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Assessment - The role of land use, land use change and forestry (LULUCF) in
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for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE
COUNCIL on accounting rules and action plans on greenhouse gas emissions
and removals resulting from activities related to land use, land use change and
forestry

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COMMISSION STAFF WORKING DOCUMENT

EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT

The role of land use, land use change and forestry (LULUCF) in the EU's climate change commitments

Accompanying the document

Proposal for a

DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on accounting rules and action plans on greenhouse gas emissions and removals resulting from activities related to land use, land use change and forestry

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1. EXECUTIVE SUMMARY

1.1. Scope and background

The EU and other world leaders agreed¹ that global warming must not exceed the temperatures experienced before the industrial revolution by more than 2° C. This long-term goal requires global greenhouse gas (GHG) emissions to be reduced by at least 50% below 1990 levels by 2050.

In the short term, the EU has committed to reduce its GHG emissions by 20% below 1990 levels by 2020, and by 30% if conditions are right². The European Parliament and the Council have agreed that all sectors should contribute to reaching the target³. The land use, land use change and forestry (LULUCF) sector does not yet form part of the target. This impact assessment (IA)'s aim is to assess how the sector could contribute.

GHG emissions in the EU come mainly from energy production and other man-made sources. Some emissions are countered by carbon being absorbed (removed) from the atmosphere through photosynthesis and stored in vegetation, soils and harvested wood products. Various land uses and management practices in forestry and agriculture and the use of long-life harvested wood products can limit emissions and enhance removals from the atmosphere. These practices are covered by LULUCF⁴.

1.2. Problem definition

There are good reasons to account for emissions and removals in LULUCF, namely:

- **to ensure EU's policy coherence**, as accounting would be consistent with the Europe 2020 strategy and would ensure that all sectors contribute to combating climate change. This is important for the EU's role in promoting a level playing field for business and a fair effort distribution;
- **to improve the environmental integrity of the EU's climate change commitments** by ensuring that emissions and removals in all sectors are recorded. Currently, emissions from biomass used for energy are not included in the accounting rules for the energy sector or other sectors that produce biomass energy;
- **to enhance the economic efficiency of EU's climate policy** in the pursuit of more ambitious targets by allowing all sectors to contribute.

Including the LULUCF requires addressing its specific profile and the different MSs' circumstances. Accounting rules are needed to distinguish anthropogenic from non-anthropogenic emissions and removals. The reversibility of emissions and removals can be

¹ Decision 1/CP.16 of the Conference of Parties to the UNFCCC (the "Cancún Agreements").

² Brussels European Council 8-9.3.2007 Presidency Conclusions, implemented through Decision No 406/2009/EC and Directive 2009/29/EC.

³ Decision No 406/2009/EC and Directive 2009/29/EC.

⁴ Other GHG from agricultural activities, e.g. methane and nitrous oxide from ruminants and fertilisers, do not count under LULUCF, which deals primarily with carbon emissions and removals in vegetation and soils. Non-CO₂ emissions are covered by the 'agriculture' inventory sector.

caused by natural disturbances such as fires, storms, droughts, pests etc. but also as a result of management decisions, e.g. to harvest or plant trees. Accounting must therefore be able to reflect reversals. In addition, monitoring and reporting of emissions and removals is complex and requires a robust system. Lastly, the emissions and removals in forests fluctuate sharply between years and can amount to very significant shares of the total annual emissions in MSs.

1.3. How would the problem evolve, all things being equal?

The sink (i.e. when removals are greater than emissions) in the LULUCF is projected to decrease in the EU by 2020 under a business-as-usual scenario⁵. This sector, as a whole, it is expected to fall by about 10% in 2020 compared to the period 2005-2009. The decrease is expected to be very pronounced in forest management. This is partly compensated by planting 'new' forests (afforestation). Emissions and removals from agricultural activities such as cropland management and grazing land management are expected to remain fairly stable or to improve. Negative trends and emissions risk being ignored unless LULUCF is part of EU's climate policy.

The projected capacity of the sink would increasingly affect policy coherence and economic efficiency. Not accounting for the decline in net removals stemming from non-action would risk an excessive use of resources for mitigation measures that count towards other objectives, thereby creating an unlevel playing field between different mitigation options. Moreover, economic efficiency losses may increase over time given that significant additional action will be required in all sectors to meet the long-term climate objectives.

1.4. Objectives

The overall objective is to ensure that LULUCF contributes to the EU's climate change commitments. The following operational objectives address the problem definition:

- monitoring and reporting by MSs should comply with Good Practice Guidance (GPG) as issued by the Intergovernmental Panel on Climate Change (IPCC) to ensure transparency, completeness, consistency, comparability and accuracy of estimates;
- accounting rules should:
 - be extensive so as to include all emissions and removals, and all main LULUCF activities (afforestation, reforestation, deforestation, forest management, cropland management and grazing land management);
 - reflect the non-permanence of emissions and removals;
 - provide incentives for climate change mitigation;
 - the policy context for integrating LULUCF should be such that MSs' ability to comply with GHG reduction targets is not put at risk due to inter-annual variability of emissions and removals or significant natural disturbances.

⁵ In this context, 'business as usual' assumes that MSs will reach their 20% reduction targets, including the ones for renewable energy.

1.5. Options

Action to account for LULUCF should be taken at two levels.

Firstly, it is necessary to define options for the **policy context** in which the sector should be accounted as there is already EU legislation on the commitment to reduce GHG emissions by 20% in 2020. A non-regulatory/‘no EU action’ option (Option 1) is not realistic as the EU is a Party to the Kyoto Protocol (KP) and any commitment there would have to be shared between MSs and would necessitate taking a common approach. Therefore, ‘do nothing’ would translate only into delaying all action until an international agreement has been reached. Option 2 involves creating a legal framework for LULUCF that is separate from the frameworks laid down in the EU's Effort Sharing Decision (ESD) and Emission Trading System (ETS). This option was subdivided into one without targets (Option 2.I) and one with targets (Option 2.II). Option 3 involves including LULUCF in the ESD legal. The option of using the ETS was discarded at an early stage.

Secondly, options were developed to assess how to achieve robust accounting, monitoring and reporting. For **accounting**, the following options were considered:

- (a) the same accounting rules as under the KP's first commitment period (CP), including voluntary accounting for agricultural activities, but with mandatory accounting for all forestry activities.
- (b) accounting rules corresponding to the expected outcome of the UNFCCC negotiations of a second CP under the KP, including mandatory accounting for all forestry activities and voluntary accounting for agricultural activities.
- (c) accounting rules corresponding to the expected outcome of UNFCCC negotiations, but with further improvements achieved by bringing in mandatory accounting for both forestry and agricultural activities.

A three-step approach to achieve robust **monitoring and reporting** was also outlined. The first step would involve achieving complete reporting of emissions and removals from the various activities using at least simple methodologies. The second step would mean increasing reported data's accuracy by using more sophisticated methods. Lastly, the MSs' data comparability would be honed to harmonise monitoring, reporting and related nomenclature. The sub-options on accounting, and monitoring and reporting are the same for the overall Options 2 and 3, but their impacts differ depending on the policy context.

1.6. Impact

The analysis shows that two of the broad policy options would meet the objective of having all sectors contributing to the EU's overall GHG reduction commitment; namely they would include LULUCF in the EU's GHG reduction commitment under a separate framework (**Option 2**) or under the ESD (**Option 3**). The environmental, economic and social impacts of the options differ widely depending on the accounting rules applied, as shown in Table 1.

Table 1. Summary of main impact for the EU

Type of impact	Option 1	Option 2.I	Option 2.II	Option 3
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Accounting option	No EU action	Include LULUCF under a separate framework			Include LULUCF under a separate framework			Include LULUCF in the Effort Sharing Decision		
	n/a	(No target)			(Target)			(a)	(b)	(c)
		(a)	(b)	(c)	(a)	(b)	(c)			
Environmental										
Net effect on economy-wide mitigation in addition to the reference scenario (MtCO ₂ per year)	Zero (delayed)	0	0	0	-7	-5	-5	80	13	39
Potential contribution to the EU's emission reduction target, including reference scenario (MtCO ₂ per year)	Zero (delayed)	-79	-10 to -86	-36 to -106	-86	-15 to -91	-41 to -111	0	0	0
Potential contribution to the EU's emission reduction target (in % of total GHG emissions in 1990)	Zero (delayed)	-1.4	-0.2 to -1.5	-0.6 to -1.9	-1.6	-0.3 to -1.6	-0.7 to -2/0	0	0	0
Economic										
Cost of mitigation	Zero (delayed)	0	0	0	40	27	27	-166	-55	-156
Cost of improved monitoring and reporting (€ million)	Zero (delayed)	0.35	0.65	1.35	0.35	0.65	1.35	0.35	0.65	1.35
Social										
Effects on employment	Zero (delayed)	0	0	0	Small (neutral or positive)			Small (neutral or positive)		

Note: Option 2.II is based on a target of -5.4 MtCO₂ accounted credits. This equals a carbon price of € 5 per tCO₂ for accounting options (b) and (c), as assumed for Option 3, but a carbon price of € 12 per tCO₂ for accounting option (a) due to the discounting of forest management. Negative values denote net removals (and positive values for net emissions). Source: calculations are based on Böttcher et al. (2011) and update of JRC (2011b), reflecting the UNFCCC review. For option 2.I (b) two estimates for the contribution to EU's emission reduction target are given: one is based on model projections and the other relies on model plus national projections.

In terms of **environmental impact**, action to increase removals and reduce emissions in forestry and agriculture should ideally be considered over a long time horizon because it can take decades before measures such as afforestation have a significant effect. However, the EU's existing climate change commitments stretch only to 2020 and are an important milestone. The extent to which the contribution could go beyond what is expected from current efforts (i.e. the reference scenario) depends on the policy context in which LULUCF is accounted for. Additional action is expected to be limited in Options 2.I and 3 and greater in Option 2.II. However, the estimate does not fully capture the mitigation potential in agriculture, and neither does it include the benefits obtained from material substitution. As regards the **economic impact**, accounting option (a) would generate higher costs in Option 2.II if there are targets because only a fraction of mitigation efforts actually count. On the contrary, it also generates high credits in the reference scenario and this leads to cost savings under Option 3 where no additional mitigation is required from LULUCF, but credits can be

used to replace emission reductions under ESD. The costs for all accounting options are zero in Option 2.I where no targets are set and in Option 1 where no accounting is carried out. The **social impacts** are limited and employment effects are estimated to be low and either neutral or positive. There are, however, some distributional effects amongst MSs in Options 2.II and 3.

1.7. Comparison of options

1.7.1. Choosing the right policy context

The objective to limit the impact of high inter-annual variability of emissions and removals and their inherent reversibility on compliance poses a major challenge in including LULUCF in the current EU's reduction targets legal frameworks. The ESD (**Option 3**) is based on annual compliance and requires MSs to decrease (or limit increases in) emissions following a linear trajectory. However, annual compliance with a linear trajectory would be difficult to apply due to variations in net emissions between MSs, and the frequent and significant recalculations of reported data. In many cases it would greatly exceed the ESD's scope for flexibility. In addition, the long lead-time of many measures in LULUCF means that annual accounting is not as meaningful as in other sectors, and a linear trajectory with required emission reductions each year will generally not be relevant. **Option 2** would address these issues by averaging emissions and removals over the CP and therefore meet the objective on inter-annual variability. A risk related to **Option 3** is that including LULUCF would reduce the agreed efforts for the sectors that are already part of existing commitments and so effectively reduce the EU's commitment. **Option 2** would avoid this risk.

1.7.2. Ensuring robust accounting

Table 2 provides a summary assessment of how the various accounting options meet the objectives. As regards providing a level playing field between different mitigation options, the most important activity is forest management. Table 1 shows that **accounting option (a)** generates substantial credits, which are largely 'windfall' (free) as they include removals that would have occurred without any change in management decisions. Any mitigation efforts will be discounted by 85%. This will make mitigation more expensive and so limit incentives to take additional action. It would also allow for substantial decreases in net removals and increases in net emissions without any real economic impacts. Lastly, it would not ensure that non-permanence is reflected in accounting because it would not cover emissions and removals related to agricultural activities, and only a fraction of those related to forest management.

Table 2. Performance of the various accounting options

Objectives	Extent to which the objectives are met by the various accounting options		
	Accounting option (a)	Accounting option (b)	Accounting option (c)
	Small changes	Likely outcome in the UNFCCC negotiations	UNFCCC+
Provide a level playing field between different mitigation options	X	•	••
Ensure extensive coverage of emissions and removals	•	•	••
Ensure that non-permanence is reflected in accounting	X	•	••

Prevent large natural disturbances from negatively affecting the compliance risk of MSs

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••

••

Notation key: x Objective not or insufficiently addressed by option, • Objective partially addressed by option, •• Objective sufficiently addressed by option

Accounting options (b) and (c) allow for a change in the sink due to natural saturation and existing policies without generating debits or credits. They do so to factor out changes in emissions and removals that are not human-induced. However, they require full accounting for any deviations from the ‘reference level’. This means that in the reference scenario, all abatement options and uses, whether sequestration or additional use of biomass for energy production (e.g. for reaching the RES-D targets) or material substitution, will face the same opportunity cost. This will ensure a level playing field between the various mitigation options.

In terms of ensuring extensive coverage of emissions and removals and that non-permanence is reflected in accounting, only **accounting option (c)** requires MSs to mandatory account for emissions and removals in both agriculture and forestry. Accounting options (a) and (b) make accounting for agriculture voluntary, which may put the credibility of the EU’s commitment at risk. Extending the scope of accounting would increase consistency between MSs. It is important that all sectors in all MSs contribute to reaching the ‘Europe 2020’ strategy targets, to secure a level playing field for business and MSs and a fair effort distribution,, and to ensure a consistent treatment of agriculture, forestry and industry within the EU’s internal market. In the longer term, a more inclusive accounting system would also be conducive to increasing the cost efficiency in reaching any given overall target.

As regards reducing the impact of natural disturbances on compliance risk, **accounting options (b) and (c)** would include accounting rules for large natural disturbances and so limit the risk of non-compliance with GHG reduction targets if emissions occur as a result of such disturbances which are beyond the control of MSs. The impact on the EU’s overall accounting would be negligible, but it would provide the necessary safeguards for those MSs most affected.

1.7.3. Improving monitoring and reporting

This IA outlines a three-step approach to meet the objective of ensuring that monitoring and reporting comply with IPCC's GPG. A first step would involve achieving complete reporting using at least simple methodologies. A second step would mean increasing the accuracy of the reported data by using more sophisticated methods. Progress is expected during the first CP of the KP, but efforts will have to continue during the period 2013-20. Lastly, the comparability of data between MSs can be improved by harmonising monitoring, reporting and related nomenclature.

The above steps would form part of the Commission’s proposal for a revised Monitoring Mechanism Decision.

1.8. Concluding comments

An international agreement on revised accounting rules for LULUCF for the second CP under the KP was only achieved during the 17th Conference of the Parties (COP17) in Durban in December 2011⁶

There are good reasons now to include LULUCF in the EU's GHG emission reduction commitments, namely to improve the policy coherence, environmental integrity and economic efficiency. But it requires addressing the special features of LULUCF and the varying circumstances in the MSs. It is therefore important to ensure that robust accounting rules and monitoring and reporting are in place.

Accounting option (c) involves mandatory accounting of emissions and removals from both forestry and agricultural activities and gives equal weight to mitigation action, whether taken in the forestry, agriculture, industry or energy sectors. This is conducive to cost efficiency and will ensure a level playing field for both MSs and the various sectors of the EU's internal market. It will also provide a framework to give incentives for mitigation action by farmers, foresters and industry, ensuring they are visible and correctly reflected. A wide coverage of emissions and removals will also ensure that potential reversals are reflected in the accounting system.

Monitoring and reporting needs to be improved to underpin the accounting framework and the indicators tracking progress in agriculture and forestry. The Commission proposes to achieve this through separate framework, i.e. by revising the Monitoring Mechanism Decision. For reasons of comparability and cost-efficiency, better use should be made of EU-wide monitoring instruments such as LUCAS and CORINE.

To provide strong incentives, the results of action taken by sectors must count towards the EU's GHG emission reduction commitments. This will only be possible if the right policy context for LULUCF is put in place. The high variability of emissions and removals in forests means that annual emissions reduction targets that apply to other sectors are unsuitable. The long lead times needed for mitigation measures to take effect also set LULUCF apart from most other sectors. This IA's results suggest that a separate legal framework for LULUCF would be the best option.

The EU has already committed to reducing GHG emissions by 20% by 2020 compared to 1990 through efforts in other sectors. Before the ambition level is increased beyond 20%, the conditions need to be right. LULUCF should therefore be formally included in commitments only once the EU decides to increase this ambition level (**Option 2.I**). This does not mean that mitigation actions should be put on hold. National action plans could be prepared to provide a strategy and forecast for LULUCF. This would be an intermediate step towards the sector's full inclusion with current policies.

⁶ Decision -/CMP.7 of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.