

PAPER AND BOARD RECYCLING IN 2018

Overview of world statistics



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

Copyright BIR 2020. All rights reserved.

CONTENTS

Introduction	4
Executive Summary	5
Analysis	6
Recovered fibre – production	6
Recovered fibre production by region and as percentage of global total	7
Recovered fibre – trade	8
Major flows of recovered fibre	8
Recovered fibre exports by region as percentage of global total	9
Major Chinese imports of recovered fibre	10
Major Indian imports of recovered fibre	11
Major Indonesian imports of recovered fibre	11
Recovered fibre imports by region as percentage of world total	12
Major EU imports of recovered fibre	12
Major EU exports of recovered fibre	13
Major US exports of recovered fibre	13
Pulp	14
Paper and board production	15
Production of paper and board by region as percentage of global total	15
Production of paper and board by segment as percentage of global total	16
Paper and board consumption	17
Apparent consumption of paper and board by region	17
BIR Calculations	19
Recovered fibre incorporation rates in paper and board production	20
Analysis of 211 million tonnes of paper and board produced in 2018 using recovered fibres	20
Types of paper and board incorporating recovered fibres out of global total of 211 million tonnes	21
Production by region of paper and board using recovered fibres out of global total of 211 million tonnes	21
Conclusions	22

INTRODUCTION

History teaches us many lessons and informs the actions we take today. By analysing data from previous years, we can identify and quantify the emerging trends around which we can base our present-day business decisions.



Some time ago, the BIR Paper Division committed itself to the task of collating statistics from the most reliable sources available. Starting with figures for 2018, we have applied our own knowledge to arrive at conclusions that, we believe, will be of great interest and benefit to our members and to their businesses.

This analysis amply illustrates the unparalleled pool of expertise within BIR and within its Paper Division, particularly in relation to recycled content incorporation rates. From our statistical base camp, we have set out to make reasoned calculations that have enabled us to quantify the massive contribution made by recycled fibres as an environmentally beneficial component of global paper and board production.

Indeed, more than half (50.2%) of paper and board production worldwide is made out of recovered fibres.

There is another major advantage to developing such a fascinating information resource: when dealing with legislators and policy-makers, we can now speak about our industry's contribution and argue our industry's case from a position of greater statistical strength. This is so important in an age when regulation plays such a vital part in our industry's activities.

In commending this analysis to you all, I would like to thank BIR, RISI, EuRIC and CEPI for their great assistance in creating this new resource for BIR members and for the many other interested parties around the world.

Jean-Luc Petithuguenin

President, BIR Paper Division
Founder/CEO of Paprec, France



EXECUTIVE SUMMARY

- More than **250 million tonnes** of recovered fibre was produced worldwide in 2018.
- Asia accounted for some **43%** of world recovered fibre production, Europe approaching **27%** and North America nearer **21%**.
- In 2018, Asia remained the main outlet for US and European exports of recovered paper.
- Despite a **38%** year-on-year fall, China remained the world's leading recovered fibre importer in 2018 on around **15 million tonnes**, with **6.4 million tonnes** coming from the USA and **4.3 million tonnes** from Europe.
- Global pulp production exceeded **187 million tonnes** in 2018.
- Global paper and board production totalled almost **420 million tonnes** in 2018.
- Asia produced around **46%** of the world's paper and board in 2018, with packaging accounting for more than **63%** of the continent's output.
- China remained the world's leading paper and board producer in 2018 (despite a year-on-year fall of **5%**) as well as the number one consumer (despite a drop of **3.1%**).

The BIR Paper Division has calculated the following for 2018:

- 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 up to **72%** 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 **54%**.

ANALYSIS

In 2018, small recovered paper production increases in Europe, North America, Latin America, Africa and the Middle East more than offset declines in Asia and Oceania, with the result that the global total edged up 0.3% to 250.195 million tonnes from 249.438 million tonnes in the previous year. This increase occurred despite a 0.4% fall in paper and board production worldwide – from 421.527 million tonnes in 2017 to 419.720 million tonnes the following year.

RECOVERED FIBRE - PRODUCTION

Asia accounted for almost 43% of the recovered fibre produced globally in 2018, although its total of 106.935 million tonnes represented a decline of 0.7% when compared to the 107.687 million tonnes produced across the world's largest continent in 2017.

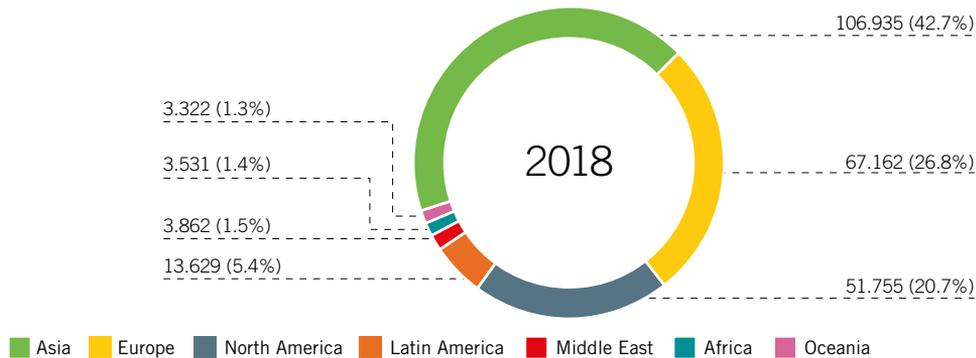
Volumes produced in Europe increased only marginally from 67.090 million tonnes in 2017 to 67.162 million tonnes the following year. In 2018, Europe's main production countries were Germany (-1.3% year on year to 15.07 million tonnes), the UK (-3% to 7.54 million tonnes), France (-5% to 6.94 million tonnes), Italy (+3.1% to 6.65 million tonnes) and Spain (-2.4% to 4.45 million tonnes). Recovered paper utilisation in these same countries was as follows: Germany +0.4% year on year to 17.20 million tonnes; the UK -0.5% to 3.13 million tonnes; France +0.2% to 5.40 million tonnes; Italy +3% to 5.14 million tonnes; and Spain -2.5% to 4.89 million tonnes.

North America's recovered fibre production total climbed 2.3% from 50.580 million tonnes in 2017 to 51.755 million tonnes the following year. Latin America and the Middle East posted small increases in recovered paper production volumes in 2018: the former upped its total from 13.606 million tonnes in 2017 to 13.629 million tonnes while the latter recorded an increase from 3.806 million tonnes to 3.862 million tonnes.



Among all the regions of the world, however, it was Africa that registered the largest proportional increase in its recovered paper production performance in boosting volumes by around 13% from 3.136 million tonnes in 2017 to 3.531 million tonnes the following year. For Oceania, conversely, there was a drop in paper production from 3.533 million tonnes to 3.322 million tonnes when comparing the two years under analysis.

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



Source: BIR, RISI, EuRIC and CEPI

RECOVERED FIBRE – TRADE

Recovered paper does not necessarily arise where it is most needed to feed production processes and so the Circular Economy in this commodity relies on international trade, which amounted to around 56 million tonnes in 2018. This figure includes intra-continent trade: for example, around 12.3 million tonnes of recovered fibre was sold between different member states of the EU in 2018.

It has been calculated that Europe's paper recovery rate of around 70% creates an annual structural surplus of 8 to 9 million tonnes per annum; this broadly tallies with the figures for 2018 as Europe imported 16.942 million tonnes of recovered paper but exported 24.430 million tonnes. In 2017, Europe's imports and exports had been significantly higher at, respectively, 17.201 million tonnes and 25.262 million tonnes.

MAJOR FLOWS OF RECOVERED FIBRE (MILLION TONNES)



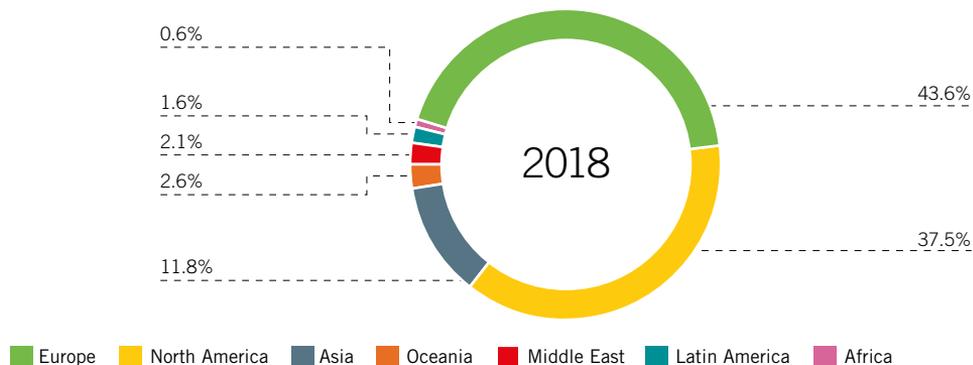
Source: BIR, RISI, EuRIC and CEPI

In 2018, Europe exported around 8.8 million tonnes of structural surplus to Asia. This represented a drop of 7.3% when compared to 2017, largely as a result of a slump in Chinese imports from around 7.5 million tonnes in 2017 to 4.3 million tonnes the following year. Conversely, European exports surged by 150% year on year to India to reach 2 million tonnes and by 50% to Indonesia in totalling 1.2 million tonnes.

Europe's largest exporters of recovered paper in 2018 were the UK on 4.5 million tonnes, the Netherlands on 2.8 million tonnes, Germany on 2.7 million tonnes, France on 2.5 million tonnes and Italy on 1.9 million tonnes.

North American recovered fibre exports edged up from 20.795 million tonnes in 2017 to 21.020 million tonnes the following year. The picture for US recovered fibre exports was similar to that for Europe as shipments to China tumbled 45% in 2018 to 6.4 million tonnes whereas deliveries to India soared 74% to 3.3 million tonnes. Other major buyers were Mexico (1.7 million tonnes), Indonesia (1.2 million tonnes), South Korea (1.1 million tonnes) and Canada (0.9 million tonnes).

RECOVERED FIBRE EXPORTS BY REGION AS PERCENTAGE OF GLOBAL TOTAL



Source: BIR, RISI, EuRIC and CEPI

And so in 2018, Asia continued to be the main recipient of others' surplus tonnages. However, its purchases from elsewhere slid around 9% from 37.384 million tonnes in 2017 to 34.007 million tonnes the following year, attributable in large part to the tighter import restrictions adopted by major market China. The steep drop-off in Chinese imports is also reflected in the volumes arriving from Australia (-25% year on year to 0.6 million tonnes) and from Canada (-64% to 0.5 million tonnes). Conversely, there were increases in recovered paper shipments to China from Japan (+12% to 2.8 million tonnes) and from South Korea (+33% year on year to 0.4 million tonnes).

MAJOR CHINESE IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2017	2018	Year-on-year change (%)
Europe	7.5	4.3	-42.67
Canada	1.4	0.5	-64.29
United States	11.7	6.4	-45.30
South Korea	0.3	0.4	+33.33
Japan	2.5	2.8	+12.00
Australia	0.8	0.6	-25.00
Total	24.2	15	-38.02

Source: BIR, RISI, EuRIC and CEPI



MAJOR INDIAN IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2017	2018	Year-on-year change (%)
Europe	0.8	2	+150.00
United States	1.9	3.3	+73.68
Total	2.7	5.3	+96.30

Source: BIR, RISI, EuRIC and CEPI

MAJOR INDONESIAN IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2017	2018	Year-on-year change (%)
Europe	0.8	1.2	+50.00
United States	0	1.2	–
Total	0.8	2.4	+200.00

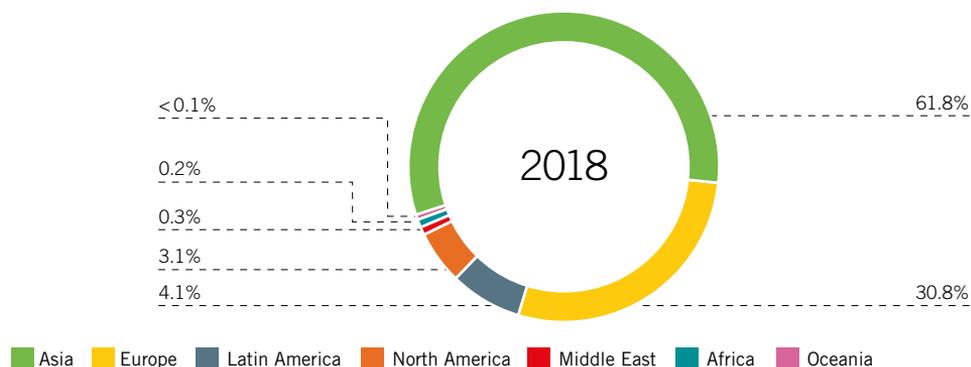
Source: BIR, RISI, EuRIC and CEPI

As for major growth markets for exporters in 2018, India's recovered fibre imports doubled from Europe and the USA to 5.3 million tonnes while overseas shipments into Indonesia tripled to 2.4 million tonnes, with Europe and the USA supplying around half each.

Asia's recovered fibre exports increased by more than 3% in 2018 to 6.633 million tonnes; however, this still means that for every tonne of recovered paper exported by Asia, more than 5 tonnes were imported.

Among the other regions of the world, Latin American imports of recovered paper climbed more than 4% from 1.926 million tonnes in 2017 to 2.011 million tonnes the following year while exports tumbled from 1.044 million tonnes to 893,000 tonnes. From a low base of 101,000 tonnes in 2017, the Middle East's imports surged to 186,000 tonnes in 2018 whereas exports declined over the same period from 1.394 million tonnes to 1.199 million tonnes.

RECOVERED FIBRE IMPORTS BY REGION AS PERCENTAGE OF WORLD TOTAL



Source: BIR, RISI, EuRIC and CEPI

Oceania imported extremely low volumes of recovered paper during the course of the two years under scrutiny (6000 tonnes in 2017 and 9000 tonnes in 2018); in contrast, its exports exceeded those of both Latin America and the Middle East despite sliding from 1.715 million tonnes in 2017 to 1.476 million tonnes the following year. In 2018, Africa's imports of recovered paper held steady at around 100,000 tonnes while its exports dipped to 344,000 tonnes from 350,000 tonnes in the previous year.

MAJOR EU IMPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2017	2018	Year-on-year change (%)
North America	0.3	0.6	+100.00
Latin America	0.02	0.02	0.00
Africa	0.1	0.02	-80.00

Source: BIR, RISI, EuRIC and CEPI

MAJOR EU EXPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2017	2018	Year-on-year change (%)
Asia	9.5	8.8	-7.37
China	7.5	4.3	-42.67
India	0.8	2	+150.00
Indonesia	0.8	1.2	+50.00
South Korea	0.2	0.1	-50.00
Latin America	0.04	0.03	-25.00
Africa	0.01	0.2	+1900.00
Intra-EU trade	12.5	12.3	-1.60
Exports outside EU	9.55	9.03	-5.45

Source: BIR, RISI, EuRIC and CEPI

MAJOR US EXPORTS OF RECOVERED FIBRE (MILLION TONNES)

	2017	2018	Year-on-year change (%)
Asia	14.5	12.0	-17.24
China	11.7	6.4	-45.30
India	1.9	3.3	+73.68
Indonesia	0	1.2	-
South Korea	0.9	1.1	+22.22
Mexico	1.6	1.7	+6.25
Canada	0.7	0.9	+28.57
Japan	0.9	1.1	+22.22
EU	0.3	0.6	+100.00
Total	18.0	16.3	-9.44%

Source: BIR, RISI, EuRIC and CEPI

PULP

Having fallen just short of 184 million tonnes in 2017, global pulp production climbed to 187.2 million tonnes the following year, with North America producing around a third of the total (63.45 million tonnes), Europe around a quarter (47.04 million tonnes) and Asia some 22% (41.56 million tonnes). Latin America was also a major producer on 30.47 million tonnes.

Figures for apparent consumption of pulp show an annual total for 2018 of 186.6 million tonnes (versus 183.4 million tonnes the previous year). Europe and North America accounted for, respectively, 50.61 million tonnes (49.72 million tonnes in 2017) and 53.84 million tonnes (53.97 million tonnes in 2017) but Asia was easily the largest consumer on 66.583 million tonnes - an increase of more than 2 million tonnes over 2017. Apparent consumption in Latin America edged lower from 10.14 million tonnes in 2017 to 10.02 million tonnes.

A comparison of the production and consumption statistics clearly confirms North and Latin America as major exporters of pulp, with Asia the largest importer by far. In 2018, Latin America shipped 17.5 million tonnes of pulp to Asia and 2.2 million tonnes to Europe. European imports of around 3.6 million tonnes of pulp comprised 1.5 million tonnes from the USA while Asia was supplied with 8.2 million tonnes of pulp from the USA.



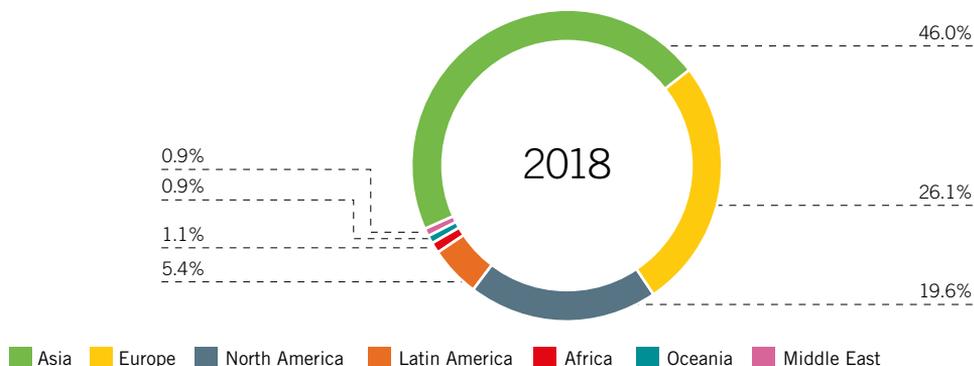
PAPER AND BOARD PRODUCTION

In 2018, the 0.4% decline in global paper and board production to 419.720 million tonnes was largely the result of output declines for newsprint (-9% year on year to 19.307 million tonnes) and for printing & writing (-2% to 96.264 million tonnes). Only Latin America recorded an increase in its newsprint production in 2018 while the Middle East and Africa were alone in upping their output of printing & writing; in effect, generation of these grades was in decline throughout the major producing regions of the world.

The reverse proved to be true for the tissue and packaging grades. In the case of the former, global production climbed 2.6% from 37.689 million tonnes in 2017 to 38.670 million tonnes in 2018; increases in tissue production were achieved in all six regions of the world covered by the statistics, led by a gain of 3.3% in Asia to 13.968 million tonnes.

As for packaging, the largest product segment in volume terms, global production edged around 0.5% higher in 2018 to 256.137 million tonnes despite a downturn for leading producer Asia to 122.053 million tonnes from 123.612 million tonnes in 2017. Every other region of the world recorded year-on-year packaging production growth in 2018, with Europe climbing 2.2% to 59.330 tonnes and North America just under 2% to 52.669 million tonnes. The steepest regional growth in packaging production was registered in Africa where output surged around 9% to 3.008 million tonnes in 2018.

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

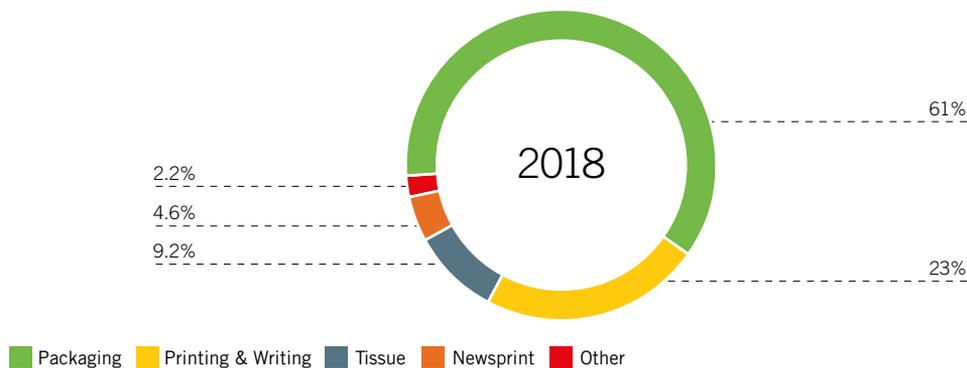


Source: BIR, RISI, EuRIC and CEPI

Overall in 2018, Asia's paper and board production fell by almost 3 million tonnes to 193.160 million tonnes while North America posted a year-on-year decrease of 65,000 tonnes to 82.242 million tonnes. Alongside minor increases in paper and board production in Europe (to 109.648 million tonnes), Latin America (to 22.468 million tonnes) and Oceania (to 3.830 million tonnes), there were significant gains reported by the Middle East (+14% to 3.667 million tonnes) and Africa (+6.6% to 4.705 million tonnes).

Among the world's top six paper and board producers in 2018, China sustained a 5% year on year fall to 109.962 million tonnes while production in the USA edged 0.3% lower to 72.062 million tonnes. Japan recorded a production decline of 1.7% to 26.070 million tonnes while Germany's total dipped 1% to 22.678 million tonnes. Conversely, paper and board production in India soared 12.9% year on year to 15.214 million tonnes while sixth-highest producer Indonesia achieved growth of 5.3% to 12.478 million tonnes.

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



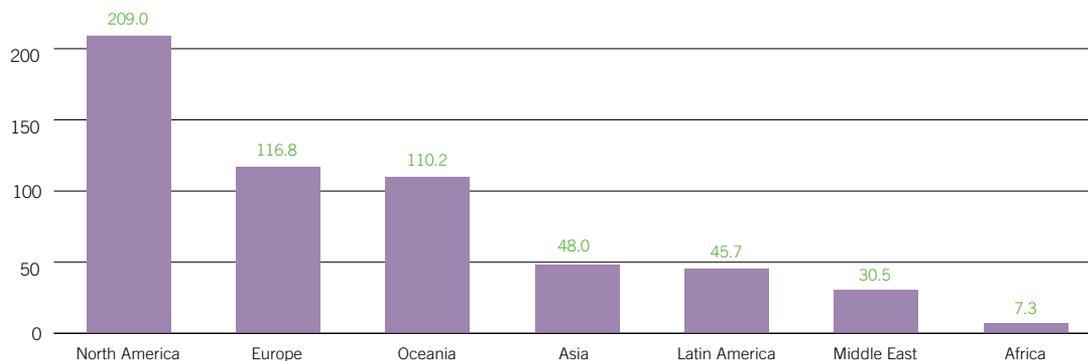
Source: BIR, RISI, EuRIC and CEPI

PAPER AND BOARD CONSUMPTION

In 2018, the top five producers of paper and board also led the world in terms of apparent consumption : Chinese consumption slid 3.1% to 110.151 million tonnes; US apparent consumption edged 0.4% higher to 70.674 million tonnes; Japan registered a 3.8% drop in domestic consumption to 25.459 million tonnes; and Germany consumed 2.7% less than in 2017 at 19.777 million tonnes. Whereas production in India leapt 12.9% in 2018, its apparent consumption gain was limited to 4.2% in reaching 16.713 million tonnes. Similarly for Indonesia, the consumption increase of 3.4% to 8.224 million tonnes in 2018 was less steep than the country's aforementioned 5.3% production hike.

Globally, apparent consumption of paper and board dropped from 424.373 million tonnes in 2017 to 421.876 million tonnes the following year.

APPARENT CONSUMPTION OF PAPER AND BOARD BY REGION, KG PER CAPITA (2018)



Source: BIR, RISI, EuRIC and CEPI

Further study of the apparent consumption statistics underlines the scope for growth in developing regions of the world. In 2018, per-capita consumption figures for North America (209 kg), Europe (116.8 kg) and Oceania (110.2 kg) were substantially higher than those for Latin America (45.7 kg), the Middle East (30.5 kg) and Africa (7.3 kg), as well as most notably for Asia (48 kg).

In pure volume terms, apparent consumption totals fell in Asia (from 199.468 million tonnes in 2017 to 196.487 million tonnes the following year), in Europe (from 99.533 million tonnes to 98.991 million tonnes), and very slightly in Oceania (from 4.205 million tonnes to 4.204 million tonnes). Elsewhere, there were increases for North America (from 75.971 million tonnes in 2017 to 76.308 million tonnes the following year), for Latin America (from 29.044 million tonnes to 29.115 million tonnes), for Africa (from 8.677 million tonnes to 9.158 million tonnes) and for the Middle East (from 7.475 million tonnes to 7.614 million tonnes).

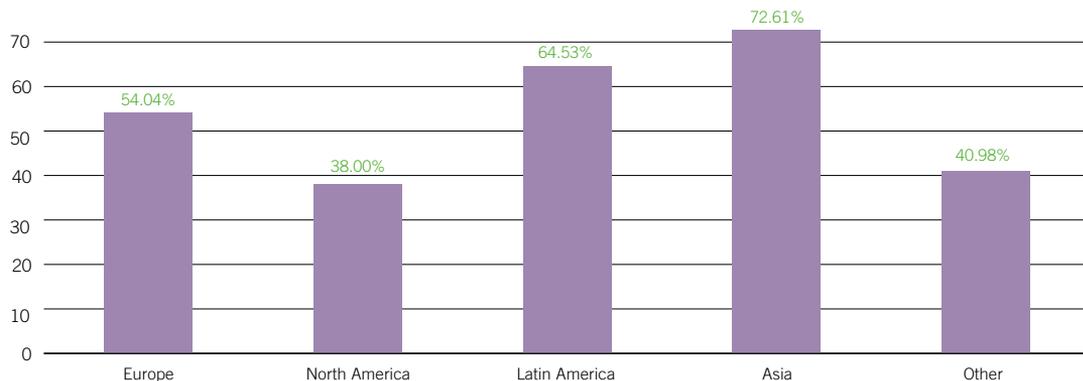


BIR CALCULATIONS

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

- Of the 420 million tonnes of the paper and board produced globally in 2018, around 211 million tonnes were produced using recovered fibres and 209 million tonnes were made exclusively from virgin fibres.
- Asia produced almost half of all the paper and board using recovered fibres, while Europe and North America accounted for, respectively, 25% and 20%.
- Europe uses more recycled fibres than North America, while Asia leads the way through its packaging performance.
- Of the 211 million tonnes of paper and board produced using recovered fibres in 2018, some 86% were packaging materials, whereas newsprint accounted for around 5%, printing/writing 4% and tissue also 4%.
- 66% of all packaging and 55% of newsprint use recycled fibres.
- Asia incorporated up to 72% of recycled content in its paper and board production in 2018 owing to its leading role as a cardboard producer.
- Europe achieved an incorporation rate average of 54% but the numbers differed widely, with Spain, Germany and France topping the list with rates of, respectively, 79.5%, 75.8% and 72.6%, whereas Finland and Sweden only incorporated up to 10% and 11%, respectively.

RECOVERED FIBRE INCORPORATION RATES IN PAPER AND BOARD PRODUCTION (2018)



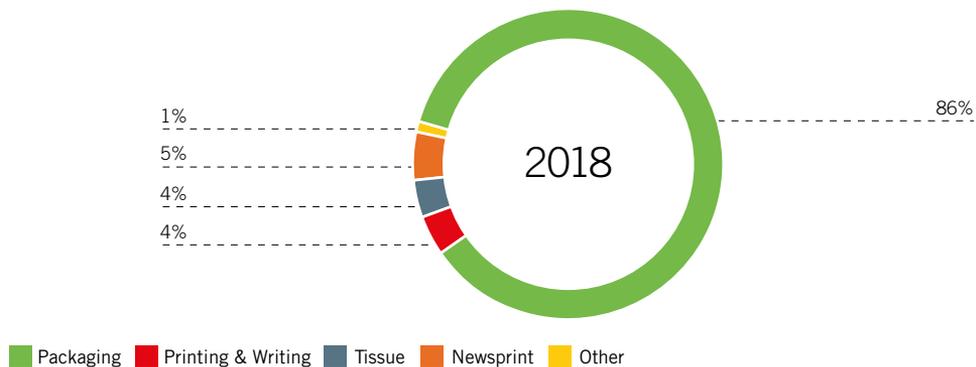
Source: BIR, RISI, EuRIC and CEPI

ANALYSIS OF 211 MILLION TONNES OF PAPER AND BOARD PRODUCED IN 2018 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	4.471	23.16	4.320	4.49	2.670	6.90	85.594	33.42	0.797	8.53	97.852	23.31
Europe	4.848	25.11	2.601	2.70	1.866	4.83	41.607	16.24	1.287	13.78	52.210	12.44
North America	2.548	13.20	1.375	1.43	1.704	4.41	36.936	14.42	0.466	4.99	43.029	10.25
Latin America	0.245	1.27	0.341	0.35	0.796	2.06	9.772	3.82	0.071	0.76	11.225	2.67
Middle East	0.031	0.16	0.033	0.03	0.143	0.37	1.739	0.68	0.006	0.07	1.954	0.47
Africa	0.104	0.54	0.054	0.06	0.163	0.42	2.109	0.82	0.026	0.28	2.456	0.59
Oceania	0.316	1.63	0.039	0.04	0.049	0.13	1.868	0.73	-	0.00	2.272	0.54
Total	12.563	65.07	8.762	9.10	7.392	19.11	179.627	70.13	2.654	28.41	210.998	50.27

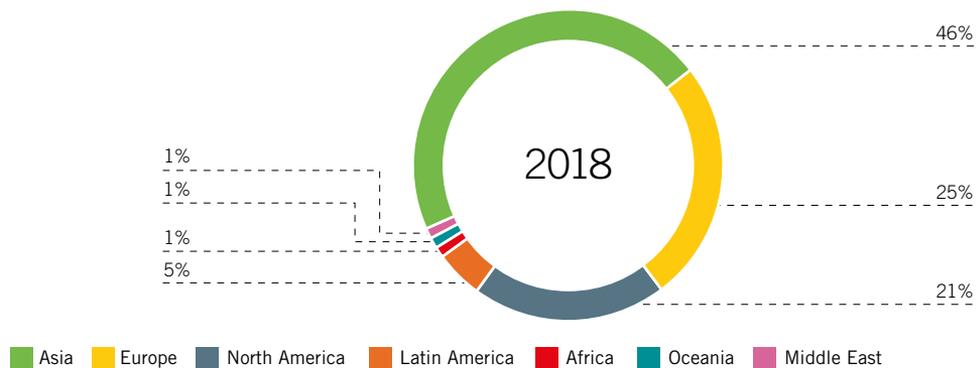
Source: BIR, RISI, EuRIC and CEPI

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



Source: BIR, RISI, EuRIC and CEPI

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



Source: BIR, RISI, EuRIC and CEPI

CONCLUSIONS

These figures illustrate **the importance of recovered fibre in the production of paper and board** around the world, particularly in the growing packaging segment. However, 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.

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.**

We are clearly heading in the direction of a world in which **recycling content will become ever more important in the final paper and board product mix.**



With the cooperation of



Bureau of
International Recycling
Paper Division

Bureau of International Recycling aisbl
Avenue Franklin Roosevelt 24
1050 Brussels
Belgium

T. +32 2 627 57 70
F. +32 2 627 57 73

bir@bir.org
www.bir.org
