuitive navigation and situational awareness for the user. In packaging, our new DIVERSA (branded STAX Technologies) is a high-speed bundler and completely distinctive case packer in one machine, with a simple adjustment to turn the case packer into a bundler, and vice versa. With these changes, we are positioned in tissue converting and packaging to provide solutions to all customer needs."

"For 2022, we are developing new technologies in the areas of safety, ease of operation and maintenance, sustainably produced products, direct-to-consumer shipping, and transforming data into insights and actions to improve OEE. We also continue to invest in understanding tissue making, converting, and packaging as a single system with a common goal of producing saleable, profitable products."

TWM/2: What features are you incorporating to minimise downtime between changes in print design, embossing design or roll format?

Zagnoni: "On our JOI embosser there has been a complete revision of the transmission system. Embossing roll changes are of course handled by the Andromeda crane, along with rubber rolls, cliché and anilox. Combined with a new storage area for embossing rolls which is fully accessible in complete safety while the line is running, this takes JOI to a new level of automation – even to the oil circulation system detachment which is managed from the control panel."

Berti: "This is a converting technical issue, I understand if you want me to get there! You all know we are the ones who invented TouchMax, don't you? Known in every corner of the world as the easiest

Andrew Green

OUR CHALLENGE WAS TO OPTIMISE OUR TISSUE CONVERTING AND PACKAGING MACHINE PORTFOLIO, CONTINUING TO PRODUCE INNOVATION IN ALL AREAS. WHILE WE HAVE PERFECTED OUR AMICA UNICA LINES WITH CONSUMER AND AFH GEOMETRY AND BROADENED OUR FORTE OFFERINGS, WE ARE EXTREMELY EXCITED ABOUT CUSTOMER RESPONSE TO PARAGON, OUR NEW FLAGSHIP REWINDER FOR CONSUMER TISSUE AND TOWEL.

solution to manufacture different products on just one line: no downtime, no weird settings, flat-out the best (by far)! Now, our next focus is going to be the unwinding phase: I'm only allowed to say that we are re-thinking the whole process from scratch, bringing efficiency and safety to the highest level in the industry."

Ulusoy: "Printing units that we are launching in 2022 are going to incorporate smart self-print-registrating technologies that are going to reduce print setup time to seconds without needing operator assistance. In addition, we are aiming to reduce the embossing roller change time to minutes in our upcoming embossing units. "Furthermore, in our new rewinders we are going to be able to recall previously saved parameters like core diameter, log diameter, log length, log density for each product eliminating the setup in between product changes."

"Our main purpose is getting rid of manual settings in every machine, thus creating user friendly machines and getting rid of setup time losses."

Luna: "Proxima S6 allows extremely fast format change via HMI panel, making it the ideal machine for AfH."

"Körber also has the widest range of embossers with the widest roll change in the world. The embossing process can present production inefficiencies and operator safety risk primarily due to the manual embossing roll changeouts. Switching the cumbersome steel rolls can take upwards of an hour, and requires an expert operator/mechanic to complete."

"The Catalyst Embosser is the only embosser on the market with automatic steel roll changes for top and bottom positions. Embossing patterns are changed as easily as pushing a button on the HMI, improving safety, efficiency, and flexibility on the line."

Carlini: "MAFLEX is known for providing flexible machinery for the tissue, towel, and wiper markets. Our products have always been known for their quick and reliable push button and tool free changeovers. Our

Universal Clamp system on our log saws, automatic roll change HERACLE embosser, and HERMES continuous winder capable of producing cored, coreless, and solid rolls demonstrate our machinery's capability to produce a wide range of formats on a single machine."

"The new Integrated Supervision System will be launched in 2022 and will allow the line user to fully plan production, maintenance and procurement of raw materials and consumables in order to optimise operations by minimising downtime, consequently increasing efficiency and simplifying production planning."

Ruglioni: "One of the main drivers of all Maxima developments is flexibility and high efficiency. More specifically for the printer these are the main benefits that we provide to our customers (PRINTECH 2 and 4):

- Changing colours (removing all ink, cleaning the chamber and inserting new ink): this is all done automatic without operator intervention reducing waste and start up issue;
- Cleaning the cliché while the machine is running also for four colour products improving efficiency significantly;
- Changing the sleeve: Cantilever in automatic, no tool needed, all operations managed by the PLC, the operator has to simply remove the sleeve (already released by high pressure, in all safety): 2 minutes per sleeve;
- Automatic timing of the sleeves: the system recognises the lot of sleeves with their design and it automatically times them: this allows reduced waste of start-up and quality control in continuous mode;
- All rolls are controlled by motors, thus eliminating all gears and long maintenance;
- Doctor blade lifetime is very long as the blade is under continuous pressure against the anilox and no adjustments from operator are required.

IN ADDITION TO OUR DEVELOPMENTS WITH JOI, ANOTHER EXAMPLE IS A LOGSAW INNOVATION: AUTOMATIC BLADE CHANGE ON THE LOGSAW IS ANOTHER GAME CHANGER ENHANCING THE SAFETY OF THE OPERATORS. THANKS TO A CAMERA MONITORING SYSTEM TO ANALYSE THE BLADE'S CONDITION WHILE IT IS RUNNING, AUTOMATIC BLADE GRINDING IS ADJUSTED AS NEEDED. THIS SYSTEM KEEPS THE BLADE IN OPTIMUM CUTTING CONDITION WITHOUT DISRUPTING PRODUCTION AND WITHOUT UNNECESSARY GRINDING.

For the embosser MULTIFUNCION

EMBOSSER 700, apart from very high-speed, Maxima has developed unique solutions that provide total flexibility to end users in terms of changing embossing pattern and adjusting the pressure to optimise products even according to line speed;

- A dedicated in-line built crane, managed by a robotic intelligence, allows to change engraved steel rolls in a matter of five minutes and positions them in the dedicated storage. To change from toilet paper (micro/deco) to Kitchen Towel (nested) takes about 10 minutes. Up to seven different patterns can be installed in the line, making Maxima solution the most flexible in the market;
- The timing of the nested rolls is managed automatically, without any tools, so that restarting the line can be done in few minutes;
- Embossing pressure is controlled by encoder installed on electromechanical cylinders: it can be managed from HMI and it self-adjusts according to line speed;
- Do you also need P/P? Multifunction Embosser also provides the characteristics of switching from DESL/ deco to P/P and vice versa in less than 30 minutes and with a high level of automation;
- Do you have various paper width as you are buying paper in the market? Maxima embosser also provides the possibility of changing cliché automatically in a matter of few minutes."

Calcagni: "All of our recent launches and machinery developments have downtime in mind. We have continued to develop the printing with the system of Chameleon by OMET, this is digital and there's no downtime to change on the machine, it's zero.

"Also in our machine with the Tronic concept, all of the printing unit is fully automated. Furthermore, the cleaning of the plate can be done automatically without any need for the operator to do this, thanks to the Raccoon system. This means that even in the big machine it can have a very short run."

Green: "There are a few fundamentals to minimising downtime between product changes. One is robust machines with repeatable settings. Another is a thoroughly planned threadup system with as few manual handoffs as possible. A third is an intuitive recipe management system. We continually make advancements in these areas.

"For very frequent embossing pattern changes within a line, our ARCO automatic roll change system provides for embossing rolls stored inside the line's guards, but away from sources of contamination like glue and dust. The RollShuttle provides a means to remove a roll from the line, or add a roll to it. For less frequent embossing pattern changes or where embossing rolls are shared among several lines, our Omnia embosser-laminator automatic dismount system takes care of all the steps to present the roll in position for an easy vertical pick-up.

"When creating a product for the first time on a PCMC PARAGON or FORTE rewinder, the software uses calculated theoretical wind profile cams to suggest a starting point for settings which can then be dialled in for that product's characteristics. These settings are then stored in a recipe which can be retrieved the next time that product is run.

"PCMC packaging has introduced closed-loop motorised adjustments to provide quick and repeatable change from format to format. Closed loop positioning ensures that operators can quickly restore machine settings to proven recipe values. Changeovers are choreographed via

operator interface screens that provide step-by-step instruction with operator verification."

TWM/3: What advances have you made in AI / Industry 4.0 / digitalisation / automation, and how can the tissue industry further take advantage of developments?

Zagnoni: "In addition to our developments with JOI, another example is a logsaw innovation: automatic blade change on the logsaw is another game changer enhancing the safety of the operators. Thanks to a camera monitoring system to analyse the blade's condition while it is running, automatic blade grinding is adjusted as needed. This system keeps the blade in optimum cutting condition without disrupting production and without unnecessary grinding.

"As for our Camallo development, this first-ever automatic system for loading and exchanging coreboard reels can handle up to 16 reels. The totally-safe handling of the new reel is guaranteed thanks to the mechanical locking of the lifting system based on the Zero Energy Concept and using an additional redundant fall arrest system which brings the safety level up to category three. There are three different mechanisms to ensure that the coreboard reels are perfectly aligned."

Berti: "I've got news for you, TWM! In late September we'll go on the market with a brand-new digitisation system: as of today, its project name is G-Box. What I can tell you is that it's a real OEE booster. Look, everybody talks about how precious data can be, how you should collect them and then process and analyse that incredible amount of stuff... But the real issue here is: can you at least read them? Do you know what to do, then? You don't need terabytes of numbers and a dashboard full of charts and gauges. You only need an asset management partner (and tool). Here we are: meet Gambini's G-Box!"

Ulusoy: "ICM is preparing itself for mainly Industry 4.0 and other competitive edges of the future in the industry like AI and digitalisation. In this area, we are firstly working to create systems that don't need operator assistance and can calibrate themselves. Then we are planning to use these systems to be prevalent in our range of products. We are also adding preventative maintenance options to our products.

"In addition, we are harvesting digital data from our products. All of these efforts



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have the main goal of satisfying our customers who are looking for Industry 4.0, AI and digitalisation advancements in the near future."

Luna: "As for Industry 4.0, Körber continues its path of innovation through the connectivity of production lines and Industrial Internet of Things (IIoT) solutions with the aim of increasing the overall efficiency of the lines (OEE), while optimising the cost of total production assets.

"The Tissue Performance Centre is an integrated solution that brings together the skills of expert technicians, IIoT platforms, and data analysis to provide information on the efficiency of the machines and suggest corrective actions to be implemented.

"It is a proactive service thanks to a direct connection with customer's machines. The online display of operating parameters offers a constant evaluation of their state of health and highlights anomalies.

"The machines connected to the Tissue Performance Centre, which currently numbers over 1,500 for a total of over 160 complete lines, keeps production data, motor temperature values, energy consumption and parameter settings under constant control. These values, also compared with historical production data, allow technicians at Körber not only to remotely implement corrections to recover the efficiency of the production line, but also to detect any causes of malfunction and to establish, in advance, the actions to resolve them.

"In recent weeks, Körber presented Sam Operational Solution, the line virtual supervisor that guarantees constant performance and quality over time, regardless of the operator's level of skills.

"Sam is a line solution designed to continuously and independently adapt the entire manufacturing process, avoiding deviations and slowdowns caused for example by wear or different operating conditions. It foresees a set of systems applicable to the focal points of the line, such as the quality of the perforation, the characteristics of the log and the quality of the package.

"Like a real supervisor, once you have established the standard you want to achieve for your final product, Sam identifies in real time any deviations and takes appropriate decisions within the previously established limits, regardless of the operator's level of skills.

"Digitisation is also a key factor at Group level. FactoryPal's mission is to

revolutionise manufacturing and to drastically improve shop floor performance by combining operator excellence with artificial intelligence. The solution helps manufacturers increase their overall equipment effectiveness (OEE) and thus significantly improve performance, outcome, and the bottom line. As a Software-as-a-Service (SaaS) solution, FactoryPal offers factories around the world a sophisticated machine learning algorithm delivered as a "plug-and-play" solution with on-site shop floor consulting."

Carlini: "The 4.0 theme for MAFLEX has been the basis of every new project. We coordinate with our suppliers and customers to ensure that the machines meet Industry 4.0 specifications. All of our lines are Industry 4.0 ready. We are also able to assist our customers in obtaining potential contributions or tax incentives by providing all the necessary documentation. Maflex lines can be easily integrated into company management networks, and planning and control will be enormously simplified through the Integrated Supervision System that will be launched in 2022.

"Another tool that completes the digitisation of our lines is the Smart Camera System, which allows remote viewing/control of the machines via digital devices positioned in strategic points. Multiple cameras help operators control and set up the line with the capability of recording critical events."

Ruglioni: "Each company is looking at the future in these terms. In Maxima we have chosen to tackle the idea of monitoring consumption both of compressed air and electrical energy, so that users can identify anomalies in the line and take actions to remedy them.

"On the other side, we believe customer may take advantage of receiving data block from the equipment and integrate them into their SCADA utilising an OPC server. Data like speed, line status, number of cycles per min, motor temperature and

all other data that may be required; in practice a BIG DATA with analysis of all the information to optimize products and production process.

"We will also see a wider usage of cameras in various points of the production line (checking web breaks, verifying quality of winding and cut of the log saw and so on) combined with higher controls on temperature of rolls bearing and their vibrations to push preventive maintenance to a higher level."

Calcagni: "We now have our digital platform which is connected to all of our machines. We can integrate existing machines of the customer from another supplier, such as a wrapping machine. It can all be integrated into the same platform so the customer can check directly the full integration of the machine's production and they can monitor electrical consumption and the previous maintenance of a machine to predict what can happen, avoiding unnecessary shut down of a machine.

"We have also created an app where the customer can connect directly from his mobile phone to our team, using augmented reality across all of the process."

Green: "Many of our advances in automation have been directed toward keeping people safe. One example is our CS unwind, which has all operator access at floor level, does not require the use of a crane, and does not have core plugs to manipulate. The automatic blade guard on our XCut logsaw is another example, which also saves time that the operator would normally spend putting on specialised personal protective equipment before entering the saw.

"PCMC's Accelerate team and suite of connected services embodies our Industry 4.0 solutions. Accelerate Live provides audio/video assistance to our customers using a simple tablet with relative 3D space capabilities through subscription service packages. Accelerate Monitoring provides easy-to-understand dashboards with customised analysis from our

Alberto Carlini

THE 4.0 THEME FOR MAFLEX HAS BEEN THE BASIS OF EVERY NEW PROJECT. WE COORDINATE WITH OUR SUPPLIERS AND CUSTOMERS TO ENSURE THAT THE MACHINES MEET INDUSTRY 4.0 SPECIFICATIONS. ALL OF OUR LINES ARE INDUSTRY 4.0 READY. WE ARE ALSO ABLE TO ASSIST OUR CUSTOMERS IN OBTAINING POTENTIAL CONTRIBUTIONS OR TAX INCENTIVES BY PROVIDING ALL THE NECESSARY DOCUMENTATION.

knowledgeable team of experts. We provide action-oriented recommendations that drive improvements in OEE and production. "Accelerate Edge provides local-only dashboards, where data from the machine stays resident at the customer site, and we work with customer teams to review the data with on-site visits or teleconferences.

"One small but significant way we use data to help the people operating our lines is a visual display of upcoming tasks and events like parent roll changes and preventive maintenance. With SmartTouch™ they can look at the display for the entire line from any HMI on the line.

"Regarding how the tissue industry can further take advantage of developments, it is fundamental that everyone in the supply chain views tissue making, converting, and packaging as a single system with a common goal. Every step in the process can affect others, sometimes in surprising ways."

TWM/4: What technologies are you implementing to improve your customer's energy efficiencies? What are your projections for trends and needs here in 2022?

Zagnoni: "There are several contributions we can highlight which improve efficiency and therefore reduce energy consumption. With Plusline we developed Together, providing a single, compact solution from log to shelf-ready pack. Thanks to the high-level automation, reduction in components and the simplification of the production line, Together also makes management and maintenance of the line easier, reduces energy consumption and the number of operators required.

"Innovations in JOI embossing, Sferica rewinding, Camallo for coreboard reel handling and logsaw automatic blade change are further examples of how a dedication to automation and safety ensure maximum production efficiency which equates to energy efficiency.

"We should also be willing and open to learn from other sectors: towards the end of last year Futura presented a revolutionary calendar for the nonwoven industry. As such, the world of nonwovens has benefited from the Andromeda fully automated roll management system and we, in turn, are open to learn from the way in which related but distinct sectors tackle similar challenges to the ones we face."

Berti: "The tissue converting industry is not an energy-intensive one: many of the features you see advertised as energy-saving are not that impactful. And

guess what? Gambini's AirMill is the only available converting technology which can have a sort of backwards effect: savings will be made in the paper mill (energy, fibres, chemicals, time), because – after that – AirMill is going to convert the paper in a way that makes you get the same characteristics anyhow."

Ulusoy: "First of all we are trying to use high energy efficiency equipment by collaborating with Rockwell Automation. If I had to give an example, we are able to use the energy of a slowing down motor in ones that are starting off or continuing their motion using regenerative DC bus supply. If there is no need then we are directing it back to system to be used by other equipment. We are intensively using many other innovative technologies in our products.

"Additionally, our main design principle is maximising operating performance which results in increasing energy efficiency. We believe that this is one of the expectations of our customers."

Luna: "See previous answer and answer for question five for projections for trends and needs: digitalisation and sustainability."

Carlini: "For many years, Maflex has installed the MERS system (Maflex Energy Regenerative System) on its lines, which will be joined next year by the Integrated Supervision System to prevent energy waste.

"Maflex believes that in addition to devices which improve energy efficiency, significant results will be obtained by coordinating with planned production, managed independently by the line. By limiting downtime – thereby increasing efficiency – energy consumption is also lower, and with this in mind, Maflex R&D is developing the lines for the future."

Rugliani: "In terms of energy efficiency, we have been implementing regenerative motors as a standard feature on all our lines. More and more we will use high efficiency energy motors in our applications.

"Inverters will also be used for auxiliary motors with continuous movements so that energy will be reduced.

"Cooling systems for electrical cabinet will also be redesigned, as inverter connected with the line will become standard. This will allow monitoring them so that their status will be displayed online preventing also overheating."

Calcagni: "Our converting machines don't usually use a lot of energy but in particular,

we are focused on developing a system to dry the ink not only by electricity but also by gas burner. The gas is much cheaper than the electrical. We have also developed the concept to have the dryer integrated."

Green: "In addition to being safer and improving operator utilisation, our CS unwind consumes 45% less energy than a comparable belt-driven unwind, due to the elimination of friction losses in the surface belt drive train. We offer complete converting lines without the use of hydraulics, which in addition to reducing fire risk and making equipment easier to maintain also removes a major source of energy loss. We have implemented energy efficient permanent magnet motors in numerous applications.

"Since saving energy drives to the bottom line in addition to being environmentally friendly, we see the energy efficiency trend continuing into 2022 and beyond, and may contribute to an accelerated replacement of older assets.

TWM/5: What events/trends from the past year will shape the future of tissue and converting in 2022 and beyond?

Zagnoni: "The past year has highlighted the need for flexibility in converting processes – to adapt to fast-changing market conditions and customer needs. Automation and integration hold the key to success in this market, always combined with maximum safety. Circumstances have also underlined the importance of providing remote assistance when physical presence is not possible, and to ensure we minimise external threats to our industrial assets through design, cyber security and training."

Berti: "I really appreciate not having to answer any pandemic-related questions... This could be the one to bring it up, but definitely I won't. If you want to know what has the potential to shape the future in our field, I'd rather talk about this whole heated roll frenzy, which has spurred so much hype during the last months. But let me put it very clearly: we have an already patented solution, and that's the only one you can find. We're not waiting for any pending approval. Because AirMill is not just the undiscussed benchmark: it is the solution. Simple as that, period."

Ulusoy: "In the tissue converting side, as in the past bulkiness and softness will become more important each and every day in the future. In the packaging side, we believe that there will be a trend of exchanging PE based materials for paper and craft because of environmental

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concerns. This conversion is going to bring about the need for new machinery investment."

Luna: "The tissue industry is dealing with unprecedented pressure. Pulp price volatility, fierce competition across global markets, and the need for stronger differentiation is just the beginning."

"If we combine all this with the increasing move towards sustainability, the difficulty in recruiting skilled operators and the goal of increasing overall operational efficiency (OEE), it's easy to see that it has become tougher than ever for you to run your operations in a profitable and sustainable way."

"The global pandemic has also caused enormous change in the tissue industry. For much of 2020, tissue paper manufacturers have been doing their utmost to meet the demand for pandemic-related products and virtually all categories of the tissue industry have seen significant growth."

"The Covid-19 lockdowns have shifted the purchasing preferences of consumers towards e-commerce, where smaller brands have been at an advantage and acquired competitive margins. Consumers have found that private label products, such as toilet paper or facial wipes, are viable solutions for convenience, quality and value. The fiscal year that ended 4 October 2020 saw a growth of 22.3% in the turnover of private label toilet paper, compared to 14.4% for national brands."

"For tissue paper producers, this information is of great value. Shifting the focus on affordability and sustainability will strengthen year-over-year growth in the toilet tissue and face wipes sectors, which are currently not expected to return to pre-pandemic levels before 2022. There will also be opportunities to offer excellent products at affordable prices to better compete on the market."

"Much of tissue paper innovation will be driven by sustainability initiatives, as consumers will inevitably continue to associate sustainability with personal well-being."

Carlini: "2020 will be remembered as the year of Covid-19 and the significant impact it had on the economic and social aspects of life. While the consumer market successfully withstood the crisis, AfH was greatly affected by the lockdowns and the closures of hotels, restaurants, and schools. This put facilities with machinery only capable of making AfH products at a great disadvantage."

"The flexibility provided in our

equipment allowed converters with MAFLEX machinery to quickly adapt to the needs of their customers. Along with being able to provide retail rolls, wet wipes were also produced on existing MAFLEX machinery."

"Culturally, the increased awareness of hand hygiene will be a driving factor in the towel market. There is a global awareness of the effectiveness of disposable tissue and towel products over pre-existing methodologies. Consumers are also paying attention to the environment through the choice of recycled and eco-sustainable products."

Ruglioni: "The past year has shown us how quickly consumption of certain products has been affected globally by external factors. How many of the tissue producers that had lines dedicated to AfH products only had to stop them or limit their production. Consequently, the need of a real swing line, capable of converting toilet paper, kitchen towel and AfH products may be one of the topics over the coming years."

"We at Maxima have already delivered "all in one" lines to the market and the trend may increase, maybe for smaller to medium producers but also for big volume ones. Moreover, the design team of the equipment suppliers will be more involved in sustainability, choosing different materials, reducing weights of the machines (look at how smaller and with same performance are embossing rolls versus 10 years old converting lines, for instance) and utilising smarter drives/motors that will become available in the next periods."

Calcagni: "That's a big question! If we are looking generally, tissue is still healthy and growing and there are many opportunities. But there's also a lot of changes following the outbreak of Covid-19."

"I see a lot of opportunity for folded products, especially inter-folded because now the final consumer is looking to save space in the home, reduce costs and make it easier to use tissue. Folding in particular is helpful here, for example a folding towel for the kitchen which is easier for the end user to use. The cost on transportation is also much cheaper here. So there are a lot of big opportunities to save energy, save cost, and to also make it easier to use for the end user and make health and safety and hygiene a priority."

"In theory, tissue could still develop much further. But it also remains a question mark as there's still some parts of the industry – such as the hotel and restaurant

sector – which has had a big influence on the consumption of tissue. After Covid, populations are still not 100% properly out and about yet, so we need to see what will happen in the next couple of months."

"One very important thing is that OMET – in this difficult time – is still growing and developing, and for this reason we will make some big announcements in the next few months. We have moved our printing division to a new 20,000sq metre plant and also moved our tissue division to a much larger plant."

"We believe that we are growing again in both sectors. We are already in production in the new plant and once fully up and running we will increase our production capacity by four to five times our current output."

Green: "First and foremost, safeguarding the environment. Limiting waste, 100% tissue from first to last sheet, recyclable packaging, energy saving, reduction in CO2 emissions, transport optimisation: these are just some of the advantages and benefits for an increasingly sustainable world."

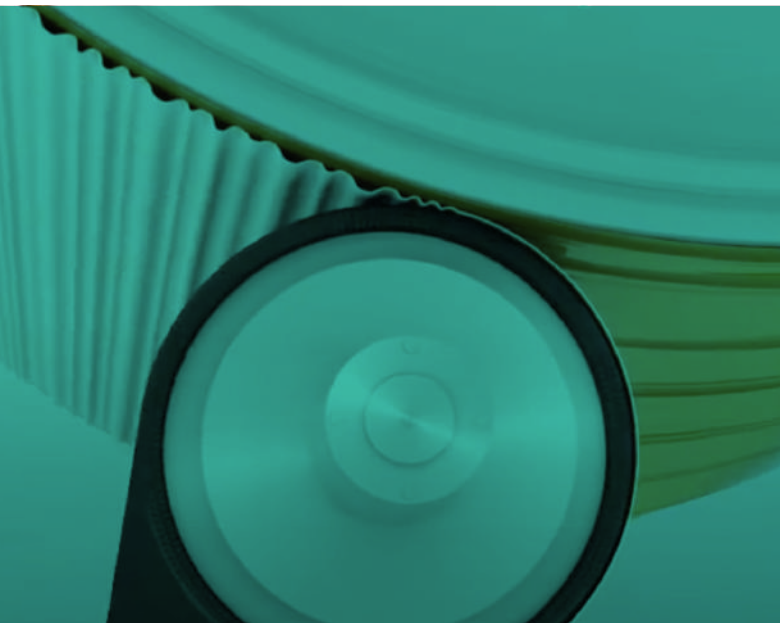
"The PCMC-branded coreless winding INVISIBLE-O technology allows rewinding of both high – and low-firmness rolls for the consumer and away-from-home markets. Ecological and sustainable solutions represent one of the biggest challenges for the packaging industry as well. As a result, PCMC and STAX equipment is already capable of doing both foil and paper wrapping or banding in some cases."

"Another trend we see continuing from recent years is the introduction of new structured and textured tissue grades. We're excited to apply our knowledge in web handling and tension control."

"It is hard to talk about the past year without mentioning the Covid-19 pandemic, which among its many impacts heightened an existing trend in direct-to-consumer shipping."

"We see these trends combining to change how the products our customers produce on our machines are designed, and we are prepared and excited to meet our customers' needs when they do."

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WHY MULTI-TASKING LGV BEATS AUTOMATED MOBILE ROBOTS IN AUTOMATION

William Nelson, President, Elettric80, explains how a fit-for-purpose logistics system is only as good as its driver . . . its brain making nanosecond decisions all day, every day.



William Nelson
President, Elettric80

What makes automation projects successful? Is it the hardware? Good operators? Luck? The answer is likely a mix of hardware and good operations management but two critical elements, arguably the most important of all, are missing.

Just think about it for a while

Planning and system design are without doubt the most important elements to reach the highest level of performance, repeatability, and cost-effectiveness. Experience in mining and interpreting information and diligence in data crunching round out the system design process. For the Elettric80 Group (E80), we have been demonstrating this since 1992, during the initial implementation of our first automatic guided vehicle.

The main objective of the system engineer, system analyst and business analysts is to develop a concept layout, test the concept under all conditions through real world simulations and write the narrative around the entire set of functions and "what if" scenarios that can occur in any given second. But this is not the end of the story.

The brain of any system drives its performance, and this is where things get really interesting. In effect planning,

system design, data crunching, simulation and the functional design story inform the development of an integrated software platform that, like a conductor of an orchestra, ensures that all pieces of any automation play, work, harmoniously and complementarily.

An integrated software platform combines the following elements and functions:

- Decision making software (SW) to optimise utilisation of resources and prioritisation of work. This SW uses native information obtained through the planning and design process outlined above to establish priorities and define processes, and uses artificial intelligence (AI) to predict and assimilate to changing conditions
- Smart mission management SW to direct resources towards work, shorten or swap missions to reduce mission time and release missions in faster successions
- Predictive traffic management to make traffic flow without interruptions, blocking intersections and intelligent route selection
- Real time system management tools such as web-based visual operator interface to observe, control and adjust missions if required.

It's the brain that makes the difference

As with world-class athletes, a truly high-performing automation systems starts with a sharp, well-trained brain connected to strong and flexible extremities (HW). Obviously, the quality of both elements (SW and HW) is fundamental to the success of an automation system as both are intertwined and one cannot function without the other.

The brain of a system is the most underrated aspect for many prospective buyers. Sure, we're all used to kicking the tires on equipment, it's the most tangible sensation we can gather and process. But let's not forget where this all starts: with

the brain. An automation system is only as good as its driver which in this case is its SW brain that commands, adapts in real time and makes nanosecond decisions all day, every day.

Sure, you can all relate to feeling foggy in the head some days and how that affects your decision making and reaction time. The same holds true for automation – clear ideas lead to outstanding results. Your SW provider will demonstrate this through analysis of your business practices followed by comprehensive E-2-E testing prior to arrival at site.

If it seems too good to be true . . .

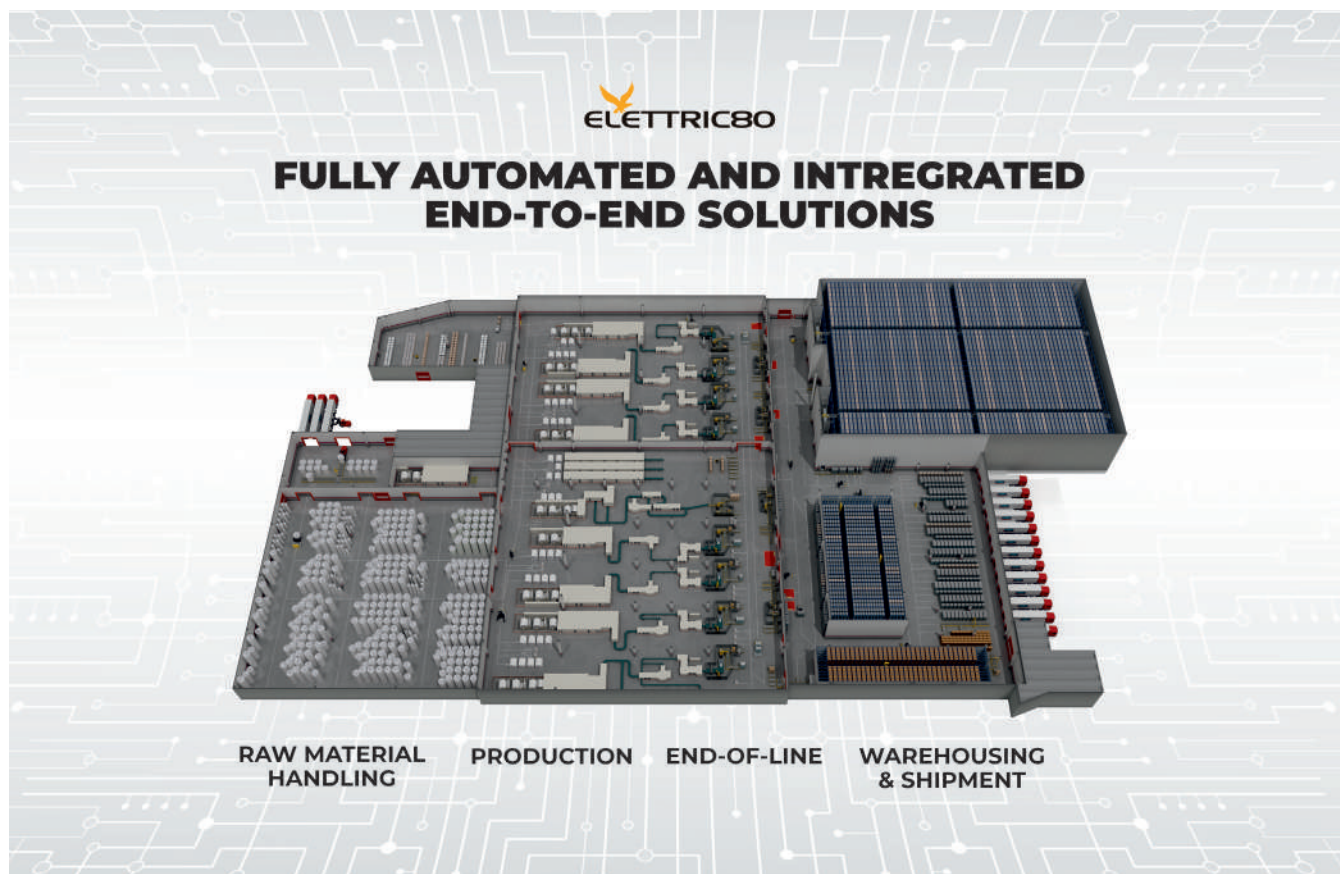
It's interesting to see the proliferation of a vast array of automated mobile robots (AMR) in the marketplace today. Surely the logistics world will benefit from the capabilities of these machines. Indeed, AMR offer a partial, but very limited set of capabilities to the automated logistics toolbox.

AMR are touted as easy to install, flexible lower cost alternatives to other mobile automation technologies and under certain specific circumstances this is true.

For the most part, however, AMR offer only a limited range of activities and capabilities and cannot be considered as a solitary solution in multifunctional logistics projects. AMR manufacturers will glowingly promote their simple navigation systems, configurable layouts and traffic control systems, however the devil, as always, lies in the details and in this case the details are important to distinguish in system planning and design.

In reality, most logistics systems require multiple functionalities such as lifting to various heights many kinds of materials of varying weights and shapes. They also include changing environments from production replenishment to warehousing to raw material handling to truck loading and unloading.

This is just a snapshot of examples of the practically unlimited logistics



The model fit-for-purpose logistics system: Driven by LGV brain making nanosecond decisions all day, every day.

requirements E80 has found and supplies today. In these multiple use scenarios laser guided vehicles (LGV) provide the best overall performance due to their flexibility, precision and repeatability that cannot be replicated by AMR. And let's not forget the most important element: connecting the brain to the extremities.

Go together and go farther

The biggest mistakes we see in logistics automation project planning and system design are apparent when the designer takes short cuts due to insufficient/overall project scope definition, overestimation of system capabilities and/or sales pressures. This has made for many "one and done" system applications. In fact, many early adaptors in far too many cases have paid the price for the panacea of a "one-size-fits-all" solution promoted by some suppliers.

On the other hand, other users of logistics automation have prospered and grown through a different approach – a diligent research of supplier capabilities that leads to a strong collaborative partnership to develop custom solutions suited to provide a competitive advantage. The track record of success of these forward-thinking companies is astounding. There are many examples that I could cite of companies who choose integrated

automation including brain, extremities, and feedback (integrated SW, HW, AI, IoT data acquisition) over less comprehensive, more short-term solutions.

Additionally, LGV solutions are fully flexible to be reconfigured over time as business needs evolve. Reconfiguration could include added production lines, drop points, increased SKU types, whatever the mind could imagine, it's been requested. In fact, LGV solutions are not only flexible but extremely durable solutions – with many of the systems in place reaching 20+ years of functional life due to the robust design of the HW and the power of the SW platform. As the saying goes: you get what you pay for.

No shortcuts

Another aspect to consider when choosing a logistics automation solution is a company's technology development capabilities and its speed to market. We already discussed the importance of planning, system design, E-2-E simulation and the value of an integrated SW platform capable of meeting present and future requirements.

Automation companies are popping up like mushrooms after rain. How many will be around in the future is anybody's guess. Companies with a solid track record

in LGV/ARM automation that can really back up their marketing claims are few in number. The best companies have compiled a long history of success through repeat business and partnership with industry leading consumer products companies (CPG). They also dedicate a significant amount of their income to R&D in products that promote safety such as Ultra-Wide Band sensing (UWB), mixed navigation systems (laser and ambient), integrated SW platforms that combine smart LGV mission management, WCS, MES, YMS and all data tracking tools to ensure quality and traceability. To this purpose, E80 continues its investments in research year after year and it has now advanced its AGV/LGV safety initiatives with the launch of SmartDect® ultra-wideband (UWB) technology – a short-range RF technology for wireless communication that can detect the location of people, assets (AGVs/LGVs) and objects with unrivaled precision.

Crucial to the success of any project is the capability of your supplier to interface to upstream and downstream processes such as unwinder lines for parent roll delivery or palletisers, truck doors and customer ERP in seamlessly transparent way allowing you to oversee all aspects of your operation through one user interface tool. Ideally, a one-stop-shop where you






can access all the above and a wide range of hardware suited to any need is the best guarantee of success.

There are cases, however, where mixing fleets merits consideration. Some companies have developed tools to manage AMR/LGV fleets under one umbrella. These implementations require careful scoping, planning and clear delineation of individual company responsibilities.

As in any case, saying is easier than doing. The experience of a supplier that has grown to know the intricacies of your processes and not just some pretty hardware is what has proved a winning proposition for those companies that have ventured into the world of logistics automation. Planning and system design are without doubt the most important elements to reaching the highest level of performance, repeatability, and cost-effectiveness. We can aspire to the glossy images of "magical thinking" but there's no substitute for the tedium of hard work combined with experience and industry-leading integrated SW and HW products on the way to profits.

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THE EMERGENCE OF PROJECTS WHERE NUMEROUS TMS ARE BEING ORDERED AT ONCE IS NOW ON A SCALE UNSEEN BEFORE

Tissue machinery suppliers are broadening their product offering and focus areas to meet rapidly diversifying tissue markets. As the global consolidation rate among tissue paper producers has been declining, machine suppliers are facing a more diverse client base. Merger and acquisition activity has proven to be one way forward to meet the evolving demands. AFRY Management Consulting's Pirkko Petäjä, Principal, and Hampus Mörner, Senior Consultant, report for TWM.



Pirkko Petäjä
Principal

By the beginning of the millennium the top-10 tissue producers accounted for almost half of the world's production footprint. In 2020, this share had dropped to less than 40% (although there are regional differences in trends), while the total capacity was strongly growing. New projects now span between small- and mid-sized to what can almost be considered as "mega projects". The latter category is much attributed to the emergence of Asian operators that in recent years have earned their place in the top-10.

The production capacity growth in the last ten years is mainly concentrated in Asia and led by China and Indonesia. On a company level, APP, Vinda (Essity Group),

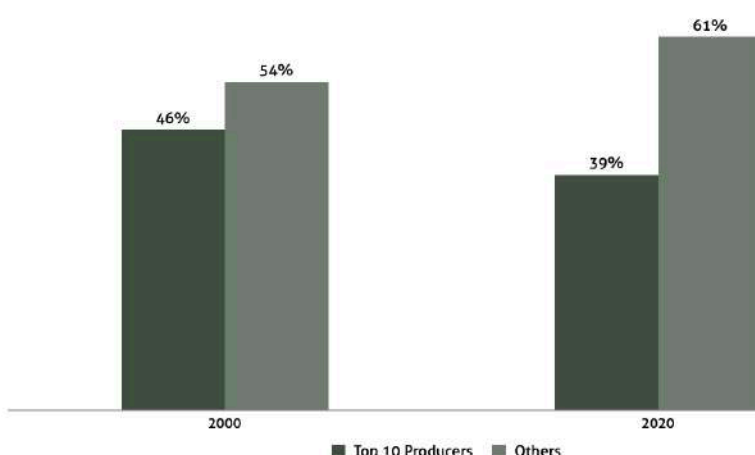
Hengan and Lee & Man are in the top of new capacity added. APP alone is estimated to have grown its Asian production footprint by more than two million annual tonnes since 2010. Within this, a project like the OKI mill in Indonesia is to be found where in total six TMs of 60kt of production capacity each were ordered from Toscotec around 2018. During the same period, a similar project in terms of size was finalised by Valmet for Lee & Man at its Chongqing mill in China where four TMs of 55kt/a each were installed. With projects of this scale the complexity grows. As new opportunities for machine suppliers open up there are also risks to be considered and mitigated. For instance, the amount of resources



Hampus Mörner
Senior Consultant

THE PRODUCTION CAPACITY GROWTH IN THE LAST TEN YEARS IS MAINLY CONCENTRATED IN ASIA AND LED BY CHINA AND INDONESIA. ON A COMPANY LEVEL, APP, VINDA (ESSITY GROUP), HENGAN AND LEE & MAN ARE IN THE TOP OF NEW CAPACITY ADDED.

Figure 1. Global Tissue Production Footprint Distribution - Top 10 Producers vs. Others (% share)



that become tied to a single project for a long period makes it more challenging to maintain a high service level or even contact with multiple clients.

Globally since the beginning of the millennium, the average size of installed new TMs has grown from about 15ktpy to some 20ktpy. At a mill level, the average production capacity at one site has grown from about 40ktpy to more than 60ktpy. Notable differences exist both on a regional and even country level. Larger TMs and mills are a natural development with economies of scale being considered. However, the emergence of projects where numerous TMs are being ordered at once at a scale unseen before has accelerated this development.

Tissue paper machine suppliers widen their portfolio through M&A

Up until the 90's, the European tissue industry was to a large extent dominated by family-owned tissue businesses with sales in the local- and nearby markets. This was also true for several machine suppliers serving these clients. Especially the cluster in Lucca, Italy, made a smaller scale possible for the machinery suppliers thanks to the local subcontracting opportunities.

Through the years as several tissue manufacturers grew larger so did the demand for larger machines and projects. North America was in the frontline of this development. TM suppliers of advanced machines; wide TMs (5,6m), TAD, etc, are typically divisions of the larger paper

UP UNTIL THE 90'S, THE EUROPEAN TISSUE INDUSTRY WAS TO A LARGE EXTENT DOMINATED BY FAMILY-OWNED TISSUE BUSINESSES WITH SALES IN THE LOCAL – AND NEARBY MARKETS. THIS WAS ALSO TRUE FOR SEVERAL MACHINE SUPPLIERS SERVING THESE CLIENTS.

machine companies. They have been successful in developing along with the demand for larger machines and premium technologies.

Internal synergies and financial strength of the very large companies have been supportive for this technology development. For the major tissue manufacturers, the machinery giants have been a good match as suppliers but also as quality - and process development partners.

However, many small and mid-scale tissue manufacturers have managed to position themselves strongly in the diverse tissue market as well and several new players have also entered the market, much attributed to Asia and other emerging markets.

Among these tissue manufacturers outside the Top-10 or even the Top-20 group, smaller- and medium sized TM suppliers have established a strong position. Small European machines (2.8m) have proven successful in both Asia and Europe. Their reliable and standardised technology at competitive pricing has been able to compete with local suppliers, for example Chinese machine suppliers in the fast-growing Asian markets. Large

and advanced TM suppliers have not had the same success in competition towards smaller and local suppliers.

To be able to serve the diversified tissue markets, tissue machinery suppliers are broadening their product offering and focus areas. M&A has been a preferred strategy and some interesting transactions have taken place, led by the large suppliers.

Valmet acquired FOCUS rewinders in 2015 to offer a competitive combining winder and in 2018 they secured a license agreement for e-TAD (from Georgia Pacific) to complement its tissue grade quality offering. Andritz acquired Novimpianti in 2018, an expert in dust control, hood heat recovery and ventilation. Voith acquired BTG in 2019 to strengthen its offering and expertise in creping.

However, to capture volume the machine suppliers need to pay attention to developing markets including Asia and especially China. So far, more advanced machinery has not been fully successful in these markets. In fact, many of the leading tissue manufacturers have continued to acquire small standard machines from both local and smaller Western machinery suppliers (in addition to large machines). Until very recently, no TAD machines or other advanced concepts had been sold in these markets.

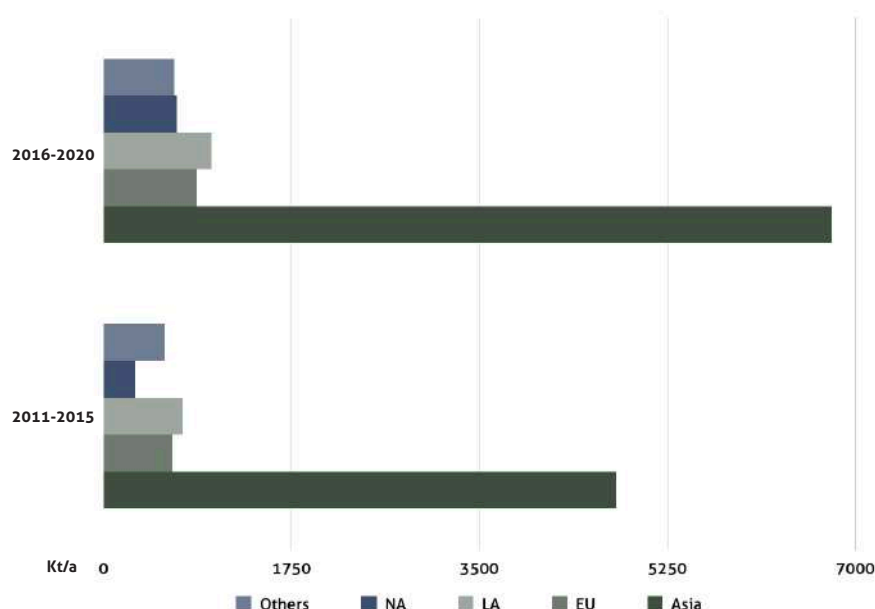
To capture more growth, two of the major advanced technology TM suppliers carried out major acquisitions last year; Voith completed the acquisition of Toscotec, and Valmet acquired PMP Group in Poland.

The Italian Toscotec has subsidiaries in China and the USA. It provides state-of-the-art technologies from complete production lines to rebuilds and single components (Steel Yankee, new shoe-press, etc) and holds a strong market position in markets where present, including China and other Asian countries.

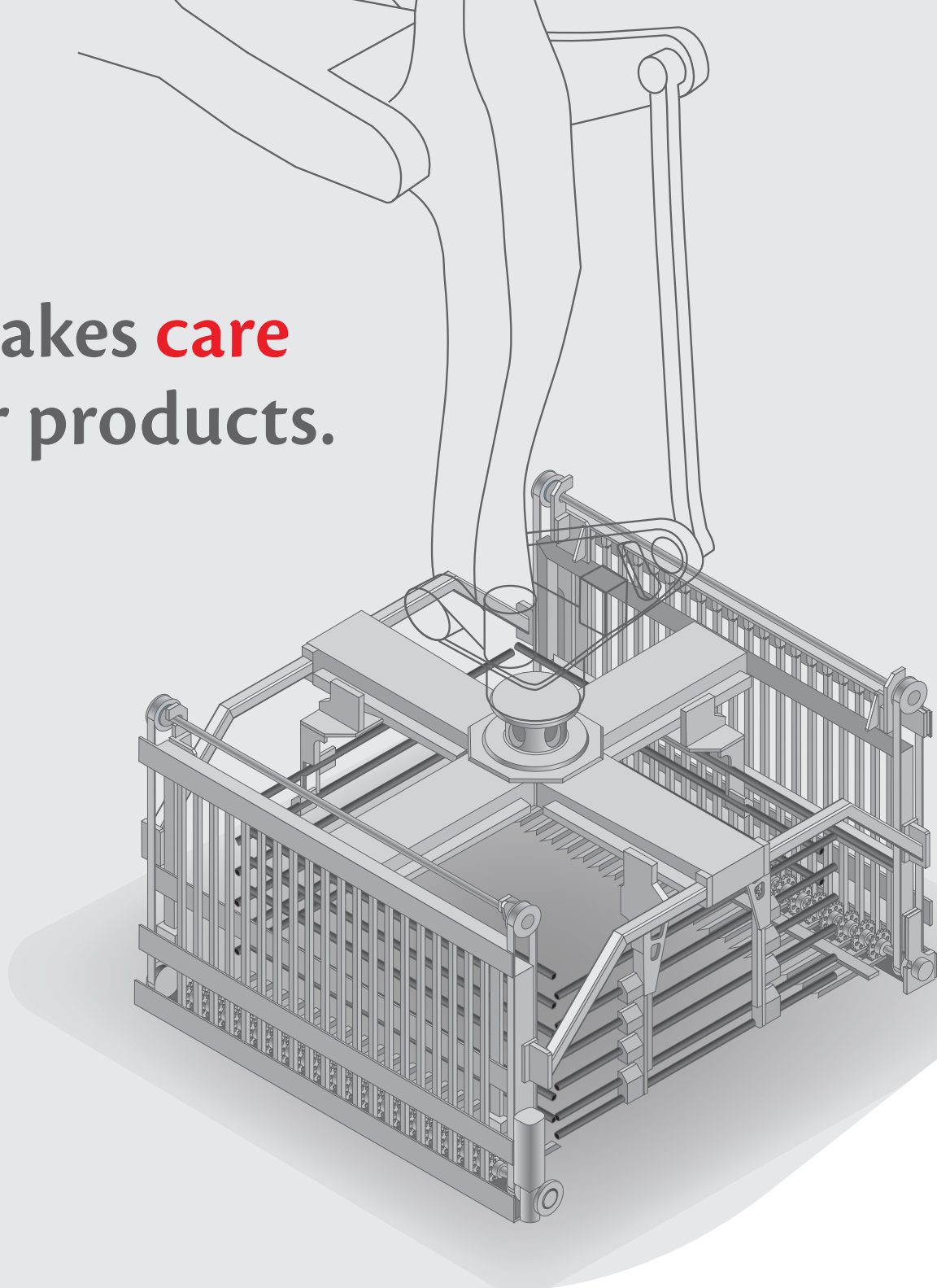
Voith announced: "The company will remain entrepreneurial in nature and will operate under the established Toscotec brand. In the area of tissue, Toscotec will carry out the business with new lines and major rebuilds for the whole Voith Group in the future."

The Polish PMP Group is significantly

Figure 2. Regional capacity growth



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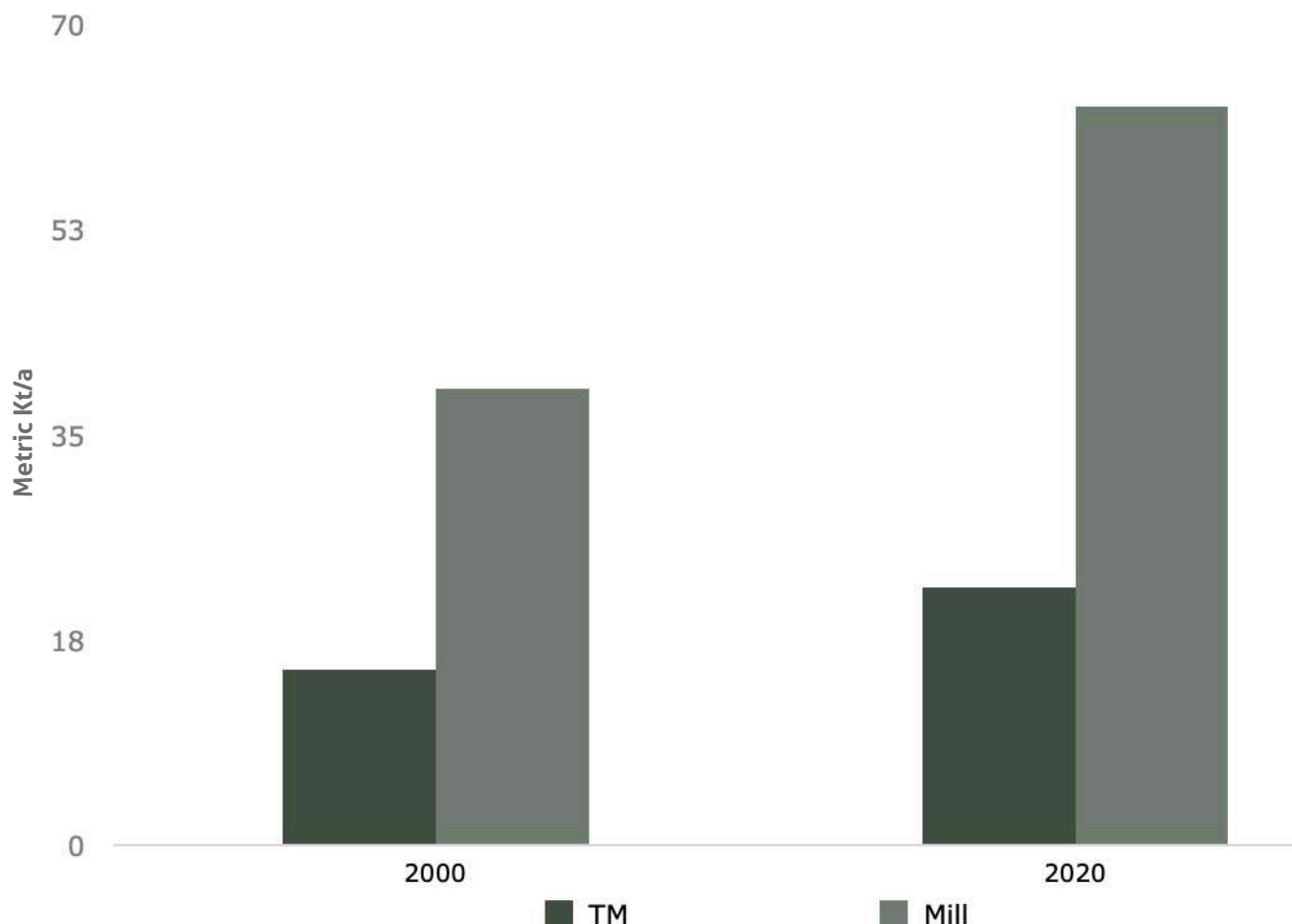


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Figure 3. Global Average Size of Tissue Assets Installed, PM and Mill respectively (Kt/a)



smaller than Toscotec and less tissue oriented, but its Intelli tissue line has proven successful and PMP has its stronghold for tissue machines in Asia among small- and medium sized tissue producers. According to Valmet: "The acquisition will bring two companies with different offerings and customer segments together. PMP's technology and services portfolio for small and medium-sized tissue machines is a very good complement to Valmet's current paper technology and services for wide and fast machines and rebuilds."

With acquisitions like these machine suppliers join forces to be able to serve the full spectrum of tissue paper manufacturers. Smaller machine suppliers

not only get access to more resources, but also mitigate the risks associated with dedicating most of their resources to single large projects. Larger machine suppliers become better suited to serving the diversified Asian markets where many not only demand state of the art technology but also standardised technology better suited for lower requirements.

Converting machinery suppliers target full supply chain with M&A

M&A activities among converting machinery suppliers reflect attempts to widen the portfolio throughout the finishing processes to different product categories and other parts in the supply chain, e.g.

packaging, palletising, etc, and by doing so targeting a fully integrated supply process.

A good example is Körber that complemented its rolled converting offering with the acquisition of Casmatic for packaging and Langhammer for palletising. Finally it also acquired MTC, a leading folded technology supplier.

Another converting machinery supplier offering a wide palette is Barry Wehmiller group which owns PCMC in the US and Italy and which acquired W & D folded converting in 2015 (from Körber) and then STAX in 2019 for packaging and palletising.

Warehousing would be a new and perhaps final step for the converting machinery suppliers to offer the full chain. Automated warehousing and product handling has its specialised suppliers, though, that also serve many other industries and benefit off those synergies. However, digitalised converting facilities and warehouses with fully integrated supply chains including even external information handling are in sight, and M&A is one method for the converting machinery suppliers to reach this.

WITH ACQUISITIONS LIKE THESE MACHINE SUPPLIERS JOIN FORCES TO BE ABLE TO SERVE THE FULL SPECTRUM OF TISSUE PAPER MANUFACTURERS. SMALLER MACHINE SUPPLIERS NOT ONLY GET ACCESS TO MORE RESOURCES, BUT ALSO MITIGATE THE RISKS ASSOCIATED WITH DEDICATING MOST OF THEIR RESOURCES TO SINGLE LARGE PROJECTS.

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