

Overview of the EU LULUCF GHG inventory



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EO for monitoring, reporting and verification of carbon removals.
Copenhagen, 8-11 October 2024.



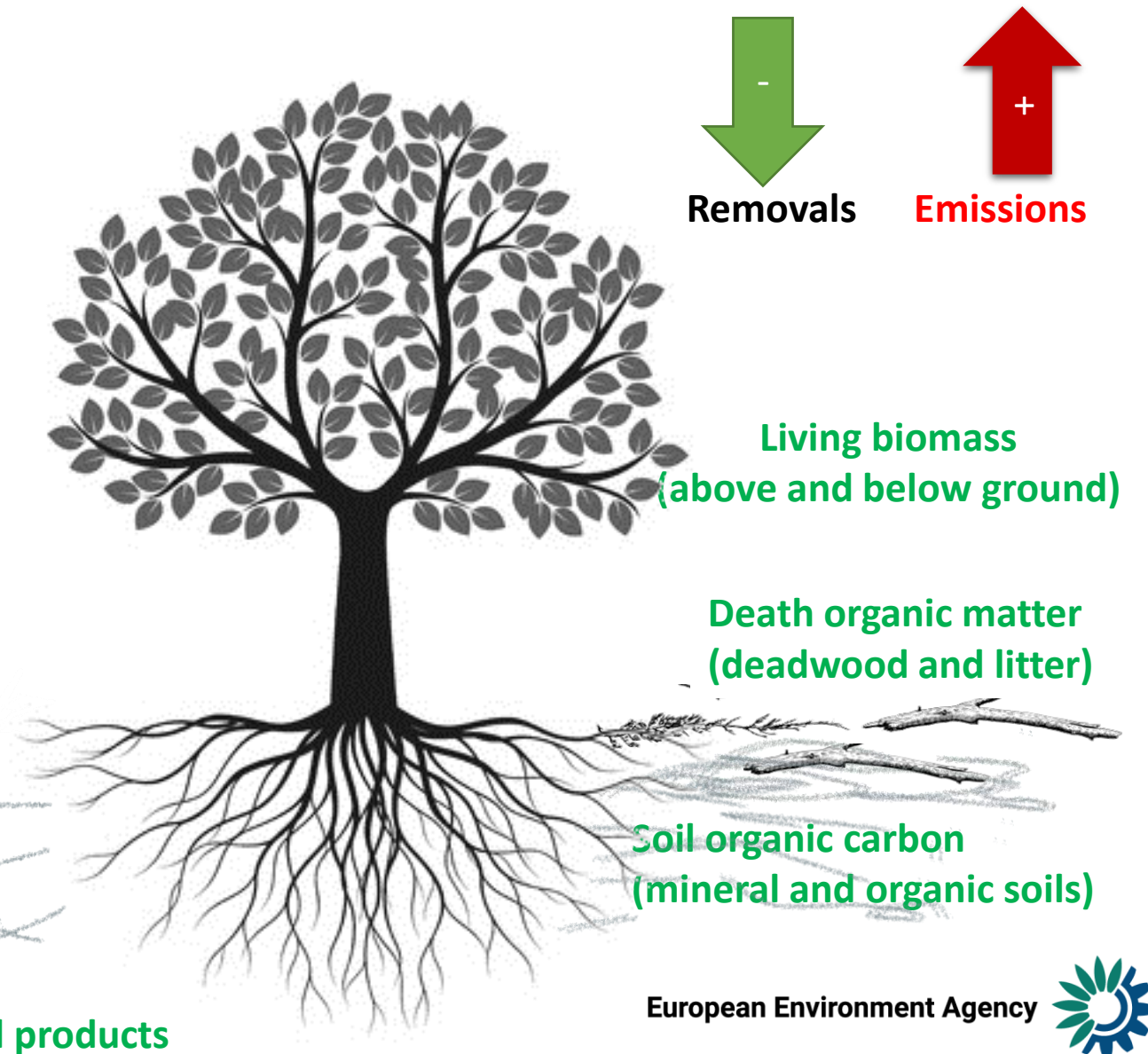
1. What does GHG inventory on LULUCF cover?
2. Reporting status of the EU LULUCF GHG inventory.
3. Reporting requirements under the EU LULUCF Regulation.

What does Land Use, land use change and forestry cover?

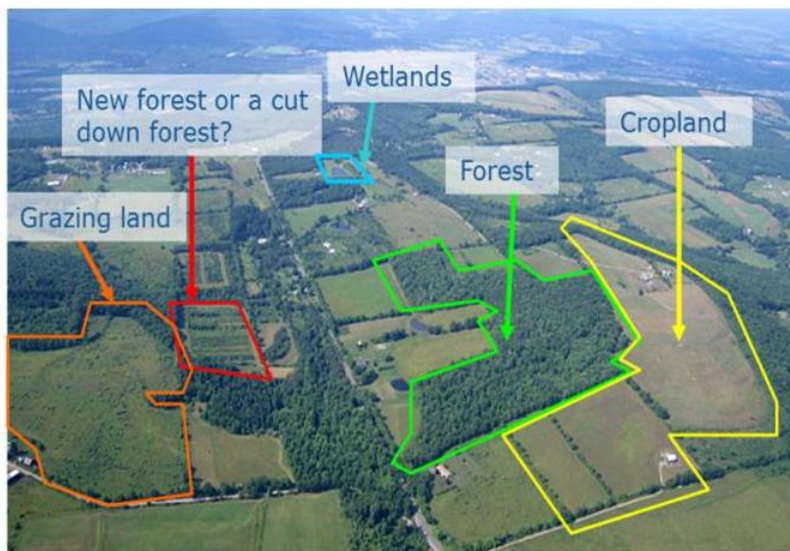
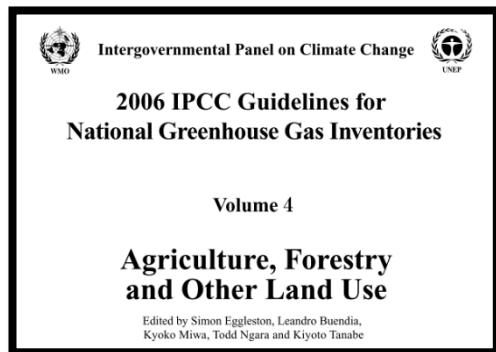
Anthropogenic GHG emissions and carbon removals occurring in different carbon pools

Land use categories

- 1. forest land*
- 2. cropland*
- 3. grassland*
- 4. wetlands*
- 5. settlements*
- 6. other land*



LULUCF – Land representation 2006 IPCC Guidelines for National Greenhouse Gas Inventories



Important role for EO data

Increasing land use change monitoring capability

APPROACH 1

Total land-use area, no data on conversions between land uses

APPROACH 2

Total land-use area, including changes between categories

APPROACH 3

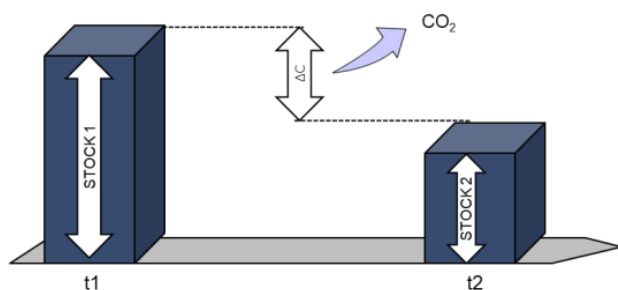
Spatially explicit land use conversion data



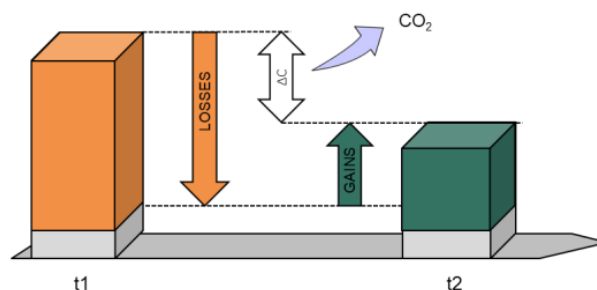


REPORTING METHODS

The Stock-Change Method



The Gains-Losses Method



IPCC Tier levels

Methodological Complexity

Tier 1

Default emission factors by IPCC

Tier 2

Country specific emission factors

Tier 3

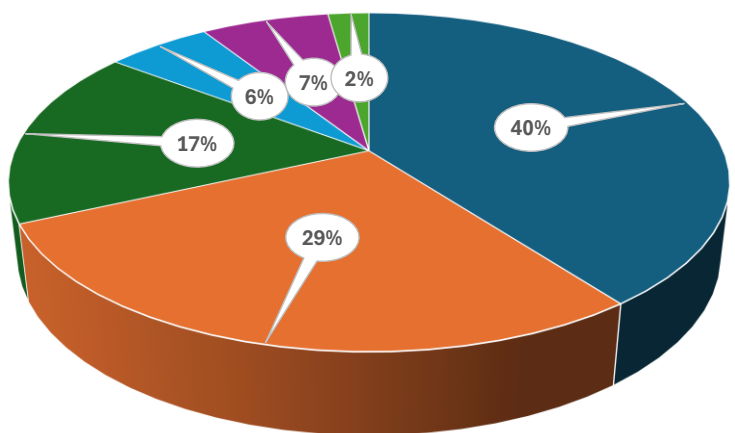
Higher order methods (e.g. models and inventory measurement systems)

$$Emissions = AD \cdot EF$$



EU LULUCF inventory: Area trend

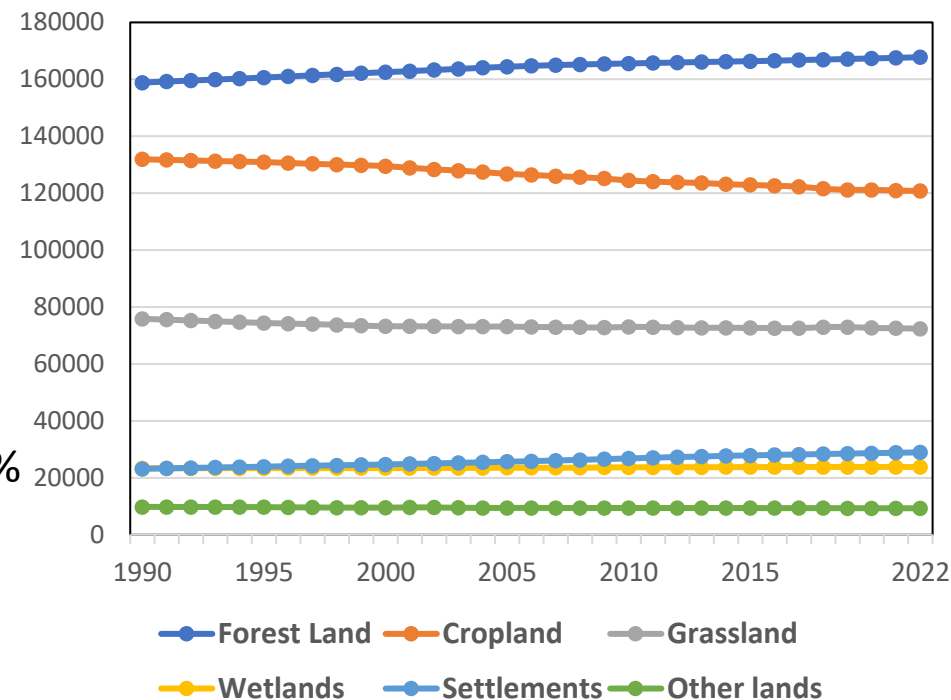
Land use in Europe



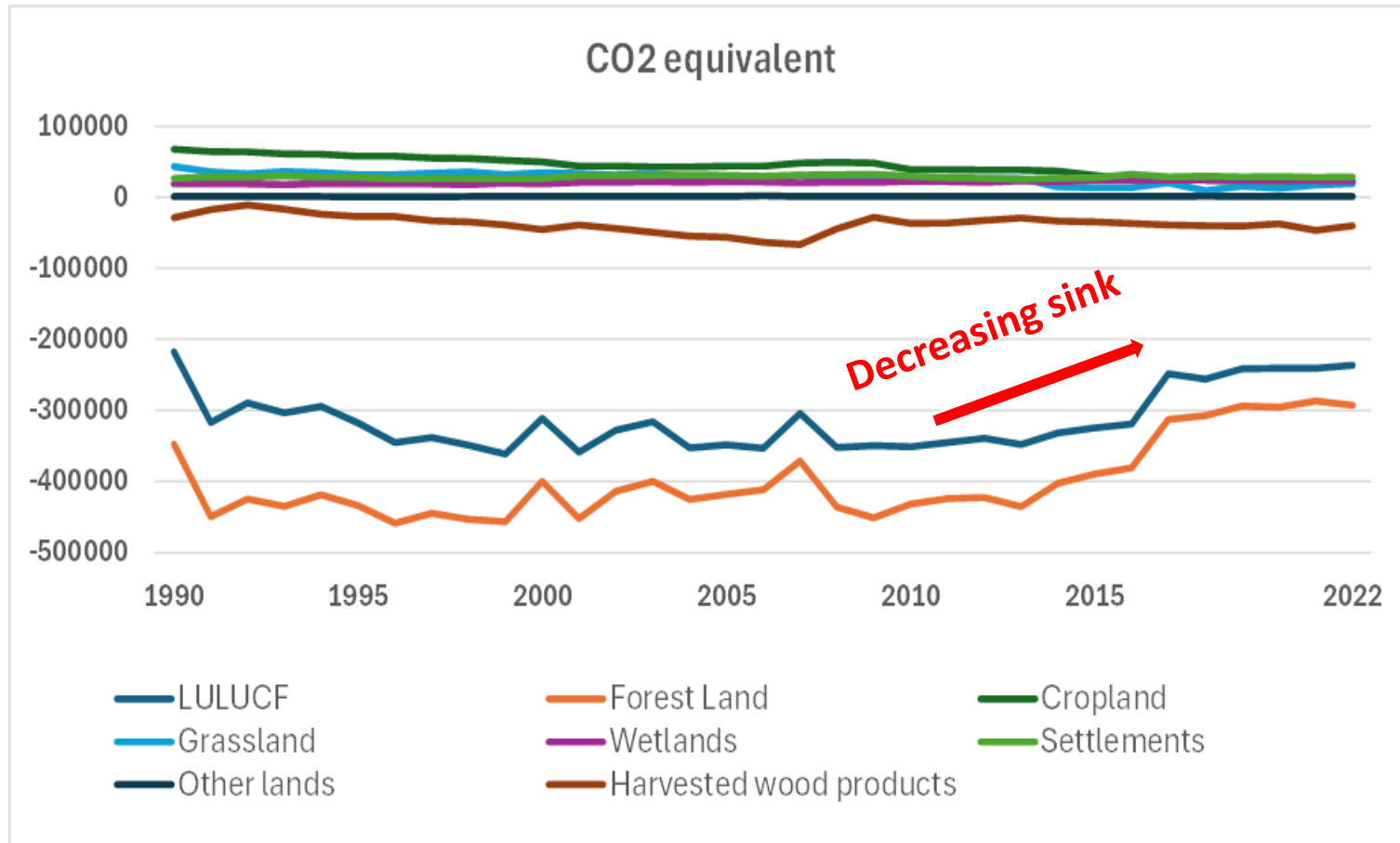
■ Forest Land ■ Cropland ■ Grassland
■ Wetlands ■ Settlements ■ Other land

- Forest land +6%
- Cropland -8%
- Grassland -5%
- Wetlands +2%
- Settlements +25%
- Other lands -5%

Area trend in Europe
1990 – (x-2)



Overview of the EU LULUCF inventory: Emissions trend



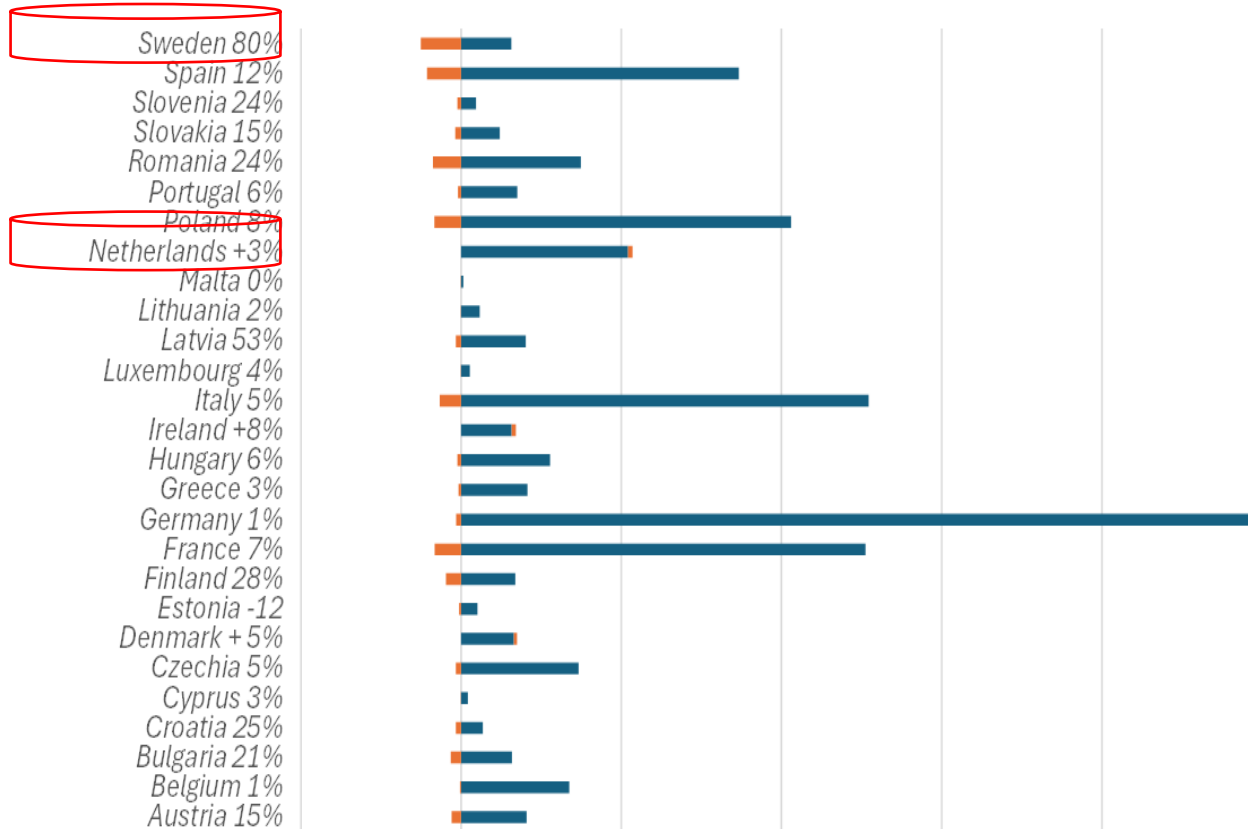
The LULUCF sectors shows at EU level a worrying trend:

- Harvesting rates
- Aging of forest

Preliminary calculations indicate that approximately 2/3 of MS are not on track to meet their LULUCF targets for the period 2026-2030.

Contribution of LULUCF overall GHG budgeted

National LULUCF contribution to GHG inventories.



Carbon Sequestration

Carbon Release

■ Total Emissions
(Other sectors)

■ LULUCF
net sink (-)/source (+)

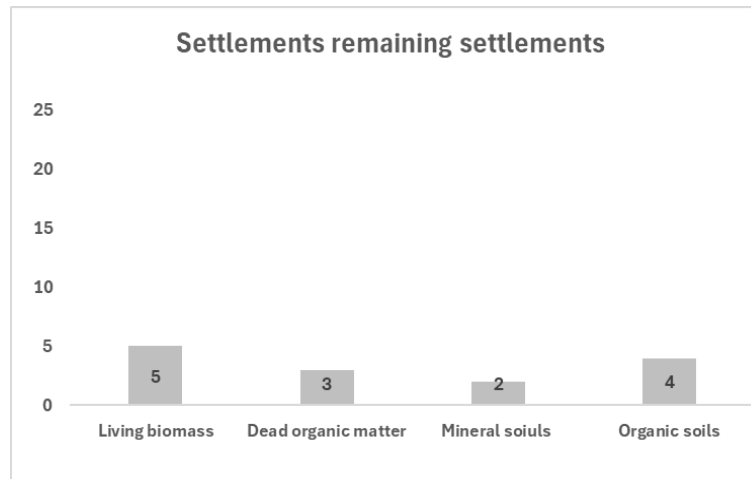
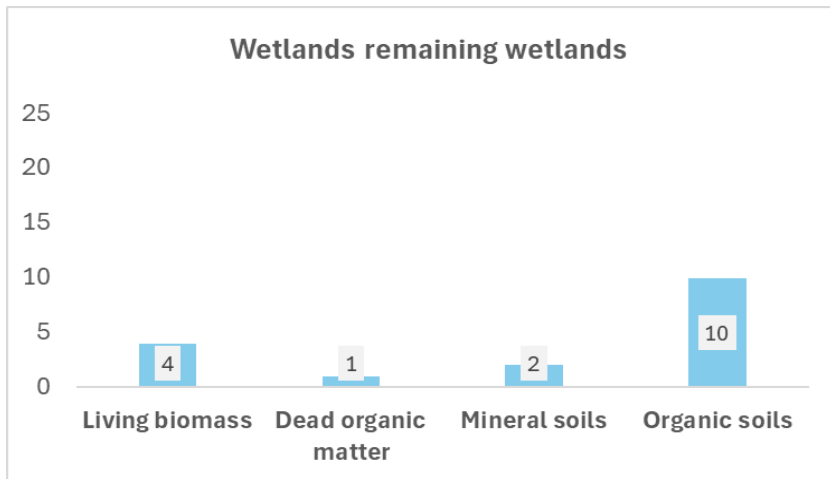
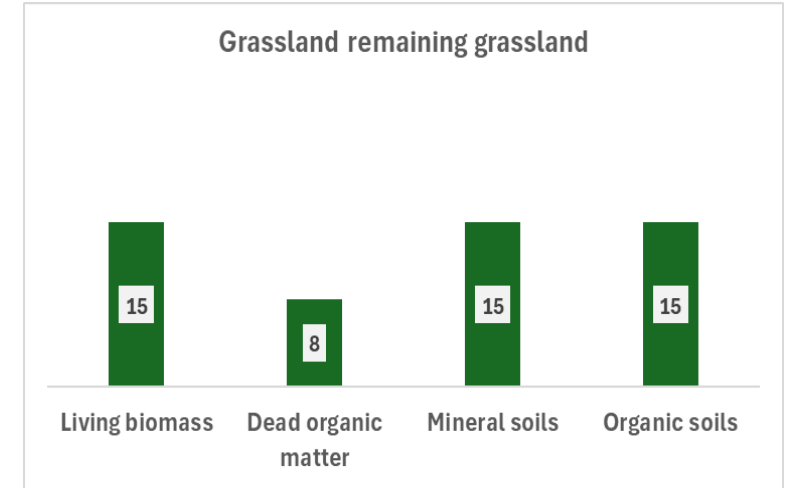
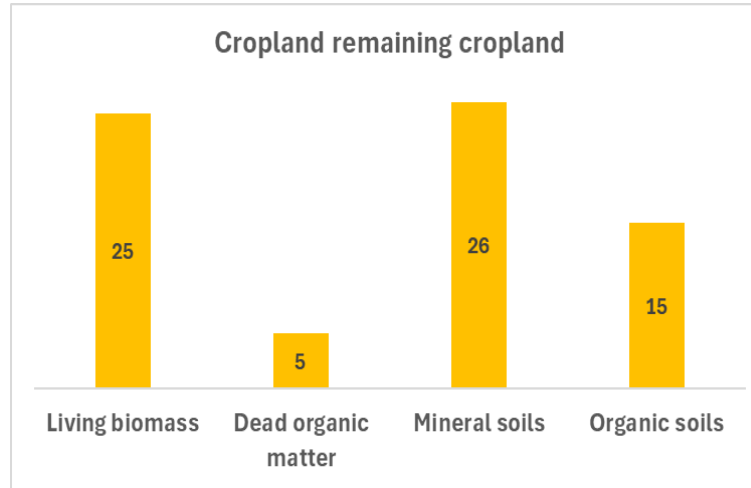
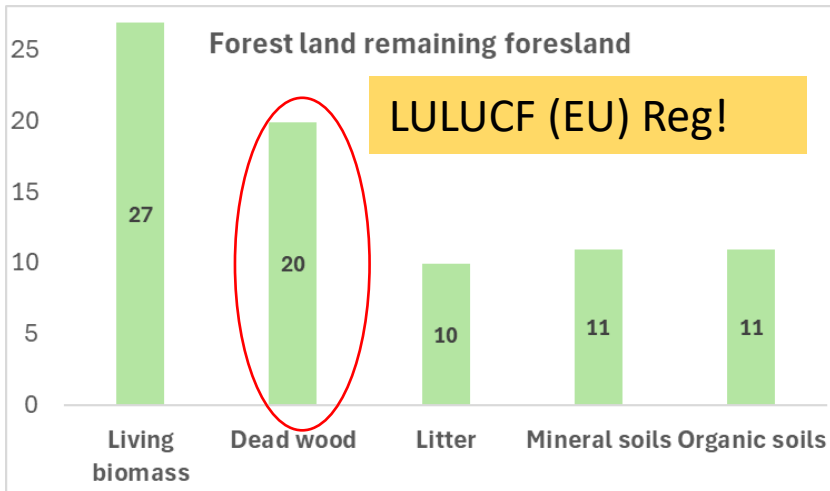
LULUCF plays a significant role on mitigating climate change.

EU LULUCF offsets in average **7%** of annual emissions from other sectors.

EU Forest land offsets in average **10%** of annual emissions from other sectors.



Overview of the EU LULUCF inventory: completeness

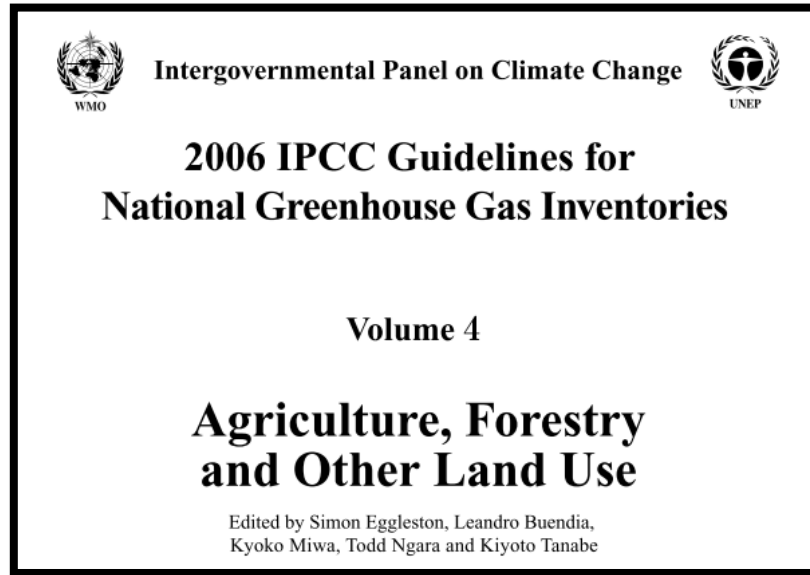


The lack of quantitative estimates for certain carbon pool layers on :

- **IPCC Tier 1** "assumption of long-term carbon **equilibrium**".
- The absence of organic soils.
- The lack of IPCC 2006 GL methods

*While accepted from a UN review perspective, it is **in some instance not in line with the LULUCF Regulation (EU) reporting requirements.***

Reporting frameworks for LULUCF- UNFCCC – EU LULUCF regulation.



Regulation (EU) 2018/841 and Regulation (EU) 2023/839 add some additional LULUCF reporting requirements



LULUCF reporting under the EU legal context

Regulation (EU) 2018/841 and Regulation (EU) 2023/839

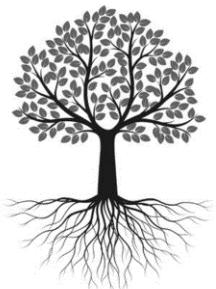
Article 5

General accounting rules

Paragraph 4.

Member States shall include in their accounts for each land accounting category any change in the carbon stock of the carbon pools listed in Section B of Annex I. Member States may choose not to include in their accounts changes in carbon stocks of carbon pools provided that the carbon pool is not a source. However, that **option not to include changes in carbon stocks in the accounts shall not apply in relation to the carbon pools of above-ground biomass, dead wood and harvested wood products, in the land accounting category of managed forest land.**

When reporting Managed Forest land, AGB, DW and HWP need to be accounted no matter whether source or sink



LULUCF reporting under the EU legal context

Regulation (EU) 2018/841 and Regulation (EU) 2023/839

Annex V

Part 3

Methodologies for monitoring and reporting in the LULUCF sector

Geographically explicit land-use conversion data in accordance with the 2006 IPCC Guidelines for national GHG inventories.

Tier 1 methodology in accordance with the 2006 IPCC guidelines for national GHG inventories.

For emissions and removals for a carbon pool that accounts for at least 25% of emissions or removals in a source or sink category which is prioritised within a Member State's national inventory system because its estimate has a significant influence on a country's total inventory of GHGs in terms of the absolute level of emissions and removals, the trend in emissions and removals, or the uncertainty in emissions and removals in the land-use categories, **at least Tier 2 methodology** in accordance with the 2006 IPCC guidelines for national GHG inventories.

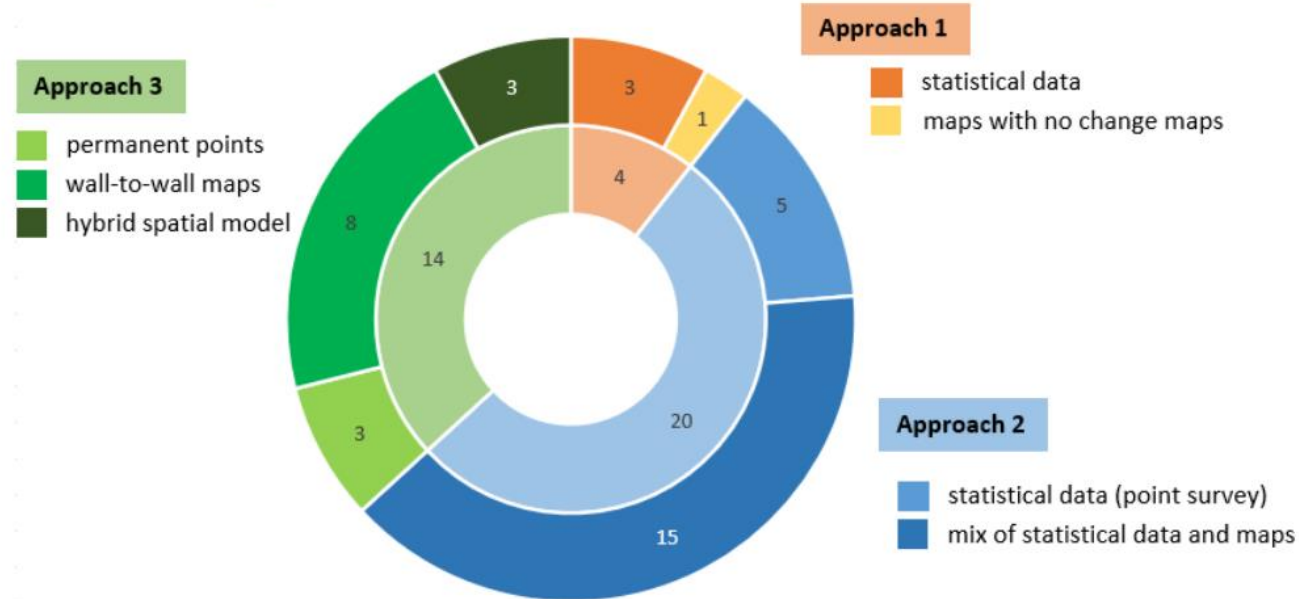
Member States are encouraged to apply Tier 3 methodology, in accordance with the 2006 IPCC guidelines for national GHG inventories.

Geographically explicit land-use conversion data & at least Tier 2 for significant pools within key categories

LULUCF reporting under the EU legal context

Thematic area: Land representation

Approaches applied by countries



Important role for Earth
Observation data

The land monitoring issue remains a methodological difficulty for most MSs

- **Land use categories definition:** mainly semantic issues such as forest definition thresholds, the difference between temporal and permanent grassland, the difference between wetland and organic soils etc.;
- **Temporal consistency,** how to assess areas and changes over time without generating artifacts;
- **Timely information,** in a way that allow the implementation of effective mitigation policies;
- **Thematical and spatial consistency** when using different datasets to fill in a timeseries 1990- (x-2)

Thank you!

