

Economic impacts of potential EU forest carbon sink policies on the forest-based sectors - Preliminary study results

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The EU plans to set the new goals for forest carbon sinks for its member states when the Paris Agreement is implemented after 2020. According to the proposal, CO₂ -emissions and removals by forests would be compared to a projected Forest Reference Level (FRL) based on past harvest intensities. This would affect the future development potential in the wood using sectors in Europe.

Even if the member states have also other options available to fulfil requirements for forest carbon targets, in this study we are simulating a situation where the FRLs are followed literally in order to demonstrate the socio-economic impacts of limitations in forest utilization within the European Economic Area (EEA). For this analysis, we compare the future development¹ in the global forest sector using two scenarios: 1) *Base* scenario (without the proposed policy), and 2) *Limited* scenario (with the proposed policy). In the *Limited* case, the harvests in the EEA countries after 2020 must not exceed the average harvests of 2000-2012 - a period suggested by the European Parliament's Environment Committee in July 2017 for calculating the FRLs. The time horizon of the study is up to the year 2030 and the scenarios are quantified by using the global forest sector model, EFI-GTM, which is briefly introduced later.

Results

The growing forest resources in the EEA would make it possible for the EEA forest sector to respond to the globally increasing consumption of forest products. In the *Base* scenario, the EEA roundwood harvests increase by some 1%/year up to 610 Mm³ by the year 2030. The growth in demand for mechanical forest products, fiber-based packaging, tissue and sanitary products, textiles and other applications as well as wood-based energy are the main drivers behind this development. In the EEA, the demand for paper products is relatively mature and even decreasing for printing and writing papers. This is reflected in the stagnant paper industry development in the region.

If the EEA countries limited their future round wood harvests to comply with the assumed levels, harvests would be almost 120 Mm³ (20%) lower in 2030 compared to the *Base*. Consequently, the EEA forest industry would need both to increase imports of wood from the rest of the world (RoW) and to cut its production. The most severe impacts hit sectors that are growing with new investments or have low thresholds to invest. In such sectors, the investments in production capacity can relatively easily "leak" outside the EEA countries. This would be the case particularly in the mechanical forest

¹ Assumptions on the forest product demand in the scenarios follow largely an earlier scenario documented in Kallio, Lehtilä, Koljonen & Solberg. 2015. Best scenarios for the forest and energy sectors - implications for the biomass market. Cleen Oy. Research report D 1.2.1: 95 p.

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industry - a sector that is relatively labor intensive and carries high expectations for increased carbon storage in wood products.

In the *Limited* case, harvests, forest industry production, and employment opportunities leak from the EEA countries to RoW. Almost 80% of the decrease in roundwood harvests in the EEA countries is replaced by harvests in RoW. This will cause a decline in forest carbon sinks in RoW. About two thirds of the harvest increase in RoW feeds the growing forest industry production there, while the rest is exported to the EEA - which becomes increasingly dependent on imported wood raw-material. The increased harvests caused by limitations in the EEA spread around the globe with North and South America accounting for three quarters of these volumes. Also, harvests in Russia increase considerably.

We tested the sensitivity of the leakage rates with alternative baselines and with different constraints on roundwood harvests (different historical reference periods). The leakage rates are not sensitive to these assumptions. A considerable leakage of harvests and forest industry production is projected to take place no matter what historical reference period was chosen.

Due to more scarce supply of wood and wood-based products in the *Limited* scenario, prices are higher than in the *Base* case. Consequently, some wood-based products will be substituted by products made of competing, non-renewable and more carbon intensive raw materials, such as steel, concrete and plastics. Hence, in addition to the regional carbon leakage, intersectoral carbon leakage takes place through material substitution.

In the next stage of the study, employment impacts and trade flows will be analyzed in more detail.

The Global Forest Sector Model EFI-GTM

Like the EFI-GTM model used here, the partial equilibrium models are based on economic theory and typically aim to mimic the behavior of competitive markets. They seek the prices and quantities of demand, supply, and trade so that the markets for all products and regions are in equilibrium. These models are particularly suitable for “what if”- analyses, e.g. of various policy alternatives.

The EFI-GTM describes the global forest sector. It has been used to examine e.g. the impacts of forest conservation, FLEGT, wood export taxes, and energy and climate policies². The model contains 57 regions, with most European countries presented on country level. The model contains a detailed representation of forest products including all relevant products (different types of roundwood, pulp, paper, mechanical forest industry products, recycled papers, forest industry side-products, liquid biofuels, etc.). About 40 products are modelled using recent real world data. Basic principles and structure of the model used have been documented in Kallio et. al. (2004)³ and the model has been continuously updated and developed.

² For a recent review, see Kallio & Moiseyev (2016) The EFI-GTM model: past - present - future. In: INA fagrapport 36: p. 13-19. <http://www.umb.no/statisk/ina/publikasjoner/fagrapport/if36.pdf>

³ Kallio, Moiseyev & Solberg (2004) The Global Forest Sector Model EFI-GTM - the model structure. EFI Technical Report 15. 24 p. http://www.efi.int/files/attachments/publications/ir_15.pdf

