BIR GLOBAL FACTS & FIGURES RECOVERED PAPER

PAPER AND BOARD RECYCLING IN 2019

Overview of world statistics

Bureau of International Recycling
Paper Division

This report was prepared by the Bureau of International Recycling with data input from RISI, CEPI, EuRIC and the BIR Paper Division.

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INTRODUCTION

The second edition of our annual analysis of key recovered fibre data covers the year 2019 and therefore describes a particularly interesting and important moment in time, namely the position of our industry right up to the point when the world was struck by COVID-19. This latest set of figures, drawn from an array of authoritative sources and analysed by our industry's own experts, provides us with a "normal year" benchmark to compare against the statistics that will emerge next year for a pandemic-hit 2020. In due time, therefore, it will be possible for us to draw conclusions about COVID's true impact on our markets and businesses.

Of course, 2019 was an important (and often difficult) year in its own right. The data contained in this report reflect the growing impact on international recovered fibre trading of the Chinese government's decision to tighten import controls in its bid to prevent "solid waste" from entering the country. Until recently the dominant customer for those regions of the world with a recovered fibre surplus, 2019 marked the point at which China was overtaken by India as the leading buyer of European fibre exports. This is a development that none of us would have anticipated only a handful of years ago.

But on the upside, the 2019 data also underline the emergence of new and significant outlets for recovered fibre, notably Vietnam, as well as the continued strong market presence of other, more established buyers in Asia such as India and Indonesia.

As with the previous report covering data for 2018, this latest document provides an insightful analysis of developments in 2019 and the emerging trends around which we can base our present-day business decisions. As mentioned above, BIR has applied its unmatched pool of expertise to the available statistics to arrive at conclusions that will help inform our members and the wider industry in their business activities. At the same time, it offers clear and well-researched messages that we can convey to legislators and policy-makers when discussing our industry's enormous environmental and economic contribution.

In particular, our experts have made reasoned calculations to quantify the fundamental role of recycled fibre as an environmentally beneficial component of global paper and board production. Indeed, they have discovered that 2019 brought an increase in the proportion of the world's paper and board that was made from recovered fibre – from 50.27% in 2018 to 51.15% the following year.

In once again commending this analysis to you all, I would like to extend my sincerest thanks to BIR, RISI, EuRIC and CEPI for their great assistance in creating this invaluable information resource for the benefit of BIR members and all other interested parties.

Jean-Luc Petithuguenin
President, BIR Paper Division
Founder/CEO of Paprec, France

EXECUTIVE SUMMARY

- Global production of recovered fibre fell from just over 250 million tonnes in 2018 to approaching **244 million tonnes in 2019**.
- Asia accounted for **43.5%** of world recovered paper production, Europe almost 27% and the USA/Canada 20%.
- Asia remained the main outlet for Europe's recovered fibre surplus but there was an overall fall in shipments in 2019.
- China remained the world's leading recovered fibre importer in 2019 but the total fell to around **11 million tonnes**, with half provided by the USA.
- For the first time, Europe shipped more recovered fibre to India than to China in 2019.
- Vietnam continued its emergence as a strong importer of recovered fibre in 2019.
- Global pulp production exceeded **183 million tonnes** in 2019.
- Global paper and board production fell more than 7 million tonnes to **412.5 million tonnes** in 2019.
- Asia produced approaching **47%** of the world's paper and board in 2019, with packaging accounting for some **63%** of the continent's output.
- China remained the world's leading paper and board producer in 2019 despite a year-on-year fall of more than 1%.

BIR's Paper Division has calculated the following for 2019:

- Once again, more than half of all paper and board produced globally had a recycled content.
- Asia produced almost half of all the paper and board using recovered fibres.
- Asia incorporated more than **70%** of recycled content into its paper and board production owing to its leading role as a cardboard producer.
- Europe achieved an incorporation rate average of almost **55%**.

ANALYSIS

In 2018, small recovered paper production increases in Europe, North America, Latin America, Africa and the Middle East served to ensure that the global total climbed 0.3% to 250.19 million tonnes; this was despite a 0.4% fall in paper and board production worldwide to 419.72 million tonnes. In 2019, however, production both of recovered paper and of paper and board slid around 7 million tonnes. But based on input from various sources and the BIR Paper Division's own calculations, global paper and board production using recovered fibres held steady at just below 211 million tonnes.

RECOVERED FIBRE: PRODUCTION

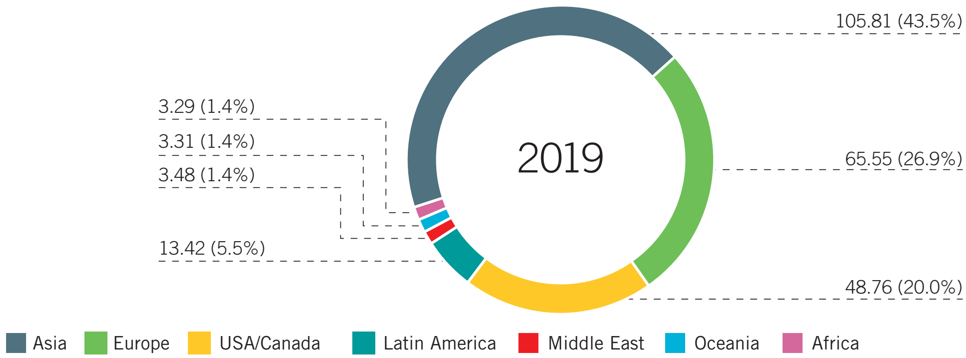
Globally, recovered paper production dropped from 250.19 million tonnes in 2018 to 243.62 million tonnes the following year. All regions of the world contributed to this overall 2.6% decline, with the USA/Canada (-5.8% to 48.76 million tonnes), the Middle East (-9.9% to 3.48 million tonnes) and Africa (-6.8% to 3.29 million tonnes) suffering the largest proportional decreases. More resilience was shown in the totals for Europe (-2.4% to 65.55 million tonnes), Latin America (-1.5% to 13.42 million tonnes) and Oceania (-0.3% to 3.31 million tonnes).

As for the world's largest recovered fibre producer, Asia followed up a decline of 0.7% in 2018 with a further 1% fall in 2019 to 105.81 million tonnes. However, Asia still upped recovered fibre production as a percentage of the global total from 42.6% in 2018 to 43.5% in 2019. Also worthy of note is the fact that Asia's imports of recovered fibre tumbled more than 15% in 2019 to 28.84 million tonnes, having stood at 37.38 million tonnes as recently as 2017. The scale of this decline owes much to China's implementation of stricter controls on imports, more of which below.

As regards Europe's leading five producer countries, totals declined for 2019 across the board. Germany produced more than twice as much as any other European country, although the figure of 14.75 million tonnes represented a year-on-year drop of more than 2%. The UK came next on 7.35 million tonnes (-2.5% compared to 2018), followed by France on 6.75 million tonnes (-2.7%), Italy on 6.56 million tonnes (-1.4%) and Spain on 4.42 million tonnes (-0.7%).

Recovered paper utilisation for the same countries was as follows: Germany (-0.3% year on year to 17.15 million tonnes), the UK (-0.6% to 3.11 million tonnes), France (-3.3% to 5.22 million tonnes) and Italy (-1.6% to 5.06 million tonnes). In contrast, Spain recorded an increase of more than 5% to 5.15 million tonnes.

RECOVERED FIBRE PRODUCTION BY REGION (MILLION TONNES) AND AS PERCENTAGE OF GLOBAL TOTAL



Source: BIR, RISI, EuRIC and CEPI

RECOVERED FIBRE: TRADE

International trade has long been essential to the maximization of recovered paper usage worldwide because fibre is not necessarily recovered where it is most needed. In other words, structural surpluses in one part of the world can be used to feed production processes in developing countries where recovery/production rates are currently insufficient to meet often rapidly increasing local and regional demand.

Having amounted to around 56 million tonnes in 2018, this international trade declined to 49.3 million tonnes in 2019, not least because of the stricter import controls imposed by the Chinese government. This figure includes intra-continental trade: for example, around 12 million tonnes of recovered fibre was moved between different member states of the EU, as compared to 12.3 million tonnes in 2018 and 12.5 million tonnes in 2017.

MAJOR FLOWS OF RECOVERED FIBRE (MILLION TONNES)

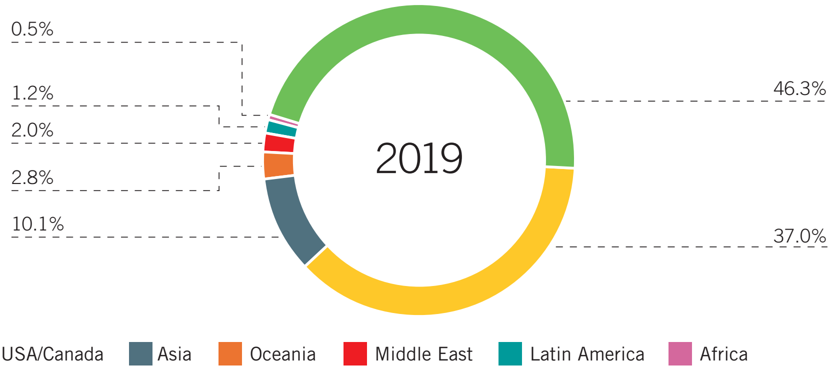
Source: BIR, RISI, EuRIC and CEPI

Europe’s strong paper recovery rate of around 70% creates a substantial structural surplus: with its collections totalling 65.55 million tonnes and its utilization 58.47 million tonnes in 2019, this led to a surplus for the year of 7.08 million tonnes. In 2018, the surplus had been an even more pronounced 7.86 million tonnes because of a far stronger collection tally of 67.16 million tonnes.

Europe’s largest exporters of recovered paper in 2019 were the UK on 4.33 million tonnes, the Netherlands on 2.58 million tonnes, Germany on 2.50 million tonnes, France on 2.43 million tonnes, Italy on 1.82 million tonnes and Poland on 1 million tonnes. These figures incorporate export shipments to destinations both within and beyond Europe.

While Asia remained the principal destination for EU exporters, shipments tumbled from 9.3 million tonnes in 2018 to 7.4 million tonnes the following year, almost exclusively as a result of the incremental reduction in China’s overseas buying activity as the deadline neared for its ban on solid waste imports. Having imported 7.5 million tonnes of Europe’s recovered fibre in 2017 and 4.8 million tonnes in 2018, volumes entering China from Europe were slashed to 2.2 million tonnes in 2019 – equating to a year-on-year drop of more than 54%.

RECOVERED FIBRE EXPORTS BY REGION AS PERCENTAGE OF GLOBAL TOTAL



Source: BIR, RISI, EuRIC and CEPI

MAJOR EU EXPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2018	2019	% change
Asia	9.3	7.4	-20.40
India	2.0	2.3	+15.00
China	4.8	2.2	-54.17
Indonesia	1.2	1.3	+8.33
Vietnam	0.7	0.8	+14.28
Thailand	0.5	0.7	+40.00
South Korea	0.1	0	
Latin America	0.03	0.01	-66.67
Africa	0.2	0.02	-90.00
Exports outside Europe	9.53	7.43	-22.04
Intra-European trade	12.3	12	-2.44

Source: BIR, RISI, EuRIC and CEPI

On the plus side, there was strong growth in European shipments to other Asian destinations, including the increasingly established markets of India (+15% to 2.3 million tonnes) and Indonesia (+8.3% to 1.3 million tonnes). This means that India overtook China as the main Asian outlet for Europe's surplus fibre – a development that would have seemed unthinkable only a handful of years ago.

Further encouragement is offered by the emergence of newer markets. In 2019, for example, Vietnam imported 0.8 million tonnes of recovered fibre from Europe (compared to less than 0.1 million tonnes as recently as 2016). Also in 2019, a further 1.1 million tonnes of fibre was shipped to Vietnam from the USA.

Similarly, there was significant growth in EU exports to Thailand in 2019 (+40% to 0.7 million tonnes).

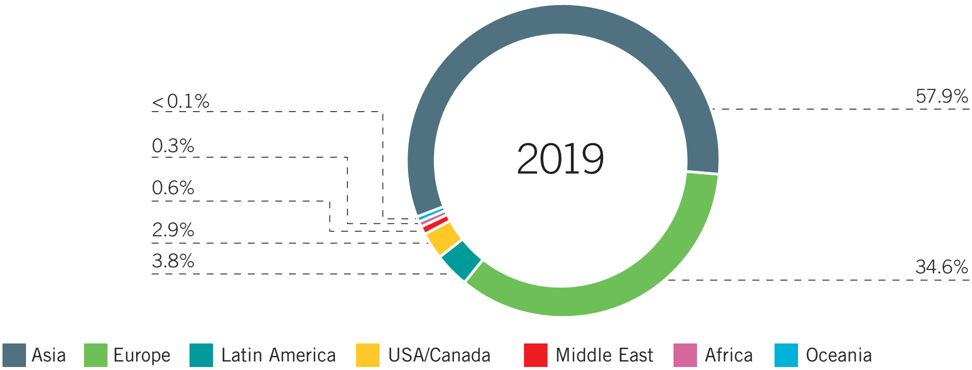
Turkey is another country to record rapid growth in recovered fibre imports, more than doubling its purchases from the EU in 2019 to 1.1 million tonnes. Turkey's overall demand in that year was around 3.4 million tonnes and is expected to reach 5.3 million tonnes in 2021 and then 6.2 million tonnes in 2022.

MAJOR US EXPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2018	2019	% change
China	6.4	5.4	-15.63
India	3.3	3.0	-9.09
Indonesia	1.2	0.9	-25.00
Mexico	1.7	1.3	-23.53
Canada	0.9	0.9	0.00
Japan	1.1	0	–
South Korea	0	1.0	–
Vietnam	0	1.1	–
EU	0.6	0.5	-16.67

Source: BIR, RISI, EuRIC and CEPI

RECOVERED FIBRE IMPORTS BY REGION AS PERCENTAGE OF GLOBAL TOTAL



Source: BIR, RISI, EuRIC and CEPI

The export channel is also key for the USA/Canada where the recovered fibre surplus in 2019 amounted to 17.09 million tonnes – effectively 10 million tonnes more than the excess built up within Europe. However, there was a fall in US recovered fibre exports to all of its major, established destinations in 2019: shipments to China fell 15.63% to 5.4 million tonnes, while India (-9.09% year on year to 3 million tonnes), Indonesia (-25% to 0.9 million tonnes) and Mexico (-23.53% to 1.3 million tonnes) also trimmed their orders from the USA. As mentioned above, Vietnam provided some welcome relief in buying 1.1 million tonnes from the USA in 2019.

Asia continued to be the main recipient of other continents' surplus tonnages in 2019 as the world's largest continent looked to offset a recovered fibre deficit of 28.18 million tonnes (by comparison, Latin America is the region with the second-largest deficit on 0.95 million tonnes).

Nevertheless, Chinese imports from all other countries dwindled to around 11 million tonnes in 2019. As recently as the middle of the previous decade, China had been importing annually more than 30 million tonnes of recovered fibre; even in 2017, its import tally was approximately 25 million tonnes. In addition to the aforementioned reductions in imports from Europe and the USA in 2019, China cut its purchases from Japan (-42.86% to 1.6 million tonnes), Australia (-33.3% to 0.4 million tonnes), Canada (-28.57% to 0.5 million tonnes) and South Korea (-50% to 0.2 million tonnes).

MAJOR CHINESE IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2018	2019	% change
Europe	4.8	2.2	-48.84
Canada	0.7	0.5	-28.57
USA	6.4	5.4	-15.63
South Korea	0.4	0.2	-50.00
Japan	2.8	1.6	-42.86
Australia	0.6	0.4	-33.33
Hong Kong	0.8	0.6	-25.00
Total	**16.5**	**10.9**	**-34.00**

Source: BIR, RISI, EuRIC and CEPI

MAJOR INDIAN IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2018	2019	% change
Europe	2	2.3	+15.00
United States	3.3	3	-9.09

Source: BIR, RISI, EuRIC and CEPI

MAJOR INDONESIAN IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2018	2019	% change
Europe	1.2	1.3	+8.33
United States	1.2	0.9	-25.00

Source: BIR, RISI, EuRIC and CEPI

MAJOR VIETNAMESE IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2018	2019	% change
Europe	0.7	0.8	+14.28
United States	–	1.1	–

Source: BIR, RISI, EuRIC and CEPI

As previously emphasized, the drastic reduction in China’s overseas purchasing has had huge implications for the surplus-generating regions of the world.

Also in 2019, Latin American imports of recovered fibre fell almost 5% to 1.91 million tonnes – similar to the level reported in 2017 – while the Middle East’s overseas purchases soared more than 47% to 0.27 million tonnes.

MAJOR EU IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2018	2019	% change
USA/Canada	0.6	0.5	-16.67
Latin America	0.02	0.01	-50.00
Africa	0.02	0.02	0.00

Source: BIR, RISI, EuRIC and CEPI

PULP

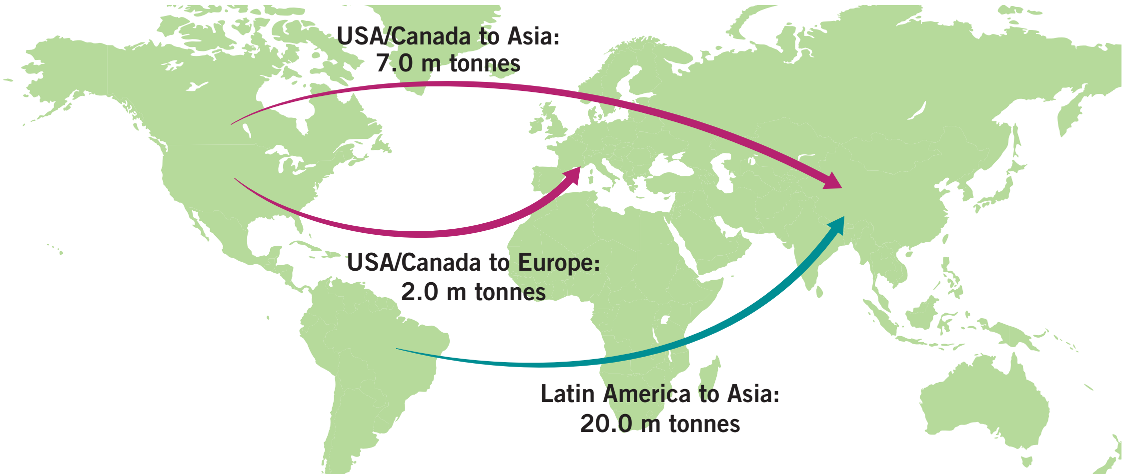
Long-haul international trade remained a key component of the pulp market in 2019. The most active exporter was Latin America which shipped to Asia around 20 million tonnes of its production of 29.21 million tonnes. A further 9 million tonnes of pulp was shipped from USA/Canada to Asia (around 7 million tonnes) and to Europe (approximately 2 million tonnes).

Having fallen just short of 184 million tonnes in 2017, global pulp production climbed to 187.2 million tonnes in 2018 but then slid back to a shade over 183 million tonnes in 2019. The USA/Canada saw pulp production slide from 63.45 million tonnes in 2018 to 60.85 million tonnes the following year while Latin America saw its output dip below 30 million tonnes – from 30.47 million tonnes in 2018 to 29.21 million tonnes the following year. Europe's pulp production edged only slightly lower from 47.04 million tonnes in 2018 to 46.91 million tonnes the following year, whereas Asia recorded a marginal increase from 41.56 million tonnes to 41.64 million tonnes.

Apparent consumption of pulp jumped from 183.4 million tonnes in 2017 to 186.6 million tonnes the following year, but 2019 brought a reduction to just above 183 million tonnes. Europe and North America accounted for, respectively, 48.8 million tonnes (50.61 million tonnes in 2018) and 51.03 million tonnes (53.84 million tonnes in 2018). Largest pulp consumer Asia followed up an increase of more than 2 million tonnes in 2018 with a further hike of more than 2.2 million tonnes in 2019 to 68.83 million tonnes.

In terms of individual countries, China was the largest net importer of pulp on 23.24 million tonnes whereas its apparent consumption of 41.55 million tonnes was a little behind the USA's 44.24 million tonnes.

MAJOR FLOWS OF PULP (MILLION TONNES)



Source: BIR, RISI, EuRIC and CEPI

PAPER AND BOARD: PRODUCTION

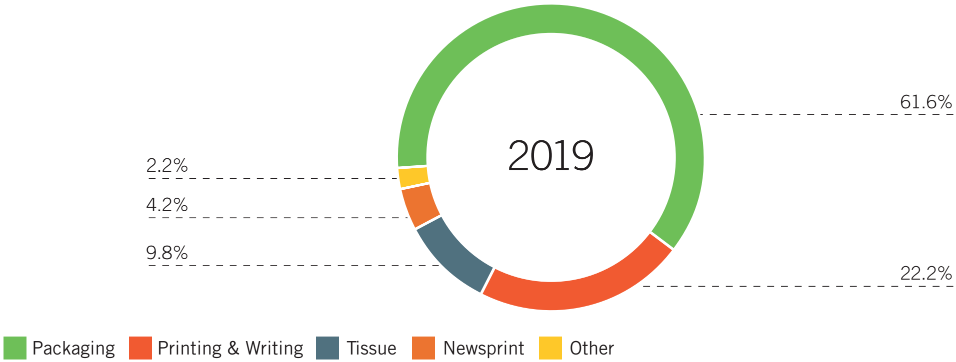
The 0.4% drop in global paper and board production in 2018 was followed by a significantly steeper fall of 1.7% in 2019 to 412.46 million tonnes.

Tissue was the only segment of the global paper- and board-making industry to enjoy an increase in production, with every region of the world contributing to year-on-year growth of 4.3% to 40.5 million tonnes. The increased tissue production was a particularly pronounced 8% in Asia to 15.21 million tonnes.

Of the other paper- and board-making segments, newsprint followed the trend of the recent past in suffering the sharpest drop in production during the course of 2019. Almost 2 million tonnes was wiped off global production as the total slid more than 10% lower year on year to 17.3 million tonnes; Asia and Latin America recorded the steepest falls of, respectively, 14% to 5.91 million tonnes and 22% to 294,000 tonnes.

Printing & writing fared little better: production worldwide was approaching 5% lower than in 2018 at 91.55 million tonnes, largely as a result of declines of 8.4% in Europe to 26.15 million tonnes and of 14% in USA/Canada to 13 million tonnes. Meanwhile, largest producer Asia witnessed only a negligible dip in its printing & writing output to 47.4 million tonnes.

PRODUCTION OF PAPER AND BOARD BY SEGMENT AS PERCENTAGE OF GLOBAL TOTAL



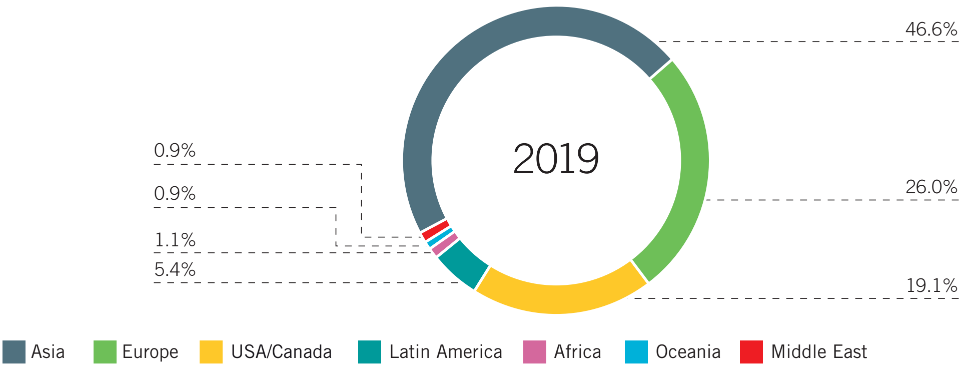
Source: BIR, RISI, EuRIC and CEPI

As regards the most sizeable segment of the paper- and board-making industry, the remorseless progress in global packaging production stalled in 2019. Global output dipped almost 1% to 253.94 million tonnes, with a similar percentage decline recorded by major producer Asia with its total of 120.77 million tonnes. While USA/Canada (-2.8% to 51.31 million tonnes) and Latin America (-0.5% to 13.93 million tonnes) also registered packaging production losses in 2019, Europe bucked this generally downward trend in posting growth of 0.6% to 59.68 million tonnes.

Looking at the production of all types of paper and board by region, Asia's total fell by almost 3 million tonnes in 2018 and registered a further decline of 0.6% the following year to 192.02 million tonnes. Decreases were also recorded in the other major producing regions of the world, with Europe totalling 107.1 million tonnes (-2.3% year on year), USA/Canada 78.68 million tonnes (-4.3%) and Latin America 22.25 million tonnes (-1%). For 2019, the greatest growth in paper and board production was reported in the Middle East, with an upsurge of almost 5% year on year to 3.85 million tonnes. An increase of 1.6% to 3.89 million tonnes was achieved in Oceania whereas African production edged 0.6% lower to 4.67 million tonnes.

The world's top six paper and board producers in 2019 accounted for more than 60% of the global total, with China continuing to lead the way despite a drop to 108.67 million tonnes from 109.96 million tonnes in the previous year. Production in the USA fell almost 3 million tonnes in 2019 to 69.13 million tonnes, the Japanese total slipped from 26.07 million tonnes to 25.39 million tonnes, and German output was trimmed from 22.68 million tonnes to 22.07 million tonnes. Whereas India's paper and board production had soared almost 13% during the course of 2018, the increase in 2019 was a more restrained 1.6% to 15.45 million tonnes. Growth in Indonesia, meanwhile, was a more robust 3.9% in 2019 to 12.97 million tonnes.

PRODUCTION OF PAPER AND BOARD BY REGION AS PERCENTAGE OF GLOBAL TOTAL



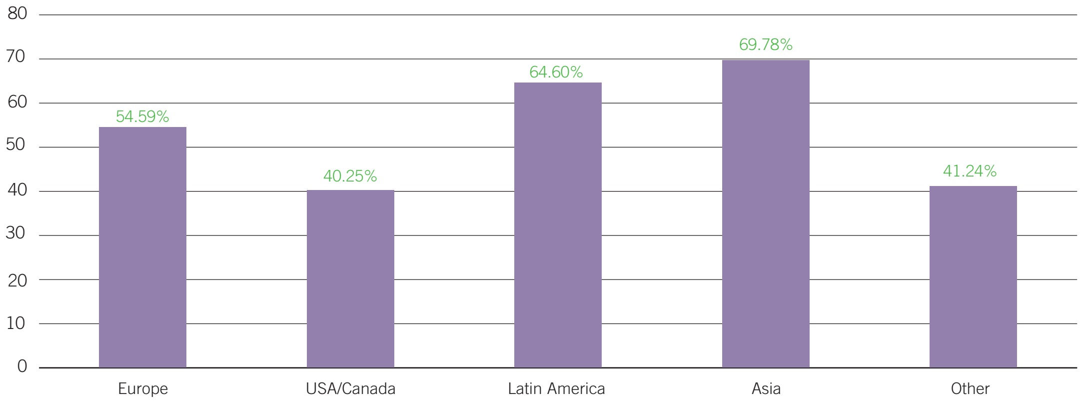
Source: BIR, RISI, EuRIC and CEPI

BIR CALCULATIONS

Combining available data with its own recycling knowledge and insight, the BIR Paper Division has calculated that:

- Of the 412 million tonnes-plus of paper and board produced globally in 2019, almost 211 million tonnes – or 51.15% – were produced using recovered fibres and 201.5 million tonnes were made exclusively from virgin fibres.
- Asia produced almost half of all the paper and board using recovered fibres, while Europe and USA/Canada accounted for, respectively, 25% and 20%.
- Europe uses more recycled fibres than USA/Canada, while Asia leads the way through its packaging performance. Asia incorporated almost 70% of recycled content in its paper and board production in 2019 owing to its leading role as a cardboard producer.
- Europe achieved an incorporation rate average of almost 55% in 2019 although the numbers differed widely from country to country. The Netherlands led the way on 89%, with Romania, Spain and the UK also above 80%. Germany and France recorded rates of, respectively, 78% and 71%. In contrast, Finland and Sweden only incorporated, respectively, 6% and 11%.
- The incorporation rates for USA/Canada and Latin America in 2019 were, respectively, just over 40% and approaching 65%.
- Of the almost 211 million tonnes of paper and board produced using recovered fibres in 2019, some 86% were packaging materials, whereas newsprint accounted for around 5%, printing/writing 4% and tissue also 4%.
- More than 71% of all packaging and over 65% of newsprint use recycled fibres. For tissue and printing/writing, respective recycled fibre use is 18% and just over 9%.

RECOVERED PAPER INCORPORATION RATES FOR PAPER AND BOARD PRODUCTION (2019)



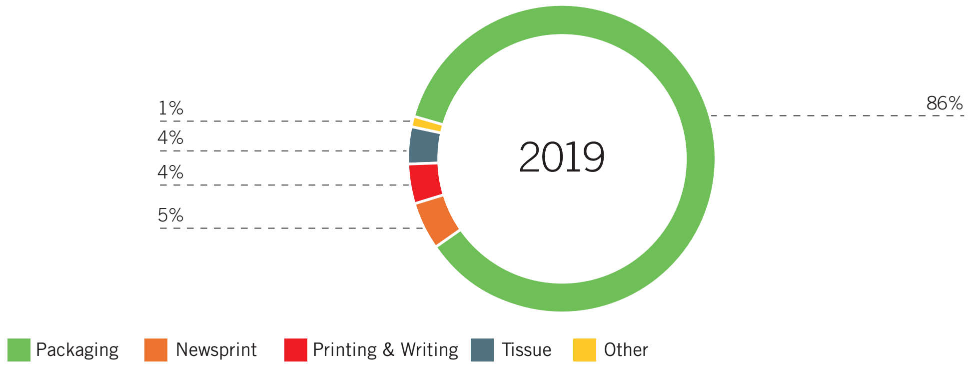
Source: BIR, RISI, EuRIC and CEPI

ANALYSIS OF 211 MILLION TONNES OF PAPER AND BOARD PRODUCED IN 2019 USING RECOVERED FIBRES (MILLION TONNES)

Tonnage incorporating recovered fibres	Newsprint		Printing & Writing		Tissue		Packaging		Other		Total Paper & Board	
	Tonnage	% of total Newsprint production	Tonnage	% of total P&W production	Tonnage	% of total Tissue production	Tonnage	% of total Packaging production	Tonnage	% of total Other production	Tonnage	% of total production
Asia	3.846	22.23	4.354	4.76	2.865	7.08	86.068	33.89	0.807	8.80	97.941	23.75
Europe	4.547	26.28	2.402	2.62	1.873	4.63	42.531	16.75	1.283	13.98	52.637	12.76
North America	2.256	13.04	1.194	1.30	1.719	4.24	36.562	14.40	0.526	5.73	42.258	10.25
Latin America	0.192	1.11	0.324	0.35	0.804	1.99	9.924	3.91	0.068	0.74	11.312	2.74
Middle East	0.031	0.18	0.043	0.05	0.150	0.37	1.791	0.71	0.006	0.07	2.021	0.49
Africa	0.099	0.57	0.054	0.06	0.166	0.41	2.117	0.83	0.024	0.26	2.459	0.60
Oceania	0.296	1.71	0.037	0.04	0.051	0.13	1.967	0.77	–	0.00	2.351	0.57
Total	**11.266**	**65.12**	**8.409**	**9.19**	**7.628**	**18.84**	**180.960**	**71.26**	**2.716**	**29.59**	**210.979**	**51.15**

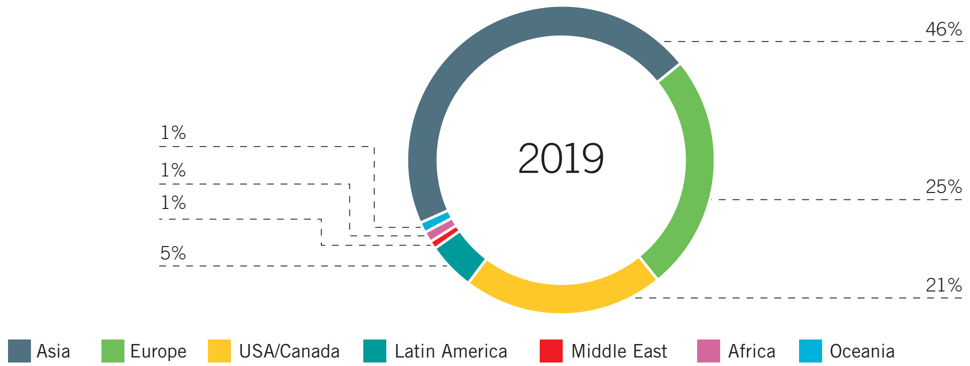
Source: BIR, RISI, EuRIC and CEPI

TYPES OF PAPER AND BOARD INCORPORATING RECOVERED FIBRES OUT OF GLOBAL TOTAL OF 211 MILLION TONNES (2019)



Source: BIR, RISI, EuRIC and CEPI

PRODUCTION BY REGION OF PAPER AND BOARD USING RECOVERED FIBRES OUT OF GLOBAL TOTAL OF 211 MILLION TONNES (2019)



Source: BIR, RISI, EuRIC and CEPI

CONCLUSIONS

As was the case in our first revamped annual statistical report published last year, data in this second edition illustrate **the importance of recovered fibre in the production of paper and board** around the world, particularly **in the growing packaging segment**. Indeed, its significance in the global production mix intensified in 2019.

Nevertheless, **there is scope for significant increases in the use of recovered fibres**, including in the printing & writing segment and in some emerging regions of the world, especially when taking into account **strong population and middle-class growth projections** for many developing countries. (Worldwide, the middle class increased from 1.8 billion people in 2009 to around 3.5 billion in 2017, and is projected to reach 5.3 billion by 2030.)

Growth in recovered fibre consumption would bring a huge environmental benefit as accepted scientific research suggests that recycling **one tonne of paper saves more than 4000 kWh of energy as well as vast quantities of water**.

The paper recycling industry enshrines the principles of a Circular Economy given that we are clearly heading in the direction of a world in which **recycling content will become an ever-increasing component** of the final paper and board product mix.

Bureau of International Recycling

With the cooperation of

EuRIC

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