The Land Use, Land Use Change and Forestry (LULUCF) sector in the EU

Giacomo Grassi
Viorel Blujdea, Raul Abad Viñas
European Commission, Joint Research Centre,
Institute for Environment and Sustainability, Forest resources and Climate Unit
Ispra (Italy)

JRC LULUCF workshop, 27 February -1 March 2013, Ispra (IT)

OUTLINE

1.Introduction

- Why the LULUCF sector is important?
- LULUCF under UNFCCC/Kyoto Protocol
- LULUCF activities at the JRC

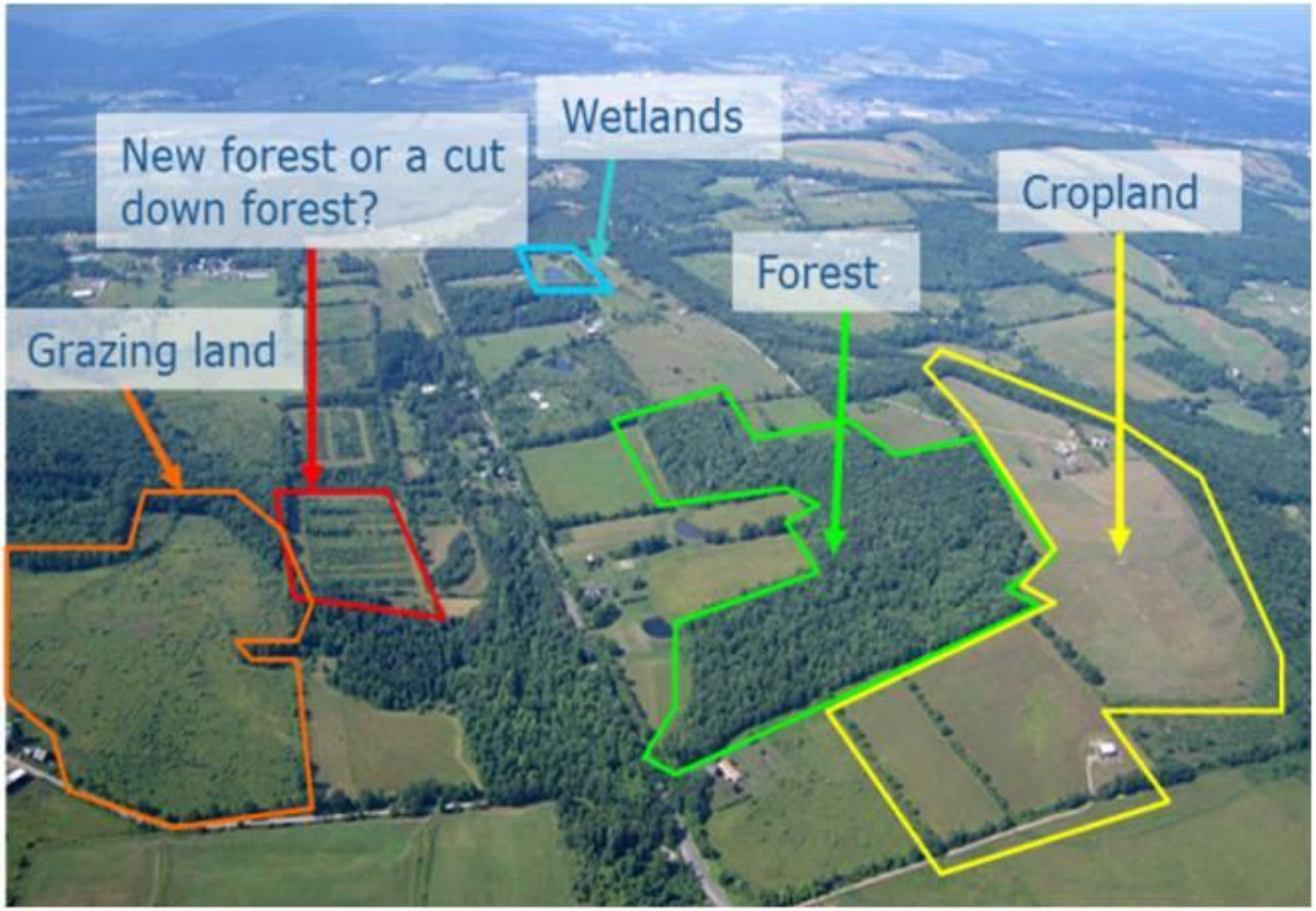
2. Overview of the LULUCF sector in the EU

3. Conclusions

European Commission

INTRODUCTION

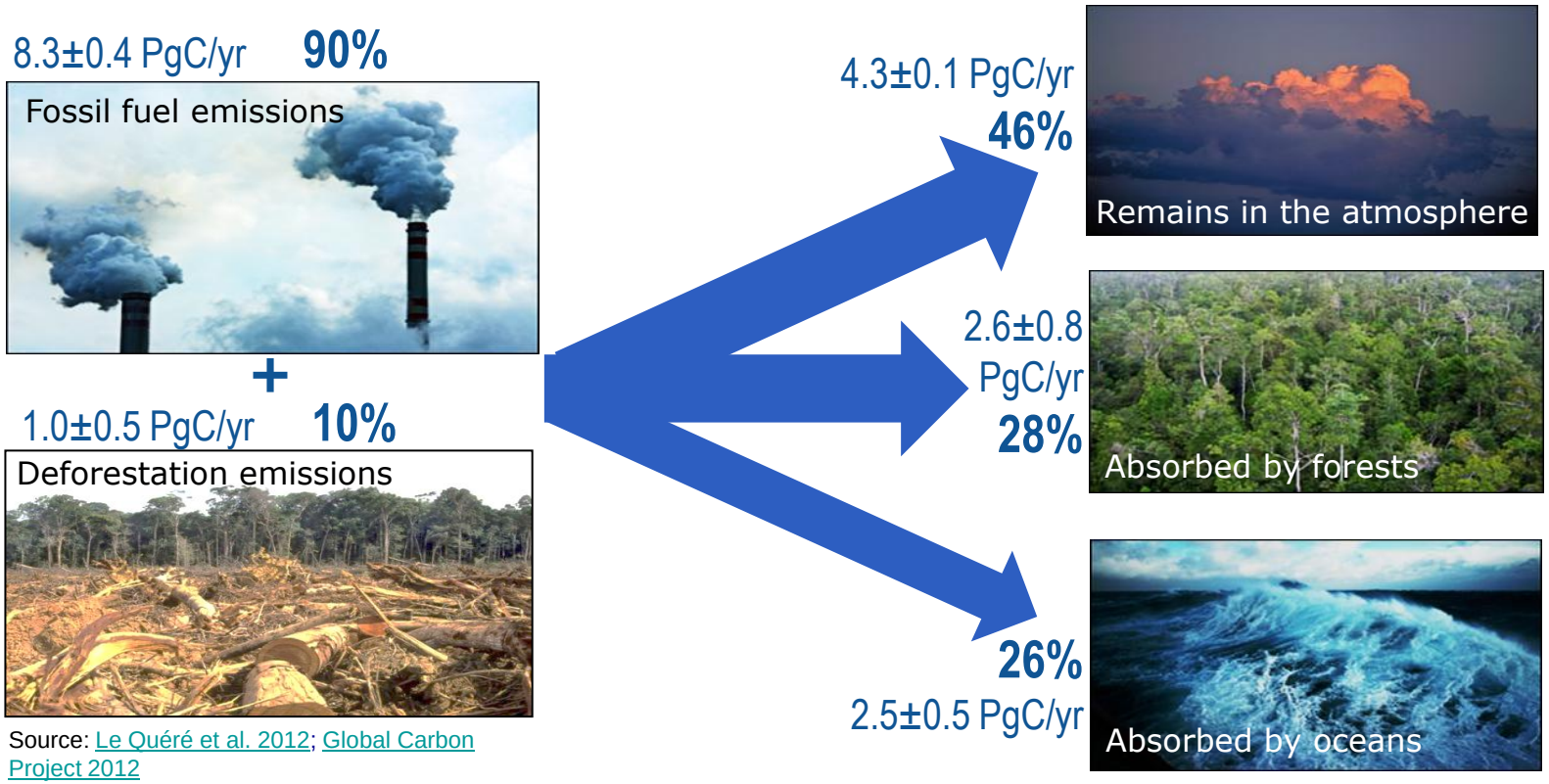
Joint Research Centre


New forest or a cut down forest?
Wetlands
Cropland
Forest
Grazing land

WHY LULUCF IS IMPORTANT?

European Commission

Sources and fate of anthropogenic greenhouse gas (GHG) emissions (2002-2011)



Source: Le Quéré et al. 2012; Global Carbon Project 2012

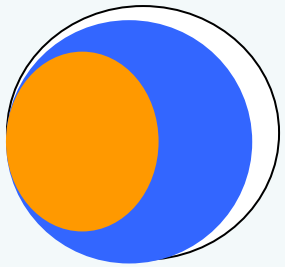
LULUCF (mainly forests) is part of the cause and part of the solution.
The **UNFCCC** and its **Kyoto Protocol** (KP) recognize the role of LULUCF.

Joint Research Centre

LULUCF under UNFCCC/KP

"Reporting": inclusion of information in national annual GHG inventory, i.e. GHG estimates in xls tables and methods in the National Inventory Report. Reviewed annually.
"Accounting": use of the reported information to meet commitments under KP.

	UNFCCC	Kyoto Protocol	
	Reporting	**Reporting**	**Accounting 2008-2012**
LULUCF	GHGs from 6 **land uses** (all managed lands) FL Forest land CL Cropland (CO_2) GL Grassland (CO_2) WL Wetland S Settlements O Other	GHGs only from direct human induced **activities** AR Aff/Reforestation D Deforestation FM Forest management CM Cropland manag. (CO_2) GM Grazing land manag. (CO_2) RV Revegetation	Mandatory, absolute amount → Voluntary, absolute amount + cap Voluntary, relative to 1990



Total GHG in a country
GHG reported under UNFCCC
GHG accounted for under KP

LULUCF under UNFCCC/KP

Estimates of emissions/removals should follow **IPCC methodological guidance** on:

- consistent representation of **areas**
- estimating changes in the carbon pools (*Biomass*, *Dead organic matter*, *Soil*) according to 3 **Tiers** of increasing complexity and certainty in estimates.
- cross-cutting issues: verification, uncertainties, **key categories** (i.e. the most important categories in a GHG inventory, to be estimated with tier 2 or 3), etc.

The following general **reporting principles** should be followed:

Transparency: all the methodologies should be clearly explained and documented.

Consistency: the same methodologies and consistent data sets should be used along time.

Comparability: countries should follow the methodologies /formats provided by the IPCC.

Completeness: estimates should include all the agreed categories, gases and C pools.

Accuracy: estimates should be systematically neither over nor under the true value, so far as can be judged, and uncertainties are reduced so far as is practicable.

Additional reporting requirements exist under the KP, including demonstrating that :

- Areas of AR are “directly human-induced”
- Not accounted C pools are “not sources”
- Land is identified and tracked over time

LULUCF activities at JRC

http://vwb-xforest.jrc.it/activities/lulucf/

1. Monitoring, reporting and reviewing LULUCF

a) Support to the EU GHG Monitoring Mechanism (dec. 280/2004/EC)

On LULUCF the role of JRC includes:

- QA/QC: checking of MS inventories for errors and inconsistencies.
- Writing the LULUCF chapter of EU inventory.
- Help to improve MS inventories, in cooperation with the scientific community.

b) UNFCCC annual review of GHG inventories

c) IPCC methodological guidance on LULUCF

2. Support to the design of LULUCF policies (UNFCCC and EU level)

3. Forest modeling

a) Modeling forest carbon dynamics for EU MS, with a forest growth model (Carbon Budget Model) + a new European Forest Dynamic Model (EFDM) under development

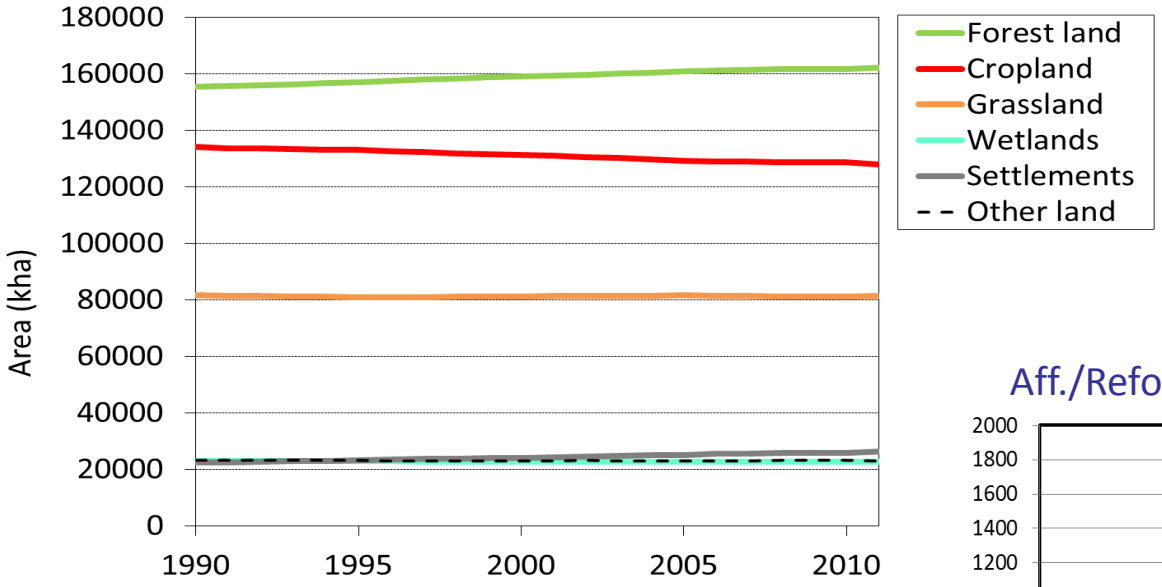
b) Building a JRC-based integrated modeling framework

European Commission

Overview of the LULUCF sector in the EU

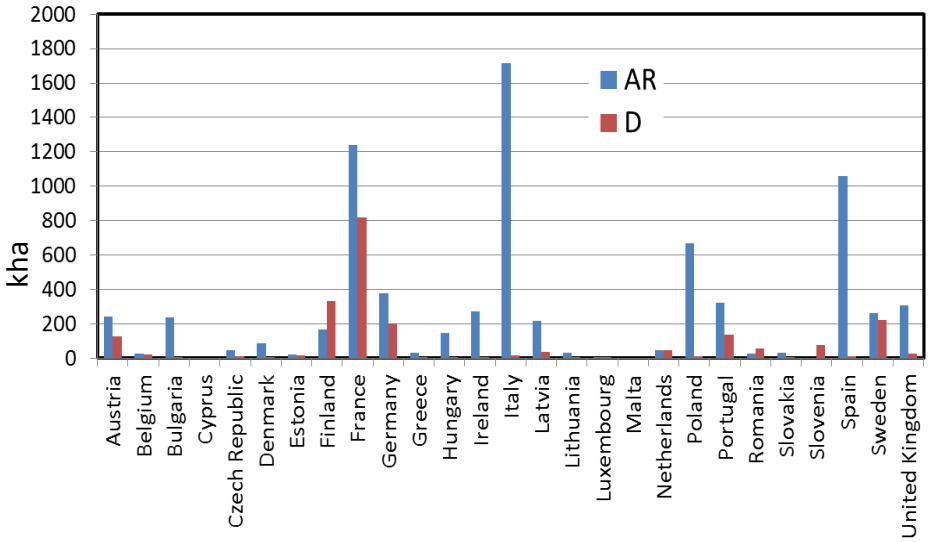
Joint Research Centre

EU: Trends in AREA of land uses

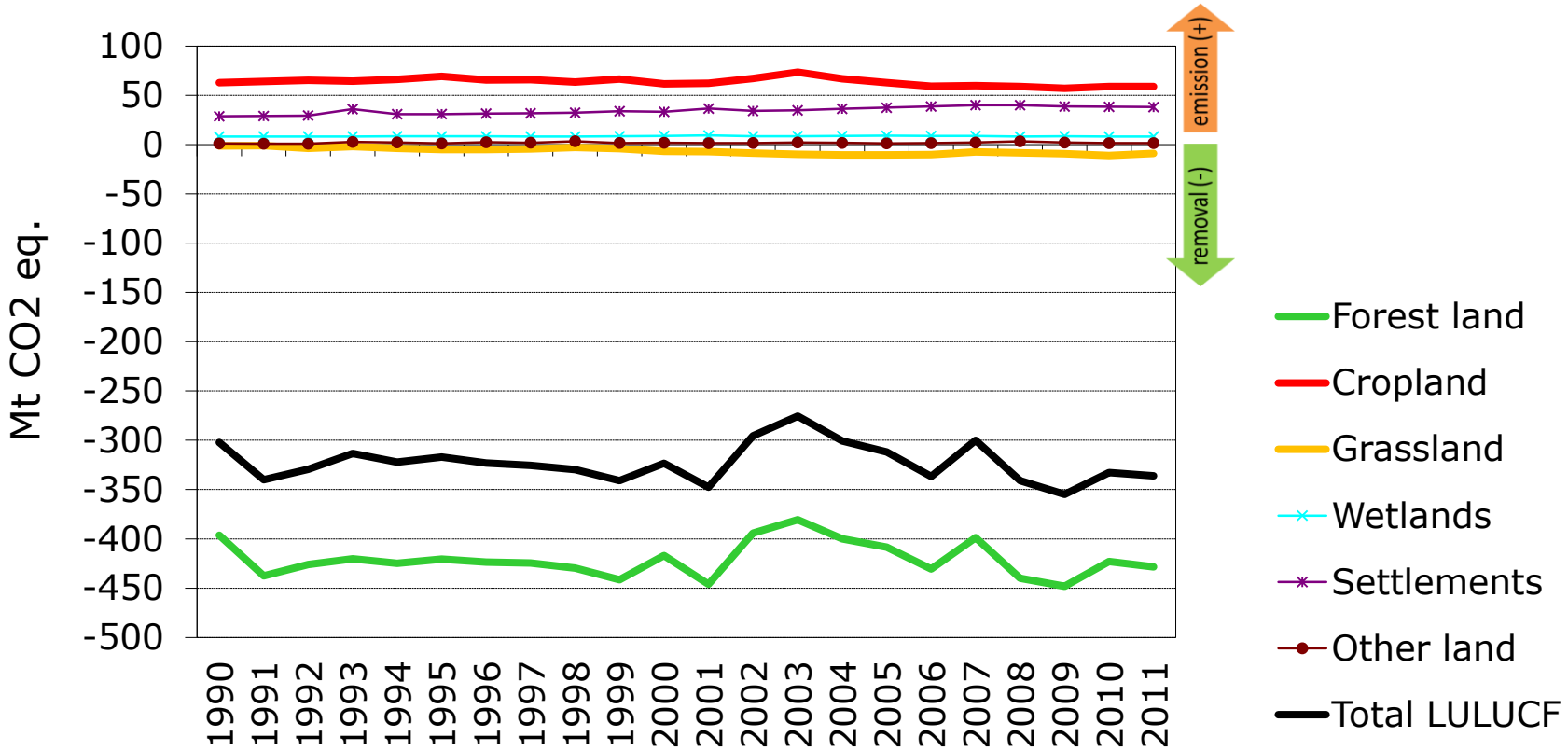


At EU level, total forest area increased from about 155 Mha to 162 Mha

On average, since 1990: 350 kha/yr of Aff./Reforest.(AR), 100 kha/yr of Deforestation (D)

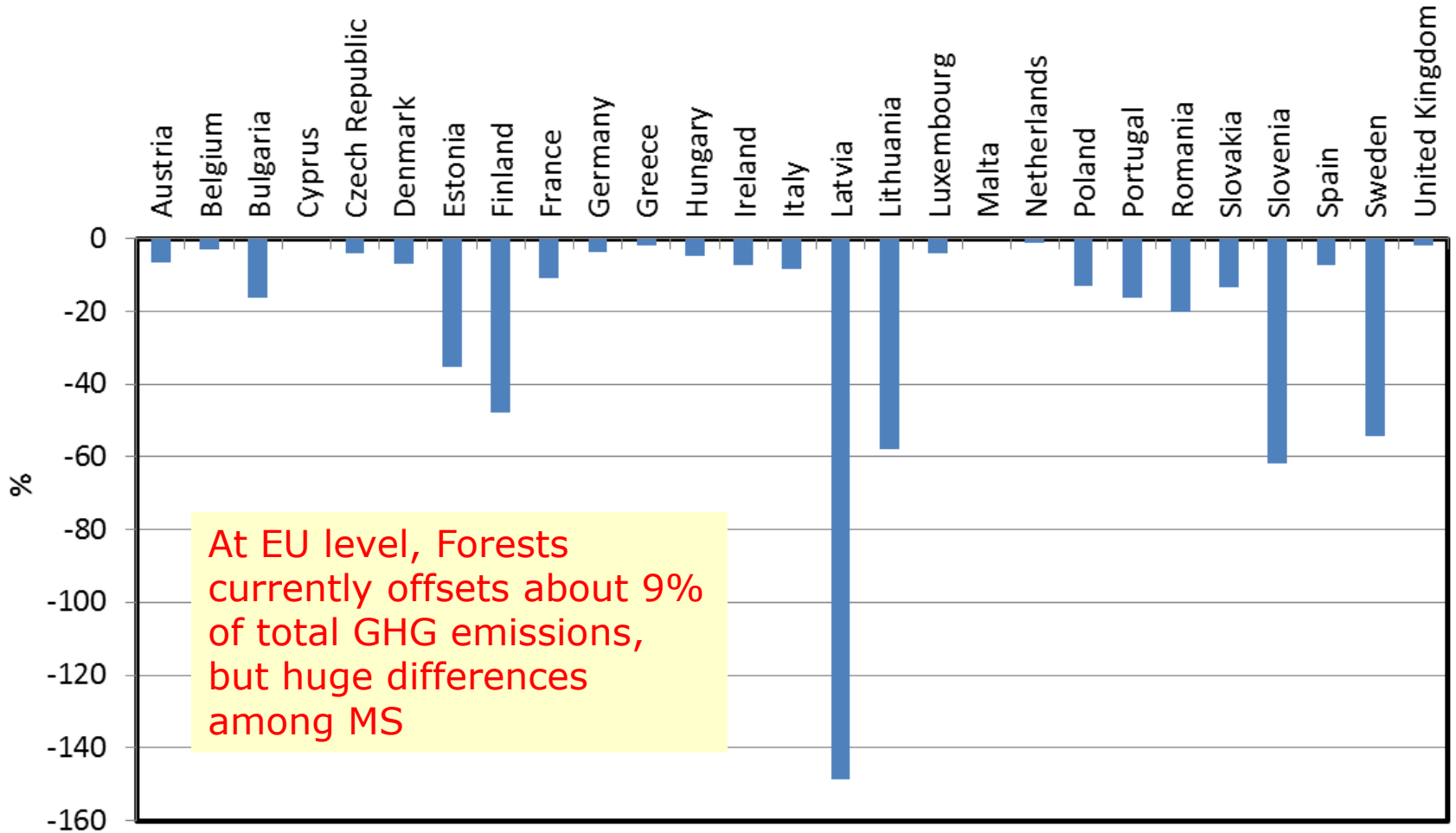


EU: trend in EMISSIONS and REMOVALS by land uses

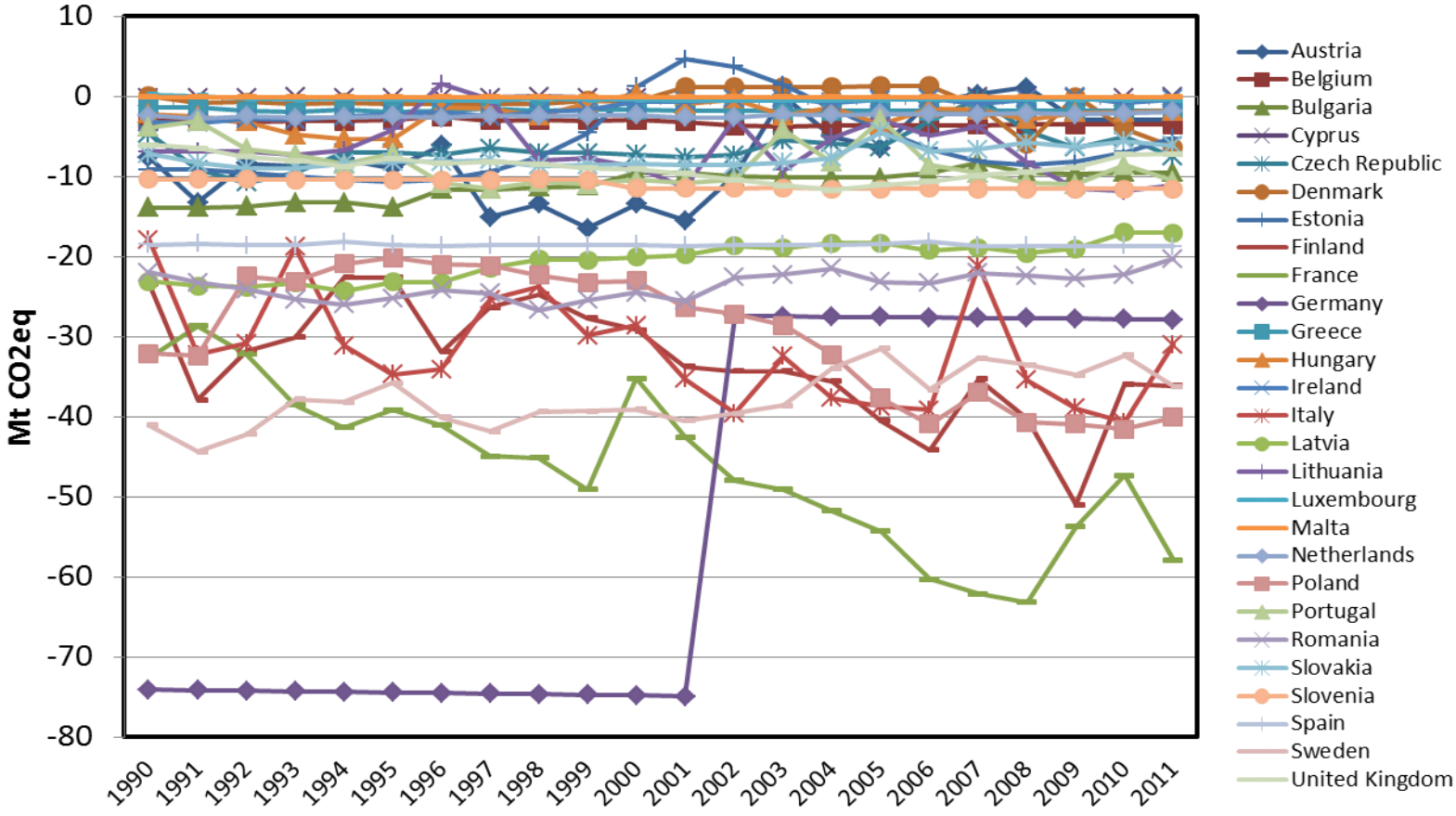


"HOTSPOTS": small areas characterized by big emissions or removals:
Land use changes, cultivation of organic soils

Contribution % of Forest land to total GHGs (without LULUCF) in 2011



Emissions and removals in Forest remaining forest



Absolute levels and long-term trend mainly affected by harvest, increments, age structure.
Interannual variability mainly affected by natural disturbances (fires, storms) and harvest.
Short-term trend also affected by the method (i.e. stock-change vs. gain-loss, e.g. DE).

Completeness of reporting of land uses (UNFCCC)

Land use	sub-category	Carbon pool		
		Living biomass	Dead organic matter	Soil-min
Forest land	FL-FL	100%	64%	36%
	L-FL	100%	60%	76%
Cropland	CL-CL	76%	12%	72%
	L-CL	80%	52%	80%
Grassland	GL-GL	24%	12%	40%
	L-GL	76%	56%	84%
Wetlands	WL-WL	8%	0%	32%
	L-WL	52%	40%	48%

= estimate not mandatory under tier 1

= estimate not mandatory under tier 2

Completeness: FL > CL > GL > WL

Completeness of land use conversions > land use remaining the same

Completeness of reporting of forest activities (KP):

	Above-ground biomass	Below-ground biomass	Litter	Dead wood	Soil Min	Soil Org
AR	96%	96%	80%	44%	88%	38%
D	100%	100%	96%	96%	92%	39%
FM*	100%	100%	76%	76%	50%	53%

* % calculated for those countries which elected FM

The lack of proper documentation for “not a source” is one of the most common issue raised during the review

Are LULUCF estimates comparable among EU MS?

Methods used in MS' LULUCF inventories are heterogeneous. While in most cases this is unavoidable, and not necessarily a problem (as long as IPCC guidance is applied), some steps toward harmonization should be considered, e.g. on assessing land use changes:

DEFORESTATION area:

- France (excluding overseas territories) 45 times higher D values than Italy
- Germany 17 times higher than Poland
- Austria 18 times higher than Bulgaria
- Latvia 35 times higher than Lithuania
- Portugal 12 times higher than Spain

Tomorrow: other examples and possible steps toward harmonization

Which is the contribution of LULUCF to EU targets?

Approx. expected LULUCF credits (-) and debits (+) during 2008-2012:

	AR	D	FM	other
Austria	-3	1	0	0
Belgium	0	1	0	0
Bulgaria	-1	0	0	0
Czech Republic	0	0	-1	0
Denmark	0	0	0	-2
Estonia	0	1	0	0
Finland	0	3	-4	0
France	-8	13	-8	0
Germany	-6	0	-5	0
Greece	0	0	0	0
Hungary	-1	0	-1	0
Ireland	-3	0	0	0
Italy	-6	0	-10	0
Latvia	-1	1	-1	0
Lithuania	0	0	-1	0
Luxembourg	0	0	0	0
Netherlands	0	1	0	0
Poland	-9	0	-3	0
Portugal	-4	1	-1	-1
Romania	0	1	-5	1
Slovakia	0	0	0	0
Slovenia	0	2	-3	0
Spain	-6	0	-2	-3
Sweden	-1	3	-4	0
United Kingdom	-3	1	-1	0
EU	**-55**	**29**	**-51**	**-5**

Overall, KP-LULUCF credits for the EU should be *around* **82 MtCO2**, or **1,4% of 1990 total EU GHGs**.

CONCLUSIONS

Significant improvements, but quality of the GHG estimates varies among MS.

Main conclusions in relation to the reporting principles :

- *Transparency*: thanks to KP reporting, transparency increased, but challenges remain (e.g. on demonstrating that unaccounted carbon pools are not sources).
- *Comparability*: methods used are heterogeneous. While often it is unavoidable, further steps forward harmonization should be done (e.g. land use changes)
- *Consistency*: generally improved.
- *Completeness:* improved recently.
- *Accuracy*: improved with KP reporting (e.g. new NFIs designed also for KP), but difficult to assess. As long as an inventory follows IPCC and passes the review it may be assumed "accurate". In practice, information on uncertainties (little is available, often uncertain itself), few incompleteness, little verification efforts (e.g. on the comparisons with independent estimates) and and frequent recalculations may challenge this assumption. Accuracy to be seen not as a static objective, but rather a *long-term process* of continuous improvements.

European Commission

Thank you for your attention!

Joint Research Centre