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Forests can save us, but only if we save them first - the case of Finland

How to Ensure EU Climate and Bioenergy Policies work for forests and people.

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Summary

Natural carbon sinks are essential for combating climate change. They have the unique ability to absorb carbon and cool the climate. Ending the use of fossil fuels and peat remains the most important way to mitigate heating. Land sector mitigation measures cannot compensate for delayed emission reductions in other sectors, reminds the IPCC.¹ However, the Paris Agreement's climate goals can not be reached without ambitious targets to enhance natural carbon sinks.

As a forested country, Finland has a large potential to increase its carbon sinks. Sanna Marin's coalition government aims to be the first fossil-free welfare state and become carbon neutral in 2035 and carbon negative thereafter.

While we reduce our dependence on fossil fuels, peat and Russian energy, pressures on forests increase. Forest loggings are already at a record high, and most forest biomass ends up as energy. Overconsumption increases our reliance on raw materials.

The positive news is that researchers have identified multiple ways to enhance forest carbon sinks and protect biodiversity at the same time. As the recent IPCC report points out, only biodiverse ecosystems are able to adapt to the impacts of heating.² By saving forests, we can save ourselves.

EU policies must support biodiverse forests and their carbon sinks, reduce overconsumption and limit biomass energy use to prevent further harm to climate and biodiversity.

¹ [Climate Change 2022: Mitigation of Climate Change. Working Group III Contribution to the IPCC Sixth Assessment Report](#)

² [Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the IPCC Sixth Assessment Report](#)



Old-growth forest with an abundance of decaying wood in Pyhä-Häkki National Park, Middle Finland.

Natural carbon sinks are needed to reach climate goals

Boreal forests in Finland store more carbon annually than they release. In recent years, natural carbon sinks have become an important part of Finland's climate policies. In 2020, the net LULUCF carbon sink was 17,2 Mt, absorbing 35 per cent of Finland's annual emissions and thus buffering the impacts of global warming.³

Carbon sinks are fluctuating, but the long-term trend is decreasing. The net carbon sink is mostly controlled by annual forest loggings, which are already at a record high.⁴ At the same time, recent observations show that forest growth is decreasing for the first time in 60 years,⁵ which could have a serious impact on carbon sinks.⁶ As wood imports from Russia have ended and a new pulp mill is starting to operate in Kemi in 2023, pressures to increase loggings mount. In 2023 loggings are expected to increase above 80,5 million m³, a level that can not be maintained long term without forest growth to diminish in the future.⁷

³ [Statistics Finland, 2021](#)

⁴ [In 2021, forest loggings were 75,8 million m³, which is only 2 million m³ less than the all time record in 2018.](#)

⁵ [Luke, 2021](#)

⁶ [Yle 16.12.2021](#)

⁷ [Helsingin Sanomat 10.4.2022](#)

Other sources of emission from the land-use sector, namely deforestation and organic soils, emit more than 10 Mt annually, and the number has not been decreasing.

Finland's target is to be carbon neutral in 2035 and carbon negative thereafter.⁸ This would require carbon sinks to be considerably higher than 21 Mt annually during 2020–2035.⁹ The LULUCF target for 2030 proposed by the EU commission is lower than the national target, namely 17,8 Mt.¹⁰

The aim of Prime Minister Sanna Marin's government is to enhance carbon sinks and ensure that quality roundwood is not burned for energy.¹¹ To further these aims, the government is to release its climate plan for the land sector and the climate and energy strategy during the spring of 2022. The national plans include a target to enhance carbon sinks by at least 3 Mt by 2035. This is expected to enable carbon sinks to reach 21 Mt annually. However, the Finnish climate panel has warned that a higher target to enhance carbon sinks will be needed for Finland to reach its climate goals.¹² So far no national policies have been set to ensure biomass energy use does not harm biodiversity or the climate.

⁸ [Government's proposal to alter the climate law, 2022](#)

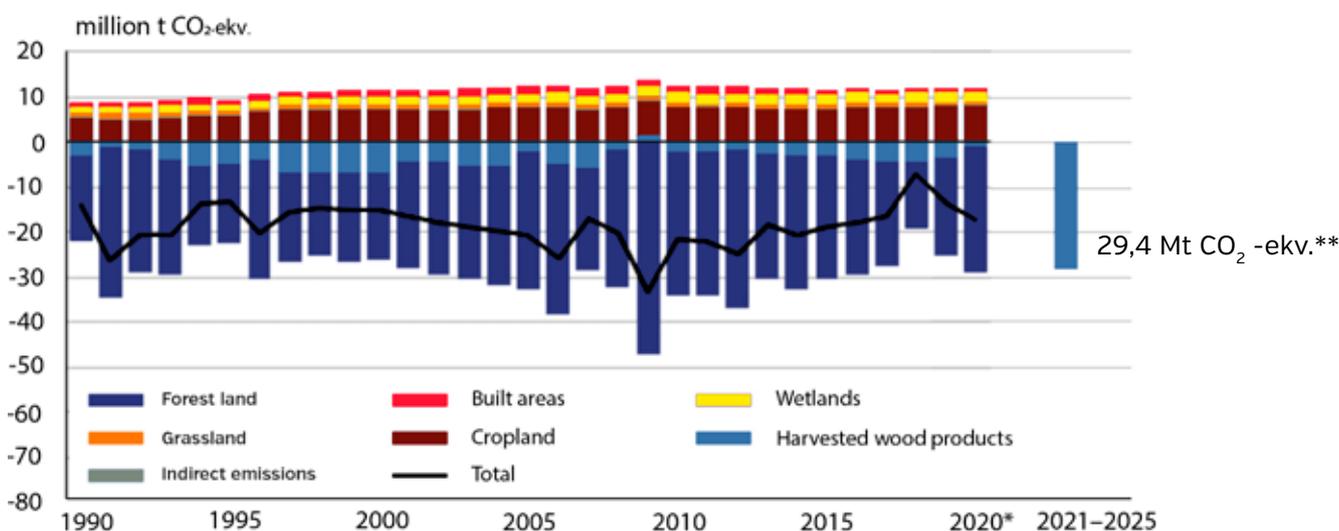
⁹ [Estimate by the Finnish Climate Change Panel, 2021](#)

¹⁰ [Commissions proposal for LULUCF Regulation, 2021](#)

¹¹ [Prime minister Sanna Marin's government programme, 2019](#)

¹² [Finnish Climate Change Panel, 2021](#)

Finland's annual carbon sink (emissions and removals) has been decreasing



**Forest management reference level for forest land and harvested wood products for 2021–2025 based on EU LULUCF Regulation

*Foreknowledge
Source: Statistics Finland

Many options to enhance natural carbon sinks

The good news is that climate policies are expected to have a positive impact on carbon sinks if put to effective use. Finland's forests are considerably young, so scientists estimate the potential to enhance carbon stocks to be high.¹³ Decreasing harvesting to 60 million m³ annually would benefit carbon sinks and forest biodiversity.¹⁴ Climate benefits follow even when substitution effects of harvested wood products are taken into account.¹⁵

A report by Natural Resources Institute Finland lists ways to enhance carbon sinks by almost 10 Mt by 2035. The main methods in regards to forests would include stopping deforestation, continuous cover forestry on organic soils, producing long-lived wood products instead of short-lived products and enhancing the amount of decaying wood in commercial forests.¹⁶ Additional effective methods include longer rotation periods.¹⁷

Deforestation is one of the main emission sources in the Finnish land-use sector. Between

2013 and 2019, the clearing of forested land for agricultural and building purposes caused 3,7 Mt emissions annually, which is 6 per cent of total greenhouse gas emissions. A ban on deforestation or a deforestation payment could be set to end deforestation by 2030.¹⁸

Climate change and biodiversity loss must be addressed simultaneously, reminds IPCC and IPBES in their joint report.¹⁹ The carbon stocks of old growth forests are high. Old growth forests also remain carbon sinks for centuries.^{20 21} Many endangered forest species dwell in old growth forests. By protecting primary and old growth forests, like the EU Biodiversity strategy outlines, we can protect both the climate and forest biodiversity at the same time. The Finnish Nature Panel has made a proposal to increase conservation funds in order to reach the EU targets related to forests.²² Finnish researchers have also proposed a carbon index to be added to the forest conservation scheme METSO and the conservation budget to be increased accordingly, to allow sites of higher quality to be selected for conservation and landowners to benefit more from conservation.²³

¹³ [In Suomen Luonto Thomas Kastner considers, based on a study in Nature, the carbon debt of Finland's forests to be a third of the current carbon stock.](#)

¹⁴ [Heinonen et al, 2017](#)
¹⁵ [Kalliokoski et al, 2020](#)
¹⁶ [Luke, 2021](#)
¹⁷ [Stokland, 2020](#)

¹⁸ [Luke, 2022](#)
¹⁹ [IPBES & IPCC, 2021](#)
²⁰ [Luyssaert et al, 2008](#)
²¹ [Gundersen et al, 2021](#)

²² [Finnish Nature Panel, 2021](#)
²³ [Kangas & Ollikainen, 2022](#)

Finland has not untapped its land use sink potential

Finland's LULUCF sink in 2020	17,2 Mt
LULUCF 2030 target (proposed by the Commission)	17,8 Mt
LULUCF 2030 target (Proposed by MEP Ville Niinistö)	30 Mt
Minimum LULUCF target for carbon neutrality in 2035	21 Mt
LULUCF maximal potential in 2035 estimated by Luke (2021)*	about 18 Mt baseline + 9,74 Mt = 27,74 Mt

*measures exclude reducing harvesting intensity and longer rotation periods

Biodiversity in Finland's forests is diminishing

Finnish forest ecosystems are under pressure. Currently, 76 per cent of forest habitats are endangered.²⁴ Old growth forests are particularly threatened. Forest habitats in southern Finland are assessed to be more threatened than those in northern Finland. Forest loggings are the main threat to forest biodiversity.

Of all endangered species, 31 per cent live primarily in forests.²⁵ The loss of old growth

forests and the lack of deadwood and large trees in forests are the primary reasons for the deterioration of forest species.

64 per cent of Finns want to swiftly protect the last remaining primary forests.²⁶

²⁴ *Assessment of threatened habitat types in Finland 2018*

²⁵ *The 2019 Red List of Finnish species*

²⁶ *Taloustutkimus, 2022*

Continuous cover forestry benefits nature, climate and landowners

Continuous cover forestry is a forestry method that does not include clear-cutting. Instead, the forest land remains covered despite commercial loggings. Continuous cover forestry was illegal in Finland until the revision of forest law in 2014. Practical and scientific knowledge is constantly increasing. In 2020, less than 5 per cent of all loggings were done according to the principles of continuous cover forestry. This could be increased considerably as 77 per cent of Finns want to limit clear cutting.²⁷

Continuous cover forestry brings several advantages to recreation, biodiversity, soil carbon, water bodies, the reduction of wind risks, reindeer herding and landowners' economic profits, the Finnish Nature Panel has found.²⁸ It can be as financially beneficial or more beneficial for a landowner as rotation forestry. This is because there are no high investment costs to renew stands.

The level of disturbance of nature and especially of species dwelling in closed forest environments is lower in continuous cover forestry than in rotation forestry. According to the Finnish Nature Panel, continuous cover forestry would thus benefit species in commercial forests. Increasing the share of continuous cover forestry, while keeping the total harvesting level constant or decreasing, would diversify forest landscapes and benefit forest species. Whatever forest management method applied, the focus should be on increasing the amount of deadwood, large trees, deciduous trees and buffer zones to fresh

waters. The need to increase forest protection remains even if continuous cover forestry is increased.

Soil carbon stock usually remains higher in continuous cover forestry. A quarter of Finland's forests grow on organic soils that have been drained for forestry. As a result, their soil carbon stock is diminishing, and emissions to water bodies are expected to even increase in the future. In 2017, greenhouse gas emissions from forests on organic soils were 7,1 million tonnes.²⁹ Continuous cover forestry on organic soils would reduce emissions to water bodies and to the atmosphere. The Finnish Nature Panel reminds us that to reach the EU targets on biodiversity protection, we need to restore and protect many areas that have been degraded, including drained peatland forests.

In general, continuous cover forests may have a greater potential to produce multiple benefits while being economically profitable.³⁰ To secure multifunctionality of forests 75 per cent of forest area should be managed according to continuous cover forestry.³¹ Crucially, unmanaged forests often provided the highest levels of services and biodiversity, making their role in delivering forest-related ecosystem services indispensable.³²

²⁷ *Yle 16.5.2019*

²⁸ *Finnish Nature Panel, 2022*

²⁹ *Tilastokeskus, 2019*

³⁰ *O Díaz-Yáñez et al, 2019*

³¹ *Eyvindson et al, 2021*

³² *Peura et al, 2017*

Most wood is used for energy production

More than a quarter of energy consumption in Finland is based on the use of forest biomass for energy production. In 2020, of all renewable energy used, 70 per cent was based on wood.³³

Finland has set an end date for the burning of coal; plus, peat burning is expected to diminish in the future as well. Thus, the consumption of forest biomass for energy is expected to grow 30–40 per cent by 2030.³⁴ This puts further pressure on forests, and part of the increase in the use of forest biomass for energy and liquid biofuels is expected to be sourced from abroad. Limits on Russian wood imports will further increase conflicts around forest use.

With current policies, the use of forest biomass for energy production is a competitive field. Investments in other renewables that are not based on burning could be promoted by introducing subsidies, especially to small operators and removing the tax exemption on biomass energy use. The potential to go beyond burning is considerable. Big investments have already been made to heat pumps, deep heat, waste heat and annual heat storages: for example, the world's largest heat storage is being built in

Vantaa³⁵ and a large seawater heat storage is about to start operating in Helsinki.³⁶

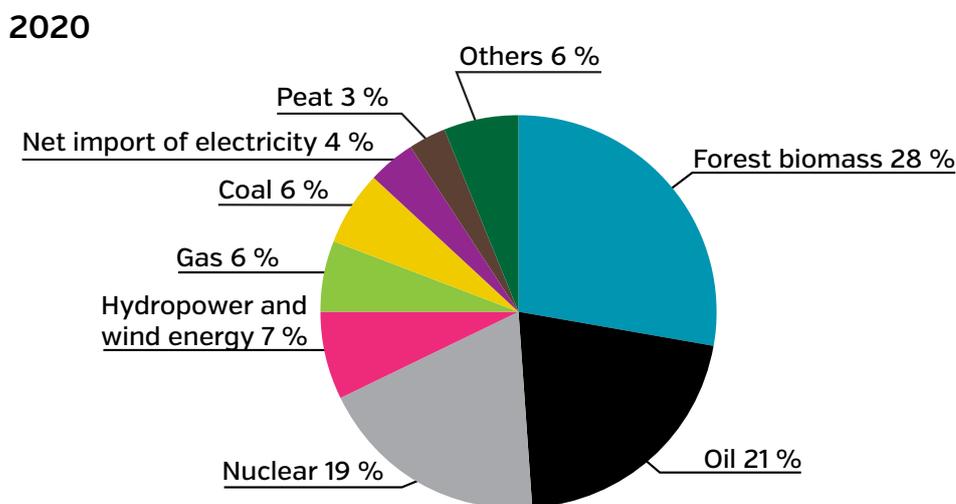
Currently, there are also big plans to invest in liquid biofuels based on forest biomass.³⁷ The demand for biofuels is driven by the EU's Renewable Energy Directive and a national distribution obligation.

The heavy reliance of the energy sector on wood burning is a problem for the climate and biodiversity. The Finnish Climate Change Panel³⁸ and European Academies' Science Advisory Council³⁹ remind us that the use of forest biomass for energy production is not carbon neutral. A Finnish study has also found that the use of harvesting residues for energy production has a negative impact on biodiversity and the carbon balance of forests.⁴⁰

Since we lack strong policies that would protect climate and biodiversity from the growing demand for forest biomass for energy production, there have been alarming cases of ancient trees being burned for energy. In 2021, it was reported that even 300 years old trees were burned for energy both in Kuusamo⁴¹ and Inari.⁴²

One way to mitigate the climate impacts of forest harvests would be to increase the share of long-lived harvested wood products while decreasing the share of wood used for pulp and

Forest biomass is the largest source of renewable energy



Share of different energy sources in 2020
Source: [Statistics Finland](#)

paper and energy production. Currently, their share is low. Out of all wood used in Finland in 2020, 58 per cent ended up as energy. The share has been increasing.⁴³ Thus, most of the carbon in the logged trees is released into the atmosphere.

” *The lower the harvest, the more climatic cooling boreal forests provided.*

Current bioeconomy is based on the increasing logging, short-lived wood products and bioenergy use. This is unsustainable. The substitution effect of wood products can not mitigate the harmful impacts of forest loggings. A modelling study has revealed that an increase in harvest rates in Finland increased the total net greenhouse gas flow to the atmosphere because emissions from logging and the decreased carbon sequestration were higher than the avoided

fossil-based CO₂ emissions.⁴⁴ Similarly, wood use did not have a positive climate impact even when used for long-lived wood products like construction.⁴⁵ Scientists say that the substitution effect of Finnish wood products would need to at least quadruple to mitigate the negative impacts of current harvests.⁴⁶ When different drivers of climate impacts were considered, the lower the harvest, the more climatic cooling boreal forests provided.⁴⁷

³³ [Metsätilastollinen vuosikirja, 2021](#)

³⁴ [Afy, 2021](#)

³⁵ [Yle, 22.9.2020](#)

³⁶ [Helen, 2020](#)

³⁷ [Helsingin Sanomat, 28.1.2021](#)

³⁸ [Finnish Climate Change Panel, 2015](#)

³⁹ [EASAC, 2017](#)

⁴⁰ [Repo et al, 2020](#)

⁴¹ [Helsingin Sanomat, 10.9.2021](#)

⁴² [Suomen kuvalehti, 1.4.2021](#)

⁴³ [Luke, 2021](#)

⁴⁴ [Soimakallio et al, 2021](#)

⁴⁵ [Seppälä et al, 2019](#)

⁴⁶ [Hurmekoski et al, 2021](#)

⁴⁷ [Kalliokoski et al, 2020](#)

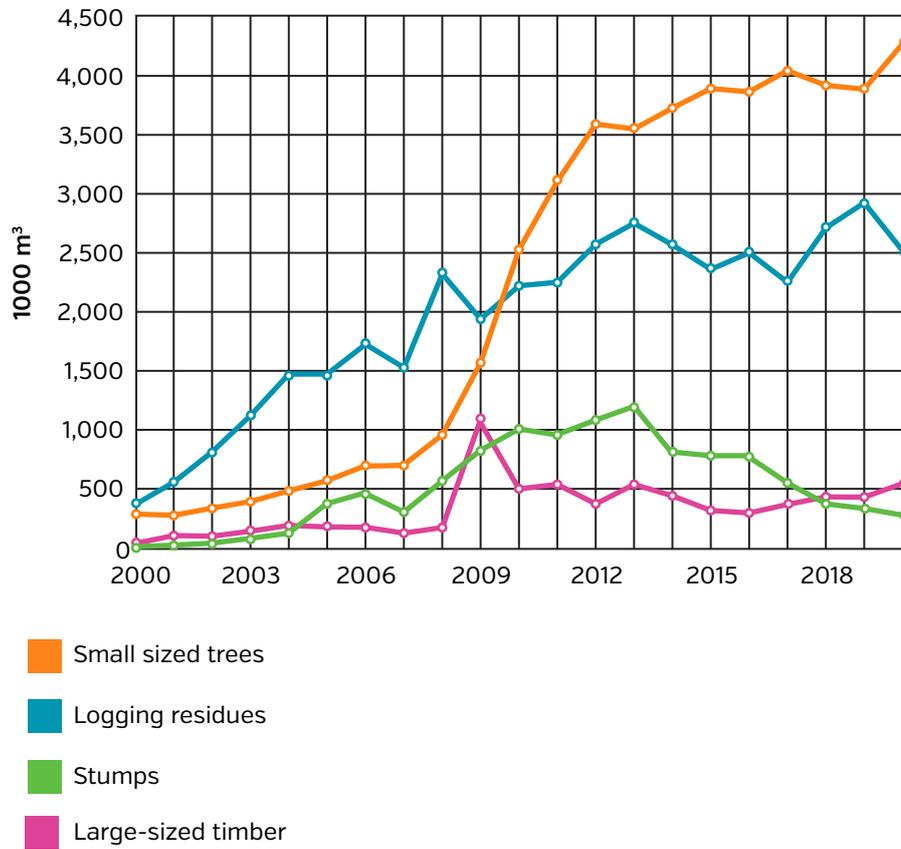


PHOTO: MERJA PAAKKANEN

Continuous cover forestry at Heinävesi, North Karelia. To secure multifunctionality of forests, 75 per cent of forest area should be managed according to continuous cover forestry, study say.

The pressure to use large trees for wood chips increases by demand

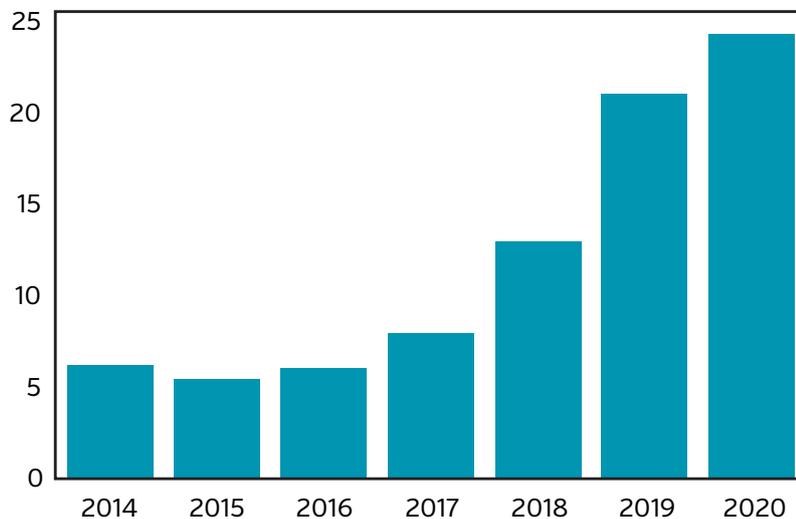
Consumption of wood chips in heating and power plants by raw material



Source OSF: Natural Resources Institute Finland, Wood in energy generation.

Even Finland has been relying on imported wood chips

Use of imported wood chips for heat and power



Source: [Luke and PTT](#)



PHOTO: VESA LUHTA

In 2021 whole trees, even 300 year old trunks, were cut to be burned for energy in Inari, Lapland.

A new forest-based bioeconomy - what would it look like?

Only 5–20 per cent of the value of global forests lies in commercial value.⁴⁸ Still in national policies commercial value has been the leading one for decades. The role of the forest sector in the Finnish economy has been decreasing, but the share in exports is still relevant. Production has been shifting towards pulp, and the value added has been halved since the year 2000 when compared with the amount of wood utilised.⁴⁹

In 2019, the value added of the forest sector was 4,33 per cent of the total value added of the national economy. The aim of Finland's bioeconomy strategy is to double the added value of bioeconomy.⁵⁰

The workforce in the sector has decreased by a third since the year 2000. In 2021, the forest sector's workforce was 65 000, which is 2,4 per cent

of all workforce in Finland.⁵¹

The role of forests in the Finnish economy is clearly changing. The importance of the multi-functionality of forests is understood better. Many forest owners live in cities now. New wood products should replace short-lived products, driven by changes towards sustainable management practices. Forest carbon sinks are an incremental part of climate policies. Nature's recreational value has increased, and people have spent more time in nature because of the COVID-19 pandemic.⁵² Jobs in nature tourism, traditional livelihoods like reindeer herding, the expansion of the use of non-timber forest products and the value of nature protection and carbon sinks for landowners are new trends that require forest management and the whole industry to adjust.

⁴⁸ [Knappen et al, 2020](#)

⁴⁹ [Helsingin Sanomat, 11.7.2020](#)

⁵⁰ [Finnish Bioeconomy Strategy, 2022](#)

⁵¹ [Luke Statistics, 2022](#)

⁵² [Ministry of the Environment and Finnish Environment Institute, 2020](#)

Key asks for EU policymakers

Restoration Law

- The loss of biodiversity in the EU must be halted by 2030 in line with the EU Biodiversity Strategy.
- Binding ambitious restoration targets with clear indicators to improve the ecosystem resilience and the functioning of forests in the EU must be set.

LULUCF Regulation

- In addition to ambitious emission reduction targets, the EU must aim to increase the EU LULUCF sector's net contribution to -600 million tonnes (Mt) annually by 2030, through a rapid expansion of practices that are a win-win for climate and biodiversity.
- Net removals by the LULUCF sector need to be combined with emissions reductions in other sectors and kept under a separate target with no flexibility with the ETS and ESR sectors.
- Synergies and concrete links between the LULUCF sector and the EU's biodiversity strategy, the EU Restoration Law and the Birds and Habitats Directive must be ensured.

Revision of the Renewable Energy Directive

- Introduce strong sustainability criteria to avoid harm to climate and biodiversity and stop subsidizing at least the use of primary forest biomass for energy production.
- Apply the cascading principle to forest biomass use.
- Apply biomass sustainability criteria to at least all installations of 5MW and above.
- Biofuels: exclude high-risk feedstocks such as some forestry and forest industry byproducts from the list of advanced biofuels. Stop the support of biofuels from palm oil [including PFAD] immediately.

Regulation on deforestation-free products

- Set strong sustainability requirements based on objective criteria to ensure no goods linked to not only deforestation or forest degradation, but also to the conversion of other natural ecosystems or human rights violations are placed on or exported from the EU market.
- Apply stronger definitions for forests, deforestation and forest degradation, reflecting those used in the Accountability Framework Initiative, which makes a clear distinction between natural forests and tree plantations and recognises deforestation caused by the building of infrastructure. The definition of "forest degradation" should aim at preserving the ability of forests to support biodiversity and store carbon. Indicators should be based on scientific evidence.
- The same strong due diligence obligations should apply to all operators regardless of size, trade volumes or the apparent risk level of the country or area of production and trace products back to the plot of land of production.