

LULUCF GHG reporting methodologies



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Content

- Regulation (EU) 2018/1999
- Intergovernmental Panel on Climate Change (IPCC) reporting guidelines
 - Tier 1, 2 and 3
 - Key category
- 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 25-30 % of emissions or removals in a source or sink category which is prioritised within a Contracting Party'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.

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

What is IPCC Tier 1, 2 and 3 ?

To compile a GHG inventory for the LULUCF sector, countries need information on whether carbon pools are increasing (removing CO₂ from the atmosphere) or decreasing (emitting CO₂ to the atmosphere).

The five carbon pools: living biomass, dead wood, litter, soil carbon in mineral and organic soils and carbon in wood products. Not all pools are relevant for all land use categories.

Each carbon pool can be estimated using Tier 1, 2 or 3 methods, where Tier 1 is the simplest using default values, Tier 2 uses national derived values, and Tier 3 is when countries use more complex models to estimate whether a pool is a source of emissions or a sink of removals. In all cases, countries need to document the data.

2006 IPCC Guidelines for national GHG Inventories, the 2013 IPCC Wetland supplement and the 2019 IPCC Refinement of the 2006 Guidelines contain detailed descriptions of how to use the different tiers for all pools including equations, decision trees and tables with default values.

According to the Paris Agreement and EU regulation it is mandatory to use the 2006 IPCC Guidelines and encouraged to use the Wetland supplement and the 2019 IPCC Refinement.

What is Tier 1, 2 and 3 ? An example

The 2006 IPCC Guidelines include the following equation 2.25 for the estimation of gains or losses of carbon from mineral soils.

EQUATION 2.25
ANNUAL CHANGE IN ORGANIC CARBON STOCKS IN MINERAL SOILS

$$\Delta C_{Mineral} = \frac{(SOC_0 - SOC_{(0-T)})}{D}$$
$$SOC = \sum_{c,s,i} (SOC_{REF_{c,s,i}} \cdot F_{LU_{c,s,i}} \cdot F_{MG_{c,s,i}} \cdot F_{I_{c,s,i}} \cdot A_{c,s,i})$$

(Note: T is used in place of D in this equation if T is ≥ 20 years, see note below)

The 2006 Guidelines have tabular values for the different climatic zones (E.g., temperate dry or temperate moist) for all parameters except the area.

Using default values is according to Tier 1.

However, using the same equation and national derived values would make it a Tier 2 method. National derived values must be supported by solid information such as a peer-reviewed scientific publication.

Tier 2 is better than Tier 1 but requires also more information from the country.



What is Tier 1, 2 and 3 ?

Tier 3 is a further improvement compared to Tier 1 and 2, but also more complex.

A national forest inventory with field sampling of biomass, dead wood, litter and soils carried out a regular interval would be considered a Tier 3 method. However, there are also models that rely on indirect data such as harvest and weather data.

In any case, countries should first focus on the pools and land use categories that have the highest impact on the GHG inventory (A key category).

In general, moving to higher tiers improves the accuracy of the inventory and reduces uncertainty, but the complexity and resources required for conducting inventories also increases for higher tiers. If needed, a combination of tiers can be used, e.g., Tier 2 can be used for biomass and Tier 1 for soil carbon.

Key category - to identify those categories that have the greatest contribution to overall inventory uncertainty in order to make the most efficient use of available resources.

Key categories are identified using a pre-determined cumulative emissions threshold. Key categories are those that, when summed together in descending order of magnitude, add up to 95 percent of the total level

In general, it is good practice to use higher tiers 2 and 3 for key categories

Key categories in the LULUCF sector for Ireland

TABLE 7 SUMMARY OVERVIEW FOR KEY CATEGORIES ⁽¹⁾
(Sheet 1 of 1)

Inventory 2021
Submission 2023 v2
IRELAND

KEY CATEGORIES OF EMISSIONS AND REMOVALS	Gas	Criteria used for key source		Key category excluding LULUCF	Key category including LULUCF
		L	T		
4.A.1 Forest Land Remaining Forest Land	CO2	X	X		X
4.A.2 Land Converted to Forest Land	CO2	X	X		X
4.B.1 Cropland Remaining Cropland	CO2				
4.B.2 Land Converted to Cropland	CO2				
4.C.1 Grassland Remaining Grassland	CO2	X	X		X
4.C.2 Land Converted to Grassland	CO2				
4.D.1.1 Peat Extraction Remaining Peat Extraction	CO2	X	X		X
4.D.1.2 Flooded Land Remaining Flooded Land	CO2				
4.D.1.3 Other Wetlands Remaining Other Wetlands	CO2				
4.D.2 Land Converted to Wetlands	CO2				
4.E.1 Settlements Remaining Settlements	CO2				
4.E.2 Land Converted to Settlements	CO2				
4.F.1 Other Land Remaining Other Land	CO2				
4.F.2 Land Converted to Other Land	CO2				
4.G Harvested Wood Products	CO2	X	X		X
4(I). Direct N2O emissions from N inputs to managed soils	N2O				
4(II). Emissions and removals from drainage and rewetting and other management of	CO2	X			X
4(II). Emissions and removals from drainage and rewetting and other management of	CH4	X			X
4(II). Emissions and removals from drainage and rewetting and other management of	N2O				
4(III).Direct N2O emissions from N mineralization/immobilization	N2O				
4(IV) Indirect N2O Emissions from Managed Soils	N2O				
4(V) Biomass Burning	CO2		X		X
4(V) Biomass Burning	CH4				
4(V) Biomass Burning	N2O				



According to the new amended Regulation (EU) 2023/839 on LULUCF, EU Member States shall from 2028 report CO₂ emissions and removals from all carbon pools and Non-CO₂ emission sources using minimum a Tier 2 method and from 2030 for specific land use a Tier 3 method.

Thank you



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