

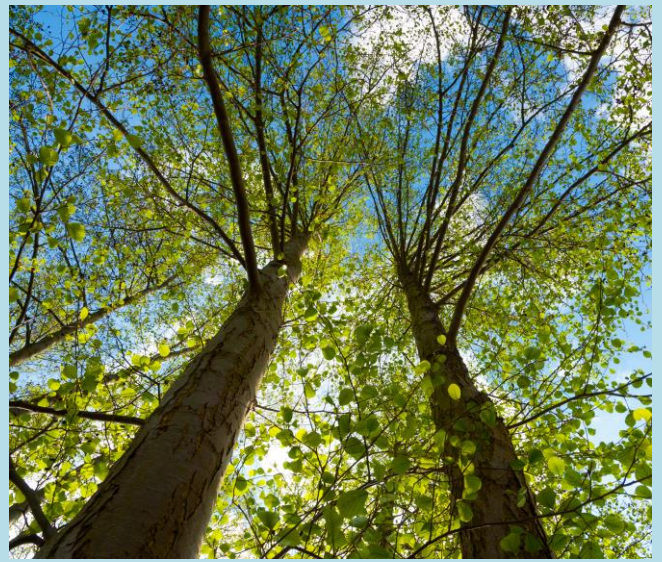


Institute for
European
Environmental
Policy

Designing a LULUCF pillar that works for forests and climate

Report and
recommendations

November 2015



Disclaimer: The arguments expressed in this report are solely those of the authors, and do not reflect the opinion of any other party. IEEP is grateful to FERN for supporting the preparation of this report, and to Kate Dooley.

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This report was commissioned by the forest and rights NGO Fern, in the light of earlier research they commissioned from the Öko-Institut on the impacts of including net carbon sequestration from what is called the Land Use, Land Use Change and Forestry sector (which we will shorten to LULUCF in the rest of this report) in the EU's climate target framework for 2030¹. It develops some proposals for how best to include LULUCF emissions and removals in the EU's climate target framework. Our underlying objective is to bring LULUCF into the framework in ways which genuinely add to the EU's mitigation contribution to tackling climate change.

The sectors covered by LULUCF – mainly forestry and agriculture – have some special characteristics which need to be borne in mind by policymakers. We outline first some of the background on LULUCF policy (section 2), in particular the context of the EU's contribution to the COP 21 negotiations at Paris and the future implementation of its decisions, before identifying some of those critically important special aspects that policy on LULUCF needs to address (section 3).

We then set out some key criteria for evaluating the effectiveness and sustainability of options for the inclusion of LULUCF (section 4), focusing on climate and wider environmental integrity. Section 5 then explains why we think it is important to tackle LULUCF in a separate instrument, rather than combining it with other sectors currently covered by the EU's Effort Sharing Decision, and identifies some possible approaches to the design of a separate LULUCF pillar. These are then assessed against our criteria in Section 6. On the basis of the analysis set out above, we recommend a design based on the following:

- A stand-alone LULUCF regime, covering the net carbon sink in all LULUCF sectors, with participation initially confined to those Member States for whom LULUCF emissions represent a significant part of their emissions;
- Targets for each Member State to be constructed on the basis of criteria reflecting their potential for LULUCF mitigation, against a rigorously calculated baseline reflecting the impact of past decisions on the net sink, modulated by GDP per head, to meet an overall target for the participating Member States designed to achieve a similar cost per tonne of carbon as will apply in the ETS and ESD sectors;
- Further consideration of options for enforcing compliance, for creating incentives for increasing the sink of harvested wood products;
- Enhanced implementation of the Strategic Environmental Assessment Directive and of the Environmental Impact Assessment Directive in relation to LULUCF plans and individual afforestation measures, to ensure effective control of wider environmental impacts.

¹ H Böttcher and J Graichen, "Impacts on the EU 2030 climate target of including LULUCF in the climate and energy policy framework", Berlin 2015

2 Background and objectives for the study

2.1 Background

Emissions and removals of greenhouse gas resulting from the EU land use, land use change and forestry (LULUCF) sector are currently not counted towards the EU's 20 per cent greenhouse gas (GHG) reduction target for 2020, as laid down in the 2020 Climate and Energy Package². This contrasts with the requirements of the Kyoto Protocol, under which some LULUCF activities³ are accounted for in the EU's quantified emission limitation and reduction commitments.

With this international context in mind, and acknowledging the need to adopt a holistic approach with respect to land use moving towards a low carbon economy by 2050, the European Council endorsed the proposed 2030 Climate and Energy Package in October 2014⁴, which foresees the inclusion of LULUCF in the framework of reduction targets to be reached by 2030. This has since been confirmed with the submission of the Intended Nationally Determined Contribution (INDC) of the EU and its Member States to the UNFCCC in advance of the COP21⁵, in which the EU announces that its next commitment target is to cover 100 per cent of emissions, implying it also includes the LULUCF sector⁶. However, it is unclear whether inclusion of LULUCF in the EU's *at least* 40 per cent domestic emissions reduction target fully reflects the European Council's guidelines, which appear to leave open the question of whether the LULUCF contribution should be *additional* to the 40 per cent reduction. There is thus considerable scope for further discussion in advance of the EU legislating for its targets, to ensure that the contribution from LULUCF is genuinely additional and maintains the overall ambition level of the EU target. Furthermore, the EU's INDC requires LULUCF to be included according to principles of 'environmental integrity'⁷.

In response to the policy guidelines from the European Council, the European Commission launched in 2015 a public consultation on the integration of agriculture, forestry and other land use (AFOLU) in the 2030 EU climate and energy policy framework to seek input on

² For information on EU 2020 climate and energy package see:

http://ec.europa.eu/clima/policies/strategies/2020/documentation_en.htm

³ LULUCF activities covered by the Kyoto Protocol are listed under Articles 3.3 and 3.4. They relate to direct human-induced land-use change and forestry activities, as follows: afforestation, reforestation and deforestation that occurred since 1990; and any elected human-induced activities, which can be: forest management, revegetation, cropland management and grazing land management.

http://unfccc.int/land_use_and_climate_change/lulucf/items/4129.php

⁴ European Council conclusions 23/24 October 2014, EUCO 169/14

http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145397.pdf

⁵ Latvia and the European Commission on behalf of the European Union and its Member States, Intended Nationally Determined Contribution of the EU and its Member States, June 2015, <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Latvia/1/LV-03-06-EU%20INDC.pdf>

⁶ Although it is unclear that this properly reflects the European Council's decisions on targets, which appeared to leave open the question of whether the inclusion of LULUCF would contribute to delivery of the 40% domestic target, or require a recalculation of the target. Maybe this should be in text rather a footnote – important point

⁷ Latvia and the European Commission on behalf of the European Union and its Member States, INDC of the EU and its Member States, op. cit.

three policy options and to reflect on how best to include and deal with emissions from these sectors. The options included in the Commission's consultation are based on changes to the current architecture for climate targets up to 2020, which divides the non-LULUCF emissions into:

- (i) those covered by the EU Emissions Trading System (ETS)⁸, which sets an EU-level cap for emissions that the main GHG-producing industrial installations, as well as some air flights, are allowed to emit, and
- (ii) the rest, which include emissions from transport, much of the heating sector, and agriculture, which are covered by the Effort Sharing Decision⁹ (ESD), which sets targets for each Member State, but allows for some trading of effort between Member States.

The responses to this consultation showed that stakeholders and Member States had mixed views on the different policy options, while many respondents did not indicate their preferred option¹⁰. The main issue preventing respondents taking a firm view on a particular option was the lack of definition and agreement on the accounting, target setting and flexibility rules that would be applied under each. This led respondents to understand or assume very different things on these pending issues, and similar interest groups to reach different conclusions as to what option was best. Broadly speaking, environmental NGOs, forestry representatives and other interest groups (e.g. including some agricultural groups) were for most part in favour of a separate LULUCF pillar (option 1) under certain conditions such as maintaining the 'environmental integrity' of the EU's 40 per cent target by 2030. For private and state forest representatives, this option was seen as potentially protecting forest sinks and forest-based industries from pressures from

Box 1: The European Commission's options for including LULUCF in the 2030 target framework

The options considered in the Commission's consultation on the inclusion of LULUCF were:

1. **LULUCF pillar:** Maintain non-CO₂ agriculture sector emissions in a potential future Effort Sharing Decision, and further develop a LULUCF sector policy approach separately;
2. **Land use sector pillar:** Merging the LULUCF and agriculture sector non-CO₂ emissions into one new and independent pillar of the EU's climate policy;
3. **Effort Sharing:** Include the LULUCF sector in a potential future Effort Sharing Decision.

Essentially, the question tackled is whether there should be a legislative boundary between non-CO₂ emissions from agriculture, and LULUCF; and where the boundary should be drawn between land use emissions and the rest of the EU economy

⁸ As set out in Directive No 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, as amended by Directive 2009/29/EC and subsequent acts

⁹ Decision No 406/2009/EC 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

¹⁰ The consultation, and the responses, can be found at:

http://ec.europa.eu/clima/consultations/articles/0026_en.htm

other sectors – for example, pressure to reduce harvesting activity as a result of a short-term gap in Member States’ mitigation in other sectors. There was a large disparity between Member States’ positions on the policy options, although some Member States with limited LULUCF mitigation potential called for more flexibility across sectors which they thought could be best allowed by merging LULUCF in the ESD sectors (option 3). There was also no clear consensus among agricultural organisations, with a slight preference for the AFOLU pillar (option 2).

2.2 LULUCF issues to be addressed at UNFCCC COP21 and their relevance for EU

A key element in the context for EU policymaking on inclusion of LULUCF in its 2030 climate and energy framework is the current negotiations of the parties to the United Nations Framework Convention on Climate Change (UNFCCC). Emissions and removals from soils and forests are reported by EU Member States as a part of their commitments under the Kyoto Protocol to the UNFCCC. As this report is being written, negotiations on a new international climate agreement are in progress in the run-up to COP21 in Paris; its concrete provisions relevant to LULUCF are therefore not yet known. Discussions about how to account for soil and forestry sinks and emissions have led to frequent changes to draft negotiating text of the COP21 agreement^{11,12}; reflecting Parties’ perception of the complexity of the LULUCF accounting and discrepancy between climate change mitigation and food security. For instance, approaches of those Parties to the agreement who would like to see LULUCF play a stronger role in climate change mitigation than it does today seem to conflict with those who are wary of additional restrictions on their land use, especially as far as the agricultural sector is concerned. These tensions are likely to influence the Parties’ decision on the extent to which land use is included in the new agreement under UNFCCC, and whether or not it should include a mandate for development of separate accounting rules for LULUCF. The outcome of COP21 will therefore provide strategic orientation on the future of LULUCF in the international context.

If a mandate on accounting is given, the accounting rules and the modalities of use of LULUCF credits are likely to be developed throughout 2016 (starting in May 2016) and may be ready for adoption in COP22. It is not clear, however, whether the new rules will lead to “more comprehensive accounting of anthropogenic emissions by sources and removals by sinks from LULUCF, including through a more inclusive activity-based approach or a land-based approach”¹³ – an approach that has been endorsed by the scientific body of the Parties to the UNFCCC and Kyoto Protocol (Subsidiary Body for Scientific and Technological Advice, SBSTA) over the past several years.

Regardless of the outcome of the COP21, the way LULUCF sinks and emissions are addressed in a new international agreement will have significant implications for the design

¹¹ ADP Contact Group, Draft agreement and draft decision on workstreams 1 and 2 of the Ad Hoc Working Group on the Durban Platform for Enhanced Action, ADP.2015.11.Informal Note, 6 November 2015, available at: <http://unfccc.int/resource/docs/2015/adp2/eng/11infnot.pdf>

¹² Ad Hoc Working Group on the Durban Platform for Enhanced Action, Streamlined and consolidated text, Version of 11 June 2015, http://unfccc.int/files/bodies/awg/application/pdf/adp2-9_i3_11jun2015t1630_np.pdf

¹³ Decision 2/CMP.7, <http://unfccc.int/resource/docs/2011/cmp7/eng/10a01.pdf#page=11>

of EU policy. Accounting for, and setting targets for, LULUCF is complicated by the fact that the sector provides both removals, in the form of carbon sequestration, and emissions, in the form of carbon losses (for example, when trees are cut down); and by the fact that increased carbon sequestration in natural ecosystems is by its very nature a temporary part of a natural cycle, and therefore not directly comparable to avoided emissions from sectors such as electricity generation. Several countries intend to use forest carbon goals as part of their contributions¹⁴ to the UNFCCC agreement¹⁵. Critically, the UNFCCC discussions addressing how LULUCF may be used to meet the nationally determined contributions¹⁶ will coincide with the EU's redefinition of the role of LULUCF in its own framework of climate targets.

As the EU Member States' commitment to include LULUCF in the EU climate and energy framework is non-conditional¹⁷, EU policy choices will have an impact on the continuing UNFCCC discussion, both in terms of the EU's own negotiating objectives, but also in terms of the message that it sends about what is acceptable in other parties, including those where inventories may be less robust, or who may have a less comprehensive legal framework of wider environmental and social protection. As we note below, the need for complex accounting rules are intrinsic to LULUCF (to separate anthropogenic from non-anthropogenic emissions, age-class structure of forests, the reversible and temporary nature of removals etc.) meaning that results are different depending on how accounting rules are set, and that Parties have a number of options open to them; and this has a significant relevance to ambition. UNEP, for example, calculated that the difference between a "strict" and a "lenient" approach to LULUCF in relation to 2010 pledges in the run-up to the Copenhagen COP could amount globally to 2 Gt of CO₂ equivalent¹⁸. There is thus an opportunity for effective LULUCF solutions developed at the EU level, both in terms of rigorous reporting and accounting, and of effective policies to drive appropriate sequestration action, to have a wider impact as a model for other Parties. There are also risks that an EU system which is insufficiently stringent in ensuring real mitigation benefits could provide a poor example to Parties where the margin for error is greater due to larger volumes of emissions and removals and more complex governance arrangements. Hence, it will be important to ensure that the EU approach adopted internally is consistent with, and does not undermine, a sustainable and ambitious approach to forests and land use from other parties to the UNFCCC.

¹⁴ The term "contribution" in this report denominates either binding or non-binding commitment.

¹⁵ For instance forest carbon goal is particularly high in the Chinese INDC; China plans to increase its forest carbon stocks by 4.5 billion cubic meters, which according to World Resources Institute, implies an increase in forest cover of 50-100 million hectares creating a roughly 1-gigaton carbon sink, Fransen, T., Song, R., Stolle, and Henderson, G. (2015), A Closer Look at China's New Climate Plan (INDC), available at: <http://www.wri.org/blog/2015/07/closer-look-chinas-new-climate-plan-indc>

¹⁶ For example, Parties may be asked to report their intention "to employ land- or activity-based accounting for the anthropogenic LULUCF categories or activities" alongside the corresponding reference values for use in accounting. ADP Contact Group, Draft agreement..., 6 November 2015, op. cit.

¹⁷ In other words, it will be implemented regardless of whether COP21 leads to an ambitious global deal.

¹⁸ UNEP, 2010: "Emissions Gap Report: Are the Copenhagen Accord Pledges Sufficient to Limit Global Warming to 2°C or 1.5°C? A preliminary assessment" -

<http://www.unep.org/publications/ebooks/emissionsgapreport/chapter3.asp?c=3.3>

In this light, the timing of new LULUCF rules at EU level is strategic. If it wishes to create a positive model, the EU cannot afford to delay the decision making process on the LULUCF accounting methodologies (as was the case under current international commitments, when the exclusion of LULUCF from 2020 EU climate framework and methodological uncertainties effectively slowed down the adoption of decision on accounting rules related to LULUCF¹⁹).

With this in mind, this report outlines a framework for a separate LULUCF pillar. Section 5.1 below explains in more detail the rationale for choosing a separate pillar for LULUCF emissions, in particular focusing on the risks to mitigation incentives in other sectors, and the uncertainties inherent to LULUCF sequestration and its measurement.

2.3 Objectives and our approach for the study

The aim of this study is to outline a framework for a separate LULUCF pillar (option 1), which ensures that Europe stays on an effective climate change mitigation pathway, whilst delivering on its renewable energy commitments and avoiding negative impacts on food security and biodiversity. Simplicity and transparency will also be important factors, in a sector where carbon impacts are often difficult to communicate both to practitioners and to a wider public.

As an introduction to our work, **chapter 3 provides a short outline of some critical issues relating to LULUCF activities** outlining the complexity and uniqueness of policies to manage emissions in this area. The issues outlined need to be considered fully when designing a separate LULUCF pillar.

As a first step in our work, **we identify a set of success criteria for the design of a separate LULUCF pillar**, providing a basis for an assessment of the various approaches to establishing such a pillar. The criteria are set out in chapter 4 of this report.

We then set out, **a list of possible approaches in designing a LULUCF pillar** which are presented in Chapter 5. This chapter provides a brief overview of the mitigation potential of these approaches at a broad level, and notes some of the likely risks. Additional elements reflecting the need to address the criteria established in chapter 4 are also discussed.

Chapter 6 presents our assessment of the different approaches to the design of a LULUCF pillar against the set of success criteria indicated in chapter 4.

Finally, **chapter 7 provides a synthesis of the work and offers recommended policy approaches**.

¹⁹ Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities

3 Critical issues relevant to inclusion of LULUCF

Before considering detailed criteria for the assessment of policy options, and defining the policy options to be assessed, it is worth first identifying a number of characteristics of the LULUCF sector that influence decisions on how best to reflect the contribution it makes, through its associated emissions and removals, to the EU emissions reduction target. The exclusion of LULUCF emissions and sinks from much of EU policymaking on target delivery up to this point, and the different policy audiences for issues relating to the land use sector on the one hand and to the industrial and energy system emissions covered by most mitigation policy, has created the potential for significant misunderstandings. In particular, stakeholders in the sectors (other than agriculture) currently covered by the Effort Sharing Decision often have gaps in their understanding of the mitigation options available in LULUCF (long timescales, temporary nature, and risks to the carbon sequestered); and the forestry sector, while it has a good understanding of mitigation potential (and an interest in carbon price rewards for mitigation activity) has limited visibility of the sorts of drivers that might be created were LULUCF mitigation to be included in the Effort Sharing Decision, or if LULUCF credits were allowed to meet emissions reduction targets in other sectors. These issues (dealt with in more detail below), explain why LULUCF emissions and removals are not directly comparable with emissions in other sectors, and is one of the reasons why this report develops options for a separate pillar.

3.1 Robustness and reliability of LULUCF inventories

A detailed analysis of the accounting rules governing LULUCF inventories is outside the scope of this report. However, it is important to recognise that, while all Kyoto Protocol inventory areas²⁰, are subject to uncertainties and potential errors in estimation, these uncertainties are much greater in the LULUCF sector. For fossil fuel emissions, it is possible to be relatively confident on the likely carbon impacts; and in ETS sectors the estimates included in national inventories are backed up in regulatory terms by direct measurement of emissions at individual installations. LULUCF accounting rules represent a good scientific method of estimating anthropogenic impacts on GHG concentrations, in the light of the complications created by recording both emissions and removals, and dealing with the measurement of natural systems. Nonetheless, these rules depend on estimation and extrapolation to determine emissions factors and activity data, in a sector that in many Member States is characterised by the existence of dispersed, fragmented and relatively small plots of land on which there are variable data, resulting in levels of uncertainty for LULUCF accounting at around 38 per cent in the EU, compared to around 8 per cent uncertainty levels on accounting for emissions from the energy sector. The introduction of targets and of a legal requirement to reduce emissions will need to be translated by Member States into specific incentives for individual landowners and forest managers; the systems available for measuring LULUCF emissions are unlikely to allow for direct measurement of emissions from each parcel of land, in a similar way, for example, possible the measurement of emissions from combustion plant covered by the EU Emissions Trading System.

²⁰ Notably non-CO₂ emissions from the agriculture sector.

There is also a risk that LULUCF inventories may struggle to reflect fully the reality of changing practices (literally) on the ground. In the case of cropland and grassland management, for example, measures likely to improve soil carbon sequestration are unlikely to be reflected at all, or reflected reliably, in national inventories, creating a risk of confused messages at the level of individual farm businesses.²¹

3.2 Temporary nature of mitigation

LULUCF mitigation is fundamentally different in nature to mitigation involving reduced emissions, particularly reduced emissions from the burning of fossil fuels. It involves increasing the capacity of natural systems (and, in the case of harvested wood products, our economy) to store carbon; but that storage is by its nature temporary, and vulnerable to early release in the event of natural disasters such as forest fires, or release of soil carbon as a result of changes in land management practices. While there is clearly a mitigation benefit from increasing the potential of natural systems to store carbon, and in particular to measures to avoid losses of carbon from deforestation, these benefits should not be treated as equivalent to the mitigation benefits of avoiding combustion of fossil fuels.

3.3 Long time-scale for key LULUCF mitigation options

The development of rules for LULUCF in the UNFCCC and the Kyoto Protocol has, from the beginning, recognised that some of the carbon sequestration that takes place in forests each year results from decisions taken historically; for example, an afforestation investment can take more than 20 years before its annual sequestration of carbon peaks. This has the implication that a significant proportion of the sink from forests is based on decisions which may have been taken before the Kyoto Protocol was agreed, and certainly before the decision to include LULUCF in the framework of the EU's 2030 targets. This challenge has been addressed in the international context by the development of a system of Forest Management Reference Levels, which aim to establish a baseline against which the effect of new policies can be measured. However, as a report produced for Fern and IFOAM by Öko-Institut²² shows, the construction of a Forest Management Reference Level involves a number of judgements, and different approaches can have significant implications for the mitigation which can be credited to the LULUCF sector.

While a delay between investment decisions and their mitigation impacts is not unique to forestry (there is a time lag, for example, between investment decisions on construction of renewable energy or major energy efficiency improvements to have an impact on emissions), the scale of that delay in the case of afforestation and reforestation is of a different order. The long-term nature of the impacts of some forestry decisions has implications not just for the construction of a baseline against which to measure action, but

²¹ The same is also true for measures to reduce non-CO₂ emissions from agriculture, where in many cases inventories are calculated on the basis of applying an emissions factor to the number of livestock units – thereby obscuring the range of different GHG intensities of different farming practices.

²² Öko-Institut (2015), Impacts on the EU 2030 climate target of including LULUCF in the climate and energy policy framework, Report prepared for FERN and IFOAM, <http://www.oeko.de/oekodoc/2320/2015-491-en.pdf>

for the effectiveness of incentives for action. The choice of a medium-term deadline such as 2030 to frame targets makes sense for most economic sectors (provided, of course, that those medium term targets are constructed so as to be consistent with a long-run resource efficient and cost-effective delivery of longer-term targets); but creates distortions in LULUCF decision-making, in that shorter-term mitigation options such as agricultural land management or reducing harvesting rates can count fully towards a 2030 target, while forestry investments will have limited impact. This risks providing insufficient recognition of the contribution of longer term forestry investments to delivery of more demanding, longer-term targets.

3.4 Impacts on biodiversity

The LULUCF sector is unique among mitigation sectors in that it is, effectively, a terrestrial ecosystem (natural or semi-natural depending on the extent of human intervention). This creates some unique challenges. Our report addresses the importance of ensuring that LULUCF mitigation action is consistent with biodiversity protection (and, ideally, contributes significantly to the creation or protection of endangered habitats), and hence the importance of designing the policy mix for LULUCF mitigation. It is, in particular, important to ensure that the incentives created at EU level, or put in place by individual Member States in order to meet LULUCF targets, do not encourage forestry investments (for example, monoculture of fast-growing tree species) which are not compatible with biodiversity objectives. There are also potential indirect land use impacts deriving from converting agricultural land to forestry, similar to the more widely publicised indirect land use impacts of using agricultural products for bioenergy. We set out below some of the accompanying measures which could be considered to address these risks.

3.5 Emissions associated with biomass use in other sectors, particularly energy

It is beyond the scope of this research to address all the potential sequestration pathways that biomass might take as it moves through a given market. However, when considering the development of a LULUCF pillar it is worth reflecting on the difference between the material use of biomass – in harvested wood products with a range of lifespans - and its use for energy purposes. Given the current accounting framework, it is particularly important that the interaction between the LULUCF and energy sectors are considered fully when designing a new LULUCF pillar in the post-2020 EU climate framework.

Currently there is a separation in the way in which the carbon impacts of bioenergy are accounted for within LULUCF and in the EU ETS sectors. Within the EU ETS, bioenergy is considered to be carbon neutral based on the assumption that the emissions associated with the energy consumption of biomass have already been accounted for by the growing of the biomass in the LULUCF sector. However, the time taken to accumulate carbon in biomass during the growing period is far greater than that in which it is consumed through the energy generating process, such as combustion. To then sequester the same amount of carbon again could take decades to centuries (in the case of forest biomass), resulting in a lag between the point at which the carbon was released and that in which it can be re-

sequestered. This lag period is often called the ‘carbon debt’ period and has been described in detail in Bowyer et al²³.

A further issue for energy use is the fact that sustainability criteria are only applied to biofuels, and not to solid biomass. This presents difficulties, particularly in relation to imported feedstock for bioenergy, since the two key factors determining whether biomass actually reduces emissions in comparison to fossil fuels are (i) the location and (ii) the method in which the biomass is produced and harvested. According to a recently established study, biomass emissions being zero carbon-rated within the EU ETS are currently in the range of 90 to 150 million tonnes of CO₂ equivalents, which equal to approximately 4-7 per cent of the overall emission allowances under the ETS cap. Naturally, sustainability concerns of bioenergy cover not only climate mitigation issues but broader environmental and social aspects as well; such issues are further detailed in the below sections.

Significant further policy analysis will be needed to ensure that the incentives for LULUCF created by its inclusion in the EU’s 2030 framework of climate and energy targets, and the rules applying to biomass use in the energy sector, both in transport and in the EU ETS, are consistent, and avoid risks of double-counting of carbon savings and wider land use impacts, both in the EU and in other economies.

3.6 The specific nature of social impacts from LULUCF mitigation

Finally, while there are significant social impacts associated with all forms of mitigation activity (both positive and negative), the social impacts resulting from LULUCF sector mitigation activity reflect the specific nature of land use. These can include impacts on land rights – mainly driven through indirect land use change impacts, and affecting populations in developing countries subject to deforestation pressures, but potentially including pressures on agricultural land in countries supplying the EU market. Other impacts could include changes to amenity land available to EU populations. Our research has not had sufficient time to address potential social impacts in any depth, but this is an important area which merits attention before the EU adopts policies which increase reliance on land based mitigation.

3.7 Implications for policy design

All of the factors discussed above need to be reflected in the design of an EU legislative approach to including LULUCF in the system of climate mitigation targets for 2030. Ideally, policy design should ensure that incentives for land managers point in the right direction on all of these issues; where this is not possible (for example, where objectives such as climate mitigation and biodiversity protection are potentially in conflict) the risks need to be mitigated as effectively as possible.

²³ IEEP (2012), The GHG emissions intensity of bioenergy. Does bioenergy have a role to play in reducing Europe’s GHG emissions?, [http://www.ieep.eu/assets/1008/IEEP - The GHG Emissions Intensity of Bioenergy - October 2012.pdf](http://www.ieep.eu/assets/1008/IEEP_-_The_GHG_Emissions_Intensity_of_Bioenergy_-_October_2012.pdf)

4 Criteria used for evaluation of policy design approaches

This section, in the light of several of the special characteristics of the sector, identifies what in our view should be the key criteria used to assess different options for the inclusion of LULUCF removals and emissions in the EU's target framework for 2030.

4.1 Climate integrity: direct impact on greenhouse gas concentrations

We propose to consider climate mitigation impacts from the point of view of whether the option chosen is likely to lead to, and to maximise, a reduction over time in the human contribution to greenhouse gas concentrations in the atmosphere. Focusing on atmospheric concentrations over time helps to ensure that the options of reducing anthropogenic emissions on the one hand, and maximising sequestration on the other hand, are treated appropriately with respect to the different value of their contribution to mitigating climate change. Crucially, given the temporary and at risk nature of carbon sequestration (including, for example, risks linked to the impact of climate change itself on natural ecosystems, such as increased forest fire risks in the Mediterranean basin), avoiding emissions in the first place has a more direct and certain impact. In addition, a key focus of our assessment will be the need to determine whether the mitigation ascribed to LULUCF can be reliably considered to be human-induced, and is additional to what would have happened under a Business as Usual trajectory (i.e. is the result of current or future decisions), rather than the result of past decisions (for example, the continuing impacts of afforestation decisions in recent years). The impacts of past decisions should be treated as an element in calculations of trend levels (a principle enshrined in the rules adopted by the Kyoto Protocol).

4.2 Climate integrity: impact on mitigation ambition in other sectors

A key risk of incorporation of the LULUCF sector into the EU 2030 framework is its potential impact on the overall level of mitigation ambition within the EU; does any additional LULUCF mitigation achieved add directly to the overall total of EU mitigation, or does it displace ambition in other sectors? Risks of reduced ambition in other sectors are lessened by ensuring that LULUCF is included in a separate pillar; but there are likely to be political pressures for LULUCF removals to be available for use to offset Effort Sharing Decision and even Emissions Trading System targets. If LULUCF mitigation can be used directly or indirectly to meet targets in other sectors, it will reduce the level of mitigation required from those sectors – potentially leading to a less cost-effective long-term trajectory for decarbonisation. This would be problematic even if it relates to the mitigation impacts of current and future LULUCF decisions (in that it would reduce the potential contribution of LULUCF to overall mitigation, and may prevent long-term cost-effective investments in decarbonisation in other sectors); and even more so if it relates to mitigation resulting from past LULUCF decisions (in that it may lead to a reduction in overall EU mitigation). While we do not address in detail the connection between rules applying in the LULUCF sectors, and the treatment of bioenergy in other policy regimes - for example, the drawbacks associated with the zero-rating of biomass combustion in the EU ETS – we note where such impacts are likely to be relevant. Finally, impacts on other sectors may be dynamic: the incorporation of LULUCF into the framework for 2030 may, even if negative impacts are avoided in the next

period, nevertheless have an impact on the levels of ambition set in the future for the 2030s and beyond.

4.3 Broader environmental integrity

Environmental impacts of LULUCF options will include on the one hand potential for positive impacts (in particular, positive biodiversity, soil quality, water quality and air pollution co-benefits from sequestration options on agricultural land or through forestry; potentially also resource use co-benefits from increased sequestration in harvested wood products displacing other, more carbon-intensive, materials). There is also a wide range of potential risks, including losses to biodiversity through inappropriate afforestation measures (which are summarised in Box 2 below), and environmental damage associated with indirect land use change impacts in other economies. There are also risks associated with displacing mitigation effort in other sectors (in particular, reducing carbon emissions from fossil fuel combustion usually also has a positive impact on air quality as a result of reductions in associated particulate and sulphur emissions - so reducing the downward pressure on fossil fuel emissions would mean foregoing some of those benefits). As noted above, there may also be impacts which are consequential on the example EU approaches to LULUCF create for other parties to the UNFCCC and to a Paris deal: a system with a robust and rigorous approach which successfully maximises environmental outcomes could provide a positive example, whereas approaches with less effective safeguards (even if some issues, for example deforestation, are viewed as less likely in the EU because of other regulatory constraints) could create unwelcome precedents which are relied on by other parties. These broader issues will need to be examined by the forthcoming impact assessment on the LULUCF decision.

Box 2: Biodiversity impacts of afforestation

A key consideration in the design of a solution for the LULUCF sectors is the impact on biodiversity of mitigation activity in response to any incentives created. This concern applies principally to the incentives for afforestation. Afforestation, understood as conversion to forest land actively promoted through planting of trees, may have either a positive or negative impact on biodiversity. The impacts depend on factors such as: biodiversity status of land before planting, size, type (e.g. natural forest vs. mono-cultures), density and location of planted forest, species of trees (native vs. exotic), forest management, associated drainage, soil amelioration, sub-soiling or landscaping, as well as subsequent changes to ecosystem services and displacement of land use change to other ecosystems.

- **Positive biodiversity impacts** of afforestation (in addition to the mitigation benefits) include: restoration of degraded land and long-term creation of new habitats when on areas of low biodiversity value, which can increase habitat diversity and connectivity at the landscape scale if species and planting is locally specific. As Bremer and Farley point out: “although plantations often support fewer specialist species than natural ecosystems, under some conditions they can play an important role in biodiversity conservation and recuperation, particularly at the landscape level”¹.
- **Negative biodiversity impacts** include loss and fragmentation of previously established habitats such as grasslands, dunes or wetlands, usually extremely rich in biodiversity. Afforestation is also often associated with other detrimental impacts, such as drainage and the creation of forest roads. Some non-native tree species used for afforestation can spread and become invasive in other sensitive habitats. Some impacts on biodiversity may be difficult to quantify, afforestation may have a neutral impact on the total number of the species but radically change the community composition².

After 2020, pressure on such land conversions is expected to grow proportionally to the increase of the economic value of forest service as a carbon sink. If the environmental integrity of new policy measures is to be ensured, adequate safeguards should be in place. Part of such safeguards are embedded in EU legislation, namely Strategic Environmental Assessment (SEA, 2001/42/EC) and Environmental Impact Assessment (EIA, 2011/92/EU) directives, legislation protecting Natura 2000 sites and strictly protected species and Environmental Liability Directive (2004/35/EC). Criteria aimed at protecting sensitive habitats from inappropriate afforestation have recently been specified under the Common Agricultural Policy (Commission Delegated Regulation (EU) No 807/2014) and the Renewable Energy Directive (Commission Regulation 1307/2014). These acts and guidance³ on their implementation will gain on strategic importance. For instance, two SEA and EIA guidance documents issued by EC in 2013 provide a good starting point for decision-making, but are based on premises that will be no longer valid after 2020. New policies call for a revision of the guidance documents. Additional binding safeguards may be needed; possibly introduced by linking the accounting rules to a set of “afforestation sustainability criteria”.

¹Buscardo, E. et al. (2008), The early effects of afforestation on biodiversity of grasslands in Ireland, chapter in: Brockerhoff, E. G., et al. (2008) *Plantation Forests and Biodiversity: Oxymoron or Opportunity?*

²Elmarsdottir, A. et al. (2008) *Effects of afforestation on biodiversity*, AFFORNORD project

³e.g. C (2013), [Guidance on Integrating Climate Change and Biodiversity into Strategic Environmental Assessment](#), and EC (2013) [Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment](#).

5 Policy design approaches to the inclusion of LULUCF in the EU's climate target framework

5.1 The need for a separate pillar

A number of organisations responding to the Commission's consultation on the incorporation of LULUCF into the framework for EU climate targets for 2030 have set out concerns about the impact of including them in the Effort Sharing Decision (which, as explained above, is one of the two broad sectors for which EU mitigation targets are defined currently, the other being the Emissions Trading System covering emissions from large installations and energy). The points made in responses to the consultation, and the evidence included in recent research, including the Öko-Institut paper referred to above, offer what we consider to be clearly dissuasive arguments in favour of the creation of a separate LULUCF pillar, as detailed below.

5.1.1 *The downsides of inclusion in the Effort Sharing Decision*

There are two principle risks of including the LULUCF sector within the Effort Sharing Decision. The first, and most significant, is the risk of a reduction in the mitigation required from the sectors currently covered by the Effort Sharing Decision. Given that LULUCF currently provides a potential net sink at the collective EU level, inclusion of the sector without any change in targets would mean a significant weakening in the Effort Sharing Decision target at EU level²⁴. In principle, inclusion of the LULUCF sector, by expanding the scope for EU mitigation, should be seen as an opportunity to contribute additional mitigation to the EU's contribution to the global response. Moreover, in practice, delaying mitigation requirements in the Effort Sharing Decision sectors (which will need to make a more ambitious contribution to the more demanding targets necessary from 2030 onwards) is unlikely to be consistent with a least-cost pathway to longer-term mitigation goals, would reduce incentives for necessary investment in energy efficiency, transport electrification, and would lead to reduced co-benefits from reducing direct carbon emissions (including air quality co-benefits with significant potential to contribute to improved health outcomes across the EU).

The second risk is that inclusion of the LULUCF sector in the Effort Sharing Decision would create significant additional complexity for an already difficult process of allocating targets between Member States. The potential for increasing LULUCF sinks varies significantly among Member States (for instance, those with significant forest cover have relatively straightforward options available to them in the form of measures to reduce harvesting rates; others with limited forest cover would be mainly reliant on afforestation (which would be slow to contribute to the national inventory) or more costly or more technically challenging measures to improve soil carbon).

²⁴ Öko-Institut (2015), Impacts on the EU 2030 climate target of including LULUCF in the climate and energy policy framework, op. cit.

5.1.2 The downsides of creating a new “Agriculture, Forestry and Land Use” pillar

Similar arguments apply to the option of creating a new pillar combining the LULUCF sector with emissions, currently covered under the Effort Sharing Decision, from the agriculture sector – principally emissions of methane and nitrous oxide from the livestock sector and from soil fertilisation. While this approach has some initial attractions, in that it would allow the incentive structure for all land management sectors to be treated under one framework, and for the potential risks of indirect land use change from changes to agricultural production patterns in the EU, it has some significant disadvantages. In particular, it would reduce the incentives for climate mitigation in the agriculture sector, at a point when improved understanding of mitigation options and early learning on mitigation options are important; in the short term, opportunities for agriculture mitigation would be drowned out by simpler and better-understood options for LULUCF mitigation. It would also divorce emissions from agricultural production from the downstream emissions from food processing and transport, and from incentives on food consumption and food waste, thereby potentially hampering Member State efforts to take a holistic approach to the sector.

There would also be an impact on the challenge represented for different Member States by their targets under the Effort Sharing Decision – the Agriculture sector’s share of emissions varies significantly between Member States, from over 30 per cent in Ireland to around 5 per cent in Malta, and removing it from the ESD would thus have a significant impact on the level of challenge represented by ESD targets. This would complicate further a negotiation which is likely to be challenging, while at the same time adding a negotiation on AFOLU targets.

5.2 The main approaches

We set out here some possible broad approaches to the policy design for LULUCF, followed by a number of features in section 5.3 which could be added to the approaches.

5.2.1 Separate pillar: Member State targets for all of LULUCF

Under this approach, targets would be set for the total of all LULUCF categories²⁵, based on an assessment of (i) a baseline for Member State net emissions which represents the business-as-usual trajectory reflecting investments up to a 2015 base year; and (ii) the estimated LULUCF abatement potential available EU-wide under a cost per tonne broadly equivalent to that applied to the ETS and Effort Sharing Decision sectors.

A 2015 base year is chosen to ensure that only action taken from the point at which a broad policy decision was taken to include LULUCF emissions in the EU’s target framework leads to mitigation which is counted towards the target – different approaches to the base year could be envisaged, and it will be important to ensure a clear distinction between the

²⁵ The categories of emissions currently covered are: afforestation, reforestation, deforestation, forest management, cropland management, and grazing land management – see Decision 529/2013/EU on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry

approach to reporting against the EU's internal LULUCF target and any more relaxed approach to the calculation of Forest Management Reference Levels in the UNFCCC context.

The approach to setting the target at a similar level of cost per tonne to that applying in the ETS and ESD sectors reflects a broad principle of aiming to ensure that the LULUCF sector faces a similar level of carbon price to that faced by other sectors.

One variant on this broad approach would be to include only forestry emissions and removals (thus excluding cropland management and grassland management), on the grounds that LULUCF inventories for the latter are likely to be significantly less capable of reflecting measures taken at the level of individual farm holdings, and that significant further policy development will be necessary before consistent incentives can be developed for farms which reflect both non-CO₂ emissions, and CO₂ emissions and removals, from their holdings.

5.2.2 Separate Pillar: EU-wide targets supported by EU-wide policies and measures

Member States have indicated a preference in the EU2030 climate and energy package for avoiding national targets where possible – for example, in respect on renewable energy and energy efficiency. An alternative to the approach of setting targets at Member State level would be to develop an EU-wide target, supported by policies and measures at EU level, which could include making use of incentives linked to existing EU policies such as the Common Agricultural Policy. For example, a top-slice of funds under the CAP (and possibly also under Cohesion Policy) from the next budgetary period beginning in 2020 could be made available to Member States whose agriculture or forestry sectors were prepared to commit to deliver LULUCF mitigation significantly in excess of a (demanding) baseline, and in line with strict environmental and broader sustainability criteria. Regulatory measures could also be considered; for example, a revised proposal for a Soils Directive, focused on maximising soil carbon sequestration, with a commitment to strict evaluation of impacts and reporting of sequestration impacts; or a ban on peat use as a fertiliser. Measures could also be linked to improved monitoring, in particular monitoring of soil carbon levels, in order to improve the evidence base on which to base further action.

Under this option, a broad target could be set at EU level based on the same cost per tonne principle identified above for Member State targets. However, it is unclear whether a target at EU level can be enforced in any meaningful way, unless it is backed up by explicit targets at Member State level.

5.3 Features which could be added to the approaches

We consider here some additional design features which could be applied to one or other of the approaches identified above.

5.3.1 Limited/voluntary participation

Either of the approaches identified, but particularly the Member State targets, could be adapted to ensure more focused Member State coverage – for example, for smaller

Member States with limited existing LULUCF activity and limited potential for mitigation, the additional administrative impact of binding targets might be difficult to justify. Member States could be selected for participation on the basis of (i) total scale of LULUCF emissions and removals and (ii) an objective analysis of the potential for cost-effective LULUCF abatement. Other Member States could opt in to such a mechanism, where they wished to demonstrate additional activity beyond their ESD contribution, or could be allowed to transfer any additional LULUCF mitigation to those Member States with targets.

5.3.2 The penalty regime applying to failure to deliver Member State targets

The establishment of targets, even legally binding ones, does not guarantee that they will be delivered, as the likely failure of several Member States to meet their Renewable Energy Directive targets demonstrates. In principle, EU legislation is ultimately enforceable through the threat of action before the Court of Justice of the European Union (CJEU), accompanied in due course by fines in the event of persistent failure to implement. However, there is limited jurisprudence on Member State failure to meet date-specific targets. There is a risk that the time inevitably required to verify a failure to deliver, and then to bring a case before the CJEU, combined with the scope to argue that further time should be allowed, and that late achievement of the target could be considered as equivalent to compliance, would not create a sufficiently clear incentive for reluctant Member States to take timely action to deliver mitigation. The current Effort Sharing Decision therefore includes a number of penalty mechanisms which apply automatically, and without reference to the CJEU, in the event of failure to deliver targets, for example, by requiring the shortfall to be made up, plus a punitive additional amount, in subsequent years, together with the preparation of a corrective action plan. Similar mechanisms should be considered for a LULUCF pillar, although the timescales involved in LULUCF measures, and the annual fluctuations which are possible, would make it challenging to apply such penalties on a year-by-year basis.

However, in a relatively untested area for mitigation targets such as LULUCF, there could also be some disadvantages to pushing Member States to implement their targets blindly, regardless of consequences on land use or on biodiversity. There is also a strong argument for considering some flexibility around the delivery of targets. The option of trading between Member States, within the LULUCF sector, is considered below, and appears clearly advisable.

An additional possibility could be created which required Member States which failed to deliver their LULUCF targets to make up the shortfall through the use of ETS allowances or ESD allocations – an “escape valve” which would have the effect of requiring additional mitigation in those sectors. It would be important to ensure that this option did not undermine incentives for LULUCF mitigation, for example by placing a minimum cost per tonne of mitigation on the option to guard against the risk of a low carbon price in the other sectors²⁶; and to emphasise that while additional ETS or ESD mitigation could meet a shortfall in LULUCF mitigation, LULUCF credits could not be used to meet any shortfall in

²⁶ Thus, a minimum carbon price of (for example) €30 per tonne would mean that if a Member State fell short of its LULUCF target, but the ETS carbon price was only €20 per tonne, the Member State would need to pay €30 for each tonne of its shortfall, in effect buying 1.5 tonnes for every tonne of shortfall.

ESD mitigation, for the reasons set out at section 5.1.1 above. However, given the untested nature of the LULUCF regime, and the sensitivity of the ecosystems potentially affected, this appears to be a potentially valuable way of ensuring that the overall climate mitigation ambition of the policy is delivered.

5.3.3 Trading of Member State delivery of targets

The setting of Member State targets for the LULUCF sector under the first approach identified above would need to establish whether they can be met only by mitigation within the relevant Member State, or by a system like that applying in the Effort Sharing Decision allowing Member States to trade under- or over-delivery of their LULUCF targets. Our working assumption is that trading would be allowed; and that there are strong arguments for this both on cost-effectiveness grounds, but also to ensure that where a Member State faces a target which can only be met by measures which, on detailed analysis, create risks for biodiversity, it would not be required to implement them, but would be able to rely on more acceptable investments in other Member States.

5.3.4 Delayed, one-off use of LULUCF credits

While a direct link between the LULUCF pillar and the ESD is ruled out by the need to ensure robustness of the ESD targets (unless the ESD targets were to be significantly strengthened), there may be options for allowing a deferred use of credits. This would create some additional incentives for Member State involvement (relevant in the event of voluntary participation as discussed at 5.3.1 above, and, in terms of practical politics, to securing Council agreement to EU legislation to set LULUCF targets), and would better reflect the longer time-scales relevant to assessing LULUCF mitigation. One approach that could be considered would be to allow Member States to use a percentage of their surplus delivery of LULUCF mitigation to meet an individual Member State shortfall against ESD targets, but only provided the EU as a whole had exceeded its ESD target. This proviso would ensure that LULUCF credits did not lead to less mitigation being delivered in the ESD sectors than planned, which is important for reasons given in section 3 and section 5.1.1 above. It is important to recognise that LULUCF removals do not cancel out emissions in fossil fuel emissions (for reasons given in section 3), and care therefore needs to be taken.

5.3.5 Incentives for an increased Harvested Wood Products sink

While most approaches to mitigation through carbon sinks focus on carbon in trees or in soil, a third approach is possible: to increase sequestration in harvested wood products. Increasing the amount of carbon stored in the medium term, for example in furniture or in construction products, could have two benefits: firstly, the intrinsic mitigation value of the additional carbon stored (and thereby delayed in its journey to the atmosphere); and secondly, the displacement of materials with higher net carbon costs of production (metals, plastics, cement). The displacement impact would not, it should be noted, add directly to the total of EU mitigation, since the EU carbon emissions from manufacturing the displaced

products are already covered by the Emissions Trading Scheme cap²⁷; however, facilitating the delivery of the ETS cap by reducing demand for carbon-intensive goods has wider economic and social benefits in terms of driving down the cost of meeting the cap – in much the same way as investments in energy efficiency – as well as wider resource efficiency benefits. Either of the approaches identified at 5.2 above could be adapted to include harvested wood products. Key questions to be addressed would include the challenge of ensuring robust data on the wood products sink to avoid over-estimation; and the need to consider whether, and how, it would be possible to avoid the risk of leakage through increased imports of timber products, with the associated risk of increased pressure for deforestation.

²⁷ Similarly, the carbon emissions associated with imported carbon-intensive goods should in future be captured in the total emissions agreed under UNFCCC.

6 Assessment of the options against the criteria

Our assessment of the approaches and features identified in section 5 will be purely qualitative, at this stage. While information exists on the availability and cost of additional mitigation potential in LULUCF sectors, it is not comprehensive, and would require a more substantial programme of work to construct quantitative estimates of impacts. It should also be noted that our criteria do not directly tackle issues such as cost effectiveness, or EU value added, which are important elements in the Commission's criteria for impact assessment, although we address them in our comments on the options. The purpose of this report is to help to ensure that inclusion of LULUCF takes place in a way which is genuinely in line with the aim of reducing emissions with environmental integrity.

All of the new options we have identified are, in line with the approach set out in section 5.1, based on the first option in the Commission's consultation paper, a separate LULUCF pillar, although with a greater or lesser degree of potential for links to the other pillars. For the purposes of comparison, however, it is helpful first to consider the potential impacts associated with option 3 in the Commission's consultation paper: incorporation of LULUCF into the Effort Sharing Decision, and with option 2 in the consultation paper, a new Agriculture, Forestry and Land Use pillar.

6.1 Inclusion in the Effort Sharing Decision

In terms of **climate integrity**, this option would score badly, particularly in respect of the impact on ambition in other sectors (the direct incentives for mitigation in the LULUCF sector would be relatively high). While in principle it would be possible to include LULUCF in the Effort Sharing Decision and at the same time make the ESD target more demanding (to reflect the availability of additional mitigation potential for Member States), this is not the approach suggested by the drafting of the EU's INDC. The Öko-Institut paper²⁸ sets out a number of the concerns, in particular the risk of a significant reduction in ambition from the existing ESD sectors. This in turn leads to further risks for broader **environmental integrity**: the potential to use afforestation as a means of reducing mitigation pressures on other sectors could create incentives for investment in fast-growing monoculture plantations, with a negative impact on broader biodiversity objectives, and on landscape amenity values within the EU; and the potentially reduced co-benefits from improved air quality associated with reduced CO₂ emissions. Similarly, there is a likelihood that enhanced incentives for afforestation of agricultural land would lead to some indirect land use change (by virtue of the unmet demand for food products creating additional pressure for farmland at the global level); while those pressures are likely to be small (given that the most productive agricultural land is unlikely to be afforested), they will nevertheless be of a scale that could impact significantly on the benefits of forest mitigation, with knock-on implications (at the margin) for **social** impacts such as food prices, and land rights.

²⁸ Öko-Institut (2015), Impacts on the EU 2030 climate target of including LULUCF in the climate and energy policy framework, op. cit. report for FERN

6.2 An Agriculture, Forestry and Land Use pillar

Inclusion of LULUCF in a broader Agriculture, Forestry and Land Use pillar faces similar disadvantages in terms of **climate integrity**, in that it would be likely to displace mitigation of non-CO₂ GHG emissions from agriculture. There are also risks that Member States would argue for a reduction in their overall ESD targets to reflect the fact that they now had a much narrower sectoral coverage. On the other hand, if the effort notionally associated under the ESD with the proportion of the current ESD sector's emissions represented by agriculture were transferred to the new AFOLU pillar, there would be significant risks to broader **environmental integrity** arising from the likely political drivers to avoid placing burdens on the agriculture sector, leading to incentives for investment in fast-growing monoculture plantations.

6.3 A stand-alone LULUCF pillar

The following sections set out our assessment of the impact of the different approaches and features we have identified against the criteria we identified in Section 4.

6.3.1 *Climate integrity: direct impact on greenhouse gas concentrations*

The separate pillar options we have identified would generally be robust in their climate integrity in respect of their direct impact, provided a strict approach is taken to setting the baseline for targets, ensuring a rigorous focus on additional mitigation resulting from decisions which take place following the inclusion of LULUCF into the climate framework. However, some elements of the LULUCF inventory are more capable of responding to and recording mitigation action than others, and there are some potential benefits in terms of climate integrity from a focus on forestry-related options, at least in the short term.

The scale of contribution to climate mitigation will depend on the approach taken to setting targets for Member States; a consistent approach, as described above, would be to set targets based on the same broad levels of cost per tonne mitigated as for the ETS and ESD sectors (while noting that the temporary nature of LULUCF mitigation means that it is slightly less valuable as a mitigation option than avoided emissions, particularly avoided emissions of non-renewable carbon fuels). The option of focusing only on forestry options would have the downside of a less ambitious scope for mitigation; the option of focusing targets only on those Member States with significant LULUCF potential also has downsides in terms of coverage, although the loss of mitigation potential from the system would (by definition) be relatively small; and it is arguable that it might be possible to set targets more ambitiously for the relatively high-potential Member States if the political debate were not clouded by the concerns of those with limited potential.

The approach of setting a single EU-wide target, and the option of incentives to increase the Harvested Wood Products sink, both create some limited risks to the direct climate integrity of the targets. In the case of an EU-wide target, there is potential for a mismatch between the assumed mitigation benefit of the measures adopted at EU level, and the extent to which they are then recorded in Member State inventories (which argues for treating mitigation under this sector as being a voluntary addition to the targets proposed under the EU's INDC). And in the case of harvested wood products, the estimation necessarily required

in constructing inventories may lead to some inaccuracies, with enhanced incentives on Member States for optimistic reporting.

6.3.2 *Climate integrity: impact on mitigation ambition in other sectors*

The impact on mitigation in other sectors of a stand-alone LULUCF target is, by definition, limited, since there is no carry-over of credits between pillars. There is some potential for those Member States making a significant contribution to the LULUCF targets to argue that this mitigation contribution should be taken into account in the calculation of their ESD target, although the risk associated with carrying over credits is significantly smaller than the risk posed to the target-setting process if LULUCF were included in the ESD from the outset.

The two options included for delayed use of LULUCF credits potentially have an impact on future ambition in other sectors, although they are designed so as to reduce that impact as far as possible (and in particular to avoid reducing the incentives on Member States for early investment in decarbonisation of ESD sectors). The option of additional incentives for increasing the Harvested Wood Products sink potentially has positive impacts on mitigation ambition in other sectors: by displacing non-renewable carbon-intensive products, an increase in the use of wood products would reduce the pressure on caps in the Emissions Trading System and (to a lesser extent) the Effort Sharing Decision, which should, in turn, enhance the political feasibility of setting more demanding targets in future.

6.3.3 *Environmental Integrity*

The extent of impacts of our options on broader environmental integrity will depend on the way in which targets are set. The more constraining the targets are, and the more they apply to Member States with limited potential for meeting them through relatively low-impact mitigation options such as changes to harvesting rates, the greater are the risks of inappropriate afforestation decisions. Thus, the option of applying targets only to those Member States with significant LULUCF mitigation potential may help to reduce risks of negative broader environmental impacts, including the risk of indirect land use change as a result of the conversion of agricultural land to forestry. Alternatively, it may be necessary, as discussed in Box 2 above, to ensure enhanced implementation of existing EU legislation aimed at avoiding environmental damage.

The approach of setting an EU-wide target, and the option of incentives for Harvested Wood Products, create divergent impacts on broader environmental integrity. An EU-wide target, based on the adoption of specific regulatory measures, has the potential for specifying more closely the types of carbon sequestration encouraged (or required), and could both enable a much greater focus on measures and investments with significant biodiversity benefits and the exclusion of monoculture afforestation. Encouraging the development of the Harvested Wood Product sink is potentially consistent with good quality carbon sequestration in the EU and elsewhere; but creates the risk that additional demand for wood products would lead to some deforestation and carbon losses in other economies.

7 Conclusions

The impacts assessed for our different options are summarised below. The criteria should not be treated as equivalent, and calculating a composite score for each option is thus inappropriate. As explained above, a number of the potential features we have identified are capable of being combined; we have not separately assessed the potential impacts of combinations of options.

	Direct climate integrity	Indirect climate integrity	Broader environmental integrity
LULUCF pillar	✓✓✓	-	x/✓
Limited participation	✓✓✓	-	✓
Delayed use of credits	✓✓	x	x
EU-wide target	✓✓✓	-	✓✓
Harvested Wood Products	✓	✓✓✓	xx
Inclusion in ESD	✓✓	xxxxx	xxx
AFOLU pillar	✓✓	xxx	x

The table above includes the option of including the LULUCF sector in the Effort Sharing Decision, for comparison, together with the option of creation of a new Agriculture, Forestry and Land Use Pillar. Our view is that there are strong arguments for excluding these options, particularly the ESD option, both because it fails to deliver an additional contribution to EU mitigation efforts, but also because of the risks of delaying decarbonisation action in existing ESD sectors such as transport, agriculture, and heating. While there are some disadvantages against some of our criteria for each of the options for a stand-alone LULUCF pillar, they are significantly smaller than the disadvantages for incorporation into the ESD.

There are significant potential benefits from an EU-wide target, including regulatory options to encourage soil carbon sequestration. We recognise, however, that the political feasibility of such an option may be limited; and that pursuing it runs a significant risk of the content being watered down before legislation is adopted. There are also concerns about the enforceability of an EU target.

While enhanced incentives for improving the sink of Harvested Wood Products have some potential for synergies with emissions reduction objectives in the ETS and ESD sectors, we recommend further analysis of the option, and in particular its potential impact on wood imports, before it is pursued further.

On the basis of the analysis set out above, we recommend a design based on the following:

- A stand-alone LULUCF regime, covering the net carbon sink in all land use sectors;
- Participation limited to Member States with significant LULUCF potential compared to the size of their economy, with voluntary participation an option for other Member States;
- Targets for each Member State to be constructed on the basis of criteria reflecting their potential for LULUCF mitigation, against a rigorously calculated baseline reflecting the impact of past decisions on the net sink, modulated by GDP per head, to meet an overall target for the participating Member States designed to achieve a similar cost per tonne of carbon as will apply in the ETS and ESD sectors;
- Trading between Member States allowed within the LULUCF pillar;
- Assuming participation is voluntary for some or all Member States, the creation of a limited incentive to participation by allowing Member States to use some or all of their over-delivery against LULUCF targets to meet their ESD targets in 2030, provided the EU as a whole has achieved its collective 2030 objective for ESD;
- Enhanced implementation of the Strategic Environmental Assessment Directive and of the Environmental Impact Assessment Directive in relation to LULUCF plans and individual afforestation measures, to ensure effective control of wider environmental impacts.