

Public consultation on the role of EU agriculture and forestry in achieving the EU's climate change commitments

Background note for the public consultation

What is land use, land use change and forestry?

Land use, land use change and forestry (LULUCF) is a greenhouse gas inventory sector that covers anthropogenic emissions and removals of greenhouse gases (GHGs) resulting from changes in terrestrial carbon stocks. It covers the carbon pools of living biomass (above and below ground), dead organic matter (dead wood and litter) and organic soil carbon for all land categories (forest land, cropland, grassland, wetland, urban land and other land).¹

What are the associated greenhouse gases and causes of GHG emissions?

The main GHG concerned is carbon dioxide (CO₂) from carbon stock changes. Other GHGs include nitrous oxide (N₂O) from, for example, nitrogen inputs (in fertilisation of forests), cultivation of organic soils and soil organic matter mineralization (from land use conversion and drainage of forest soils) and emissions of methane (CH₄), in addition to CO₂ and N₂O, from forest fires or anaerobic decomposition of organic material in wetlands. Non-CO₂ GHG emissions from agricultural land are covered by the inventory sector 'agriculture' and therefore not part of LULUCF.

How can the sector contribute to climate change mitigation?

Possible mitigation measures in LULUCF include all actions that can reduce emissions or increase removals of GHGs, particularly CO₂ related to changes in carbon stock in soils and biomass. For soils, this could include reduction in the conversion of grassland to arable land, conversion from annually cultivated land to permanent cropping (especially on organic soils), incorporation of organic materials (farmyard manure, straw, crop residues) into cultivated land, leaving organic materials (farmyard manure, straw and crop residues) in and on the soil to increase soil organic matter and fertility, reduction in tillage frequency (conservation tillage, zero tillage), productivity increases in grasslands, appropriate crop rotation, cover crops, prevention of loss of topsoil by limiting soil erosion, maintenance or restoration of the level of the water table in peat soils. For forests, it can include the reduction or avoidance of the conversion of forest to other land uses, afforestation, leaving more organic materials (deadwood, stems and branches and harvest residues) in and on the soil to enhance soil organic matter and fertility, prevention of forest fires, modifying rotation lengths and increasing and restoring woody landscape elements such as hedgerows and windbreaks. Carbon removed from land can stay bound in products for a long period of time without being re-emitted to the atmosphere, in particular wood products contain significant quantities of carbon that that can be retained for extended periods of time. Carbon contained in this harvested wood product pool can be expanded, for instance, through the "cascading use of

¹ See http://unfccc.int/methods_and_science/lulucf/items/4127.php for relevant information on the UNFCCC website

wood" by prioritising wood used for long-lived wood products and increasing the recycling of wood products.

In addition, harvested biomass can be used in other sectors to substitute materials associated with high greenhouse gas emissions (e.g. building with timber instead of steel, concrete, glass) and to substitute fossil fuels directly through direct combustion (of solid biomass or biofuels/biogas generated from biomass). Under the UN Framework Convention for Climate Change (UNFCCC), the emission savings resulting from the substitution of energy and materials with harvested biomass appear in the energy or industry sectors, while the emissions related to the production of the biomass are reported under LULUCF.²

How big are emissions and removals?

In the EU-27, net removals in LULUCF reported to the UNFCCC amounted to 410 million tonnes CO₂ in 2008, or 8 % of total greenhouse gas emissions. The corresponding figure was 1 657 million tonnes CO₂ in the other Annex I countries.

Table 1 Reported LULUCF net removals in the EU-27 and Other Annex I countries (million tonnes CO₂)

	1990	2008
EU-27	-344	-410
OTHER AI	-1 036	-1 657

Source: European Commission Joint Research Centre (2010)

What is reported, what commitments exist?

Under the *UN Framework Convention for Climate Change*, Parties are required to develop, periodically update and publish national inventories of anthropogenic emissions and removals of all GHGs not controlled by the Montreal Protocol. Emissions and removals from LULUCF are included as described above. Parties are also required to promote sustainable management, and promote and cooperate in the conservation and enhancement of sinks and reservoirs, including biomass, forests and other terrestrial ecosystems.

Under the *Kyoto Protocol* (KP) to the UNFCCC, developed countries took on quantified emission limitations and reduction obligations (also known as 'Kyoto targets'). Parties must also implement and/or further elaborate policies and measures to protect and enhance sinks and carbon reservoirs, promote sustainable forest management, afforestation and reforestation and sustainable forms of agriculture.

The Kyoto targets are defined in relation to national total emissions in the base year (1990) without LULUCF. However, some LULUCF activities – emissions and removals related to afforestation, reforestation and deforestation that occurred since 1990 – must be counted towards the achievement of the target. Parties could also elect additional activities – forest management, cropland management, grazing land management and revegetation – to be included in their accounting in the first commitment period (2008-12). In addition, emission

² According to the revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Vol. 3, Energy, p. 1.10) 'biomass fuels are included in the national energy and emissions accounts for completeness. These emissions should not be included in national CO₂ emissions from fuel combustion. If energy use, or any other factor, is causing a long term decline in the total carbon embodied in standing biomass (e.g. forests), this net release of carbon should be evident in the calculation of CO₂ emissions described in the Land Use Change and Forestry chapter.'

reductions from project activities, including LULUCF project activities³, in other countries may be used by Annex I Parties in complying with their emission reduction commitments.

The accounting rules and definitions of the different LULUCF activities for the first commitment period are set out in Article 3.3 and 3.4 of the Kyoto Protocol⁴, and in subsequent decisions of the Conference of the Parties, most notably Decision 16/CMP.1⁵. A greatly simplified explanation of some of the main principles is given in Box 1. The accounting rules for a second commitment period are currently being negotiated.

Box 1 – Simplified illustration of LULUCF accounting rules under the Kyoto Protocol

Accounting is **mandatory** for emissions and removals related to **afforestation, reforestation and deforestation** activities. These are accounted for using a 'gross/net' approach. Accounting is **optional** for emissions and removals related to **forest management, cropland management, grazing land management and revegetation**. When elected, forest management is accounted for using a 'gross/net' approach with a cap. The other three optional activities use a 'net/net' approach (see below).

Gross/Net means that a country's total net emissions or removals from forest during the commitment period are accounted for in its GHG balance, without regard to what those emissions/removals were in the base year. A 'cap' means that the net emissions or removals accounted for are limited to a specified amount.

Example: If forest removes 10 million tonnes of CO₂ in the commitment period (2008-12) the country books a credit of 10 million tonnes CO₂ for the commitment period. However, if a cap was set at e.g. 1 million tonnes CO₂ per year, then only 5 million tonnes can be booked, i.e. the annual cap times the number of years in the commitment period.

Net/Net means that only the difference between the total net emissions or removals from cropland management, grazing land management and/or revegetation in the commitment period (2008-12, i.e. 5 years) and that in a defined base year (1990) times five are accounted for in the country's GHG balance.

Example: In the base year, grazing land management removed 1 million tonnes CO₂. In the commitment period the activity removes 10 million tonnes CO₂. The country books a credit of 5 million tonnes CO₂ in the commitment period (i.e. the total removals in the commitment period minus the removals in the base year times five).

What are some of the key changes to accounting rules that are being discussed in the international negotiations?

The most recent text used in the international negotiations can be found on UNFCCC's website.⁶ One of the key issues discussed is how to count for **forest management**. As shown in Box 1 above, this activity is currently accounted for on a Gross/Net basis with a cap. Other options under discussion are 1) Gross/Net accounting on the basis of a discount factor which,

³ Two of the flexible mechanisms of the Kyoto Protocol make provisions for the implementation of LULUCF project activities by Parties; the Clean Development Mechanism (CDM) and Joint Implementation (JI). Whereas all LULUCF activities can be used for JI, the CDM is limited to afforestation and reforestation.

⁴ See <http://unfccc.int/resource/docs/convkp/kpeng.pdf>

⁵ See pp. 3-9 in FCCC/KP/CMP/2005/8/Add.3, <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=3>

⁶ See pp. 26-39 in FCCC/KP/AWG/2010/CRP.2, http://unfccc.int/files/kyoto_protocol/application/pdf/draft_proposal.pdf

in the example above, would mean that if a discount factor of 85 % were used the country would book a credit of 1.5 million tonnes CO₂ in the commitment period, 2) Accounting against a reference level which is similar to Net/Net accounting but differs in the sense that the reference level would be set as, for example, the average of net emissions/removals in a historical period (e.g. 2008-12) or based on the projected net emissions/removals under a business-as-usual scenario in the commitment period rather than based on 1990. A number of variations on the reference level are also under discussion, for instance a cap around the reference level which would limit the credits and debits generated and band/interval around the reference level which would mean that only net emissions/removals which differ from the reference level by a predetermined amount would generate debits or credits.

As noted in Box 1 accounting for certain activities (afforestation, reforestation and deforestation) is **mandatory** while for other activities (forest management, grazing land management, cropland management and revegetation) it is **voluntary**. A question discussed in the international negotiations is whether the current rules should apply or whether more activities should be accounted for on a mandatory basis.

Another issue is that of **force majeure** which, at the current stage of the international negotiations, is taken to mean 'extraordinary events or circumstances, defined as those events or circumstances whose occurrence or severity was beyond the control of, and not materially influenced by, a country [...]'. Discussions concern the extent to which emissions associated with force majeure should be accounted for, e.g. a country accounts for a certain percentage of the emissions associated with the natural disturbance as compared to the country's total emissions in 1990, or whether it should be possible to 'carry over' emissions associated with the natural disturbance and account for them in the subsequent commitment period.

Under the rules of the Kyoto Protocol emissions are assumed to occur at the time of harvesting ('instantaneous oxidation') but the current discussions suggest that, in addition to instantaneous oxidation, emissions may be accounted for on the basis of when they actually occur. For instance, if harvested biomass is used to produce a table, the carbon is not released until the table is incinerated or decomposes. Accounting for changes in the **harvested wood product** pool may include either domestically produced and consumed harvested wood products only or also the exported harvested wood products.

Why is LULUCF currently not part of the EU's GHG reduction commitment for 2020?

The EU has committed unilaterally to reduce its overall greenhouse gas (GHG) emissions by 20 % below 1990 levels by 2020, and by 30 % if conditions are right.⁷ The 20 % reduction commitment is mainly implemented through Directive 2009/29/EC⁸ and Decision 406/2009/EC⁹ which require sectors participating in the EU Emissions Trading System (EU ETS) to jointly reduce emissions by 21 % below 2005 levels and non-trading sectors (under the Effort Sharing Decision; ESD) to reduce emissions by 10 %. While sectors in the EU ETS are regulated at the EU level, it will be the responsibility of Member States to define and

⁷ i.e. that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries contribute adequately according to their responsibilities and respective capabilities.

⁸ [Directive 2009/29/EC](#) of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community

⁹ [Decision No 406/2009/EC](#) of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020

implement policies and measures to limit emissions of sectors under the ESD. There are other policy instruments, such as the Renewable Energy Directive¹⁰ that also will contribute to reaching the target.

As accounting rules for LULUCF had not been agreed internationally for the post-2012 period at the time of the EU agreement, the sector was not included in the commitment. However, according to Decision 406/2009/EC (Articles 8 and 9), the Commission is required to assess modalities for the inclusion of emissions and removals from activities related to LULUCF in the EU reduction commitment and, as appropriate, make a proposal on how to include them while ensuring permanence and the environmental integrity of the contribution of LULUCF as well as accurate monitoring and accounting. The provisions differ slightly depending on whether an international agreement on climate change is reached or not (see Box 2).

Box 2 – Legislative basis for the Commission's work on LULUCF

In the event of an **international agreement** (Article 8 of Decision 406/2009/EC) on climate change leading to mandatory reductions of greenhouse gas emissions exceeding 20 percent compared to 1990 levels, the Commission is required, within three months of the signature by the EU to submit a report assessing appropriate modalities for including emissions and removals related to LULUCF in the EU reduction commitment. On the basis of rules agreed as part of an international agreement on climate change, the Commission shall propose to include emissions and removals related to land use, land use change and forestry in the Community reduction commitment, as appropriate, according to harmonised modalities ensuring permanence and the environmental integrity of the contribution of land use, land use change and forestry as well as accurate monitoring and accounting. The Commission shall assess whether the distribution of individual Member States' efforts should be adjusted accordingly.

In the event of **no international agreement** by 31 December 2010 (Article 9 of Decision 406/2009/EC), Member States may specify their intentions for the inclusion of land use, land use change and forestry in the Community reduction commitment taking into account methodologies within the work carried out in the context of UNFCCC. Taking into account such specification by Member States, the Commission shall, by 30 June 2011, assess modalities for the inclusion of emissions and removals from activities related to land use, land use change and forestry in the Community reduction commitment, ensuring permanence and the environmental integrity of the contribution of land use, land use change and forestry as well as accurate monitoring and accounting, and make a proposal, as appropriate, with the aim of the proposed act entering into force from 2013 onwards. In the event that no international agreement on climate change is approved by the Community, The Commission's assessment shall consider if the distribution of individual Member States' efforts should be adjusted accordingly.

¹⁰ [Directive 2009/28/EC](#) of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC