

KEY STATISTICS 2019

European pulp
& paper industry



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Introduction

Welcome to the latest issue of Cepi's Key Statistics. This booklet contains the key statistics necessary to give a clear picture of the performance of the European pulp and paper industry in 2019.

The statistics included in this booklet are a compilation of data received from the National Associations which are Cepi members, under the auspices of Cepi's Statistics Network. Some additional sources, such as Eurostat, have been used where necessary and relevant. Extra statistical information is accessible online to members on Cepi's Members Area website at <http://www.cepi.org/members/statistics> and to non-members by subscription¹.

The Confederation of European Paper Industries (Cepi) is a Brussels-based non-profit making organisation founded in 1992, which represents the European pulp and paper industry towards the European Institutions. Through its member associations, Cepi also represents approximately 495 pulp, paper and board producing companies across Europe, ranging from small and medium-sized enterprises to multinationals (counting companies with a presence in more than one

Cepi country only once). It represents 92% of the European² pulp and paper industry in terms of production. The pulp and paper industry provides more than 180 000 jobs in Europe directly, and 1.5 million in the value chain. It has a turnover of 90 billion euros and adds 20 billion euros to the EU GDP. It is strong in export markets, with an export rate of 22% of its paper and board production.



Circular Economy in the European Pulp and Paper Industry

The European Pulp and Paper industry plays a big role in the circular economy.

This icon has been introduced in the report to highlight the many areas that are circular in our sector. More information on circular economy can be found on Cepi's website. <https://www.cepi.org/policy-area/sustainability-circularity/>

Members of Cepi in 2019

The National Associations of the 18 following countries are Cepi members: Austria, Belgium, Czech Republic, Finland, France, Germany, Hungary, Italy, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.



Data quality and compliance with EU competition rules.

Responsibility for the collection and management of statistical data lies with the Cepi statistics department, which is constantly working to improve the quality of the data reported. In order to further increase the reliability and credibility of the data reported, Cepi has commissioned Deloitte to issue a limited assurance statement on the data quality rating that Cepi carried out on its core indicators in the statistics report. The limited assurance statement is available at <http://www.cepi.org/topics/statistics>. The compliance of the data produced with the EU competition rules is periodically checked by a law firm.

¹ More statistics reports (annual, quarterly and monthly) are available by subscription:

- Please visit our website <http://www.cepi.org/topics/subscribe-to-statistics>
- Or contact Ariane Crèvecoeur – Statistics Manager – a.crevecoeur@cepi.org
Marjukka Rautavirta – Statistics Officer – m.rautavirta@cepi.org






² Europe minus the Russian Federation



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Pulp and Paper Industry

	1991	2000	2010	2015	2018	2019	% Change 2019/2018	% Change 2019/2000
Industry Structure								
Number of Companies ¹	1 082	979	725	685	684	680	-0.6	-30.5
Number of Mills	1 570	1 309	992	918	896	891	-0.6	-31.9
Pulp	296	233	172	155	151	151	0.0	-35.2
Paper and Board	1 274	1 076	820	763	745	740	-0.7	-31.2
Number of Paper Machines	2 182	1 858	1 393	1 288	1 255	1 252	-0.2	-32.6
Employment	411 113	279 987	194 894	178 418	182 353	181 504	-0.5	-35.2
Turnover ² (Million Euros)	n.a.	79 388	75 790	80 679	94 000	90 000	-4.3	13.4
Investments ² (Million Euros)	n.a.	5 637	2 913	4 181	5 080	5 000	-1.6	-11.3
Added Value ² (Million Euros)	n.a.	24 494	16 560	18 262	21 000	20 000	-4.8	-18.3
Total Pulp³ ('000 Tonnes)								
Production Capacity	39 584	43 842	44 189	40 805	43 010	43 650	1.5	-0.4
Operating Rate	85.4%	91.2%	87.6%	88.9%	89.2%	87.3%	-1.9	-3.9
Production	33 807	39 962	38 695	36 256	38 365	38 087	-0.7	-4.7
Total Deliveries	n.a.	40 556	39 612	38 632	42 619	42 699	0.2	5.3
Cepi Internal Deliveries	n.a.	39 224	37 045	35 392	38 299	36 282	-5.3	-7.5
Consumption ⁷ (Apparent)	37 815	46 377	43 849	41 108	43 660	40 751	-6.7	-12.1
Market Pulp ('000 Tonnes)								
Production	9 314	11 423	12 706	13 078	14 442	15 410	6.7	34.9
Exports to Outside Cepi	n.a.	1 332	2 567	3 240	4 320	6 417	48.5	381.7
Imports from Outside Cepi	n.a.	7 924	7 721	8 091	9 615	9 081	-5.6	14.6
Trade Balance with Outside Cepi	n.a.	-6 592	-5 154	-4 851	-5 295	-2 664	49.7	59.6
Consumption ⁷ (Apparent)	n.a.	18 015	17 860	17 930	19 737	18 074	-8.4	0.3
Exports/Production	n.a.	11.7%	20.2%	24.8%	29.9%	41.6%	11.7	30.0
Imports/Consumption	n.a.	44.0%	43.2%	45.1%	48.7%	50.2%	1.5	6.3
Paper and Board ('000 Tonnes)								
Production Capacity	73 280	97 658	103 714	99 832	101 200	101 552	0.3	4.0
Operating Rate	88.8%	93.0%	91.7%	91.1%	91.3%	88.2%	-3.1	-4.8
Production	65 052	90 823	95 065	90 982	92 427	89 581	-3.1	-1.4
Cepi Internal Deliveries	n.a.	78 796	80 263	77 628	78 055	76 880	-1.5	-2.4
Exports to Outside Cepi	n.a.	13 887	19 164	19 194	20 510	20 145	-1.8	45.1
Imports from Outside Cepi	n.a.	6 383	5 783	5 367	5 583	5 455	-2.3	-14.5
Trade Balance with Outside Cepi	n.a.	7 504	13 381	13 827	14 927	14 689	-1.6	95.7
Consumption ⁷ (Apparent)	60 102	82 065	81 684	77 155	77 500	74 891	-3.4	-8.7
Exports/Production	n.a.	15.3%	20.2%	21.1%	22.2%	22.5%	0.3	7.2
Imports/Consumption	n.a.	7.8%	7.1%	7.0%	7.2%	7.3%	0.1	-0.5

	1991	2000	2010	2015	2018	2019	% Change 2019/2018	% Change 2019/2000	
Wood ('000 m³)									
Consumption	120 274	148 093	148 901	144 456	153 245	152 831	-0.3	3.2	
Hardwood	30 410	40 048	38 119	40 428	41 628	42 073	1.1	5.1	
Softwood	89 863	108 046	110 782	104 028	111 617	110 758	-0.8	2.5	
Imports/Consumption	12.8%	17.1%	17.1%	15.3%	15.9%	15.8%	0.0	-1.2	
Domestic/Consumption	87.2%	82.9%	82.9%	84.7%	84.1%	84.2%	0.0	1.2	
Paper for Recycling ('000 Tonnes) 									
Collection	25 452	43 658	55 917	55 829	56 900	55 623	-2.2	27.4	
Utilisation	25 360	40 922	48 122	47 751	49 047	48 876	-0.3	19.4	
Exports to Outside Cepi	n.a.	3 751	9 592	10 086	9 918	8 792	-11.3	134.4	
Imports from Outside Cepi	n.a.	1 015	1 796	2 008	2 065	2 046	-0.9	101.5	
Trade Balance with Outside Cepi	n.a.	2 736	7 795	8 078	7 853	6 747	-14.1	146.6	
Utilisation Rate	39.0%	45.1%	50.6%	52.5%	53.1%	54.6%	1.5	9.5	
Exports/Collection	n.a.	8.6%	17.2%	18.1%	17.4%	15.8%	-1.6	7.2	
Imports/Utilisation	n.a.	2.5%	3.7%	4.2%	4.2%	4.2%	0.0	1.7	
Recycling Rate in Europe⁴									
Recycling Rate	40.3%	51.8%	68.5%	71.9%	71.7%	72.0	0.4	20.3	
Non-Fibrous Materials ('000 Tonnes)									
Consumption	9 504	15 609	16 218	14 475	13 901	13 158	-5.3	-15.4	
Energy and Environment⁵									
Fuels Consumption ('000 Tj)	930	1 141	1 282	1 141	1 149	n.a.			
Biomass Use (%) of Total FC 	44.4	49.3	52.9	57.7	60.0	n.a.			
Electricity Consumption (GWh)	86 527	110 424	113 137	98 243	94 879	n.a.			
% of Electricity produced through CHP ⁶	88.0	90.4	95.4	96.2	95.5	n.a.			
CO ₂ Direct Emissions (Mega Tonnes)	39.05	41.94	37.83	32.39	32.02	31.14	-2.7	-25.8	
Specific CO ₂ Emissions (kt CO ₂ / kt of product)	0.54	0.42	0.35	0.31	0.30	0.30	-1.0	-30.2	

¹ 495 groups or corporations in 2019, when considering the entities established in one or several countries that are not bound together by legal and/or financial links.

² 2018 and 2019 figures are based on members' data, Eurostat and estimates for some countries.

³ Total Pulp = Market Pulp + Integrated Pulp.

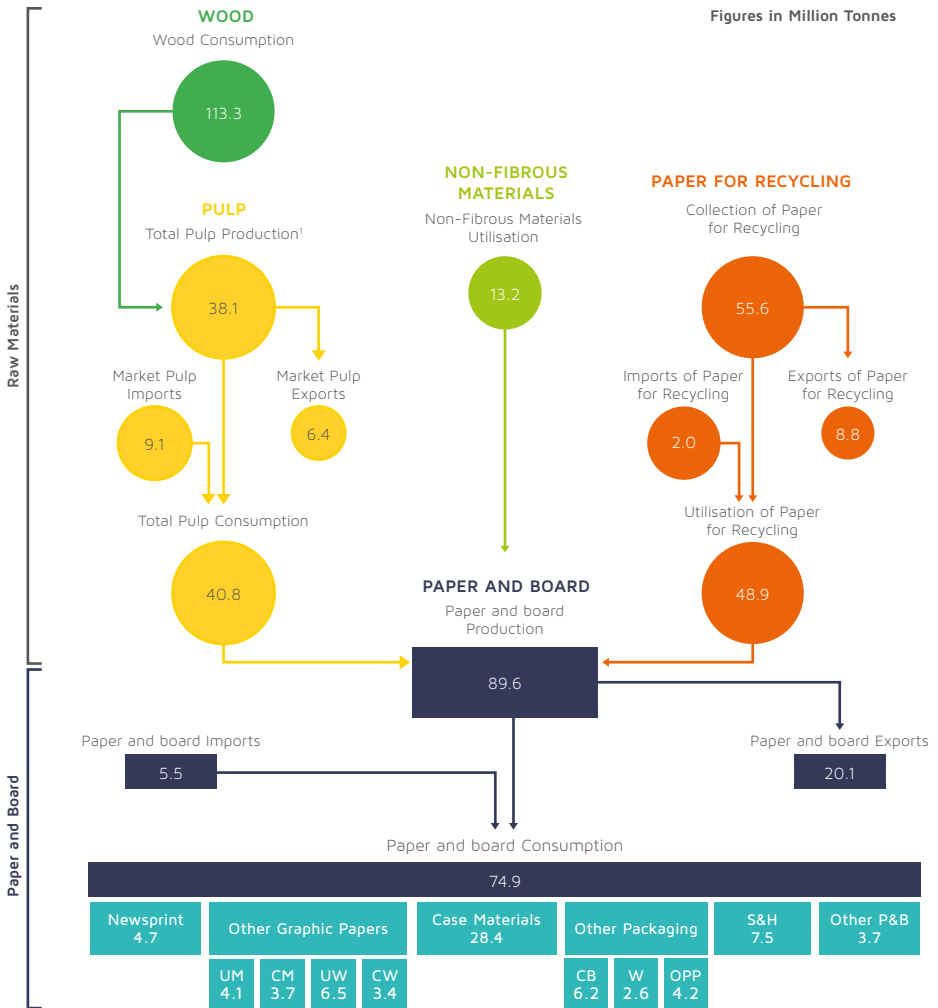
⁴ Europe means EU-28 countries plus Norway and Switzerland.

⁵ Hungary, Romania and Slovenia are not included in Energy data, except for CO₂ emissions.

⁶ CHP: combined heat and power (compared to total on-site electricity generation).

⁷ Cepi Apparent Consumption = production - exports to outside Cepi + imports from outside Cepi.

Pulp and Paper Industry in 2019

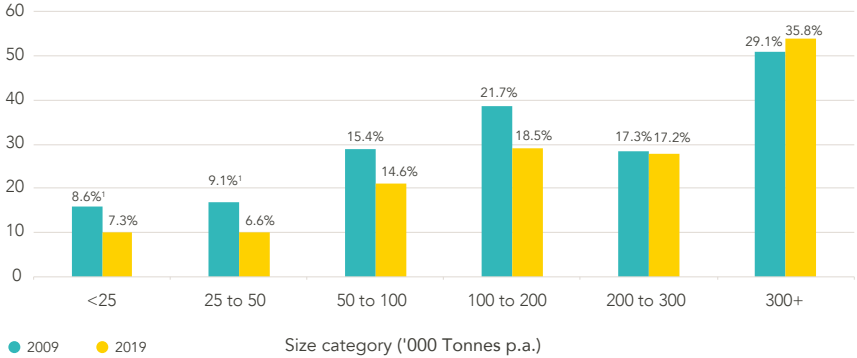


Paper and Board Consumption = Production + Imports from outside Cepi - Exports to outside Cepi.
 UM = Uncoated Mechanical - CM = Coated Mechanical - UW = Uncoated Woodfree - CW = Coated Woodfree.
 CB = Carton Board - W = Wrappings - OPP = Other Paper and Board for Packaging - S&H = Sanitary and Household.

¹ of which Integrated Pulp 22.7 Million Tonnes.

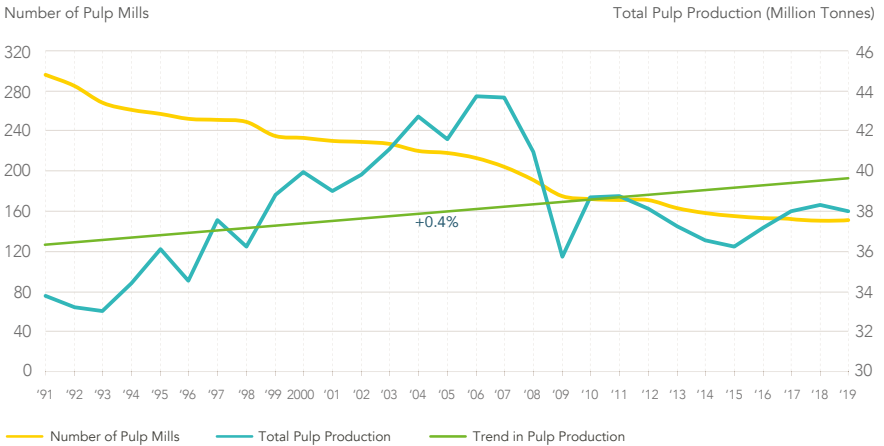
Number of Pulp Mills by Volume in 2009 and 2019

Number of Pulp Mills



¹Share of Total Number of Mills.

Number of Pulp Mills and Total Pulp Production



Total Pulp¹ Production and Consumption

'000 Tonnes

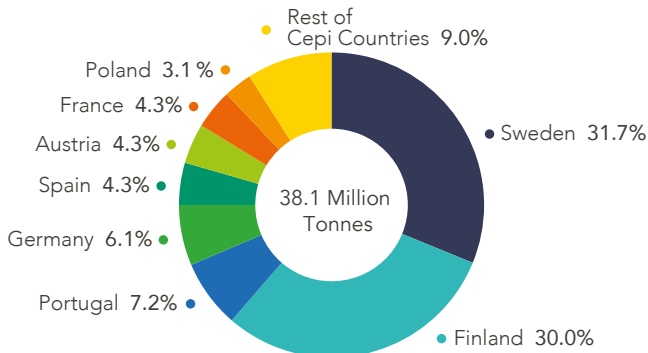
Total Pulp ¹	Production			Consumption		
	2018	2019	% change 2019/2018	2018	2019	% change 2019/2018
Mechanical & Semi-Chemical	10 184	9 554	-6.2	10 323	9 622	-6.8
Sulphite Pulp	1 678	1 672	-0.4	1 441	1 445	0.2
Sulphate Pulp	26 224	26 589	1.4	31 595	29 358	-7.1
Total Chemical Pulp	27 903	28 261	1.3	33 036	30 803	-6.8
Total Woodpulp	38 086	37 814	-0.7	43 359	40 425	-6.8
Other Pulp	279	273	-2.2	301	327	8.6
Total Pulp¹	38 365	38 087	-0.7	43 660	40 751	-6.7

... of which Market Pulp Production and Consumption

'000 Tonnes

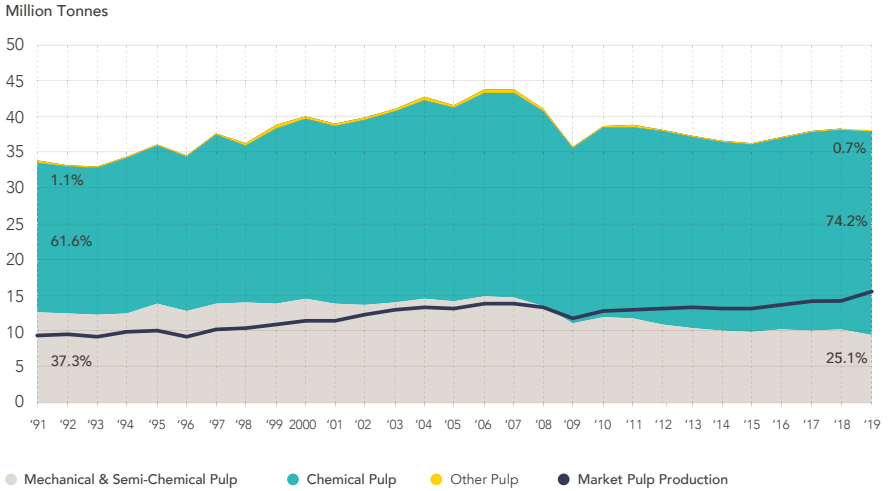
Market Pulp	Production			Consumption		
	2018	2019	% change 2019/2018	2018	2019	% change 2019/2018
Mechanical & Semi-Chemical	987	999	1.3	1 126	1 067	-5.2
Sulphite Pulp	603	565	-6.3	366	338	-7.6
Sulphate Pulp	12 696	13 684	7.8	18 067	16 453	-8.9
Total Chemical Pulp	13 300	14 249	7.1	18 434	16 791	-8.9
Total Woodpulp	14 286	15 248	6.7	19 559	17 858	-8.7
Other Pulp	156	162	3.8	177	215	21.4
Total Market Pulp	14 442	15 410	6.7	19 737	18 074	-8.4

Total Pulp¹ Production by Country in 2019

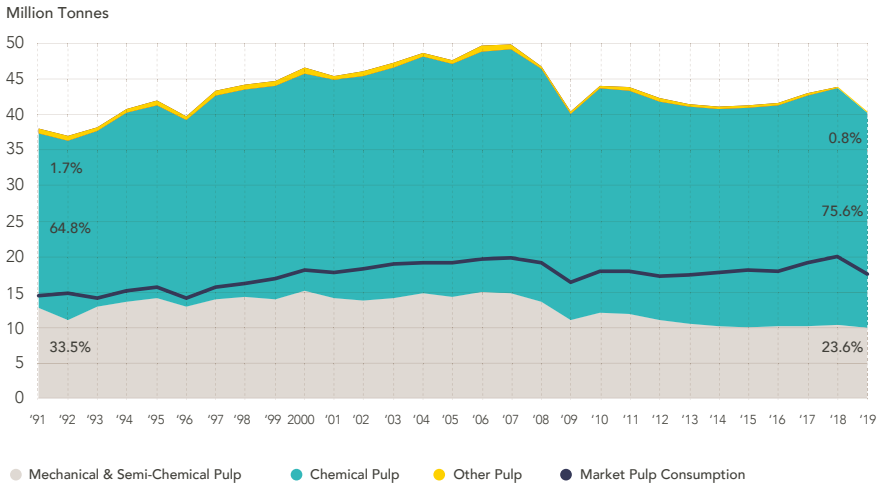


¹ Total Pulp = Market Pulp + Integrated Pulp.

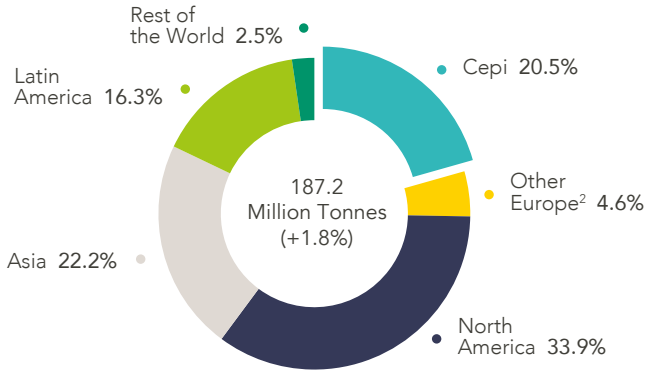
Total Pulp¹ Production by Grade and Market Pulp Production



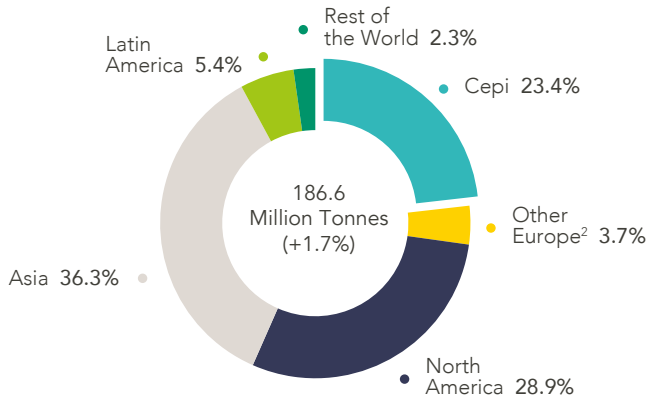
Total Pulp¹ Consumption by Grade and Market Pulp Consumption



World Total Pulp¹ Production by Region in 2018³



World Total Pulp¹ Consumption by Region in 2018³



¹ Total Pulp = Integrated Pulp + Market Pulp.

² Other Europe: total Europe excluding Cepi countries.

³ Sources: Cepi, RISI - 2019 figures will be available end-2020.

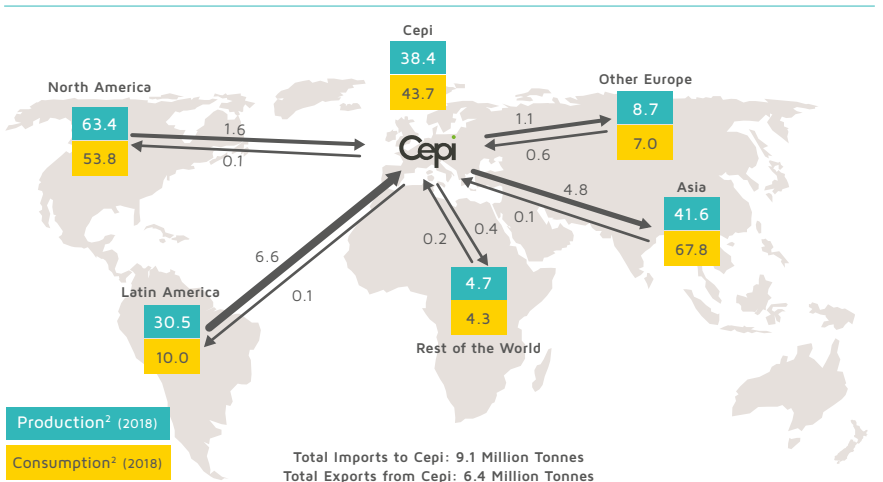
Market Pulp Exports to Other Regions

'000 Tonnes	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Other Europe ¹	724	719	768	922	1 100	17.1	19.4
North America	104	62	59	58	137	2.1	137.3
Latin America	6	49	69	61	58	0.9	-5.3
Asia	412	1 595	2 156	2 982	4 751	74.0	59.3
Rest of the World	86	142	187	298	371	5.8	24.5
Total	1 332	2 567	3 240	4 320	6 417	100.0	48.5

Market Pulp Imports from Other Regions

'000 Tonnes	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Other Europe ¹	657	480	663	646	611	6.7	-5.5
North America	4 623	2 292	1 415	1 434	1 559	17.2	8.7
Latin America	1 916	4 733	5 657	7 222	6 643	73.2	-8.0
Asia	272	134	220	82	54	0.6	-34.5
Rest of the World	456	81	135	230	214	2.4	-7.1
Total	7 924	7 721	8 091	9 615	9 081	100.0	-5.6

Trade Flows of Market Pulp in 2019 (Million Tonnes)

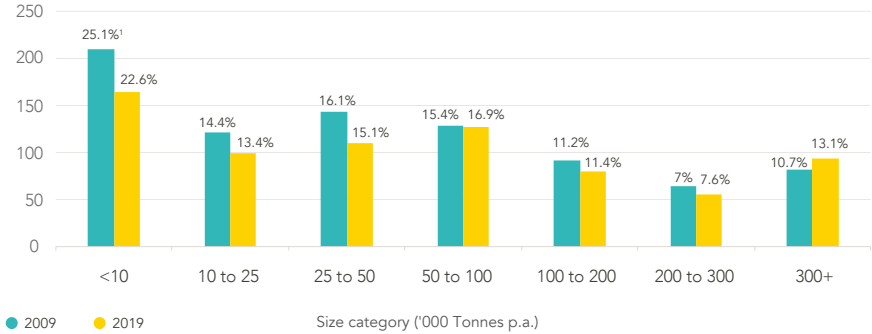


¹ Other Europe: total Europe excluding Cepi countries.

² Production and consumption of total pulp (market and integrated).

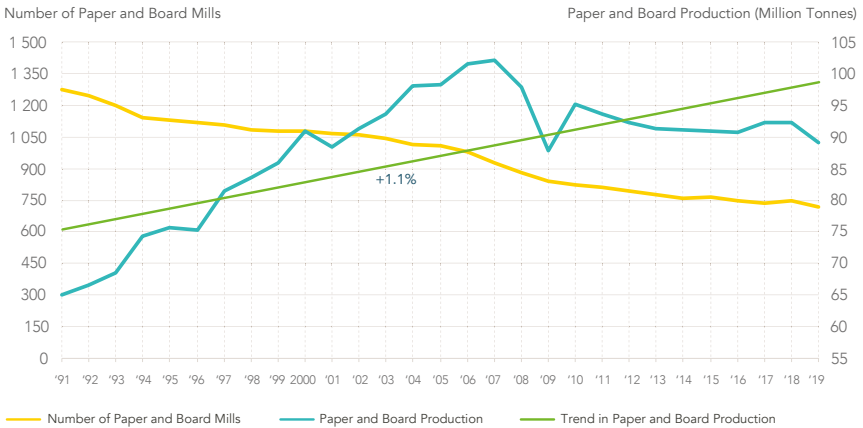
Number of Paper and Board Mills by Volume in 2009 and 2019

Number of Paper and Board Mills



¹Share of Total Number of Mills.

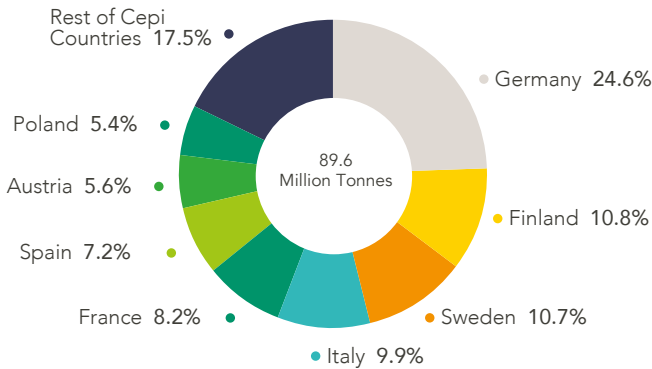
Number of Paper and Board Mills and Paper and Board Production



Paper and Board Production and Consumption

'000 Tonnes	Production			Consumption		
	2018	2019	% Change 2019/2018	2018	2019	% Change 2019/2018
Newsprint	5 651	5 195	-8.1	5 049	4 719	-6.5
Uncoated Mechanical	5 566	4 974	-10.6	4 635	4 083	-11.9
Coated Mechanical	6 208	5 563	-10.4	4 214	3 670	-12.9
Uncoated Woodfree	8 492	8 067	-5.0	6 911	6 523	-5.6
Coated Woodfree	6 212	5 416	-12.8	3 980	3 383	-15.0
Other Graphic Papers	26 478	24 020	-9.3	19 741	17 659	-10.5
Total Graphic Papers	32 129	29 215	-9.1	24 790	22 377	-9.7
Sanitary and Household	7 685	7 775	1.2	7 392	7 474	1.1
Case Materials	29 876	30 321	1.5	28 552	28 369	-0.6
Carton Board	9 712	9 585	-1.3	6 143	6 169	0.4
Wrappings	4 152	4 056	-2.3	2 591	2 647	2.2
Other Paper and Board for Packaging	4 749	4 683	-1.4	4 230	4 166	-1.5
Total Packaging Paper and Board	48 488	48 645	0.3	41 516	41 351	-0.4
Other Paper and Board	4 124	3 945	-4.3	3 802	3 689	-3.0
Total Paper and Board	92 427	89 581	-3.1	77 500	74 891	-3.4
Including Speciality Paper and Board¹	10 521	10 519	0.0			

Paper and Board Production by Country in 2019

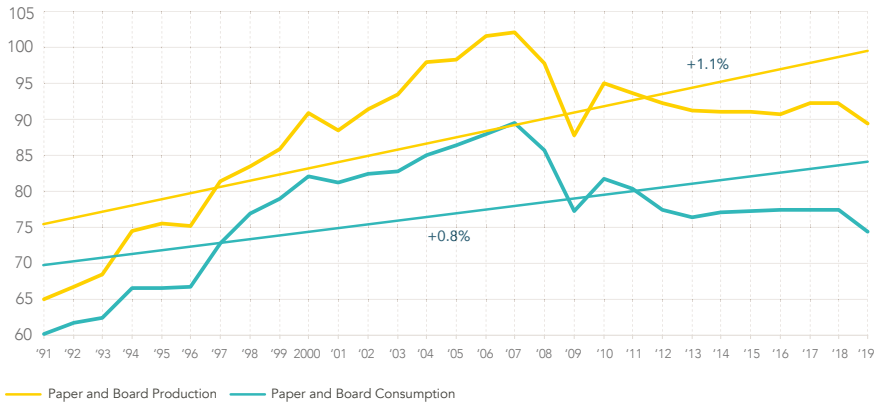


¹ Speciality paper and board can be defined as paper or board that require properties (physical, optical, electrical, chemical and/or other special considerations) that are different from the norm for the market sector and application being served. Speciality paper and board can be found under several Cepi grades: wrappings, carton board, graphic paper, sanitary and household and other paper and board.

Based on AWA (Alexander Watson Associates) and Cepi estimates.

Paper and Board Production and Consumption

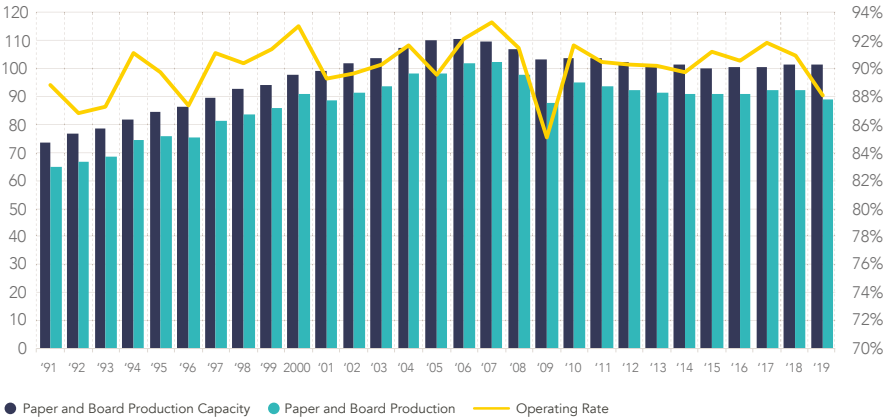
Million Tonnes



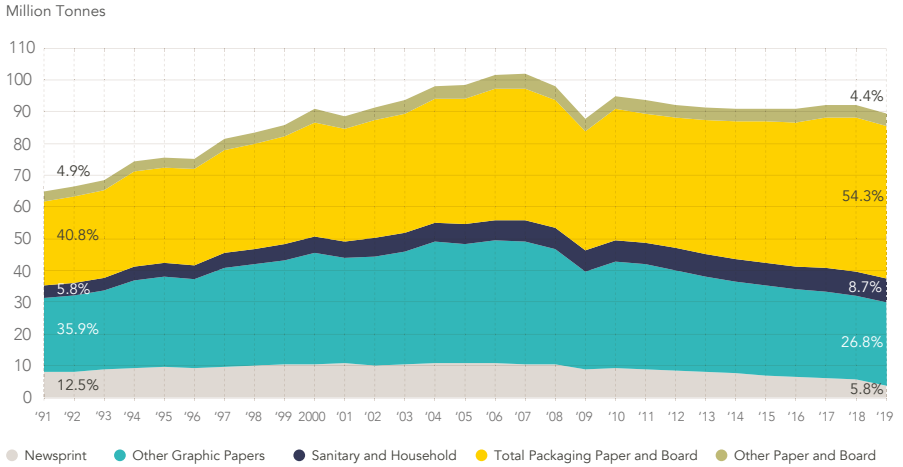
Paper and Board Production and Capacity

Paper and Board Production (Million Tonnes)

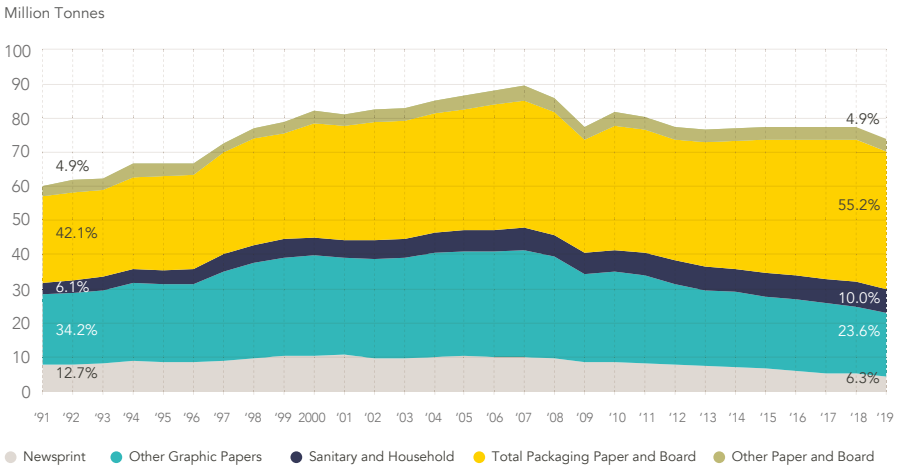
Operating Rate



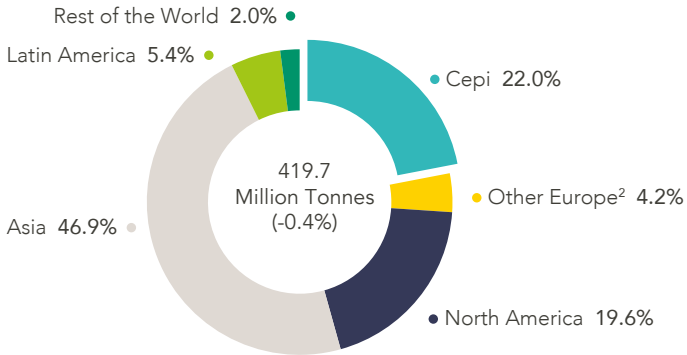
Paper and Board Production by Grade



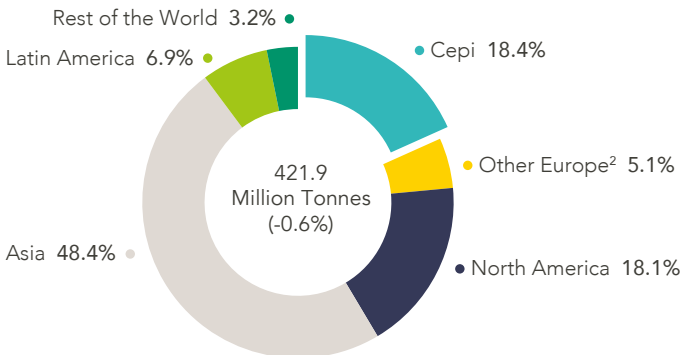
Paper and Board Consumption by Grade



Paper and Board Production by Region in 2018¹



Paper and Board Consumption by Region in 2018¹



¹ Sources: Cepi, RISI - 2019 figures will be available end-2020.

² Other Europe: total Europe excluding Cepi countries.

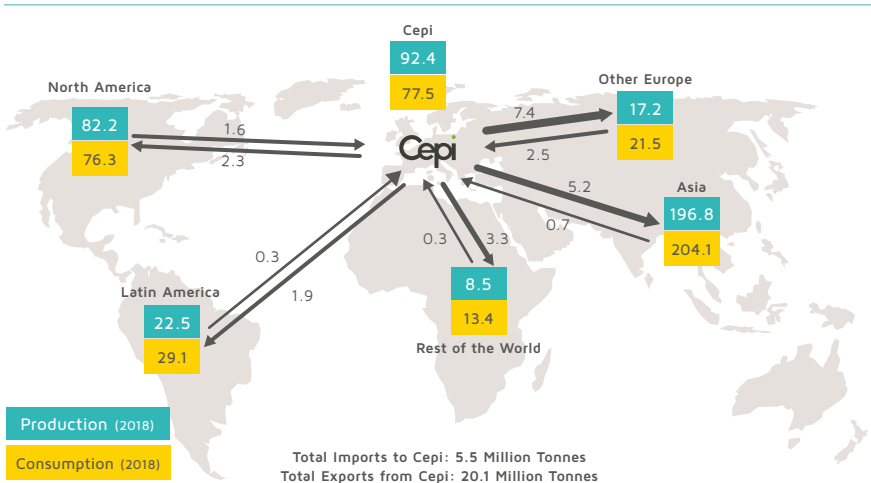
Paper and Board Exports to Other Regions

'000 Tonnes	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Other Europe ¹	6 090	7 349	7 288	7 407	7 417	36.8	0.1
North America	2 283	2 055	2 069	2 611	2 348	11.7	-10.1
Latin America	874	1 879	1 794	2 028	1 874	9.3	-7.6
Asia	2 933	5 099	4 980	5 252	5 155	25.6	-1.8
Rest of the World	1 707	2 783	3 063	3 212	3 349	16.6	4.3
Total	13 887	19 164	19 194	20 510	20 145	100.0	-1.8

Paper and Board Imports from Other Regions


'000 Tonnes	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Other Europe ¹	3 318	2 525	2 544	2 668	2 539	46.6	-4.8
North America	2 191	1 829	1 608	1 719	1 578	28.9	-8.2
Latin America	198	498	363	362	336	6.2	-7.1
Asia	332	625	581	628	737	13.5	17.3
Rest of the World	344	307	270	206	264	4.8	28.4
Total	6 383	5 783	5 367	5 583	5 455	100.0	-2.3

Trade Flows of Paper and Board in 2019 (Million Tonnes)



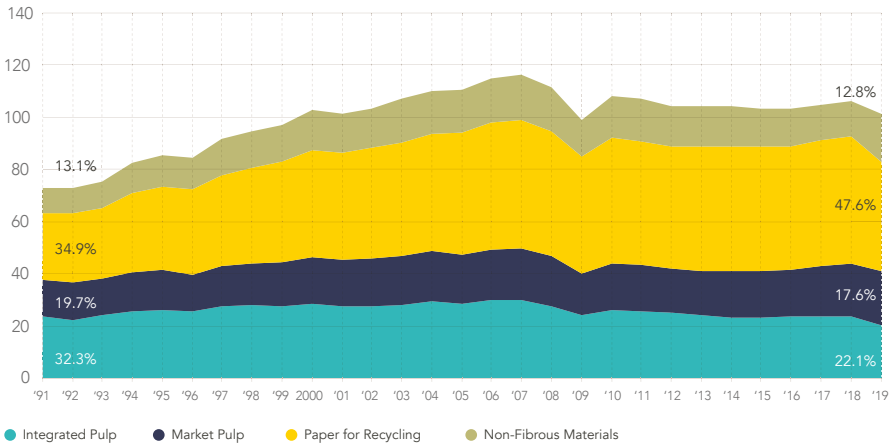
¹Other Europe: total Europe excluding Cepi countries.

Raw Materials Consumption

'000 Tonnes	1991	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Integrated Pulp	23 483	28 362	25 989	23 178	23 923	22 678	22.1	-5.2
Market Pulp	14 332	18 015	17 860	17 930	19 737	18 074	17.6	-8.4
Paper for Recycling 	25 360	40 922	48 122	47 751	49 047	48 876	47.6	-0.3
Non-Fibrous Materials	9 504	15 609	16 218	14 475	13 901	13 158	12.8	-5.3
Total Raw Materials	72 679	102 908	108 189	103 333	106 608	102 785	100.0	-3.6

Raw Materials Consumption

Million Tonnes



Wood Consumption

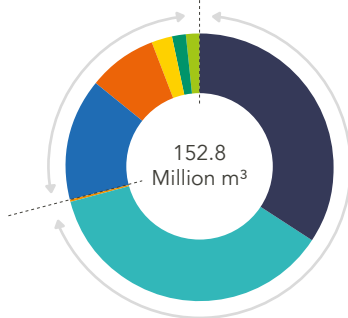
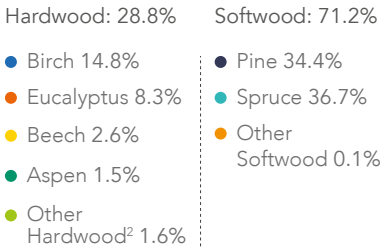
'000 m ³	1991	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Softwood Roundwood	65 240	72 372	76 641	70 532	76 393	75 694	49.5	-0.9
Softwood Chips	24 623	35 673	34 141	33 497	35 224	35 064	22.9	-0.5
Total Softwood	89 863	108 046	110 782	104 028	111 617	110 758	72.5	-0.8
Hardwood Roundwood	28 963	38 542	36 635	38 293	39 606	39 822	26.1	0.5
Hardwood Chips	1 447	1 505	1 483	2 134	2 021	2 251	1.5	11.3
Total Hardwood	30 410	40 048	38 119	40 428	41 628	42 073	27.5	1.1
Total Roundwood	94 204	110 915	113 276	108 825	115 999	115 517	75.6	-0.4
Total Chips 	26 070	37 179	35 625	35 631	37 246	37 314	24.4	0.2
Total Wood	120 274	148 093	148 901	144 456	153 245	152 831	100.0	-0.3



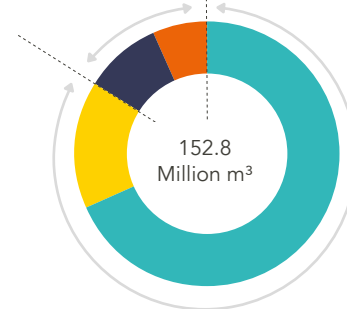
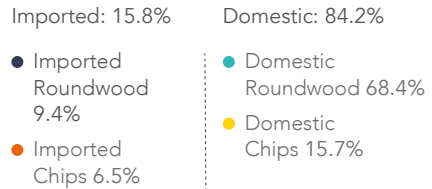
Woodchips used to produce pulp are residues from sawmills and woodworking industry, and are in fact an important contribution to circular economy through industrial symbiosis, although traditionally not reported by Cepi as recycling.

Share in Wood Consumption in 2019

By Species¹



By Origin

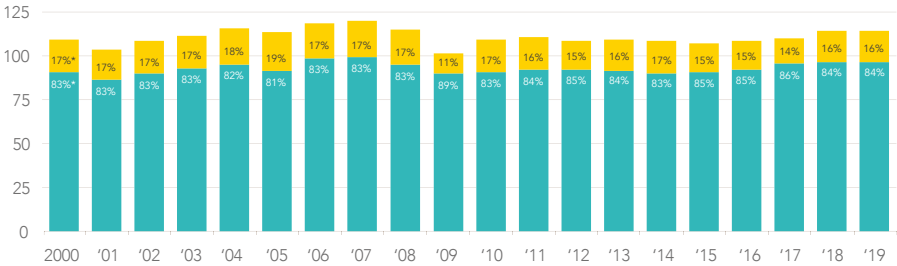


¹ Based on a sample representing 90% of total Cepi consumption.

² Other Hardwood = hornbeam, ash, maple, accacia, quercus-cerris, oak, alder, poplar, willow, chesnut.

Wood Consumption by Origin

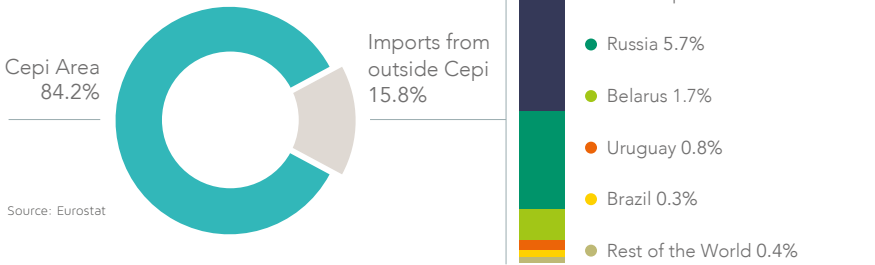
Million Tonnes



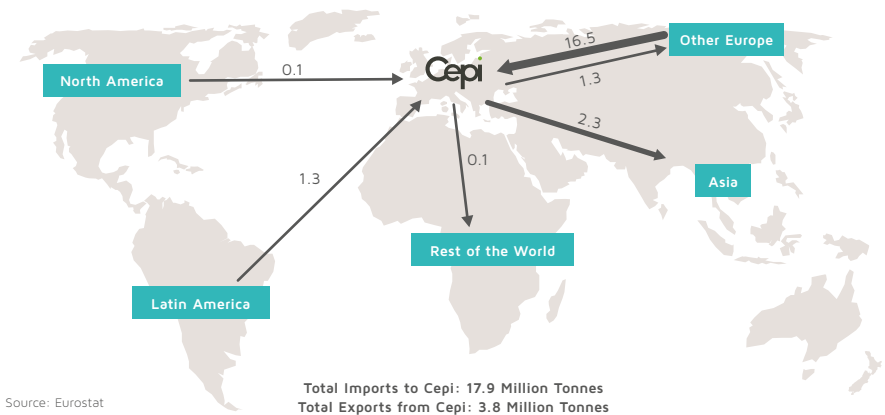
● Wood from Domestic Origin ● Imported Wood

* Percentage of total wood consumption.

Wood Consumption Origin in 2019



Trade Flows of Wood in 2019 (Million Tonnes)



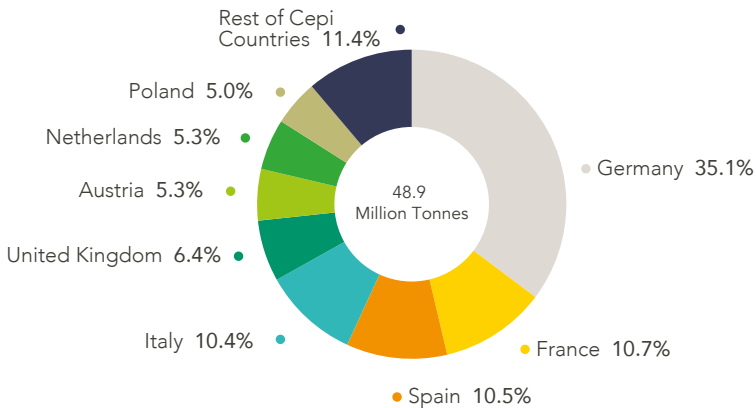
Utilisation of Paper for Recycling by Sector in 2019

'000 Tonnes Paper Sector	Grades of Paper for Recycling							
	A Mixed Grades	B Corrugated and Kraft	C Newspapers & Magazines	D Other Grades	E Total Use of Paper for Recycling	F Utilisation by Sector ¹ %	G Total P&B Production	E/G Utilisation Rate ² %
Newsprint	23	1	4 687	121	4 833	9.9	5 195	93.0
Other Graphic Papers	51	2	2 608	490	3 152	6.4	24 020	13.1
Total Graphic Papers	74	3	7 295	612	7 985	16.3	29 215	27.3
Case Materials	4 787	22 538	204	872	28 400	58.1	30 321	93.7
Carton Board	1 722	793	82	756	3 353	6.9	9 585	35.0
Wrappings, Other Pack.	2 148	1 946	160	483	4 737	9.7	8 738	54.2
Total Packaging Paper and Board	8 657	25 277	445	2 111	36 490	74.7	48 645	75.0
Sanitary and Household	266	148	492	2 023	2 929	6.0	7 775	37.7
Other Paper and Board	192	1 050	76	141	1 459	3.0	3 945	37.0
Total Paper and board	9 189	26 479	8 309	4 886	48 863	100.0	89 581	54.5
Share of Total	18.8%	54.2%	17.0%	10.0%	100.0%			

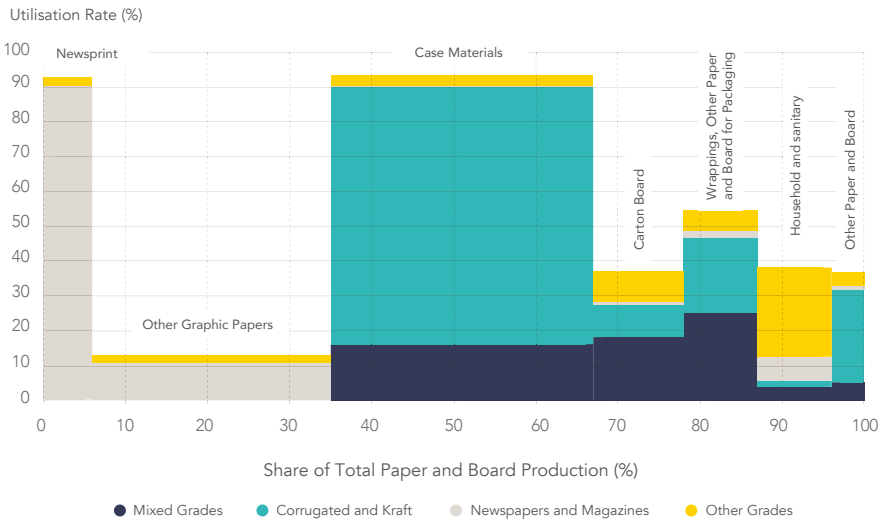
¹Utilisation by sector: total use of paper for recycling in a sector as a percentage of the total paper for recycling used by the industry.

²Utilisation rate: use of paper for recycling in a sector as a percentage of total paper and board production in that sector.

Utilisation of Paper for Recycling by Country in 2019



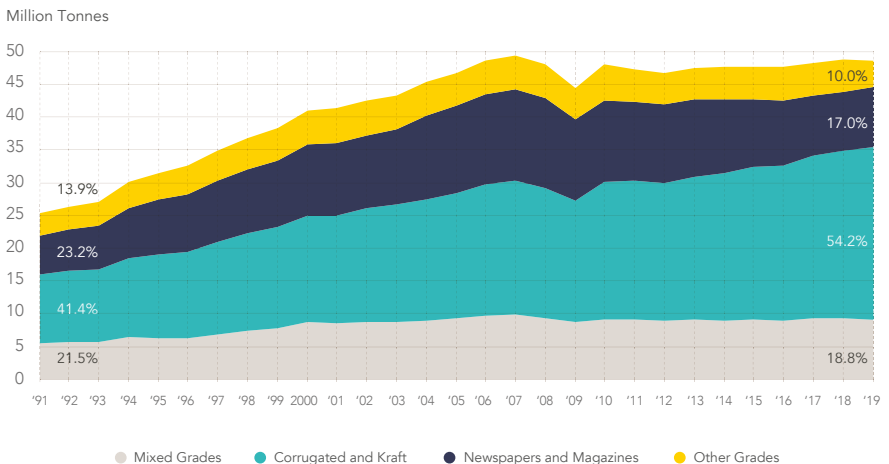
Utilisation of Paper for Recycling by Sector in 2019



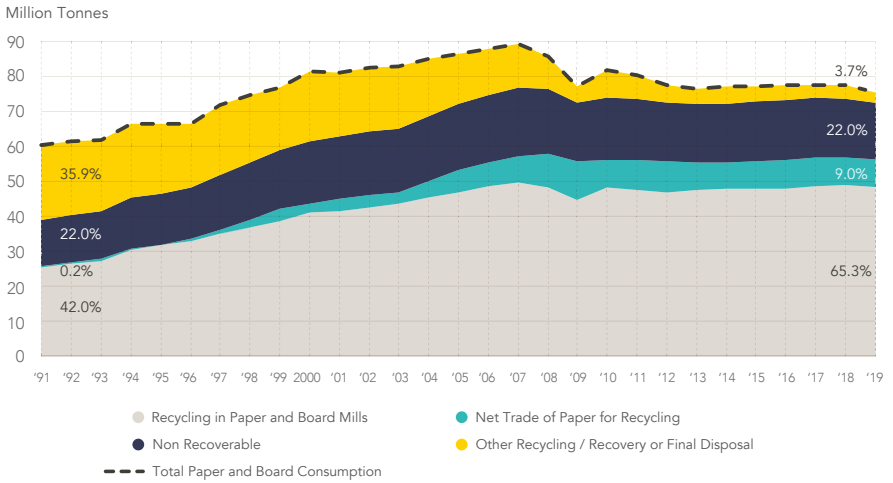
For instance: case materials represent 34% of total paper and board production, have an utilisation rate of 94% and use 58% of total paper for recycling volumes used by the industry.

Important Note: Paper for recycling is composed of fibres but also unusable materials - non-paper components as well as paper and board detrimental to production. The share of unusable materials depends on the actual sorting and collection of used paper. It varies according to grades of paper for recycling and countries. The volume of recycled fibres actually used to produce new paper is therefore lower than the volume of paper for recycling considered. The utilisation rate compares utilisation of paper for recycling to paper and board production.

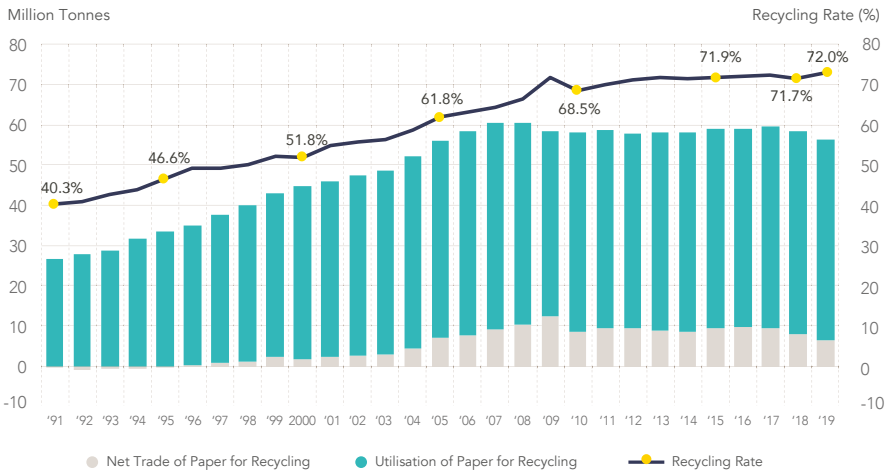
Utilisation of Paper for Recycling by Grade



Paper and Board Consumption and Recycling



Utilisation, Net Trade and Recycling Rate¹ of Paper for Recycling in Europe²



¹ Recycling Rate = "Utilisation of Paper for Recycling + Net Trade of Paper for Recycling", compared to Paper and Board Consumption.

² Europe means EU-28 countries plus Norway and Switzerland.

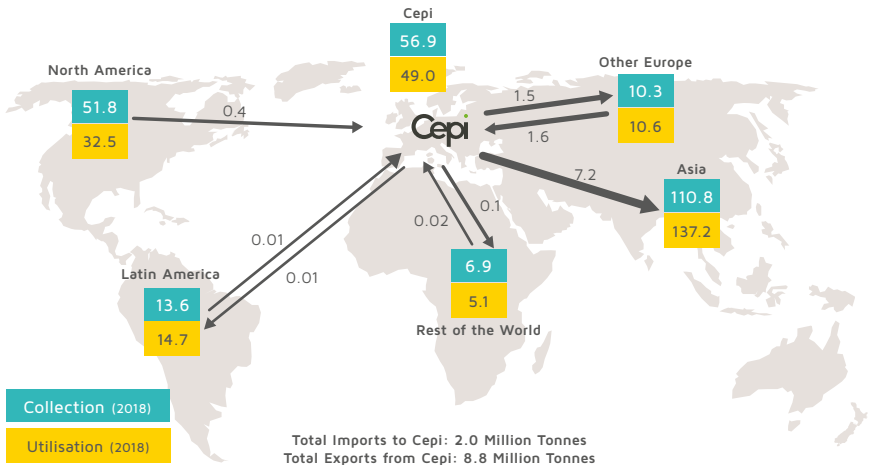
Exports of Paper for Recycling to Other Regions

'000 Tonnes	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Other Europe ¹	676	373	667	965	1 496	17.0	55.0
North America	47	27	1	5	2	0.0	-50.0
Latin America	7	21	9	32	11	0.1	-65.2
Asia	2 894	9 157	9 396	8 762	7 161	81.4	-18.3
Rest of the World	127	14	13	154	121	1.4	-
Total	3 751	9 592	10 086	9 918	8 792	100.0	-11.3

Imports of Paper for Recycling from Other Regions

'000 Tonnes	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Other Europe ¹	735	1 596	1 787	1 617	1 639	80.1	1.4
North America	264	184	185	389	376	18.4	-3.2
Latin America	0	3	18	27	7	0.3	-74.0
Asia	9	6	3	3	3	0.1	-2.5
Rest of the World	7	8	15	30	20	1.0	-32.6
Total	1 015	1 796	2 008	2 065	2 046	100.0	-0.9

Trade Flows of Paper for Recycling in 2019 (Million Tonnes)

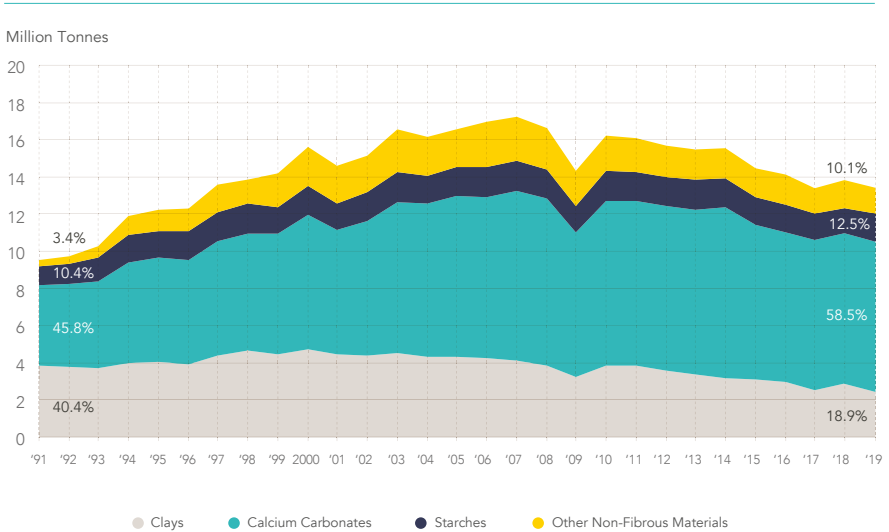


¹Other Europe: total Europe excluding Cepi countries.


Non-Fibrous Materials Consumption

'000 Tonnes	1991	2000	2010	2015	2018	2019	% Share of Total	% Change 2019/2018
Clays (coating and filler)	3 842	4 716	3 825	3 080	2 719	2 484	18.9	-8.6
Calcium Carbonates (coating and filler)	4 349	7 247	8 903	8 324	8 055	7 698	58.5	-4.4
Starches (native and modified)	989	1 551	1 593	1 521	1 658	1 648	12.5	-0.6
Other Non-Fibrous Materials	324	2 095	1 897	1 550	1 469	1 328	10.1	-9.6
Non-Fibrous Materials	9 504	15 609	16 218	14 475	13 901	13 158	100.0	-5.3

Non-Fibrous Materials Consumption



Primary Energy and Electricity Consumption¹

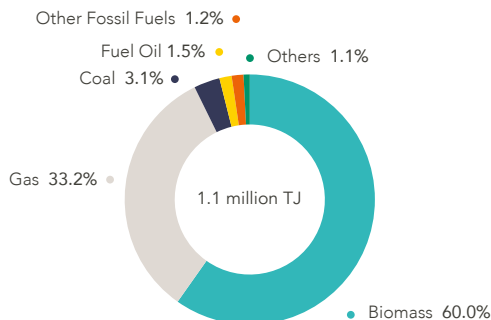
Primary Energy Consumption TJ	1991	2000	2010	2015	2017	2018	% Share of Total ²	% Change 2018/2017
Gas	259 593	404 946	489 565	395 064	384 278	381 052	29.0	-0.8
Fuel Oil	129 461	90 914	37 856	19 368	18 804	17 399	1.3	-7.5
Coal	113 867	59 304	53 280	45 925	38 693	35 051	2.7	-9.4
Other Fossil Fuels	10 134	19 052	14 529	10 624	11 675	13 236	1.0	13.4
Biomass 	413 248	562 865	677 569	657 986	686 779	689 185	52.5	0.4
Other	3 560	4 151	8 948	12 374	15 465	13 166	1.0	-14.9
Total Fuels Consumption	929 863	1 141 232	1 281 746	1 141 341	1 155 695	1 149 089	87.5	-0.6
Net Bought Electricity	205 852	246 864	202 945	167 381	166 270	163 419	12.5	-1.7
Total Primary Energy Consumption	1 135 715	1 388 096	1 484 691	1 308 722	1 321 965	1 312 508	100.0	-0.7
Fraction of Biomass in Total Fuels Consumption	44.4%	49.3%	52.9%	57.7%	59.4%	60.0%		0.6

Electricity Consumption GWh	1991	2000	2010	2015	2017	2018	% Share of Total	% Change 2018/2017
Total Electricity Produced at Site	29 416	41 930	56 780	51 748	50 359	49 485	52.2	-1.7
Purchased Electricity	59 045	72 255	67 567	57 838	58 033	57 150	60.2	-1.5
Sold Electricity	-1 864	-3 681	-11 193	-11 343	-11 846	-11 755	12.4	-0.8
Total Electricity Consumption	86 527	110 424	113 137	98 243	96 545	94 879	100.0	-1.7
% of Electricity produced through CHP³	88.0%	90.4%	95.4%	96.2%	95.5%	95.5%		0.0



In 2018, 60% of fuels used in the pulp and paper industry came from biomass; large amount of that is process residues.

Fuels Consumption in 2018¹



¹Excluding Hungary, Romania & Slovenia - excluding Poland before 2003.

²CHP: combined heat and power (compared to total on-site electricity generation).

³Share of total primary energy consumption (including net bought electricity).

Key Figures on Energy and Environment¹

	1991	2000	2010	2015	2017	2018	% Change 2018/2017	% Change 2018/1991
Energy Consumption								
Production of Market Pulp and Paper and Board ('000 Tonnes)	71 971	98 691	106 084	102 047	104 292	104 732	0.4	45.5
Specific Primary Energy Consumption (TJ/kt)	15.78	14.07	14.00	12.82	12.68	12.53	-1.1	-20.6
Specific Electricity Consumption (MWh/kt)	1.20	1.12	1.07	0.96	0.93	0.91	-2.1	-24.6
Direct CO₂ Emissions²								
Absolute (Mega Tonnes)	39.05	41.94	37.83	32.39	32.22	32.02	-0.6	-18.0
Specific (kt CO ₂ / kt of product)	0.54	0.42	0.35	0.31	0.30	0.30	-1.1	-44.8
Indirect CO₂ Emissions³								
Absolute (Mega Tonnes)	13.88	14.33	11.59	10.30	10.05	9.98	-0.8	-28.1
Specific (kt CO ₂ / kt of product)	0.19	0.15	0.11	0.10	0.10	0.10	-1.2	-50.6
Water Specific Emissions								
COD (kg / T of product)	23.36	9.08	6.32	5.61	5.41	5.31	-1.9	-77.3
AOX (kg / T of product)	0.433	0.049	0.030	0.022	0.022	0.021	-5.2	-95.1
Air Specific Emissions								
SO ₂ (kg S / T of product)	1.32	0.40	0.24	0.16	0.13	0.09	-28.4	-92.8
NOx (kg NOx / T of product)	1.31	0.90	0.85	0.73	0.67	0.63	-5.4	-51.8

¹ Excluding Hungary, Romania & Slovenia - excluding Poland before 2003.

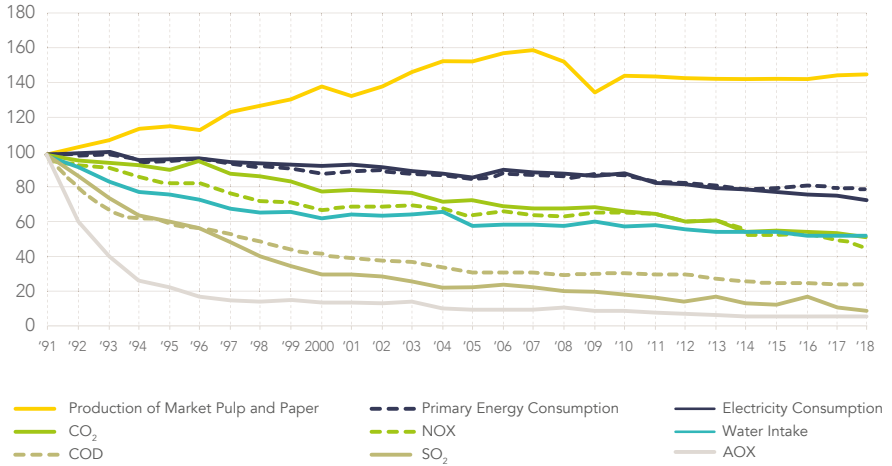
² Including all Cepi countries from 2005. See Key Figures for the 2018 data.

³ Indirect CO₂ Emissions: CO₂ emissions from net bought electricity, calculated as "net bought electricity" multiplied by the "electricity emissions factor" applied in each country.

Note: Direct CO₂ Emissions are the fossil emissions produced by pulp and paper mills and connected energy plants.

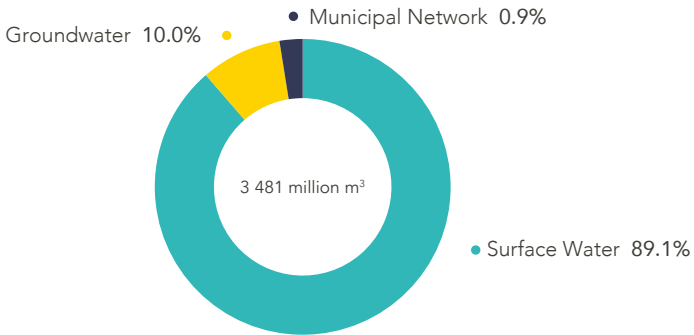
Evolution of Environmental Impacts

Index of Specific Values (1991=100)



Water Emissions: COD (Chemical Oxygen Demand) - AOX
 Air Emissions: CO₂ - NOX (Azote Oxides) - SO₂

Sources of Water Intake in 2018¹

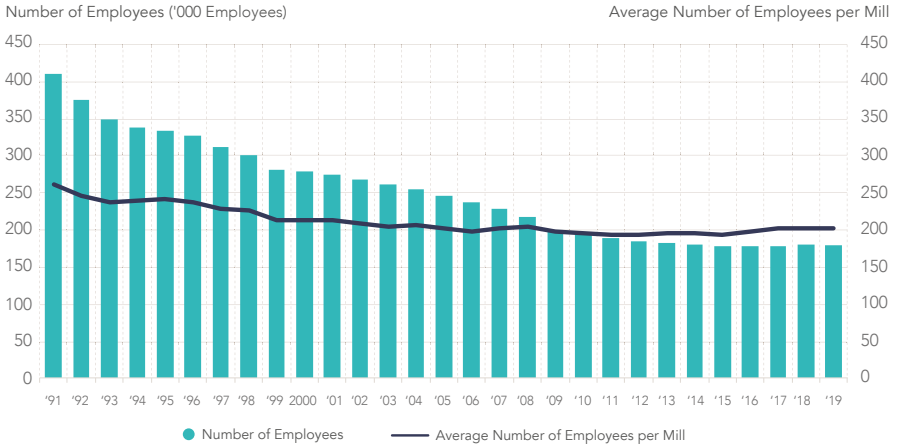


¹ Excluding Hungary, Romania & Slovenia - excluding Poland before 2003.

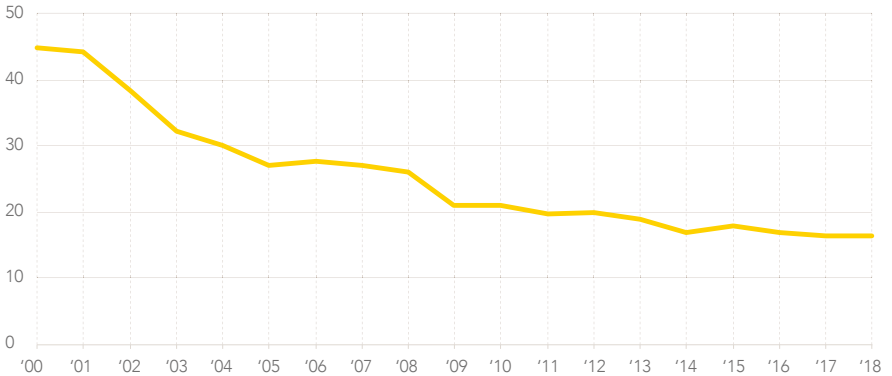


More than 90% of the water is returned to the source, in good condition, after being recycled several times within the paper and board mill.

Employment Evolution



Accident Rate¹



¹ Accident rate: Number of accidents (fatal and non-fatal) x 1000/number of employees (absence of more than 3 days)
 Include Austria, Finland, France, Germany, Italy, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom.
 Data for 2019 will be available end-2020.

PULP

Pulp Consumption: production + Imports from outside Cepi - Exports to outside Cepi

Integrated Pulp Production: integrated pulp is produced for use as raw material in the production of paper at the same mill, or for shipment by a producing mill to other mills, which it owns, controls or with which it is affiliated within the same country and therefore not sold on the open market.

Pulp Grades:

Mechanical - Stone groundwood: pulp produced by grinding wood into relatively short fibres.

Cepi Harmonised Code is 923 000 000.

Thermo-mechanical: pulp produced in a thermo-mechanical process where wood particles are softened by steam before entering a pressurised refiner. Cepi Harmonised Code is 923 400 000.

Semi-chemical: pulp produced in a two-stage process which involves partial digestion with chemicals, followed by mechanical treatment in a disc refiner. Cepi Harmonised Code is 921 000 000.

Chemical - Sulphite: pulp produced by cooking wood chips in a pressure vessel in the presence of bisulphite liquor. Cepi Harmonised Code is 922 200 000.

Chemical - Sulphate (or kraft): pulp produced by cooking wood chips in pressure vessels in the presence of a sodium hydroxide (soda) liquor. Cepi Harmonised Code is 922 100 000.

Other Pulp: pulp produced from fibres other than wood, such as sugar cane bagasse, wheat straw, kenaf, cotton rags and hemp.

PAPER AND BOARD

Paper and Board Consumption: production + Imports from outside Cepi - Exports to outside Cepi

Paper and Board Grades:

Newsprint: paper mainly used for printing newspapers. Cepi Harmonised Code is 100 000 000.

Uncoated mechanical: paper suitable for printing or other graphic purposes where less than 90% of the fibre furnish consists of chemical pulp fibres. Cepi Harmonised Code is 211 000 000.

Uncoated woodfree: paper suitable for printing or other graphic purposes, where at least 90% of the fibre furnish consists of chemical pulp fibres. Cepi Harmonised Code is 231 000 000.

Coated papers: all paper suitable for printing or other graphic purposes and coated on one or both sides with minerals such as china clay (kaolin), calcium carbonate, etc.

Cepi Harmonised Code for Coated Mechanical is 212 000 000 and for Coated Woodfree is 232 000 000.

Sanitary and Household: this covers a wide range of tissue and other hygienic papers for use in households or commercial and industrial premises. Cepi Harmonised Code is 700 000 000.

Case materials: papers and boards mainly used in the manufacture of corrugated board.

Included are kraftliner, testliner, semi-chemical fluting, and waste-based fluting (Wellenstoff).

Also known as containerboard, corrugated case materials, cardboard, linerboard or corrugating medium.

Cepi Harmonised Code is 300 000 000.

Carton board: made from virgin and/or recovered fibres, mainly used in cartons for consumer products.

Also known as solid board, folding box board, boxboard or carrier board. Cepi Harmonised Code is 400 000 000.

Wrappings: papers whose main use is wrapping or packaging made from any combination of virgin or recovered fibres, bleached or unbleached. Included are sack kraft, other wrapping krafts, sulphite and grease-proof papers.

Cepi Harmonised Code is 500 000 000.

Other paper and board for packaging: this category embraces all paper and board mainly for packaging purposes other than those listed above. Cepi Harmonised Code is 600 000 000.

Other paper and board: includes cigarette papers and filter papers, as well as gypsum liners and special papers for waxing, insulating, roofing, asphaltting, and other specific applications or treatments. Cepi Harmonised Code is 800 000 000.

PAPER FOR RECYCLING

Collection: utilisation - Imports from outside Cepi + Exports to outside Cepi

Utilisation rate: percentage of paper for recycling utilisation compared to the total paper & board production.

Important Note: paper for recycling is composed of fibres but also unusable materials - non-paper components as well as paper and board detrimental to production. The share of unusable materials depends on the actual sorting and collection of used paper. It varies according to paper for recycling grades and countries. The volume of recycled fibres actually used to produce new paper is therefore lower than the volume of paper for recycling considered. The utilisation rate compares utilisation of paper for recycling to paper & board production.

Recycling rate: "utilisation of paper for recycling + net trade of paper for recycling", compared to paper and board consumption.

Utilisation by sector: total utilisation of paper for recycling in a sector as percentage of the overall utilisation of paper for recycling.

More information can be found in the Cepi booklet "Pulp and paper industry - definitions and concepts" available on Cepi's website.



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