BACKGROUND PAPER:
Logging and carbon storage in Estonia and what can be done

Estonian Fund for Nature, May 2022

PHOTO: KATRE LIIV

This background paper is designed for Estonian and EU policy makers, primarily members of the European Parliament, and officials in Estonia and abroad who take part in the negotiations of the 'Fit for 55' package. It is also intended to help stakeholders, such as journalists, businesses, and non-governmental organisations (NGOs) to get better acquainted with the topic and form their opinions. The background paper is published in both Estonian and English: elfond.ee/lulucf

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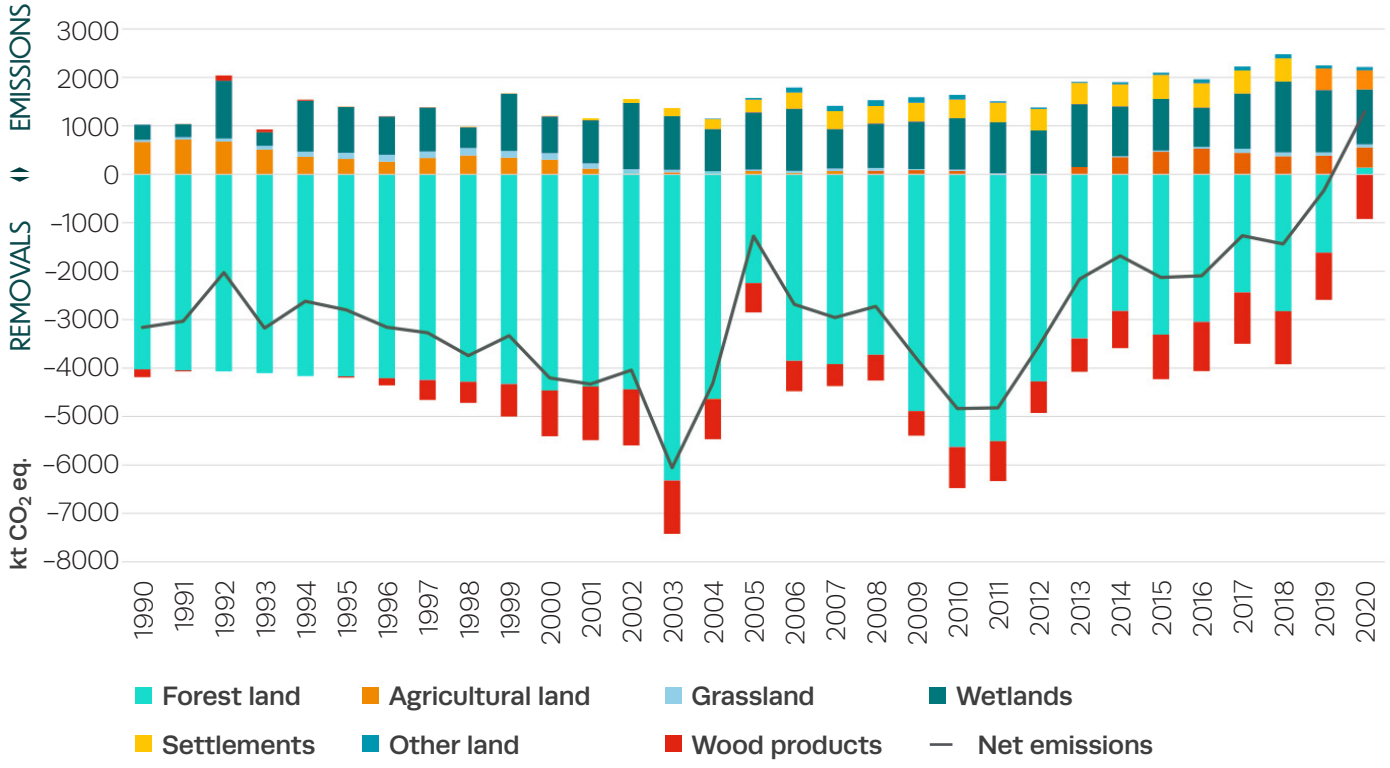
Introduction

Forests and forest management are mentioned a lot in the context of tackling the climate crisis. For the first time, Estonia has the legal obligation to store an agreed amount of carbon in landscapes. Climate promises must become actions and measurable results. As the movement of carbon between ecosystems, the atmosphere, and the technosphere is relatively complicated, it is hard to measure and related climate policy is often difficult to understand. Below, we explain Estonia's options and choices in handling our forests within the framework of climate policy.

Estonian forests have become a source of emissions

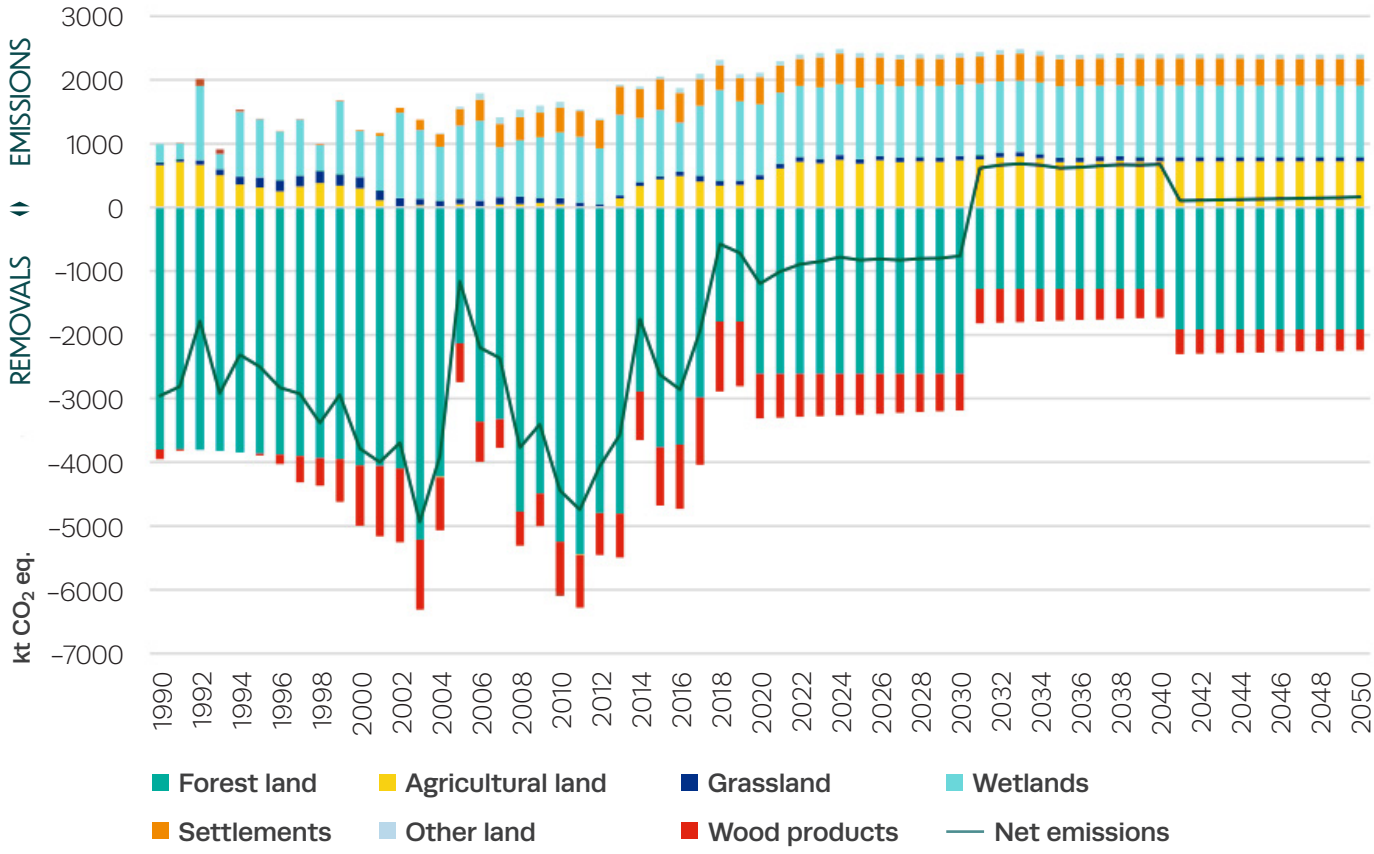
Based on the data published by the Ministry of the Environment in March 2022, the figures for Estonia over the last thirty years are as follows:

GHG emissions in the LULUCF sector in 1990–2020



In 2020, Estonian forests became emitters for the first time since records began, which means that the amount of carbon bound was lower than the amount emitted. The only sector capable of removing carbon has become a source of emissions due to excessive felling.

This figure also exceeds current forecasts. The prospects of carrying on with the current measures published in 2021 predicted that LULUCF would become an emitter by 2023.



The knowledge that controlling felling is the main measure for remaining within the EU agreed limits has inspired the Estonian government to order studies for comparing the different scenarios. 'Mets ja kliimamuutused' ('The forest and climate change', 2020) and the 'Maakasutuse, maakasutuse muutuse ja metsanduse sektori sidumisvõimekuse analüüs aastani 2050' ('Analysis of the GHG removals capability of the land use, land use change, and forestry sector until 2050', 2021) describe in detail the impact of potential felling volumes on the LULUCF indicators in this and later decades.

Logging scenarios in table

Scenario	Compliance with the regulation in force	Compliance with the draft of the EC	Cumulative benefit 2050, Mt	Cumulative benefit 2100, Mt	Potential for selling quotas	Estimated impact on the timber sector
No logging at all	+	+	ca **110***	ca **308***	+	Devastating – the wood sector and forest management cannot function without logging
Less logging than now	+	+	ca **66****	ca **191****	+	Transforming – the raw material deficit will force innovations in forest management and wood processing
Carrying on as now	+/–	–	ca **27*****	ca **52*****	+/– ***	Stagnating – forest management which exceeds tolerable limits from the perspective of the climate and biodiversity will continue. The business as usual for timber industry for a while, but will be affected by a significant shortage of raw material in the new decade
Increasing of the felling volumes	–	–	ca **–109******	ca **73******	–	Promising short-term gains, devastating in the long run – the abundance of timber feeds a short-term boom which ends with an abrupt drop in available timber due to the peculiarities of the age distribution

* The data provided in 'The forest and climate change'.

** Overall logging of 7.2 million cubic metres per year as in "Analysis of the GHG removals capability of the land use, land use change, and forestry sector until 2050" 2021 scenario R4.

*** Slightly different scenarios similar to the current felling levels have been presented, with some of them remaining within the limits of the obligations. On the other hand, some of the presumptions used are questionable. Potential for selling quotas depends on validity of presumptions and strictness of new regulation. Scenario R1 from "Analysis of the GHG removals capability of the land use, land use change, and forestry sector until 2050" 2021is used while it is slightly less of average of last decade logging rate and significantly less of logging that apared in last years last of decade.

**** Overall logging of 19,3 million cubic metres per year as in "Analysis of the GHG removals capability of the land use, land use change, and forestry sector until 2050" 2021 scenario R3 (maximum felling).

Misleading myths

Myth 1 'We have too many old forests'

In this myth, people claim that old forests do not remove carbon and the poor total removal of Estonian forests arises from the large percentage of old forests.

In fact, the different logging scenarios modelled in studies show that Estonian forests are great carbon sinks. According to 'The forest and climate change', if felling was discontinued completely, the forests could remove over 110 million tonnes of carbon dioxide in the next decade. None of the scenarios which involve carrying on with felling would provide even remotely the same result. This scenario is not realistic or advisable, but shows the potential level. If we were to log all of our old managed forests immediately upon 'reaching maturity' (i.e. when they become old from a forest growing perspective), we would not achieve the same cumulative result compared to preserving the forests in the next one hundred years. Thus, it would be a good idea to preserve existing forests instead of logging them.

Myth 2 'Climate reporting does not take into account the substitution effect'

In this myth, people claim that as a result of using wood, some other, more carbon-intensive materials will remain unused, but this climate benefit is not included in greenhouse gas reports. For example, climate reporting does not reflect the carbon footprint of cement production, which will not occur if wood is used in construction instead of cement.

In fact, there are no such large-scale blind spots in climate reporting. For example, the lower amount of concrete used as a result of using wood means a drop in the industrial emissions sector. Lower demand for concrete also means less emissions. Highlighting the gains from using wood separately would mean double reporting, which would not reflect the actual situation concerning emissions.

Myth 3 'Restriction of logging comes with an unbearable socio-economic impact'

In this myth, people claim that any reduction in felling volume would harm the approximately 60,000 people in Estonia involved in the timber and wood sector.

In fact, such claims are usually based on a heavily simplified calculation of average income and jobs created based on the valorisation of one cubic metre of wood. These calculations do not consider the difference in quality, the different labour needed, and additional factors which have an effect on the added value of the wood sector and employment. Continuous cover forest management can provide significantly more jobs per unit of wood, and more expensive traditional and innovative end products can also provide a high added value.

The number of employees in the wood sector was the same around a dozen years ago, although felling volumes were significantly lower. As the economy develops and the level of mechanisation increases, it is possible to increase volumes or develop production towards more expensive end products to maintain the economic value of the sector. The former is not sustainable from an environmental perspective.

Myth 4 'Estonia needs a large pulp mill'

In this myth, people claim that building a large pulp mill would help to improve our carbon accounting indicators.

Portraying a large pulp mill as an important controller of climate change is a magic trick. The decomposing time of cellulose in human consumption is relatively short and the carbon stored in cellulose products is released relatively quickly. When speaking about paper, we often imagine a book, which could be preserved and remain in use for decades. In actual fact, the majority of the production of a pulp mill is used as packaging, hygiene products, and other disposable products. The positive climate effect of building a large pulp mill would be marginal, while the impact of the logging to satisfy its demand may be large-scale. On the other hand, the domestic processing of the paper wood obtained by less extensive felling would make a small contribution to the GHG removals of the LULUCF wood products section.

Myth 5 'Forestation and other support measures are the main issue'

In this myth, people claim that the most important LULUCF measures include planting new forests, peat extraction and use, and better regulation of the use of agricultural land.

If implemented in a considered manner, forestation, restriction of peat production, preservation of peat soils, and other measures to reduce emissions from the LULUCF sector are very welcome, but the gains arising from them are several times lower than the climate benefits from restricting felling. 'Analysis of the GHG removals capability of the land use, land use change, and forestry sector until 2050' suggests a set of measures including forestation, restriction of peat production, a large cellulose factory, reshaping the agricultural use of peat soils, and estimates the total volume amounting to 1.3 million tonnes of reduced emissions/additional removals per year. This difference is, however, lower than the difference arising from the logging of 2 million cubic metres of wood in the felling scenarios.

Myth 6 'Old trees do not remove carbon'

In this myth, people claim that old forests must be logged, as they no longer remove carbon and may, in the worst case, generate emissions themselves,thereby endangering the climate.

In fact, trees remove carbon in all of their parts – in the roots, branches, and primarily the trunks. In the Estonian climate, each year a new growth ring is formed on the trunk and the older and thicker the tree, the more extensive the surface on which the carbon-rich tissue is grown. In good conditions, an old tree removes significantly more carbon than a young one. At the level of a forest, the picture is more complicated, as more falling and decomposition of trees occurs in an old forest. However, Estonian studies have also proven that a 200-year-old pine grove may still remain a carbon remover.

From the perspective of the climate, logging an old forest means immediate and large-scale emissions, as the wood will be decomposing into water and carbon dioxide. It is the old forest where considerable amounts of carbon are stored for a very long time. Furthermore, logging itself also causes greenhouse gas emissions.

Forests alleviate climate change

Forests have a very significant role in tackling the climate crisis. As the crisis is caused by excessive amounts of greenhouse gases in the atmosphere, the only way to deal with it is to reduce the amount of those gases. As the technological options for removing the carbon dioxide emitted into the air have not proven successful so far (and perhaps never will), the only sufficiently quick, large-scale, and accessible solution for the removal of carbon dioxide would be the wise treatment of forests. This conclusion has also been reached in global climate discussions and thus, separate references to the role of the forests can be found in almost all cornerstones of climate policy. As a result, countries are now obligated to keep records of how much carbon is stored in their forests and set targets for removing additional amounts that will be stored over an agreed period of time.

Records of the carbon stored in forests are kept as part of the land use, land use change, and forestry (LULUCF) sector, which covers the carbon removed from forests as well as the carbon sunk in forests. Carbon released by natural factors and the removals or emissions of other landscapes and land use are also included. In addition to forests, wetlands are also an important carbon store in Estonia and Europe and damaging these areas causes extensive carbon emissions. In the short-term, the gains from the preservation and restoration of wetlands are smaller than those from the good treatment of forests, but in the longer term, the benefits are huge.

Younger and middle-aged forest stands remove more carbon dioxide from the air than old forests, but this should not lead to the incorrect conclusion that significant climate benefits would arise from felling old forests and growing new ones. Even though the carbon contained in felled wood is not released into the atmosphere immediately (it remains in products such as wood pellets, houses, books and packaging), it is released once these products are disposed. The emissions generated by felling older forests are so large that they would neutralise the benefits from the rapid growth of younger forests, meaning that forests and forest management become a contributor to climate change.

According to climate scientists, we are dangerously close to the amount of greenhouse gases in the atmosphere which would cause the critical 1.5-degree warming, but taking quick measures would allow us to remain within the limits in the Paris climate Agreement. Exceeding the critical limit would, in turn, activate irreversible natural processes and pave the way for an area of unstable climate. A warmer climate would result in problematic changes in ecosystems and food production, increase the world's sea level, cause extreme weather conditions, and a lot more. These phenomena would put to risk the welfare and security of all residents of the planet. As the situation is already critical and measures must be taken urgently, the knowledge that a new forest may theoretically neutralise the emissions from felling an old one in 50, 70, or 100 years is no consolation.

The European Union has set a legally binding goal to reduce the carbon emissions by 55% by 2030 (compared to the 1990 level) to make a fair contribution and lead the way in preventing the overheating of the planet. This target is not sufficient to achieve the Paris Agreement, but is quite pioneering as it is systematic and multifaceted. In order to achieve the target, European landscapes must remove hundreds of millions of carbon per year in the upcoming decade. The obligation has been distributed between the Member States, who each have specific targets.

Estonia's obligations in the LULUCF sector

A regulation was adopted in the European Union in 2018 which establishes binding LULUCF emissions targets for Member States for the first time. This is part of the climate policy's aim of removing at least 225 million tonnes of carbon per year from the landscape all over the European Union. Countries must draw up forestry plans and stick to the levels specified in them.

Estonia has agreed to remove 1.75 million tonnes of carbon per year on forest land and in wood products between 2021 and 2025. The Estonian Environment Agency estimates that Estonia will have to keep its felling volumes lower than 9.5–10.5 million cubic metres to achieve this.

The new European Commission, which took over in 2019, introduced its plans for increasing climate ambition. European Commission specifies a LULUCF target of removing at least 310 million tonnes of carbon per year by 2030. In July 2021, the new draft LULUCF regulation was introduced, which includes a simpler method for dividing the target between different countries (the forest calculation plan–based approach has gone). If the regulation is adopted, Estonia will have to remove 2.5 million tonnes of carbon in total over all land categories (forest, fields, wetlands, settlements, etc.) by 2030.

What would happen if the obligations were not fulfilled?

Estonia has agreed to decisively control climate change through the EU plans and to eliminate the total emissions by 2050. The trajectory towards achieving this goal is as significant as the final target. We only have two choices: stick to the targets or pay for failing to fulfil them.

Both the current EU climate and energy policy framework and the one being discussed allow countries to trade LULUCF quotas if targets are exceeded or missed, so as to help achieve the general Europe-wide target. In order to find out whether exceeding the thresholds could be economically beneficial for Estonia, we should look at which countries are likely to have excessive quotas by the end of the decade, but this cannot be predicted, and the outcome is too risky to be based on guesswork.

The price of the Emissions Trading System (ETS) allowances cannot be used to foresee the potential price of the LULUCF quota, nor should future decisions be based on the 25 Euro per tonne which is used in the 'Analysis of the GHG removal capability of the land use, land use change, and forestry sector until 2050'.

There are still some undecided issues concerning the exact prices and the measures for implementing the regulation, but carrying on with the current felling volumes would probably bring hundreds of millions of euros of expenses for Estonia, which must be covered from public funds.

How to calculate the GHG emissions and removals of forest land?

The removals/ emissions of LULUCF = **the total of the removals/emissions of arable land, grassland, wetland*, forest land, settlements, other land, and wood products.**

Of the above, forest land and wood products are concerned with forests and forestry

The emissions/removals of forest land

=

the emissions/ removals of forest soil + **growth of wood in the forest** − **removal of wood by felling** − **natural destruction of wood (through decomposing or burning)**

Wood products' removals

=

production of wood products and the carbon bound in them − **destruction and decomposition of wood products over time**

* excluding wetlands in natural state

What good will come from cutting felling volumes?

Less extensive logging provides immediate climate benefits, but a forest does not merely consist of carbon. Reducing the amount of logging is also good for the forest biodiversity. The majority of the endangered species in Estonia depend on old forests and many common forest species are also shrinking in numbers. Reducing felling volumes would improve their situation, thereby helping to slow down the global loss of biodiversity. There will also be more berry, mushroom, and leisure forests left for people.

Forests protect us from climate change – both by mitigating and adapting to the change. For them to fulfill this role, however, we must preserve forests and manage them wisely.

You can find out more about Estonian environmental associations' vision of the forestry of the future in our forestry vision (in Estonian).