# JRC/EEA LULUCF workshop 2025

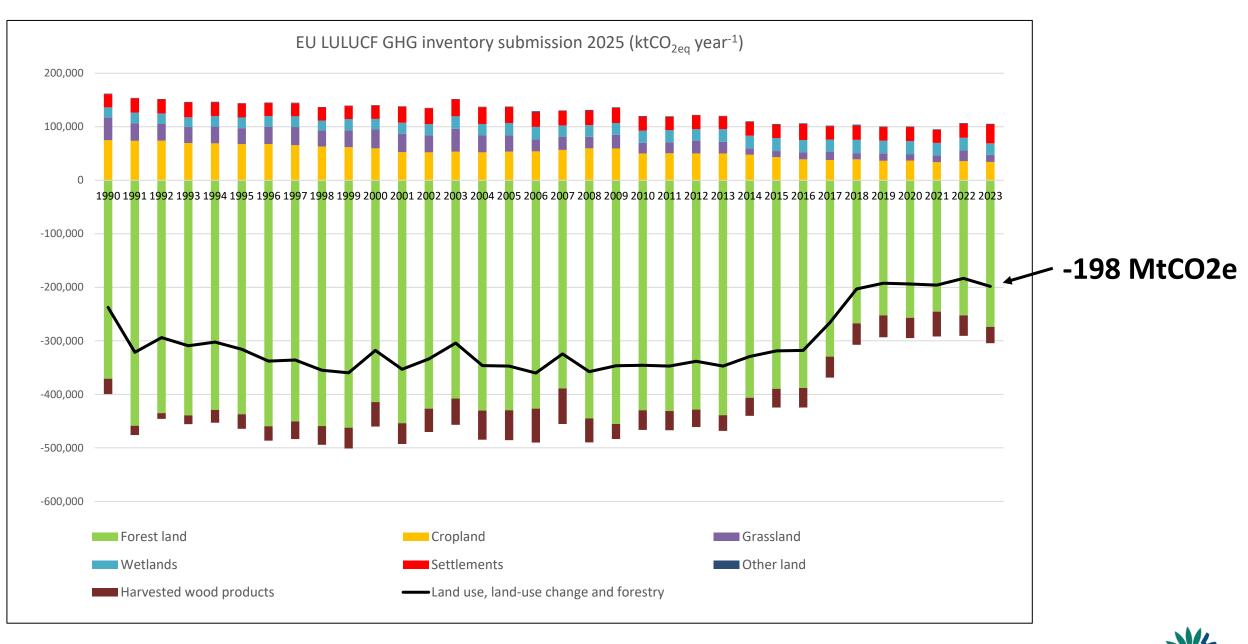
Peter Iversen, Raul Abad, Lucia Perugini, Tobias Langanke JRC/EEA LULUCF Workshop/ Presentation date: 6 May 2025

European Environment Agency

# Content

- LULUCF 2025 status
- Initial checks
- LULUCF accounting 2021-2025
- Comprehensive review and capacity building
- Supporting activities at EEA





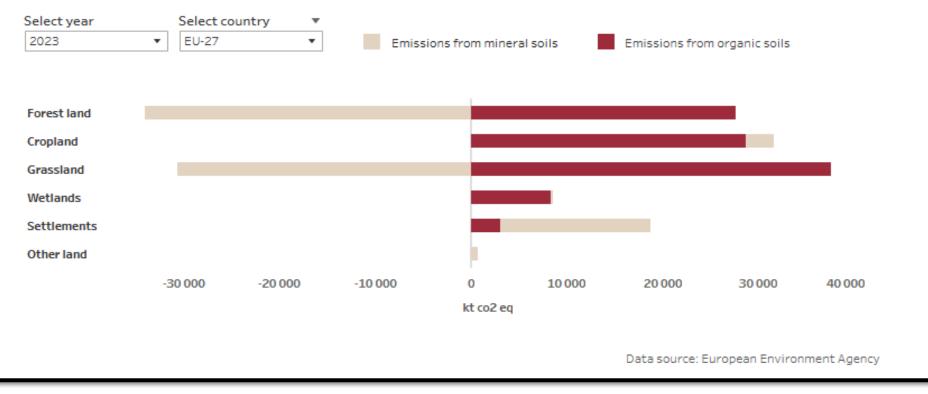
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#### Net emissions/removals by soil type

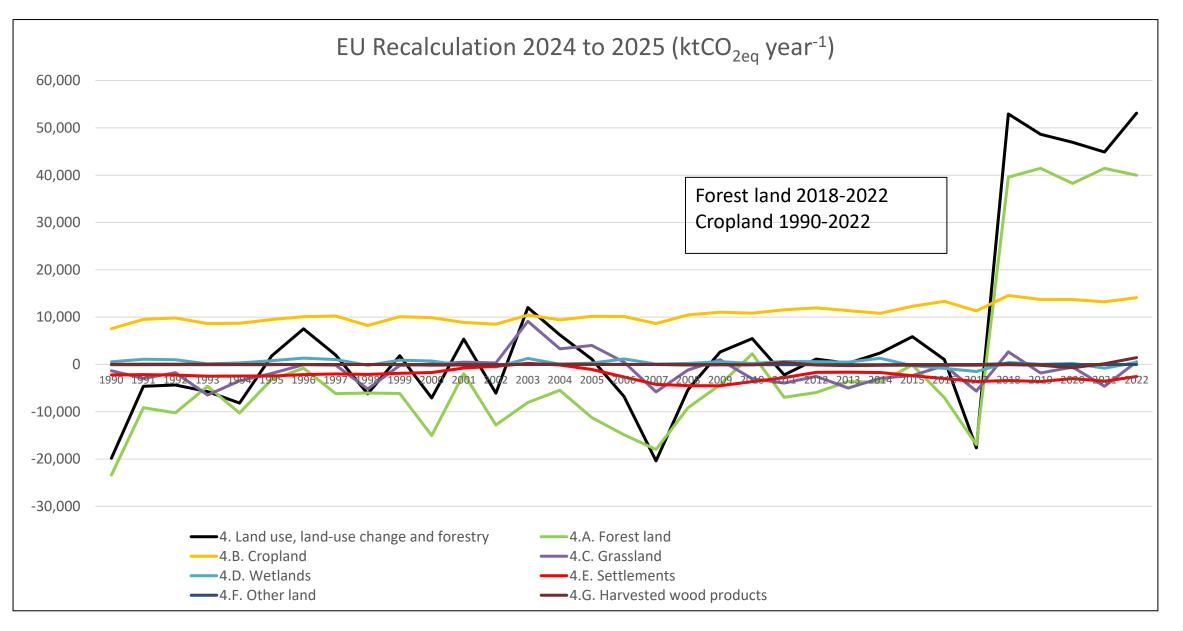


Emissions and removals of greenhouse gases are affected by land use. Soil carbon can increase due to growth of plants and be lost due to disturbance of the soils including drainage. Note: Emissions is a positive number and removals is a negative number. Only land use categories and soil types for which countries report emissions or removals from soils are shown in the overview.

#### Net emissions/removals in 2023 in EU-27 by land use category and soil type









### Initial check, LULUCF observations

## **227** Observations uploaded into the EMRT

- Blank cells (29);
- Reporting zero (6);
- Identical values (8);
- Area inconsistencies (28);
- EF outliers (33);
- N<sub>2</sub>O emissions reporting (12)
- Spikes in time series (43);
- Recalculations (15) and
- Potential compliance issue with Regulation (EU) 2018/841 (15)
- Others, (38)





# Accounting 2021-2025



# Last year's efforts – looking at 2021-2022 only

	2005	2006	2007	2008	2009	Average 2005-2009	2021	2022	2023	2024	2025	Sum 2021-2022
orest Management (inc. HWP)	-30 183,1	-31 227,3	-30 827,4	-30 548,0	-28 861,1	-30 329,4	-34 454,5	-34 890,2				-69 344
DeforestedLand	2 314,4	2 346,8	2 072,9	2 090,1	2 103,2	2 185,5	1 355,3	1 349,2				2 704
Afforested	-16 874,5	-17 006,8	-17 198,0	-17 175,4	-16 959,1	-17 042,7	-9 951,5	-9 497,3				-19 448
Cropland Management	- 553,6	-1 614,6	1 281,9	1 138,4	1 358,4	322,1	-3 498,3	-3 396,1				-6 894
Grassland Management	-1 326,8	-1 429,7	-1 461,2	-1 504,6	-1 406,0	-1 425,7	-1 319,6	-1 352,9				-2 672
Wetlands			-				-	-				-
Harvested Wood Products	-3 307,9	-3 874,3	-2 796,2	-2 244,9	- 394,5	-2 523,5	-2 488,4	-2 725,0				-5 213
Paper	- 164,1	- 635,2	11,4	- 328,5	291,4	- 165,0	- 42,7	- 413,7				- 456
				Accounted values for ES in	the period 2021-2022							
			Forest Management	-3 678,6								
			Deforested Land	2 704,6								
			Afforested	-19 448,8								
			Cropland Management	-7 538,7								
			Grassland Management	178,9								
			Wetlands									
			Total accounting value	-27782,7								
	REMARKS:											
	1. The total final accounting va		eriod 2021-2022 is: -27782	2.7. This is -13891.3 per yea	ır.							
	2. The FRL value used ES is: -32											
	3. ES DOES NOT account wetlar											
	3. ES cap value is -20110.006 wh	nich is 3.5% of bas	e year emission value (28	7285.795). In this case the	re are 2 year(s) consid	ered in the calculation. Th	e formula used is: (Base	eYear*0.035*(-1))*Number	rOfYears). According	to the LULUCF regulation.		
	4. Applies cap to ES? NO											
	5. Accounting categories include			I) and 4(V). It was not poss	ible to include indired	t N2O emissions from tab	le 4(II) consistently the	refore are not included an	d need to be calculat	ted manually.		
	<ol><li>Annual reported data is disp</li></ol>	layed for informat	tion.									

Only partly useful because

a) no information on TC of FRL

b) no information on natural disturbance

c) CRT tables do not provide the necessary information

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#### Accounting information in Annex IV in the updated implementing regulation (former Annex XX)

				Tabk ccounti						
	a fallal, the 1st is the left).			ccounti	ng table	-				
	s (click the '+' in the left):									
	eve to be filled with numbers or no									
	ds are automatically calculated									
	o be filled manually only if source									
elos do n	of need to be filled in.									
hat this ve	ersion of the table is designed for g	ubmission	2025, the	equations	to calculat	te the acco	unting qua	ntity refer to the pe	riod 2021-2028.	
add rows	or columns to this template. Do n	ot add info	mation ou	tside of the	yellow fie	ids in this	template. T	he information will	not reach us.	
	-		NETE	MISSION S	REMOVA	8 (10)		Accounting Accounting		
	Land Accounting Categories	2021	2022	2023	2024	2025	Total <sup>(2)</sup>	parameters	quantity (2)	
A	Mandatory accounting									
	oategories									
A.1	Managed Forest land	0,00	0,00	0,00	0,00	0,00	0,00		0,00	
	thereof Forest land remaining Forest land						0,00			
	thereof HWP from Managed									
	forest land <sup>(8)(9)</sup>						0,00			
	thereof HWP in the category of									
	paper from Managed forest						0,00			
	land (8)(9)									
	thereof Dead wood (8)									
	excluded emissions from									
	natural disturbances (4)									
	excluded subsequent									
	removals from land subject to									
	natural disturbances <sup>(5)</sup>									
	Forest Reference Level (FRL) <sup>(6)</sup>									
	Technical correction(s) to									
	FRL (7)									
	Forest management cap (*)							0,00	0,00	
A.2	Afforested Land	0.00	0.00	0.00	0.00	0.00	0.00		0.00	
~ ~	thereof HWP from Afforested	u,00	u,00	0,00	0,00	0,00	4.00		0,00	
	land (9(11)						0,00			
	excluded emissions from									
	natural disturbances (4)									
	excluded subsequent									
	removals from land subject to									
	natural disturbances (5)									
A.3	Deforested Land						0,00		0,00	
A.4	Managed Cropland (1)						0,00		0,00	
A.6	Managed Grassland (1)						0,00		0,00	
в	Elected accounting categories									
в	Elected accounting categories									
B.1	Managed Wetland (If elected)						0,00		0,00	
1										

All MS are encouraged to provide this information **annually**.

A reporting template for the first three years was shared via WG1.

Important to be able to **anticipate the outcome in 2027** including for the **ESR** but also for the **potential use of managed forest land flexibility** (art. 13).

#### 18 countries provided this information:

- Only three included information on the TC of the FRL.
- No information on emissions from ND.
- Some did not include the correct FRL as provided in annex IV to regulation 2018/841.
- Some MS included information on managed wetland even when this activity is not elected.
- One MS included information on all 5 years.

We will share a new template covering four years later this year.



### Annex IV, table 2 on emissions from natural disturbances

				Informa	ution on emissi	ions an	Table : d remo	-	om natura	l disturba	nces <sup>(1)</sup>				
				AREA SUBJECT DISTURBANCES WHEN IT V REPOR	ions and removals from natural disturba EMISSIONS FROM AREAS SUBJECT TO NATURAL DISTURBANCES					Background level	Margin Ø	Trigger test <sup>(8)</sup>	ACCOUNTING QUANTITIES		
Identification code of geographic location <sup>(2)</sup>		IDENTIFICATION OF NATURAL DISTURBANCES EVENT		Area subject to natural disturbances in the year when it was first reported				Salvage Logging	Emis- sions from natural distur- bances (6)				Emissions in inventory year that can be exluded in the inventory year	Subsequent removals in inventory year <sup>(10)</sup>	
		Year of natural disturban- ces <sup>(3)</sup>	Disturbance type			CO <sub>2</sub>	CH4	N <sub>2</sub> O						Emissions	Removals
				(kha)		(kt CO <sub>2</sub> eq)		(kt CO <sub>2</sub> eq)		(kt CO <sub>2</sub> eq)		(Yes/No)	(kt CO <sub>2</sub> eq)		
natu	al for 2021 tral distur- ces <sup>(11), (12)</sup>	Year: 2021	Total for 2021 natural distur- bances <sup>(11), (12)</sup>												
natu	al for 2022 tral distur- ces <sup>(11), (12)</sup>	Year: 2022	Total for 2022 natural distur- bances <sup>(11), (12)</sup>												
natu	al for 2023 Iral distur- ces <sup>(11), (12)</sup>	Year: 2023	Total for 2023 natural distur- bances <sup>(11), (12)</sup>												
nati	al for 2024 tral distur- ces <sup>(11), (12)</sup>	Year: 2024	Total for 2024 natural distur- bances <sup>(11), (12)</sup>												
natu	al for 2025 tral distur- ces <sup>(11), (12)</sup>	Year: 2025	Total for 2025 natural distur- bances <sup>(11), (12)</sup>												

Have any MS tried using this table?

It would be very useful to have some testing before March 2027.

Do we need an additional table to calculate the background level?

Reporting template and format for the submission of information?

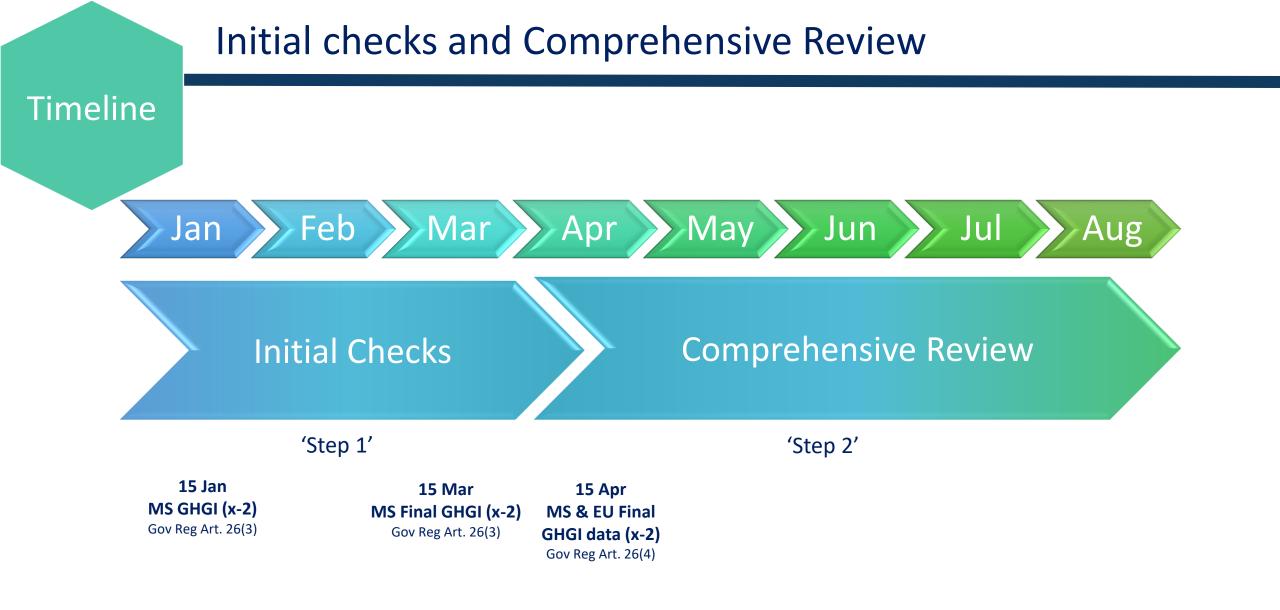




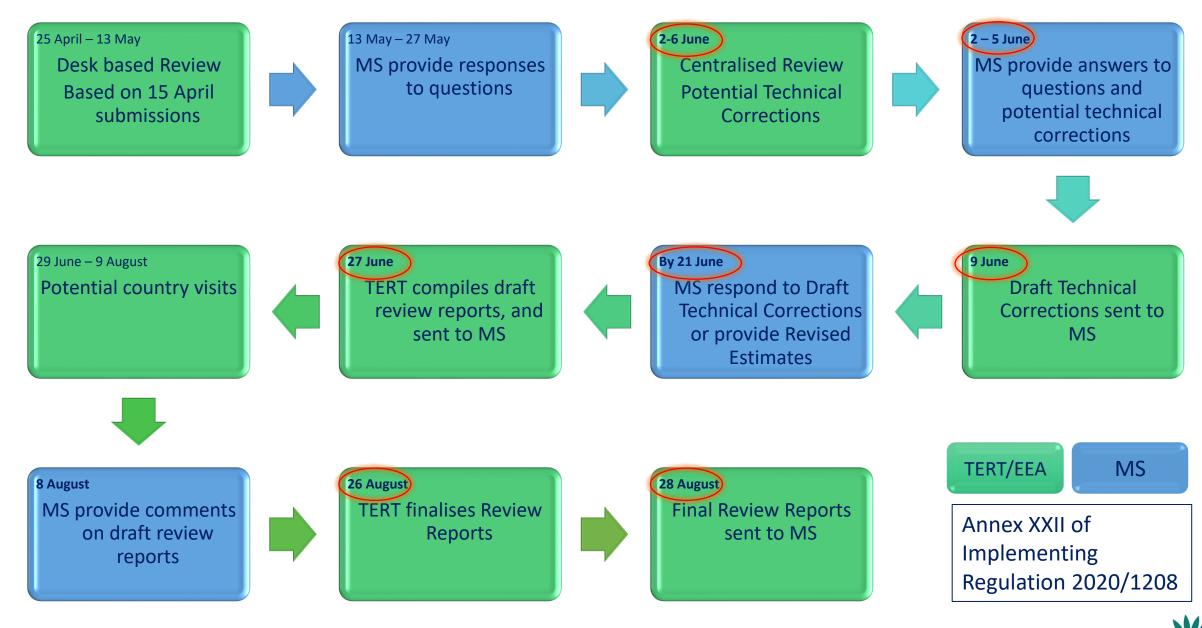
# **Comprehensive review 2025** Governance regulation article 38

# To establish the 2026-2029 budget – will focus on 2016-2018 and 2021-2023 - *not compliance*









European Environment Agency

# Capacity building as part of comprehensive review



Following the review, there will be offered capacity building meetings with Member States' LULUCF experts taking into considerations the results of the comprehensive review

When: October 2025

**Topics**: to be identified during the comprehensive review

Format: online





# GHGI improvements support







## **OPTIONS FOR LAND USE TRACKING**





#### Activities:

- Analysis of the NID
- Extraction of Methods and EF
- Gap identification
- Identification of datasets
- Guidance for improvement
- Webinars







#### **SOIL CARBON**

- Non-CO2 emissions from managed soils (EF, methods)
- Organic soils (EF, maps identification)
- Mineral soil models (Model Library) → Relevance for CRCF
- Analysis of the applicability of the tier 2 Steady State Method IPCC2019 (Explore new method → Workshop in October)

#### Activities

- Analysis of the NID
- Extraction of Methods and EF
- Gap identification
- Guidance for
  improvement
- Webinars

# FIRE

Methods, status and options for inventory improvements





#### • Urban green mapping and classification (new datasets)

- Explore spatial datasets
- Develop and describe methodologies to map and quantify (total and relative areas) of the land surface that is covered by urban vegetation within settlements (aligned with Tier 2a Crown cover area method) and the areas covered by these components within the various settlement systems (aligned with Tier 3 methodology).

Identification of emission factors for trees outside forests (EF, stocks)

 Identify datasets to associate stocks of carbon for the different settlement types for the refinement of the estimation of land converted to settlement

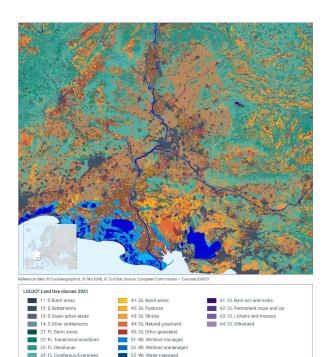




25: FL Other forestlar

31: CL Burnt areas 32: CL Annual crops 33: CL Perennial crop 34: CL Other cropland

- Use of LPIS/IACS data (review methods+ guidance) → Rafal Zielinski pres. (PM)
- LULUCF INSTANCE (CLMS)



#### LULUCF instance – what and when?

- <u>Operational product</u>, combining ca. 15 existing pan-European datasets (mainly CLMS)
- Production <u>annual and funded by CLMS</u>
- Initial versions available <u>every January</u> for inventory year +2 <u>in sync with country</u> <u>reporting</u>

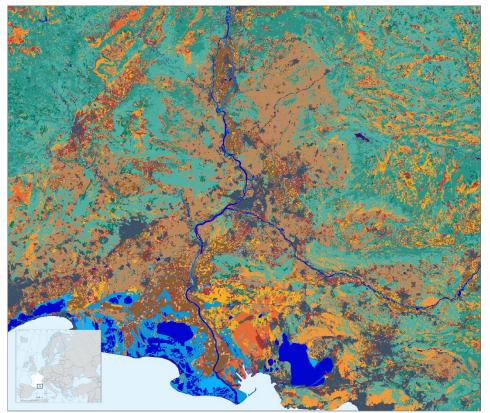


#### **LULUCF instance** as operational EO based activity data proxy

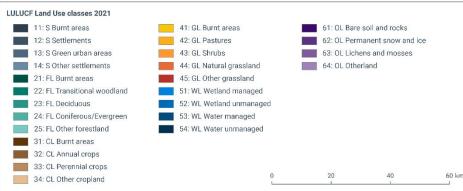
#### Status and next steps

- Data available on request today (2021 & 2023), publication on CLMS portal planned for Q3/2025, then every year in Q1
- Detailed **Product User Manual** in preparation
- Testing of **EEA workflow to use the data** ongoing in 2025
- Reminder: workflow will not replace or interfere with existing initial checks, but will add bilateral discussions on content of activity data reporting
- LULUCF instance-based checks will build on <u>detailed</u> <u>"Country Fact Sheets"</u> collecting relevant information for each country
- <u>Additional training/outreach activity</u> in Q3&Q4 2025 planned

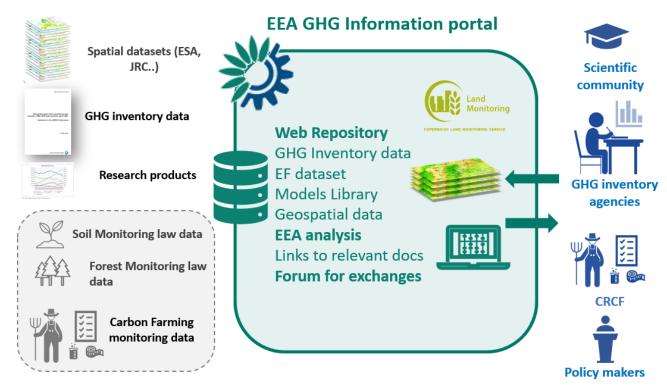
**Reminder**: countries can also use the *CLCplus Core Database* & web-interface to create their own geospatial LULUCF datasets!



Reference data: © EuroGeographics, © FAO (UN), © TurkStat Source: European Commission - Eurostat/GISCO



# **On line GHG knowledge hub**



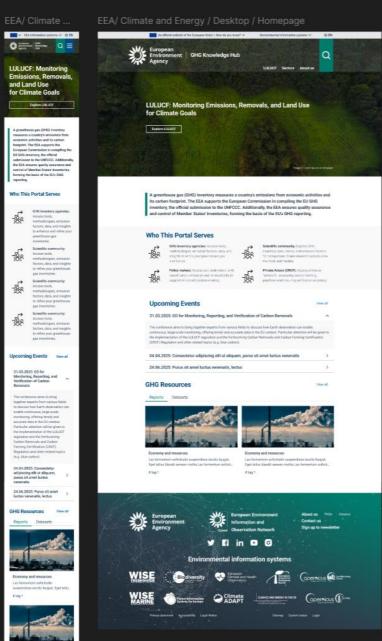
The EEA GHG knowledge hub aimed to facilitate the access of relevant data to improve the MS GHG inventories

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#### Data types

- General information on LULUCF/Inventory requirements and methods produced by CLIMA3 Unit
- Inventory related data such as estimation methodologies and emission factors
- Geospatial data coming from different sources (links and metadata info): e.g. Copernicus; ESA CCI biomass data





#### EEA/ Climate ... EEA/ Climate and Energy / Desktop/ LULUCF MEGA MENU V Ekidemalarapana V SDI An offic CERT DENA QE European Environment | GHG Knowledge Hub Agency LULUOF LULUCF Sectors About us LILLICE metales -> LULUCE Overview -> About LLUCE About LUTUCE Data & Tools Guidance National obligations Land transition Deta & Tools Interoperability Outlance Methods & Models Tracking progress Projections Sectors About un Methods & Models

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#### European Environment Agency

Handbook on the updated LULUCF Regulation EU 2018/841

Guidance and orientation for the implementation of the updated Regulation

Version: 2 Date: 13.05.2024 EEA activity: FRAMEWORK SERVICE CONTRACT EEA/CET/22/001

#### About LULUC ... About LULUCF Version A 0 = C = European Environment | GHG Knowledge Hub Agency LULUCF Sectors About us About LULUCF About LULUCF Massgervert of land reatives for how we address climate charge. It is also important for achieving the climate targets is the future. Why? We manage load the aggleadhare, fumera or settlersem. Q + LILUCT + Americaluct Management of land matters for how we address climate change. It is also important for achieving the climate targets in the future. Why? We manage land for agriculture, forests or settlements This can either cause entiations or temovale of greetbase game, depending on too land use charger and how intensively we manage least But the last sector is also subscribe to be impacted by ofmate change. It is a sector that provides the sector is a subscriber to be impacted by ofmate change. 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These management decisions, some of Aukh were mater in the detaint part, these perturbed refers on emissions with termainty for decisions. For device on other hype of theme experiment 2. The land sector consists of distributed secrors and sinks. are used for fareat regresentian had lang term legacy effects as growth rates, the response to natural disturbances are 3. The land sector is subject to natural and arithrapogenic effects The potential wood products are quecies specific. The U/LICF Regulation has specific rules for accounting emissions are removals from forests during the period 2021 to 2025. 6. Land sector pools ultimately face saturation. In the land soctor, sudden and large emissions can occur due to national impacts. 7. Land sector emissions and removals have high natural and statistical uncertainties 5. The land sector nonpurstas cyclic bands and legacy effects. FAQS 1. What is the LULUCF Regulation about? Emission and removals from some land use catigories like forests part show regular systemets, e.g. due to temper hervesting and management 2. What is Tand use' and why is it important? sinch havesting and havageneet doctains, these trainageneet doctains, sumin of which were mode in the doctar pair, contrive pendeter allwhich or instances, the shore on which type of two genesis an adde for forest representation fuel for forest representation takes to per hears agreementation takes to per hears 3. What is GHG reporting? 4. Which greenhouse gases have to be reported? 5. What are carbon pools? Because growth and determinantion cause CO2 retrievals and exclusions, respectively. While there are emissions of CO2 and network/CO2 gamas, remedia and you can be CO2/WEVMEN, bibliosance/CO2 gamas, they are antimisted by planethyse effected catelog To estimate CO2 emissions and remedia the study catelog cate effects as growth releat, the suppress to natural disturburges and the potential wood products are speciel specific: The LILUCF Regulation has specific rules for accounting, aminance and amenda from recording. These extensions are calculated on annual numbers. Carban sinks wher to pools that remove more carbon the during the period 2021 to 2025 they end not out put, increase their carbon stocks over time. Podot has annually end more carbon than they remove are referred to as particly success. When total carbon atocks arroas all carbon podia increase, net removals of carbon from the atmosphere coust. Net emissions occur when total particip stocks decrease. 6. Land sector pools ultimately face saturation. Changes in carbon stocks are estimated for the following carbon pools: + Using biometic differentiated into above ground (i.e. stem, tourobes, and leaves) and below-ground 7. Land sector emissions and Litter: a specific pool of tead organic matter in fistests. removals have high natural and statistical uncertainties Deed wood, includes lying and standing deal trees in forests; Deed organic matter (2044), consists of deal plot material manufactures/receive the pouls deal wood at reported if their wood and time convict is easi related by . For conglinit, grassland, nel vectords; - Soli organic carbon (SOC) in mineral and organic solia, and FAQS Very all · Harvested wood products; paper, wood used for construction or furniture and others 1. What is the LULUCF 6. What are the key components of GHG emissions and removals from the land sector in the Regulation about? 2. What is "land use" and why You may also be interested in 3. What is GHG reporting? ) 4. Which growthouse gases > have to be reported? 5. What are carbon pools? Policy info cause CO2 removals and emasters, respectively. While there are ermissions of CO2 and non-CO2. Post talky, Maniff January matter i av larmentum od art gause, removals only sumar for-C024F4F4F4F4 Linike non-C02 gauge, they are entireated by stard kine different nation peaks sitemitiying different catture pools, cattures pools encensorialis of cattores that hold a satisfier model (ii a simplifi-amount of castore). 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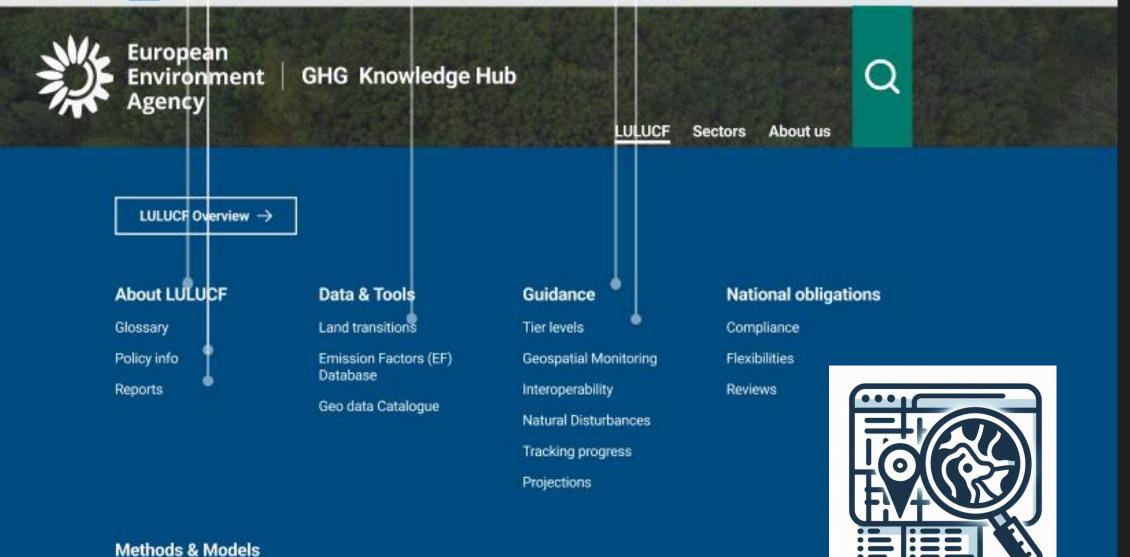
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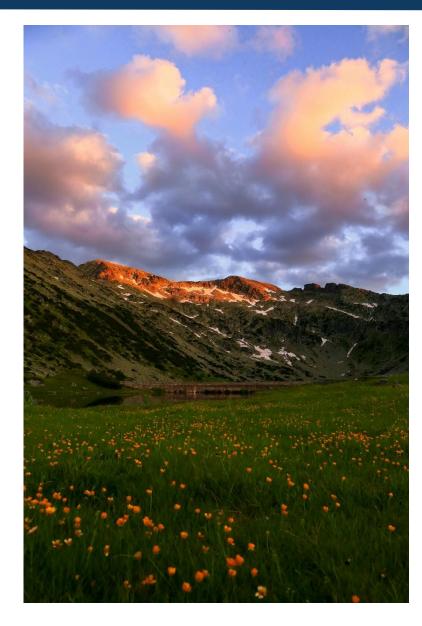
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Methods (Annex III Table) Models Library

EF/Parameter Visualization tool

## EEA Report – Enhancing Europe's land sink: status and prospects



Report has been developed in collaboration with several ETCs and with the valuable comments from the Commission and Eionet.

#### Scope of the report:

- General description
- Status of the sector in terms of reported GHG emissions/removal, and reflections on current reporting practices and areas for improvement.
- Assessment of options to reduce emissions or increase removals in LULUCF, in terms of mitigation potential, co-benefits/trade-offs and enabling conditions.
- Description of the policy framework at EU level and resulting data needs and use cases.
- Overview and high-level description of relevant pan-European geospatial data-sets.
- > Report foreseen to be published end of May / early June 2025





# Second Conference on EO for monitoring, reporting and verification of carbon removals

7-10 October 2025 Copenhagen

- LULUCF INVENTORY FOCUS: 7/10 PM 9/10 PM
- **3<sup>RD</sup> CARBON MARKET FORUM**: 9/10 AM-10/10 PM

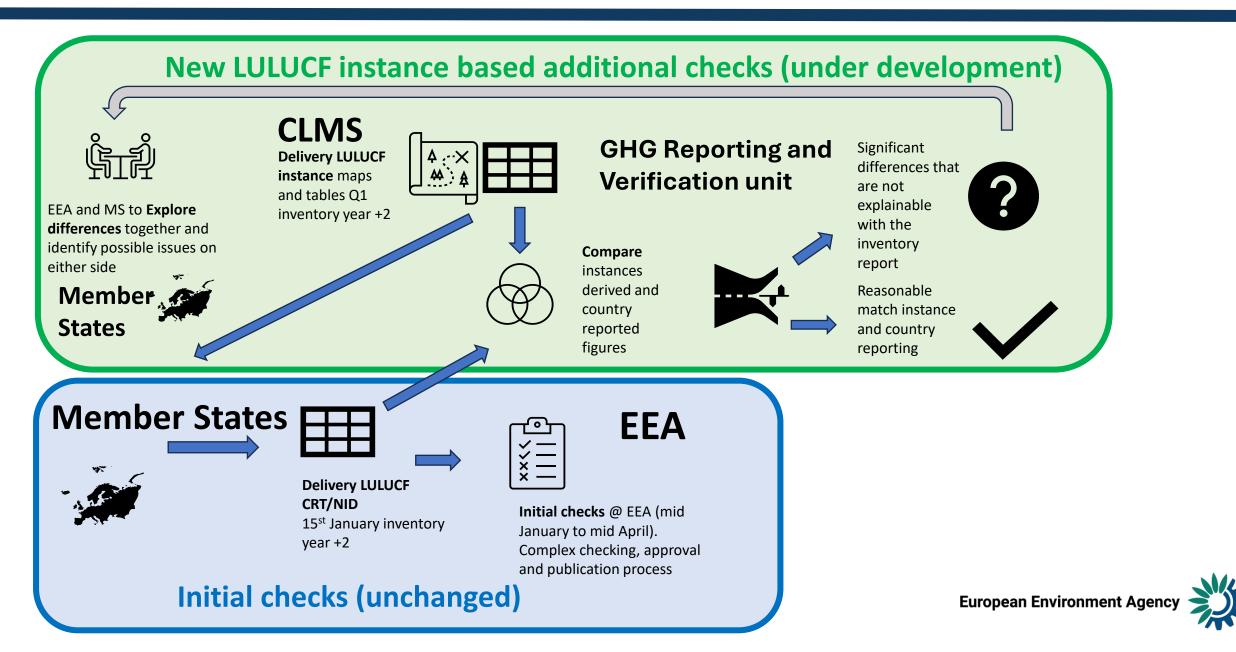




# Thank you

# Contact us! lulucf@eea.europa.eu

## Use of LULUCF instance as independent data for EEA (in development)



### LULUCF instance and CLCplus Core: where to find out more?

#### LULUCF instance access to the data:

- 2021 and 2023 on request (email to tobias.langanke@eea.Europa.eu)
- 2022 and improved version for 2023 from October 2025
- From January 2026 annual updates in synch with reporting (inventory year +2)
- All data published on CLMS portal from Q3/2025, including Product User Manual

#### CLCplus Core database and web-interface:

- <u>https://clcplus-core.land.copernicus.eu/</u>
- Access with EIONET password (contact tobias.langanke@eea.Europa for more info)

#### **Overview CLMS portfolio** and EO derived products

• <u>CLMS portfolio — Copernicus Land Monitoring Service</u>

