



**KENNISCENTRUM
PAPIER EN KARTON**

THE EVOLUTION OF PAPER MILLS: CIRCULAR ECONOMY IN PRACTICE!

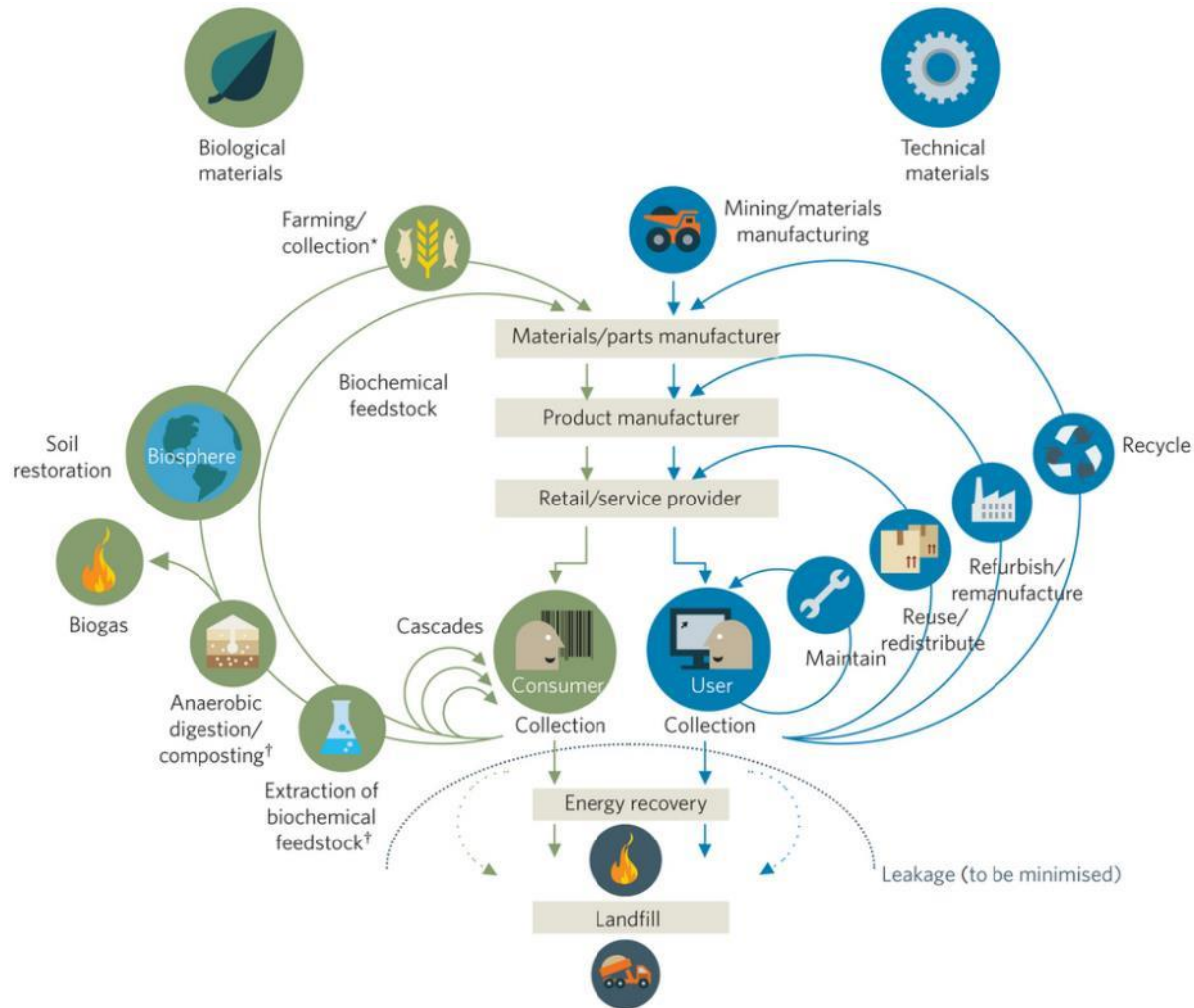
THE NETHERLANDS...?



Ah... the Dutch...



CIRCULAR ECONOMY



PBI: A BENCHMARK FOR CIRCULARITY



**We are already
a benchmark
model of resource
efficiency**

**RESOURCE EFFICIENCY
IN THE PULP AND
PAPER INDUSTRY**
**MAKING MORE FROM
OUR NATURAL RESOURCES**

DUTCH PBI AT A GLANCE



Board



Production in 2014 [VNP]:

891 kton Graphical paper

116 kton Hygiene products

1760 kton Packaging materials

PIER

pa



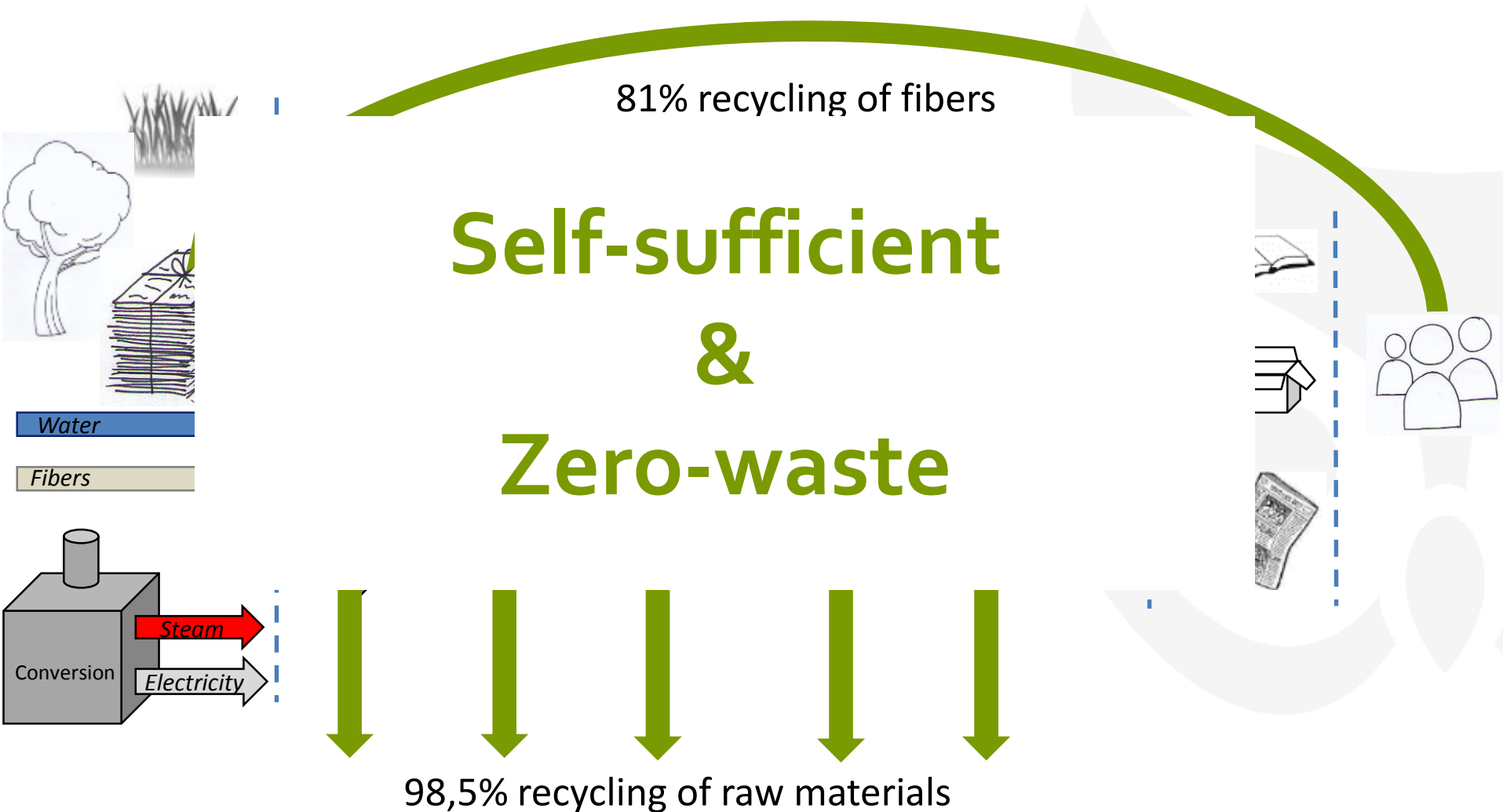
Total NL production: 3 Mton

EU: 100 Mton and Worldwide: 350 Mton



VanHoutum

PBI: A CIRCULAR ECONOMY BY TRADITION



VISION OF THE DUTCH PBI

“The paper industry is the **centerpiece** of a biomass-based **circular economy**. We **make the most** out of Biobased **raw materials**, thereby **reducing energy** consumption and **CO₂** emissions and **increase** the **added value** and **customer value** of products and services. Our **people** make the difference”.

ICON PROJECTS




Raw materials of the Future

Market introduction of three paper and board products based on alternative (local) raw materials



To a sustainable Energy supply

Realization of sustainable energy supply for several paper and board mills; independence from natural gas



High performance materials

Market introduction of a range of paper and board products with completely new functionality

AND YOU KNOW WHAT...?



YESTERDAY'S PAPER INDUSTRY

Linear approach:

Single raw material (wood-based cellulose) to make one **single end product** (paper & board)



Reduce and Minimize

TODAY'S PAPER INDUSTRY

Multi-product mills:
Raw materials and waste streams
are converted into a **variety of end products**

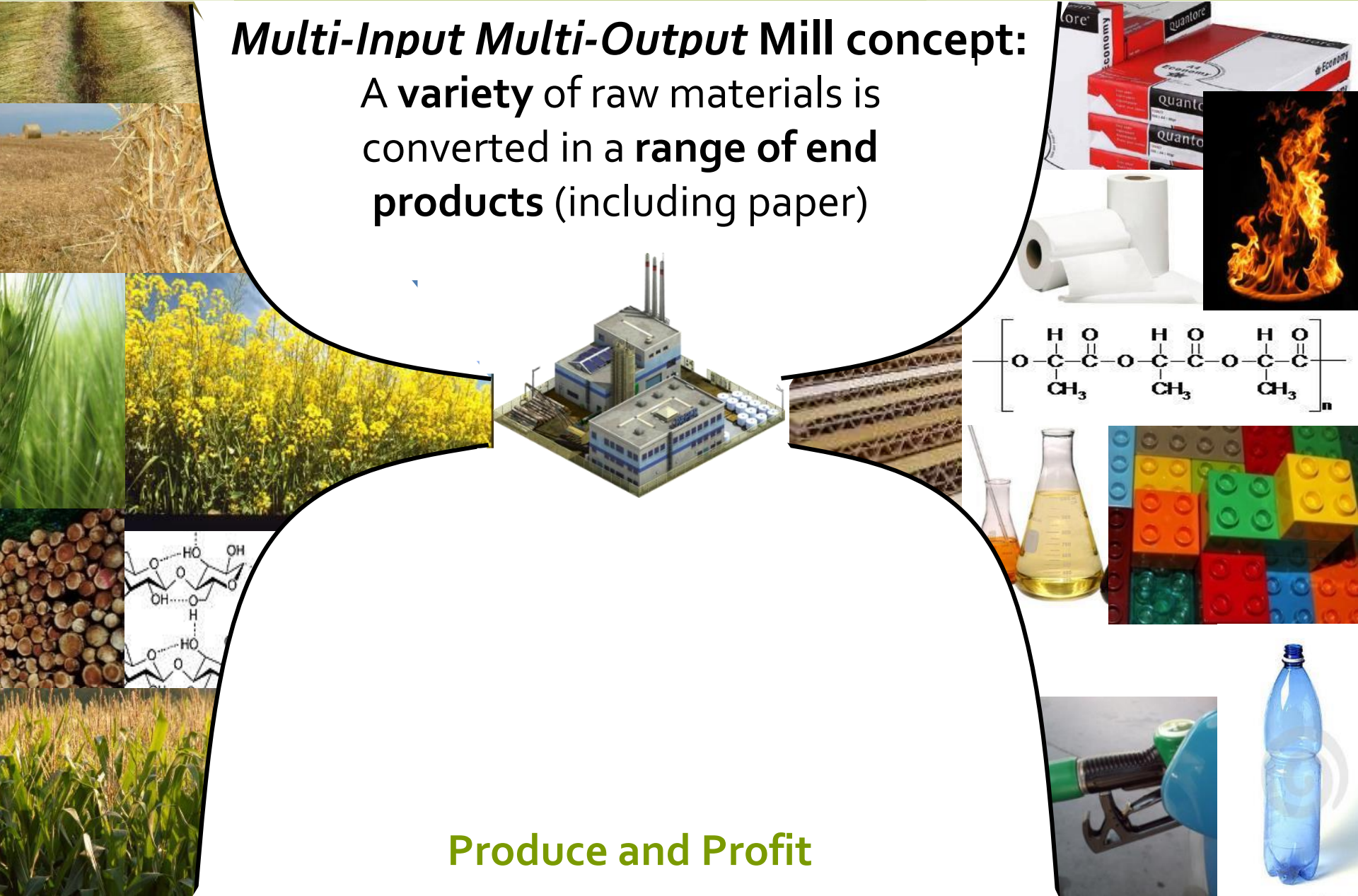


Accept and valorize

TOMORROW'S PAPER INDUSTRY

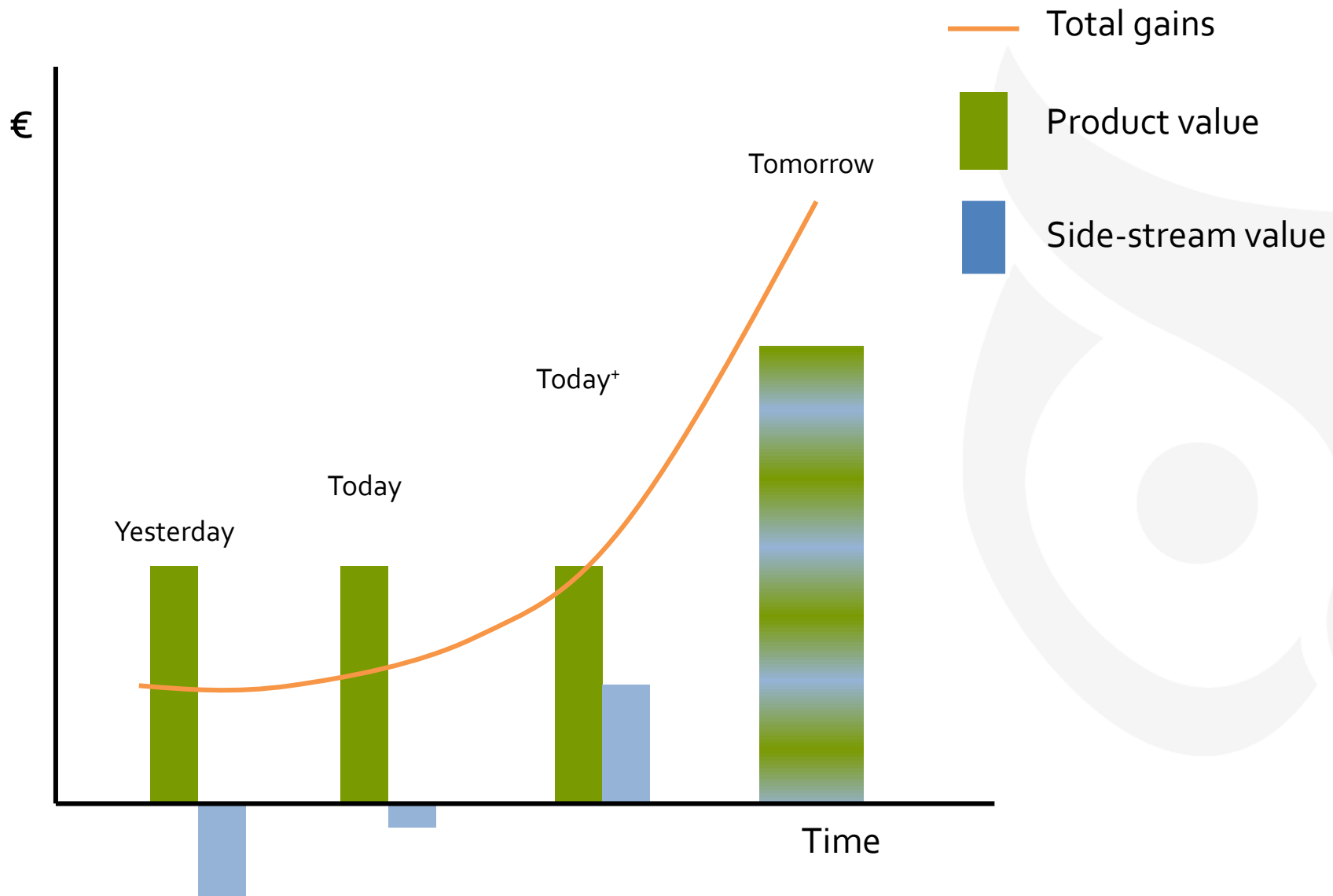
Multi-Input Multi-Output Mill concept:

A **variety** of raw materials is converted in a **range of end products** (including paper)



Produce and Profit

THE EVOLUTION CURVE



GETTING THERE... STEP BY STEP



TYPICALLY DUTCH: GREENHOUSES

Every year: 805.000.000 kg tomatoes!

But also: 80.000.000 kg plant waste



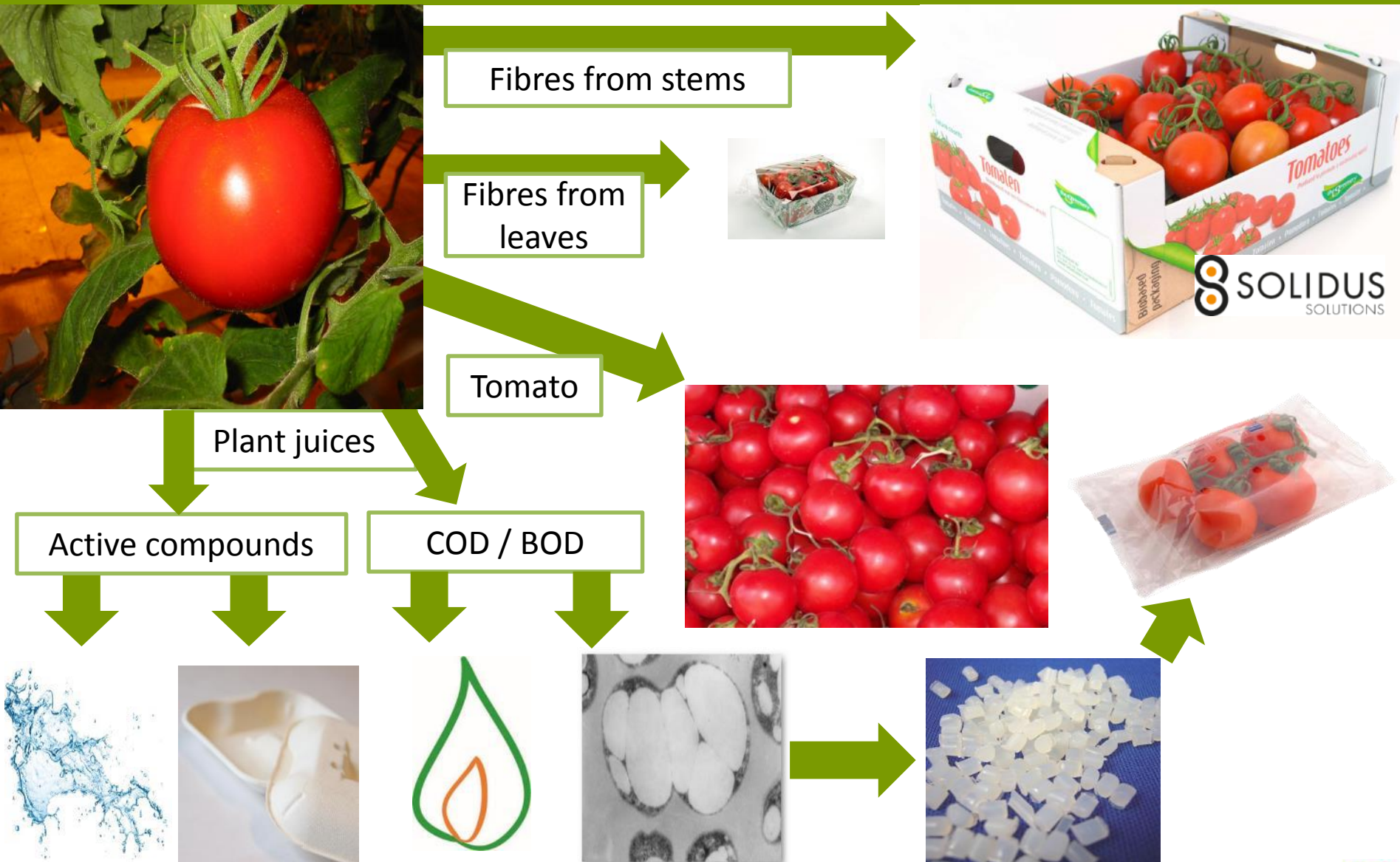
NOW: COMPOSTING PLANT WASTE



€€€ !



FUTURE: TOMATO PLANT PAPER PACKAGING



use the entire barrel of biomass!!



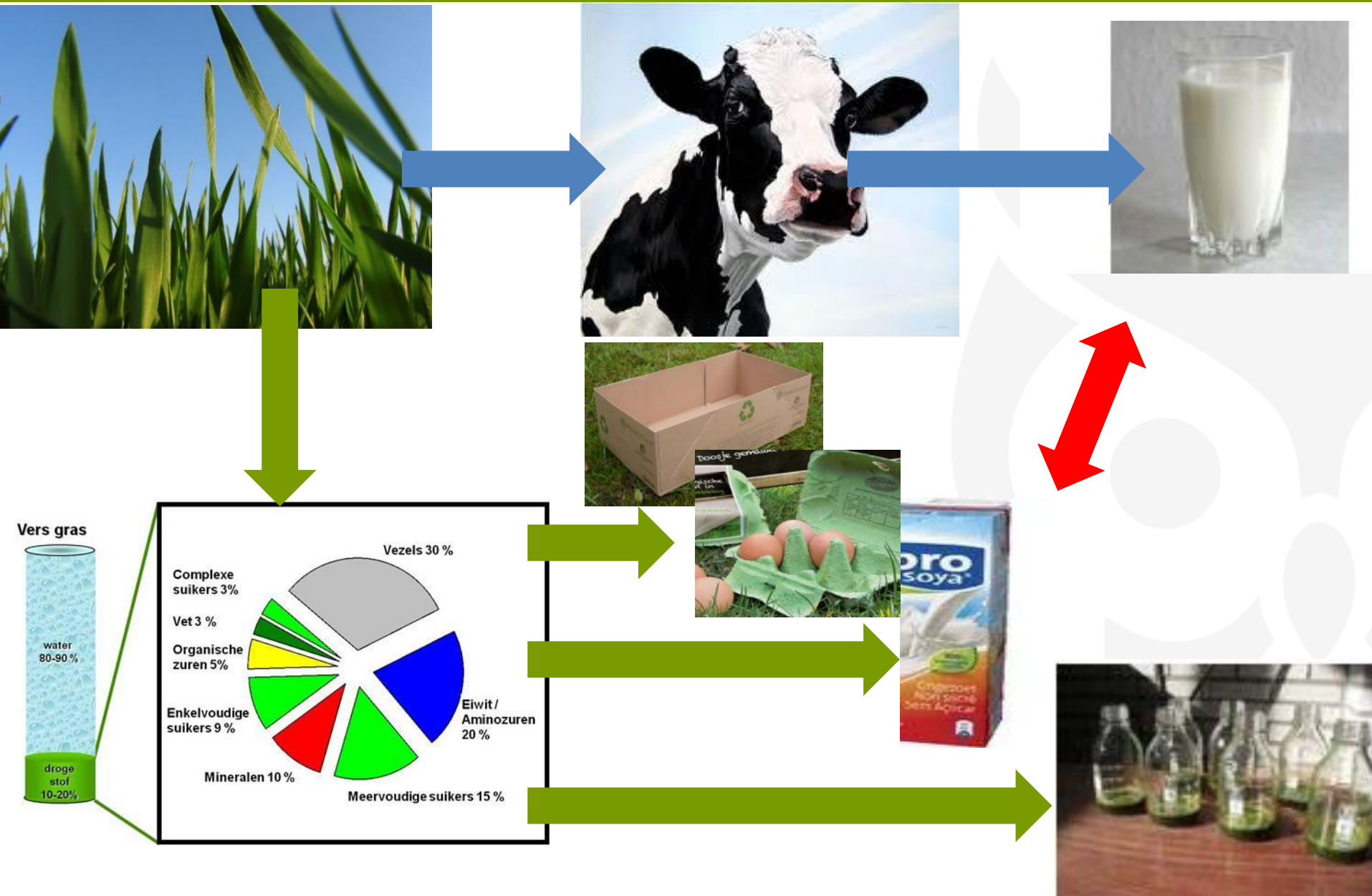
DE SUBSIDIEREGELING CLUSTERPROJECTEN
MEDE GEFINANCIERD MET STEUN VAN HET
EUROPEES FONDS VOOR REGIONALE
ONTWIKKELING VAN DE EUROPESE COMMISSIE



TYPICALLY DUTCH: GRASSLANDS & COWS



"NEIGHBOURS GRASS IS ALWAYS GREENER"

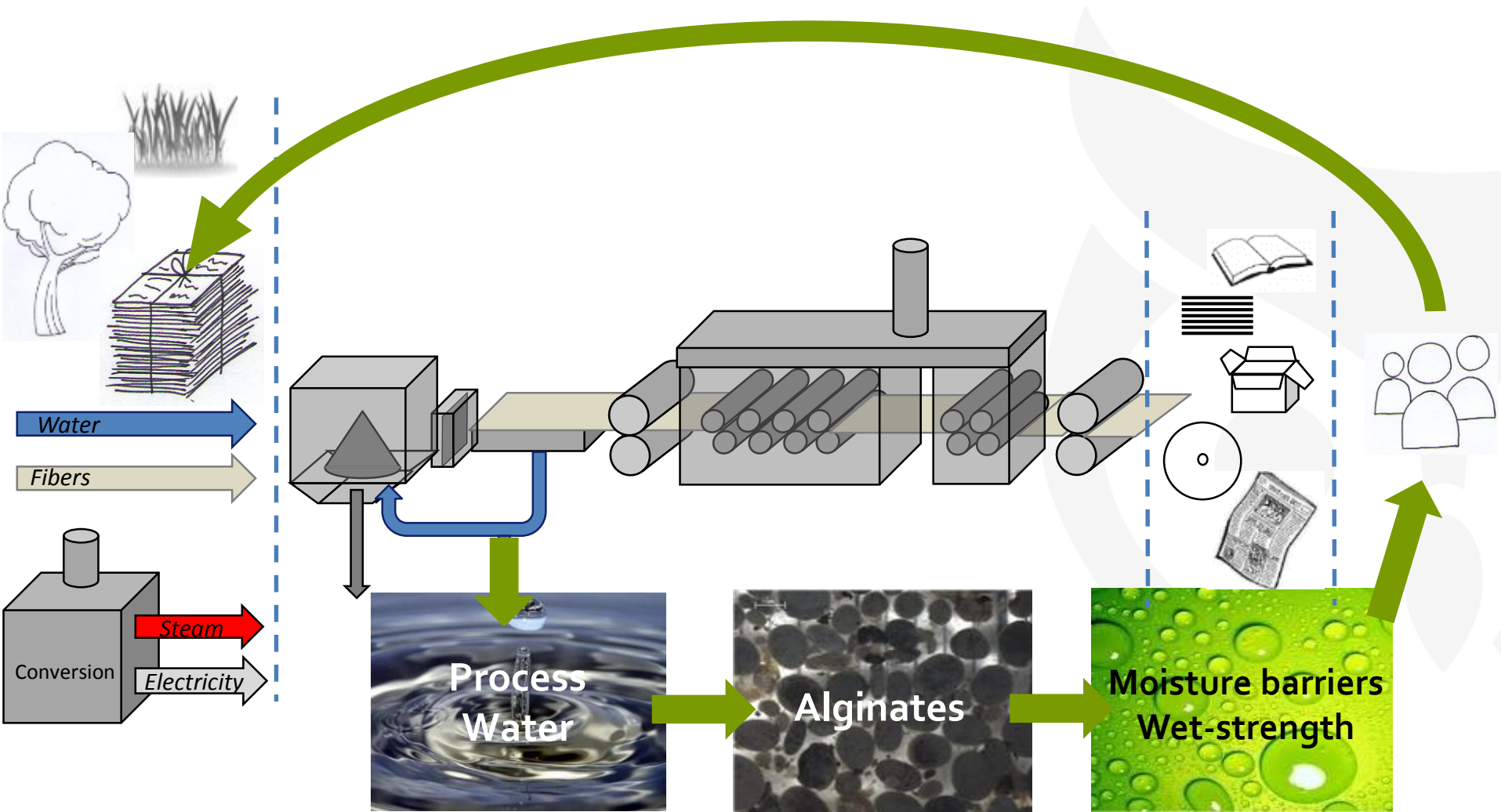


THE BEST WAY TO BECOME CIRCULAR



He's his own best friend."

INTEGRATED CONCEPT: ALGINATES



BUSINESS MODELS: PAPER FOR PAPER



Closed loops for offices:

- Collecting archives and office papers
- Giving hygiene products in return
- Using recovered paper for the hygiene products
- Can be combined with closed loops for coffee cups

BUSINESS MODELS: BIBLES



Just in 2013:
100.000X

Paper processed
in France

New paper used
for bibles for less
Privileged people

LESSONS LEARNED



WHICH IS MORE SUCCESSFUL?



Transport packaging



Consumer packaging



CONSUMER PACKAGING!



INTEGRATED APPROACH IS NECESSARY

Shift from **costs** towards **opportunities**

Branding, customer bonding and added value

Assess on **multiple levels** (fibers, active components, plastics) and on **multiple benefits** (business, society)

Broader view (not only supplier and buyer) causes

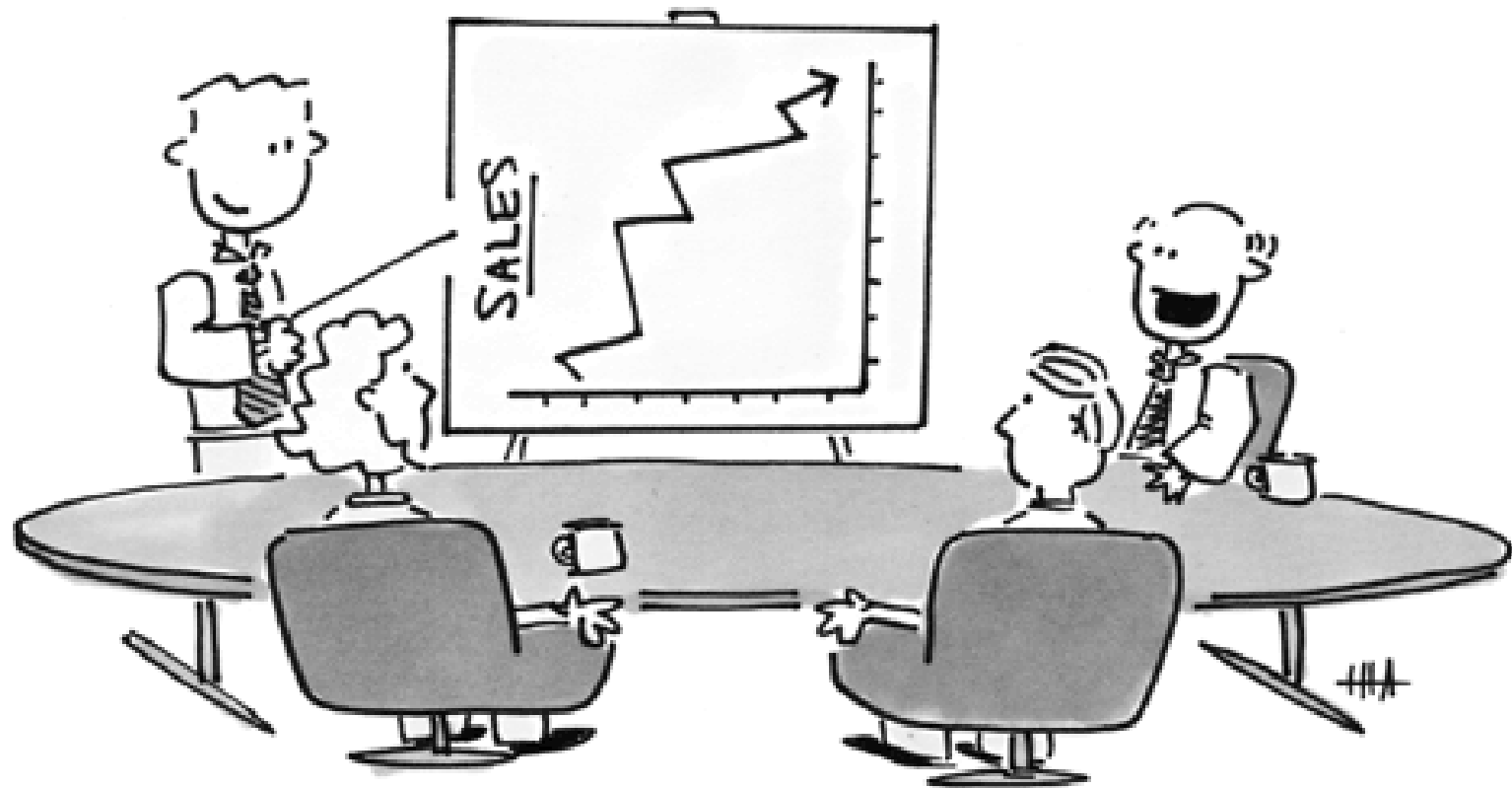
supplier = customer = supplier = customer

Going from “Outside the Box” to “**Beyond the Box**”

LOOK AT THINGS FROM A DIFFERENT ANGLE

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"He's right, when you look at it that way,
it's not so bad!"

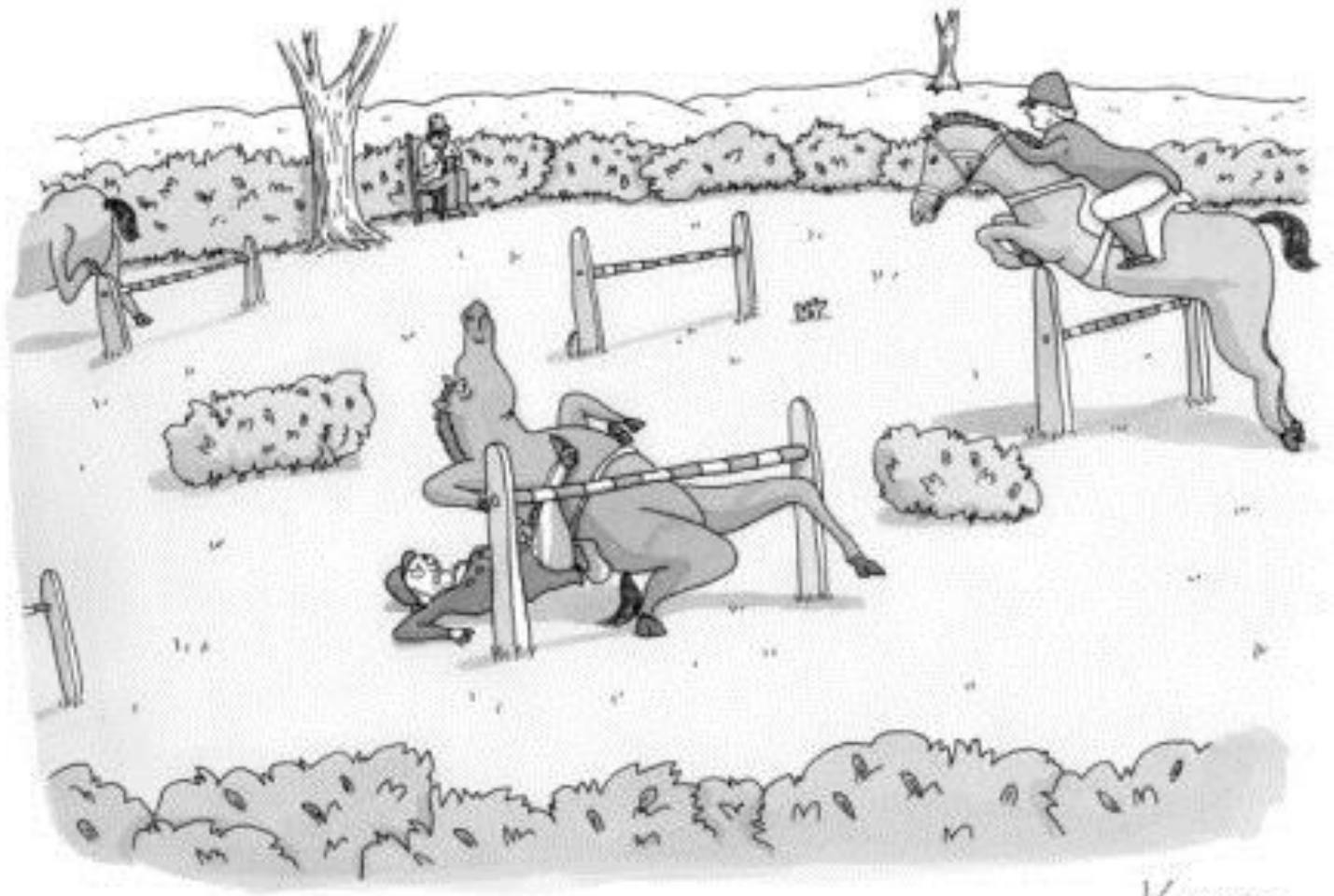
INTERSECTORAL COOPERATION

**"Coming together is a beginning;
keeping together is progress;
working together is success."**

Henry Ford



THE RIGHT CHAIN PARTNER..?!



"Over, damn you, over!"

Kanin

SOCIETAL CHALLENGES



If it looks like a duck,
swims like a duck,
and quacks like a duck,
then it's a duck



Paper made
from limestone

- 100% compostable
- 100% recyclable



BUT MOSTLY THIS...



"This really is an innovative approach, but I'm afraid we can't consider it. It's never been done before."



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