

Commentary by the European Academies' Science Advisory Council (EASAC) on Forest Bioenergy and Carbon Neutrality

Since the publication of its report on "[Multi-functionality and Sustainability in the European Union's Forests](#)" in April 2017, the European Academies' Science Advisory Council ([EASAC](#)) has engaged with the European Commission, the European Parliament and other stakeholders on the science underlying the use of forest biomass as a form of 'renewable' energy, within the debate and negotiations on the 'Clean Energy for all Europeans' package.

Our report (*inter alia*) analysed current trends to substitute fossil fuels by forest biomass at a large scale, and the relevance of the concept of carbon neutrality to its justification. We highlighted, for example, that carbon emissions per unit of electricity generated from forest biomass are higher than from coal and thus it is inevitable that the initial impact of replacing coal with forest biomass in power stations is to **increase** atmospheric carbon dioxide levels. Regulations thus need to be carefully designed to ensure that only uses making a positive contribution to climate change mitigation are allowed to be regarded as 'renewable' energy. EASAC concluded in the report that:

- The concept of all bioenergy being carbon-neutral is too simplistic and does not offer any general context-independent justification to increase forest utilisation. Carbon neutrality involves a 'payback' period (the time taken for forests to reabsorb the carbon dioxide emitted during biomass combustion), which ranges from decades to **hundreds** of years (depending on the type of biomass and what happens to the forest and land area after harvesting). To use a monetary analogy, switching from fossil fuels to forest biomass is the equivalent of taking out a carbon 'loan'. However, although monetary loans require paying back in a specified period, carbon loans currently are free of any such conditions; yet until payback is achieved, the effects on climate are negative.
- The proximity of current levels of warming to the 1.5 °C Paris targets requires that only projects whose payback periods are of the order of a decade or less should be regarded as 'renewable energy'. In calculating payback periods, it is essential to properly include the effects of harvesting on carbon stocks as well as supply chain and biogenic emissions.
- The distorting effects of the current separation of combustion and Land Use and Land-Use Change and Forestry (LULUCF) emission accounting rules on climate must be considered. From a mitigation perspective, it is important that forest carbon stocks are maintained — or preferably increased over time. However, current rules allow countries to record imported biomass as zero emission on combustion, giving a false

impression of the importing country's progress towards reducing emissions, and shifting responsibility for LULUCF reporting to the exporting country. Assessing the 'renewability' of biomass projects should ensure that there is a positive effect on climate across both emission and LULUCF categories.

As discussed in our report, the use of forest biomass for energy (electricity, heat or transport fuels) can be climate neutral or climate positive after short payback periods (for example, where wastes or thinnings are used as part of an integrated wood supply chain), but regulations should differentiate between these and climate-negative applications.

EASAC therefore advises policy-makers to focus their attention on ensuring that regulations lead to positive contributions to climate change mitigation within a climate-relevant timescale, and that incentives are limited to measures that deliver positive contributions to climate change mitigation.

EASAC – European Academies' Science Advisory Council

EASAC is formed by the 27 National Science Academies of the EU Member States, Norway and Switzerland, to enable them to collaborate with each other in providing independent science advice to European policy-makers. It thus provides a means for the collective voice of European science to be heard. EASAC was founded in 2001 at the Royal Swedish Academy of Sciences and works mainly on policy-relevant issues in Biosciences, Energy and Environment.

This commentary was written by the [EASAC Environment Steering Panel](#), which consists of experts representing EASAC's Member Academies, and signed-off by [EASAC Bureau](#).

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