

The next phase

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An industry sector in transformation

Growth

Decline

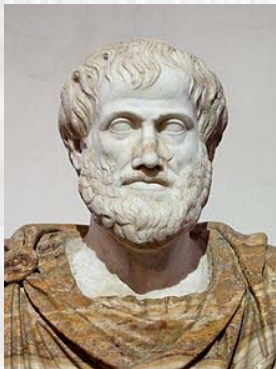
Investment



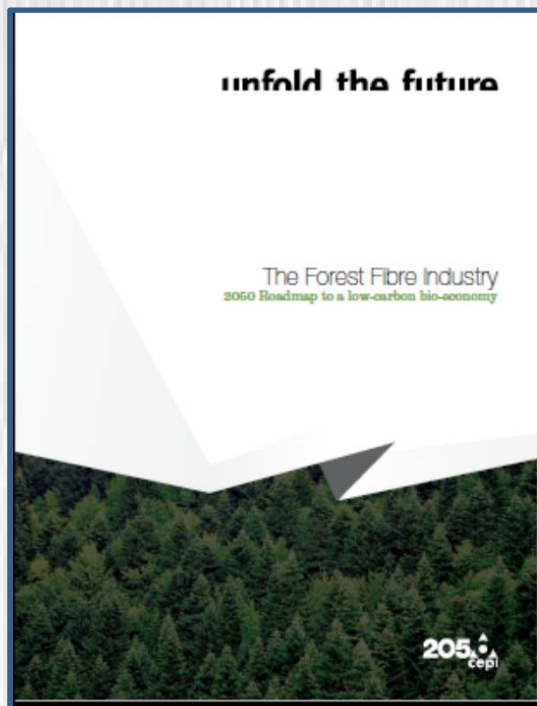
Innovation

One swallow does not a summer make

- From a remark by Aristotle (384 BCE - 322 BCE): "One swallow does not a summer make, nor one fine day; similarly one day or brief time of happiness does not make a person entirely happy."



Check out the two team results!



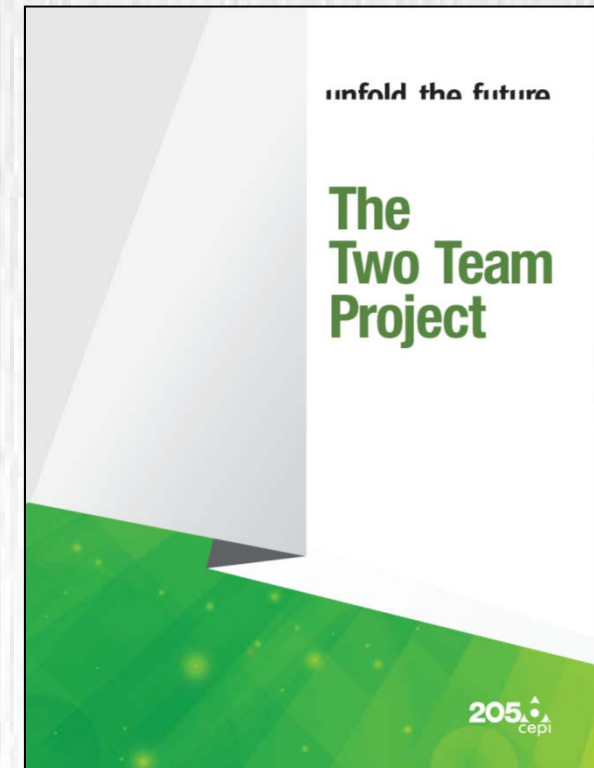
In our technology assessment, the CO₂ reduction pathway to 2050 depends on

breakthrough technologies.

This is two investment cycles, or a maximum of two paper machines or boilers away. Breakthrough technologies have to become

available by 2030

to be on time for 2050.



Breakthrough technologies for the 2050 world

Deep Eutectic Solvents

WINNER

A ground-breaking discovery: Deep Eutectic Solvents (DES), produced by plants, open the way to produce pulp at low temperatures and at atmospheric pressure. Using DES, any type of biomass could be dissolved into lignin, cellulose and hemicellulose with minimal energy, emissions and residues. They could also be used to recover cellulose from waste and dissolve ink residues in recovered paper.



Flash condensing with Steam

FINALIST

Waterless paper production? Very nearly. Largely dry fibres would be blasted into a forming zone with agitated steam and condensed into a web using one-thousandth the volume of water used today.



Steam

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Using more energy to use less? You read it right. Using the full power of pure steam for superheated steam drying would save energy as most heat could be recovered and recycled. Steam will then be used as fibre carrier for making and forming paper.



DryPulp for cure-formed paper

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Imagine a papermaking process that uses no water. This is it. Fibres are treated to protect them from shear, and then suspended in a viscous solution at up to 40% concentration. The solution is then pressed out and the thin sheet cured with a choice of additives to deliver the end-product required.



Supercritical CO₂

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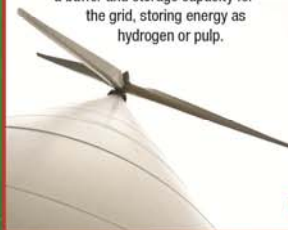
Neither gas nor liquid but somewhere in between, Supercritical CO₂ (scCO₂) is widely used in many applications, to dry vegetable, fruits and flowers, extract essential oils or spices. Suppliers for NIKE, Adidas and IKEA use it to dye textile. Coffee and tea have been decaffeinated with scCO₂ since the early 80s. We could use it to dry pulp and paper without the need for heat and steam, and why not dye paper or remove contaminants too, while we're at it?



100% electricity

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Shifting pulp and paper production to energy-efficient technologies using electricity rather than fossil fuel power to generate heat will cut all CO₂ emissions as the power sector shifts to renewable energy. The sector would also provide a buffer and storage capacity for the grid, storing energy as hydrogen or pulp.



Functional Surface

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The key to unlocking greater added value from fewer resources depends on a shift to producing more lightweight products, and selling surface area and functionality rather than weight. Advances in sheet formation and new cocktails of raw materials will lead the way to the lightweight future.



The Toolbox to replicate

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What about the great ideas that never make it? Put together a combination of process, material and equipment innovations as a toolbox of stepping stones to 2050 and the pathway becomes clearer, boosting sector and investor confidence.



CEPI stands in Brussels

- To improve competitiveness
- To reduce regulatory risks
- To contribute to a good business climate
- To address image and reputation challenges

From the mouth of the Commission

“In line with the Union’s innovation and industrial policies, the concept of an expanded NER300 system will, therefore, be explored as a means of directing revenues from the ETS towards the demonstration of innovative low carbon technologies in the industry and power generation sectors”

A policy framework for climate and energy in the period from 2020 to 2030 [COM(2014)15]



CEPI is determined

- Jean Monnet (the father of Europe, together with Schumann) (and only one of two Honorary citizens of Europe (with Helmut Kohl)):
- When asked whether he was an optimist or a pessimist, he answered "I am determined".



Thank you!

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