

## CLIMATE EFFECTS OF FOREST USE AND THE DEVELOPMENT OF CARBON SINKS (12/2015)

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### Abstract

The study summarized recent research results on climate impacts of forest use and the development of forest carbon sinks in Finland. The scenario results of different forest models show that the Finnish forests will remain as notable carbon sinks in the next decades. The carbon sink capacity is increasing within the framework of projected increase in the utilization of forests. However, the modelling results show that increased harvesting will decrease forest carbon stock compared to harvesting at the current level. The results show that with wood utilization corresponding the current situation the current levels of harvest will cause more climate benefits even in the medium term (50-100 years), compared to the increased harvesting scenario. The loss of carbon sinks in forests is greater than the benefits gained from the use of wood in the short and even medium terms.

However, the use of wood will produce more climate benefits in the long term compared to the use of fossil fuels, if the growth conditions for forestry land will not be degenerated. On the other hand, the high increase of CO<sub>2</sub> concentration in the atmosphere due to increased use of wood is not positive trend in the current situation of climate change mitigation. The climate benefits, even in the short term, can be reached by using wood residues for energy production instead of using round wood. In addition, reforestation/afforestation offers immediate climate benefits. The use of wood can be best argued on the basis of climate reasons, when a wood product can replace a product with high greenhouse gas emissions (with the whole product chain taken into account), and its carbon content can be stored for a long time, and finally, it is used for energy purposes.

In addition to carbon aspects, the effects of aerosols and albedo, as well as black carbon should be taken into account in the assessment of climate impacts caused by the use of forest. Currently, it is difficult to say what the net impact of aerosols and albedo is on radiative forcing in Finland. The study points out that the current rules in international climate agreements do not sufficiently encourage to increase carbon sinks of forests. The rules should be changed, but they should not lead to a reduced willingness to cut fossil-based emissions. The study also draws attention to the need of imposing correctly designed economic policy instruments to account for climate impacts of the forest sector.