What climate strategy for European Forests?

Rethinking their contribution to climate neutrality

Webinar wrap up

The European Union (EU) has pledged to become carbon neutral by 2050. This will require us to both drastically reduce greenhouse gas emissions and to increase carbon dioxide removals. Many countries rely heavily on scenarios that substitute fossil fuels with wood products, which reduces the forest carbon sink. Several recently published research papers have found that introducing more resilient forestry practices can help achieve societal and environmental goals.

These developments provided an important opportunity for Fern and Canopée to invite EU representatives, experts, industry and civil society to our panel event on 15 July 2020, "What Climate Strategy for European Forests? Rethinking their contribution to climate neutrality". The event discussed the many variables that should be discussed when creating pathways for forests to adapt to and fight climate change. Speakers addressed land-use trade-offs of certain strategies, the complexities of addressing wood substitution, the impacts of actions on biodiversity, and the overall need to address ecology, economy and society when devising strategies for forests.

The event discussed three studies:

- **Kelsey Perlman**, Fern: Introduction - Increasing the role of forests under the European Green Deal.
- **Sebastian Rüter**, ClimWood2030 study: What is the climate impact of substituting fossil resources with wood-based biomass in the EU?
- **Gaëtan du Bus de Warnaffe**, Arbre et Bois Conseil: French case study: Forest Management and Climate Change: a new approach to forest mitigation strategies
- **Gino Baudry**, Imperial College London: The European Calculator: A user-friendly tool to explore sustainable futures / A focus on the land-use, land-use change and forestry modelling framework

Question and answers from the audience:

Questions to Sebastian Rüter:

How were the substitution effect of energy use of wood calculated? ClimWood shows very high substitution effect of energy use in the reference scenario (-180 Megatons of carbon dioxide (Mt CO2)/year) while a recent study commissioned by CEPI shows only -90 Mt CO2/year and a much higher substitution potential of wood products (above -300 Mt CO2/year compared to -30 Mt CO2/year in your study)?

Answer: For the reference scenario, all values for material and energy use represent the absolute greenhouse emission budgets associated with use of timber as energy carrier or its use for material purposes (including manufacturing, use and end-of life impact). Only the values deviating from the reference scenario represent the actual substitution potential (see page 15 of the slides).

Franck Trolliet from FSC International DAEL: *It was said that lower wood consumption should lead to larger carbon sink. I wonder to which extent this a generally accepted assumption. My question: did you consider the cumulated carbon sequestered over time, given that regenerating vegetation could have a higher carbon sequestration rate?*

Answer: The correlation between lower wood consumption and a resulting larger forest carbon sink was not based on a generally accepted assumption, but represents calculated results applying the ClimWood model framework (G4M, GLOBIOM, WoodCarbonMonitor and LCA model). Based on Intergovernmental Panel on Climate Change (IPCC) methods for estimating emissions and removals from the carbon stocks in the forests (i.e. estimating the effect of "cumulated carbon sequestered over time"), the geographically explicit agent-based G4M model considers MAI depending on the relevant stocking degree, age class and harvest amounts respectively. Due to the relative short scenario period under consideration as requested by the European Commission, higher growth rates of younger trees due to an increase in harvest rates do not compensate for the loss of carbon in time. The results would look different if another timeframe (e.g. until 2100) had been chosen.

Questions to Gaëtan du Bus de Warnaffe:

Florian Clayes from European Commission: *How did you deal with the uncertainties associated with the parameters of the model used and the heterogeneity of French forests, and what are the consequences of this cascade of uncertainties on the final results?*

Answer: As explained in the report, each type of French stand was considered to have different values concerning annual 'Production', 'Mortality rates' and 'Harvest', based on the last values given by the national institute in charge of the forest inventory (IGN). Other parameters also vary according to the type of stand (including percentage of exploitable wood, deadlock (where forests aren't growing because of poor health) and unmanaged areas, branches and root expanding factors, initial deadwood volume, mean deadwood degradation time).

Concerning the impact of the "cascade of uncertainties" produced: we have used the last and largely used parameters in France (e.g. Bicaff and INRAE studies) to reduce the possible impact. The objective was to test the influence of scenarios differing by harvest intensity and not to produce absolute values or to test the effect of every hypothesis differing by variables, which no study has done until now.

Florian Clayes from European Commission: *How do you compare your work with existing work on French forest projections to 2050, notably the 2017 work of Valentin Bellassen and Aude Valade in the BICAFF project, the 2017 work of INRAE and IGN coordinated by Jean-François Dhôte, and the IPCC Special Report conclusions on climatic change and land (section 4.8.4. page 4-65 et seq.)?*

Answer: WeWe produce similar results concerning the impact of harvest intensity on the evolution of global stocks and sink (decrease with harvest). I list some differences here:

- the way scenarios are defined (e.g. branches and mortality harvest, harvest rates and limits, evolution from 2020 to -2050);
- interpretation of substitution effects (stability of climate benefits of stocks vs substitution);
- impacts on fertility, biodiversity and resilience studied (or not);
- report effects between pressure on the different compartments of the resource at local and national levels.

Questions to Gino Baudry:

Gerrit Hansen, researcher: *In the calculator, the highest ambition level for fuel mix in transport is set to 100% biofuel, ignoring e-fuels, electricity and hydrogen (or at least so it seems from the "fuel mix" panel for 1.5Tech and 1.5 combo) - this is an interesting choice. Can you comment on that?*

Answer: The biofuel capacity (supply) is expressed in absolute values of Million Tonnes of Oil Equivalent (Mtoe). The capacity can be set from a phase out to its full potential (maximum found in the literature). On the demand side, you can check the "Technology & Fuels" / "Passenger technology" lever to deploy other technologies (e.g. hybrid cars, electric cars, hydrogen). You can also check the "Technology & Fuels" / "Fuel mix" to select other fuels than biofuels (e.g. E-fuels). You

can also click on the levers to check the deployment patterns that are available as well as the literature that backs these patterns. We tried our best to be agnostic and to consider any promising technology. If you have any suggestions we are open to add it as long as there is existing robust scientific literature .

Poshendra Satyal from BirdLife International: *How do you account for and deal with the land use transition between different land use transitions? Do you assume fixed transitions as defined by the user (i.e. a fixed transition from agriculture to forest) or do you simply use historical values?*

Answer: The land transition matrix depends on both the lever setting and the historical data as provided by the Unites Nations Framework Convention on Climate Change (UNFCCC) official inventories. Given the need for a common granularity, we had to compromise and only use the 6x6 matrix but depending on the country we can go a lot deeper by considering the land management (up to 36x36 if I remember well). This approach is a compromise to stick to a well-known and used data base, making the model replication easy for any country by following UNFCCC/IPCC directions.

In terms of lever, the "Resources and Land-Use" / "Land-management" lever set the dynamics for the transition matrix. Level 1 being the least ambitious following the past trends. For example, if a country is used to crop forest and grassland for the benefits of urban expansion, then it sets the same pattern for the future. Up to lever 4, the more ambitious, the less the forest is cropped for other purposes (relatively speaking as the total amount depends on the diets, bioenergy, biomaterial, etc.). As mentioned in the conference, some levers have been aggregated to avoid information overload but it comes with a price, as now levers are not necessarily explicit (such as land management that sets land matrix dynamics and freed land usage allocation).

It is worth mentioning that the current online version is still waiting for a major update due to a glitch with the Greenland/ Denmark data and to add a "land-shortage" item in the land graphs. Users can set patterns that can imply land shortage (as we want the user to explore and learn from unsustainable/ inconsistent pathways too).