Cepi
RENEWABLE
RECYCLED
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EUROPEAN PAPER

Cepi Energy Solutions Forum

The pulp and paper industry today

The pulp and paper industry has already made significant progress on the path to decarbonisation by reducing very effectively its carbon emissions by 28% from 2005 to date. The industry is the largest industrial generator and user of renewable energy. 60% of the industry's total primary annual energy consumption is biomass-based. Nevertheless, a significant share of carbon emissions is primarily caused by fossil fuel combustion.
This means that to meet the EU 2030 and 2050 climate change and energy targets, in view of the future implementation of the EU long-term strategy, a thorough rethinking of the way business operates is needed.

The industry's challenge

How will industry reduce their CO_2 emissions, while at the same time remaining financially healthy and competitive? Which technologies are possible and profitable? Where can the largest savings be made? What can they do now without hindering necessary future innovations? What should they do themselves, and what should be developed by others?
Options to phase out fossil combustion are more costly, and the imminent risk of carbon leakage leaves no room for more expensive alternatives. A complex challenge, in which choices also significantly depend on external factors, such as infrastructure, subsidies, CO_2 and energy prices, taxes and other incentives.

The industry's objectives

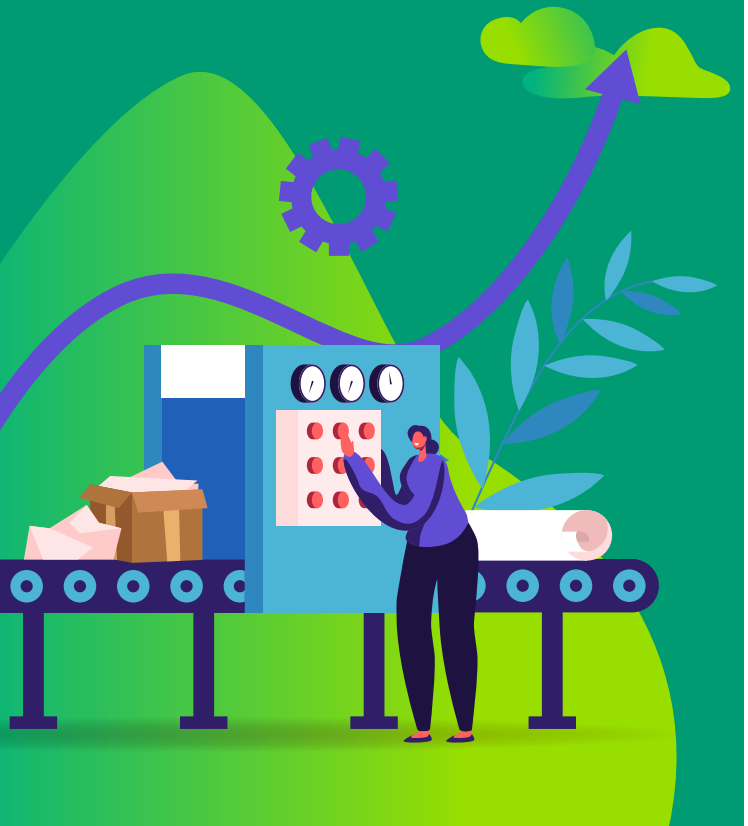
The pulp and paper industry can and will contribute to reaching the 2030 goal and European carbon neutrality in 2050. This requires emission reduction in our production processes by the implementation of both energy-efficient technologies and carbon-neutral energy sources.

Why the Cepi Energy Solutions Forum?

To reach these goals, it is imperative to timely bring to the market innovative solutions that are sustainable from an environmental, economic and social perspective. To this end, the Cepi Energy Solutions Forum, gathering the pulp and paper industry and technology suppliers, aims to accelerate the development and implementation of carbon-reducing technologies and concepts. This is done through:

- Facilitating the exchange of knowledge
- Ensuring the crucial R&D&I topics are included in European R&D calls
- Facilitating the set-up of common development projects within the paper industry
- Supporting suppliers to develop the required technologies and accelerate the implementation
- Creating a stimulating environment

A stimulating environment



The availability of technical solutions is not sufficient to accelerate implementation. Cepi is committed to eliminate non-technological hurdles and create a stimulating environment. To enhance carbon-reducing investments, the pulp and paper industry needs:

- Focus on the key technological challenges to provide long term security for technological developments.
- High-level agreement and support as the basis for suppliers to invest and for the industry to set up Joint Development Agreements
- Stimulating financial conditions and support to stimulate and protect first movers, to ensure the required energy infrastructure, to compensate for higher energy prices due to electrification, to create new business models and solve the stranded asset challenge.

The key challenges

The paper production consists of two processing parts:

- The pulping processes currently applied are very effective and CO_2 neutral. They isolate high-quality cellulose fibres. The remaining lignin serves as a sustainable energy source feeding the process, while pulping chemicals are being recovered. However, the increasing demand for biobased feedstock to replace fossil feedstock for chemicals and materials requires pulping processes with lower energy demand. This allows the lignin side stream to become available for new materials while keeping a CO_2 neutral process.
- The papermaking process generally consists of dispersing recycled and/or virgin cellulose fibres in water, the formation of the paper web and removing the water by pressing and thermal drying. On average 70% of the energy required for papermaking is used for thermal drying.

The carbon saving technologies

	SHORT TERM Up to 2025 – Best Practices and Operational excellence	MEDIUM TERM Up to 2030 – Modular innovations	LONG TERM After 2030 - Breakthrough Technologies	CROSS-CUTTING 2025-2040 Integration of cross-cutting technologies
The technological innovation concepts	• Lightning • Data automation and control • Improved mechanical dewatering • Water and heat saving through inline water cleaning • Drives and valves • Adjust pressure levels • Personnel training and behaviour analysis • Heat recovery by heat exchangers • Electrification • Direct renewable heat sources • Raw material replacement	• Mild repulping technologies • More effective fibre refining technologies • Innovative mechanical dewatering technologies • Advanced process control, machine learning and digital twins • Heat storage during breaks • Electric drying assisting technologies • Demand side flexibility • Hydrogen to increase pulp mills product portfolio • New systems eliminating or minimizing the use of vacuum	• Integral drying and heat recovery processes • Paper making without water • Water removal without evaporation • Mild pulping processes, e.g. by Deep Eutectic Solvents	• Industrial components (boilers, pumps, valves, compressors, fans, conveyors… all of which systems typically contain motors and drives) • Heat pump technologies • Industry 4.0: digitalisation and machine learning • System integration • Industrial symbiosis • Renewable energy systems (e.g. Solar thermal, hydrogen, nuclear)
Activities	Facilitate exchange of knowledge • Best practice sharing meetings • ESF toolkit • Industry discussion meetings • Online database with Best Practice stories	Facilitate consciousness + implementation • Technology carrousels with suppliers • Pilots and demo's among the European paper industry	Realise joint development programmes • Create public funding opportunities • Set up joint development programmes • Acquire innovative ideas	Cooperation with and between the (new) equipment suppliers for integrated solutions
Average savings to be expected	10%	25-30%	>50%	5-100%

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