

European climate targets: forests and forest-based sector potentials and challenges

Policy targets

Forests and forestry play a key role in achieving climate neutrality. **Forests and wood products in the European Union (EU) remove approximately 380 MtCO₂eq/year** (average for 2017-2019), compensating for about **10% of the total annual EU greenhouse gas emissions**. In international reporting, greenhouse gas (GHG) emissions and removals by forests and wood products are part of the Land Use, Land-Use Change, and Forestry (LULUCF) sector. This sector also includes cropland, grassland and the conversion of land to settlements which represent net sources of GHG emissions.

Altogether, the entire LULUCF sector represents a net sink of 256 MtCO₂eq/year (average for 2017-2019). According to the European Commission's policy targets, the EU's LULUCF sector needs to remove 310 MtCO₂eq/year by 2030, which implies an **additional ~50 MtCO₂eq/year**. The additional removals would need to increase even by ~170 MtCO₂eq/year by 2050 to achieve climate neutrality.

Forest-based mitigation

Forest-based mitigation activities can reduce emissions by sequestering carbon in forest ecosystems, retaining carbon in wood products and avoiding emissions through improved management and material or energy substitution. These activities can be broadly categorised as actions to:



Protect forests, e.g., avoiding deforestation and forest degradation, conservation, etc.



Manage forests, including altered harvesting or active other management.



Restore forests, e.g., afforestation and reforestation.






Improve wood use, e.g., shifting towards longer lived products, material substitution, etc.



Forest-based mitigation potential

According to a recent review of the scientific literature [1], mitigation activities such as **avoiding deforestation, afforestation/reforestation, shifts in wood use, cascading and increased efficiency** can be combined as they have limited effects on each other and can have positive impacts on biodiversity. When combined, these measures **could provide an additional mitigation potential of up to 72 MtCO₂eq/year by 2050 in the EU-27**. This could increase to:

-  **125 MtCO₂eq/year** when combined with forest conservation activities, or
-  **138 MtCO₂eq/year** when combined with other active forest management, or
-  **143 MtCO₂eq/year** when combined with decreasing forest harvest.

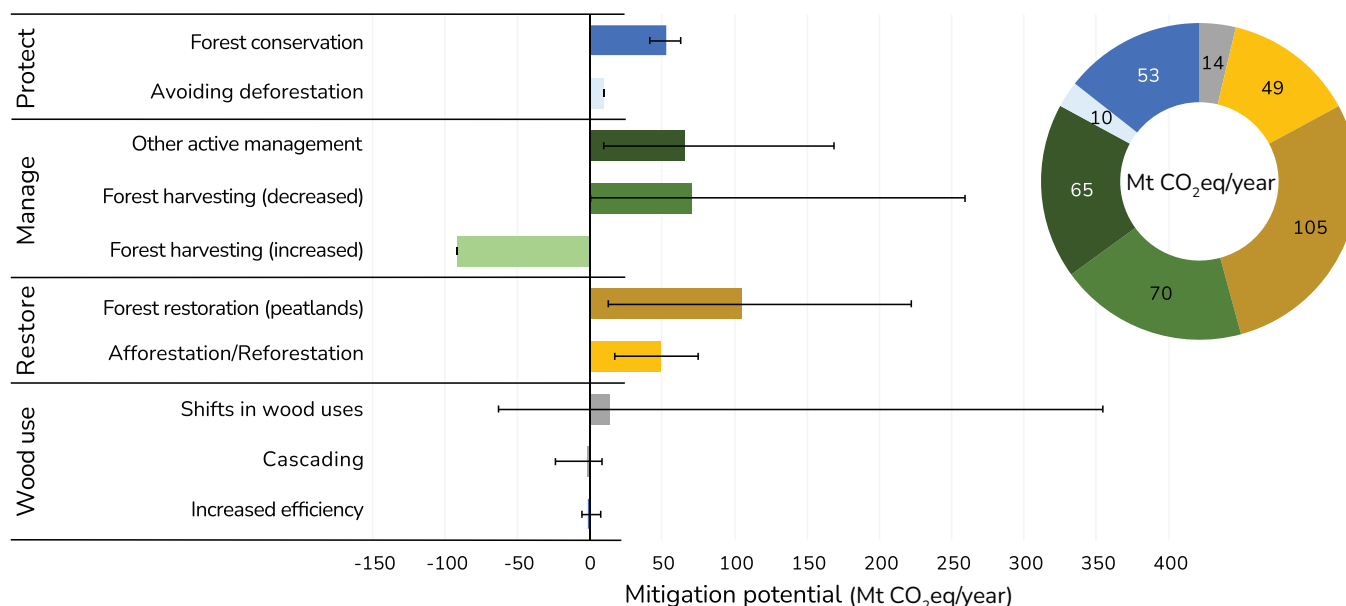


Figure 1. Forest-based mitigation potential by 2050 in the EU-27 by mitigation activity type.

Need for a holistic approach

According to the recent review of the scientific literature [1]:

1. European forests and wood products can provide a significant contribution to achieve climate neutrality by 2050, but their contribution is finite and cannot compensate for delayed actions in other sectors.
2. A high degree of uncertainty applies as different scientific studies use different data, methods, system boundaries, types of potential (e.g., technical, economical) and scenario assumptions.
3. Climate change is already affecting European forests, forestry activities, and forest product markets and impacts may strengthen in the future. Therefore, forest-based mitigation and adaptation need to be considered together.

A **holistic approach** (both in research and policymaking) is needed that considers the interactions between forest-based mitigation activities, adaptation and other sectors, as well as biodiversity and other ecosystem services. Such an approach must cover all the relevant carbon pools and fluxes of forest ecosystems, wood products, avoided emissions through material and energy substitution, as well as any leakage and rebound effects.

References

- [1] Verkerk, P.J., Delacote, P., Hurmekoski, E., Kunttu, J., Matthews, R., Mäkipää, R., Mosley, F., Perugini, L., Rey, C. P. O., Roe, S., Trømborg, E. 2022. Forest-based climate change mitigation and adaptation in Europe. From Science to Policy 14. European Forest Institute. <https://doi.org/10.36333/fs14>
- [2] Verkerk, P.J., Delacote, P., Hurmekoski, E., Kunttu, J., Matthews, R., Mäkipää, R., Mosley, F., Perugini, L., Rey, C.P.O., Roe, S., Trømborg, E. 2022. How can forests and wood use help meet climate goals? Policy Brief 2. European Forest Institute. <https://doi.org/10.36333/pb2>

This policy brief builds on a report [1] and policy brief [2] originally published by the European Forest Institute. ForestPaths aims to co-design, quantify and evaluate holistic forest-based policy pathways to optimise the contribution of forests and the forest-based sector to climate change mitigation, and which consider the need to adapt forests to climate change, conserve biodiversity and sustain the provisioning of forest ecosystem services.

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