

# Quo vadis, Mixed Paper?

## Aspects of quality and availability of paper for recycling

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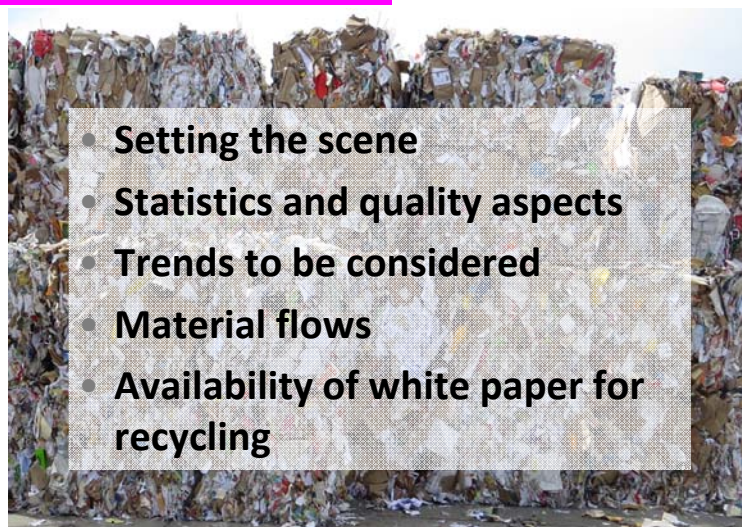
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## Quo vadis, mixed paper?

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## Mixed paper – definitions



- **A mixture of various grades of paper and board**  
(EN 643, grade 1.01.00, ordinary mixed paper and board)
- **A mixture of various qualities of paper and board, containing a maximum of 40 % newspapers and magazines**  
(EN 643, grade 1.02.00, mixed paper and board)
- **A mixture of various paper grades that can be found in the groups 1 to 5**  
(EN 643, grade 5.01.00, mixed papers)



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## Composition of paper for recycling from households



The content of graphic papers (mainly newspapers, magazines and flyers) is typically between 50 and 65 %

Packaging papers and board are 35 to 50 %

In addition, there are some non-paper materials



Picture: Grade 5.01.00 with about 65 % content of graphic papers

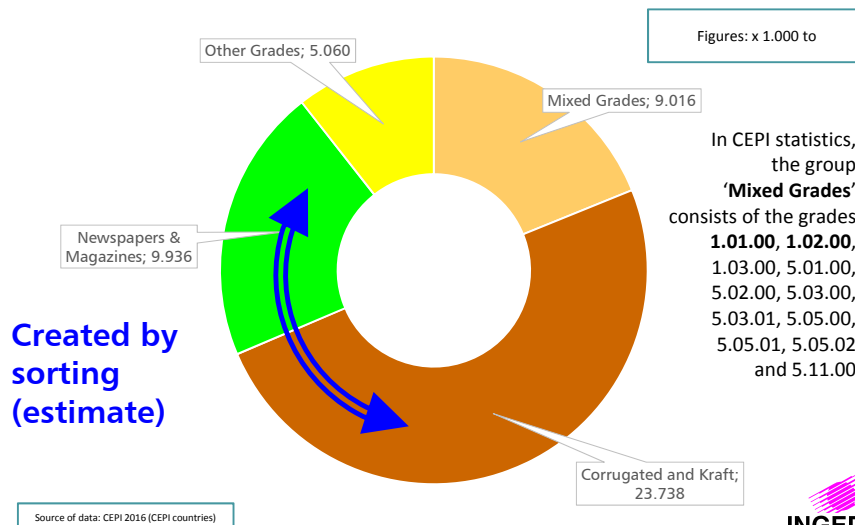
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# Output of sorting plants

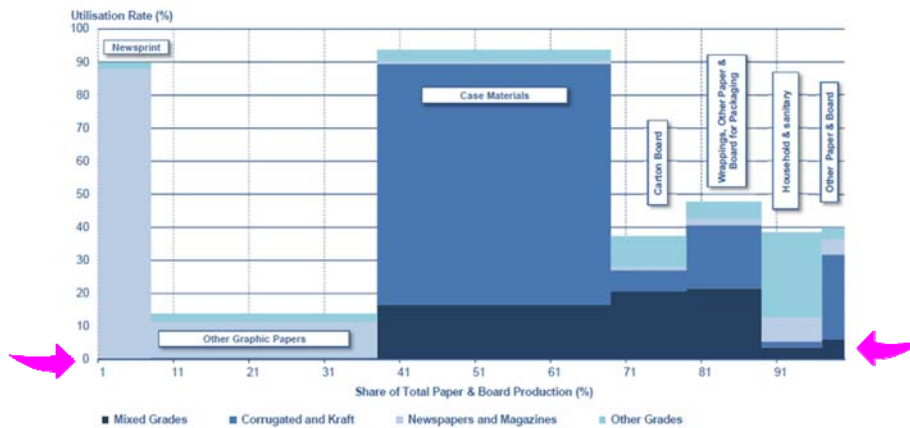
- **Graphic paper**  
(Usually grade 1.11.00, sorted graphic paper for deinking)
- **Packaging paper**
- **Mixed paper**
- **F-Mix**  
(low amount)



# Fibrous raw materials of the European paper industry



## Utilisation of paper for recycling in the European paper industry



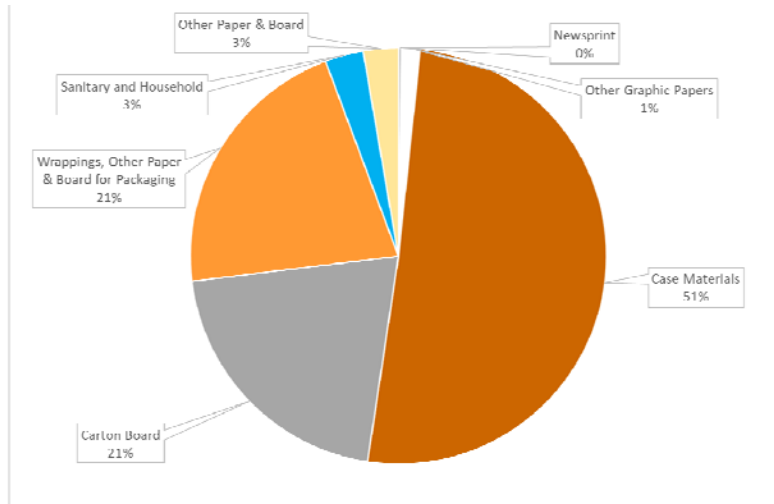
In this CEPI chart, the group 'Mixed Grades' consists of the grades **1.01.00, 1.02.00, 1.03.00, 5.01.00, 5.02.00, 5.03.00, 5.03.01, 5.05.00, 5.05.01, 5.05.02** and **5.11.00** (CEPI countries)

## Key quality parameters of main paper & board grades

- Graphic papers:  
**Optical properties**
- Case materials:  
**SCT, CMT, bursting strength**
- Carton Board:  
**Bulk, bending stiffness, hygiene**
- Wrappings, other paper & board for packaging:  
(no statement due to wide variety of paper grades)

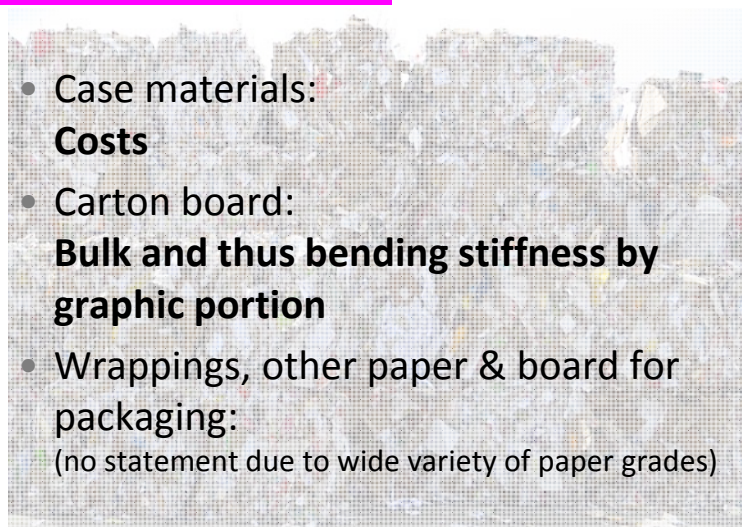


## CEPI utilisation of mixed grades by sector



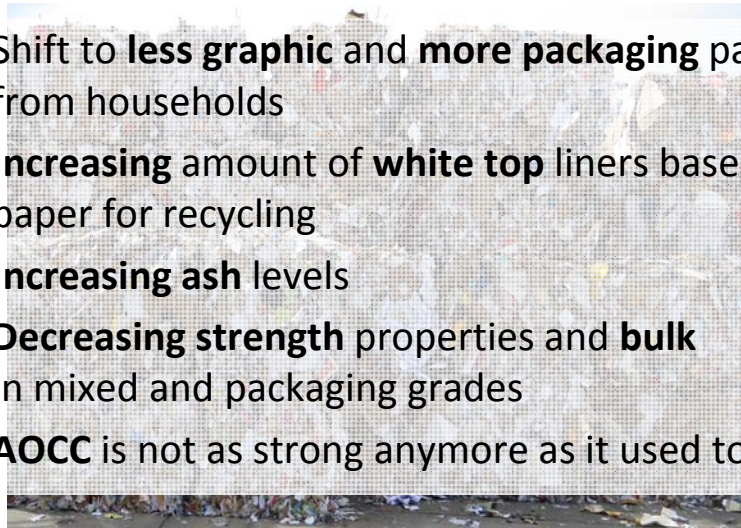
Source of data: CEPI

## Main reasons for utilisation of mixed grades

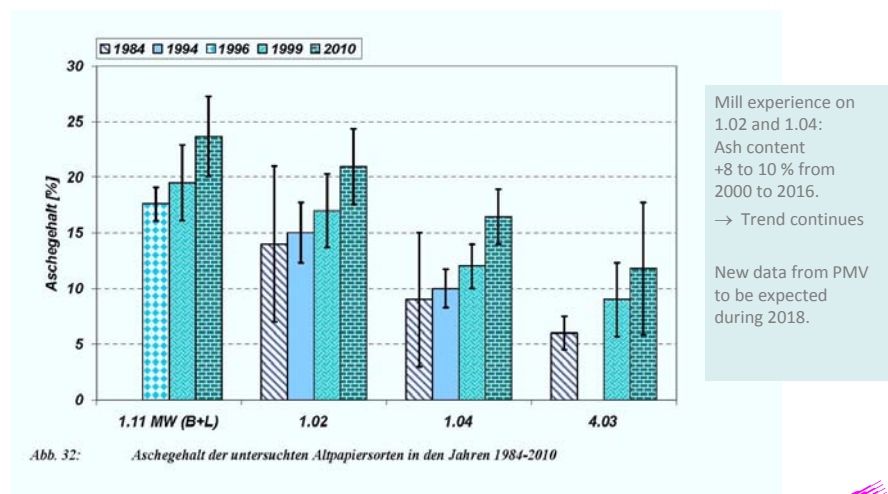


## Trends to be considered

- Shift to **less graphic** and **more packaging** papers from households
- **Increasing** amount of **white top** liners based on paper for recycling
- **Increasing** ash levels
- **Decreasing strength** properties and **bulk** in mixed and packaging grades
- **AOCC** is not as strong anymore as it used to be



## Ash content of paper for recycling



Mill experience on 1.02 and 1.04:  
Ash content  
+8 to 10 % from  
2000 to 2016.  
→ Trend continues

New data from PMV  
to be expected  
during 2018.

## Important results of IGF 15408 / Mill experience

- Most **strength parameters** in grades 1.02 and 1.04 **dropped** by 5–10 % from 1999 to 2010  
→ Compensation in production by raw material mix, starch, dry strength agents and/or grammage
- **COD increased** by 10–20 %  
→ Adding starch is obviously the dominant compensation
- **Bending stiffness decreased** by 10–15 % in 16 years  
→ Compensation in board production by addition of virgin fibres (mechanical pulp or CTMP), lower coating weights (more expensive pigments), lower press loading, higher grammage

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## Situation of graphic paper for recycling

- Supply is generally short
- Standard grades (newspapers & magazines) partly
  - have to be shipped over long distances
  - are of poor quality (purity) due to unsuitable collection and handlingSome mills decreased utilisation of paper for recycling and increased virgin fibres
- White grades used for white top liners do not return to the graphic loop



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## Material flows of news & mags



Parameter	Tonnage [1 000 to]	Description, (Source)
Consumption of graphic paper	<b>26 849</b>	(CEPI Key Statistics 2016)
+ 2 % Additives	27 386	Printing ink etc. (estimation)
+ 2 % Import of graphic products	27 934	User manuals etc. (estimation)
Availability at <b>78,4 %</b> graphic recycling rate (AGRAPA 2016: <b>83,3 %</b> )	<b>23 269</b>	Calculated rate in in order to match figures at the bottom of the table
Net export of paper for recycling (graphic products only)	<b>- 1 723</b>	Estimated 20 % share von 8 614 000 to
Graphic products to Medium and High Grades of paper for recycling	- 4 554	Estimated 90 % of utilisation of Other Grades (CEPI 2016)
Graphic products 'leakage' to Corrugated and Kraft	- 1 187	Estimated 5 % of utilisation of Corrugated and Kraft (CEPI 2016, IGF 15408)
Newspapers & Magazines 'leakage' to Mixed Grades	<b>- 4 508</b>	Estimated 50 % of utilisation of Mixed Grades (CEPI 2016)
Availability of Newspapers & Magazines	<b>9 936</b>	
Actual utilisation of News & Mags	<b>9 936</b>	(CEPI Key Statistics 2016)

## Increasing availability of white paper for recycling – starting points



- **Increasing collection rates** from households
- **Improving separation efficiency** of sorting plants
- **Selective collection** of graphic paper for recycling
- Stepping up of **high-quality collection** from offices





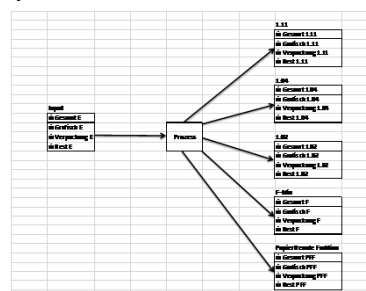
## Increasing collection rates from households – key factors

- Education/environmental consciousness
- Provision of convenient collection systems
- Fees/incentives
- Negative example: Apartment buildings with waste chutes and low waste fee  
→ High paper content in residual waste



## Improving separation efficiency of sorting plants

- INGEDE started with a systematic data collection from sorting plants
  - 1<sup>st</sup> step: from plants of members and their subsidiaries
  - 2<sup>nd</sup> step: from external plants



## Selective collection of graphic paper for recycling – examples

- Separation at the consumer is the cheapest way of sorting!
- Collection by:
  - Collection shops
  - Bring banks
  - Volunteer collection
  - Resource yards
  - Multi chamber collection trucks



## Selective collection of graphic paper for recycling – considerations

- Monitored acceptance (collection shops, volunteer collection, manned resource yards and possibly multi chamber collection trucks) do not require additional sorting
- Multi container bring banks and resource yards can be used for selective collection
- Multi chamber collection trucks are probably only feasible in rural areas



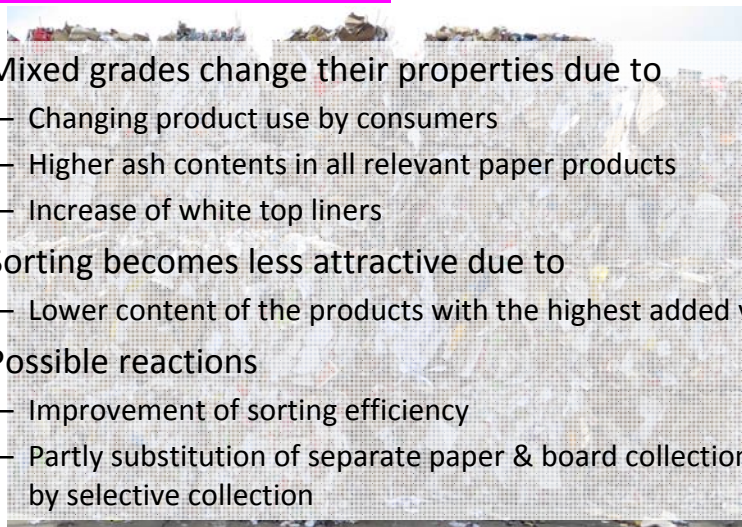
## Stepping up of high-quality collection from offices

- Conveniently located collection bins
- Provisions for confidential material (Pulping guarantees confidentiality!)



## Conclusions

- Mixed grades change their properties due to
  - Changing product use by consumers
  - Higher ash contents in all relevant paper products
  - Increase of white top liners
- Sorting becomes less attractive due to
  - Lower content of the products with the highest added value
- Possible reactions
  - Improvement of sorting efficiency
  - Partly substitution of separate paper & board collection by selective collection



Thank you for your attention!



Recyclability  
Paper for Recycling  
Drinking Process

