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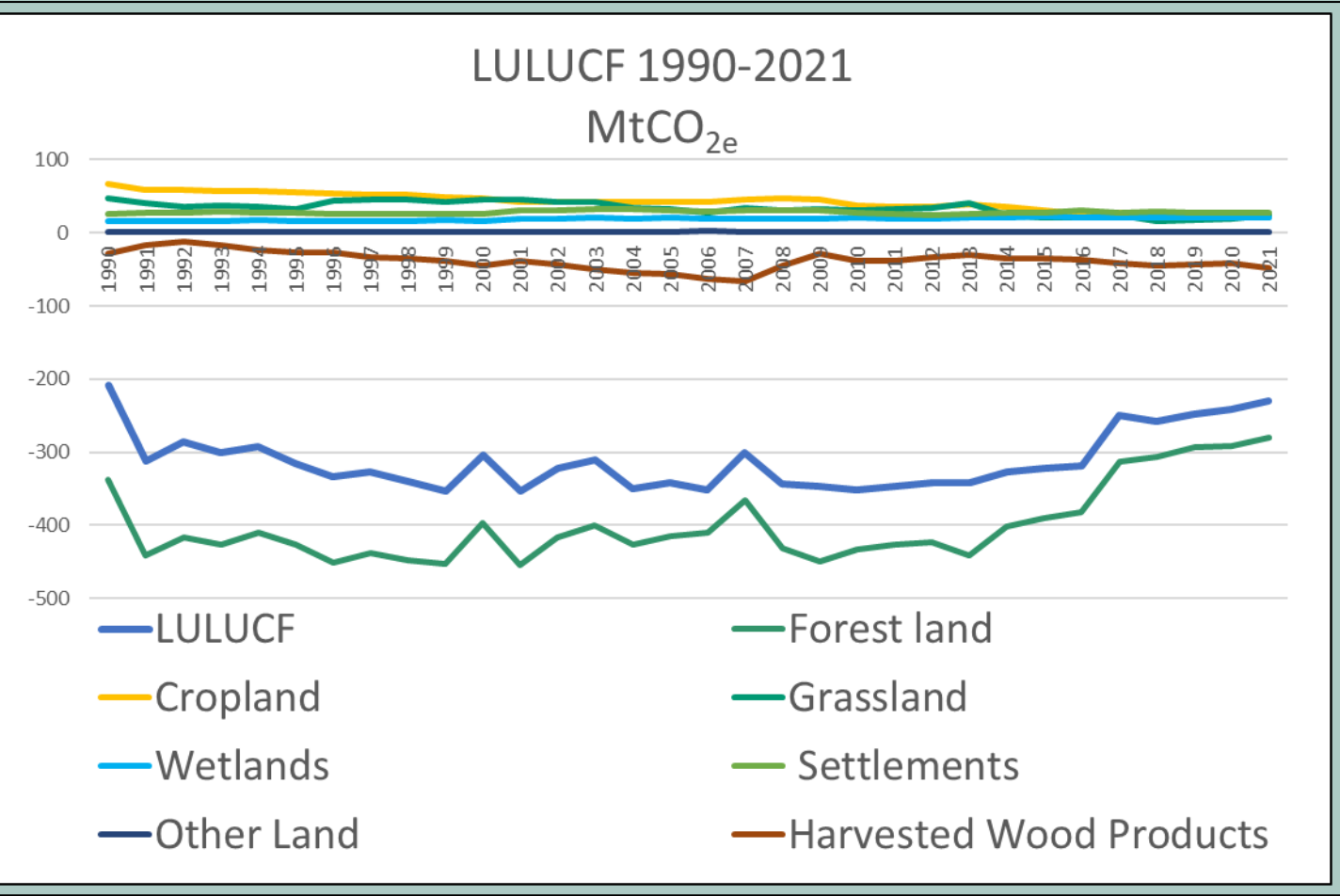


European  
Environment  
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# EU LULUCF REPORTING

The EU GHG Inventory is the sum of the inventories of the 27 Member States. The European Environment Agency is mandated to do quality assurance/quality control of the individual Member States inventories and compile the EU GHG inventory for submission to the UNFCCC. Data in this poster is mainly based on the 2023 submission to the UN covering the inventory years 1990-2021.

### Development from 1990 to 2021 for the LULUCF sector

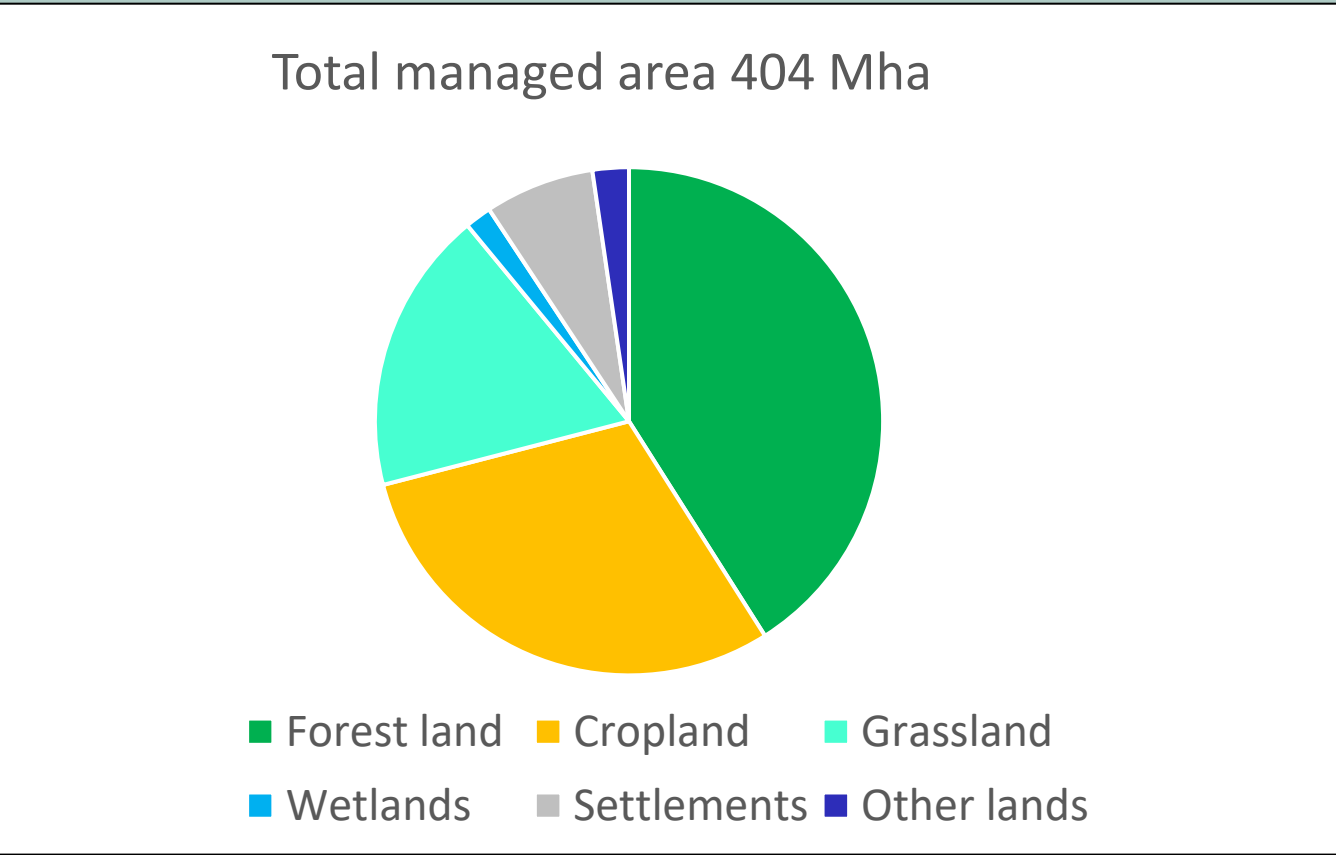


In 2021 The LULUCF sector had net removals of - 253 MtCO<sub>2</sub>. The figure includes CH<sub>4</sub> and N<sub>2</sub>O, thus resulting in -230 MtCO<sub>2e</sub>. Only forest land and harvested wood products are reported to have net removals. The overall trend of the LULUCF sector is largely driven by the Forest Land category consisting of forest land remaining forest land and land converted to forest land. Forest land converted to other land use categories is reported under the new land use category. Harvested Wood Products is the net sum of an annual inflow minus an annual outflow, at the scale of around 275 MtCO<sub>2</sub> per year. Inter-annual variations are well assumed in the emission trend of the LULUCF sector and are mainly related to natural disturbance events such as windstorms, severe wildfires, and in recent years the effects of droughts that were followed by bark beetle infestations.

### Member States use definitions appropriate for their national circumstances

Member States provide both quantitative threshold and additional qualitative criteria to define the different land use categories. For estimating the GHG fluxes, it is important that Member States apply the definitions consistently across the time series. Difference in definitions between Member States does not mean that some land and carbon pools are not reported. All land is reported and consistency in the total area can be checked via the land use matrix. Approximately 5% of the area (mostly natural wetlands) are classified as unmanaged and following the managed land proxy approach, emissions from these areas are considered non-anthropogenic and not reported in the inventory.

### Managed land area by land use category



### Land use conversions have a disproportional contribution to the reported emissions and removals

Land use change	(a) land area (Kha)	(b) Area % of the corresponding category	(c) Emissions (+) and removals (-) (Kt CO <sub>2</sub> eq.)	(d) Net emissions % of the corresponding category
4A2. Land converted to Forest Land	7 375	4%	-41 807	14%
4B2. Land converted to Cropland	10 428	9%	14 432	75%
4C2. Land converted to Grassland	14 706	20%	-13 576	30%
4D2. Land converted to Wetlands	845	4%	3 437	25%
4E2. Land converted to Settlements	5 120	18%	23 007	96%
4F2. Land converted to Other Land	247	3%	1 106	100%
Total land use changes	38 720	9%	-13 400	25%

Land use conversions are generally reported in the conversion category for 20 years (in some instances 30 years). In 2021, these sub-categories included 9% of the total EU area but contributed with a much larger share of the net emissions/removals for each land use category (column d). For some land uses such as forest land converted to another land use category there are large emissions initially, while it is generally assumed that it takes 20 years for soil carbon under one land use to reach a new equilibrium under another land use. Annual land use conversions are reported in Table 4 and in 2021 they amounted to 0.4% of the total land area in the EU.

IPCC Method used for estimating carbon stock changes in forest aboveground biomass.	
Country	IPCC method
Austria	Gain-loss
Belgium	Stock-difference
Bulgaria	Stock-difference
Croatia	Gain-loss
Cyprus	Gain-loss
Czechia	Gain-loss
Denmark	Stock-difference
Estonia	Gain-loss
Finland	Gain-loss
France	Gain-loss
Germany	Stock-difference
Greece	Stock-difference
Hungary	Stock-difference
Ireland	Gain-loss
Italy	Gain-loss
Latvia	Gain-loss
Lithuania	Stock-difference
Luxembourg	Gain-loss
Malta	Gain-loss
Netherlands	Gain-loss
Poland	Stock-difference
Portugal	Gain-loss
Romania	Gain-loss
Slovakia	Gain-loss
Slovenia	Stock-difference
Spain	Stock-difference
Sweden	Stock-difference

The annual change to the living biomass pool in forest is the single most important pool for the EU LULUCF sink (see figure below). Individual submissions of GHG inventories follow 2006 IPCC guidelines for estimating the carbon stock changes in forest carbon pools. For living biomass, methodologies are based either on the “stock difference” or “gain-loss” methods.

Data sources for estimating carbon stock changes in living biomass differ among countries. Nowadays, National Forest Inventories (NFIs) represent the primary source of information for most Member States, while others rely on other forestry statistics and yield tables. In addition, forest fire statistics complement both data sources. Data collection and data analysis programs are ongoing in most of the countries to further improve the completeness and accuracy of the estimates, primarily of carbon stock changes.

### EU LULUCF Regulation

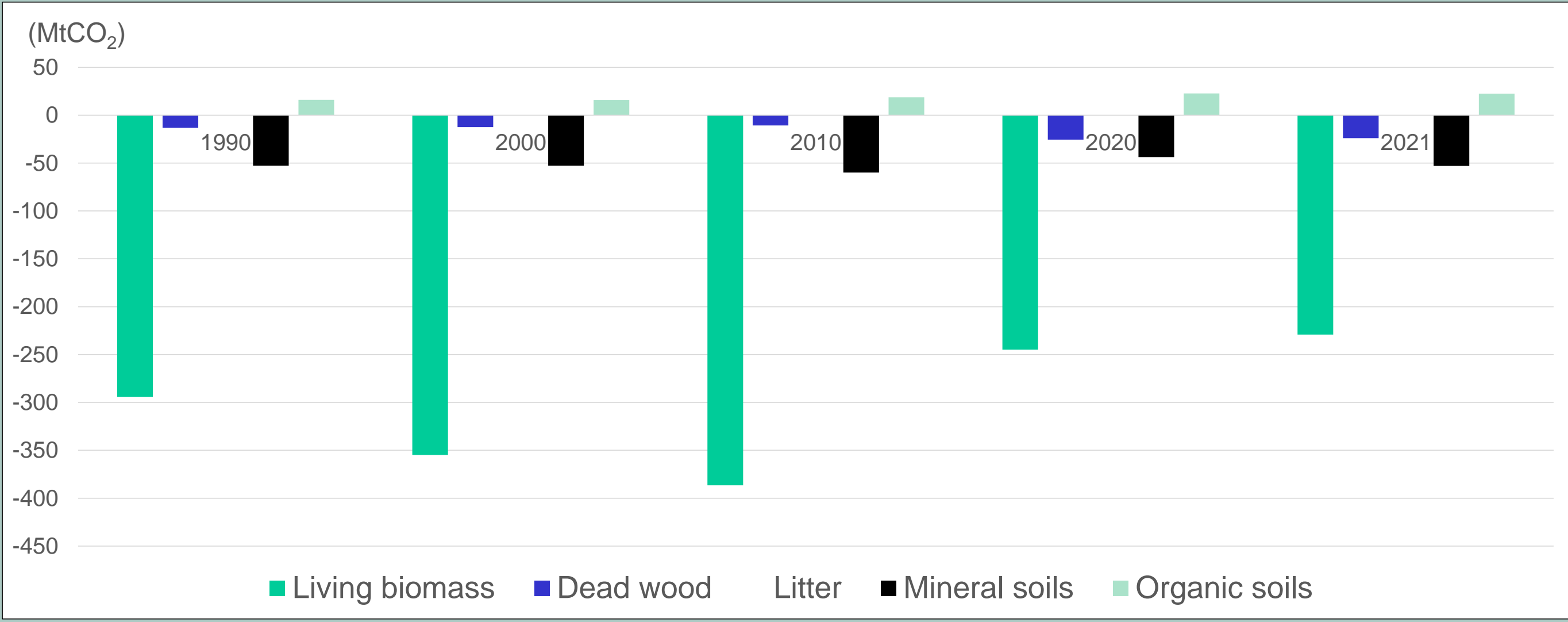
The LULUCF Regulation stipulates that all carbon pools that contribute with a minimum of 25% in a sub-category characterized as a key category must be estimated using higher Tier methods. From 2028 all carbon pools must be estimated using minimum Tier 2. From 2030 there is an annex identifying specific areas such as areas with high carbon stocks that must be estimated using Tier 3.

These requirements for improved monitoring and reporting come together with specific LULUCF targets for each Member State as part of the EU ambition to reduce emissions by a minimum of 55% in 2030 compared to 1990 and to be climate neutral by 2050.

### GHG Inventory Quality Assurances and Quality Control procedures

The QA/QC procedures are described in the Governance Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action. EU Member States submit a GHG inventory and draft National Inventory Report (NIR) to the European Environment Agency (EEA) by January 15<sup>th</sup>, covering the inventory year X-2 as well as the updated time series back to 1990. The EEA undertakes QA/QC procedures and communicates possible findings to the Member States by February 28<sup>th</sup>. The Member States reply and if in agreement incorporate the necessary changes to the inventory and resubmit a revised GHG inventory to the EEA with a final NIR by March 15<sup>th</sup>. In some cases, it is not possible to make all necessary changes in the current year and it will be implemented in the subsequent year. The EEA then compiles an EU GHG inventory which is the sum of the Member States GHG inventories. In 2025, 2027 , and 2032, there will also be a comprehensive review of the Member States inventories for the LULUCF sector. This is in addition to the UNFCCC reviews.

### Contribution of different carbon pools to the forest sink



### Quantitative estimates of carbon stock changes on carbon pools for the most important land use subcategories

COUNTRY	Reporting category																											
	Forest land										Cropland								Grassland									
	4.A.1. F-F					4.A.2. L-F					4.B.1. C-C				4.B.2. L-C				4.C.1. G-G					4.C.2. L-G				
	LB	DW	LT	SOC min	SOC org	LB	DW	LT	SOC min	SOC org	LB	DOM	SOC min	SOC org	LB	DOM	SOC min	SOC org	LB	DOM	SOC min	SOC org	LB	DOM	SOC min	SOC org		
AUT	R	R	E	R		R	R	R	R		E		E		E	E	E				R	E	E	E	R			
BEL	R					R	R	R	R				E		E	E				E	E	E	E	E	R			
BGR	R	R				R	R	R	E		E		R	E	E	E				R		E	E	R				
HRV	R					R	R	R	E		R		E	E	R						E	E	E	R				
CYP	R					R	R	R	R		R		R		E	E	E			R			E	E	R			
CZE	E	R	R	R		R	R	R	R		R		R		E	E	E				R		R	E	R			
DNM	R	R	R		E	R	R	R	R	E	E		R	E	E	E	E		E			E	E	R	E			
EST	E	R			R	E	R	R	R	E	E		R	E	E	E	E	E	E			E	E	R	E			
FIN	R				R	E	R			R	E		E	E	E	E	E	E	E			E	E	R	E			
FRA	R	E	R	R		R	E	R	R		E	R			E	E	E		E	E	R		E	E	R			
DEU	R	R			R	E	E	R	E		E		E	E	E	E	E	E	E			R	E	R	E			
GRC	R										R		R	E	E	E	E		E				E	E	R			
HUN	R	R			E	R	R	R	R		E		R		E	E	E			R		E	E	R				
IRL	E	R	R	E	E	R	R	R	E	E	R		R								R	E			E	E		
ITA	R	R	R			R	R	R	R		E		R		E			E		R	R	R	R		R			
LVA	R	R			E	R	R	R		E	R	E		E	E	E	E	E	E	E	R		E	E		E		
LTU	R	R				R	R	R	R		E		R		E	E	E						R	R	R			
LUX	R	R				R	R	R	R		E		R		E	E	E						R	E	R			
MLT	R					R		R			R		E		R		R						R		E			
NLD	R	R	R		E	R	R	R	E	E			E	E	E	E	E	E	E	R		R	E	R	E			
POL	R	R		R	E	R	R		R	E	R		E	E			E	E	E			R	E	R	E			
PRT	R		E	E		R		R	R		R		R		R	E	E		R	R	R		R	E	R			
ROU	R	R	R	R	E	R	R	R	R		R		R	E	R	E	R		R		R	E	E	E	R			
SVK	R	R				R	R	R	R		R		R		E		E					E	E	R				
SLV	R	R				R	R	R	R		E	E	R	E	E	R	E		R	R	E		E	E	R			
ESP	R					R	R	R	R		R		R		E	E	E				R		E	R	R			
SWE	R	R	E	R	E	R	R	E	R	E	R	R	R	E	R	E	E	E	E	R	R	R	E	E	E	E		

Pools: DW-Dead Wood, LT- Litter, LB – Living Biomass, SOCmin – Soil Organic Carbon in mineral soils, SOCorg – Soil Organic Carbon in organic soils.

R: Removals; E: Emissions; Empty cell: Quantitative estimates were included elsewhere, or no quantitative estimates are provided in line with Tier 1 assumption. Columns in grey indicate that the Tier 1 methodology assumes this carbon pool is in equilibrium.