

Organic soils – Finnish approach to sustainable use of peatlands

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Peatlands in Finland

26 % of Finland's surface is peatland

Peat fields account 10,5 % of agricultural land

Peatlands account for 60 % of Finland's agricultural emissions

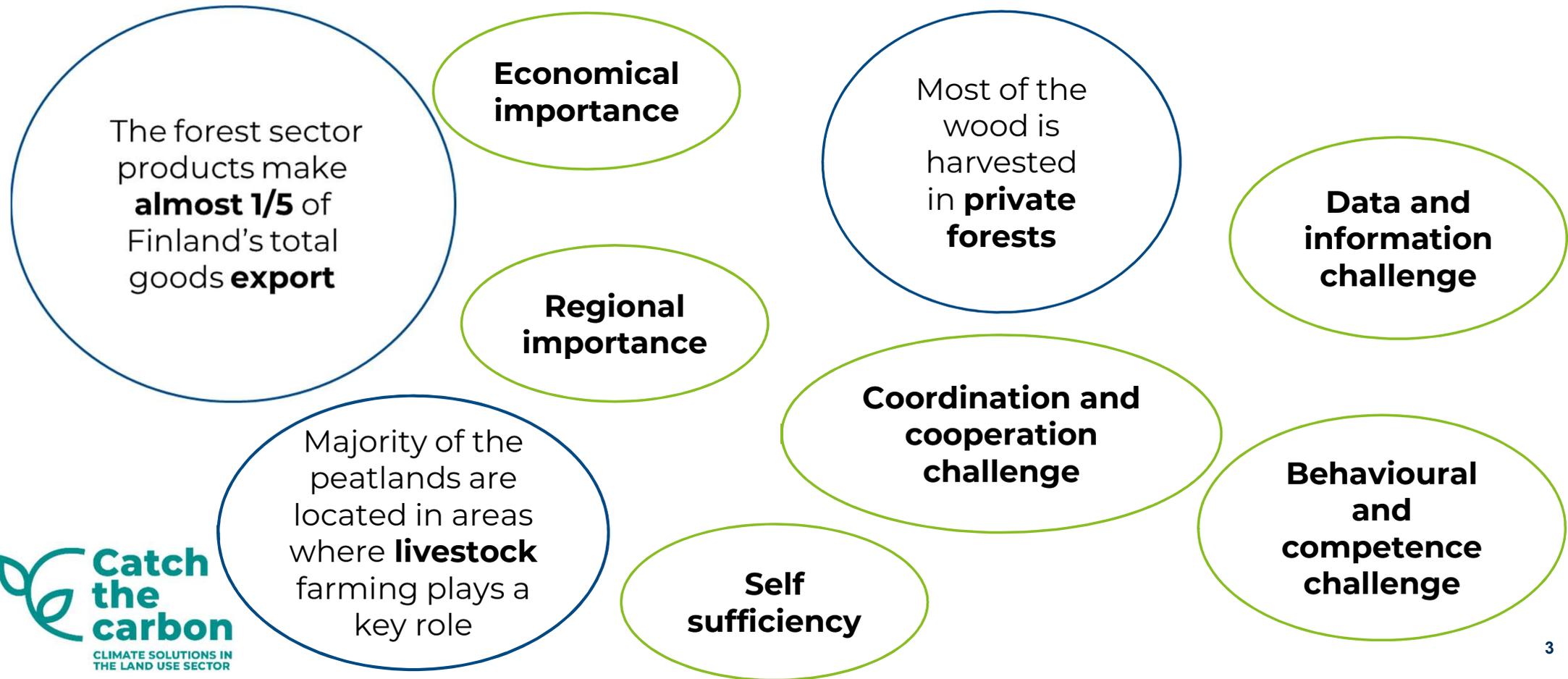
Average peat layer is 1,2 m.
1/2 of the peat fields are thin peat (0,3-0,6 m)

1/3 of commercial forest land is peatland

Half of the peatland has been drained



Framework for choosing instruments to enhance climate action in Finland





Measures on peatlands play a key role contributing to the carbon neutrality target 2035

- Climate measures for the land use sector are implemented across the different sectors building interlinkage with several other Government, EU and international strategies, programmes and initiatives (e.g. Fit for 55, Biodiversity Strategy, Regulation on Deforestation-free Products, Nature Restoration Law, CRCF Regulation, EU Soil Mission, 4/1000 e.g.)
- We have measures to cut down greenhouse gas emissions **from peatlands** both in the new Common Agricultural Policy Strategic Plan (CAP) and on national level in [Climate Plan for the Land Use Sector](#), in [Medium-term Climate Change Policy Plan](#) in [National Forest Strategy 2035](#) and in [Climate Change Adaptation Plan](#).
- The objectives of the [low-carbon roadmaps](#) designed by private sector in Finland contribute to the implementation – to be updated 2024
- Climate Act (2022): Finland carbon neutral by 2035 – national & EU climate policy planning system safeguards the persistence
- New climate unit supporting implementation in regional administration (ELY Centre)



Key measures on peatlands



Agriculture

- Reducing emissions from peatland farming (e.g. perennial ecological grasslands, controlled subsurface drainage) – **limited effect**
- Rewetting of peatlands and development of paludiculture – **how to kick off?**

Forestry

- Comprehensive planning of peatland forest management – continuous cover forestry methods instead of draining – **multiple benefits**
- Targeted promotion of ash fertilising of drained peatland forests – **long traditions**

Land use changes

- Prevention of new emissions e.g. by preventing deforestation and conversion of forests of peat extraction sites into fields – **politically challenging**
- Promotion of alternative use of areas no longer used for peat extraction – **politically challenging**



Catch the Carbon: Kicking off climate measures on LULUCF-sector 2020-2025

- 100 M € national public investment in climate measures on land-use sector coordinated by the Ministry of Agriculture and Forestry
- [The Recovery and Resilience Facility](#) (RRF): 8,5 M € investment in projects enhancing climate sustainable forestry and biodiversity 2022–2025
- Financial instruments e.g. subsidies for the afforestation of wasteland (2021-2023), remedial ash fertilization of peatland forests, CAP measures aligned
- New ownership policy decisions on state forests, state revenue requirement eased 2020-2024
- Development projects, an information program and research- and innovation program to support agricultural producers, forest owners and other parties making decisions on land use in developing and introducing climate change resilient practices
- Implementation of the new scientific data e.g. through Best Practices for Sustainable Forest Management in Finland and several education projects



Definition and identification of peatlands – challenge in many ways



- The reduction of the soil emissions with targeted measures require field parcel specific soil information and mitigation measures:
- Recently completed Catch the Carbon development project ([MaaTu](#)) has produced refined spatial data on the occurrence and depth of peat soils in Finland using remote sensing, empirical field data, and machine learning methods.
- The produced spatial data is map-based, and it allows the identification of field parcels with peat soils, as well as the implementation of field parcel specific mitigation measures.
- Discussion on use and availability of the new data



Definition of peatlands in Finland

- The internationally used World Reference Base for Soil Resources (WRB) classification system, in turn, provides an internationally applicable definition of Histosol for peat soils, and it is also used by the IPCC. The Histosol definition has minor differences with the commonly used Finnish definition of peat soils. In Histosol, the minimum thickness for organic soil layer is 0.4 m, whereas in Finnish definition for peat soil it is 0.3 m.
- In addition, in Histosol the organic carbon content of the organic soil layer is $\geq 20\%$, whereas in Finnish definition for peat soil the organic matter content is $\geq 40\%$, which corresponds to 23,2% organic carbon (conversion factor 1.724).
- However, the replacement of the thresholds of Histosol for the layer thickness and organic carbon content with Finnish thresholds for peat soil, results in definition that is very close to the definition of organic soils (Histosols) used by IPCC. It also prevents development of parallel and contradictory classification systems in Finland.
- The definition of peat field parcel also requires development of criteria for minimum surface area of peat at the field parcel, as the analyses showed that peat occurs often only at part of the field parcels.
- The analyses also revealed that in the identification of peat soils the deeper soil layers should also be considered. In the plough layer of the fields the organic carbon content was on average 28–37 % lower and the peat was more decomposed than in deeper peat layers, which may result in incorrect soil type classification in some cases if the identification is done only from the surface soil.
- Source: [Turvepeltolohkojen määrittely ja tunnistaminen – Maatalousmaiden turvetieto \(MaaTu\) -hankkeen raportti, 2023](#)



Data, research and piloting needed

- Regional Solutions to reduce climate impact of organic agricultural soils ([ARMI](#)), Natural Resources Institute: project brings together social sciences and natural sciences. Activities take place at farm, regional, and national levels.
- Climatically sustainable use of peatlands - farmer's view ([TURINA](#)): Setting up pilot areas to activate farmers to implement long-term emission reduction measures at the best possible legitimate way for each field to slow down the decomposition of peat. At the same time, the project promotes the implementation of paludiculture and its production chains by bringing companies and farmers in the sector together.
- Mitigating carbon emissions from cultivated peat soils by innovative water management ([VESIHIISI](#)): The project aims at reducing carbon emissions from cultivated peat soils through water management measures like controlled drainage and subsurface irrigation.





Projects supporting policy and the sustainable use of peatlands

- [Road map for the use of peat fields](#) – cost-effective reduction of GHG-emissions in the regions and on country level in order to reach the environmental and climate targets without serious contradictions and conflicts.
- The [SuoHitu](#) project examines the long-term impact of ash fertilisation in peatland forests on soil greenhouse gas emissions and balance and on biodiversity and the load on water bodies.
- State fund piloting project ([Peltopankkipilotti](#)) coordinated by National Land Survey of Finland – the project aims to (in connection with land rearrangements) to buy land areas that can be used to promote the establishment of wetlands and to develop a working cooperation model for taking into account climate and water management measures in land rearrangements.



Projects supporting policy and the sustainable use of peatlands

- CarbonNudges in Climate Wise Land Use in Agriculture and Forestry ([TUIMA](#)): Developing and piloting nudges and investigating the commitment of farmers and forest owners to climate actions including its prevalence, determinants, and association with mental wellbeing in general.
- Forests on peatlands – solutions for reducing emissions and increasing of carbon sinks ([TURNEE](#)), Finnish Meteorological Institute & al: Hydrological and climate effects of afforestation of cutaway peatlands and restoration of eutrophic forested mires.



Need for additional measures on LULUCF-sector to reach the EU-targets



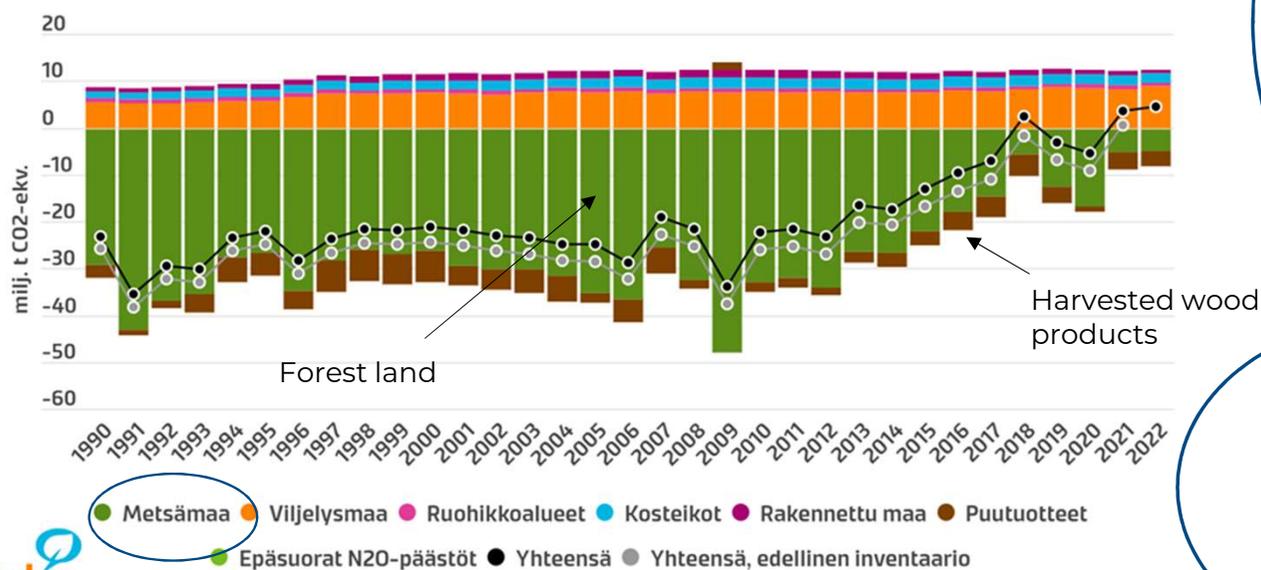
Preliminary data: LULUCF-sector
4,5 Mt CO₂-eq net-emission 2022

- improvement of GHG inventory calculation methods
- technical corrections made to the inventory
- decreased forest growth
- changes in loggings

LULUCF obligation for 2030:
2,9 Mt CO₂-eq additional sink to the level of the carbon sink 2016-2018

LULUCF-sektorin päästöt ja poistumat maankäyttöluokittain (milj. t CO₂-ekv.)

Positiivinen luku on päästöä ja negatiivinen poistumaa (nielu).



Implementing the actions in the climate plan can still achieve the desired climate impact, but the actions are no longer sufficient to achieve a significant net sink for carbon neutrality.

Definition and decision on additional climate measures 2024

14.12.2023 preliminary data on GHG-inventory, [Natural Resources Institute](https://www.nri.fi/) (9.3.2024)





Start the work, assess and improve

- More emphasis on coordination, interaction, communication and building competence
- Investing in future – importance of engaging young researchers
- Interdisciplinary approach: Research expertise also on e.g. technology, economics, law and behavior sciences (e.g. [nudging forest owners](#)) necessary
- Collaboration between the researchers and forest owners indispensable to ensure the knowledge and to understand the needs on the ground
- There's always more to know >< action needed
- Public finance >< carbon markets
- Limited finance – finding synergies between different policies, piloting new policy measures (e.g. performance-based funding models for carbon sequestration)
- Development of the GHG-inventory needed to make the actions visible

More information

- [Catch the Carbon package of climate measures 2020-2025](#)
- [Impact assessment of Catch the Carbon development projects](#)
- [Policy brief about the impact assessment](#)
- [Research and innovation programme](#)

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