

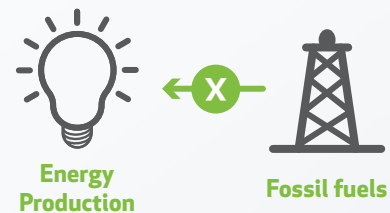
EXPLORING TWO SIDES OF AN ENVIRONMENTAL MODEL

Cascading system

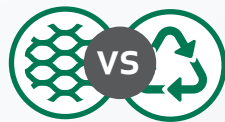
The most eco-efficient use of wood fibre for paper and paperboard sits within a cascading system.



Both virgin and recycled fibres are crucial assets of a wood fibre flow that maximizes the value of each harvested tree.



VIRGIN FIBRES



RECYCLED FIBRES

Virgin and recycled fibres are basically the same material but in different life stages, as the first becomes the second.

The two fibres are crucial for the paper cycle. They each have their own attributes and benefits, and these are critical in deciding which is most appropriate. It all depends of the output desired.

Pick the best for you.

Learn more on how Discovery can help you achieve more value at discovery-paper.com



PRODUCED IN PORTUGAL BY THE NAVIGATOR COMPANY

VIRGIN FIBRES VS RECYCLED FIBRES

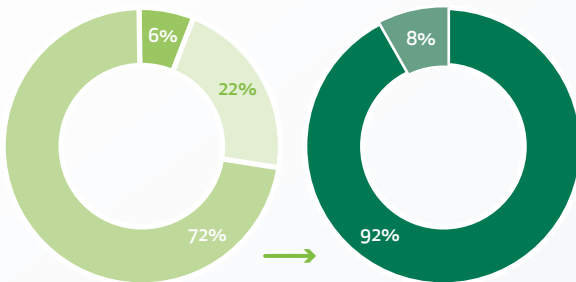


Based on extensive research, Discovery explores the arguments of this dual issue, from an environmental, economic, but also quality and performance point of view. Providing you with information that leads to better informed decisions.

- R** Recycled fibres do not cause trees to be cut down, **but**
- V** They would not exist if fresh fibres were not introduced into cascade.
 - Note:** Plus, harvesting trees leads to reforestation, which is the most effective and natural means of carbon sequestration and retention.
- R** Recovery rates are increasing all over the world, **but**
- V** There are limits to the amount of used paper that can be recovered, since there is paper that we store and paper that cannot be recycled.

CEPI* paper and board consumption and recycling

Paper and board theoretical maximum and recycling rate



- Recycling
- Archived or not recyclable (Ex: Books or toilet paper)
- Non Recoverable
- Current recycling rate
- To be achieved

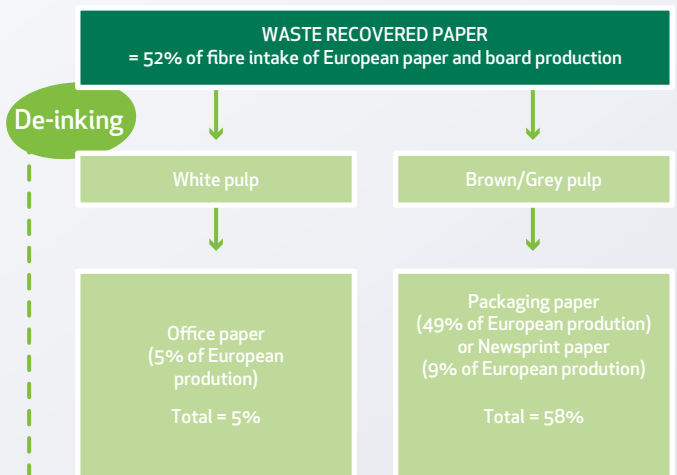
In Europe, the recycling of paper and paperboard is approaching the maximum that can be practically achieved. The 72% recycling rate out of the total paper and board consumption corresponds to 92% (=72%/100%-22%) of the theoretical maximum.

*CEPI - Confederation of European Paper Industries



- R** Recycling returns used fibres to the paper manufacturing stream, **but**
- V** There is a loss of fibres during recovery and recycling processes and reuse is limited (3,5 times in Europe) - Fibre degrades and becomes unsuitable for use in paper and paperboard.
- R** Recycling has lower environmental impacts than landfill disposal or burning for energy, **but**
- V** If used paper is diverted from disposal and burned for energy, in the end you will have the best of both worlds.
- R** Recovered waste paper fibre for recycling calls for intense (and sometimes not so eco-friendly) transformation processes to whiten it.
- V** Virgin fibre pulp is much more suitable for producing white paper.
- R** State of the art technological assets make it possible to get increased quality recycled paper, **but**
- V** Only virgin fibres can achieve the best premium quality for your printed work.

Use of waste recovered paper by European paper and board industry



De-inking concerns:

- 1) Sludge after flotation on de-inking process is a clear environmental concern.
- 2) Waste paper that has been inkjet printed cannot be used for white paper since the ink cannot be separated in the flotation stage and turns the fibres grey.