

unfold the future

The forest fibre industry in 2050

Roadmap towards a low-carbon and resource-efficient bioeconomy

Making
industry transformation
happen in Europe?

Stakeholders' discussion paper

The European forest fibre and paper industry envisions itself at the forefront of a climate-friendly bioeconomy in which renewable raw materials are replacing fossil resources and are “kept in the loop”, contributing to a better environment and quality of life.

The pathways to this destination, reducing greenhouse gas emissions while creating added-value, were first outlined in 2011 in CEPI’s landmark “2050 Roadmap to a low carbon bioeconomy”. Building upon an expert review of the identified pathways and recent developments, this paper explores the investment agenda that the roadmap implies for industry. It also underscores that this unprecedented industry transformation will be “made in Europe” if policies, both at EU and national levels, and financing conditions are best aligned to make it happen. This paper will serve as a platform to consult stakeholders on the pathways and conditions industry has identified to lead the transition towards a low-carbon and resource-efficient bioeconomy.

Since the release of its “2050 Roadmap to a low carbon bioeconomy”, CEPI has persistently explored ways for the industry to reduce its emissions and bring added value to its materials, products and processes. Significant progresses have been made over the past five years. Industry has already achieved a reduction of its total (direct and indirect) greenhouse gas emissions by 44% per tonne produced since 1990. To move forward, CEPI’s ground-breaking “Two Team Project” led to a major Horizon 2020 research consortium on a breakthrough technology for low emission pulp production. Industry also engaged into a €3.8 billion Public-Private Partnership with the Bio-based Industries Joint Undertaking. “The Age of Fibre” publication further demonstrated the industry’s vision and innovative potential to move away from fossil-based products.

New and additional developments further led CEPI to revisit its 2050 Roadmap project.

On the one hand, the acceleration in digitalisation of manufacturing industry – the so-called Industry 4.0 – and the evolution of consumer behaviour (connectivity, collaborative economy, mass-customisation) are reshaping the future of both processes and products. Yet Europe continues to face anaemic growth with low levels of investment in manufacturing which could compromise the long-term competitiveness and sustainability of entire sectors.

On the other hand, the Paris Agreement to maintain climate change well below 2°Celsius will increase global pressure towards reducing carbon emissions. Its implications for European policies and on industry’s global level playing field will require thorough assessment before being factored into future scenarios. In the meantime, several EU policies being developed or recently put in place are already shaping industry’s investment capabilities and decisions.

The most prominent among these are:

- the 2030 Climate and Energy Framework with new targets for emissions reductions, renewable energy and energy efficiency and the related Emission Trading Scheme (ETS);
- the Bioeconomy Strategy currently under review and the future of the EU framework programme for research Horizon 2020, including the Bio-based Industries Public Private Partnership;
- the Circular Economy Package, which would enhance recycling capabilities and offer more opportunities for bio-based products; and
- the European Fund for Strategic Investments (EFSI), which, beyond its focus on infrastructures, may offer new funding bridges for transformative investment in manufacturing.

Renewable and recyclable: the building blocks for a circular bioeconomy

The bioeconomy will build upon the unique strengths and properties of forest fibres – from their renewability and carbon sequestration capacity to their recyclability.

- EU forests are estimated to absorb the equivalent of nearly 10% of total EU greenhouse gas emissions each year. Between 2005 and 2015, European forests grew by 44,000 km²
- Sustainable forest management practices are mainstreamed in industry and will contribute enhancing European forests carbon sink capacity.
- The pulp sector can today extract full value from wood components and side streams. Zero waste processes are now common practices in the forest fibre and paper industry.
- Paper recycling in Europe reached the record level of 71.5% in 2015, keeping fibres longer in the loop and extending the benefits of their renewable origin.
- After several loops, the paper and renewable cycles are ultimately maintained with new forest fibres brought in the value chain.

The pathways to our 2050 vision

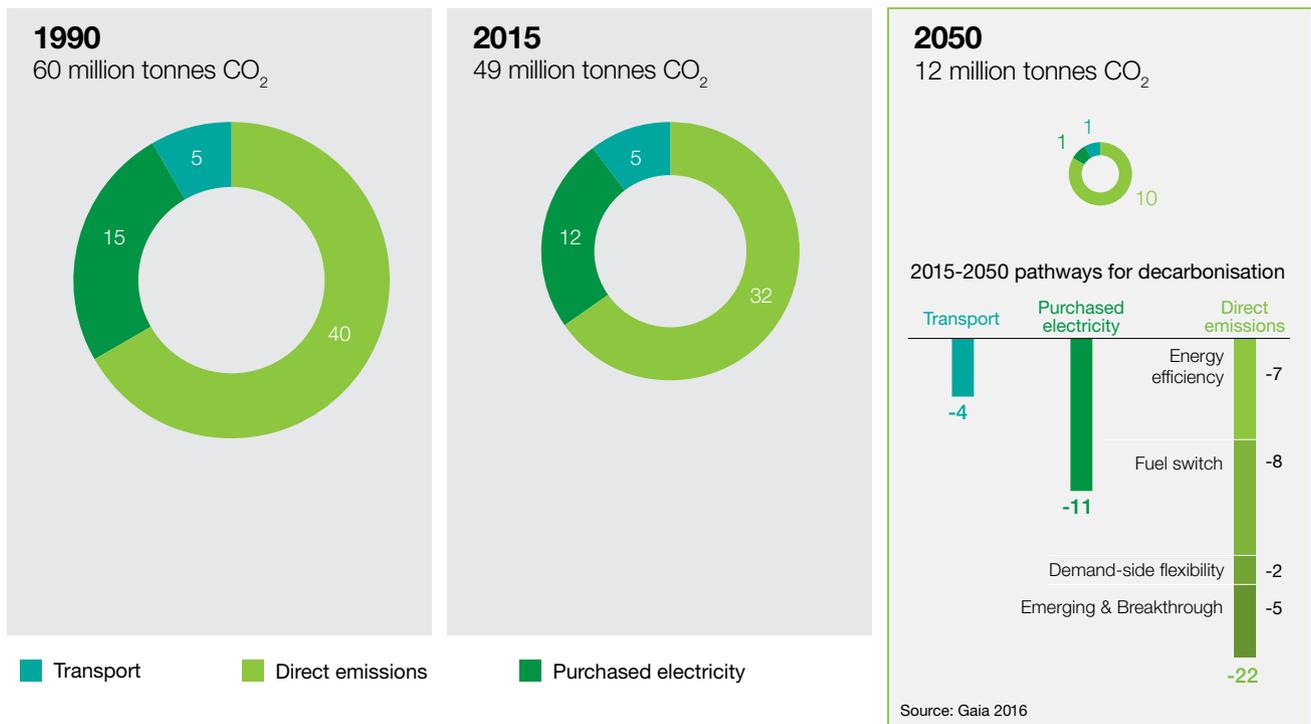
Industry and external experts reviewed the pathways identified in 2011 for “decarbonising” by 80%, while creating 50% more added value by 2050. In a fast-changing competitive and regulatory environment, industry re-affirms today its ambition and belief that such industrial transformation can be “made in Europe” with the right pro-investment policies and financing conditions in place.

Moving away from a fossil-based society: decarbonising

Quantitatively, decarbonising by 80% compared to 1990 means that the European forest fibre and paper industry emissions would be brought down to 12 million tonnes of CO₂ by 2050. This absolute emission reduction would not account for the benefits provided by carbon sequestration in managed forests; its long-lasting storage in bio-based products that are further recycled; or the substitution of fossil-based and less climate-friendly products and materials.

Nevertheless, reducing the sector’s direct and indirect emissions so substantially (by 37 million tonnes from 2015) will require a combination of specific measures to gradually deliver results up to 2050.

Graph 01: CO₂ emissions reduction and decarbonisation pathways for the European forest fibre and paper industry by 2050



Energy efficiency: the combination of process improvements, including the transition to Industry 4.0, as well as investments in state-of-the-art production technologies are estimated to lead to a reduction of 7 million tonnes of CO₂ by 2050.

Fuel switch: further conversion of industrial installations to low-to no-carbon energy, notably from renewable sources, are modelled to deliver 8 million tonnes of CO₂ reduction.

Demand-side flexibility: leveraging its on-site cogeneration assets, the industry has the ability to engage on the energy market and adapt its energy sourcing to take hold of low prices, in particular from surpluses of intermittent renewable energy. The associated decarbonisation benefits could reach 2 million tonnes.

Emerging and breakthrough technologies: in addition to some of the breakthrough concepts identified in the “Two Team Project” such as the “deep eutectic solvents” technology now under development, other innovative and disruptive solutions could complement the emission reduction effort by some 5 million tonnes of CO₂.

Indirect emissions: As the European power production will accelerate its decarbonisation, the forest fibre and paper industry’s indirect emissions from purchased electricity will decrease by 11 million tonnes over the coming 35 years.

Transport: emissions reduction will come from the combination of improving transport efficiency and of using alternative transport fuels, like biogas, advanced biofuels, electricity or even fuel cells. This should lead to reducing the sector’s transport footprint by 4 million tonnes of CO₂ emissions.

Leading the European bioeconomy: creating value

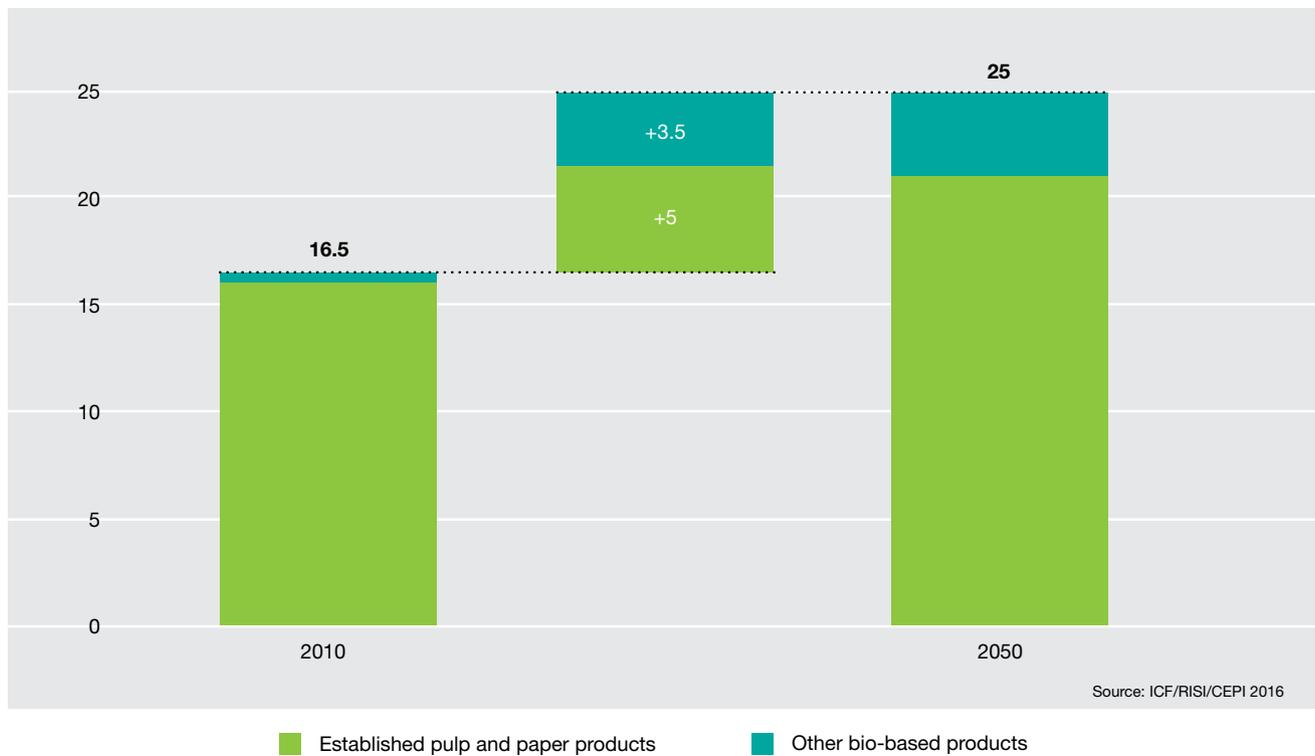
The European forest fibre and paper industry is at the heart of the bioeconomy and sees its future in Europe. Beyond contributing to economic growth, it adds value to European society at large. Our value creation builds upon our sustainable raw materials, uniquely combining renewability and recyclability, our strong base of European suppliers, local communities and skilled workforces to deliver innovative solutions that substitute fossil-based products.

With its ambition to add 50% more value compared to 2010, our industry would deliver approximately €25 billion of added value in Europe by 2050 (gross value added at factor cost). This development should partially result from efficiency gains, enabled by smarter manufacturing, better data management and the Internet-of-Things or, in other words, the Industry 4.0 revolution.

Adding new functions and services to existing paper and board products - connectivity, anti-counterfeiting, water-repellence, etc. - can also offer new ways to differentiate European production from global competition, with higher value and tailor-made solutions. Together with the growth of existing products segments, such as packaging, hygiene or specialty papers, these developments would generate €5 billion added value.

The projected evolution of industry's product segments also shows that another significant share of added-value (+ €3.5 billion from 2010) will come from the development and growth of new bio-based products. Ranging from food additives to biocomposites, from advanced biofuels to nanocellulose, these emerging bio-based products will indeed bring even more growth opportunities from renewable and innovative solutions to move away from a fossil-based economy.

Graph 02: Added-value growth projection for the European forest fibre and paper industry by 2050 (in billion €)



Transforming industry: 40% more investments

Since 2010, the forest fibre and paper industry has invested on average some €3.5 billion per year in tangible capital goods in Europe. However, a combined effort to decarbonise and grow the sector will require significant additional investment, beyond current “business as usual” levels.

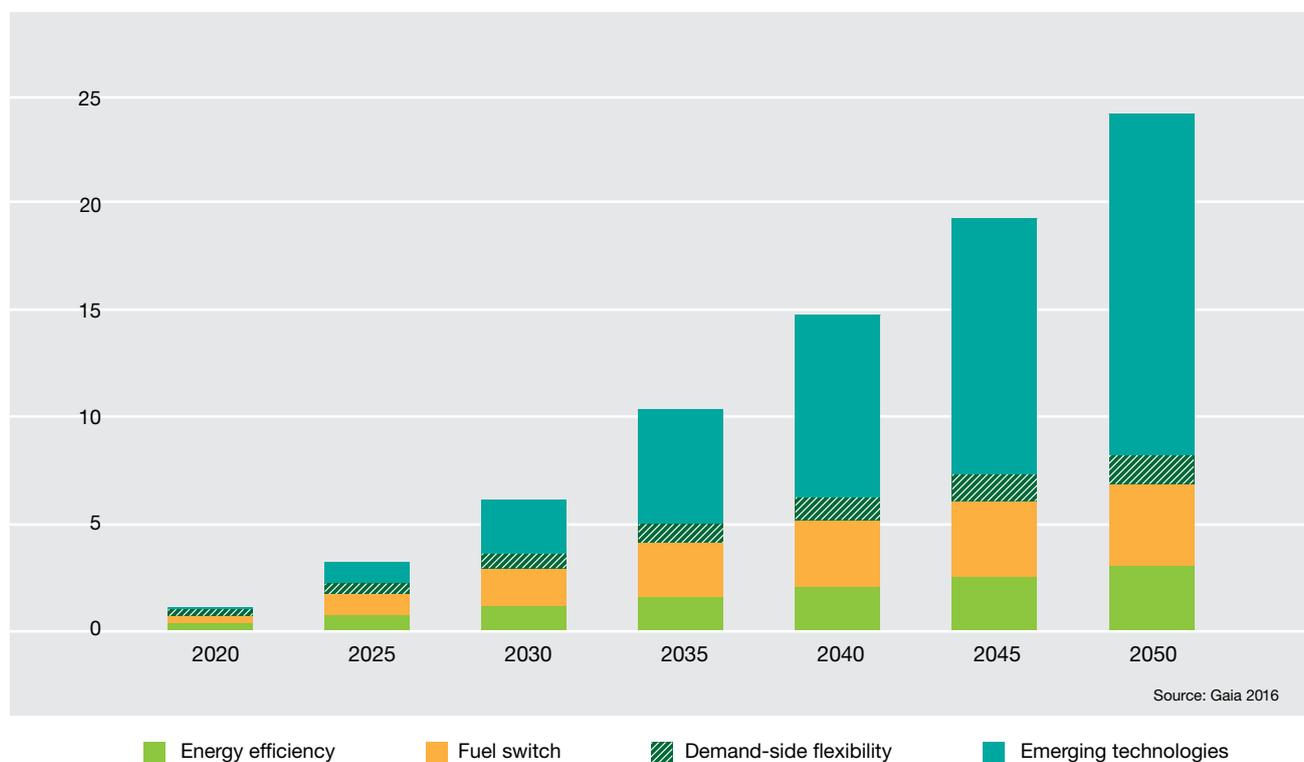
Estimates foresee the need for an extra €24 billion by 2050 to ensure that the decarbonisation measures identified effectively deliver their expected reduction benefits for industry direct emissions. Over the same period, a further €20 billion will need to be invested in the production of new bio-based products.

Investments for decarbonising direct emissions from industry have been estimated according to the short to long term commercial availability of technology and industry investment cycles.

Projected amounts outlined refer only to capital expenditure (CAPEX) and do not include research and development expenditures. The projection stresses how critical the commercial availability of emerging and breakthrough technologies will be to enable their large scale deployment in Europe and ramp up direct emissions reduction.

Overall, the decarbonisation and value creation pathways identified by industry would require 40% more investments than current levels over the next 35 years. This increase in capital expenditure is an obvious challenge in an increasingly competitive international environment where investments returns and risk profiles weight on capital allocations between competing regions. In this context, it will be essential to strengthen the financial sustainability hence the investment capability and attractiveness of European industry, to deploy transformative investments.

Graph 03: Cumulative investments for the forest fibres and paper industry decarbonisation pathways by 2050 (in billion €)



To do so, three areas need specific attention: regulatory costs, risk profiles and investment cycles.

- 1 A Cumulative Cost Assessment of EU policies made for the European Commission in 2016, reveals that unwarranted regulatory costs, notably energy and climate related ones, swiped on average a third of the forest fibres and paper industry profitability over the past 10 years. A regulatory reset to restore competitiveness, alleviate policy uncertainty and support investment capacities at both EU and national levels is obviously necessary to propel long-term investments.
- 2 New models of risk-sharing or financial facilities will also be required for transformative investments with radically different or specific risk profiles. Public finance instruments could play a key role, be it by “de-risking” investments, guaranteeing loans, or facilitating a faster transition between R&D and large-scale technology deployment.
- 3 Investment cycles are an additional parameter for policymakers to take into account – just as the sector is obliged to do. The average age of industry production equipment in Europe (between 15 and 30 years) gives more time for developing and implementing some of the steps to decarbonise and generate value, including as-yet-unknown breakthrough technologies. The implementation of policy measures should be phased to better match rather than conflict with investment cycles.

Realising our sector's potential: let's make it happen in Europe

The European forest fibre and paper industry believes that 80% decarbonisation combined with 50% value addition in Europe can be a reality within 35 years. It has the potential to “walk the talk” along the identified pathways. To set the right investment environment, some basic and more specific conditions should apply at both EU and national levels.

First and foremost, a level playing field needs to be restored and maintained both with global competitors and trade partners as well as within the EU between products or sectors. As mentioned above, specific de-risking or risk-sharing tools and improved conditions for accessing finance, including for research and development, should be assessed and where needed brought up.

Putting together the pieces of the policy jigsaw puzzle will require policy shifts in six specific areas:

1 Raw materials – Ensuring wood mobilisation from sustainably managed forest resources and fostering a high-performing recycling chain will be both critical to securing the quantity and quality of the raw materials industry needs for its development in Europe. The principles of a cascading use of wood should guide and allow for enhanced value creation and resource allocation across the forest fibre industry and paper value chain. In a context of growing competition between energy and more value-creating use of renewable resources, support schemes or policy measures incentivising low-efficient energy uses shall be eliminated. In parallel, and as waste collection improves, it will be essential to ensure that recycling operation effectively happens in Europe and feed final production processes.

2 Energy and climate change - The new Electricity Market Design needs to complete EU market integration and remove regulatory barriers to unleash the potential of industrial demand-side flexibility. The on-site generation of low- to no-carbon energy by the industry should be encouraged.

To allow for the most cost-effective decarbonisation of electricity, market distortions should be avoided. Over the transition phase towards an integrated and low-carbon power system in Europe, a compensation mechanism for the carbon cost pass-through in the price of electricity should be established.

As carbon price will increase over the next decade, financial capacities and investment risk profile of industries exposed to the Emissions Trading Scheme will further erode. It will also deter international capital allocation in exposed European industries. The ETS needs to be decisively used as a pro-investment tool that rewards and effectively supports manufacturing industry investments to accelerate greenhouse gas emissions reduction.

3 Transport - Europe's decarbonisation will need a cost- and resource-efficient reduction of transport emissions, e.g. through optimal use of transport networks and infrastructure, as well as of the various transport modes (rail-road in particular). Policies should facilitate cross-border trips, which are currently restricted by divergent truck weights and load limits. Maritime transport requires a global approach and solutions to avoid a distortion of competition for European versus overseas players.

4 Research - Future European R&D programmes need to focus less on incremental research and development of known technologies and more on speeding up both the development and deployment of emerging technologies, and the acceleration of the identification of breakthrough technologies. More funding must be directed to commercial pilots and demonstration plants to validate new technologies at industrial scale.

5 Bioeconomy – Building a vibrant bioeconomy in Europe also requires a collective effort by all EU institutions to make it a mainstream priority. It should be at the core of the next EU framework programme for research and innovation, just as it should be central in other EU policies (agriculture and rural development, climate and energy, environment, public procurement...).

6 Skills and education - Embracing Industry 4.0 and the bioeconomy revolution will also require new skills and competences to operate the smart factories of the future as well as to develop and produce new bio-based products. Member States will therefore play a decisive role in adapting education and training curricula to the new needs, drawing from exchange of experiences and best practices at European level. In addition, enhanced mutual recognition of qualifications at European level will ease mobility, not only across borders, but also between companies.

Through this discussion paper, the European forest fibre and paper industry wants to engage with all its stakeholders to make this transformation and growth agenda happen in Europe. The roadmap resulting from this process will be followed by specific projects to move forward on the pathways it has explored and will further map out.

We look forward to working with you on leading the transition towards a low-carbon and resource-efficient bioeconomy.

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