

KEY STATISTICS 2021

European pulp & paper industry

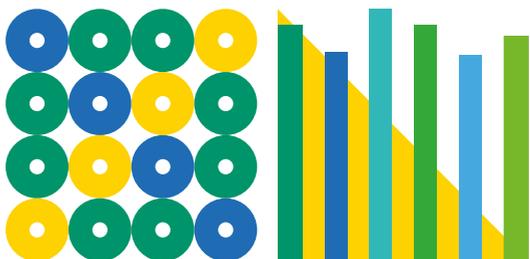


Table of Contents

Introduction		3
Key Figures		4
From Raw Materials to Paper and Board		6
Pulp	Industry Structure	7
	Production and Consumption	8
	Production and Consumption by Grade	9
	Production and Consumption - Global View	10
	Exports and Imports	11
Paper and Board	Industry Structure	12
	Production and Consumption	13
	Production and Production Capacity	14
	Production and Consumption by Grade	15
	Production and Consumption - Global View	16
	Exports and Imports	17
Raw Materials Summary	Raw Materials Consumption	18
Wood	Consumption by Species	19
	Trade Flows and Origin	20
Paper for Recycling	Utilisation by Sector	21
	Utilisation by Sector and by Grade	22
	Utilisation and Recycling Rate	23
	Exports and Imports	24
Non-Fibrous Materials	Non-Fibrous Materials Consumption	25
Energy	Energy and Electricity Consumption	26
Energy and Environment	Key Figures	27
	Environmental Impact and Water	28
Social Affairs	Employment and Accidents	29
Glossary		30
Cepi National Associations' Contact Details		31

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 2021.

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 Library at <https://library.cepi.org/> 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 490 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 91% of the European² pulp and paper industry in terms of production. The pulp and paper industry provides

179 000 jobs in Europe directly. It has a turnover of 95 billion euros and adds 21 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 2021

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/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 <https://www.cepi.org/statistics-order-form/>
- Or contact Ariane Crèvecoeur – Statistics Manager – a.crevecoeur@cepi.org

² Europe minus the Russian Federation



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Pulp and Paper Industry

	1991	2000	2010	2015	2020	2021	% Change 2021/2020	% Change 2021/2010
Industry Structure								
Number of Companies ¹	1 082	979	728	688	684	679	-0.7	-6.7
Number of Mills	1 570	1 309	994	921	894	886	-0.9	-10.9
Pulp	296	233	172	155	152	151	-0.7	-12.2
Paper and Board	1 274	1 076	822	766	742	735	-0.9	-10.6
Number of Paper Machines	2 182	1 858	1 396	1 292	1 243	1 220	-1.7	-12.3
Employment	411 113	279 987	194 894	178 418	182 880	179 270	-2.0	-8.0
Turnover ² (Million Euros)	n.a.	79 388	75 790	80 679	82 000	95 000	15.9	25.3
Investments ² (Million Euros)	n.a.	5 637	2 913	4 181	4 500	4 500	0.0	54.5
Added Value ² (Million Euros)	n.a.	24 494	16 560	18 262	18 000	21 000	16.7	26.8
Total Pulp³ ('000 Tonnes)								
Production Capacity	39 584	43 842	44 189	40 805	43 324	43 409	0.2	-1.8
Operating Rate	85.4%	91.2%	87.6%	88.9%	83.2%	85.9%	2.7	-1.6
Production	33 807	39 962	38 695	36 256	36 049	37 297	3.5	-3.6
Cepi Internal Deliveries	n.a.	39 224	37 045	35 392	33 899	36 241	6.9	-2.2
Consumption ⁷ (Apparent)	37 815	46 377	43 849	41 108	37 794	40 258	6.5	-8.2
Market Pulp ('000 Tonnes)								
Production	9 314	11 423	12 706	13 078	15 321	15 226	-0.6	19.8
Exports to Outside Cepi	n.a.	1 332	2 567	3 240	6 532	5 734	-12.2	123.4
Imports from Outside Cepi	n.a.	7 924	7 721	8 091	8 277	8 695	5.1	12.6
Trade Balance with Outside Cepi	n.a.	-6 592	-5 154	-4 851	-1 745	-2 961	69.7	-42.5
Consumption ⁷ (Apparent)	14 332	18 015	17 860	17 930	17 065	18 187	6.6	1.8
Exports/Production	n.a.	11.7%	20.2%	24.8%	42.6%	37.7%	-5.0	17.5
Imports/Consumption	n.a.	44.0%	43.2%	45.1%	48.5%	47.8%	-0.7	4.6
Paper and Board ('000 Tonnes)								
Production Capacity	73 280	97 658	103 714	99 832	100 744	100 567	-0.2	-3.0
Operating Rate	88.8%	93.0%	91.7%	91.1%	84.7%	90.1%	5.4	-1.6
Production	65 052	90 823	95 065	90 982	85 349	90 583	6.1	-4.7
Cepi Internal Deliveries	n.a.	78 796	80 263	77 628	73 090	77 623	6.2	-3.3
Exports to Outside Cepi	n.a.	13 887	19 164	19 194	19 366	20 160	4.1	5.2
Imports from Outside Cepi	n.a.	6 383	5 783	5 367	5 124	4 796	-6.4	-17.1
Trade Balance with Outside Cepi	n.a.	7 504	13 381	13 827	14 242	15 364	7.9	14.8
Consumption ⁷ (Apparent)	60 102	82 065	81 684	77 155	71 108	75 219	5.8	-7.9
Exports/Production	n.a.	15.3%	20.2%	21.1%	22.7%	22.3%	-0.4	2.1
Imports/Consumption	n.a.	7.8%	7.1%	7.0%	7.2%	6.4%	-0.8	-0.7

	1991	2000	2010	2015	2020	2021	% Change 2021/2020	% Change 2021/2010
Wood ('000 m³)								
Consumption	120 274	148 093	148 901	144 456	146 515	152 161	3.9	2.2
Hardwood	30 410	40 048	38 119	40 428	40 192	40 229	0.1	5.5
Softwood	89 863	108 046	110 782	104 028	106 323	111 932	5.3	1.0
Imports/Consumption	12.8%	17.1%	17.1%	15.3%	14.5%	14.3%	-0.2	-2.8
Domestic/Consumption	87.2%	82.9%	82.9%	84.7%	85.5%	85.7%	0.2	2.8
Paper for Recycling ('000 Tonnes) 								
Collection	25 452	43 658	55 917	55 829	54 462	55 404	1.7	-0.9
Utilisation	25 360	40 922	48 122	47 751	47 951	50 737	5.8	5.4
Exports to Outside Cepi	n.a.	3 751	9 592	10 086	8 364	6 893	-17.6	-28.1
Imports from Outside Cepi	n.a.	1 015	1 796	2 008	1 852	2 226	20.2	23.9
Trade Balance with Outside Cepi	n.a.	2 736	7 795	8 078	6 512	4 667	-28.3	-40.1
Utilisation Rate	39.0%	45.1%	50.6%	52.5%	56.2%	56.0%	-0.2	5.4
Exports/Collection	n.a.	8.6%	17.2%	18.1%	15.4%	12.4%	-2.9	-4.7
Imports/Utilisation	n.a.	2.5%	3.7%	4.2%	3.9%	4.4%	0.5	0.7
Recycling Rate in Europe⁴   								
Recycling Rate	40.3%	51.8%	68.5%	71.9%	73.3%	71.4%	-2.0	2.8
Non-Fibrous Materials ('000 Tonnes)								
Consumption	9 504	15 609	16 218	14 475	10 684	11 409	6.8	-29.6
Energy and Environment⁵								
Fuels Consumption ('000 Tj)	930	1 141	1 282	1 141	1 147	n.a.		
Biomass Use (%) of Total FC 	44.4	49.3	52.9	57.7	60.5	n.a.		
Electricity Consumption (GWh)	86 527	110 424	113 137	98 243	89 777	n.a.		
% of Electricity produced through CHP ⁶	88.0	90.4	95.4	96.2	95.7	n.a.		
CO₂ Emissions (Cepi Countries)								
CO ₂ Direct Emissions (Mega Tonnes)	39.05	41.94	37.83	32.38	28.93	28.17	-2.6	-25.5
Specific CO ₂ Emissions (kt CO ₂ / kt of product)	0.54	0.42	0.35	0.31	0.29	0.27	-7.4	-24.2

¹ 490 groups or corporations in 2021, when considering the entities established in one or several countries that are not bound together by legal and/or financial links

² 2020 and 2021 figures are based on members' data, Eurostat and estimates for some countries

³ Total Pulp = Market Pulp + Integrated Pulp

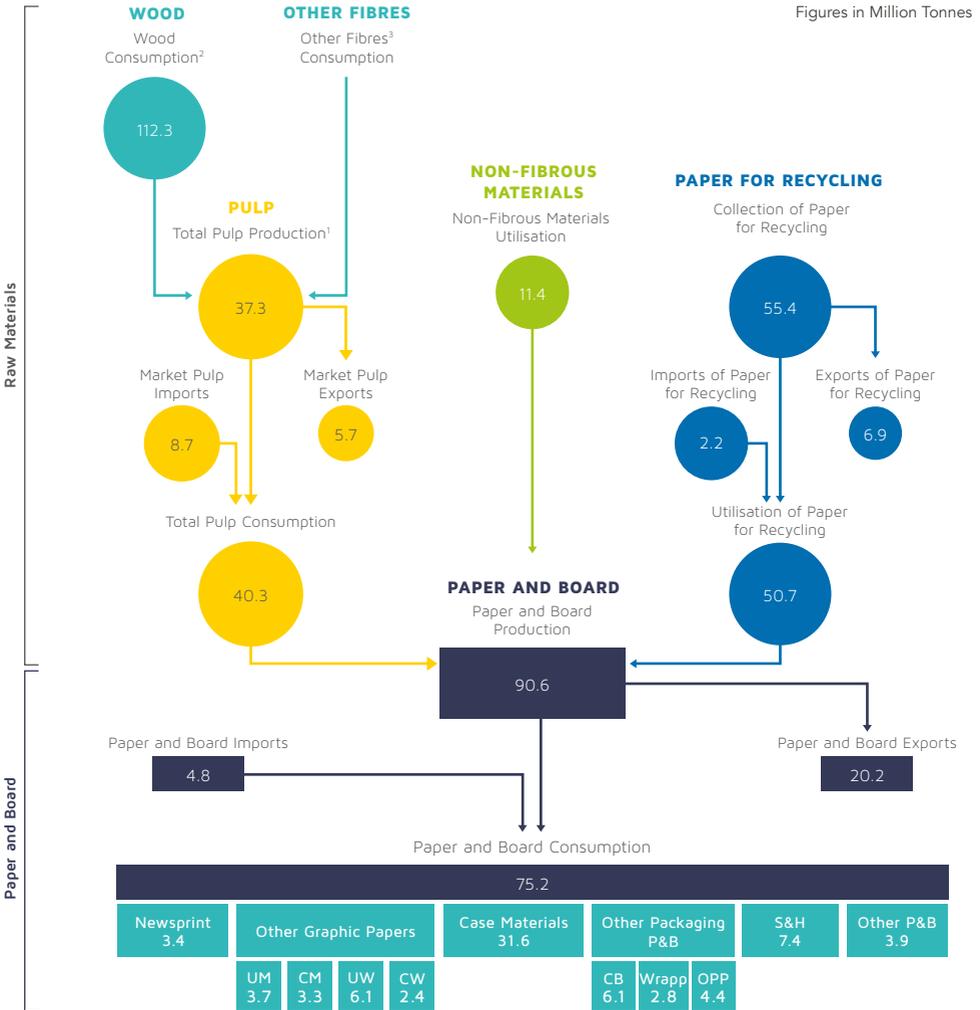
⁴ Europe means EU-27 countries plus Norway, Switzerland and United Kingdom

⁵ Hungary, Romania and Slovenia are not included in Energy data

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

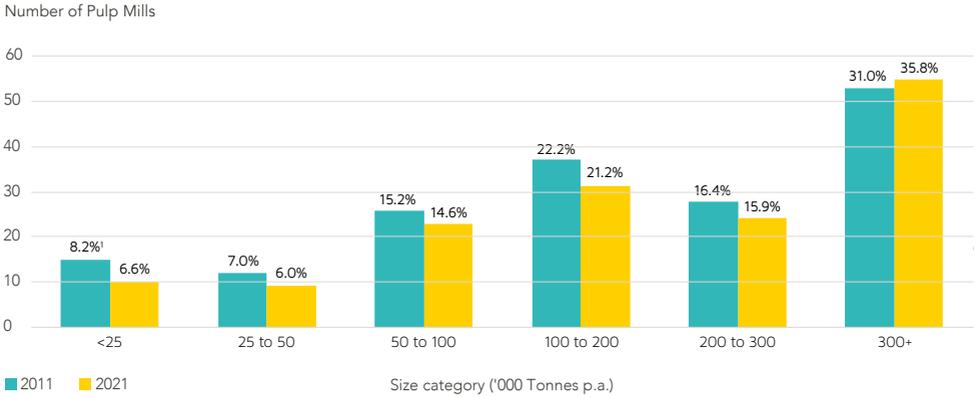
Pulp and Paper Industry in 2021



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

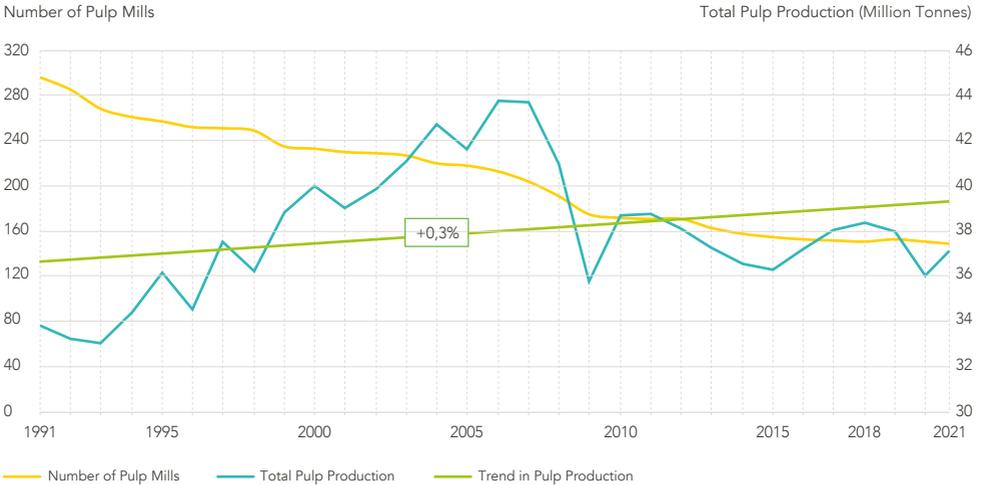
¹ of which Integrated Pulp 22.1 Million Tonnes
² Wood consumption: see definition on page 30
³ Straw, Bamboo, Bagasse, ...

Number of Pulp Mills by Volume in 2011 and 2021



¹ Share of Total Number of Mills

Number of Pulp Mills and Total Pulp Production



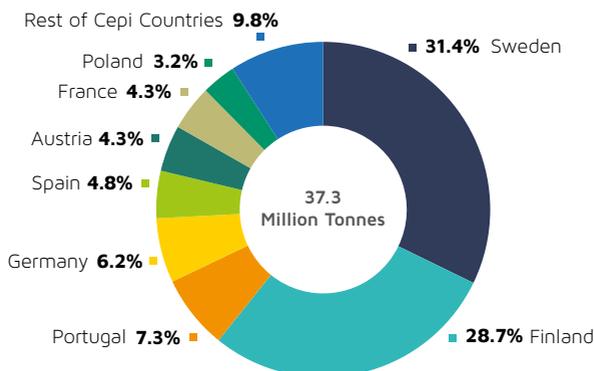
Total Pulp¹ Production and Consumption

Total Pulp ¹	Production			Consumption		
	2020	2021	% Change 2021/2020	2020	2021	% Change 2021/2020
Mechanical & Semi-Chemical	8 324	8 499	2.1	8 268	8 502	2.8
Sulphite Pulp	1 549	1 567	1.1	1 290	1 330	3.1
Sulphate Pulp	26 083	27 141	4.1	28 064	30 201	7.6
Total Chemical Pulp	27 633	28 707	3.9	29 354	31 531	7.4
Total Woodpulp	35 957	37 206	3.5	37 622	40 032	6.4
Other Pulp²	92	91	-1.6	172	226	31.7
Total Pulp¹	36 049	37 297	3.5	37 794	40 258	6.5

... of which Market Pulp Production and Consumption

Market Pulp	Production			Consumption		
	2020	2021	% Change 2021/2020	2020	2021	% Change 2021/2020
Mechanical & Semi-Chemical	1 190	1 185	-0.5	1 134	1 187	4.7
Sulphite Pulp	540	492	-8.9	281	256	-9.1
Sulphate Pulp	13 532	13 491	-0.3	15 512	16 551	6.7
Total Chemical Pulp	14 072	13 983	-0.6	15 793	16 807	6.4
Total Woodpulp	15 262	15 168	-0.6	16 927	17 994	6.3
Other Pulp²	59	58	-2.0	138	193	39.7
Total Market Pulp	15 321	15 226	-0.6	17 065	18 187	6.6

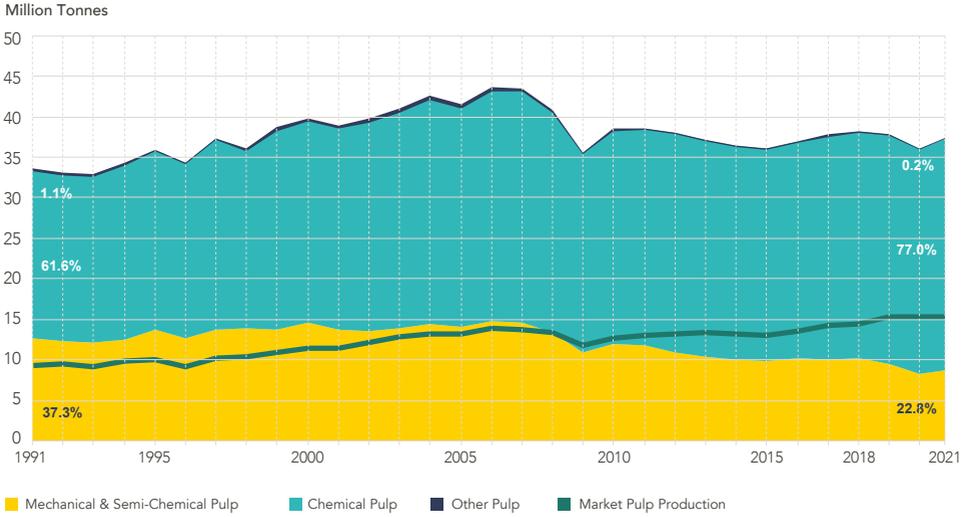
Total Pulp¹ Production by Country in 2021



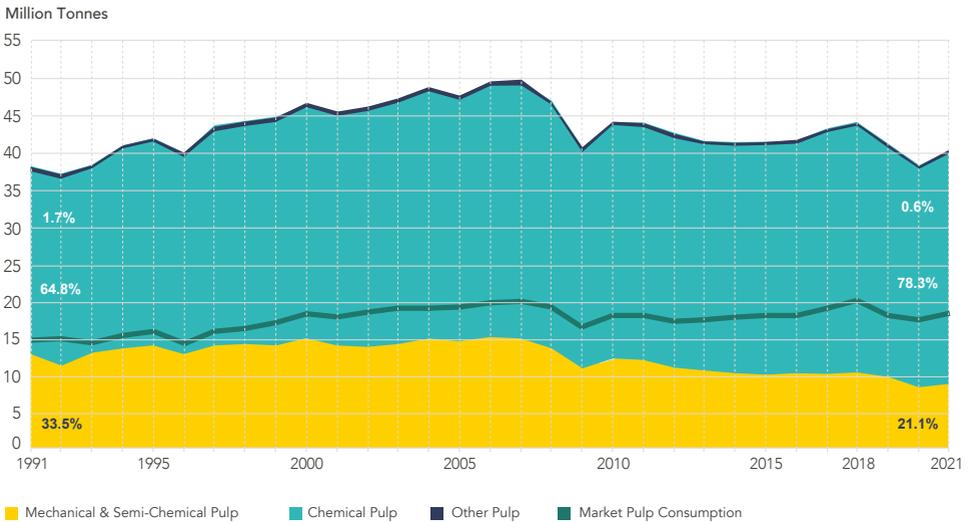
¹ Total Pulp = Market Pulp + Integrated Pulp

² Other Pulp: see definition page 30

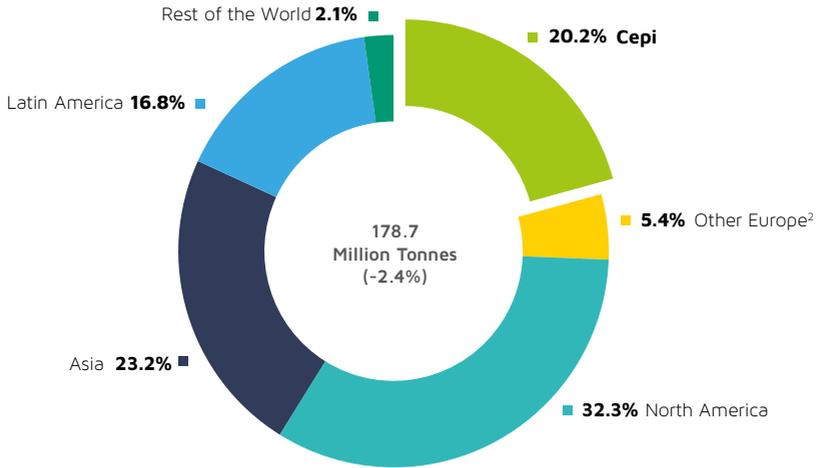
Total Pulp¹ Production by Grade and Market Pulp Production



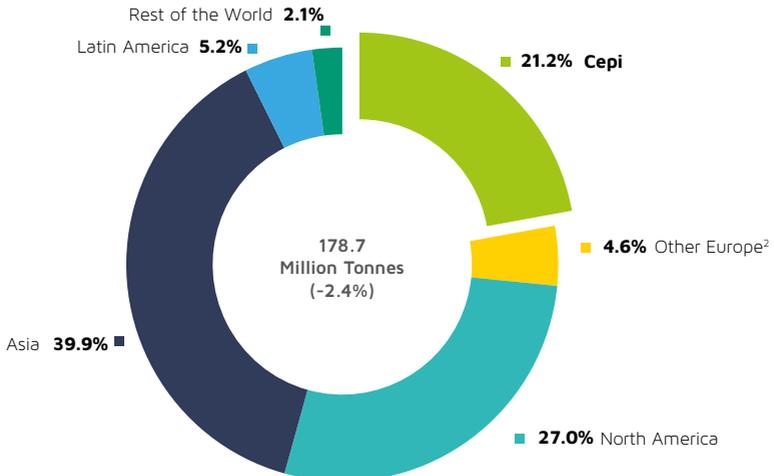
Total Pulp¹ Consumption by Grade and Market Pulp Consumption



World Total Pulp¹ Production by Region in 2020³



World Total Pulp¹ Consumption by Region in 2020³



¹ Total Pulp = Integrated Pulp + Market Pulp

² Other Europe: total Europe excluding Cepi countries

³ Sources: Cepi, Fastmarkets RISI - 2021 figures available end-2022

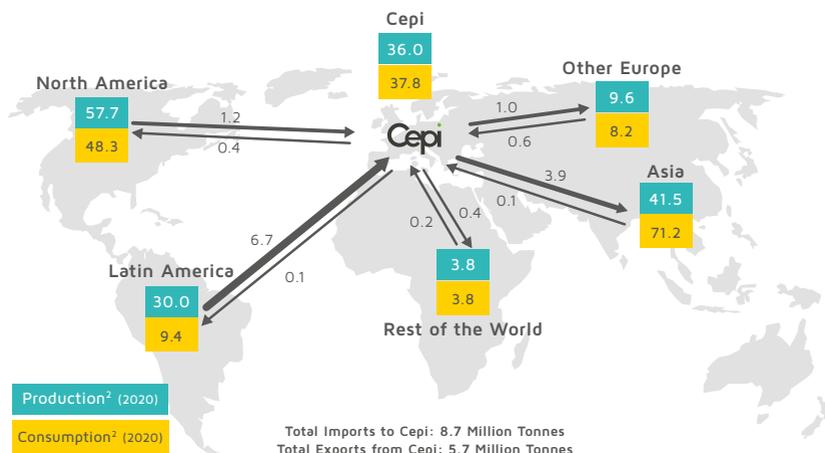
Market Pulp Exports to Other Regions

'000 Tonnes	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Other Europe ¹	724	719	768	1 167	1 014	-13.1	17.7
North America	104	62	59	266	419	57.7	7.3
Latin America	6	49	69	61	56	-8.4	1.0
Asia	412	1 595	2 156	4 662	3 891	-16.5	67.9
Rest of the World	86	142	187	377	354	-6.2	6.2
Total	1 332	2 567	3 240	6 532	5 734	-12.2	100.0

Market Pulp Imports from Other Regions

'000 Tonnes	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Other Europe ¹	657	480	663	553	594	7.4	6.8
North America	4 623	2 292	1 415	1 333	1 169	-12.3	13.4
Latin America	1 916	4 733	5 657	6 122	6 686	9.2	76.9
Asia	272	134	220	53	35	-34.1	0.4
Rest of the World	456	81	135	215	210	-2.2	2.4
Total	7 924	7 721	8 091	8 277	8 695	5.1	100.0

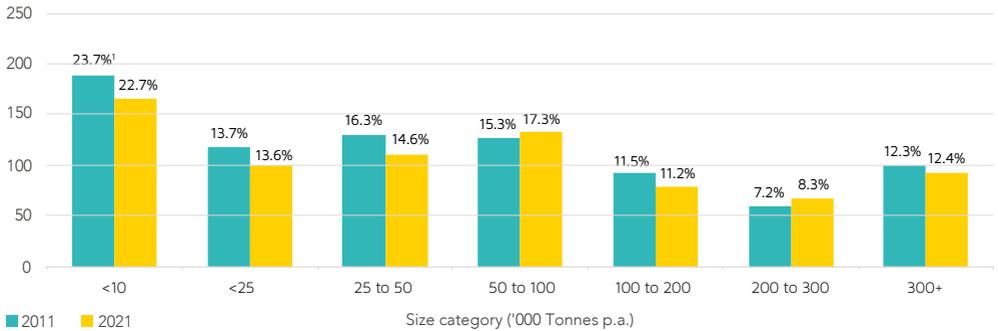
Trade Flows of Market Pulp in 2021 (Million Tonnes)



¹ Other Europe: total Europe excluding Cepi countries
² Production and consumption of total pulp (market and integrated)
 Sources: Cepi, Fastmarkets RISI - 2021 figures available end-2022

Number of Paper and Board Mills by Volume in 2011 and 2021

Number of Paper and Board Mills



¹ Share of Total Number of Mills

Number of Paper and Board Mills and Paper and Board Production

Number of Paper and Board Mills

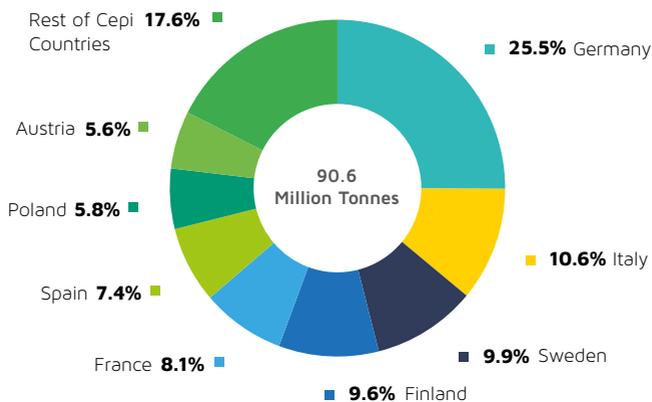
Paper and Board Production (Million Tonnes)



Paper and Board Production and Consumption

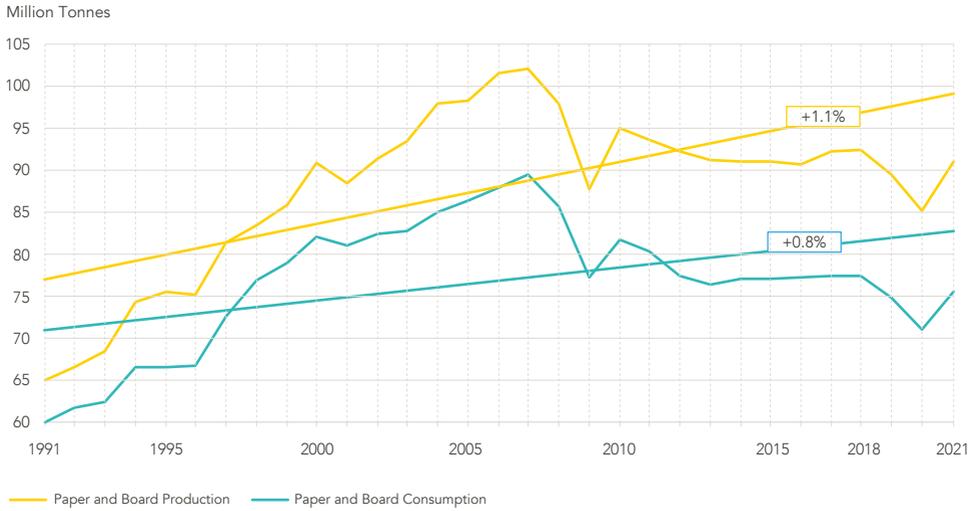
'000 Tonnes	Production			Consumption		
	2020	2021	% Change 2021/2020	2020	2021	% Change 2021/2020
Newsprint	4 126	3 820	-7.4	3 499	3 405	-2.7
Uncoated Mechanical	4 229	4 486	6.1	3 675	3 744	1.9
Coated Mechanical	4 216	4 528	7.4	3 087	3 309	7.2
Uncoated Woodfree	7 173	7 842	9.3	5 805	6 080	4.7
Coated Woodfree	4 006	4 409	10.1	2 411	2 444	1.4
Other Graphic Papers	19 624	21 265	8.4	14 978	15 577	4.0
Total Graphic Papers	23 750	25 085	5.6	18 477	18 982	2.7
Sanitary and Household	7 933	7 758	-2.2	7 673	7 439	-3.0
Case Materials	31 463	34 113	8.4	28 803	31 646	9.9
Carton Board	9 626	9 857	2.4	6 008	6 058	0.8
Wrappings	4 085	4 560	11.6	2 517	2 844	13.0
Other Paper and Board for Packaging	4 659	5 015	7.6	4 094	4 386	7.1
Total Packaging Paper and Board	49 831	53 545	7.5	41 421	44 934	8.5
Other Paper and Board	3 836	4 196	9.4	3 536	3 864	9.3
Total Paper and Board	85 349	90 583	6.1	71 108	75 219	5.8
Including Speciality Paper and Board¹	10 547	10 836	2.7			

Paper and Board Production by Country in 2021

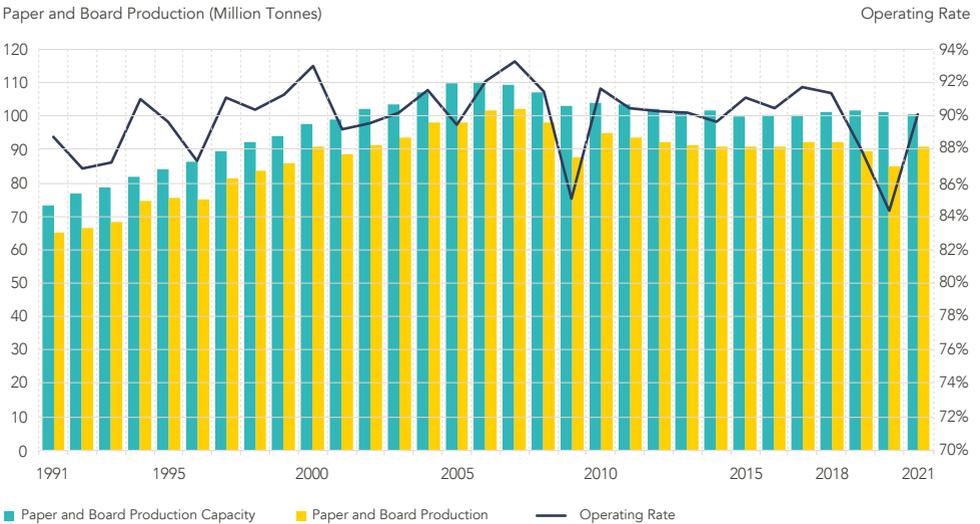


¹Speciality paper and board can be defined as paper or board that require properties (physical, optical, electrical, chemical and/or other special considerations) that are different from the norm for the market sector and application being served
Based on AWA (Alexander Watson Associates) and Cepi estimates

Paper and Board Production and Consumption

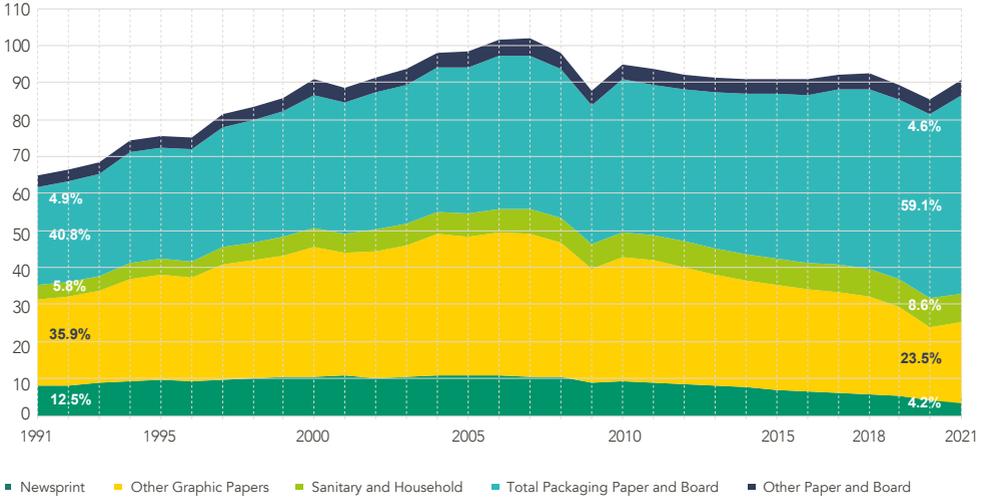


Paper and Board Production and Capacity



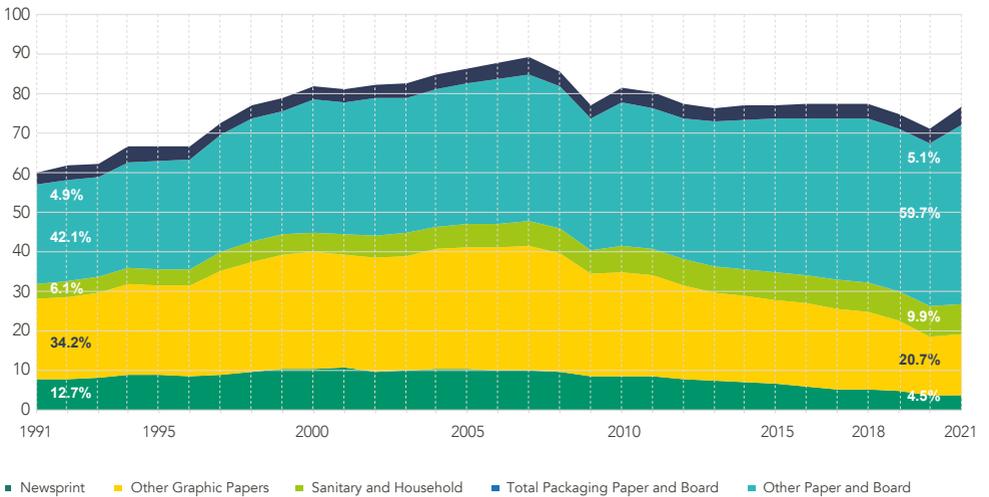
Paper and Board Production by Grade

Million Tonnes

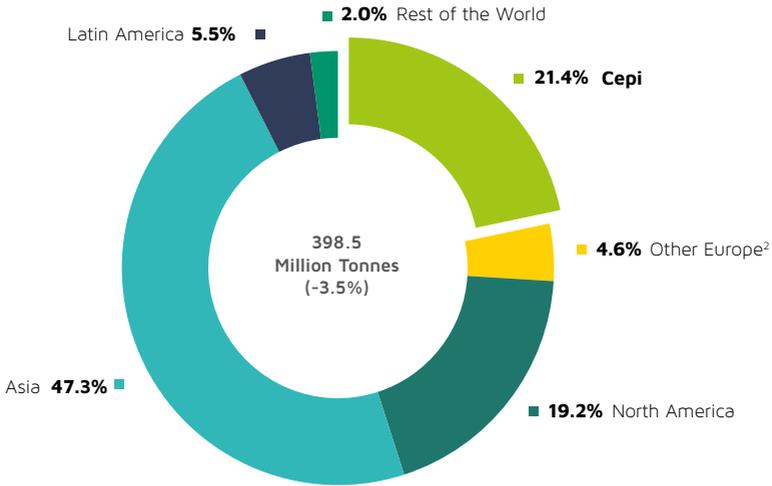


Paper and Board Consumption by Grade

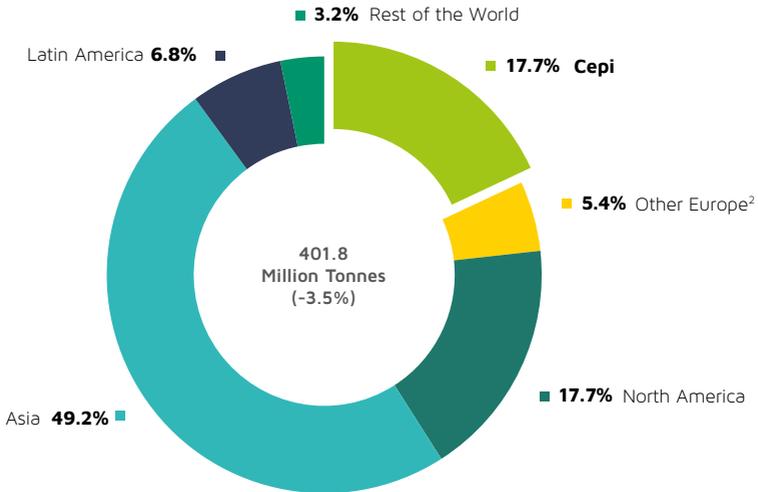
Million Tonnes



Paper and Board Production by Region in 2020¹



Paper and Board Consumption by Region in 2020¹



¹ Sources: Cepi, Fastmarkets RISI - 2021 figures available end-2022

² Other Europe: total Europe excluding Cepi countries

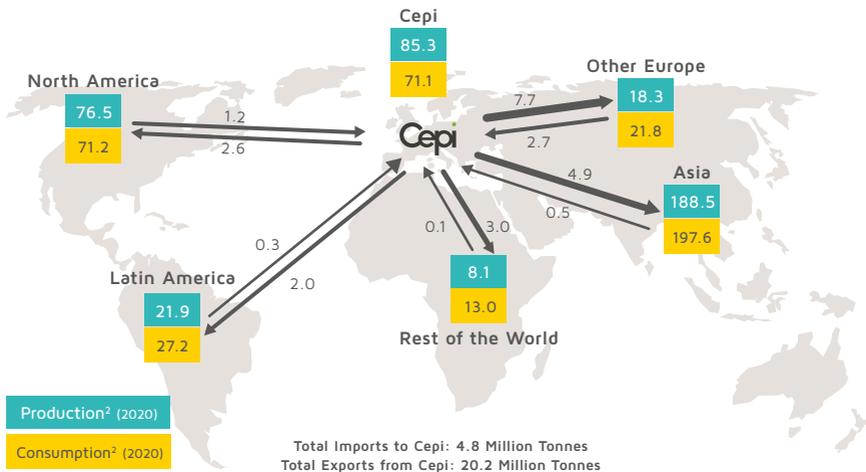
Paper and Board Exports to Other Regions

'000 Tonnes	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Other Europe ¹	6 090	7 349	7 288	7 123	7 669	7.7	38.0
North America	2 283	2 055	2 069	2 160	2 584	19.7	12.8
Latin America	874	1 879	1 794	1 604	2 020	26.0	10.0
Asia	2 933	5 099	4 980	5 504	4 882	-11.3	24.2
Rest of the World	1 707	2 783	3 063	2 975	3 004	1.0	14.9
Total	13 887	19 164	19 194	19 366	20 160	4.1	100.0

Paper and Board Imports from Other Regions

'000 Tonnes	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Other Europe ¹	3 318	2 525	2 544	2 443	2 659	8.8	55.4
North America	2 191	1 829	1 608	1 513	1 178	-22.2	24.6
Latin America	198	498	363	348	326	-6.5	6.8
Asia	332	625	581	662	503	-24.1	10.5
Rest of the World	344	307	270	157	131	-16.9	2.7
Total	6 383	5 783	5 367	5 124	4 796	-6.4	100.0

Trade Flows of Paper and Board in 2021 (Million Tonnes)



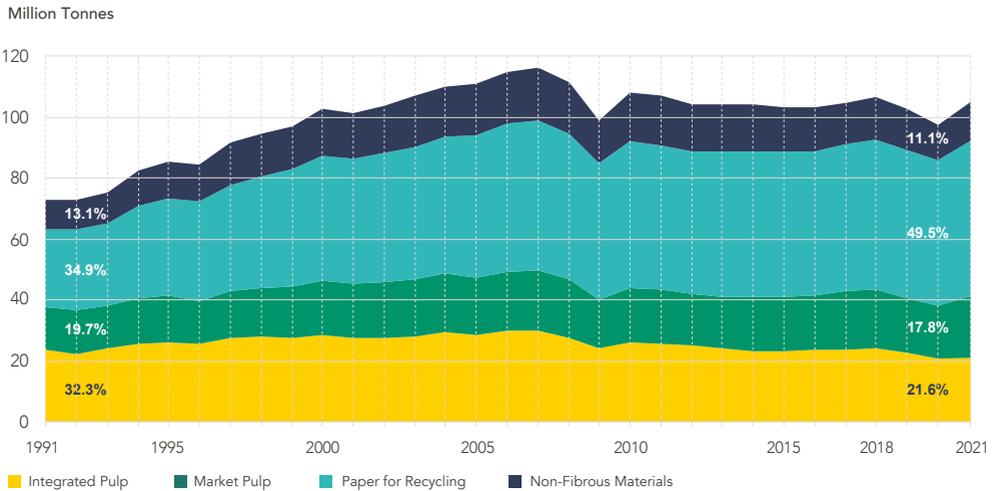
¹ Other Europe: total Europe excluding Cepi countries

² Source: Cepi, Fastmarkets RISI - 2021 figures available end-2022

Raw Materials Consumption

'000 Tonnes	1991	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Integrated Pulp	23 483	28 362	25 989	23 178	20 728	22 072	6.5	21.6
Market Pulp	14 332	18 015	17 860	17 930	17 065	18 187	6.6	17.8
Paper for Recycling 	25 360	40 922	48 122	47 751	47 951	50 737	5.8	49.5
Non-Fibrous Materials	9 504	15 609	16 218	14 475	10 684	11 409	6.8	11.1
Total Raw Materials	72 679	102 908	108 189	103 333	96 429	102 405	6.2	100.0

Raw Materials Consumption



Wood Consumption

'000 m ³	1991	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Softwood Roundwood	65 240	72 372	76 641	70 532	71 963	76 316	6.1	50.2
Softwood Chips 	24 623	35 673	34 141	33 497	34 360	35 616	3.7	23.4
Total Softwood	89 863	108 046	110 782	104 028	106 323	111 932	5.3	73.6
Hardwood Roundwood	28 963	38 542	36 635	38 293	38 892	38 436	-1.2	25.3
Hardwood Chips 	1 447	1 505	1 483	2 134	1 301	1 793	37.9	1.2
Total Hardwood	30 410	40 048	38 119	40 428	40 192	40 229	0.1	26.4
Total Roundwood	94 204	110 915	113 276	108 825	110 854	114 752	3.5	75.4
Total Chips	26 070	37 179	35 625	35 631	35 661	37 409	4.9	24.6
Total Wood	120 274	148 093	148 901	144 456	146 515	152 161	3.9	100.0

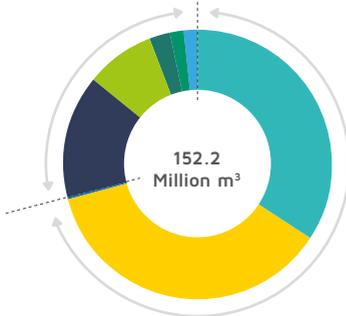


Woodchips used to produce pulp are residues from sawmills and woodworking industry, and are in fact an important contribution to circular economy through industrial symbiosis, although traditionally not reported by Cepi as recycling.

Share in Wood Consumption in 2021

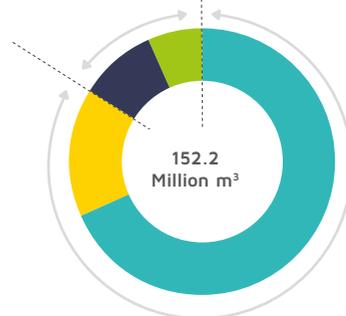
By Species¹

- Hardwood: **27.8%**
- Softwood: **72.2%**
- Birch **13.7%**
- Eucalyptus **8.7%**
- Beech **2.4%**
- Aspen **1.3%**
- Other Hardwood² **1.6%**
- Pine **34.0%**
- Spruce **38.2%**
- Other Softwood **0.1%**



By Origin

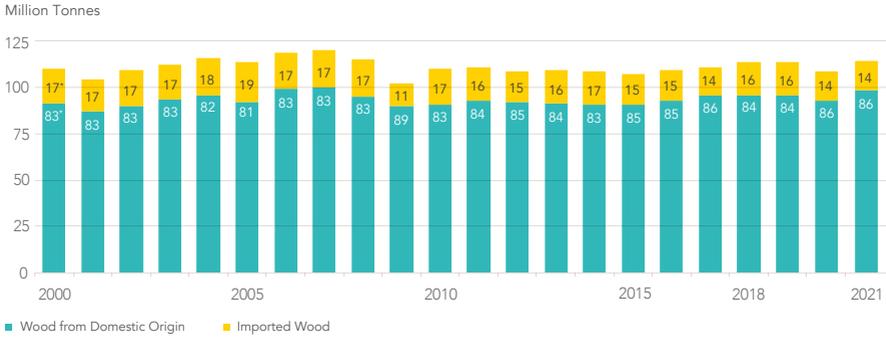
- Imported: **14.3%**
- Domestic: **85.7%**
- Imported Roundwood **8.7%**
- Imported Chips **5.6%**
- Domestic Roundwood **68.9%**
- Domestic Chips **16.8%**



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

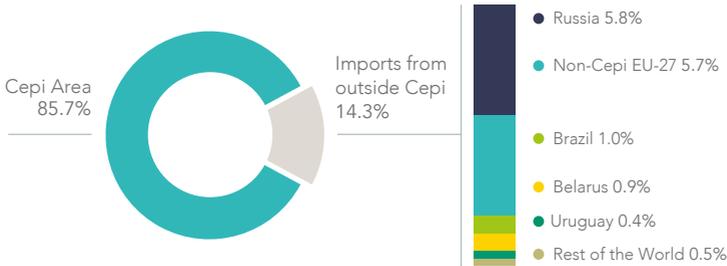
²Other Hardwood = hornbeam, ash, maple, accacia, quercus-cerris, oak, alder, poplar, willow, chesnut

Wood Consumption by Origin

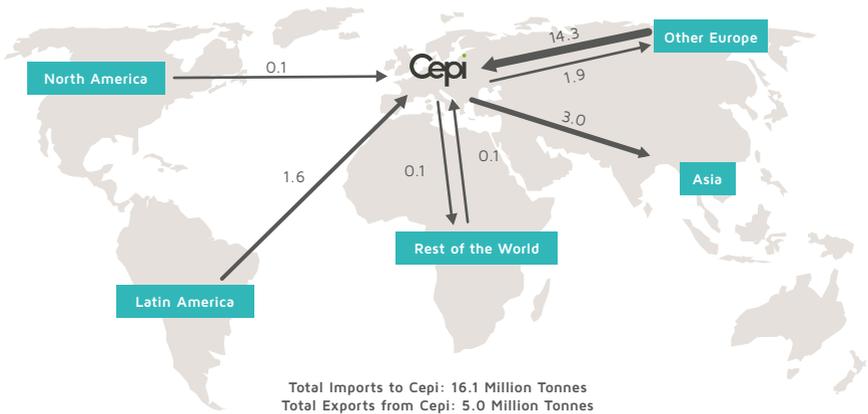


* Percentage of total wood consumption

Wood Consumption Origin in 2021



Trade Flows of Wood in 2021 (Million Tonnes)



Source: Eurostat

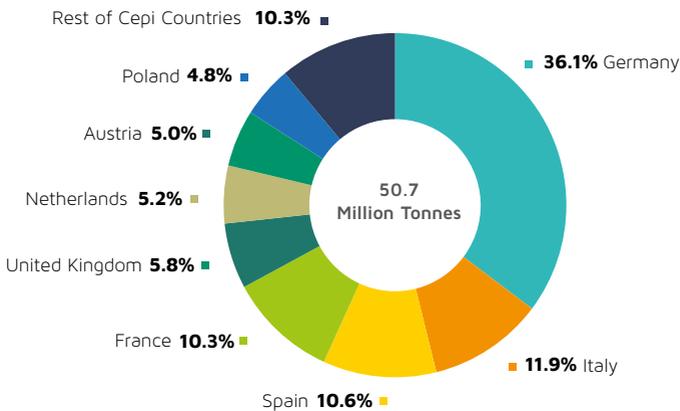
Utilisation of Paper for Recycling by Sector in 2021

'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 %
Newspprint	4	10	3 406	104	3 524	6.9	3 820	92.3
Other Graphic Papers	58	28	2 255	586	2 927	5.8	21 265	13.8
Total Graphic Papers	62	38	5 662	690	6 451	12.7	25 085	25.7
Case Materials	5 060	25 787	166	741	31 754	62.6	34 113	93.1
Carton Board	1 732	927	80	740	3 479	6.9	9 857	35.3
Wrappings & Other Packaging	2 233	1 960	210	430	4 832	9.5	9 575	50.5
Total Packaging Paper and Board	9 025	28 674	455	1 911	40 066	79.0	53 545	74.8
Sanitary and Household	247	137	476	1 682	2 541	5.0	7 758	32.7
Other Paper and Board	250	1 052	63	311	1 676	3.3	4 196	40.0
Total Paper and board	9 584	29 901	6 656	4 593	50 734	100.0	90 583	56.0
Share of Total	18.9%	58.9%	13.1%	9.1%	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

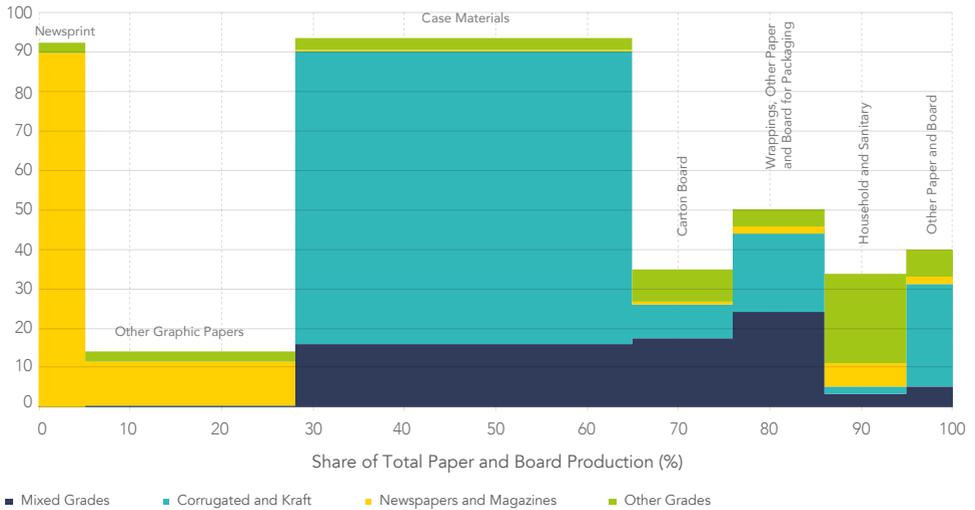
²Utilisation rate: use of paper for recycling in a sector as a percentage of total paper & board production in that sector

Utilisation of Paper for Recycling by Country in 2021



Utilisation of Paper for Recycling by Sector in 2021

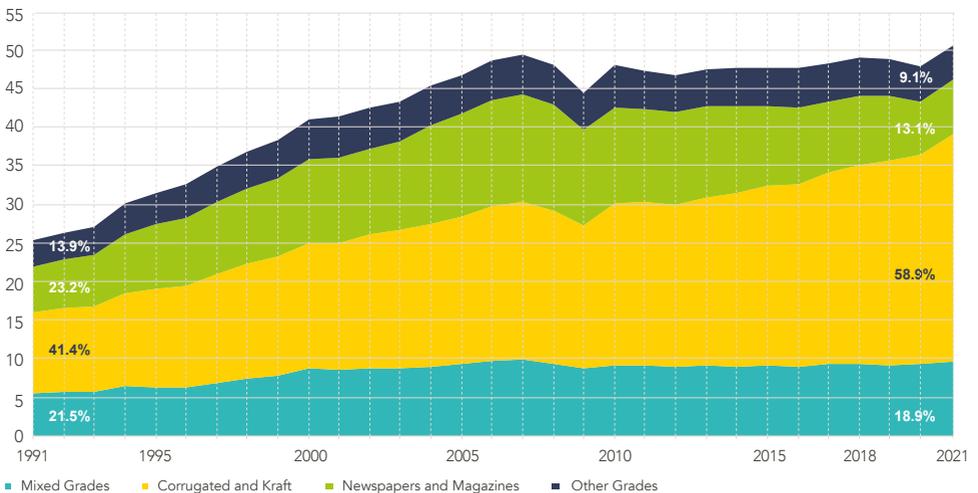
Utilisation Rate (%)



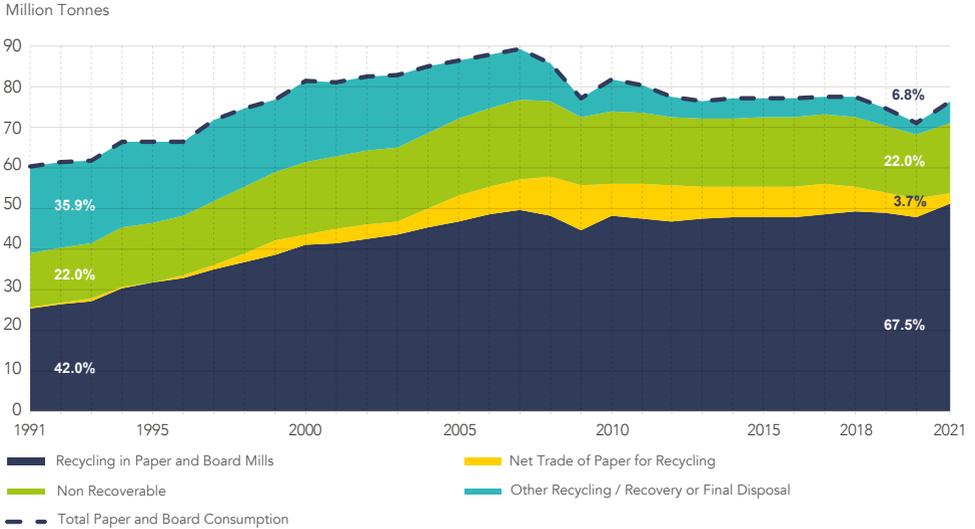
For instance: case materials represent 38% of total paper and board production, have an utilisation rate of 93% and use 63% of total paper for recycling volumes used by the industry.

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 & board production.

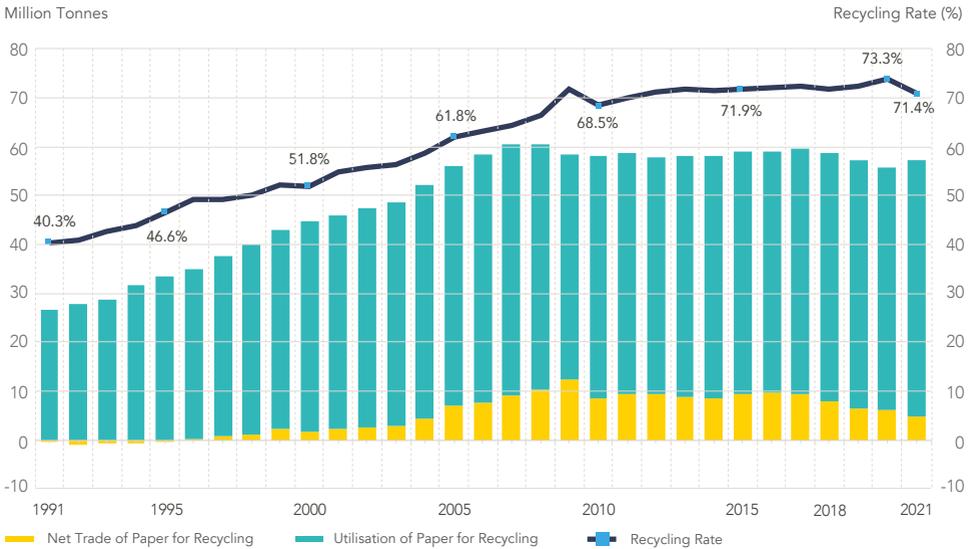
Utilisation of Paper for Recycling by Grade



Paper & 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-27 countries plus Norway, Switzerland and the United Kingdom

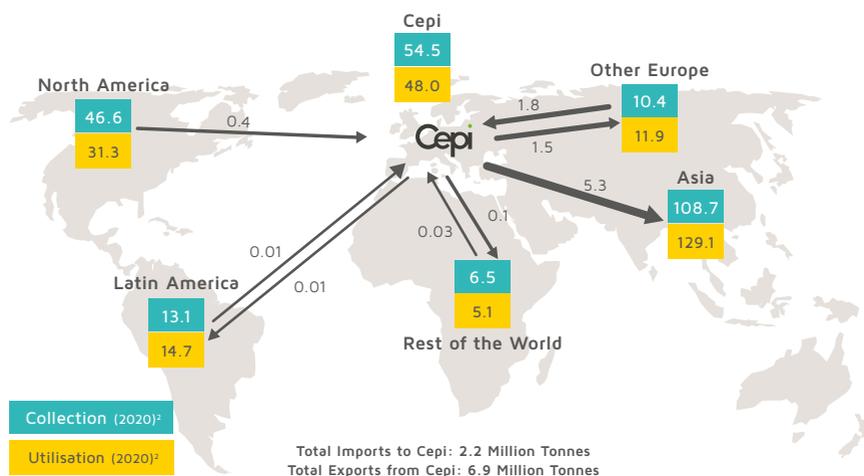
Exports of Paper for Recycling to Other Regions

'000 Tonnes	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Other Europe ¹	676	373	667	1 709	1 525	-10.8	22.1
North America	47	27	1	1	0	-69.1	0.0
Latin America	7	21	9	38	9	-75.5	0.1
Asia	2 894	9 157	9 396	6 600	5 300	-19.7	76.9
Rest of the World	127	14	13	16	58	273.2	0.8
Total	3 751	9 592	10 086	8 364	6 893	-17.6	100.0

Imports of Paper for Recycling from Other Regions

'000 Tonnes	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Other Europe ¹	735	1 596	1 787	1 477	1 769	19.8	79.5
North America	264	184	185	323	402	24.6	18.1
Latin America	0	3	18	11	5	-52.5	0.2
Asia	9	6	3	10	15	41.7	0.7
Rest of the World	7	8	15	30	34	11.5	1.5
Total	1 015	1 796	2 008	1 852	2 226	20.2	100.0

Trade Flows of Paper for Recycling in 2021 (Million Tonnes)



¹ Other Europe: total Europe excluding Cepi countries

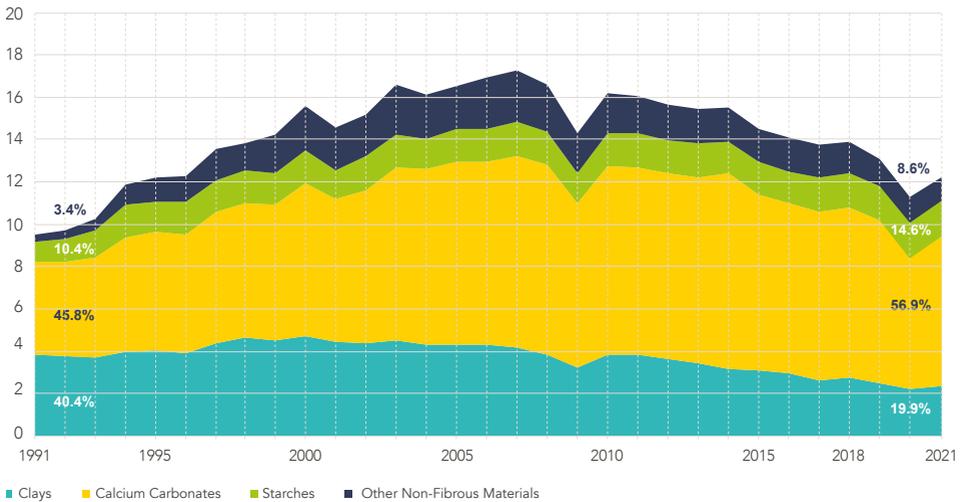
² Source: Cepi, Fastmarkets RISI - 2021 figures available end-2022

Non-Fibrous Materials Consumption

'000 Tonnes	1991	2000	2010	2015	2020	2021	% Change 2021/2020	% Share of Total
Clays (coating and filler)	3 842	4 716	3 825	3 080	2 078	2 275	9.5	19.9
Calcium Carbonates (coating and filler)	4 349	7 247	8 903	8 324	6 041	6 488	7.4	56.9
Starches (native and modified)	989	1 551	1 593	1 521	1 609	1 661	3.2	14.6
Other Non-Fibrous Materials	324	2 095	1 897	1 550	957	986	3.0	8.6
Non-Fibrous Materials	9 504	15 609	16 218	14 475	10 684	11 409	6.8	100.0

Non-Fibrous Materials Consumption

Million Tonnes

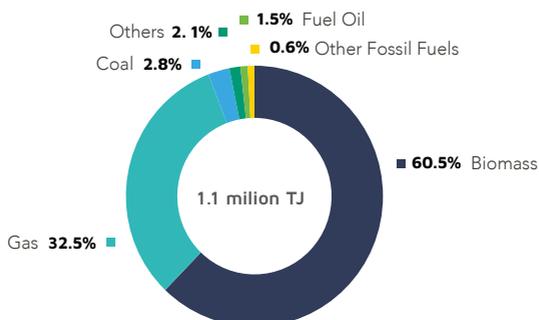


Primary Energy and Electricity Consumption¹

Primary Energy Consumption TJ	1991	2000	2010	2015	2019	2020	% Change 2020/2019	% Share of Total ³
Gas	259 593	404 946	489 565	395 064	385 696	372 509	-3.4	28.9
Fuel Oil	129 461	90 914	37 856	19 368	17 758	17 343	-2.3	1.3
Coal	113 867	59 304	53 280	45 925	34 981	31 937	-8.7	2.5
Other Fossil Fuels	10 134	19 052	14 529	10 624	10 056	7 280	-27.6	0.6
Biomass 	413 248	562 865	677 569	657 986	700 900	693 588	-1.0	53.7
Other	3 560	4 151	8 948	12 374	22 416	24 301	8.4	1.9
Total Fuels Consumption	929 863	1 141 232	1 281 746	1 141 341	1 171 805	1 146 960	-2.1	88.9
Net Bought Electricity	205 852	246 864	202 945	167 381	154 795	143 557	-7.3	11.1
Total Primary Energy Consumption	1 135 715	1 388 096	1 484 691	1 308 722	1 326 601	1 290 517	-2.7	100.0
Fraction of Biomass in Total Fuels Consumption	44.4%	49.3%	52.9%	57.7%	59.8%	60.5%	0.7	

Electricity Consumption GWh	1991	2000	2010	2015	2019	2020	% Change 2020/2019	% Share of Total
Total Electricity Produced at Site	29 416	41 930	56 780	51 748	50 908	49 900	-2.0	55.6
Purchased Electricity	59 045	72 255	67 567	57 838	54 730	52 472	-4.1	58.4
Sold Electricity	-1 864	-3 681	-11 193	-11 343	-11 731	-12 595	7.4	14.0
Total Electricity Consumption	86 527	110 424	113 137	98 243	93 906	89 777	-4.4	100.0
% of Electricity produced through CHP²	88.0%	90.4%	95.4%	96.2%	95.7%	95.7%	-0.1	

 In 2020, 61% of fuels used in the pulp and paper industry came from biomass; large amount of that is process residues.

Fuels Consumption in 2020¹

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

² 2021 data will be available end-2022

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

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

Key Figures on Energy and Environment¹

	1991	2000	2010	2015	2019	2020	% Change 2020/2019	% Change 2020/1991
Energy Consumption								
Production of Market Pulp and Paper and Board ('000 Tonnes)	71 971	98 691	106 084	102 047	101 923	97 714	-4.1	35.8
Specific Primary Energy Consumption (TJ/kt)	15.78	14.07	14.00	12.82	13.02	13.21	1.5	-16.3
Specific Electricity Consumption (MWh/kt)	1.20	1.12	1.07	0.96	0.92	0.92	-0.3	-23.6
Direct CO₂ Emissions²								
Absolute (Mega Tonnes)	39.05	41.94	37.83	32.39	30.57	28.93	-5.3	-25.9
Specific (kt CO ₂ / kt of product)	0.54	0.42	0.35	0.31	0.29	0.29	-1.4	-47.0
Indirect CO₂ Emissions³								
Absolute (Mega Tonnes)	13.88	14.33	11.59	10.30	9.45	8.77	-7.2	-36.8
Specific (kt CO ₂ / kt of product)	0.19	0.15	0.11	0.10	0.09	0.09	-3.2	-53.5
Water Specific Emissions								
COD (kg / T of product)	23.36	9.08	6.32	5.61	5.31	5.17	-2.6	-77.9
AOX (kg / T of product)	0.433	0.049	0.030	0.022	0.023	0.022	-2.1	-94.8
Air Specific Emissions								
SO ₂ (kg S / T of product)	1.32	0.40	0.24	0.16	0.11	0.12	9.4	-90.9
NOx (kg NOx / T of product)	1.31	0.90	0.85	0.73	0.65	0.66	0.5	-49.7

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

2021 data will be available end-2022

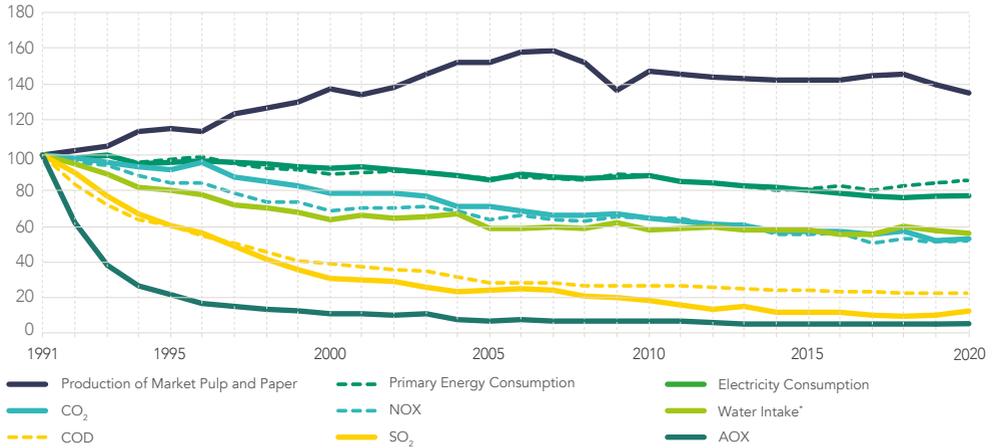
² Including all Cepi countries from 2005

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

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

Evolution of Environmental Impacts

Index of Specific Values (1991 = 100)

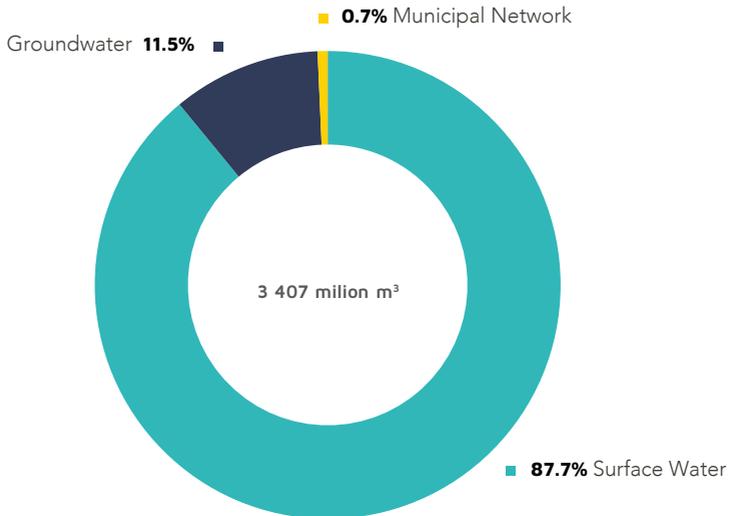


Water Emissions: COD (Chemical Oxygen Demand) - AOX

Air Emissions: CO₂ - NOX (Azote Oxides) - SO₂

***Water Intake:** Due to the change in data collection system in one country, 2019 data on water can't be compared to 2018 data

Sources of Water Intake in 2020¹

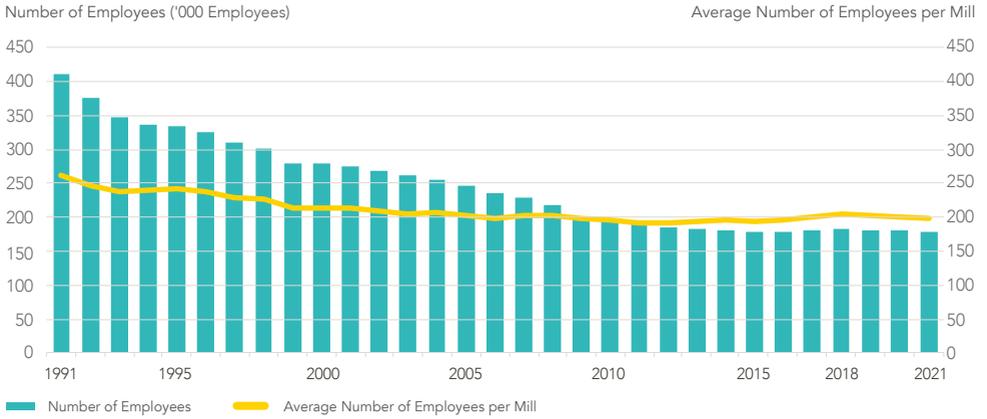


¹ Excluding Hungary, Romania & Slovenia - excluding Poland before 2003

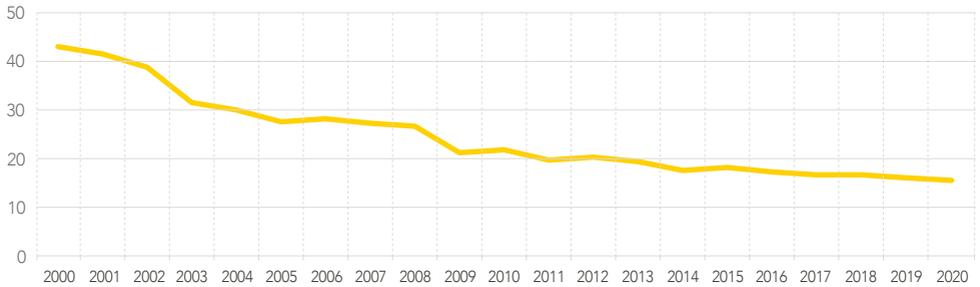


In 2020, around 90% of water abstracted to produce paper and board has been returned to its source after treatment

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
 2021 data will be available end-2022

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

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

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

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

Wood

The wood used for pulp and paper manufacturing is mainly constituted of the following assortments: pulpwood (roundwood other than sawlogs, from silvicultural measures such as thinning or final felling), chips and residues from sawmills. The utilisation of sawlogs is very limited and sawdust volumes consumed are negligible. The relative shares of softwood and hardwood used depend on the country considered and the pulp and paper grades produced. The main softwood species used are pine and spruce. The main hardwood species used are birch, eucalyptus, beech and aspen. Oak is hardly used

The wood consumption figures reported by the pulp and paper companies and included in the Cepi statistics are the volumes of wood at the mill gates and come from domestic supply or imports

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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