

TWM

TISSUE WORLD MAGAZINE

The independent news
provider for the global
tissue business

THE MIDDLE EAST

TISSUE DEMAND TRENDS UP ON POPULATION GROWTH AND HIGH PER CAPITA INCOME

Plus ...

MarketIssues

Four in 10 consumers switched brands in pandemic buying

Annual Review:

2021 and prospects for 2022

Demand growth to accelerate to 3.0% as AfH volumes continue to grow

Technical Theme: Environment

Sofidel: Multiple green cogeneration the key

WEPA: Sustainability pioneer advances its targets

Pehart Group: Photovoltaic park study first step to new energy source

ExitIssues

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Cover: An image showing the positive impact a growing population and increased disposable income is having on the Middle East's tissue market. Image by Contrast Creative, Manchester, UK.



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THE MIDDLE EAST: A STUDY IN CONTRASTS AND CONTRADICTIONS, EXTREME WEALTH AND POVERTY

Helen Morris

Senior Editor, Tissue World Magazine

Fourteen nations make up the Middle East for TWM's purposes, as diverse as any in world economics, demographics, political and social stability, and too often, instability.

Different organisations define the region as consisting of different territories, up to 22, or do not define it as a grouping at all. A region of tumultuous histories, TWM's Fisher International report makes clear. So much so that today "political factors, not geography, are what determine intra-regional economic cooperation and trade." Our *Regional Reports* present both the wide, comprehensive analysis – made even more challenging by the pandemic disruption – and the site level prospects and planning of individual companies ... in one case, the regional tissue leader.

In some cases access to information is hindered by cultural or political preference. But a lot is accessible; Retail tissue is a modest 2.3% of total world consumption, but it is increasing. Saudi Arabia, Israel and the UAE collectively constitute 44% of tissue value sales. The UAE has the largest production capacity, followed by Egypt, Iran, Lebanon, and Kuwait. The UAE, Egypt, Iran, and Saudi Arabia have made significant upgrades to their tissue fleets. Israel and Iran are the only countries producing commercial bath tissue. Energy costs are highest in Israel, while Iraq, Oman, Qatar, Palestinian Territories, and Yemen have no tissue machines.

Importantly for industry-wide balance and context, TWM also speaks to the companies themselves, including the market leader Fine Hygienic Holding (FHH) at its Dubai base. In a wide-ranging interview Chief Executive James Michael Lafferty summaries the distinct issues – one in particular is uniquely striking – faced by the region coming through Covid-19, before expanding on FHH's impressive strategies for growth: "While some countries have seen business stay quite steady, others had a mass exodus of expatriates during the pandemic, where people had to go home because they lost their jobs and exited the country. So there was a population decline and a consumption decline – some countries had populations drop by high single digits, and that impacted the tissue business as our business closely correlates to population." In context, at times upwards of 90% of Dubai's residents have been expats, many migrant workers on construction work.

Saudi Arabia imports more tissue than any other Middle Eastern nation, a fact which makes its move into tissue doubly important. On 7 December 2021, the Middle East Paper Company officially entered the global tissue market at its \$90.13m plant in King Abdullah Economic City on the Red Sea coast. Chief Executive Sami Safran explains to TWM the strategy behind the historic investment, as he sees demand for tissue products at large trending upwards.

Middle Eastern tissue is a study in contrasts and contradictions shaped by vastly differing per capita wealth, birth rates, culture and tradition, democracy deficit, political ideologies and, in its wealthier nations, a long-term dependency on the petrodollar. Looking years ahead, Fisher International suggests, given the potential wealth generating crisis which looms for nations so heavily dependent on fossil fuel, the seven emirates which make up the UAE seem to be the one nation showing signs of diversifying its economy away from petroleum products. That will be an immense transformation, and a different, major, essential, reliable growth sector product will ease the transition.

In a crisis, value-for-money will always come first

Our *MarketIssue* report throws a little cold water on the idea that green issues and sustainability play a dominant part in most consumers' buying habits. It isn't as prominent as might have been thought. Consumers "who regularly buy 'green', recycled bath tissue are first, a very small market segment, even allowing for some growth since 2019, and second, very active in all types of sustainable activities".

The pandemic, not surprisingly, has also seen shifts in brand loyalty – the switch has mainly been about cost. Value brands are the main drivers in the category, while features such as softness, strength and absorbency are still important.

SHIFTS IN BRAND LOYALTY HAVE BEEN A FEATURE OF PANDEMIC BUYING – SO HOW DO CONSUMERS NOW RATE GREEN SUSTAINABILITY AGAINST VALUE?

One of the strongest trends over the pandemic has been shifts in brand loyalty, with over 40% of consumers switching brands in one or more product categories. Here, Susan Cornish, President, Insight + Action, analyses the product attributes driving the trends.



Susan Cornish
President, Insight + Action

Consumer surveys from many sources have shown that a growing percentage of consumers want 'sustainable' products, and are often willing to pay more for them. Another trend evident in consumer product categories like food, beverage, and tissue is the 'premium-ization' of brands, a strategy often used to enhance product differentiation and support higher pricing. In bath tissue, premium-ization has meant fast growth of the ultra-premium and super-premium brands. Incorporating recycled materials into new products improves sustainability, yet recycled fibre is rarely used in premium brands because it is more difficult to create

softness, strength, and absorbency with shorter fibres. Environmental groups have made headlines in recent years by pointing out that many of the high market share bath tissue brands in the US have little or no recycled fibre content.

Historically, the North American AfH tissue sector has used higher levels of recovered fibre than other global regions, but usage is declining in North America. This trend has occurred over roughly the same timeframe as the expansion of premium bath tissue brands, and is likely to continue for a number of reasons.

The volume of Sorted Office Paper (SOP), the main recovered fibre feedstock for tissue, has been declining for some time as less paper is used in offices and other workplaces, and the decline has become more pronounced over the course of the pandemic. Limited supply has led to higher prices for the grade. Alternative types of virgin fibre such as eucalyptus (BEK) are readily available and can be competitively priced.

Another impact of the pandemic has been a major decline in demand for tissue in the AfH segment in which recovered fibre is far more important than in the At-Home (AH) market which has seen significant growth.

If consumers are seeking greater sustainability in products, how will the tissue sector respond if expanding the use of recovered fibre is not likely to be an alternative? This raises several questions in the bath tissue category: what percentage of the AH market is concerned about sustainability in tissue relative to the buyers of ultra- and super-premium brands; and what product attributes do consumers link to sustainable bath tissue?

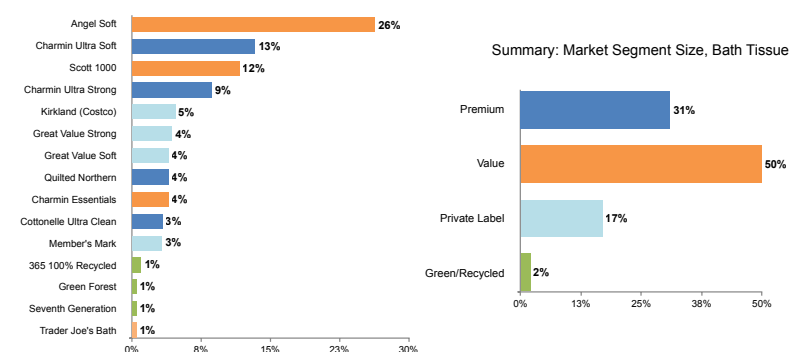
Many new, niche tissue brands that identify as 'sustainable', 'green', or 'eco-friendly' have emerged in recent years, with expressive names such as The Cheeky Panda, Who Gives a Crap, Bim Bam Boo, Bambootiful, NooTrees, and others (many of the upstarts are based on bamboo fibre).

In order to address these questions, a short consumer survey was conducted with a US online panel in early 2020, and results have not been presented elsewhere due to the sudden market changes that followed. The survey sampled 300 nationally representative grocery shoppers who purchase bath tissue for their household, which implies an accuracy level of +/- 6%.

Despite the pre-pandemic timing of data collection, results are very consistent with more recent research in this sector conducted by McKinsey & Company*. Research questions included:

- What is the relative size of key market segments for bath tissue – Premium, Value, Private Label, and Green/ Recycled - and why do consumers buy each segment?
- How important are recycled content and other 'green' attributes to consumers, relative to softness, strength, absorbency, and other traditional bath tissue characteristics?
- Do consumers know what their current bath tissue brand is made of and whether it has recycled fibre?

Figure 1: Bath Tissue Brand Bought Most Often



Q2b. Which one brand of bath tissue do you buy most often?



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to increase people's health and well-being,
by spreading the culture of personal hygiene
through unique products.



Gambini
beyond tissue

- Which sustainable tissue characteristics, such as recycled, unbleached, packaged in paper, are consumers most responsive to?
- Will consumers buy bath tissue made from alternative fibres such as bamboo, wheat straw, eucalyptus, or sugar cane/bagasse?

Segments in the bath tissue category

Respondents indicated which brands of bath tissue they had Ever Purchased as well as which individual brand they buy Most Often. Results for the two questions are very consistent and indicate that even 'green' brands that have been in the marketplace for many years (such as Seventh Generation, for example) have very low market share. Among brands Ever Purchased, Angel Soft is the leading brand, followed by Charmin Soft, Charmin Strong, and Scott 1000. Figure 1 (left side) shows the results for brands bought Most Often, a very similar lineup. Regular users of 'green' brands such as Whole Food's 365 100% Recycled account for only 2% of the sample. Note that all of the 'green' brands reported in this research are based on recycled content, while none of the upstart brands noted above, with even smaller followings, were mentioned.

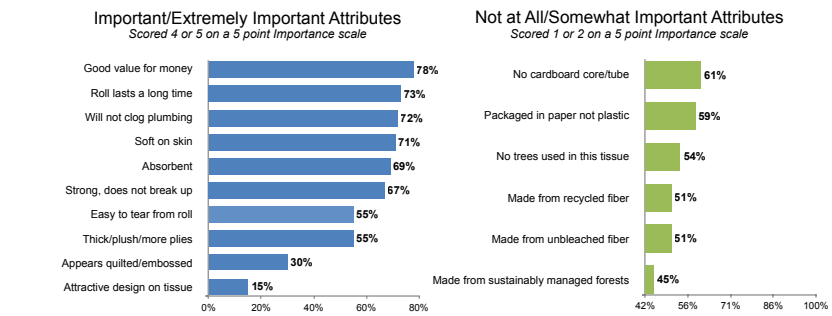
In Figure 1 (right side), each brand is allocated to one of four segments: Premium, Value, Private Label, and Green. For regular Most Often purchasers of bath tissue, Value brands dominate the market, followed by Premium brands. When considering the brands consumers have Ever Purchased, the Premium segment is larger than Value. In effect, Value brands dominate regular purchasing but consumers do try Premium brands from time to time.

As Lingqvist et al found in recent research, one of the strongest trends over the pandemic has been shifts in brand loyalty, with over 40% of consumers switching brands in one or more product categories. Given the shortages experienced in the bath tissue sector in 2020, we would expect considerably more switching in the tissue category. Value is the main driver for switching behaviour in tissue according to Lingqvist et al.

Which product attributes drive the category

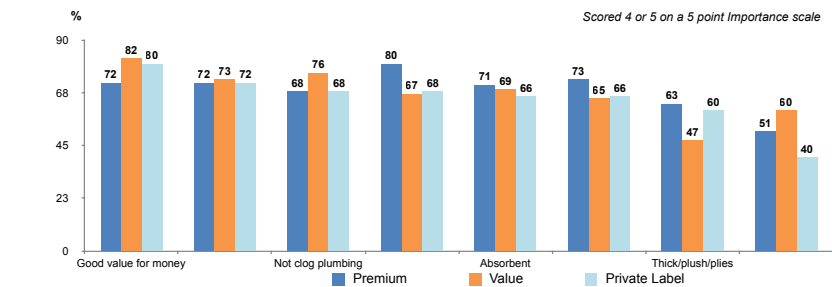
Figure 2 indicates how important each of 16 tissue product attributes are to consumers. 'Good value for money', followed by 'Roll lasts a long time', lead reinforcing the importance of value in this category. Functional attributes like not clogging

Figure 2: Characteristics that Drive the Category



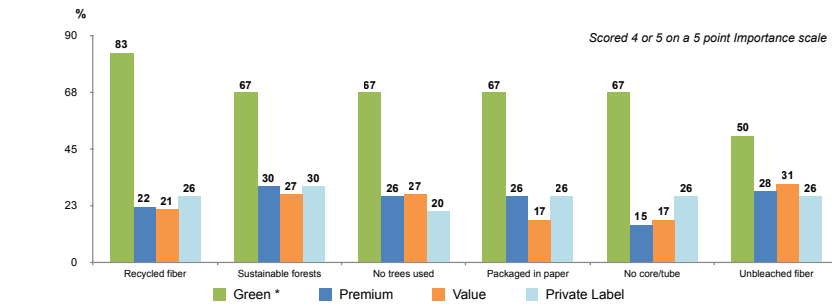
Q4a. When you buy bath tissue, how important are each of the following characteristics?

Figure 3: Characteristics that Drive Segments



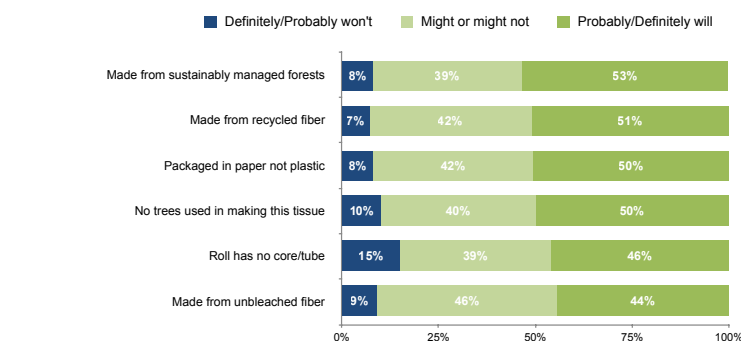
Q4a. When you buy bath tissue, how important are each of the following characteristics?

Figure 4: What Buyers of Green Bath Tissue Value



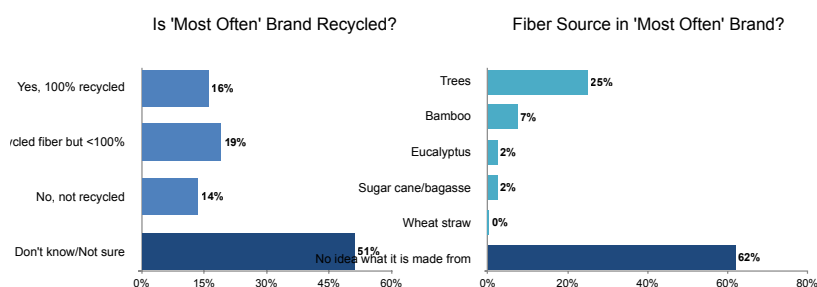
* Directional, qualitative data; Green segment has very small base size.
Q4a. When you buy bath tissue, how important are each of the following characteristics?

Figure 5: Buy Tissue with Sustainable Features?



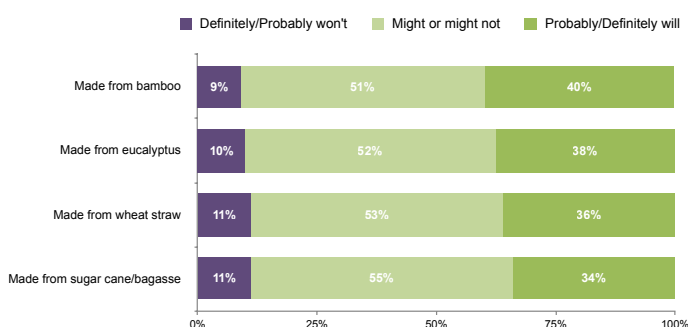
Q5b. If bath tissue with the following characteristics is available where you shop, at a price point that works for you, how likely are you to purchase it?

Figure 6: Knowledge of Bath Tissue Composition



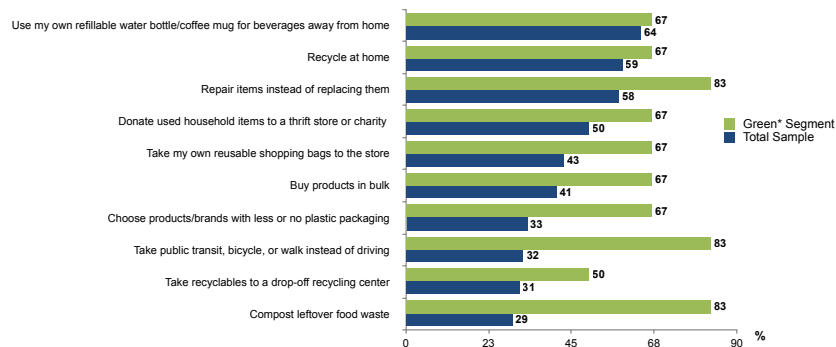
Q5a. Thinking about the brand you buy most often, do you know if it is made from recycled paper?
Q6a. Most bath tissue is made from trees... Do you know what the main source of fiber is for that tissue?

Figure 7: Buy Tissue Made of Alternative Fibres?



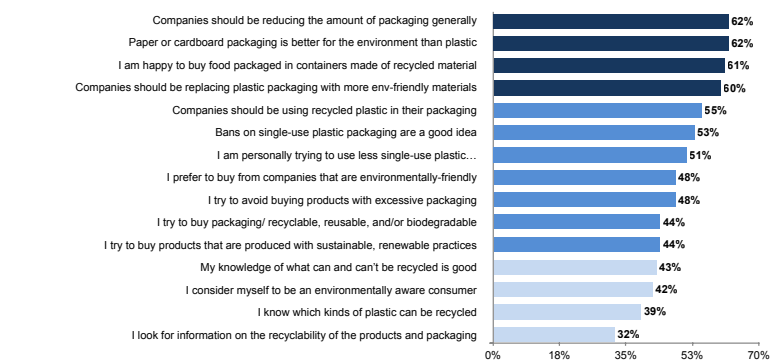
Q6b. If bath tissue with the following characteristics is available where you shop, at a price point that works for you, how likely are you to purchase it?

Figure 8: Green Buyers/More 'Green' Behavior



* Directional, qualitative data; Green segment has very small base size.
Q1. How frequently do you do each of the following? Rated Always/Often on 5 point scale.

Figure 9: Attitudes Toward Sustainability Issues



Q7. How much do you agree or disagree with the following statements? Scored 4 or 5 on a 5 point Agreement scale.

plumbing do matter, followed by soft, absorbent, and strong. Attributes that might be considered more sustainable, shown in green, are rated almost the opposite with around half (or more) indicating these features don't really matter.

Breaking out the three larger segments in Figure 3 suggests different product attributes are important to each segment. Those who buy Premium tissue score 'value for money' low and 'soft' much higher. Value brand buyers are concerned about 'value for money' and functional attributes like 'don't clog' and 'good for septic', but not 'thick/plush/more plies'. Private Label buyers are similar to Value buyers.

Figure 4 shows how all consumers rate the six sustainable attributes, breaking out the very small group of regular Green brand buyers. This group, which may have grown in size since this research was done, trends younger (18-24 and 25-34) and values each of the sustainable attributes considerably higher than consumers overall.

How many would buy tissue with the six sustainable product attributes if it was offered "at a price point that works for you"? As Figure 5 shows, consumers are fairly open to considering bath tissue with sustainable features with around half indicating they "Probably/Definitely" would. Tissue made from sustainably managed forests is the most appealing; unbleached fibre of the least interest. Respondents with higher education and income are more likely to probably/definitely purchase. The fact that very few say they "Definitely/Probably Would Not" purchase and another 40% say they "Might or Might Not" suggests that consumers are not opposed to sustainable features in tissue; they may simply be unfamiliar with the concept.

Bath Tissue Composition & Alternative Fibres

When asked if their Most Often purchased brand is made of recycled fibre, half of consumers acknowledge that they really do not know, and another quarter say it is wholly or partially recycled – when we know that almost all the brands they mentioned are not made with recycled fibre. As shown in Figure 6, knowledge about the source of fibre in their Most Often brand is equally as limited with well over half indicating "No idea".

When asked how likely they are to purchase bath tissue made from four alternatives fibres (bamboo, eucalyptus, wheat straw, and sugar cane/bagasse), the response shown in Figure 7 is a little less optimistic

with around half indicating the “Might or Might Not” purchase. Willingness to try increases with higher education and income, and/or younger age groups, however there may be more resistance to new fibres than to other sustainable bath tissue features. Bamboo is most well-known, as shown by the new, upstart brands. Consumers’ open-ended comments on alternative fibres were not flattering.

Behaviour and attitudes toward sustainability

Figure 8 summarises the percentage who “Always/Often” engage in various environmentally-friendly behaviours. Overall, the strongest areas of participation are using refillable containers for beverages when AfH, recycling at home, and repairing instead of replacing. The small number of Green brand buyers score similarly on the first two of these measures.

Overall, one third or less “Choose products with less plastic...”, “Take public transit, bicycle...”, use a “Drop-off recycling centre”, or “Compost leftover food waste” but the Green segment score substantially higher on these and all these other behaviors. Those who regularly buy ‘green’, recycled bath tissue are first, a very small market segment (even allowing for some growth since 2019), and second, very active in all types of sustainable activities.

The importance of 15 sustainability issues to tissue buyers is profiled in Figure 9. It is interesting to note that three of the top five highest scoring items are things “companies should be” doing regarding packaging. “Companies” should be reducing the amount of packaging, replacing plastic with more environmentally friendly packaging, and using recycled plastic. Consistent with other surveys, consumers feel that paper packaging is better for the environment than plastic, and like to buy packaging made of recycled material.

Only four out of 10 agree their “knowledge of what can be recycled is good”, they are an “environmentally aware consumer”, or

they “know which kinds of plastic can be recycled”, while a mere three out of 10 seek out information on the recyclability of products and packaging.

Given a fairly low level of consumer knowledge about recycling and a perception that companies should be making the changes, will consumers pay more for sustainable products/packaging? Figure 10 shows that responses are fairly consistent regardless of the type of product or packaging in question. Just under half would not pay more while one fifth would pay 10-20% more, particularly those in younger age groups.

Summary

The research reviewed here shows that the majority of consumers know very little about their bath tissue, both in terms of what the fibre is and whether it is made from recycled fibre. They are generally not that interested in tissue made from alternative fibres and probably have little knowledge of this option.

There is evidence that Value brands are the main drivers in the category although traditional premium product features such as soft, strong, and absorbent are still important. Sustainable attributes such as ‘from sustainably managed forests’, ‘made from recycled’, ‘packaged in paper not plastic’ rank very low on the list of features important in bath tissue for the majority of buyers.

A very small segment that skews younger regularly purchase ‘green’ brands of tissue (in this study, all recycled content brands). This group values sustainable attributes far more than other segments, and engages in ‘green’ behaviours on a much more frequent basis.

The lack of interest in ‘green’ product features is consistent with attitudes to broader sustainability concerns. Many feel companies should be doing more to make packaging more sustainable while they report knowing little about recycling

or what it takes to be an environmentally aware consumer, and very few search out information on such topics.

Yet when asked if they would buy tissue with sustainable characteristics, half indicate they Probably/Definitely Would and most of the remainder would at least consider it. Consumers appear to be relatively open to considering bath tissue with sustainable features, despite low knowledge and interest on many sustainability characteristics.

Implications

As many other studies have shown, consumer interest in greater sustainability in products and packaging continues to grow. There are many options for bath tissue producers to show improved sustainability, and this study suggests several. For example, linking a brand to the benefits of ‘sustainably managed forests’ or products made with ‘sustainable, renewable practices’ may be a stronger driver for consumers than some other ‘green’ attributes.

Product innovations that resonate with some consumers may become more meaningful with time, such as replacing plastic wrap with paper; producing tissue rolls with no core/tube; or using unbleached fibre. More focused consumer research would suggest which changes would generate the widest support in the market and the type of messaging that would be optimal to educate consumers (and environmental groups).

Considering the overall tissue production life-cycle, there are many additional opportunities for which improvements and achievement of sustainability goals could be communicated to consumers to improve perceptions of sustainability:

- Water is a key ingredient to tissue production with the potential to be used more efficiently in many locations;
- Carbon emissions can always be improved, and at least one study shows that US mills have higher emissions than elsewhere globally;
- Similarly, a better understanding of the sustainability balance involved in using the various alternative fibres could be communicated more widely.

**Lingqvist, Nordigarden, Roeper, & Vainberg, “Beyond Covid-19: The new consumer behaviour is sticking in the tissue industry”, McKinsey & Company, October 2019.*

PRODUCT INNOVATIONS THAT RESONATE WITH SOME CONSUMERS MAY BECOME MORE MEANINGFUL WITH TIME, SUCH AS REPLACING PLASTIC WRAP WITH PAPER; PRODUCING TISSUE ROLLS WITH NO CORE/TUBE; OR USING UNBLEACHED FIBRE. MORE FOCUSED CONSUMER RESEARCH WOULD SUGGEST WHICH CHANGES WOULD GENERATE THE WIDEST SUPPORT IN THE MARKET AND THE TYPE OF MESSAGING THAT WOULD BE OPTIMAL TO EDUCATE CONSUMERS (AND ENVIRONMENTAL GROUPS).

NEWS IN BRIEF

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



Premium boost: FHH's Gambini-supplied converting line changes embossing patterns on its products

MIDDLE EAST

FHH boosts premium converting capacity with UAE investment

Fine Hygienic Holding (FHH) has installed a Gambini-supplied converting line at its Abu Dhabi plant as part of a \$136m investment project in the UAE. The \$8.2m converting project joins investments in the paper mill, converting facility and warehouses, and will upgrade production in the toilet and kitchen towel categories, enabling FHH to "provide consumers in the region with higher quality products", and also offer different embossing patterns on the toilet paper and paper towels products. The machine incorporates AIR MILL technology and a process which reduces pulp and paper while improving the quality of the products.

James Michael Lafferty, FHH's Chief Executive, said the investment helps the business further differentiate its products from competitors, deliver premium, value-packed products across the GCC markets.

He said: "This investment is the latest example of FHH's dedication to innovation and production excellence, highlighting the company's bold commitment to investment in quality products in spite of the Covid-19 pandemic which has impacted business growth all over the world."

Go to p.20 to read this issue's Operations Report interview with Fine Hygienic Holding's Chief Executive James Michael Lafferty.

CHINA

Zhihu Cloud Commerce boosts household paper capacity

Zhihu Cloud Commerce Industrial Co. has started up the third of four Baotuo-supplied BC1500-4200 Crescent former tissue machines.

Based in Henan Industrial Park, Guangxi Province, TM3 has a design speed of 1,500m/min and a paper width of 4.2m.

The machine makes 11-12g e-commerce base paper from the local wet mixed pulp in Guangxi and has an annual production capacity of 30,000 tonnes.

BRAZIL

Suzano invests in eucalyptus pulp plant

Suzano has invested in an Andritz-supplied complete pulp mill to be installed at its Cerrado project in the municipality of Ribas do Rio Pardo. The supplier will deliver state-of-the-art technologies for

all main processes in the fibre production and chemical recovery plant. Start-up is scheduled for the second half of 2024.

UNITED KINGDOM

K-C's UK operations move to renewable energy

Kimberly-Clark (K-C) has signed an agreement that will lead to the construction of a wind farm owned by Octopus Renewables Infrastructure Trust that will make almost 80% of all its electrical power consumption in the UK renewable. Once up and running, the Cumberhead onshore wind farm in South Lanarkshire, Scotland, will supply K-C with 160,000 megawatt hours of renewable energy annually for its consumer brands Andrex, Kleenex, Huggies, and business-to-business brands WypAll and Scott. K-C said this represents an emissions reduction of 55,625 MTCO2e per year.

The agreement is a first for the business outside of North America and the business said it marks "a significant step" towards the company's goal of halving its absolute greenhouse gas Scope 1 & 2 emissions by 2030. The construction of the new windfarm recently started and will take approximately 12-15 months.

GLOBAL

Buckman launches immersive digital technology range

Buckman has announced a range of immersive digital technology that combines artificial, augmented, and mixed reality capabilities. Supported by its expanding Ackumen platform, the company said its Ackumen Connected Reality enables Buckman personnel and customers to see, collaborate and solve problems remotely, which it added will dramatically reduce response time, errors, costs, and downtime.

Kemira introduces advanced polymer technology

Kemira has launched its latest advanced polymer technology to solve stickies



Packaging focus: Aldar Tissues' investment includes two Universa tissue wrappers, and a Cinque and a Quattro plus bundler

challenges in recycled paper, board and tissue. The company said its quick inversion polymer technology helps address stickies originating from tapes, glues, and labels used in recovered and recycled packaging material. It also highlighted a case study from a tissue mill producing recycled tissue grades.

IRELAND

Aldar Tissues boosts packaging capacity with TMC investment

Tissue converter Aldar Tissues has increased its consumer and AfH production capacity after investing in TMC-supplied tissue roll packaging lines.

The multimillion-euro investment will include two complete end-to-end fully automated production lines offering flexible production that will be installed at the company's new plant in Dublin, where it manufactures Consumer and AfH products.

TMC has supplied Aldar with packaging equipment from wrapping through to bundling and palletising for the site's manufacturing lines.

A Universa tissue wrapper will cover the plant's converting needs and has a production speed of up to 200 packs per minute, ready for paper-based wrapping materials.

A Cinque bundler has also been supplied to process pack typologies including single, double, triple layer packs and AfH products.

To complete the production line, TMC supplied Aldar Tissues with two end-of-line systems: a stretch-wrapping automatic pallet wrapper for products in a bundle and a palletiser.

FRANCE

Lucart consolidates in Europe with €80m project

Lucart has announced an €80m three-year investment project that will include the start-up of a tissue machine in 2024 at its plant in Laval sur Vologne.

The operation also includes the installation of three converting lines, the construction of a 25,000m² logistics hub, and plans to reduce CO₂ emissions by more than 12,000tpy by installing a biomass power plant at site. Once up and running, PM15 will consolidate the group's international presence in the AfH sector, producing up to 40,000 tonnes of high-quality tissue paper per year.

POLAND

WEPA boosts AfH capacity in Poland with Toscotec start-up

WEPA Group has started up a Toscotec-supplied AHEAD 2.2S tissue machine at its Piechowice site. Part of a full turnkey supply, the machine has a sheet trim width of 2.7m and a maximum operating speed

of 2,100m/min.

With an annual production capacity of 36,000tpy, the plant increases its total capacity to 70,000 tonnes of raw paper which is processed into toilet paper, kitchen paper, paper towels and cleaning rolls, primarily for the AfH market.

GERMANY

Essity launches green hydrogen pilot for CO₂-free tissue production

Essity has launched a €4m pilot project to run a paper machine CO₂-free with green hydrogen at its plant in Mainz-Kostheim.

Natural gas will be successively replaced by green hydrogen on the site's largest paper machine during ongoing production.

Essity said the project is the first of this magnitude in the paper industry and will test to what extent green hydrogen can replace natural gas in the tissue production process without compromising on product quality.

WEPA boosts consumer converting capacity

WEPA has invested in a Gambini-supplied 700m/min consumer converting line. The complete line will be started up at the company's plant in Leuna. Runnability tests have been carried out jointly at TissueHub, the spin-off technology and development centre established by Gambini, offering clients a complete 2.8m-wide pilot line.

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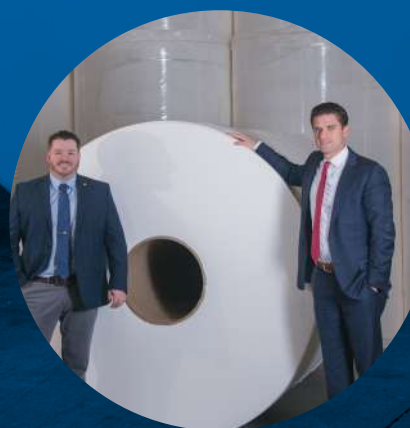


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THE MIDDLE EAST TISSUE BUSINESS: A STUDY IN CONTRASTS AND CONTRADICTIONS, WHERE TISSUE DEMAND AND USE GROWTH RATES ARE DRIVEN BY ECONOMICS AND DEMOGRAPHICS

The Middle East has some of the world's oldest recorded history and has played a significant role in developing human language, agriculture, laws and religion for over 5,000 years. The region has been the source of rotating empires as many wars for power have occurred.

However, despite a long-shared history, today's divisions between peoples and states appear greater than almost any region on earth. These were exacerbated by colonialism and differing early 20th century mandates after World War I. Political factors, not geography, are what determine intraregional economic cooperation and trade, which must be considered to analyze tissue demand and production in the region.

The component countries that make up the Middle East are not well defined and

vary by political definitions instead of geographical ones. While statistical sources use several different definitions, this report considers Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian Territories, Saudi Arabia, Syria, UAE, and Yemen as the countries of the Middle East. Table 1 provides a summary of key differences in the region derived from the World Factbook. In this case, the Palestinian Territories are broken down separately as Gaza and West Bank.

Table 1: Middle East Economic Statistics Supporting Tissue Demand Growth

It would be hard to find another region of the world with as significant of a variation in economic statistics as the Middle East. The range of real GDP per capita shown in Table 1 illustrates Qatar at 34 times



Bruce Janda
Senior Consultant, Fisher International

the level of Yemen. Some of the statistics shown are relatively out of date and, in some cases, unavailable. It should be noted that the specific data available for the Palestinian Territories are combined,

Country	Population	Population Growth	Real GDP Per Capita	Real GDP Growth	Inflation Rate	Unemployment Rate	Urbanization %
Bahrain	1,526,929	0.9%	\$40,900	2.49%	1.47%	5.3%	89.6%
Egypt	106,437,241	2.17%	\$12,000	4.2%	9.3%	7.86%	42.9%
Iran	85,888,910	1.03%	\$12,400	3.7%	10%	11.8%	76.3%
Iraq	39,650,145	2.06%	\$9,300	-2.1%	-0.1%	16%	71.1%
Israel	8,787,045	1.45%	\$38,300	-2.6%	1.8%	4.4%	92.7%
Jordan	10,909,567	0.82%	\$9,800	2%	0.3%	19.1%	91.6%
Kuwait	3,032,065	1.2%	\$49,900	-3.3%	1.5%	11%	100%
Lebanon	5,261,372	0.68%	\$11,600	1.5%	2.8%	9.7% (2007)	89.1%
Oman	3,694,755	1.89%	\$27,300	-0.9%	0.1%	NA	87%
Qatar	2,479,995	1.23%	\$85,300	1.6%	-0.6%	8.9%	99.3%
Palestinian Territories			\$5,400		0.2%	27.9%	77%
Gaza Strip	1,957,062	2.05%	\$5,400	-15.2% (2014)	0.2%	27.9%	77%
West Bank	2,949,246	1.72%	\$5,400	5.3% (2014)	0.2%	27.9%	77%
Saudi Arabia	34,783,757	1.62%	\$44,300	-0.9%	-2%	6%	84.5%
Syria	20,384,316	NA	\$2,900	-36.5%	28.1%	50%	56.1%
UAE	9,856,612	0.62%	\$67,100	0.8%	-1.9%	1.6%	87.3%
Yemen	30,399,243	1.93%	\$2,500	-5.9%	24.7%	27%	38.5%

but some are separated as shown. While the more internationally active countries' data is typically from 2020 or 2021, most of the economic information is from 2017. This excludes the effects of the pandemic and some other catastrophes that have occurred, such as Lebanon's warehouse explosion. Any data that is further out of date is noted in the table. In some ways, it is worse than it looks for supporting tissue demand in several countries, as there are no tissue machines in the countries identified in the light blue region in the table above.

Figures 1-4 show some of the same data as trends available from Fisher International. Figure 1 shows Egypt's

population growing significantly faster through the 14 years compared to the others. Iran, Iraq, Saudi Arabia, and Yemen are other larger populations, but the rest are minimal, and Syria stopped reporting data as of 2010.

Figure 2 shows the trend of purchasing power parity GDP per capita during the same time frame. The large swings in GDP per capita from oil prices during the recovery period from the last global recession had an enormous effect on oil-producing countries like Qatar, who is at the top of the chart. Other countries, like Yemen, just became poorer during their civil war. This has resulted in a challenging environment

for the growth of tissue demand and tissue production in the area. The United Arab Emirates, however, appears to be more diversified and did not respond to oil prices in the same way.

Figure 3 shows the trend of inflation. This shows inflation swings in countries with unstable economies due to civil wars and trade difficulties. Lebanon stands alone with the last inflation report at 84.9% at the end of 2020. Iran and Yemen also show significant inflation problems, while Egypt has returned to more normal operating rates.

The unemployment rate trend data is more difficult to obtain in closed

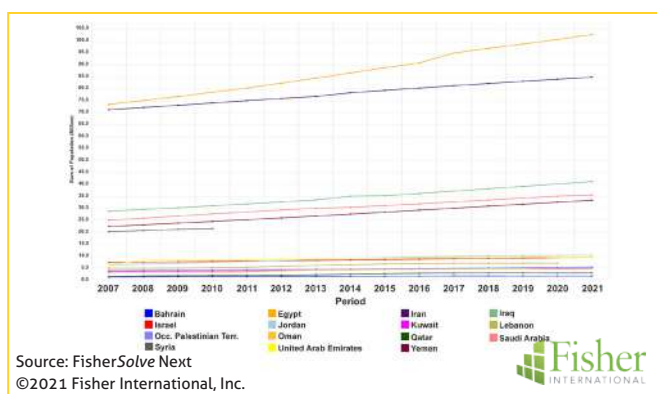


Figure 1: Middle East Population by Country

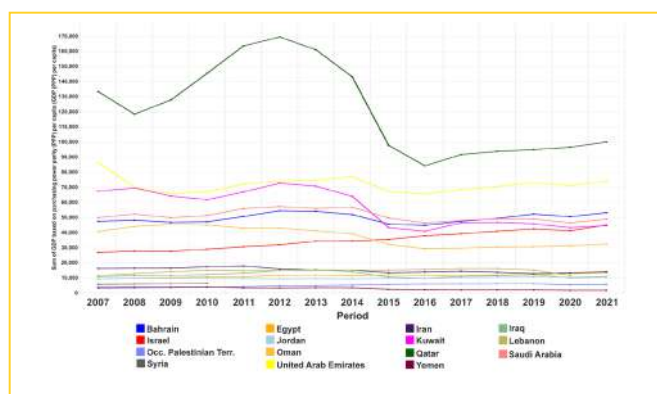


Figure 2: Middle East GDP per Capita

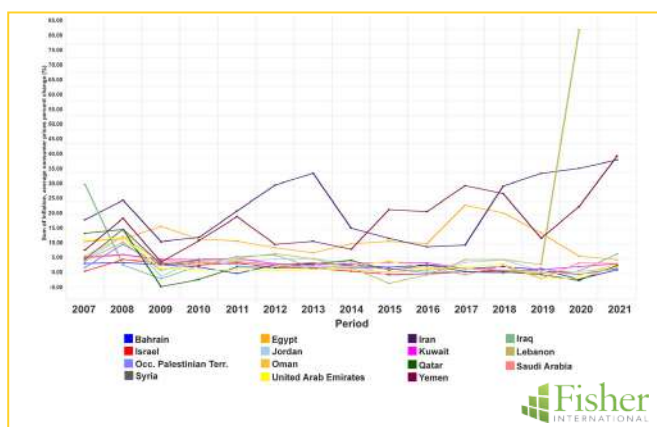


Figure 3: Middle East Inflation

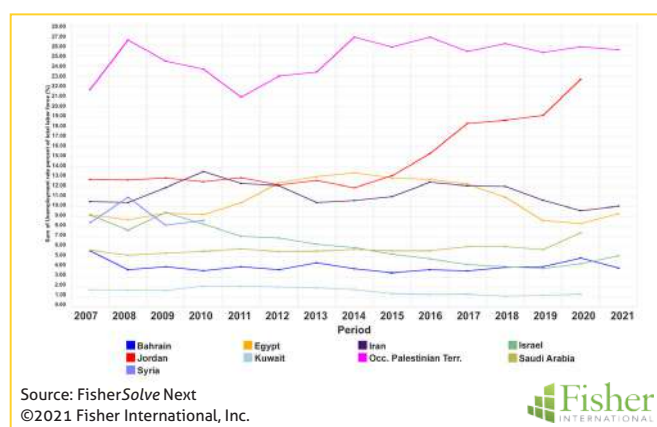


Figure 4: Middle East Unemployment

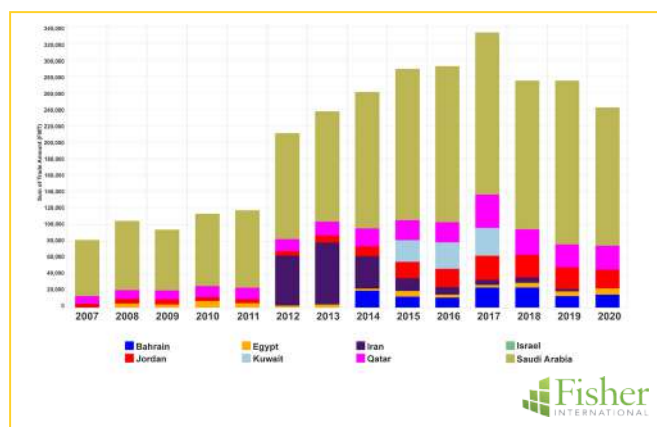


Figure 5: Middle East Tissue Imports by Country

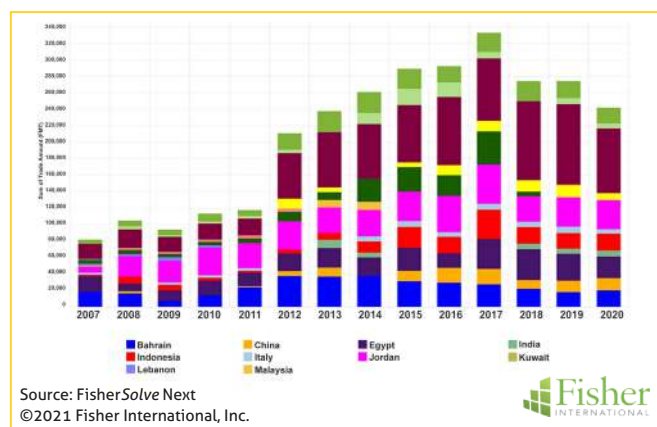


Figure 6: Middle East Import Sources

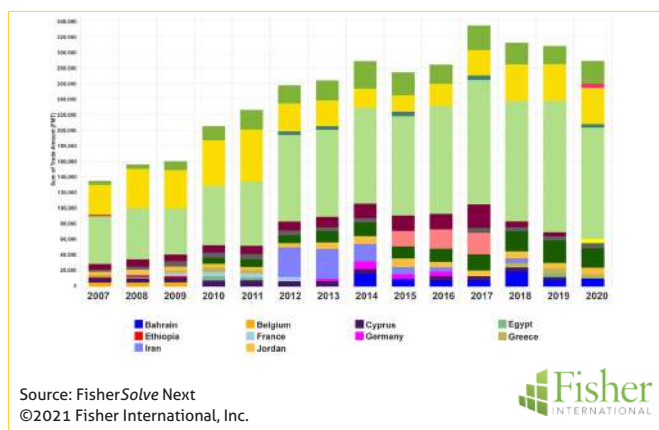


Figure 7: Middle East Tissue Exports

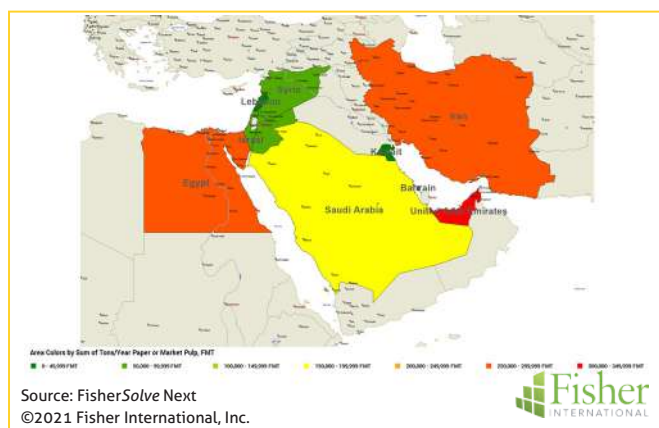


Figure 8: Middle East Tissue Production Heat Map

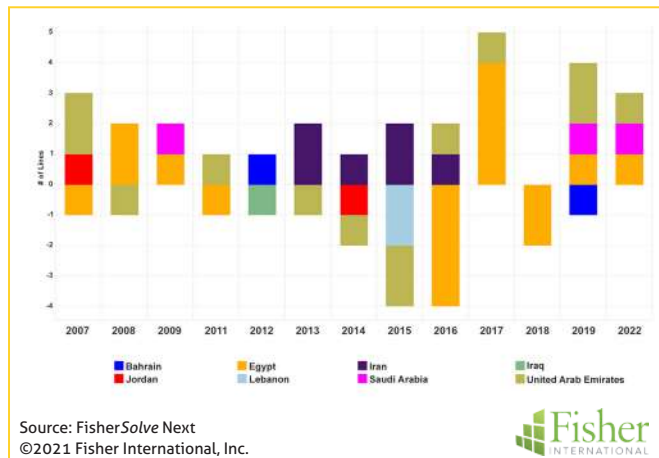


Figure 9: Middle East Tissue Machine Additions/Deletions

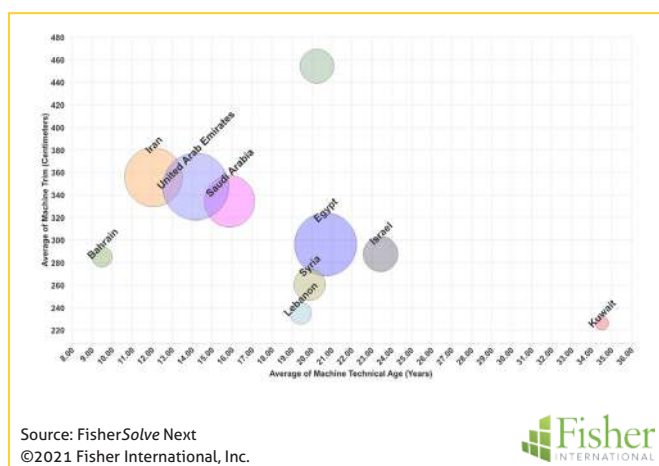


Figure 10: Middle East Tissue Machine Quality °

societies. This is seen in Table 1 and illustrated in Figure 4 as fewer countries have statistics to be reported. The Occupied Palestinian Territories suffer from long-term unemployment. Jordan shows a significant increase in unemployment over this term as well. Saudi Arabia, Kuwait, Israel, and Bahrain have seen stable or falling unemployment rates. Syria stopped reporting in 2010.

Figure 5 shows the tissue imported into the Middle East by each reporting country. Total imports by the Middle East have grown from about 10% to 20% of the total production in the region. Most of that tissue is being imported by Saudi Arabia.

Figure 6 plots the same tissue import data as Figure 5; however, the source of the imports is shown. Unsurprisingly, some imports come from within the region, with Egypt as the leading exporter to the Middle East. Unfortunately, trade data for several of the countries are not available, including Yemen, Syria, and Palestinian territories.

The Middle East does export some tissue, as shown in Figure 7. While most of this trade is done within the Middle East region, we see some occurring in Europe and the Mediterranean.

Figure 8 provides a heat map showing the relative tissue production capacity in the Middle East tissue-producing countries. The United Arab Emirates has the largest production capacity, followed by Egypt, Iran, Lebanon, and Kuwait.

Figure 9 shows the paper machine additions and deletions behind the capacities shown in Figure 8. The United Arab Emirates, Egypt, Iran, and Saudi Arabia have made significant upgrades to their tissue fleet, and Lebanon has taken out tissue capacity. However, Kuwait and Syria have not changed.

Figure 10 represents the average quality of tissue machines in the Middle East for each of the countries. The bubble size represents the total capacity in each country, with United Arab Emirates, Egypt, Iran, and Saudi Arabia as the top producers. However, Egypt's machines tend to be older and smaller compared to the other three. Bahrain has the newest machines, but they are small in width. Kuwait has not invested in machine upgrades or replacements. So far, there has been one advanced technology tissue machine in the Middle East, which was installed in the United Arab Emirates.

The composite tissue furnace used in the Middle East is shown in Figure 11. The paper section represents the amount coming from recovered paper fibre. The virgin pumps come from various regions, including southern, northern, eucalyptus, and tropical fibres.

A composite view of Middle Eastern tissue products produced is shown in Figure 12. Consumer bath and consumer facial are the significant grades produced. Consumer towel production comes in as the number three grade. Israel and Iran are the only countries producing commercial bath tissue. Egypt produces commercial facial tissue, while Saudi Arabia produces commercial towels.

The relative production costs of Middle Eastern tissue are plotted in Figure 13. Iran has the lowest cost while Kuwait is the highest

THIS ARTICLE PRESENTS A STATIC SUMMARY OF THE MIDDLE EAST'S TISSUE INDUSTRY TODAY WITH LIMITED VISIBILITY ON SEVERAL COUNTRIES DUE TO INTERNAL AND POLITICAL ISSUES. FIBRE PRICES, EXCHANGE RATES, AND ENVIRONMENTAL REGULATIONS WILL CHANGE, PROVIDING SOME PARTICIPANTS WITH ADVANTAGES AND NEW CHALLENGES.

cost tissue producer. However, this broad range from lowest to highest cost seems smaller than expected. The cost component breakdown shows that every producer uses some recovered fiber except for Jordan, Bahrain, and Kuwait. However, energy costs are much higher in Israel.

Fisher International provides a proprietary viability ranking based on each tissue machine's future expected relative competitive position based on capital required, cost, size, and technological age. Figure 14 shows a broader distinction between the tissue-producing countries in the Middle East than the cost curve in Figure 13. Iran is projected to be the most viable, but the United Arab Emirates' newer fleet of machines is scored much better than on the cost curve. Egypt's ranking has improved as well.

Figure 15 shows the average carbon emissions in a cradle to gate score based on CO2 content in the raw materials, fuel combustion on-site, and purchased electricity. Again, United Arab Emirates, Egypt, and Iran are in the best position, which is probably due to the efficiency of their tissue operations.

The Middle Eastern tissue business is a study in contrasts and contradictions. Tissue demand and use growth rates are driven by economics and demographics. This region contains both very high and low personal income with large and small populations. Political factors limit trade within and outside the region. Statistical data on economics and demographics is available in the wealthiest countries, but very limited in the more troubled areas.

Iraq, Oman, Qatar, Palestinian territories, and Yemen do not have tissue machines within their borders, and Syria and Kuwait have not made changes in their tissue fleet in the last 14 years. Bahrain, Iran, United Arab Emirates, and Saudi Arabia have updated their tissue fleet and have the youngest machine technical age. Iran, United Arab Emirates, Saudi Arabia, and Egypt are the major players in volume, followed by Jordan. These are the same five countries with the best viability rankings. The United Arab Emirates appears to be trying to diversify its economy away from petroleum products, which could support tissue production growth and exports in the future.

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

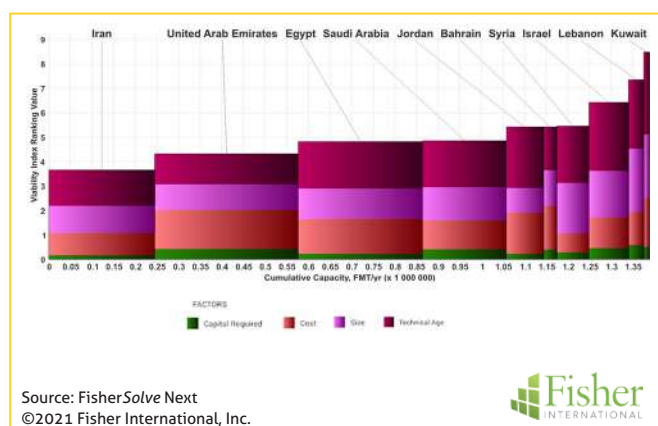


Figure 14 Middle East Tissue Machine Viability by Company

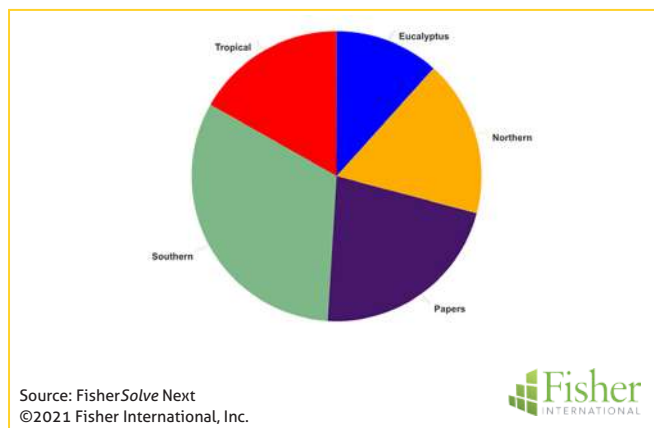


Figure 11: Middle East Tissue Furnish

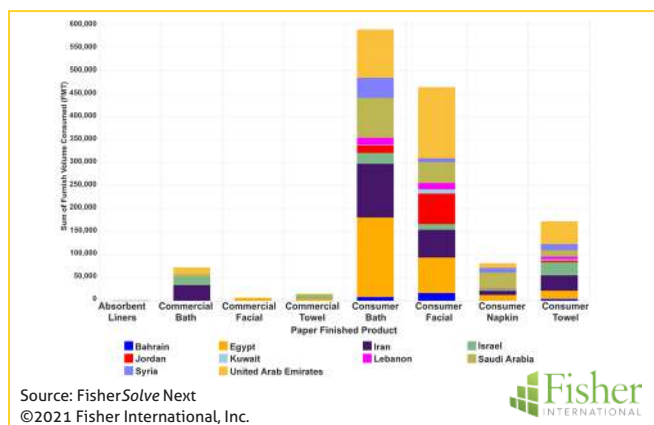


Figure 12: Middle East Tissue Products

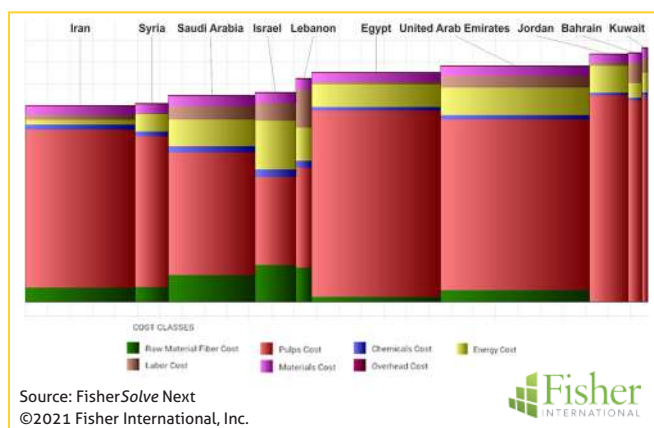


Figure 13: Middle East Tissue Relative Production Cost by Country

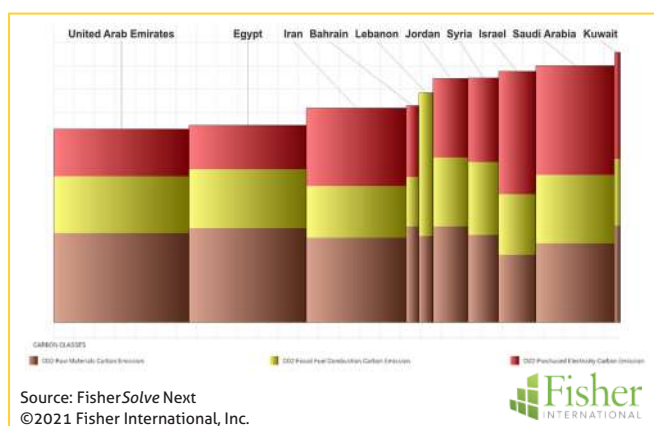


Figure 15 Middle East Tissue Machine Carbon Emission by Company

HOW THE EFFECTS OF THE PANDEMIC PLAYED OUT ACROSS THE REGION'S NATIONS

Mixed picture follows increased hygiene awareness, AfH was hit by 23% decline, big increases in VAT, lost value share, extensive price discounting ... set against an organic growth in population.



By Isam Arshad
Senior Analyst, Home & Technology,
Euromonitor International

While retail tissue in the Middle East contributes a modest 2.3% of total world tissue consumption, it continued to grow in 2020. Saudi Arabia, Israel and the United Arab Emirates collectively constitute 44% of tissue value sales in the Middle East and are the core contributors to the trends that influence the region as a whole. Whilst global retail tissue volume sales grew by 7% in 2020, with North America recording the fastest retail volume growth of 12%, the Middle East followed with regional growth of 8% to reach 1.1 million tonnes, which is still far lower than US per capita consumption but does indicate room for further expansion.

Covid-19's impact on tissue in the Middle East

Retail tissue performed relatively well in 2020 in the Middle East due to increased consumer awareness of the need for stringent cleaning and hygiene in both their homes, and on a personal level. Major influences, especially for retail tissue including toilet paper, were that many consumers remained at home for long periods of time due to social distancing and lockdown mandates in an attempt to control the spread of the virus, which resulted in a

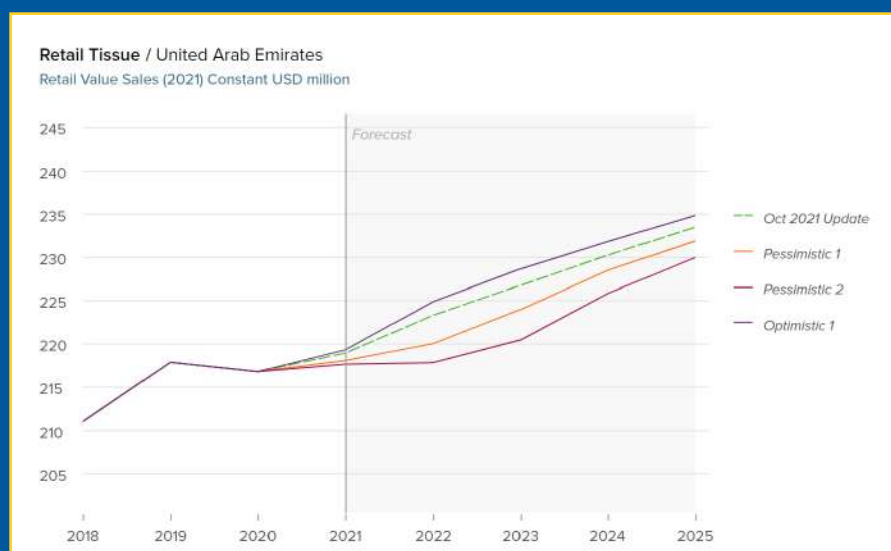
surge of remote working and studying. The fact that international travel was also halted for an extended period led to cancellations of travel plans, thereby contributing to a natural decline of 23% in value sales of tissue via the AfH channel in 2020.

A common trend noted across the Middle East has been a shift in consumer behaviour; the initial shock linked to the emergence of the pandemic and the subsequent lockdowns resulted in a temporary shortage of some tissue products as demand surged, supported by some panic buying.


An illustration of the importance of tissue products to consumers came from Saudi Arabia, where in July 2020 retail VAT was increased from 5% to 15%. Despite decreasing disposable incomes due to wage reductions or unemployment (seen across the region),

Saudi Arabia retail tissue value grew by 12% in 2020 compared to 2019. In Saudi Arabia, Hygienic Paper Co Ltd (Fine) maintained its lead with 23% market share in retail tissue in 2020. It is the local representative of The Nuqul Group in the Kingdom, offering the well-known international brand Fine.

However, many tissue brands witnessed a decline in value share in 2020, as consumers



Source: Euromonitor International



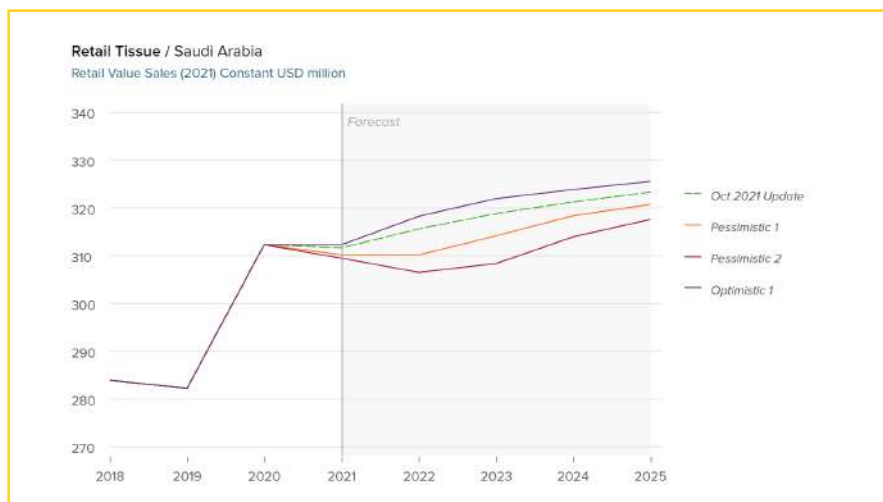
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Source: Euromonitor International

shifted to lower-priced options due to the implementation of 15% VAT, which came as a blow, especially to low- and middle-income consumers. Companies responded by offering extensive price discounts (30-40% in some cases in Saudi Arabia), as well as dual/triple pack offers, free units, changes in pack sizes and value pack offerings in a bid to stay afloat and provide some kind of relief to consumers.

In particular, promotional activities and discounts have been used to stimulate interest in categories which have seen high growth due to consumers having to stay at home, and those with antibacterial properties.

Recent developments in Middle East tissue market

Retail tissue is set to continue to experience increasing normalisation in 2021 and beyond, as the threat of Covid-19 wanes due to social distancing, mask-wearing and the rollout of vaccination programmes. However, having witnessed a pandemic on such a scale, it seems highly unlikely that all consumers will immediately return to previous routines. There is likely to be some relaxation of hygiene and cleaning routines, although demand for many products, especially those directly related to home care and personal hygiene, will

remain higher than before the pandemic. The continued rise in the population will also help drive further demand. By 2025, organic growth in the population is expected to contribute an additional three million consumers to Saudi Arabia.

Meanwhile, AfH tissue is expected to experience an improved performance in 2021, which will in part be due to the rebound from a strong decline witnessed in 2020. Domestic consumers are expected to regain their confidence in visiting foodservice outlets, whilst the return of tourists will also contribute to the improving performance; tourists significantly contribute to sales in the AfH channel. Generally in developed markets such as the US or Europe, AfH tissue's value approximately constitutes 40% of tissue's value, which is similar to trends in the Middle East.

Tourism is expected to gradually recover in major Middle East markets in 2021 and onwards, as religious pilgrimages open up again for international visitors in Saudi Arabia, Expo 2020 in Dubai, and the United Arab Emirates. Although unlikely to return to the levels of 2019, AfH demand for tissue will certainly improve compared with the huge decline witnessed in 2020.

Five trends shaping the retail tissue market

1. Affordability in focus; premium re-evaluated

With developing markets still lagging behind in terms of income levels and developed regions feeling the economic impact of Covid-19, affordability is high on the agenda in tissue, with value for money often taking priority over a premium positioning. For example, in the United Arab Emirates, average unit price per kg for toilet paper is expected to decline by a CAGR of 1.5% over 2020-2025.

2. Private label gains share of sales

Private label is a significant contributor to sales in developed markets and has gained traction as increased availability across retail networks, particularly discounters, and consumers' growing price sensitivity have favoured this segment worldwide. In Israel, private label held a 14% value share of retail tissue in 2020, which is expected to grow by a 4% CAGR to 2025.

3. Direct-to-consumer (D2C) insurgents drive purpose-led innovation

As an increasing number of consumers embrace e-commerce, rising D2C brands' multi-faceted approach to building a purpose-led identity that embodies not only unique product features, but also authenticity, sustainability, and wellness, will become more entrenched in future branding. In Saudi Arabia and the United Arab Emirates, Fine Hygienic Paper FZE for Nuqul Group, launched The Fine Shop, an online store which gives consumers around the world access to the full range of Fine sterilised, wellness-related products.

4. Strong health focus catalyses adoption of wellness positioning

Consumers' growing health concerns and hygiene awareness have prompted tissue players to dial up manufacturing transparency, as well as multifunctional cleaning and skin care properties in ingredient formulations and brand communications.

5. Sustainability remains an untapped opportunity for the tissue industry in the Middle East

Sustainability remained relevant even during the pandemic and continues to drive new product development and positioning. With it still being an untapped area, or limited in some areas of the global

RETAIL TISSUE IS SET TO CONTINUE TO EXPERIENCE INCREASING NORMALISATION IN 2021 AND BEYOND, AS THE THREAT OF COVID-19 WANES DUE TO SOCIAL DISTANCING, MASK-WEARING AND THE ROLLOUT OF VACCINATION PROGRAMMES. HOWEVER, HAVING WITNESSED A PANDEMIC ON SUCH A SCALE, IT SEEMS HIGHLY UNLIKELY THAT ALL CONSUMERS WILL IMMEDIATELY RETURN TO PREVIOUS ROUTINES.

industry, the opportunities range from alternative fibres to overhauls in supply chain and environmental certification.

Future of tissue in the Middle East

Retail tissue in the Middle East will also continue to see strong demand early in the forecast period and is expected to reach \$3bn by 2025. However, over time as the threat of the virus wanes and consumers start to spend longer periods of time outside of the home, including returning to their places of work, there is likely to be a subtle shift back towards AfH tissue through the horeca and business/industry channels, a trend which will be further supported by the eventual return of international tourists.

While overall tissue value growth slowed in 2020 due to a noticeable trend towards value-for-money products as a result of increasing price sensitivity in the Middle East, it is expected to eventually recover to record a stronger performance (at constant 2020 prices) compared to the review period. Beyond the immediate threat of the virus and economic shock where it is likely to take some time for the economy to fully recover, players are likely to attempt to add value to the market by improving functionality and softness of tissue and hygiene products using more natural components, whilst addressing the increasing demand for greater sustainability.

The influence of megatrends

As with all FMCG, tissue sales will largely be governed by a broad set of five socioeconomic drivers generating and shaping consumer trends. These long-term shifts explain the ongoing changes we see in consumer behaviour and ultimately tissue selection.

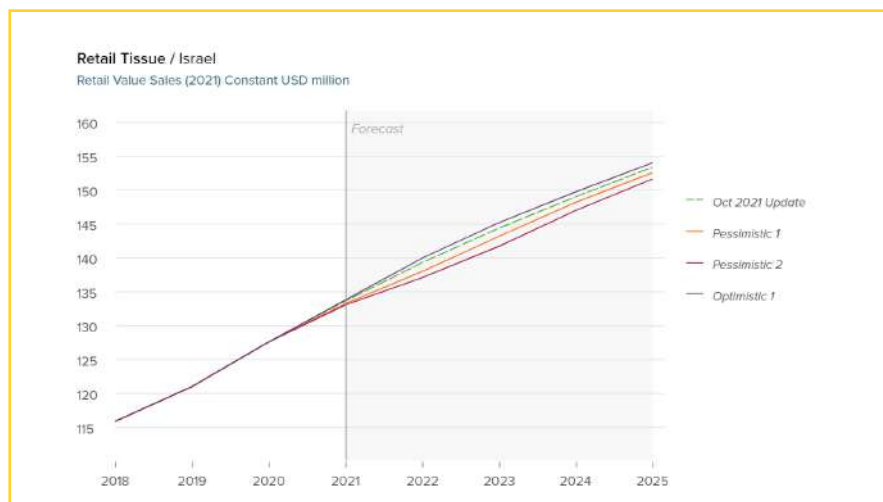
1. **Shifting Economic Power:** The Covid-19 pandemic is likely to boost existing global decoupling trends by deepening divides between global economic partners, and to allow China to secure its position as an economic power centre on a par with the US. China is a major non-oil trading partner for the Middle East with exports of

raw material and finished tissue products.

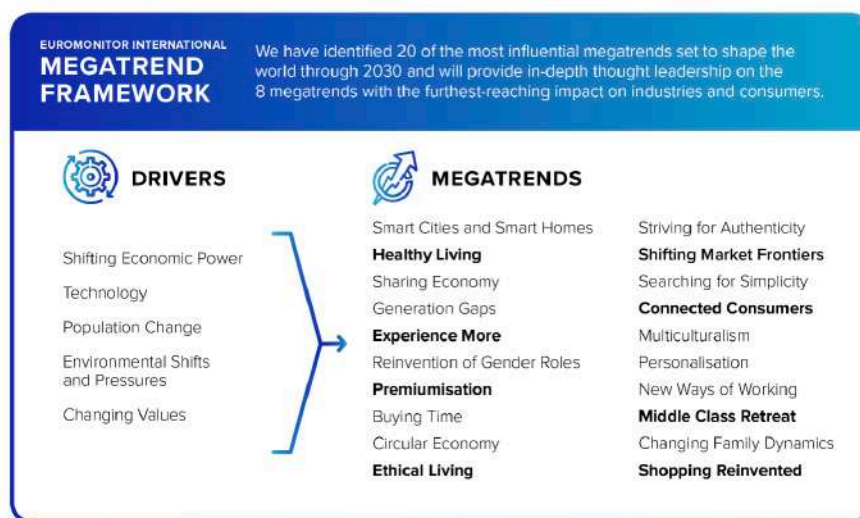
2. **Population Change:** Lockdowns and economic recessions triggered by Covid-19 are resulting in short-term disruption in global migration and urbanisation trends, which directly affect the expat population in the Middle East, constituting 89% of the United Arab Emirates and 25% of Saudi Arabia's total population.
3. **Environmental Shifts and Pressures:** Competition for resources and increasing awareness of environmental challenges are having a transformative effect on consumer behaviour – sometimes at a rapid pace. A sustainable eco-friendly

tissue industry is on par with expectations.

4. **Technology:** It plays a pivotal role in consumer decision-making and the ability of businesses to meet the needs of today's consumers. It has created upheavals in consumer expectations, lowered the barriers of entry and inspired new business models. For example, tissue players in the Middle East have developed cost-effective ways of producing perfumed tissues and rolls with high water absorbent features.
5. **Changing Values:** Covid-19 is likely to embed long-lasting fear and anxiety, resulting in consumers re-evaluating their values, priorities and behaviour, with some permanent shifts expected.



Source: Euromonitor International



WHILE OVERALL TISSUE VALUE GROWTH SLOWED IN 2020 DUE TO A NOTICEABLE TREND TOWARDS VALUE-FOR-MONEY PRODUCTS AS A RESULT OF INCREASING PRICE SENSITIVITY IN THE MIDDLE EAST, IT IS EXPECTED TO EVENTUALLY RECOVER TO RECORD A STRONGER PERFORMANCE (AT CONSTANT 2020 PRICES) COMPARED TO THE REVIEW PERIOD.

THE REGION'S TOP TISSUE COMPANY RAISES THE BAR HIGHER: "WE ARE GOING TO DO LOTS OF THINGS THAT NOBODY HAS EVER DONE."

Fine Hygienic Holding (FHH) — the tissue market leader in the Middle East and North Africa region — has a history dating back to 1958. Here, Chief Executive James Michael Lafferty offers his projections for a modern future to TWM Senior Editor Helen Morris.



Capacity boost: FHH's integrated Abu Dhabi facility has just started up the final part of its \$136m project — a \$8.2m Gambini-supplied converting line.

The direction of travel for Fine Hygienic Holding (FHH) Chief Executive James Michael Lafferty could not be made clearer. He brings to mind that famous Americanism ... "When the going gets tough, the tough get going."

Enablers of positivity punctuate his mission summary — upgrade, drive, improvement, better, programme, forward, character, next level, deliver, head-on, premium, quality, higher.

And the going, has indeed been tough: "This type of character is defined when you're up against it, and we have showed our character during this pandemic," he says.

Across-the-board product improvement during a time of crisis links the many different topics discussed on a Teams call from Dubai: "We are on a major drive to

FINE WAS ESTABLISHED AS A SMALL, LOCAL MANUFACTURER OF TISSUES IN 1958 BY ELIA NUQUL, WHO HAD FOUNDED NUQUL BROTHERS COMPANY SIX YEARS PRIOR. FHH IS NOW THE REGION'S LEADING PRODUCER AND DISTRIBUTOR OF HYGIENIC PAPER PRODUCTS SELLING STERILISED TISSUES, BABY AND ADULT DIAPERS, AS WELL AS WHOLE LINES OF FMCG PRODUCTS SUCH AS PPE, LONG-LASTING GERM PROTECTION SOLUTIONS AND 'NAI ARABIA' — A 100% NATURAL ICED TEA — TO 80 COUNTRIES GLOBALLY.

continuously upgrade all of our products, to upgrade on tight timings, where everything gets improved so we can improve the lives of consumers and have better products in our hands."

Improvements will go across both the AfH and At-Home sectors: "Hotels care about

improving products for their guests just as much as a mother and father want to improve the products in their homes. Our product improvement programme is going across the entire range of products in our company, and we forecast a big year next year for both sectors."



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"WHILE OTHERS HAVE SCALED BACK OR HALTED INVESTMENTS, FHH IS PREPARED AND DETERMINED TO CONTINUE MOVING FORWARD AND FACE THIS OBSTACLE HEAD-ON, WHILE KEEPING IN MIND THE FUTURE OF THE WORLD AFTER THE CORONAVIRUS CRISIS HAS BEEN RESOLVED. WE DON'T NECESSARILY VIEW ADDING CAPACITY AS A BADGE OF HONOUR."

FHH CHIEF EXECUTIVE JAMES MICHAEL LAFFERTY



FINE was established as a small, local manufacturer of tissues in 1958 by Elia Nuqul, who had founded Nuqul Brothers Company six years prior. FHH is now the region's leading producer and distributor of hygienic paper products selling sterilised tissues, baby and adult diapers, as well as whole lines of FMCG products such as PPE, long-lasting germ protection solutions and 'Nai Arabia' - a 100% natural iced tea - to 80 countries globally.

It has manufacturing operations across Jordan, the UAE, Saudi Arabia, and Egypt, with its tissue division manufacturing 210,000tpy across five tissue mills.

Egyptian-based Al-Sindian produces 18,000tpy on PM1, a Voith-supplied twin wire Crescent Former, while PM2 produces 54,000tpy on a Valmet-supplied Crescent Former machine; Jordan's Al-Keena Hygienic plant produces 30,000tpy on a Valmet-supplied Crescent Former and the Al-Snobar Hygienic mill produces 54,000tpy on a Valmet-supplied Crescent Former; at integrated UAE-based Al Nakheel - which TWM visited in 2018 - 54,000tpy are produced on a Valmet-supplied TM. There are also converting facilities across Jordan, KSA, Egypt, and the UAE.

American-born Lafferty began his varied career with Procter & Gamble

(P&G) in 1985, and has since worked in other multi-nationals including Coca-Cola and BAT before joining FHH's board of directors in 2015.

One of his first tasks was to oversee the start-up of the company's Abu Dhabi production facility, and the Al Nakheel plant has just started up the final part of its \$136m project - a \$8.2m Gambini-supplied converting line.

The line incorporates AIR MILL technology and takes the company's products "to the next level," according to Lafferty. "It means we can further differentiate our products from competitors and deliver premium, value-packed products across the GCC markets. It will upgrade production in our toilet and kitchen towel categories, enabling us to provide consumers in the region with higher quality products and also offer different embossing patterns on the toilet paper and paper towels products."

Lafferty says the business is also continuously adding more discrete modifications to increase speeds and production across its plants: "While others have scaled back or halted investments, FHH is prepared and determined to continue moving forward and face this obstacle head-on, while keeping in mind the future of the world after the Coronavirus

crisis has been resolved. We don't necessarily view adding capacity as a badge of honour. What I view as a badge of honour is a group of great engineers that increase line speed and squeeze more capacity out of the current assets. Every time you buy a machine, you have to depreciate it, it costs money to the consumer. So we are constantly looking to reduce these costs."

Across the five plants, FHH mainly produces its own-branded products for the AfH and At-Home sectors which it then sells across 80 countries, as well as some private label products: "While AfH is a significant business for us, our main focus will continue to be the At-Home market," he adds.

There had been some stockpiling across the region during the past 20 months, but Lafferty says the dynamics of the region are varied country by country: "While some countries have seen business stay quite steady, others had a mass exodus of expatriates during the pandemic, where people had to go home because they lost their jobs and exited the country. So there was a population decline and a consumption decline - some countries had populations drop by high single digits, and that impacted the tissue business as our business closely correlates to population. Every person is consumption, so when they



UAE-based Al Nakheel: the integrated plant produces 54,000tpy on a Valmet-supplied TM.

leave, you lose consumption."

The main growth areas have been across the Gulf Cooperation Council (GCC) and also Egypt, both of which he says have grown well. "Levant has had more problems and has been quite hard hit by Covid. Clearly also from external factors like Lebanon with the economic situation and the explosion in the harbour, a lot of factors have impacted demand there. They've had a tough time, our heart goes out to them. Countries such as Lebanon have been severely impacted by economic factors and that really impacts purchasing power and consumption of tissue and towel products. Some of our consumption is correlated to population and some is discretionary, kitchen towels for example are a discretionary category, you can choose to not use it."

FHH will continue to spend a lot of time and energy across its sites to modify and enhance its "current massive production" facilities: "We are always looking at ways to speed things up and get more output, to squeeze every last pack of product out before we add more capacity and new capital investment. I try to respect my consumer's pocketbook – I owe them maximum efficiency before I sink more money and more depreciation costs into the price of my product."

Is expansion on the horizon? "When we get to export to 209 countries, we'll be happy. The main issue is that paper has a limitation due to its shipping distance. So the competitive context – if we're trying to export into a high duty restrictive market that's quite a distance away, especially with the current shipping costs, then we're not going to be very competitive. We need to continue to push but also be realistic to our local production. It's a limited proposition."

Business in Europe and North America is "quite steady", as is business in Africa:

"We're in North Africa and also seeing more growth potential in sub-Saharan Africa. Egypt is part of the trade agreements, so shipping from there to Ethiopia is straight forward." Is China's Belt & Road initiative creating opportunities? "We'll see. We're still looking at the pros and cons and options for that."

After a year of pulp price volatility he adds that in these "tougher times" the business has a moral obligation to keep its value very sharp: "With the combination of pulp and all the port and global supply chain issues, we've had no choice that people have had to raise prices. Across the world, the most efficient companies have announced price increases, and we're no different. But what we have done is shared it, so we have taken a hit into our company to help the consumer swallow the inflation. We have sacrificed to soften the blow for the consumer."

Environmental efforts remain "a top priority": "We want to be the first paper company to get certain certifications in the Middle East. We are doing some of those little things that make us very different from anyone else ... it starts with that we will only buy certified pulp, most companies don't do that, they'll buy anything. We are 100% FSC-certified and have launched a number of environmental products such as the Duetto pack that have no core to reduce our waste imprint."

The Gambini converting line "reduces pulp by up to 25% and replaces it with air". And the business has also made great strides in terms of water preservation: "Having the only paper mills in Jordan, one of the most arid countries in the world, we have taken water treatment and conservation seriously. We treat and reuse wastewater with an on-site treatment facilities that was completed in 2018. Now,

some 80% of wastewater from factory production is treated, with 35% being reused for production operations and the remainder donated to local agriculture. Our two Jordan factories are now also supplied with natural gas from Egypt, reducing reliance on fossil fuels and decreasing CO2 emissions.

"For efforts such as these we have been lauded by the United Nations – we're a signatory of the United Nations Global Compact – and the US government for our work in Jordan conserving water. Our products are made with raw, 100% virgin tree pulp and we have also reached our goal of zero landfill waste across all of our operations."

Following the outbreak of the pandemic, Lafferty adds the business didn't start production of paper masks: "We have never produced one paper mask," he says. "You can make a paper mask on a diaper line, and I saw all these companies launch paper masks which have filtration, a nonwoven filter, which basically biodegrades in about 1,000 years. It's basically solid waste. We are a paper company, so what did we do? We launched only re-usable masks. I was crystal clear – not on my shift will we bring a disposable mask. We saved millions of lives with those masks, and every fabric mask we sold replaced 210 disposable masks. Those are the steps we have taken, and I am very proud of that."

He re-emphasises his commitment to sustainability: "We are going to go for that recognition and certification and it's all the little things that add up quite quickly. We have proven ourselves during the past 20 months. We didn't cut people's salaries, we didn't cut people or take advantage of the situation. We launched reusable masks in a paper business when I had production lines that could make them. This is what principles are all about."

What's next in 2022? "Lots of innovation. We expect to see a big increase in demand for AfH and At-Home products, and we are ready for that. I think we will be selling a lot more in both sectors. So we are going to do lots of things that nobody has ever done – we are going to upgrade every product, every product category, every SKU. I've never seen a company try and do what we are doing."



LAUNCH OF FIRST STATE-OF-THE-ART TM AIMS TO REDIRECT SAUDI ARABIA'S TRADITION AS THE LARGEST IMPORTER IN THE MIDDLE EAST

Aided by population growth and high income per capita, Saudi Arabia's tissue consumption is forecast to accelerate in the medium term with per capita consumption jumping to a potential 300,000tpy per person. Here, MEPCO Chief Executive Sami Safran spoke with TWM Senior Editor Helen Morris via Zoom from Jeddah.

On 7 December 2021, Saudi Arabia's Middle East Paper Company (MEPCO) officially entered the global tissue market after breaking ground on its brand new 132,000m², SAR338m (\$90.13m) tissue plant in King Abdullah Economic City (KAEC).

The City – a megaproject announced in 2005 by King Abdullah bin Abdulaziz Al Saud, the former king of Saudi Arabia – is located along the coast of the Red Sea, and around 100km north of Jeddah, the country's commercial hub and the location of MEPCO's headquarters.

KAEC's Industrial Valley is already a symbol of economic development, supporting the ambitious Saudi Vision 2030, a framework announced seven years ago to diversify the country's economy, develop public and business sectors, and encourage tourism. It is an emerging destination for local and international factories, and logistics services based on the Red Sea.

In 2023, it will also be the home of a 60,000tpy Toscotec-supplied AHEAD 2.2L tissue machine, and MEPCO's future tissue expansion plans.

Over a Zoom call from his office in Jeddah, Chief Executive Sami Safran describes his strategy for the project. MEPCO currently has a design capacity close to half a million metric tonnes for the containerboard and specialty paper markets, offering a range of products serving the packaging, construction, furniture, and paper core industries around the world. Its location and proximity to Jeddah's seaport enables it to serve its 50+ customers in four continents within a very short lead time – currently 50 markets worldwide including the local Saudi market as well as the Gulf Cooperation Council (GCC), Middle East and Africa. It's this strategy, Safran says, that will soon be applied to the company's tissue business; while tissue will be more focused on supplying the local market, it does not

KAEC'S INDUSTRIAL VALLEY IS ALREADY A SYMBOL OF ECONOMIC DEVELOPMENT, SUPPORTING THE AMBITIOUS SAUDI VISION 2030, A FRAMEWORK ANNOUNCED SEVEN YEARS AGO TO DIVERSIFY THE COUNTRY'S ECONOMY, DEVELOP PUBLIC AND BUSINESS SECTORS, AND ENCOURAGE TOURISM. IT IS AN EMERGING DESTINATION FOR LOCAL AND INTERNATIONAL FACTORIES, AND LOGISTICS SERVICES BASED ON THE RED SEA.

exclude export.

The Toscotec-supplied TM4 was announced on 7 December 2020 and it is the result of a noteworthy gap between supply and demand of tissue products in Saudi. Safran says the Saudi tissue market has traditionally been one of the "less active" markets, and then in the early 90's, local tissue manufacturers grew to reach a capacity and leverage of 410,000tpy. The demand for products from Saudi Arabian people continued to be supported by a natural growth in population and also in per capita consumption, as well as the social transformation taking place recently, as well as the influx of pilgrims, which will be resumed in full force in 2022 after being cancelled/trimmed due to Covid.

"During the past three decades, Saudi Arabia did not grow in terms of general capacities because there were limited local and GCC players," he adds. "Our internal numbers suggest that in the 1990s, per capita consumption was around 4kg per person, and now in 2021 we're talking about more than 7kg per person across all tissue consumption patterns."

While being focused on its core business, containerboard manufacturing, the company had tissue manufacturing in its view and noticed a sizable imbalance between local supply and

local production: "Saudi is the largest importer of tissue in the whole of the Middle East – it is now importing more than 150,000tpy of tissue from abroad. We are determined to change that situation,

so we decided to go for tissue and launch the first state-of-the-art tissue machine in the country from Toscotec. This move into tissue was a lucrative opportunity to fill a significant import gap in the local market, which enjoys population growth and high GDP per capita, but limited local supply; it also included benefits of localising the industry and tissue-making know-how. We think big, and have an ambitious vision to realise. And we have also chosen a location so it's possible to expand further into tissue."

The tissue plant will initially occupy 30% of the 132,000m² plot and will be powered by natural gas. Its production of jumbo rolls will cover a wide range of basis weights, with Toscotec supplying the new line on a turnkey basis and the scope of supply including two OPTIMA 2600L slitter rewinders designed to ensure superior bulk and softness preservation – key characteristics for the local consumers.

As the Saudi population grows organically, tissue consumption is forecasted to witness healthy growth in the medium-term: "Covid-19 had a significant positive impact on tissue demand worldwide, especially during lockdowns, despite the AfH sector witnessing less demand," he adds. "In Saudi Arabia, the absence of guests for Hajj and Umrah, the Islamic pilgrimages to Mecca, definitely took a toll on consumption volumes. But the government recently announced resuming Hajj and Umrah at full capacity in 2022 in addition to the announced tourism programmes, so we do believe we'll see a rebound. Demand for tissue products at large is definitely trending upwards and will constitute solid grounds for investment, especially that virgin pulp prices have lower cyclicity."

Export practices are part of the company's current strategy – it has previously sold its containerboard product all the way up to the UK – and the same will be applied to the tissue division once up and running. However, there is a huge gap between supply and demand in

THE TISSUE PLANT WILL INITIALLY OCCUPY 30% OF THE 132,000M² PLOT AND WILL BE POWERED BY NATURAL GAS. ITS PRODUCTION OF JUMBO ROLLS WILL COVER A WIDE RANGE OF BASIS WEIGHTS, WITH TOSCOTEC SUPPLYING THE NEW LINE ON A TURNKEY BASIS AND THE SCOPE OF SUPPLY INCLUDING TWO OPTIMA 2600L SLITTER REWINDERS DESIGNED TO ENSURE SUPERIOR BULK AND SOFTNESS PRESERVATION – KEY CHARACTERISTICS FOR THE LOCAL CONSUMERS.

the country that Safran initially wants to address before it looks to export. "In the past two decades I've seen a major change in Saudi in per capita consumption, and I have also seen a change in consumer behaviour where tissue is becoming a dominating habit for the consumers here.

"The pandemic has also created a significant shift in behaviour, which has put more focus on the importance of hygienic paper products in general."

He adds that tissue prices in Saudi Arabia compared to Europe are lower. And with improved consumer income locally, that drives the appetite to consume more and more tissue: "We are looking at some per capita consumption that is way higher than the 7kg we announced.... maybe even up to 9kg."

The pandemic has improved hygiene awareness in Saudi, but that it is still evolving: "Due to differences in cultural habits, we are different from Western cultures. Yet we are seeing that the awareness and concern of the people towards usage of sanitisers and tissues has increased."

Environment is also a key growth strategy. Bassem ElShawy, the company's Head of Strategy and Business Development, explains that sustainability remains one of the key pillars of building any project for the entire group, not just for tissue: "We chose KAEC primarily because it has the natural gas connection there, and that's mainly for our carbon footprint significantly. We are using the latest technology in tissue manufacturing also from Toscotec to manage the lowest level of carbon emissions and air and water pollution.

"There is a lot that MEPCO is doing with its current operations to manage water, air and soil pollution in every possible way. This will be copied into the tissue expansion project and will even be expanded into a much higher level. We will continue taking serious steps forward

THE PANDEMIC HAS IMPROVED HYGIENE AWARENESS IN SAUDI, BUT THAT IT IS STILL EVOLVING: "DUE TO DIFFERENCES IN CULTURAL HABITS, WE ARE DIFFERENT FROM WESTERN CULTURES. YET WE ARE SEEING THAT THE AWARENESS AND CONCERN OF THE PEOPLE TOWARDS USAGE OF SANITISERS AND TISSUES HAS INCREASED."

to look at how to bring down the carbon footprint of MEPCO as a group in the next 10 years."

As for the company's desert location, ElShawy adds that the business has "done the impossible" when it comes to water management for its existing containerboard facilities: "For containerboard production, we need a tremendous amount of water, every day. Being in the desert with absolutely no rivers or the like that we see in Europe for containerboard or paper mills, we are using recycled water.

"Our containerboard mill is located next to the water treatment facility of the city of Jeddah, where we source recycled water from. The tissue plant will use desalinated water sourced from KAEC's on-site desalination facility. Here, the tissue plant will source water from KEAC's Reverse Osmosis (RO) plant, and the discharge will be routed back for further chemical treatment."

Safran says the business has targeted the lowest possible levels of water consumption for the tissue plant, adding that it should be less than 8km per tonne:

"We are going to build water treatment facilities to utilise the discharged water for partial recycling and agricultural use. Water was one of the major concern areas for building a paper industries in Saudi Arabia, so you'll find these milestone achievements for different areas and we have received awards for our efforts there. And I am confident we can demonstrate an example of proper water management

project to retain valuable resources."

Saudi Arabia's 2030 Vision is also working on highlight environmental awareness across communities, business, and the country. One month ago, Safran adds, the government is now targeting carbon neutrality by 2060: "It is looking to minimise carbon footprints in business, and it is supporting companies that are moving towards this. 90% of MEPCO's fibre consumption is recycled paper at approximately 500,000 tonnes. There is no way these initiatives could be possible without cascading it down to community awareness. We try to be ahead of these initiatives. There is a lot of increasing awareness and concern across the population of Saudi Arabia for these topics."

With the main raw material for containerboard being recovered paper, MEPCO collects it from a wholly owned subsidiary, owned by the business. "So we control roughly 50% of all waste paper generated in Saudi, and also collect waste paper from Sudan and Jordan," he adds.

Safran says the business has high ambitions to be one of the tissue market leaders: "We have a great track record for being the market leader in the containerboard market, and we aim to do the same in the tissue industry.

"The business environment in Saudi Arabia nowadays is becoming very appealing for growth, agility and success. We are very blessed that the future, when you take the right steps, the right measures, is indeed bright."

"WE ARE GOING TO BUILD WATER TREATMENT FACILITIES TO UTILISE THE DISCHARGED WATER FOR PARTIAL RECYCLING AND AGRICULTURAL USE. WATER WAS ONE OF THE MAJOR CONCERN AREAS FOR BUILDING A PAPER INDUSTRIES IN SAUDI ARABIA, SO YOU'LL FIND THESE MILESTONE ACHIEVEMENTS FOR DIFFERENT AREAS AND WE HAVE RECEIVED AWARDS FOR OUR EFFORTS THERE. AND I AM CONFIDENT WE CAN DEMONSTRATE AN EXAMPLE OF PROPER WATER MANAGEMENT PROJECT TO RETAIN VALUABLE RESOURCES."

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WHAT WITH THE RETIRED GREYHOUND, THE ONGOING HOUSE RENOVATION AND MY DUST ALLERGY. . . BOY DO WE USE A LOT OF TISSUE

Hazel Gage is a Manchester, UK-based Senior Designer at Contrast Creative.

Thinking about what tissue and towel products we actually use in our house, and - it's a lot of different types!

Kitchen towels and toilet rolls are an obvious shopping trolley essentials and my fella is also partial to wet wipe type products such as antibacterial wipes and bathroom wipes. We, like everyone else in the UK, got a dog recently and unfortunately he has a tendency to tell us how much he's missed us at night by leaving us a puddle. No, not a puddle, a lake. He's a retired greyhound and boy does he let us know! We have XL puppy pads placed strategically around the room he sleeps in for those random nights he decides he needs to go, but even with these we still get through a lot of kitchen roll.

I have individual packs of soft tissues (those fancy Kleenex also vera ones) in pretty much every room and every bag as I have a dust allergy which seems to randomly rear its head. We're renovating a 1930s semi-detached house, so also have rolls of the blue paper dotted around the place for cleaning up. I also have a pack of lint free tissues which I use for my gel nails, and sometimes for toner instead of cotton wool pads if they're nearby.

With toilet paper and kitchen towels I like to think I'm quite savvy and want the best quality for the best price. While it's a nice surprise when someone has a puppy embossed roll in their loo, I look for the number of sheets per roll and the price per roll rather than the brand. I've found that often the supermarket own brand with a high ply works out best for quality and budget. I once bought a well-known brand and was disappointed to see the actual cardboard roll was pretty big, meaning we were getting less and paying more.

I've been an online grocery shopper for several years now. It's so beneficial to be able to adjust the order up until the night before - so if I did forget to add toilet paper, or we are having people over, I can pop it in the basket. I am being dragged back to in-person shopping though as we've become a little too comfortable with getting everything we want and paying over our allocated grocery budget in the past few months.

One thing we have noticed after the outbreak of the pandemic is that we have



a lot more toilet roll on hand. If there's an offer on a nine pack I have occasionally been tempted. But generally, I just ensure we're never on our last roll as I would do in the "before" times.

We do generally bulk buy some items, mostly for our dog as we get through a lot of items quickly (we're on our second pack of 100x XL puppy pads!) If my fella had his way we would bulk buy everything, but we just don't have the room to store vast amounts of it all. I think having enough of something to last us an extra week is enough.

I'm keen to buy from a brand which is environmentally-friendly and not just because they're doing it for commercialism reasons. I've seen lots on social media about 'Who Gives a Crap' toilet paper but I'm not sold on it just yet, maybe because it's very Instagrammable and yet another subscription where I would have to sign up to. It's easier for me to just put a pack of four in my basket.

Generally there is a huge rise in buying from independent sources and being environmentally-minded within groups who work in marketing, design and advertising. There was a huge thing about greenwashing previously and I'd like to think consumers aren't as naïve to believe that just because something has a fancy green logo on means it is good for the planet.

I think millennials and the below generations are more open to new brands doing things differently, rather than the status quo of mass commercialism due to how we grew up and how we saw our parents shopping. My fella and I buy most things online - I only go out shopping if I want to browse, maybe with a friend.

I think if an online system were to be designed which consolidated multiple subscription services into one delivery that would be a winner for people and planet in the interim.

AS FOSSIL FREE TECHNOLOGY IS NOT YET IN SIGHT... MULTIPLE GREEN OPTIONS MAY BE THE KEY

Sofidel's emissions reduction targets have recently been approved by the Science Based Targets initiative as consistent with levels required to meet the goals of the Paris Agreement. Here, TWM spoke with Riccardo Balducci, Sofidel's Energy & Environment Director, to discuss the company's ongoing green transition at its Italian and Swedish green energy projects amidst a backdrop of sharp energy price hikes.



Riccardo Balducci
Energy & Environment Director, Sofidel

In 2020, Sofidel committed to a 10-year timeline to reduce our greenhouse gas (GHG) emissions by 40% per tonne of paper with a reduction in scope 1, scope 2, and scope 3 CO₂ emissions in relation to its suppliers' pulp production activities when compared to the base year 2018. We have also committed to reducing scope 3 GHG emissions by 24% per tonne of paper by 2030 from a 2018 base year.

The project has been approved by the Science Based Targets initiative (SBTi) as consistent with reductions required to keep global warming to well-below 2°C. The commitment to achieving the 2030 SBTi targets will be achieved primarily by an

increased use of energy from renewable sources and from newly-built plants, the construction of which from a financial point of view is made possible by the signing of long-term supply agreements.

Such agreements have already been signed in Italy with RWE Renewables for the supply of wind energy, and in Sweden at our Kisa production site where we have partnered with Meva Energy for the construction of a renewable gas production plant.

The agreements are a responsible and effective opportunity for Sofidel to procure renewable energy for the group's activities and at the same time generate additional capacity aimed at supporting the green transition.

We have undertaken these green transition projects during a backdrop of sharp hikes in energy costs. The first nine months of 2021 were characterised by sharp increases in energy prices as well as for raw materials and transportation. Between December 2020 and September we have seen the price of natural gas almost quadruplicated, whilst electricity costs have almost triplicated. Moreover, the price of the European Union Allowance – the currency of the EU Emission Trading System for carbon – has reached the maximum ever, with quotations close to €70.

With regards to our future strategy, as we have already done in Italy and Sweden we plan to further implement our decarbonisation initiatives by recurring different renewable sources on the basis of the contexts of the various countries where we operate. We will continue to look at our other locations across Europe.

As for the USA, taking into consideration the relatively low price of methane, this source will be more difficult to be substituted. Instead, for electric energy Sofidel is looking for a long-term agreement of renewable power.

Looking further into the distance, currently it is hard to point out a paper tissue technology that is able to free our sector from the dependence on fossil fuel once and for all. It is more likely to see the present technology enriched by solutions aimed at reducing energy consumption and/or introducing different sources of green fuels.

It isn't yet within our sight and it's not a 'silver bullet'. Instead, we are prepared to think of multiple options, and of a future where we'll see cogeneration technology fuelled by a mix of hydrogen and biomass.

Case study: Sofidel and RWE Renewables, Italy

RWE's Renewable completed the construction of its 13.6 megawatt onshore wind farm Alcamo II in Sicily in April 2021. The green electricity produced by this wind farm was contracted to the Sofidel Group on a long-term basis as part of a Power Purchase Agreement (PPA), and will run until the end of 2030. Sofidel is the sole corporate off-taker contracting 26 gigawatt hours per year of the green energy to use at its plant/s.

The wind farm consists of four Goldwind turbines (GW 136-3.4MW) with a total installed capacity of 13.6 megawatts (MW). The PPA with Sofidel enabled Alcamo II

WE HAVE UNDERTAKEN THESE GREEN TRANSITION PROJECTS DURING A BACKDROP OF SHARP HIKES IN ENERGY COSTS. THE FIRST NINE MONTHS OF 2021 WERE CHARACTERISED BY SHARP INCREASES IN ENERGY PRICES AS WELL AS FOR RAW MATERIALS AND TRANSPORTATION. BETWEEN DECEMBER 2020 AND SEPTEMBER WE HAVE SEEN THE PRICE OF NATURAL GAS ALMOST QUADRUPPLICATED, WHILST ELECTRICITY COSTS HAVE ALMOST TRIPPLICATED.



Renewable energy: Sofidel's Kisa plant in Sweden will replace fossil fuels within two years following the partnership with Meva Energy

by providing financial stability through contracting 26 gigawatt hours per year as the sole corporate off-taker. As part of the deal, Sofidel purchases all the guarantees of origin the wind park produces.

The agreement with RWE represents a major step toward Sofidel's carbon footprint reduction goals. This is also in line with what the latest climate science says is needed to prevent the worst impacts of climate change. In our commitment to a low carbon economy we regard PPAs as a useful and effective tool to source renewable power for our industrial operations and, at the same time, trigger the creation of additional generation capacity, aimed at sustaining the green energy transition.

CASE STUDY: Sofidel and Meva Energy, Sweden

In September 2021, Sofidel announced it had partnered with Meva Energy to supply renewable gas to its Kisa production site. The 10-year agreement will see Meva Energy complete the construction of a bio-syngas (a mix of molecules which will be produced from woody biomass from the local supply chain) generation plant at the facility.

THE AGREEMENT WITH RWE REPRESENTS A MAJOR STEP TOWARD SOFIDEL'S CARBON FOOTPRINT REDUCTION GOALS. THIS IS ALSO IN LINE WITH WHAT THE LATEST CLIMATE SCIENCE SAYS IS NEEDED TO PREVENT THE WORST IMPACTS OF CLIMATE CHANGE. IN OUR COMMITMENT TO A LOW CARBON ECONOMY WE REGARD PPAS AS A USEFUL AND EFFECTIVE TOOL TO SOURCE RENEWABLE POWER FOR OUR INDUSTRIAL OPERATIONS AND, AT THE SAME TIME, TRIGGER THE CREATION OF ADDITIONAL GENERATION CAPACITY, AIMED AT SUSTAINING THE GREEN ENERGY TRANSITION.

The plant will then supply renewable energy that Sofidel will use directly at its Swedish site, replacing fossil fuel sources within two years. As well as benefiting from additional green energy, once fully up and running the agreement will enable the group to reduce CO₂ emissions by a further 8,500tpy compared to the current carbon footprint generated by the consumption of Liquefied petroleum gas (LPG). Meva Energy will run the plant, which will have a generation capacity of at least 4.2 MW.

The plant will deploy innovative technology developed by Meva Energy – a world leader in gasification technology

for the production of renewable energy – in collaboration with Sofidel's Technical Office, the Andritz Group and the Department of Energy of Pisa University (UniPi).

Sofidel's strategy envisages the greater involvement of its partners in achieving the sustainability goals set for the benefit of communities. This process had already begun with the partnership with RWE Renewables, where Sofidel is the sole buyer of energy produced at the Alcamo II plant in Sicily. This is an onshore park with a capacity of 13.6 MW.



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EUROPEAN SUSTAINABILITY PIONEER ADVANCES ITS TARGETS ACROSS ENTIRE VALUE CHAIN

Stefan Gräter, Head of Sustainability at WEPA Group, discusses the key aspects of the company's recently published sustainability report. A TWM report.



Stefan Gräter
Head of Sustainability, WEPA Group

Sustainability has always been one of the core values of the WEPA Group as a family business. We are noticing that the topic of sustainability is also becoming increasingly important among our customers and consumers. And we are certain – sustainability will become the new normal. WEPA has been a pioneer in the field of sustainability since the 1980s – today we are among the three largest European manufacturers and the market leader in the production of hygiene papers from recycled fibres.

Our vision is to be the most sustainable and agile first-class partner for personal and professional hygiene solutions. Long-term economic success, the preservation of natural resources and social commitment are closely linked and form the basis of our actions.

We have set ourselves ambitious goals to fulfil this vision and will report in a highly transparent way about our progress.

Our goals in the areas of future fibres, operational efficiency, sustainable hygiene paper portfolio and portfolio extension through innovation are clear and measurable. Here we summarise the key strategies.

1/ Future Fibres

The WEPA Group has been using recycled fibres for more than 30 years as the most sustainable raw material for

manufacturing hygiene papers. Today the WEPA fibre mix consists already of 40% recycled fibres. The other 60% consist of FSC and PEFC certified virgin fibres.

In the future, we will increase the share of recycled fibres and innovative alternative fibres to be 60% of our fibre mix by 2030. This will help to reduce the environmental footprint of our used fibre raw materials by 25%.

2/ Operational efficiency

The WEPA Group pursues an ambition – to become climate-neutral by 2040.

Furthermore, we aim towards a zero-waste production and a sustainable water footprint. CO₂, circular economy and water are the three factors that significantly define our operational efficiency.

CO₂ reduction

Our strategy includes a consistent reduction of emissions through, for example, continuous improvements in efficiency and the use of renewable energy. To achieve this we have launched a group-wide energy management programme.

We are guided in reducing our CO₂ footprint by the targets of the Science Based Targets initiative (SBTi). In April 2021, the WEPA Group committed to the SBTi in order to contribute to limiting global warming to a maximum of 1.5

WE HAVE SET OURSELVES AMBITIOUS GOALS TO FULFIL OUR VISION AND WILL REPORT IN A HIGHLY TRANSPARENT WAY ABOUT OUR PROGRESS. OUR GOALS IN THE AREAS OF FUTURE FIBRES, OPERATIONAL EFFICIENCY, SUSTAINABLE HYGIENE PAPER PORTFOLIO AND PORTFOLIO EXTENSION THROUGH INNOVATION ARE CLEAR AND MEASURABLE.

degrees Celsius. Targets are calculated on a scientific basis to ensure that global warming will be limited. WEPA's submitted target is currently in the evaluation phase at SBTi. The implementation of measures will take place in two areas: in internal company processes and in the selection of and cooperation with suppliers and service providers.

In order to reduce emissions we work in all areas of the value chain, according to which our greenhouse gas emissions are subdivided into categories (Scopes) as defined by the SBTi. Scope 1 consists of all emissions from our own production plant (e.g. production processes) including purchased steam, whereas Scope 2 includes emissions from the use of purchased electricity.

Scope 3 comprises indirect emissions along the value chain. WEPA is setting ambitious targets for emission reductions within these Scopes along the entire value chain. Furthermore, we plan to increase the energy efficiency of all processes in Scopes 1 & 2 by 10% per ton of goods sold.

Sustainable water management

We work systematically to conserve water as a resource and, since 2016, have reduced our relative water consumption by approximately 40%. One lever for this is the closing of water cycles in our factories.

With the WWF Water Stewardship programme, we are taking things one step further. To protect the environment and society, it is essential to comprehend the risks of water use and manage it accordingly. Together with our long-standing partner WWF Germany, we have launched a new project to assess water risks at our 13 production sites.

At the centre of this project is an analysis that identifies risks to the environment, people and businesses in connection with water use in order to reduce them. The measurable target for this is in development together with the WWF.

Waste

Already today WEPA's production waste recycling rate is at 74%. Our aim is to reach 100% material or energy recovery of production waste by 2025 and the maximisation of material recycling and minimisation of energy recycling.

TODAY 100% OF WEPA PACKAGING IS RECYCLABLE AND CAN BE REUSED. IN ADDITION, THE SHARE OF RECYCLED MATERIAL USED FOR PACKAGING IS TO BE INCREASED TO 60% BY 2025. THIS ENABLES WEPA TO SAVE 8,000 TONNES OF PRIMARY PLASTIC EACH YEAR.

3/ Sustainable hygiene paper portfolio

Already today 100% of WEPA packaging is recyclable and can be reused. In addition, the share of recycled material used for packaging is to be increased to 60% by 2025. This enables WEPA to save 8,000 tonnes of primary plastic each year.

Furthermore, a system for evaluating and managing the sustainability of our product portfolio is currently under development and will help to support our customers in reaching their own sustainability goals.

Evaluation of different materials such as polyethylene (PE), PE recyclate and paper

The decisive factor for the evaluation of individual material alternatives is calculating the environmental footprint. The result: polyethylene is superior to paper packaging and other materials. The reason for this is that types of paper currently available either do not provide sufficient protection for the product or have poorer recycling properties due to additional coatings. This is why we use single-grade polyethylene for a large part of our packaging and increasingly use recycled material for this purpose. All packaging materials used by us are fully recyclable. Naturally, this requires correct disposal.

WEPA has an in-house working group for innovative packaging alternatives to make our packaging even more eco-friendly. The team studies different packaging materials in detail and evaluates their potential. This effort has resulted in an agenda for the continuous further development of our sustainable packaging development:

- reduction of packaging thickness
- increased use of post-consumer recyclate (PCR)
- further development of protective, recyclable paper packaging

Example "mach m!t"

Some 60% recycled post-consumer polyethylene (PCR) and 15% chalk are used in the packaging of "mach m!t" toilet paper. As a consequence, the use of primary plastics has been reduced to 25%. Recyclability remains completely intact. We also removed the carrying handle, saving roughly 20% of material. The decision to use chalk also leads to a 12% reduction in carbon emissions.

In the spirit of "design for recycling", the number of printing inks was cut to four, and the colours are less intense. Ink consumption has been reduced by 50%. This leads to a better quality of recyclate obtained from the used packaging.

4/ Portfolio extension through innovation:

We will expand the WEPA product portfolio with new, sustainable hygiene solutions – among other measures through an in-house innovation unit as well as cooperation and partnerships with a special focus on sustainability along the value creation chain of the company. To ensure the sustainability of our hygiene solutions sustainability criteria are included in any portfolio extension assessment.

Case study: Swalmen, Netherlands

In 2020, our Swalmen location was named the nation's most energy-efficient mill in the industry by the Association of Dutch Paper Mills. The decisive factor here was a significant reduction in CO₂

emissions, for example thanks to a modern steam generator and optimised production processes. In addition, a photovoltaic system is used for electricity generation.

ROMANIA'S PEHART GROUP BETA TESTS PRODUCING GREEN HYDROGEN AS AN ALTERNATIVE ENERGY SOURCE

Study underway into installation of a photovoltaic park as first step towards sourcing fuel in a cogeneration plant mixed with natural gas. By Gabriel Stanciu, General Manager, Pehart Group



Gabriel Stanciu
General Manager, Pehart Group



Photovoltaic park: the Romanian company is conducting a pre-feasibility study for the installation of green hydrogen.

With almost 185-years of history, Pehart Group now annually produces 100,000 tonnes of tissue paper at its two factories in Petrești-Sebeș, Alba County, and in Dej, Cluj County, and we also have a finished products processing capacity of over 75,000tpy. Some 70% of the entire quantity of household and industrial products is sold in Romania and we ensure the production for a large part of our own branded products including Pufina, Alint and Altessa, for a large part of retail chain's private labels and we also produce jumbo roll tissue paper. Pehart Group is defined by continuous evolution and our latest focus is to reduce CO₂ emissions across the production of our tissue and towel products. Our aim now is to reduce our CO₂ emissions with 50% by 2025.

We are conducting a pre-feasibility study for the installation of a photovoltaic park – and the production of green hydrogen by electrolysis. This includes looking into creating the necessary facilities for the storage of produced green hydrogen as well as its use as fuel in a cogeneration plant mixed with natural gas.

With the goal of reducing the carbon footprint of the business, we are one of the first Romanian businesses that is taking such steps to produce green hydrogen in the

PEHART GROUP IS DEFINED BY CONTINUOUS EVOLUTION AND OUR LATEST FOCUS IS TO REDUCE CO₂ EMISSIONS ACROSS THE PRODUCTION OF OUR TISSUE AND TOWEL PRODUCTS. OUR AIM NOW IS TO REDUCE OUR CO₂ EMISSIONS WITH 50% BY 2025.

production of tissue products.

Initially, we are conducting a pre-feasibility study to analyse the implementation of hydrogen-based energy technologies. The scope of this study is to give the clear idea of the sustainability of the usage of green hydrogen for fulfilling our energy needs. It will show, based on the initial input of the energy produced by solar panels, the economic, environmental and social impact of developing a power-to-X-to-power system. It will confirm our initial estimations regarding the opportunity of the investment from the point of view of sustainability.

Pehart Group aims to –

- Install a photovoltaic park for the production of green energy;
- Install an electrolyser to use the energy produced by the photovoltaic park for the production of green hydrogen;
- Create storage for the produced hydrogen;

- Mix hydrogen with natural gas and use it in a cogeneration plant, which will also include carbon capture solutions.

The first draft of the study will be delivered by the middle of January 2022. The full completion of this energy production system is estimated for end of 2023, with an intermediary milestone – the completion of the solar panel power plant

We have already signed a contract with the researchers from ICSI Energy Râmnicu Vâlcea, which is specialised in the implementation and development within Romania of energy technologies based on hydrogen. We are convinced that hydrogen-based energy technologies represent the future and not just in this industry, but for everyone. And even if now the production of green hydrogen is not widely used in Romania, we believe that it can develop in the coming years. This is an important trend in Europe which we want to follow.

ANNUAL REVIEW 2021

As 2021 draws to a close, TWM asks leading figures across tissue's global supply chain for their retrospectives on 2021... and predictions for 2022



"We do think the pandemic has caused structural changes"

Mathieu Wener, Economist, Numera Analytics, USA

This year, we've been surprised by the extent of the de-stocking in mature markets. On a global basis, we expect demand to end 2021 up just 1%, which would make 2021 the weakest year going back to at least 1990. This suggests that most of the above-trend growth we saw last year (+4.5% globally) was due to inventories rather than increased consumption of higher basis weight At-Home tissue. Still, we do think the pandemic has caused structural changes.

Compared with our pre-pandemic projections, our latest global forecast shows an upward step change of roughly half a million metric tonnes in the long-run. This reflects increased usage of towelling in both At-Home and AfH markets due to hygiene concerns, and the new working arrangements.

In terms of challenges, we have seen tissue demand decline in all mature markets this year (North America, Europe, Japan, South Korea and Australia). In our view, this is mainly due to last year's pantry stocking, but it's also clear that supply-chain disruptions have accentuated the inventory adjustment. Global trade volumes of parent rolls and converted products combined are down 10% through nine months.

Pulp prices have also had an impact on producer profitability. Looking at financial statements from nine publicly traded tissue producers, we find that low pulp prices and strong At-Home volumes boosted overall industry margins by 2-3%, on average, last year. In Q2-2021, margins fell about 1% below the 2019 average due to the combined drag of higher fibre and energy prices, downstream destocking and supply-chain issues. In Q3, margins were back to the 2019 level, thanks to higher AfH volumes and cost increases being successfully passed on to buyers. With peak destocking likely behind us, continued

improvement in AfH sales should contribute to higher margins next year.

Technology will continue to play a large role in the 'new normal'

The increasing prevalence of remote and hybrid working arrangements will play a large role in the 'new normal' where AH tissue has gained market share at the expense of AfH. In the AfH market, the extent and direction of structural changes will vary considerably by end-use and by type of product. For instance, offices are the AfH end-use with the lowest likelihood of making a full recovery. If you look at mobility data, they show that traffic through workplaces is stable at roughly 15-20% below the pre-pandemic level. Hotels will also continue to demand less tissue as long as international travel restrictions remain in place. On the other hand, spending in restaurants has fully recovered, and hygiene concerns are a plus for the usage of towelling.

We expect demand growth to accelerate to 3.0% next year, mainly driven by a continued recovery in AfH volumes. Yet we believe AfH growth in 2022 will be very uneven. Geographically, immunisation rates by region will play an important role. The emergence of the Omicron variant at the end of 2021 is also adding uncertainty with regards to the recovery in the AfH sector.

Looking at it by segment, towelling should continue to benefit from hygiene concerns, for both surface cleaning purposes and as a substitute for hand dryers. Producers will likely face more challenges selling to AfH users who mainly buy toilet grades, for which demand will depend on developments on the epidemiological front.



We expect a consolidation of the costs issues by 2022 Q2 onwards

Klaus Blechinger, Vice President Tissue, Andritz, Austria

We have seen no real impact on Andritz as a business in general. In the previous years, we have established a global set-up which over the past 20 months has served us well, giving us high flexibility to source, manufacture and sell in different regions of the world. All our machine deliveries could be commissioned and started up successfully despite the pandemic, and partly even with remote support and optimisation. Here to stay will definitely be the trend to an increased hygiene behaviour, the accelerated trend to digitalisation and an enhanced demand to provide environmentally-friendly and sustainable solutions.

The main challenges for us as a tissue machine supplier have been the significant increases of prices for steel and other components. Additionally, the availability of items such as electronic components became increasingly limited, with impact on the time needed for procurement of certain parts and components. And finally, the increase of transportation costs, caused by higher fuel and energy prices as well as lack of container availability in certain areas of the world turned out to be a major impact on project costs and on-time delivery.

NBSK and BEK pulps have reached peaks

changed to certain degrees to online communication vs. regular traveling. And as a consequence of the recent developments, digitalisation has received a strong boost. Metris is the Andritz digital platform which unifies the two worlds of Operational Technology (OT) and IT. The classical OT such as the DCS System of a plant is now seamlessly integrated together with Applications and Tools for Production Optimisation, Artificial Intelligence and Cyber Security, with permanent access to Data Scientists and Andritz Domain Experts out of one platform. Plant optimisation, remote start-up, on-line monitoring and support, etc. are possible with this digitalisation tools and are becoming more common in our industry.

Further focus will be on sustainable tissue production in all kind of tissue technologies, dry-crepe, intermediate and premium. We have launched the "CircleToZero" initiative with the goal of achieving zero emissions and zero waste, as well as a target for our "CO2 footprint reductions" at tissue mills, comprising four corner pillars: Reduction of energy consumption, fibre savings and use of alternative fibres and nanocellulose, reduction of fresh water consumption, emissions, recover and recycle rejects in other industries and use of bio-chemicals. All of this will be supported by a higher degree of digitalisation.

As for trends going into 2022, we see trends for higher product qualities in regions such as China and Southeast Asia. However, the limitations given for energy consumption and emissions are getting more stringent, so intermediate technologies will be of interest for these markets. On the other hand, TAD will still have its strong presence in North America, and we are developing solutions to significantly reduce the energy consumption of TAD technology, while still maintaining the product quality.

In drying technology, the focus will remain to be on fossil-free resources, which we already have experience with and which we will further develop and optimise, e.g. use of biomass, syngas, electrical heating and others. Depending on the resource availability and local regulations at a certain location, the right energy concept is the key to strengthen the future of a tissue mill.

THE MAIN CHALLENGES FOR US AS A TISSUE MACHINE SUPPLIER HAVE BEEN THE SIGNIFICANT INCREASES OF PRICES FOR STEEL AND OTHER COMPONENTS. ADDITIONALLY, THE AVAILABILITY OF ITEMS SUCH AS ELECTRONIC COMPONENTS BECAME INCREASINGLY LIMITED, WITH IMPACT ON THE TIME NEEDED FOR PROCUREMENT OF CERTAIN PARTS AND COMPONENTS.

again during mid 2021 after really high price levels during the whole of 2018. NBSK even reached its all-time high since 2010.

All the latter has put tremendous pressure on tissue producers. However, we are currently seeing pulp prices drop towards the end of the year 2021 with an expected stabilisation on a lower level through 2022. For 2022 we expect a consolidation of all those issues and even an improvement vs. the actual situation. When this could take place nobody can really predict, but we expect it from Q2 onwards.

In any case, communication with our customer, partners and sub-supplier has

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Digital development has taken off in a manner and pace that was difficult to anticipate

Jenny Lahti Samuelsson, Vice President Tissue Global Technology, PAP Tissue Mills Business Unit, Valmet, Sweden

For Valmet, the largest impact of the past year has been the fact that our personnel haven't been able to travel as needed. In many cases, they have been quarantined for weeks before being admitted to enter the community and mills sites globally. As a direct result, the digital development has taken off in a manner and pace that was difficult to anticipate; we have rapidly managed to take full benefit of our digital tools and developed our way to operate in order to serve and support our customers remotely. A concrete example of this is that we have carried out machine check-out and start-up at customer sites with our experts supporting remotely. This change is persistent and will be a good complement to on site services in the future.

The pandemic has of course impacted tissue consumption. When the world shut down it was the AfH market that took the hit, naturally increasing the consumption on the consumer side. We also see a persistent increase in towel demand. This can be explained by new hygiene behaviours due to Covid-19. With the improving health awareness we have even seen, we also expect to see the continued replacement of hand dryer machines with tissue and towel products.

How the industry will continue to cope with cost increases – not only for pulp, but also for energy in all forms, specially electricity and natural gas in the EU – will be key for 2022. Also, on the logistics side, there are issues not only about raising costs, but also about the lead time for transports which has been extended. At the end of the day, this increases the risks in the supply chain for all parties. Valmet has been putting a lot of effort minimising the risks and has coped to ensure that deliveries are on time and within our own manufacturing as well at customer sites. The challenges have forced us to focus even more on developing our technologies and deliveries in order to optimise the use of raw material and energy, as well as the efficiency of our tissue machines and process.

The market of raw material, energy and logistics is volatile at the moment and very difficult to predict, and is mainly dependent on the evolution of the pandemic. Sustainability is, as we all know, in every company's interest and strategy. To become more energy efficient and in the end of the day, achieve a fossil free operation is essential both for us and for our customers. Valmet's climate neutrality programme



The AfH market has been in bad shape... but I think this industry will hugely rebound in 2022

Sumit Khanna, Chief Executive, Beeta Tissues, India

The past 20 months have had a negative impact on the domestic tissue market as sales have gone down – and export prices have gone up due to high increase in logistic costs! I think inflation is here to stay for the long-term, which will have a negative impact on India's tissue and towel markets. The AfH market has been in bad shape with restaurants and hotels and offices being shut down. However, I think this industry will rebound in 2022. Even now we are starting to see this; the last two months have seen restaurants approaching full capacity. Generally, I don't see private label increasing because of the pandemic. However, one big change I would like to share is the sudden surge in new supermarkets, chemists and mom-and-pop store sin India after the outbreak. We have also seen a continuous rise in pulp prices in 2021. We forecast that, hopefully, that may stabilise by the middle of 2022. The rise in fuel and logistical costs has led to this increase, and we as a tissue mill have had to absorb the prices for the first two months, and finally been forced to pass them on to the consumer. While we as a business

have no expansion plans for the year 2020 and 2021, environmental issues remain key for us and the market. We have released another range of products made from 100% recycled tissues and we are seeing increased popularity for these products in India. With the current business environment, the consumption of kitchen rolls and facial tissues has definitely increased. People are prioritising hygiene now, and I think that's a trend that will stay. I believe that the increase in tissue products consumption will continue to have a major impact on the global tissue paper industry. The main challenges I see for 2022 and beyond is that there are now many more companies diversifying into the tissue market or coming into the tissue market for the very first time. We are definitely seeing more tissue players, and that means a lot more competition for our products, raw materials and resources. The main opportunity remains that, with an increase in awareness for hygiene and sanitation, there will be more consumption from consumers for our products. I believe that trend is here to stay.



A huge opportunity for us will be our range of eco-friendly products ... hosting COP 26 in the UK has heightened consumer awareness

Oday Abbosh, Founder and Chief Executive of Better All Round and Chairman of Consuma Paper Products, UK

2021 has, without doubt, been a challenging year on many levels. Covid has continued to have a significant impact on most businesses, and it's also clear that Brexit ramifications are beginning to filter through. It is no secret that the labour market in general has been more challenging than any time in recent history, whether that's specifically for HGV drivers or more general labour supply. Similarly raw material availability has seen its own set of challenges, as pretty much anything related to fibre has had unprecedented demand, restricted availability and increasing prices. To top it all, energy prices have seen huge spikes this year as well, with no end in sight quite yet.

Against this backdrop, we have continued to drive our investment programme across all aspects of our business to ensure we are able to serve all our customers as expected. We have increased our capacity and capability significantly over the past year and are optimistic about the future even if we know the coming months will continue to be difficult. Importantly, the changes seen in the past couple of years around increased hygiene, increased ecommerce and new

part to new ways of working.

As an industry, we continue to make great strides in finding more sustainable solutions to how we manufacture and bring the products to market. At Consuma, we have switched to 100% renewable energy, and we're excited to be embracing a more circular approach to some of our products. For example, with our Ora Household Towels, the pulp bases are now made from our factory waste and generally we continue to reduce the amount of plastic packaging across the site having invested in machinery capable of wrapping all our rolled products in paper.

As with all companies, we have had to adapt to new ways of working with increased remote working and implementing new processes to protect all from Covid transmission has become critical. For example, we now have temperature monitors as you enter our building and factory; we have new diagnostic kit on a number of our machines; and as a smaller player, we have been able to be nimble and flexible, whilst meeting the needs of our customers with their changing requirements. Customer meetings on zoom and commissioning of new lines, with input and training from machine manufacturers across the globe have become the norm, meaning our workforce has had to be more flexible in their working hours and be willing to learn in very different ways.

I believe some of 2021's challenges will continue in to 2022 – labour shortages and the knock on effect of inflation impacting wages. But there are some exciting innovations in alternative, more sustainable and environmentally-friendly fibres that we should be keeping an eye on. A huge opportunity for us will be in relation to the breadth of eco-friendly products we manufacture and the range of new and emerging technologies and partnerships that will allow our business to grow across the paper spectrum. Hosting COP26 in the UK has heightened consumers' awareness more than ever, so we fully anticipate consumers and retailers to continue to demand products with a reduced carbon footprint. Innovations in machinery and production process will be key to this. And, not only will the switch in the raw materials deliver opportunities, but an ability to source locally will be increasingly important too.

WE HAVE CONTINUED TO DRIVE OUR INVESTMENT PROGRAMME ACROSS ALL ASPECTS OF OUR BUSINESS TO ENSURE WE ARE ABLE TO SERVE ALL OUR CUSTOMERS AS EXPECTED. WE HAVE INCREASED OUR CAPACITY AND CAPABILITY SIGNIFICANTLY OVER THE PAST YEAR AND ARE OPTIMISTIC ABOUT THE FUTURE EVEN IF WE KNOW THE COMING MONTHS WILL CONTINUE TO BE DIFFICULT.

ways of working are all here to stay and we continue to ensure we are well positioned to serve all our customers in future.

In addition to these broader market challenges, we have witnessed significant increases in the cost of pulp from the start of the year and the outlook remains uncertain given the energy crisis affecting all paper mills. Demand for fibre-based raw materials will keep rising given the transition underway for everyone to replace fossil fuel-based packaging with more sustainable alternatives. The continued rise in e-commerce is also creating further demand and all this at a time when supply of recycled raw material is in decline owing in



2022 could be good for our segment as we have presidential elections when money is normally injected into the economy

Pedro Vilas Boas, Director, Anguti Estatística, Brazil

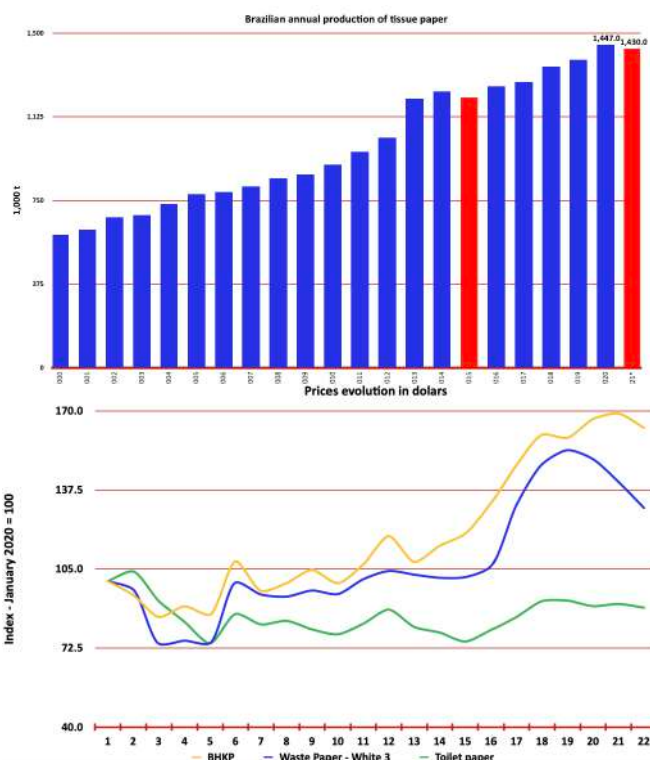
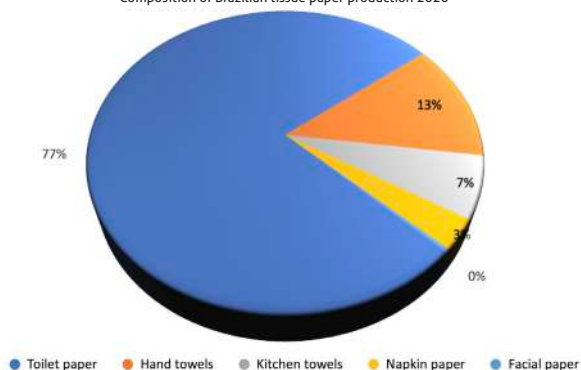
2021 has been a difficult year for the Brazilian tissue paper industry, mainly due to the strong evolution in production costs, which harmed the profitability of companies, and this was further aggravated by the low demand seen in the year. It has led us to estimate a drop of 2% in production this year compared to 2020, which is unusual in Brazil. Since 2000, only in 2015 have we recorded another unfavourable result. Across the tissue market, some negative results were expected with a drop in the performance of the AfH segment following the closing of shopping centres, offices and restaurants for the lockdown, and this brought down the consumption of the third most important product in the sector, the hand towel. However, the strong increase in toilet paper consumption which was observed in 2020 at the beginning of the pandemic offset the losses in the institutional segment, which did not repeat this year even with an even stronger second wave of the disease.

Undoubtedly, the biggest problem has been the mismatch between the increase in raw material costs and the prices of paper, that, with weak demand, has not been getting readjustments by supermarkets, which are the largest distributors of toilet paper in Brazil. If we consider prices converted into dollars, while eucalyptus pulp was readjusted by 63% and white waste paper

by 30%, multi-ply toilet paper recorded an 11% reduction in its average price on supermarket shelves, that is even more serious if we consider that our currency has appreciated by 31% in the period. The consequence was the shutdown of machines and, worse, of smaller factories. However, if we don't have more problems with the pandemic and if we can go back to operating without any big surprises, then 2022 could be good for the segment. This is mainly likely because we will have presidential elections when money is normally injected into the economy, and this is already happening with the new emergency aid programme that was readjusted recently and could mean an increase in consumption by the neediest Brazilians. Another fact that is impacting the market and that will change the sector in the coming years is that we are seeing a concentration of companies, especially with Softys announcing the purchase of Carta Fabril shortly after acquiring Sepac. With this acquisition, the Chilean company is approaching a 30% share of the Brazilian market. In addition, if we consider the recent purchase of Santher by the Japanese association Daio/Marubeni and, already traditional in our market, the American Kimberly-Clark, foreign capital companies are close to holding a 50% share of the Brazilian tissue market.

ACROSS THE TISSUE MARKET, SOME NEGATIVE RESULTS WERE EXPECTED WITH A DROP IN THE PERFORMANCE OF THE AFH SEGMENT FOLLOWING THE CLOSING OF SHOPPING CENTRES, OFFICES AND RESTAURANTS, AND THIS BROUGHT DOWN THE CONSUMPTION OF THE HAND TOWEL SECTOR.

Composition of Brazilian tissue paper production 2020



LACK OF CONTROL ON SIZE AND WEIGHT MEANS SOME COMPANIES ARE GIVING AWAY TISSUE PAPER FOR FREE

Companies struggle to control base weight even within a single batch. In order to meet minimum weight targets, most compensate by increasing the average weight of their tissue rolls, therefore “giving away” a percentage of their product. Eduardo de Almeida, partner, Cognit NRG, and Fernando Correa, Head of Process Industries, Spain, AFRY, explains what to do about it.

EI



Eduardo de Almeida
Partner, Cognit NRG

The tissue paper market has seen continuous growth since the early 1900's. Growth has been driven by various market drivers. Nonetheless, the latest global turmoil caused by Covid-19 has also had a lasting effect on the tissue industry, changing consumer behaviour.

In addition to the market and demand fluctuations, more recently other topics are increasingly putting pressure on tissue producers, such as high pulp prices or rising energy cost, or both, which are impacting profitability in the sector.

Now is a very relevant moment to pay attention to all opportunities that could help tissue producers to optimise the production processes to improve profitability.

more relevant, and that is precisely what many companies advertise. Whatever the production strategy chosen by a tissue producer, one thing is clear and common for all: the weight of the end product must be as homogeneous as possible. The base weight affects most of other paper characteristics, and good weight control has benefits in better quality, process stability as well as cost reduction.

Tackling that issue, our team set out to evaluate tissue producers in Iberia. How homogeneous is the basis weight of the products we can find in our supermarkets?

For the analysis, we simply had to purchase commercially available tissue, weigh it, and measure the total surface. The chosen product for comparison was compact 2-ply toilet rolls in every case. To ensure a sufficient sample for statistical significance, at least 36 tissue rolls from different manufacturing lots were analysed for each brand from different producers.

Our study aimed to quantify the variability that comes from differences in the base weight on a single ply of paper. To answer this question, our team had to unroll each tissue roll and count the number of pieces, to find out the total surface in each roll. Base weights ranged from 14,9 g/m² to 19,6 g/m², so to compare variability we had to divide the weight of each roll by the average base weight of its given brand.

EI



Fernando Correa
Head of Process Industries, Spain, AFRY

Weight control improves the quality of the end product

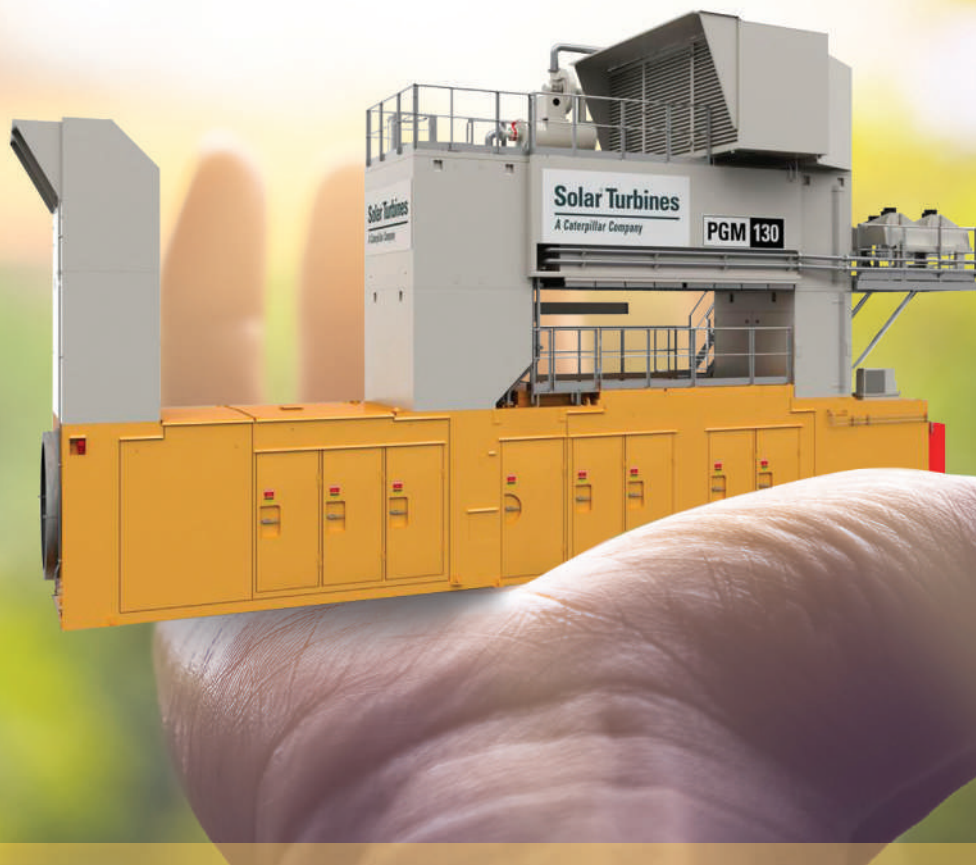
Weight control in the tissue industry has always been controversial. While some brands clearly indicate minimum weights on their packaging, many simply avoid the subject altogether.

Unlike other sectors, such as food or cosmetics, legislation does not generally require tissue manufacturers to provide minimum weight information on the packaging.

Some would argue that total surface is

OUR STUDY AIMED TO QUANTIFY THE VARIABILITY THAT COMES FROM DIFFERENCES IN THE BASE WEIGHT ON A SINGLE PLY OF PAPER. TO ANSWER THIS QUESTION, OUR TEAM HAD TO UNROLL EACH TISSUE ROLL AND COUNT THE NUMBER OF PIECES, TO FIND OUT THE TOTAL SURFACE IN EACH ROLL. BASE WEIGHTS RANGED FROM 14,9 G/M² TO 19,6 G/M², SO TO COMPARE VARIABILITY WE HAD TO DIVIDE THE WEIGHT OF EACH ROLL BY THE AVERAGE BASE WEIGHT OF ITS GIVEN BRAND.

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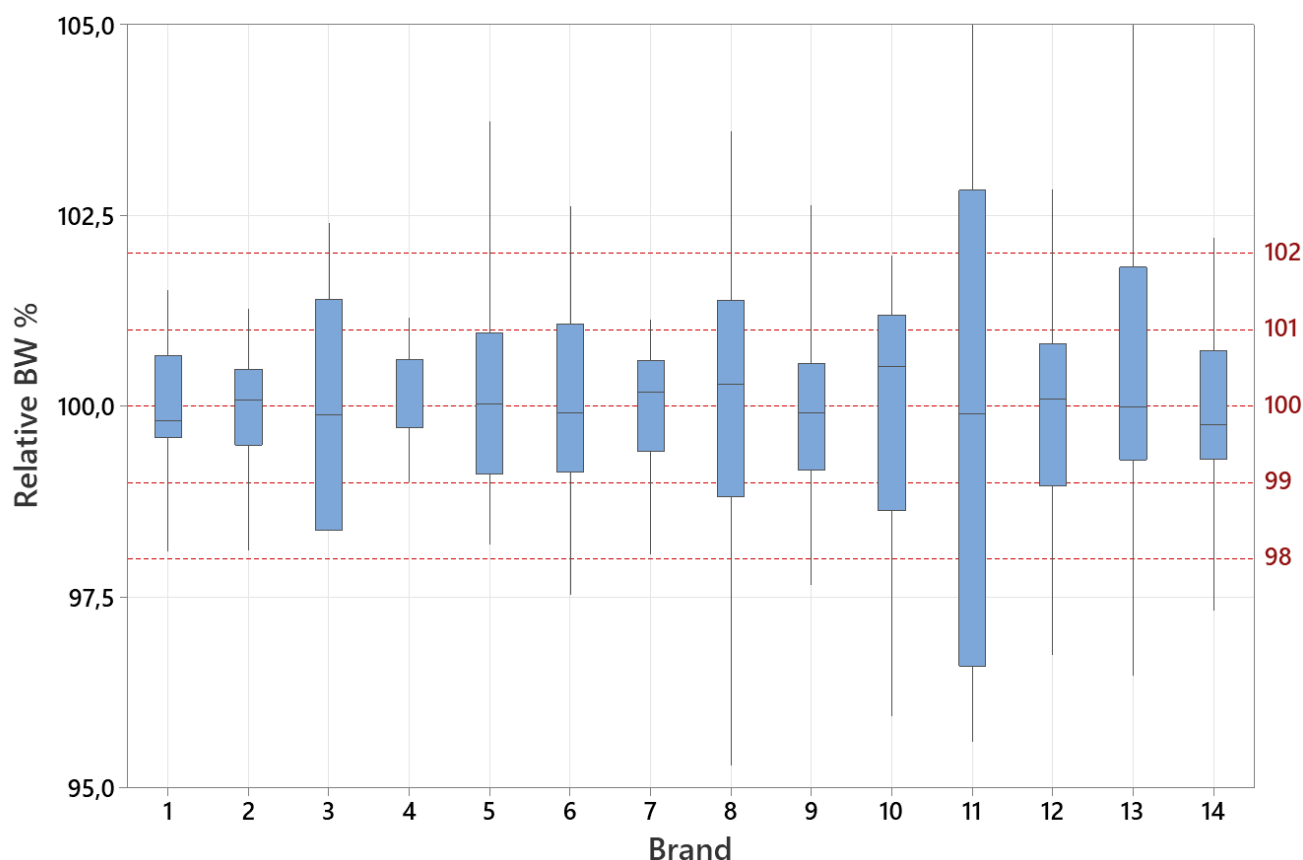
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With few exceptions, most producers had the same length for all their rolls, meaning that most of the variability of the roll's total weight came from base weight and not overall roll length.

Each roll weight was divided by the average of its producer, to be comparable. Therefore, a roll that is 101% on the following chart is 1% above the weight of the other rolls of that given brand.

How to minimise variability and reach a stable quality?

With the above presented results in mind, one can say: to minimise variability in the final product, a company must have minimal variability in paper base weight. It is an obvious statement, and most companies know this. However, as shown, many companies struggle to control base weight even within a single batch.

In order to meet minimum weight targets, most companies compensate by increasing the average weight of their rolls, therefore "giving away" paper for free. Within this study, there was a case of a company supplying an average weight of 3% above specs (rolls were on average 3% above target).

Financially, for example, reducing variability on a paper machine that makes

70,000tpy by 1% could save a company approximately €450,000.

Where does this variability come from and how can a company minimise it?

Variability comes from many sources. Some are intrinsic to the process, such as cross-directional variability. It can be minimised by careful head-box adjustment optimisation, but there will always be a certain amount of noise left.

However, there are many other sources, such as longitudinal oscillation, measurement methods, instrument calibration, machine control, converting processes, etc. Each source of noise should be evaluated, quantified, and acted upon accordingly.

Because weight variability in the end-product has multiple sources, Process Engineering should evaluate it at factory

level. Every tissue maker should monitor weight variability of its end products as a Key Performance Indicator and resources should be allocated to control processes to achieve maximum stability.

In order to reduce grammage variability with minimal cost and time, AFRY, in cooperation with Cognit Paper, have applied digital tools in different projects to quantify the different sources of variability in the process, taking measures and quickly reducing variability.

This can be from cross-directional or machine-direction variability, lab procedures, scanner calibration, operator procedures, converting handling, through to any other sources of variation.

WITH THE ABOVE PRESENTED RESULTS IN MIND, ONE CAN SAY: TO MINIMISE VARIABILITY IN THE FINAL PRODUCT, A COMPANY MUST HAVE MINIMAL VARIABILITY IN PAPER BASE WEIGHT. IT IS AN OBVIOUS STATEMENT, AND MOST COMPANIES KNOW THIS. HOWEVER, AS SHOWN, MANY COMPANIES STRUGGLE TO CONTROL BASE WEIGHT EVEN WITHIN A SINGLE BATCH.

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