Biomass carbon neutrality

What science tells us
The natural carbon cycle

The European pulp and paper industry is one of the largest bioenergy producers and consumers in the European Union. **56% of its primary energy consumption comes from bioenergy**, mostly by using its process residues and by-products as fuel. It is therefore highly dependent on its manufacturing process and wood procurement. In addition, **90% of the wood used by the European paper industry comes from within the European Union**.

The use of wood to produce energy is part of a carbon cycle that starts with photosynthesis, where trees absorb carbon. The cycle continues with the use of wood as a raw material, whereby the carbon is stored for the duration of a product’s life. The cycle is prolonged by recycling the product to make new products several times. In fact, **more than 70% of paper consumed in Europe is recycled**. At the end of the product’s lifespan, when the product is used as fuel for energy production, carbon is released and the cycle starts again. At the same time, new trees are regrowing and absorbing carbon. Such a cycle does not add any carbon to the atmosphere, contrarily to fossil fuels that release geological carbon stored underground over millions of years.

The Intergovernmental Panel on Climate Change (IPCC) has recognised the value of this cycle, acknowledging the forest and forestry’s contribution to mitigate the greenhouse effect: “Active forest management, including management for bioenergy, is therefore important for sustaining the strength of the forest carbon sink well into the future”.

Questioning the Carbon Cycle

This natural cycle should not raise any concerns, especially when compared to fossil fuels’ impact on climate. However, some studies, reports and campaigns have raised the following questions:

1. Can Europe’s forest still remain a carbon pool and expand while more biomass is used?
2. Should renewable energy from biomass be used?
3. Is Europe exporting its climate impacts outside its borders when promoting bioenergy?
4. Where is the carbon actually going?
5. Is the claim of carbon neutrality of biomass scientifically based?

Sectors Considered in the Reporting of Emissions and Removals (2006 IPCC Guidelines)
WHAT SCIENCE TELLS US

A review of scientific reports and studies provides the following answers to these questions:

- **Overall, science does not challenge the natural carbon cycle** nor the renewable character of bioenergy.

- The **two basic concepts of carbon neutrality are no land-use change and long time frames**. The divergence between short-term policy time frames and long-term natural cycles is at the origin of misleading debates.

- The EU climate and energy targets must be seen as intermediate targets towards a long-term goal. **Replacing fossil fuels with renewables should be considered as an “investment” with long-term climate benefits** even though an increasing use of bioenergy may lead to temporarily higher biogenic emissions in the short-term.

- **Europe’s forests have been a substantial carbon sink for decades.** As forests get older, the growth in the carbon sink slows down.

- Planting trees without harvesting them produces no long-term climate benefit once the forest is grown. **Active forest management brings a more effective contribution to a climate change mitigation strategy.**

- Some studies are based on stand-scale perspectives only, assuming that old and fully-stocked forest stands are harvested for bioenergy. This is not carried out in practice, as trees are primarily harvested for wood-based products. **Studies that focus on a stand-level approach are always misleading and cannot be extrapolated at landscape level.**

- From a carbon accounting perspective, **what matters is that carbon emissions of bioenergy are accounted for somewhere** and that there is no double counting. Once carbon emissions have been accounted for in the land-use sector (LULUCF), accounting them in the energy sector violates the “no double-counting” rule.
What policy can offer

If all countries accounted for and reported land-use emissions and removals, no questions would be raised. Policy can currently offer robust solutions by implementing the following principles:

- **Carbon accounting**: policy makers should encourage more countries to account for and report their land-related carbon emissions and removals.

- **Sustainability**: biomass used for energy (or other purposes) should be sourced from responsibly managed sources, where no land conversion takes place and where harvesting does not exceed the annual increment.

- **Predictability**: as time is important, policy should secure fair and stable long-term climate and energy objectives as well as fair and suitable means to achieve them.

- **Efficiency**: although renewable, biomass availability is limited. Policy must promote the most efficient uses of biomass and the highest yield when converting it into products or energy. Supporting the use of industrial wood in power plants should be avoided as it wastes resources and distorts markets.

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1. With the exception of urban expansion, infrastructure building, etc.
The Forest Carbon Cycle

Growing forests absorb carbon and release oxygen

Sustainable forest management enhances the forest carbon cycle

Wood products store carbon

Bioenergy from forest biomass can replace fossil fuels

Atmosphere