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Easily Recyclable Barrier Boards for Food Service and Packaging Applications

Saila Kettunen
Director, Barrier Boards
Kotkamills Oy





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**We accelerate
change for good
with the power
from wood**

KOTKAMILLS





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Good FUTURE ?



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NEED TO PROVIDE SOLUTIONS FOR
TODAY'S LIFE STYLE



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Global Consumer Expectation

Sustainable packaging without compromising food safety or freshness

Demands & desires, % of respondents	Total	France	Great Britain	Germany	Sweden	US East Coast	US West Coast
It is important to me that the food I buy is safely packed, so that I can be sure of its freshness.	75	80	74	58	77	81	78
It should be clearly visible how the product packaging should be recycled.	69	71	77	66	68	67	65
I value brands that take clear action to be tangibly sustainable.	64	74	64	68	61	60	56
The packaging I use must be easy to recycle.	62	72	67	64	58	57	56
I prefer brands that listen to consumer demands on sustainability issues.	61	66	64	60	59	58	59
If available, I always choose a plastic-free packaging solution.	57	60	62	70	50	51	51
I choose packaging that feels functional and safe and looks good.	57	64	56	42	59	60	59
I primarily go for recyclable packages.	55	63	55	56	51	54	49
It is important for me to get clear information about the sustainability of the packaging materials of the products I use.	52	57	52	55	49	51	49
I have a busy lifestyle, so I value convenient on-the-go solutions.	50	57	47	41	44	56	55
Whenever possible, I buy products that are packed in fully plastic-free solutions.	49	54	53	47	44	49	48
I am ready to pay more for a sustainable / environmentally friendly product.	47	54	45	50	44	47	44
When choosing what to buy in the food store, I consider the environmental impact of the product.	45	47	46	45	44	46	43

- 2/3 prefer brands that act on sustainability → buying criteria

Source: Oppobot & Dynata, n = 500 per market area, nationally representative in relation to gender and age

Brand Owner Sustainability Targets

Commitment to make 100% of packaging recyclable or reusable by 2025

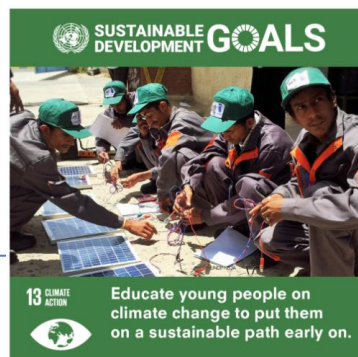
Goal of recycling, 100% sustainable packaging by 2025

Target to have 100% of the consumer packing recyclable primarily fiber based by 2022

To have 100% of the packing fully recyclable or compostable by 2025



Goal 12: Responsible Consumption and Production



Goal 13: Climate Action



Goal 14: Life Below Water



Goal 15: Life on Land



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What are your sustainability goals?

Cartonboard life cycle





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**Renewable raw material
from sustainable sources**



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3rd party forest certification

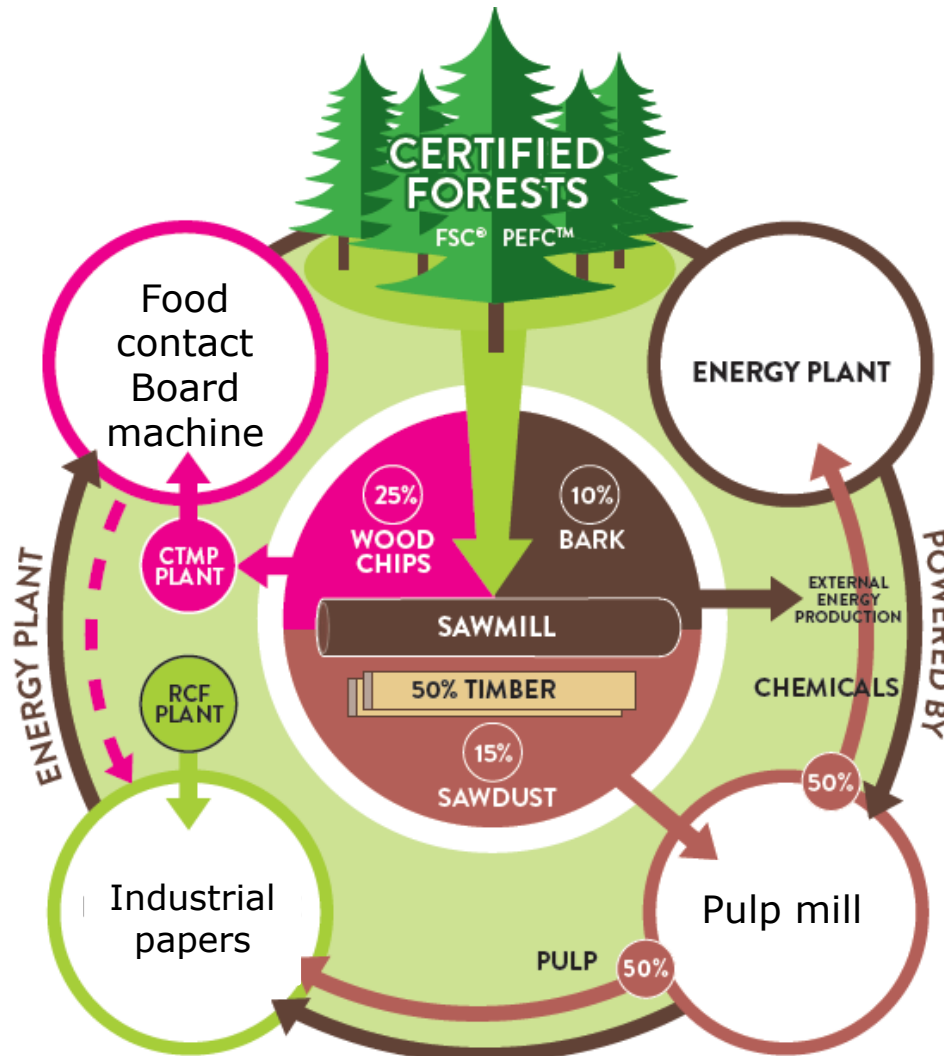


Programme for the Endorsement of Forest Certification is an international forest certification system promoting ecologically, socially and economically sustainable forestry throughout the world.

The Forest Stewardship Council – promotes environmentally appropriate, socially beneficial, and economically viable forest management all over the world.

Cartonboard life cycle





Mill integrate utilizing the wood logs without waste generation.

Hygienic strong fiber for Food contact applications

Recycled fiber for industrial use or secondary packaging

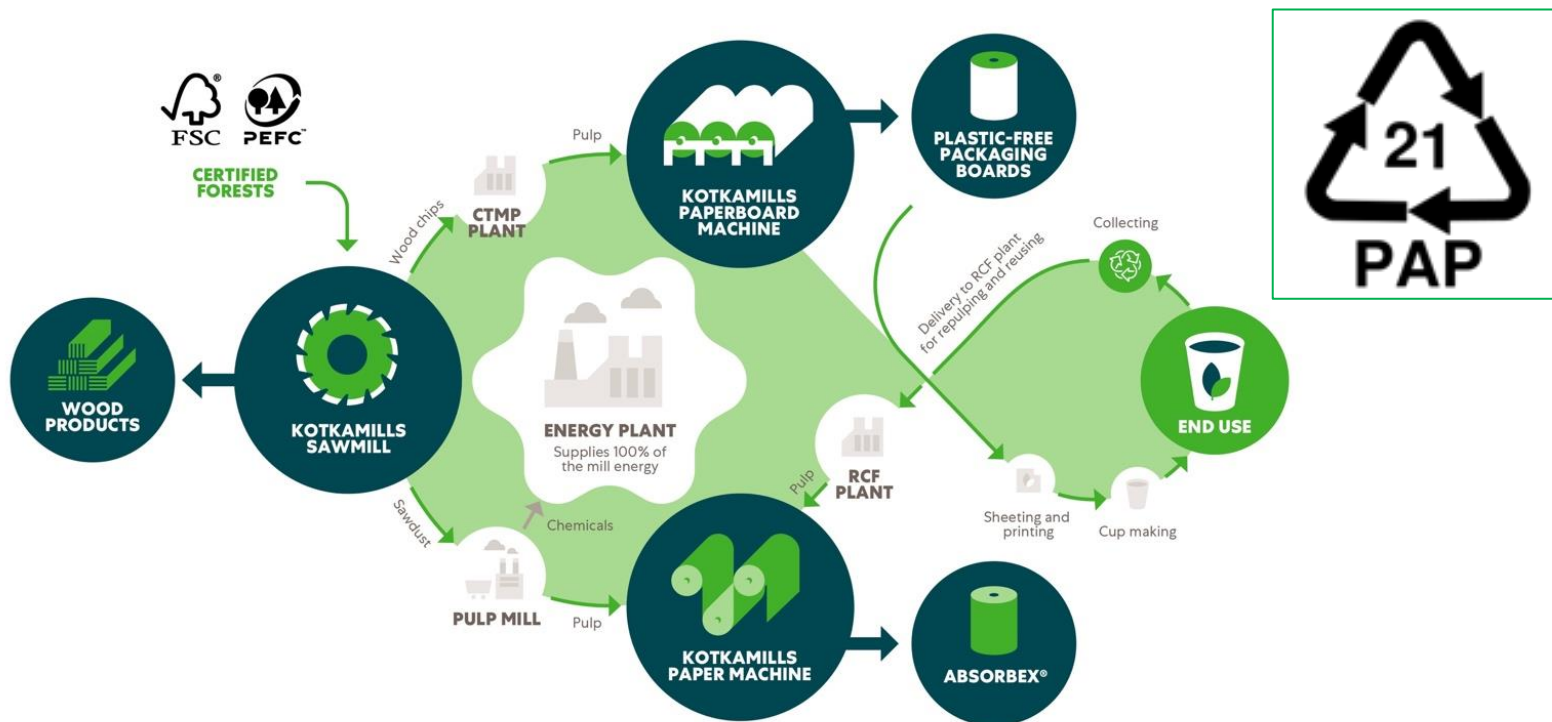


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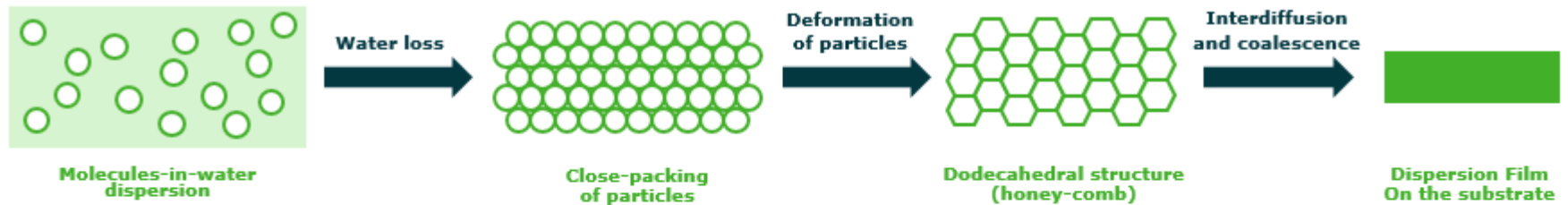


Product and process design for easy circularity



Water-based barriers are dispersions, and therefore repulpable

Simplified view of Film Formation



Barrier dispersions typically contain a large number of ingredients, needed to produce the intended barrier and functional properties.

Typical components are

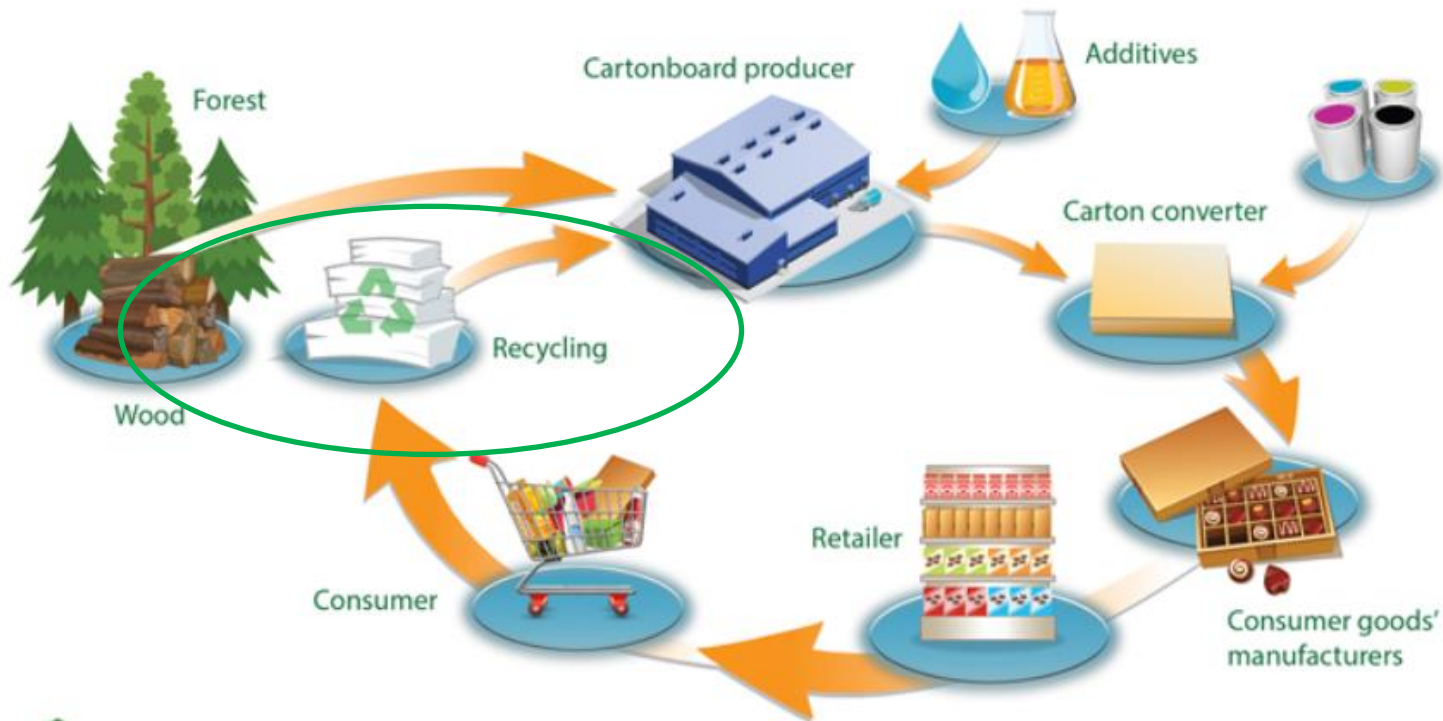
- Film forming agent
- Additives
- Rheology modifiers
- Fillers
- Water

Molecule chains are weak and break down easily with the fibers

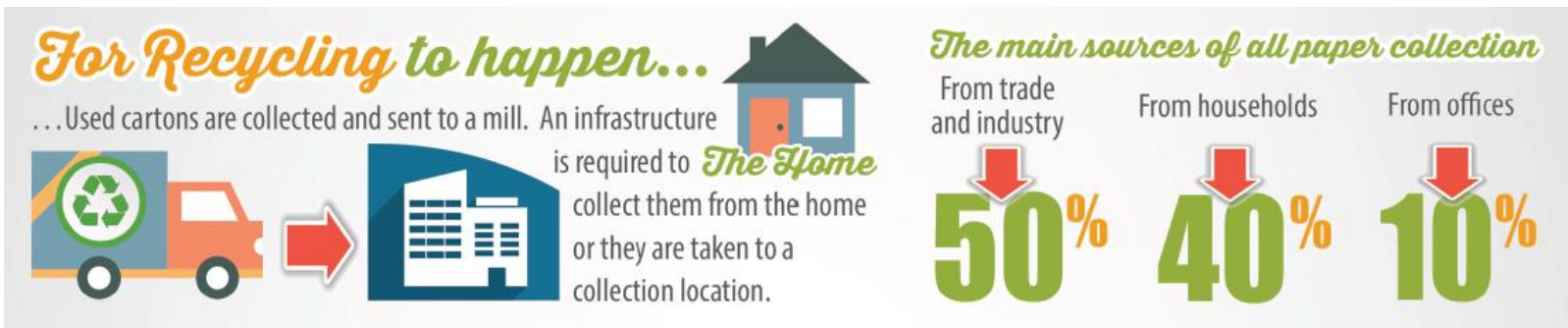
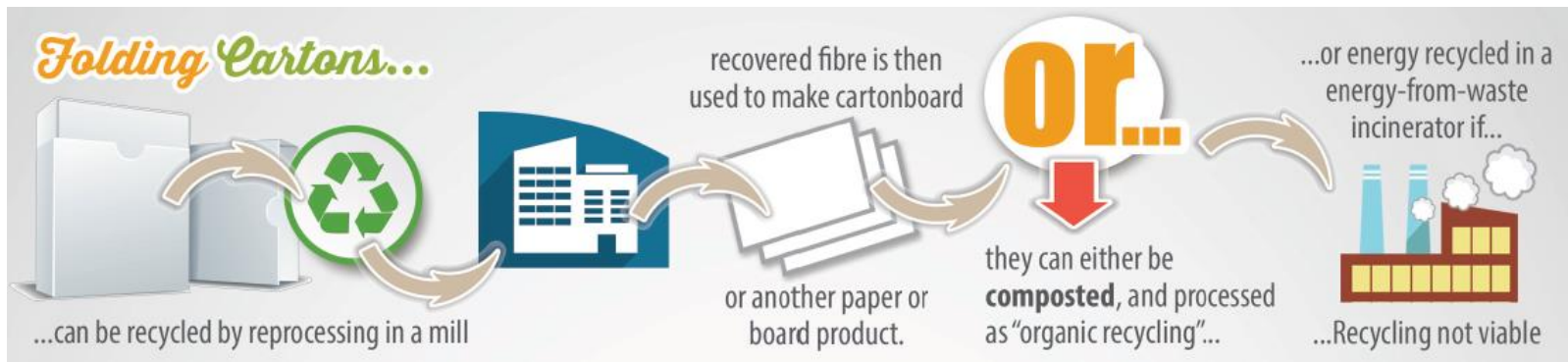
- Biodegradable
- Recyclable with normal paper waste

Kotkamills' present water based dispersion barrier products are forerunners in their field. The barriers do not function as a main structural component of the board nor have they melting point or other plastic-like properties given in various standards and are thus not to be regarded as plastics according to the Single-Use Plastics (SUP) Directive – Directive (EU) 2019/904. Continuing the company strategy with further sustainability goals, we increasingly grow the share of renewable wood based materials in our barrier boards.

Cartonboard life cycle

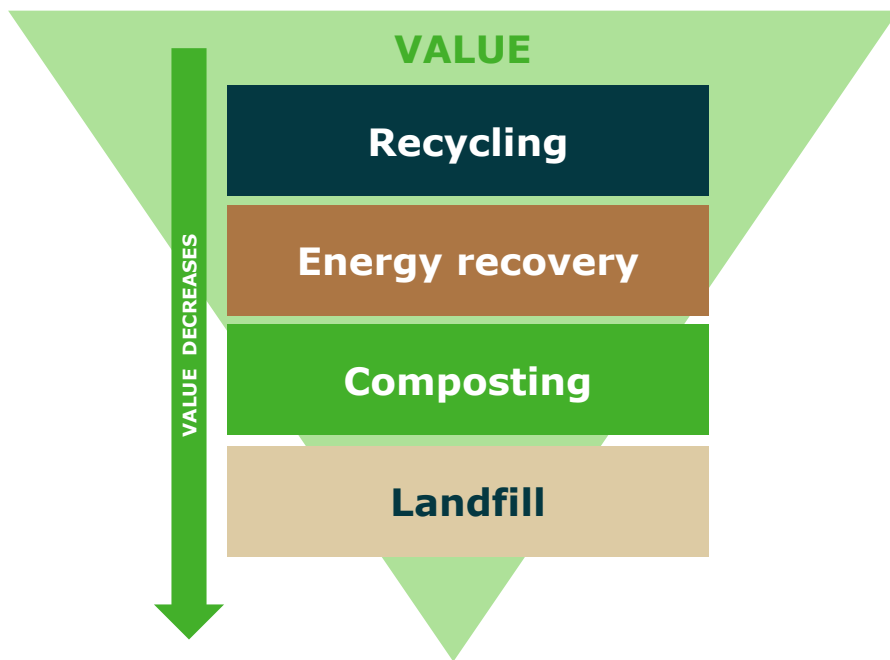


Cartonboard life cycle





Easily recyclable materials have value after use



REPULPABLE

Used material which can be re-wetted and fiberized and which can form a sheet.

RECYCLABLE

Used material capable of being recycled and processed into new fibre-based products, such as paper or cartonboard packaging, by using available processes and technologies.



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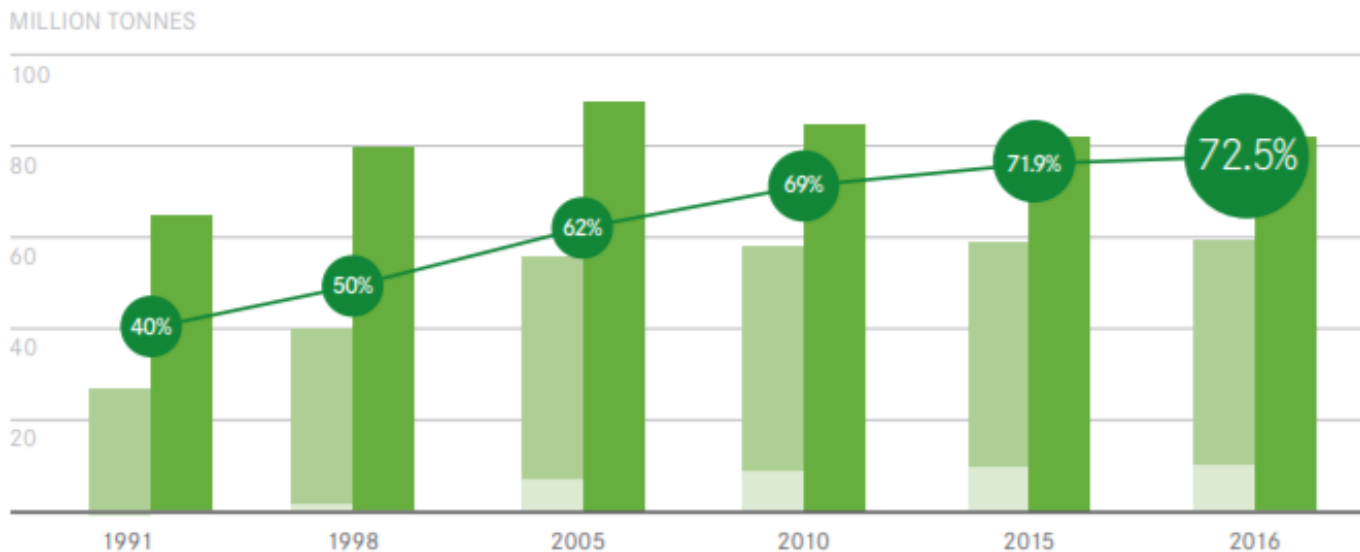


Recycling rates

EUROPEAN RECYCLING 1991-2016

Source: CEPI 2016

- Recycling outside Europe
- Recycling inside Europe
- Paper and Board consumption in Europe
- Recycling Rate





EU Circular economy Package defines recycling targets for packaging by 2025/2030

- All packaging 65/70 %
- Paper 75/85%
- Strict definition of recycling rates (collection → use)
- Extended producer responsibility



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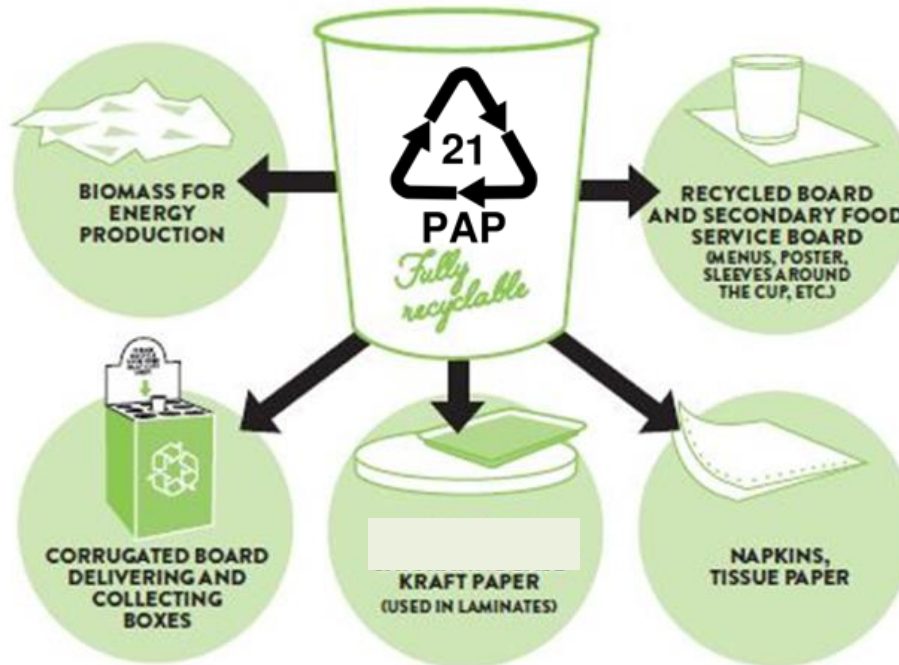


Code	Name	Origin	Max [%]* WBDB	Max [%]* PE-coated Board
EN 643				
1.02.00	Mixed paper and board	Households (DE)	100	100
1.03.00	Boxboard cuttings	Sheeting and converting facility	100	2
1.04.00	Corrugated paper and board packaging	Organisations, supermarkets (DE)	30	30
1.05.00	Ordinary corrugated board	Organisations, supermarkets (FI)	10	10
1.09.00				
2.05.00	Ordinary sorted office paper	Organisations	5	1
3.11.00	White heavily printed multiply board	Sheeting and converting facility	100	0,5
3.12.00	White lightly printed multiply board	Sheeting and converting facility	100	0,5
3.13.00	White unprinted multiply board	Sheeting and converting facility	100	0,5
5.02.00	Mixed packaging	Households (FI)	100	100

*indicative, based on definition, separate acceptances by mills

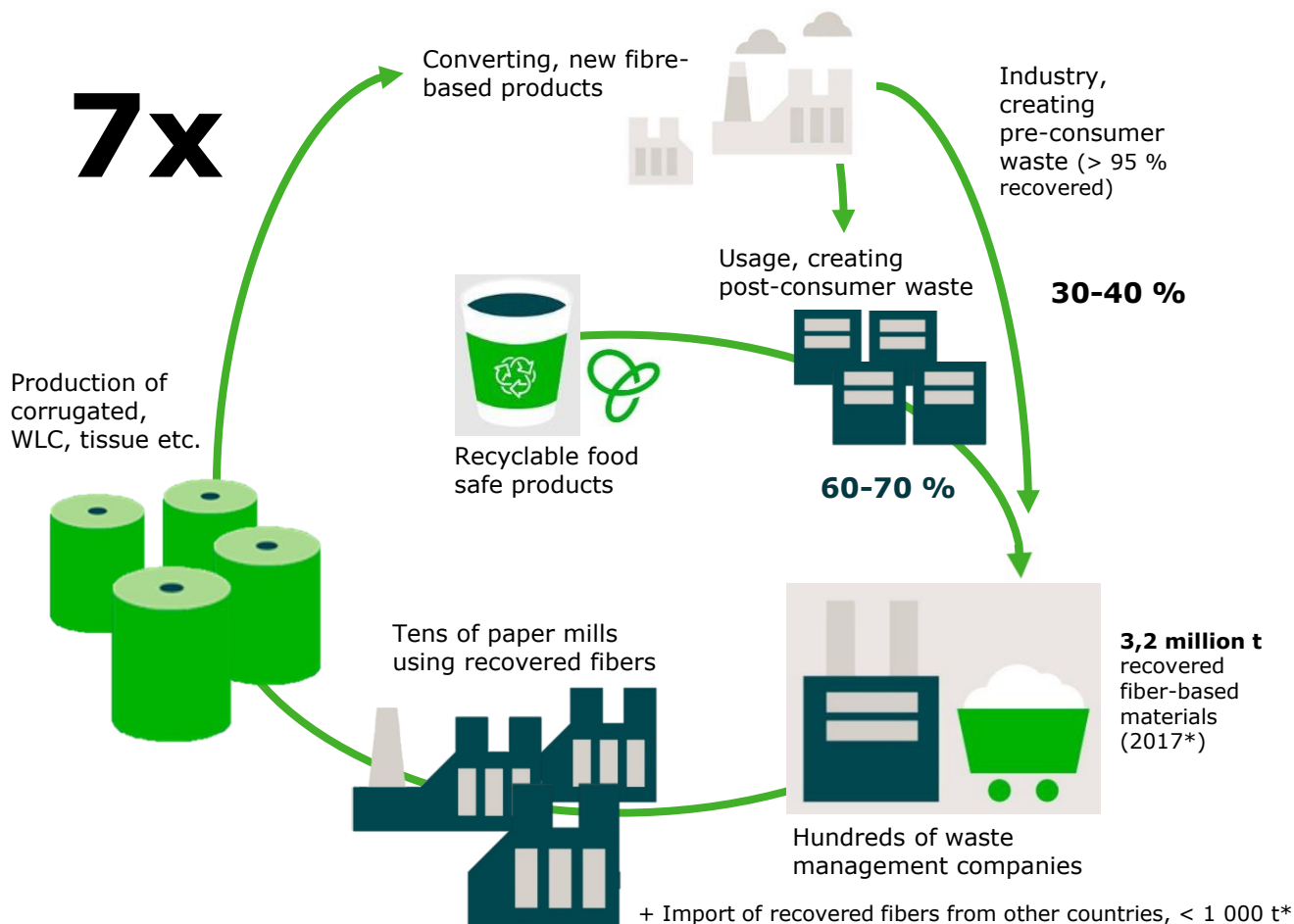
PLASTIC-FREE CUPS CAN BE FULLY RECYCLED AS SUCH

VIRGIN FIBRES USED IN CUPSTOCK CAN BE RECYCLED UP TO 7 TIMES,
MAKING IT HIGH VALUE RAW MATERIAL



- ✓ Sustainable renewable furnace
- ✓ No plastic lining
- ✓ Easy recycling in many available paper streams
- ✓ Payback value from recycled fibers

Current fiber loops in Turkish market

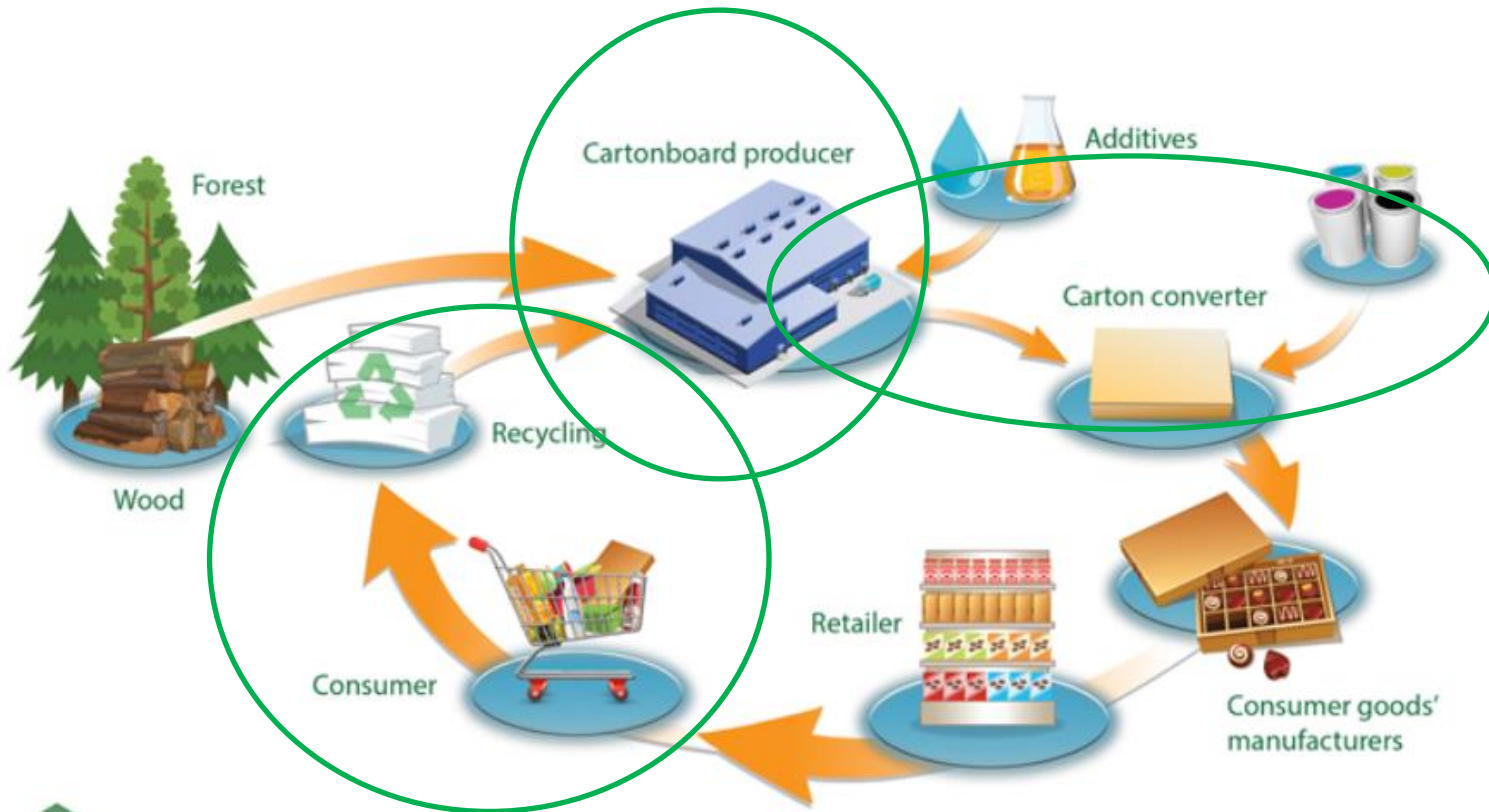


EASY RECYCLABILITY

21
PAP

PE-free paperboard is easily recyclable to new paper and board production.

Cartonboard life cycle - collaboration





Recognizing the path towards higher recycling rate

Key stakeholders

Converter
Retailer
Consumer
Collector
Sorting
RCP

Values

€
Environmental aspect
Work load
Hygiene
Quality
Availability

Solutions

High value fiber
Easy recyclability
Communication
Labeling
Information



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Aqueous barriers can typically be recycled like normal FBB board without barriers. Suitable streams shall be found by collaborating between the parties.

For convertor finding the optimal stream, may have huge economical benefit for all parties.

A05	Collected corrugated cardboard	90	Paper and cardboards with 90% corrugated + 10% other grades
A04	Collected corrugated cardboard	70	Package paper and cardboards with 70% corrugated + 30% other grades
A02	Corrugated mixed	< 40	Paper and cardboard with a maximum of 40% corrugated + 60% mix of other grades

B03	White multi-ply cardboards	Cardboards made from bleached sulphate cellulose
B02	White multi-ply cardboards	White, multi-layer cartons without gray layer, unprinted or printed in clear tones
B01	White, printed multi-ply cartons	Printed, white, multi-layer cardboards without gray layer



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Recycling and repulping

Board

Sheeting and converting facility

Client/retailer

Consumer

Municipal take-back point

Waste management company

RCF facility for FBB

Separation of PE-coating

RCF facility for PE-coated board

Biodegradation

Thrown into the nature

Mixed waste

Waste management company

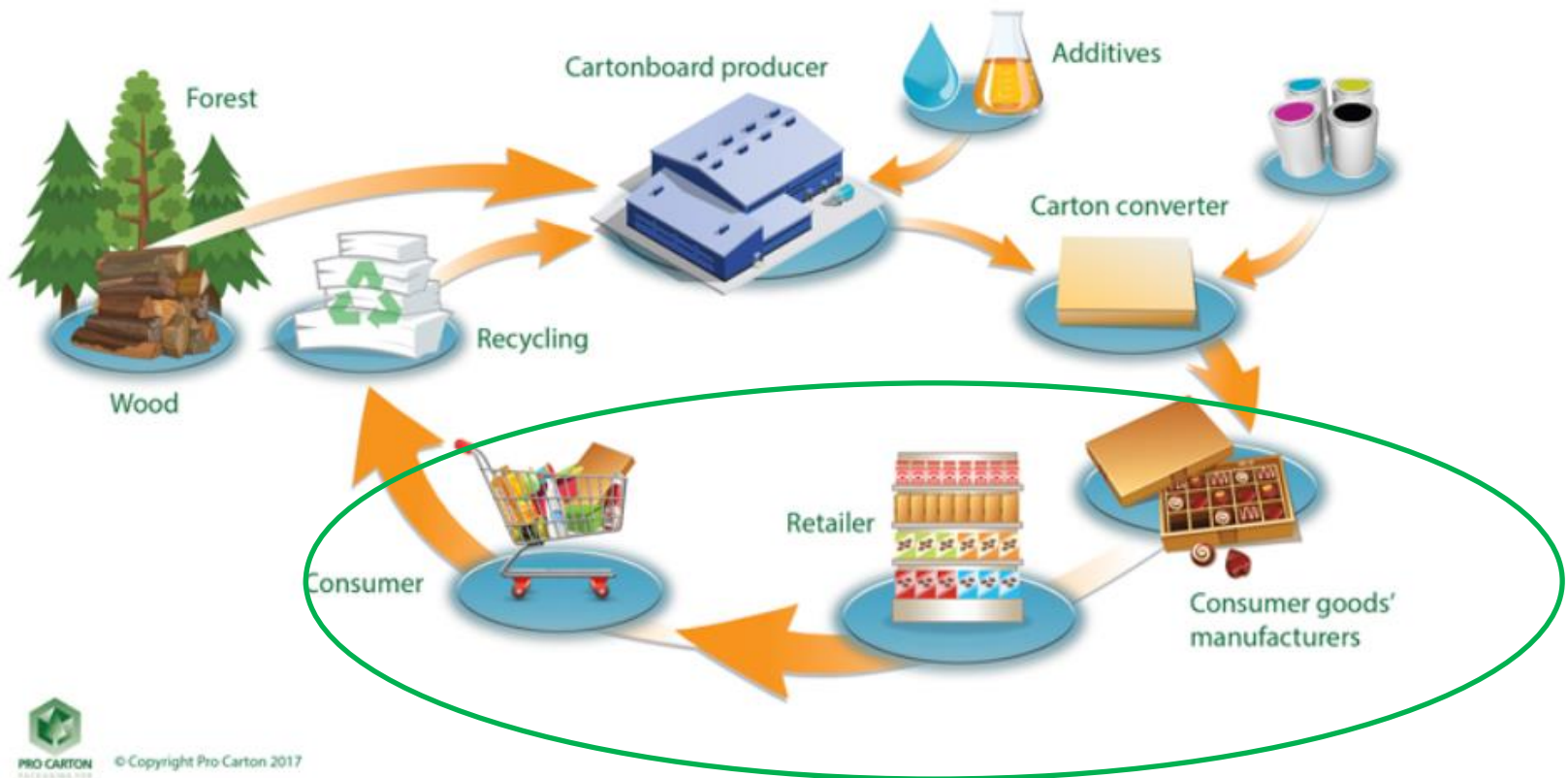
Incineration or landfill

- Pre-consumer
- Post-consumer
- PE-coated board

Recycling is consumer's decision.

We need to make it easy by product design and solutions for collection and utilization.

Cartonboard life cycle





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Our offering to brand owners, retailers, consumers



Circular Economy – Story





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Solutions for Sustainable, PE-free packaging



AEGLE® Pro



AEGLE® White



AEGLE® Barrier Light



AEGLE® Barrier Plus



ISLA® Duo



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“Circularity as a concept is of high importance in all we do. Our customers are in the center. And not only them: also our customers’ customers.

Our business is ultimately driven by consumers and their changing needs. We observe and listen to all the participants in the value chain, answering to their demands and expectations efficiently and safely.”

Markku Hämäläinen
CEO, Kotkamills Oy

