THE FUTURE – A PERMANENT REINVENTION

Industry Forum
CEPI 2050 Roadmap – The Strategic Role of the Value Chain
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BLUE SKY AND DOWN-TO-EARTH
BLUE SKY ...
FIVE WAVES OF CONTINUOUS INNOVATION OF THE PAPER INDUSTRY

First: The Age of Papyrus

Second: The Age of The Codex

Third: The Age of Gutenberg

Fourth: The Modern Paper Industry

Fifth Wave: Confluence

1 AD

Now
... AND DOWN-TO-EARTH
A Heavy Sector: Capital Bound in Chemical Forest Industry

- Our last estimate of the capital bound in chemical forest industry was 564 000 000 000 USD. Let’s go with 400 bill. EUR
- A recent estimate of Bill Gates’ personal wealth was 61 000 000 000 USD. Thus, the capital bound in the chemical forest industry is 9 Bill Gates-units
- In 2010, the original EUR safety net involving rescue package in creating the EFSF (European Financial Stability Facility), EFSM and IMF was 750 bill. EUR. So, the chemical forest industry has about half of that bound in capital.
... AND FURTHER DOWN TO EARTH

~390 mn tonnes  pulp/fibre  expanding into new end uses

~140 mn tonnes  paper  competition with e-media

~180 mn tonnes  packaging  competition with other materials

~30 mn tonnes  tissue  expanding into new end uses
... AND STILL DOWN-TO-EARTH
GLOBAL ASSET QUALITY COMPARISON 2011

Average capacity and technical age of the world’s paper and paperboard machines.

*) China data include identified, industrial scale machines only
Constant reinvention is the norm in the forest-based value chain. The chain is weighed down by bound capital in many parts, which makes adjustment trickier.
BRICKING, GOLDBRICKING AND OTHER CHANGES
PERCEIVED BRICKING AND GOLDBRICKING

As it appears to many, true or not

**BRICKing**

![Brick]

= The future belongs to Brazil, Russia, India, China and a (painfully) reunited Korea

**GOLDBRICKING and productivity gains**

![Goldbrick]

= Goldbricking, in today's terms, generally refers to staff who use their work internet access for personal reasons while maintaining the appearance of working, which can lead to inefficiency. The term originates from the confidence trick of applying a gold coating to a brick of worthless metal.
REINVENTING THE EUROPEAN FOREST-BASED VALUE CHAIN IN A DIVIDED WORLD - A BALANCING ACT

Production share of North America and Western Europe

- 2010: 46%
- 2025: 34%

Production share of Asia (incl. Japan)

- 2010: 43%
- 2025: 53%

Projected European paper and paperboard growth 2010-2025, relying on Eastern Europe

- 6%

India’s projected share of the growth of the world’s paper and paperboard production 2010-2025

- 11%

Eastern Europe’s hygiene share of projected growth 2010-2025

- 12%

Eastern Europe’s cartonboard share of projected growth 2010-2025

- 14%

Eastern Europe’s containerboard share of projected growth 2010-2025

- 52%

China’s projected share of the growth of the world’s paper and paperboard production 2010-2025

- 65%
THE EMPEROR’S BREATH: IN, OUT AND IMPACT ON OUR VALUE CHAINS
“There is always an emperor in China – a good or bad one”

Shi Huangdi, the first emperor of China

BREATHING IN
- Tight imperial control.
- No freedom for out-Chinese and coast.

BREATHING OUT
- Looser imperial control
- Freedom for out-Chinese and coast.
- Focus on Middle Kingdom
WHAT BEHAVIOR WILL INDIA’S POPULATION ADOPT?
PYRAMID IMPACT

Very strong impact of the ”next generation”
As long as somebody keeps providing the resources for each layer of the pyramid that grows up to be active consumers, there are winners. Until there are no more de facto available resources, and the scam crashes.

=> Resource efficiency in the value chain!
RESOURCE EFFICIENCY
Resource convergence is proceeding with increasing speed – a parallel, analogous but not an identical phenomenon to e.g. media and device convergence.

From a separation between sectors and raw materials, the former are both forced and sometimes willing to reconsider their borders; the latter are driven together by interconnections between product, trade political and consumer level.

Biomass and energy have lead the convergence, followed by water and land. Chemicals and metals are approaching fast.
RESOURCE EFFICIENCY DIAMOND
Trade-Offs Between Material and Other Components of Resource Efficiency
RESOURCE EFFICIENCY DIAMOND
Building Scenarios for Resource Efficiency

1. Water
   - Minimise water waste (process, product)

2. Metals
   - Minimise espec. rare metal use (inks, machinery)

3. Energy
   - Minimise energy use as a whole – sometimes local optima not enough

4. Non-food biomass
   - Cooperate with food sector for no/minimum impact on food chain

5. Land
   - Sustainable forestry/agroforestry

6. Social capital
   - Follows from the rest, if social aspects taken care of

EXAMPLE:
GLOBAL PACKAGING SOLUTION (FOOD/BEVERAGES/BRANDS)

OR

GLOBAL LUXURY MAGAZINE CHAIN
RESOURCES EFFICIENCY DIAMOND
Building Scenarios for Resource Efficiency

EXAMPLE:
GLOBAL PACKAGING SOLUTION (FOOD/BEVERAGES/BRANDS)

OR
GLOBAL LUXURY MAGAZINE CHAIN

Boils down, from many directions, to land use
NO SAFE PLACE FOR CHEAP LAND COSTS

Land costs are increasing, and pushing up wood prices in Latin America and China, for example.

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**Nominal Land Price Development in Brazil and Uruguay**

100 = 2011 Land Price

- **Brazil**
- **Uruguay**

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**Land Prices in Brazil**

- North – very low
- Northeast - low
- Center West -medium
- Southeast - high
- South – very high
AT THE EPICENTRE: THE MAGICAL SQUARE KILOMETER

Land is the epicentre of the resource quake. How is the optimum value from one square kilometer anywhere in the world realised? Or, how is material efficiency optimally applied to one square kilometer?

=> Only the value chain together can provide optimal solutions!
THE FOREST-BASED VALUE CHAIN SIMPLY HAS TO WORK TOGETHER TO MEET THE RESOURCE EFFICIENCY CHALLENGES – THERE IS NO SUCCESSFUL ALTERNATIVE
THE GREAT ENEMY OF RESOURCE EFFICIENCY

The **Face** of The **Book** of Waste

**Productivity loss** = 1 000 000 000 users * loss of worktime * value of hours = ??!!

**Resource use** = energy + water + chemicals + ... + land = ?!?!
Constant reinvention is the norm in the forest-based value chain. The chain is weighed down by bound capital in many parts, which makes adjustment trickier.

Promising unlimited billion-consumer markets in China and India is irresponsible. The "population pyramid scam" demands continuous resource efficiency improvement from whole value chains working together.

1.

2.

3.

4.
CONTINUOUS INNOVATION IN THE FOREST-BASED CHAIN
INCREASINGLY FAST DIFFUSION OF INNOVATIONS

Penetration into the market (%)

Years

0 10 20 30 40 50 60 70 80 90 100 110 120

0 10 20 30 40 50 60 70 80 90 100

Microwave Internet

Mobile phone TV Electricity Phone

Radio Video recorder
E-MAIL BEING ALREADY REPLACED...
DEAD BEFORE ARRIVAL or DEAD ALMOST UPON ARRIVAL

US Web-based email usage: 2010/11 change in time spent by age

FIVE WAVES, SAME PATTERN

First: The Age of Papyrus

Second: The Age of The Codex

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Fourth: The Modern Paper Industry

Fifth Wave: Confluence

(Re)invent

Evolve

Evolve

Evolve

(Re)invent

Evolve

(Re)invent

(Re)invent

Evolve
Reinvention while keeping current base competitive!
STEEL VS. PAPER
Transition Shape for Next Wave

Number Of Years Of Steel Production Above 500 kg/Capita

- US – 30 years
- Japan – 44 years (continuing)
- Germany – 45 years (continuing)
- Korea – 27 years (continuing)
- China – 0 years

Source: Rio Tinto
A SERIES OF FOOTPRINTS

- Water footprint
- Water and carbon footprint
- Innovation footprint
- Carbon footprint
- Economic footprint
What Is The Research Footprint for The Forest Cluster?

www.newscientist.com
QUANTIFYING INNOVATIVENESS
A More Aggressive Form: ”The Innovation Footprint”

- Share of buzz about new consumer products
- Share in cross-cluster innovations
- Share of PhDs working (wholly or periodwise) in industry
- R&D and Technology Licensing as % of GDP
- Researchers, developers, patent hunters, technology marketers per 1000 workforce
- Share of world innovations
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Promising unlimited billion-consumer markets in China and India is irresponsible. The “population pyramid scam” demands continuous resource efficiency improvement from whole value chains working together.

Innovation for innovation’s sake is not for the forest-based chain. However, innovation impact can be quantified.
In 60 Internet Seconds...

(BIO)VALUE created?

In 60 Papermill Seconds...

A mile of paper
PULSE AND CORE OF INNOVATION IN VALUE CHAIN/NETWORK

Quantification

Pulse = speed and intensity of action

Core = value creation

Screenshot from "ARETE" value network & business model evaluator
FROM MATERIALS CORE TO END USES

There is a tight core of bio-based products that radiates an impact on products, sectors and companies globally.
The Coca Cola-Heinz deal illustrates how players can jointly accelerate the prospects of bio-based materials to the benefit of all.
INNOVATIONS BALANCING GLOBAL ASYMMETRY IN FOREST-BASED VALUE CHAINS

PLATFORM
Existing strength in European chain

SYNERGY
Overlap inside value chain

Innovations close to current fundamentals

Innovations uniting parts of value chain

Innovations close to end consumer

VALUE ADDED
Actual value
INNOVATIONS BALANCING GLOBAL ASYMMETRY IN FOREST-BASED VALUE CHAINS

The right mixture

PLATFORM INNOVATION
"Rocks"

SYNERGY INNOVATIONS
"Weaves"

"Bullseye": Connects value chain actors, built on current strengths, close to value core

VALUE ADDED INNOVATIONS
"Pearls"
AN EYE ON THE GAMECHANGER RADAR: SO MUCH GOING ON

A selection of items looming on the horizon with surprise power

”LITTLE EMPEROR”: and the future of China

FEAR: and impact on all value chains

ENERGY TECH: ”Petrol from air” and other candidates

MYCOECONOMY: fungi processing and molding products

CHEMATICS: crunching new chemical routes

LIQUID PROTEINS: and other biotech shocks

MINDREADING THE CONSUMER: fMRI and others

NULLOMERS: molecules that could/should exist but so far don’t
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With so much happening, the simultaneous innovation and evaluation of innovations is necessary, with the whole chain involved.