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European Commission
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via electronic mail

RE: **JOINT SUBMISSION FOR PUBLIC CONSULTATION ON INDIRECT LAND-USE CHANGE**

On behalf of Transport & Environment, ClientEarth, European Environmental Bureau, and BirdLife International, we submit these comments to the Commission public consultation on indirect land-use change. The impacts of European Union (EU) biofuel policies have far reaching implications for climate, biodiversity, food and human populations worldwide. This consultation response outlines the main findings of the Commission-funded studies and advances solutions to address flaws in current EU biofuel legislation.

EU POLICIES ON TRANSPORT FUELS AND CLIMATE CHANGE

In April 2009, the EU legislature adopted the Renewable Energy Directive (RED), requiring Member States to use renewable energy sources to meet 10% of their transport needs by 2020.[1] This target will be met in large part through increased use of biofuels, which are considered a renewable source under EU law. Under the National Renewable Energy Action Plans (NREAPs) submitted to date, biofuels will by 2020 have a share of 9.5% in surface transport energy. First-generation biofuels will have a share of approximately 90% – in other words, comprising 8-9% of overall transport needs.[2] At the same time, the EU legislature adopted amendments to the Fuel Quality Directive (FQD) requiring a 6% reduction in lifecycle greenhouse gas (GHG) emissions from fuels consumed in the EU by 2020.[3]

[1] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2001 on the promotion on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (hereinafter "RED" for Renewable Energy Directive).
[2] COD/2008/0016.
[3] Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC (hereinafter "FQD" for Fuel Quality Directive).

The objectives of reducing GHG emissions are best achieved by a GHG-reduction target for transport fuels as contained in the FQD, not a 10% target for renewables or biofuels in the transport sector as contained in the RED. Setting a GHG-reduction target for transport fuels is a better approach to decarbonising the sector as it allows fuel suppliers a wide range of reduction options—reducing flaring, improving refineries, using less-dirty crudes, employing low-carbon alternative fuels and electricity, to name a few—and hence offers the best potential for significant carbon cuts. The approach taken in RED, on the other hand, simply requires Member States to achieve a predetermined volume of renewable energy or biofuels in the transport with no requirement to reduce overall GHG emissions in the sector. The EU should therefore abandon the 10% target and move towards the FQD-based approach to transport fuels. The target set in the FQD will only be achieved, however, if it is properly implemented and its monitoring and enforcement are based on realistic carbon accounting. Furthermore efforts to increase efficiency and reduce transport demand are needed to reduce the climate impact of the transport sector.

DIRECT AND INDIRECT LAND-USE CHANGE FROM BIOFUELS

Regardless of the nature of the targets adopted, it is crucial that the emissions from all different fuels are properly accounted, including emissions from indirect land-use change (ILUC).

The EU legislature recognizes that its biofuel policies have land-use implications. When public policies increase biofuel consumption, additional demand for agricultural commodities is created, which impacts land conversion around the world resulting in significant GHG emissions. With such a policy comes the responsibility to ensure climate objectives are achieved. Indeed, unless ILUC is addressed through legislative action, RED and FQD will not achieve their primary objective to reduce GHG emissions from transport. Existing biofuel policies include safeguards—in the form of "sustainability criteria"—that are supposed to prevent conversion of forests and other natural areas for the purpose of producing biofuels directly on the converted land.[4] This phenomenon is called *direct* land-use change and it is critical that it is prevented through robust implementation of these criteria in producer countries. But even if safeguards against direct land use change were proven effective the pressure on land arising from the 10% target, which artificially props up biofuel consumption, would still be driving land conversion indirectly. Biofuel production would happen on existing agricultural croplands, rather than on newly deforested or converted natural areas, with those agricultural croplands lost to biofuel production moving into forests and other natural areas instead. This phenomenon is called *indirect* land-use change. Existing policies encourage this practice, driving deforestation and biodiversity loss.

The destruction of forests and other natural areas releases GHG emissions from vegetation and soil. In addition to these climate consequences, ILUC holds implications for other values, namely biodiversity, ecosystem services, human rights, and sustainable development. Therefore, both RED and FQD contain an legislative mandate on ILUC with detailed provisions requiring the Commission to report by 31 December 2010 on ILUC impacts and, if appropriate, make proposals to incorporate unaccounted GHG emissions into the statutory framework, which is a

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[4] This is the theory. Unfortunately, the evidence to date indicates that the 'sustainability criteria' and GHG saving threshold that were agreed in the final Directive will not provide the environmental protection that is needed, both due to inadequacy of the criteria and/or of the implementation.

first step toward closing this loophole and reducing these impacts. This mandate has been subject to an extensive legal analysis by ClientEarth, which is enclosed herein and incorporated by reference.[5]

Numerous scientific publications and research from the European Commission's Joint Research Center (JRC 2008, 2010), the Food and Agricultural Organization of the United Nations (FAO 2008), the Renewable Fuels Agency (RFA 2008) and the United Nations Environmental Programme (UNEP 2009), to name a few, indicate that GHG emissions caused by ILUC are substantial and will most likely outweigh any savings from biofuel usage.[6] Indeed, the Commission's own studies underscore that ILUC emissions cannot be ignored lest EU biofuel policies become a net contributor to climate change.

The essential difference between biofuels and other GHG-increasing activities, such as eating beef or building power plants, is that the EU has a *mandate* for the use of renewable energy in transport for 2020, which will largely consist of biofuels. Obviously such a mandate only makes sense if it improves sustainability and achieves climate objectives. Commissioners Hedegaard and Oettinger have also made it clear that biofuels should be seen primarily as a measure to reduce GHG emissions with energy, trade, and agricultural objectives being secondary. As it stands now, though, none of these objectives will be met.

Addressing ILUC will require amendments to the Directives themselves.[7] The timeframe set out in RED and FQD for a legislative decision is 31 December 2012, which underscores the EU legislature's urgency to find near-term solutions to ensure consistency between biofuel targets in 2020 and climate objectives. At present, the Commission is drafting the report and considering the form of any legislative proposal. As shown below, a set of appropriate ILUC factors is the only viable, science-based approach toward addressing ILUC within the context of RED and FQD in the short to medium term.

PART 1

THE ANALYTICAL WORK PRODUCED BY THE COMMISSION CONSTITUTES THE BEST AVAILABLE SCIENTIFIC EVIDENCE FOR DETERMINING FEEDSTOCK-BASED ILUC FACTORS

According to the mandate in RED and FQD, any proposal must be based on the "best available scientific evidence." This indicates that the unavailability of additional scientific evidence should not be used to justify Commission inaction or delay. The analytical work produced by the Commission to date underscores the need for legislative action on this pressing issue. And, as the best scientific evidence available on the impacts of EU biofuel policies, it should form the basis for the legislative proposal described *infra* in Part 2.

The Commission's analytical work shows that the expected land-use conversion resulting from the policy is very significant. Importantly, none of the studies comes out with zero or negative

[5] ClientEarth, *Legal Briefing: Legislative Mandate to the Commission on Indirect Land-Use Change* (October 2010).
[6] For a complete list of studies saying that ILUC should be accounted, see the attached *T&E Briefing: The Science of Biofuels and Indirect land use change* (September 2010).
[7] *See, e.g.*, RED, Recital 85; RED, Article 19(6).

ILUC emissions for any land-using biofuel feedstock.[8] Nor does any study show that moving from today's levels of biofuels use to levels expected by 2020 would, without additional safeguards, result in net GHG emission reductions. As a result, there is a clear need for corrective action.

Despite some variation in the assumptions underlying the studies and differences between models, similar conclusions can be drawn. The Commission studies give enough indication to be able to draw conclusions on two issues relevant for policymakers:

- the aggregate impact of the policy by 2020 based on Member States' predicted use of biofuels in their NREAPs (which will lead to an upfront "carbon debt" that is currently unaccounted for); and

- the marginal GHG emissions for different biofuel feedstocks under different studies that indicate those biofuels leading to GHG emissions increases and those that still meet the GHG-savings threshold (the basis for differentiated "ILUC factors").

In this vein, we first review the aggregate impact of the policy as a whole. Aggregate emissions underscore that propping up an artificial biofuel market with a 10% target without further legislative action is ill-advised, compelling serious reconsideration of the policy as a whole. Next, we review the marginal ILUC impacts of individual biofuel feedstocks, which is what the Commission must resolve to ensure compliance with the GHG-saving criterion in Article 17(2) of RED. Marginal ILUC impacts therefore get at the primary purpose of this consultation. As will be shown below, action should be based on incorporating these marginal impacts for each biofuel feedstock into the accounting system currently in place through the introduction of ILUC factors thereby encouraging greater use of some categories of biofuels and discouraging the use of other categories of biofuels.

The Commission published several studies for the purpose of producing the report referred to in the legislation. Three of these studies yielded quantitative results on ILUC emissions. The three studies are:

ISPRA for DG CLIMATE
FULL TITLE: Indirect Land Use Change from increased biofuels demand - comparison of models and results for marginal biofuels production from different feedstocks. Joint Research Centre, Institute for Energy, Ispra, July 2010, commissioned by DG ENV/CLIMA, July 2010 (referred to as "ISPRA study");

IFPRI for DG TRADE
FULL TITLE: Global Trade and Environmental Impact Study of the EU Biofuels Mandate, Final Draft Report, March 2010. International Food Policy Research Institute (IFPRI), March 2010, commissioned by DG TRADE, (referred to as "IFPRI study"); and

[8] This is not the case with dedicated energy crops, which were not studied in the Commission's studies, despite the fact that they also use (sometimes fertile) land. ILUC impacts of energy crops could also be substantial and should be further studied.

JRC ISPRA report quantifying DG AGRI IPTS and IFPRI
FULL TITLE: Biofuels: a New Methodology to Estimate GHG Emissions Due to Global Land Use Change. A methodology involving spatial allocation of agricultural land demand, calculation of carbon stocks and estimation of N2O emissions" by R. Hiederer, F. Ramos, C. Capitani, , R. Koeble, V. Blujdea, O. Gomez, D. Mulligan and L. Marelli. EU Report 24483, 2010 (referred to as "ISPRA study 2").

The results of these three studies, taken in tandem with predicted biofuel usage in NREAPs, indicate the scale of ILUC. The studies also represent the best available scientific evidence.

Two other studies were also released:

IPTS for DG AGRI
FULL TITLE: Impacts of the EU biofuel target on agricultural markets and land use: a comparative modelling assessment. Joint Research Centre, Institute for Prospective Technological studies, Seville, July 2010, commissioned by DG AGRI of the European Commission (referred to as "IPTS study ");[9] and

DG Energy Literature Review
FULL TITLE: The Impact of Land Use Change on Greenhouse Gas Emissions from Biofuels and Bioliquids. DG Energy, July 2010.[10]

These two additional studies, however, do not reveal quantitative information on GHG effects of ILUC.

Taken together, these studies represent the best available scientific evidence to date on ILUC impacts of EU biofuel policies upon which the legislative proposal should be based. In reviewing these studies, two important conclusions can be drawn. First, there are calculations for aggregate impacts of the biofuel policies and marginal GHG emissions for different biofuels feedstocks. Second, there is a range of GHG emissions from different biofuels that the ILUC factor must fall within. Each is addressed in turn.

I. AGGREGATE EMISSIONS IMPACT OF THE POLICY AS A WHOLE

The landscape for this analysis has become much clearer with the submission of the majority of NREAPs in which EU countries project what shares of biofuels they will use. The 19 Member States that submitted their plans by late September include the big countries and therefore represent a large share of the transport fuel market. It is now possible to calculate aggregate ILUC impacts based on actual predicted biofuel usage rather than fictitious assumptions.

[9] This study stops at analysing land use change impacts but does not translate these impacts into GHG effects. The JRC ISPRA report quantifying DG AGRI IPTS and IFPRI, listed above, translates the land-use change from this study to marginal GHG emissions from biofuels.

[10] DG Energy, which has traditionally driven the EU's biofuel policy and is responsible for RED, decided not to commission an external study. Instead its staff made a literature review that, despite its title, does not draw any quantitative conclusion on ILUC emissions. Therefore, we have chosen not to consider this paper here. We refer to the ICCT review of the literature review for the critical assessment of this work, enclosed herewith.

According to the analysis of the NREAPs,[11] Member States plan to use an additional 15 Mtoe of first generation land-using biofuels by 2020 and 5.4 Mtoe bioliquids.[12] The split between biodiesel and ethanol is approximately 73% in favour of biodiesel. Biofuels are expected to have a 9.5% of the market of fuel for surface transport and first-generation biofuels will constitute more than 92% of this share.[13] The use of bioliquids in electricity and heat sectors will add an additional 2% to this total. Although the figures from the NREAPs analysis differ from assumptions used in the studies, it is nevertheless possible to calculate aggregate ILUC impacts of increases in biofuel consumption using the ISPRA study with the updated numbers. This gives us the best approximation of the actual ILUC impacts due to EU biofuel policy.

Combining predicted biofuel usage with land-use change from the ISPRA study, one can calculate how much land will be converted worldwide to meet the 10% target. The global land-use change will be in the range of 5.1 and 8.4 million hectares due to the predicted increase of biofuels consumption, as illustrated in Table 1.[14]

Table 1: Estimated Land-Use Change Due to ILUC

Table 1	Increase in production from 2008 to 2020 from NREAPs (Ktoe)	Overall land increase to meet 2020 targets (thousand hectares)	
		Minimum additional land	Maximum additional land
Ethanol	4250	1657.5	2210
Biodiesel	10797	2483.31	4318.8
Bio liquids	5462	1000.46	1892.17
Total	**20509**	**5141.27**	**8420.97**

As noted above, converting forests and other natural areas into croplands releases GHG emissions. Translating the hectares figure into emissions according to the IPCC figures, we come up with the one-off release of GHG emissions between 876 and 1459 Mt CO_2, as illustrated in Table 2. These emissions should be divided over 20 years as specified in RED. After incorporating approximate direct savings from the approximate aggregated use of biofuels due to displacement of fossil fuels, we still end up with a policy that will be a net emitter of up to 58 Mt CO_2 per year. This is the equivalent of adding an extra 12 to 25 million cars on European roads by 2020.

[11] We are including the analysis of 23 out of 27 NREAPs.

[12] Bioliquids consumed in the electricity and heat sector are subject to the same sustainability criteria as biofuels in transport and have the same impacts on land use change. However, we did not manage to find, what is the levels of their current use or the so-called baseline. For this reason, we assumed that the baseline was zero.

[13] Includes road, rail and inland waterway transport, excludes maritime and air transport. For simplicity reasons when the rest of this paper talks of 'transport' we mean 'surface transport'.

[14] The highest estimates from one of the studies (Leitap) were not included in this review - these results are especially high for biodiesel, namely 1928 kHa per Mtoe of biodiesel.

Table 2: Emissions from Land-Use Change[15]

Table 2	Emissions from land use change		
	One-off ILUC emissions	ILUC emissions on the annual basis (divided over 20 years as specified in RED)	ILUC emissions including GHG savings from biofuels use (divided over 20 years)
	Mt CO2eq	Mt CO2 eq	Mt CO2 eq
Minimum	875.92	43.8	29.04
Maximum	1459.34	72.97	58.21

The IPTS study came up with similar results. According to the JRC report, which calculated GHG impacts of the IPTS study, increasing biofuels from current shares to 7% would lead to estimated one-off GHG emissions of 1.092 Mt CO_2-eq.[16] Averaging this over a 20-year timeframe would yield around 54.6 Mt CO_2 per year (excluding GHG savings from biofuels use).

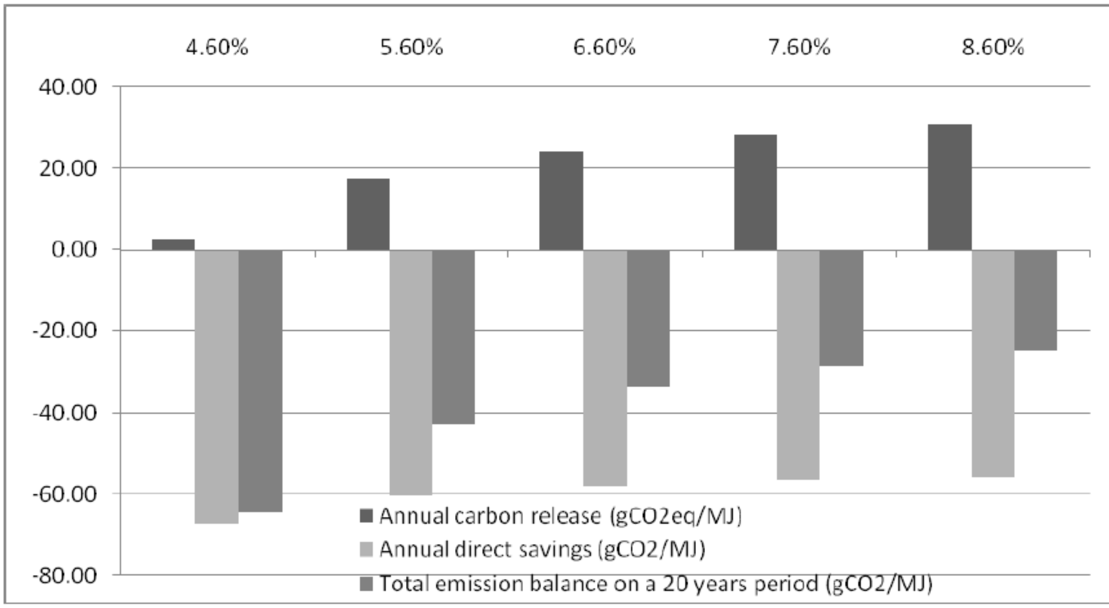
There is one Commission study that came up with net GHG savings from the policy as a whole: the IFPRI study. That study, however, did not analyze realistic scenarios of biofuel shares and splits between ethanol and biodiesel. Its main outcome is that there is a global net balance of nearly 13 Mt CO_2 savings per year, over a 20-year horizon, due to an increase of biofuels from 3.3% to 5.6%. Under the 5.6% scenario, direct emission savings from biofuels are estimated at 18 Mt CO_2 with additional ILUC emissions at 5.3 Mt CO_2 (mostly in Brazil), resulting in a global net balance of nearly 13 Mt CO_2 savings per year over a 20-year horizon.[17] As noted above, however, the NREAPs indicate that predicted biofuel usage will be much higher than 5.6% and the biodiesel/ethanol split will be hugely skewed toward biodiesel (while the study looks at an almost even split), making the projections based on this assumption irrelevant for our purposes.

But, more importantly, the IFPRI study presents aggregate GHG impacts for scenarios other than 5.6% as sensitivity tests. These sensitivity tests show that at higher levels of biofuel use the ILUC emissions are much higher, resulting in a worsening—and eventually negative—GHG balance. This impact is best illustrated in figure 9 at page 67 of the IFPRI study, included here as Graph 1.

[15] The use of bioliquids would result in additional one-off emissions in the range of 210 – 400 Mt CO2.
[16] Marelli et al. 2010.
[17] JRC ISPRA later recalculated GHG emissions from IFPRI study on the most likely land use changes occurring around the world. For the BAU scenario total GHG emissions from ILUC are estimated at 201 Mt COeq (BAU) and 248 Mt CO eq (FT) over a period of 20 years. This means that net emissions from ILUC would be between 2 and 7 MT CO2 eq over a 20 year period.

Graph 1: ILUC and Net GHG Savings for Different Target Levels (IFPRI 2010)

Figure 9 Indirect land use emissions and direct savings for different mandate levels, No change in trade policy



Source: Authors' calculations
Note: Negative figures represent an emission reduction, positive values represent an emission increase.

The IFPRI study makes sensitivity analyses for the impacts of 4.6%, 5.6%, 6.6%, 7.6% and 8.6% biofuel volumes – with the latter closest to estimates in NREAPs. From these figures we can derive the impact of going from, for example 4.6% (close to today's level) to 8.6% (the level closest to what could be expected in 2020 according to NREAPs analysis). The results are summarised in Table 3 below.

Table 3: Emissions from ILUC from IFPRI Study[18]

Table 3:	Total GHG impact					
	4.6% biofuels	8.6% biofuels	moving from 4.6 to 8.6%	1% increase of biofuels in EU		GHG increase compared with fossil fuels (%)
No change in trade policy	-64MT	-24MT	+40MT	**+10MT**	**75 g CO2eq/MJ**	**82%**
Free trade	-70MT	-26MT	+44MT	**+11MT**	**83 g CO2eq/MJ**	**90%**

[18] Source: IFPRI for TRADE, figures 9 and 10, p 67. Last column calculated by T&E by taking the IPFRI assumption that 1% of biofuels equals 3.16 Mtoe, and that GHG from fossil fuels is 92 g CO2eq/MJ.

Table 3 shows that a 1% increase in biofuel volume leads to an increase in GHG emissions of about 10MT. After recalculation, this implies that the 4% increase from today's levels of biofuels use would lead to the emissions of the EU biofuel policy including ILUC effects roughly twice those of extra oil. In other words, compared to maintaining current levels of biofuel penetration, expanding the mandate will actually reduce any atmospheric benefits while significantly increasing costs to climate and biodiversity.

Ironically, the summary of the IFPRI study emphasizes that biofuel policy as a whole has GHG benefits. But the above analysis shows that the same study demonstrates that whilst today's levels of biofuel may reduce emissions, the much more relevant move from today's levels of biofuels use to expected biofuels use in 2020 as recorded in the NREAPs actually increases them. It also underscores that all Commission studies are largely consistent in terms of results.

This means that two conditions under which the 10% target for renewables in transport was adopted will not be met. These conditions were:

1. That biofuels have to be sustainable. The studies show that the target will end up increasing, not decreasing, carbon emissions from the transport sector and have negative impacts on forests, other natural areas, and biodiversity.

2. That "second-generation" biofuels will be commercially available. The studies show that the share of second-generation biofuels will be less than 10% of overall biofuels use because no effective incentives are in place to promote them (or rather, the current flawed accounting system greatly favours current biofuels technologies).

In short, both conditions are not met. Therefore, not only should sustainability criteria be reviewed, but so should the 10% target itself.

II. MARGINAL GHG EMISSIONS OF DIFFERENT BIOFUELS

The studies also provide the information needed to address the legislative mandate in RED and FQD. The information required is "annualised emissions from carbon stock losses from indirect land-use change" and would be based on a methodology similar to the approach taken for the other factors. This will be based on modeling, which produces reliable—if not conservative—values down to the feedstock level. There are two ways to calculate marginal ILUC emissions. On the one hand, we can extrapolate emissions per unit of fuel from aggregate emissions of the policy.[19] This would yield a feedstock-neutral ILUC factor applicable across the board. On the other hand, models can extrapolate marginal ILUC emissions for small increases in consumption of specific biofuel feedstocks. This would yield feedstock-specific ILUC factors, which is the preferred alternative because it better reflects actual differences in feedstock emissions.

[19] If we calculate marginal GHG impacts of biofuels on the basis of the assumed use and split of biofuels according to NREAPs and marginal land-use change from ISPRA study, we also come up with the range for an ILUC factor between 38 and 201 g CO2/MJ, as illustrated in Annex II.

For calculating feedstock-specific ILUC factors, the IFPRI study represents the best available information on marginal ILUC emissions produced to date for EU biofuel policies, as illustrated in Table 4.

Table 4: IFPRI Study Marginal ILUC Factors

Table 12 Marginal Indirect Land Use emissions, gCO2/MJ per annum. 20 years life cycle.

	MEU_BAU		MEU_FT	
	Without Peatland effects	With Peatland effect	Without Peatland effect	With Peatland effect
Ethanol	*17.74*	*17.74*	*19.16*	*19.18*
Ethanol SugarBeet	16.07	16.08	65.48	65.47
Ethanol SugarCane	17.78	17.78	18.86	18.86
Ethanol Maize	54.11	54.12	79.10	79.15
Ethanol Wheat	37.26	37.27	16.04	16.12
Biodiesel	*58.67*	*59.78*	*54.69*	*55.76*
Palm Oil	46.40	50.13	44.63	48.31
Rapeseed Oil	53.01	53.68	50.60	51.24
Soybean Oil	74.51	75.40	67.01	67.86
Sunflower Oil	59.87	60.53	56.27	56.89

Source: Authors' calculations

Note:The marginal coefficient is computed in 2020 after the implementation of the 5.6% mandate.

Despite being a very conservative estimate compared to other studies (see Annex I), it could serve as a basis for the first set of ILUC factors until further research is completed. These should incorporate precautionary assumptions about the conversion of peatlands. If the Commission feels that relying on marginal ILUC emissions from the IFPRI study is inadequate, it can request JRC scientists to provide feedstock-specific values based on their existing modelling comparison study in the ISPRA study. Gathering additional information should not be used as pretext for delaying a legislative proposal. This conclusion is further compelled in that all studies confirm that marginal ILUC impacts of land-using biofuels are substantial and, in most cases, increase emissions of biofuels compared to fossil fuels.

From the table in Annex I of this submission, it can be seen that ILUC emissions range from 16 g CO_2/MJ (IFPRI study for sugar beet under BAU scenario with conservative assumptions about the biodiesel/ethanol split) to 352 g CO_2/MJ (LEITAP for EU biodiesel scenario). Adding marginal ILUC emissions on top of direct emissions of producing biofuels (cultivation, transport and processing), means that the GHG emissions of most biofuels feedstocks increase compared to fossil fuels. The range in the Annex I is also due to the fact that the studies that we summarize have used two different methodologies, as mentioned above.

III. CONCLUSION

The policy conclusion is that differentiated ILUC factors would have to be initially chosen somewhere within the ranges provided in the studies to date, which represent the best available science, addressing any differences by applying the precautionary principle. These values should, however, be regularly updated as science progresses and a transparent and independent process for doing this should be set up. It is also clear that, without legislative action, ILUC emissions will erase any GHG benefits from EU biofuel policies. This means that, under the existing legal framework, Member States will be mandating and subsidising harmful biofuels that actually increase GHG emissions compared to fossil fuels. We therefore have a clear answer to the second question posed by the Commission: ***from the accumulated scientific evidence, including the Commission's own studies, EU must take action to address ILUC. A contrary conclusion is scientifically indefensible and inappropriate.***

PART 2

THE COMMISSION MUST INCLUDE ILUC EMISSIONS WHEN CALCULATING TOTAL EMISSIONS FROM EACH BIOFUEL FOR DETERMINING COMPLIANCE WITH ARTICLE 17(2)

In this section, we will address the third and fourth question from the public consultation regarding the appropriate course of action on ILUC based on the best available scientific evidence. The starting point for this discussion on the form of the response to ILUC must be the mandate to the Commission in Article 19(6) under which this consultation is taking place. Article 19(6) has been subject to an extensive legal analysis, as noted above and enclosed herewith and incorporated by reference. For the convenience of the Commission, however, we provide a brief overview here.

In Article 19(6), the EU legislature sets forth in explicit terms its ILUC mandate to the Commission. In addition to reporting and submitting a proposal, if appropriate, the EU legislature stipulates statutory requirements on any proposal. A proposal that fails to meet these requirements should be considered as violating clear RED and FQD requirements:

> "The Commission shall, by 31 December 2010, submit a report to the European Parliament and to the Council reviewing the impact of indirect land-use change on greenhouse gas emissions and addressing ways to minimise that impact. The report shall, if appropriate, be accompanied by a proposal, based on the best available scientific evidence, containing a concrete methodology for emissions from carbon stock changes caused by indirect land-use changes, ensuring compliance with this Directive, in particular Article 17(2).
>
> Such a proposal shall include the necessary safeguards to provide certainty for investment undertaken before that methodology is applied. With respect to installations that produced biofuels before the end of 2013, the application of the measures referred to in the first subparagraph shall not, until 31 December 2017, lead to biofuels produced by those installations being deemed to have failed to comply with the sustainability requirements of this Directive if they would otherwise have done so, provided that those biofuels achieve a greenhouse gas emission saving of at least 45%. This shall apply to the capacities of the installations of biofuels at the end of 2012.
>
> The European Parliament and the Council shall endeavour to decide, by 31 December 2012, on any such proposals submitted by the Commission".[20]

[20] RED, Article 19(6); FQD, Article 7d(6).

Under a plain reading of Article 19(6), the Commission is afforded only two possible options: do nothing or develop a methodology to account for emissions from carbon stock changes caused by ILUC. There is no other option to consider. It further requires that the methodology ensure compliance with the GHG-saving criterion in Article 17(2). This provision renders other actions, such as extending the use of bonuses, tangential to the core legislative mandate.[21] Together, Recital 85 and Article 19(6) make clear that the EU legislature envisioned the Commission developing a methodology with the primary objective of introducing ILUC factor. That is because compliance with the GHG-saving criterion is a biofuel-specific question, which will encourage the use of some biofuel feedstocks, namely those with higher GHG savings, and discourage the use of others biofuel feedstocks, namely those that are destructive to climate and the environment. This dynamic is even more evident with FQD, which encourages fuel suppliers to use biofuels with higher levels of GHG savings in order to meet the 6% GHG reduction target. The threshold question is therefore whether a proposal is appropriate. Previous chapters on the results of the Commission's studies have sufficiently demonstrated the appropriateness of the proposal.

Once the appropriateness question is answered in the affirmative, RED stipulates four statutory requirements on the Commission in fulfilling its legislative mandate: (i) be based on the best available scientific evidence; (ii) include a concrete methodology for emissions from carbon stock changes caused by ILUC; (iii) ensure compliance with RED, particularly Article 17(2); and (iv) include safeguards to ensure certainty of investment. Only introducing ILUC factors meets these requirements.[22] In tandem with ILUC factors, the Commission may decide to introduce a set of ILUC avoidance options that would incentivize certain practices, such as the use of wastes or residues and responsible use of degraded or marginal lands into productive systems. This approach is further set out below.

I. OVERALL METHODOLOGICAL FRAMEWORK IN THE RENEWABLE ENERGY DIRECTIVE AND ARTICLE 17(2)

Under Article 3(4) of RED, the EU legislature outlined the mandatory national overall targets for renewables in transport:

> Each Member State shall ensure that the share of energy from renewable sources in all forms of transport in 2020 is at least 10% of the final consumption of energy in transport in that Member State.[23]

Under this system, Member States were required to adopt NREAPs setting out their national targets for the share of energy from renewable sources consumed in transport. NREAPs must also outline the measures to be taken to achieve those national targets.[24] Member States submit NREAPs to the Commission for evaluation and recommendations.[25] The method for demonstrating compliance with the 10% target in transport requires Member States to calculate

[21] European Commission, Pre-consultation on Indirect Land-Use Change – Possible Elements of a Policy Approach – Preparatory Draft for Stakeholder/Expert Comments (Summer, 2009).
[22] ClientEarth, Legal Briefing: Legislative Mandate to the Commission on Indirect Land-Use Change (October 2010).
[23] RED, Article 3(4).
[24] RED, Article 4(1).
[25] RED, Article 4(5).

the final consumption of energy from renewable sources in transport.[26] To do so, Member States require economic operators to show that biofuels comply with sustainability criteria,[27] likely placing the responsibility on the economic operator that pays the excise duty on the transport fuel.[28]

From the beginning, the Commission envisioned biofuels being the "primary" beneficiary of the 10% target in transport.[29] Early in the legislative process, the Commission minces no words when discussing the objectives of its proposal:

> [I]t is proposed that each Member State shall achieve at least a 10% share of renewable energy (primarily biofuels) in the transport sector by 2020. This is done for the following reasons: (1) the transport sector is the sector presenting the most rapid increase in greenhouse gas emissions of all sectors of the economy; (2) biofuels tackle the oil dependence of the transport sector, which is one of the most serious problems of insecurity in energy supply that the EU faces; (3) biofuels are currently more expensive to produce than other forms of renewable energy, which might mean that they would hardly be developed without a specific requirement.[30]

But not all biofuels are created equal. Some result in more GHG emissions than others and various factors are relevant, including emissions from extraction, cultivation, processing, transport, distribution, production, and use.[31] Also, if new land—forests, for example—is converted as a result of biofuels production, the emissions released during deforestation could far exceed those that would otherwise be emitted using a conventional fossil fuel instead of that specific biofuel. This is because deforestation and forest degradation are significant sources of GHGs. The Intergovernmental Panel on Climate Change (IPCC) estimates that deforestation contributes up to 20% towards total carbon-dioxide emissions. Forest preservation and restoration of degraded forests, on the other hand, are significant carbon sinks. Standing forests contain about 50% of the global terrestrial biomass carbon stocks, and have the potential to contain much more.[32] Forests also harbour two-thirds of all terrestrial species and forest biodiversity provides a critical insurance policy against climate change.[33] And, in addition to their intrinsic and spiritual value, the destruction of forests and other natural areas also undermines the livelihood of local communities and is commonly preceded by land-tenure and human-rights abuses.[34] Increased demand for biofuels is driving destruction of forests and other natural ecosystems. These are very serious issues.

As a result, the EU legislature attempted to discourage reliance on certain biofuels and therefore put in place a set of sustainability criteria. The EU does not allow Member States to

[26] RED, Article 5(1)(c).
[27] RED, Article 18(1).
[28] Directive 2008/118/EC; Directive 2003/96/EC.
[29] COD/2008/0016.
[30] COD/2008/0016.
[31] RED, Annex V(C)(1).
[32] IPCC 2007, FAO 2000.
[33] Thompson, I., Mackey, B., McNulty, S., Mosseler, A. (2009). *Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems*. Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 43, 67 pages.
[34] *See, e.g.,* Rights and Resources 2009-2010, *The End of the Hinterland: Forests, Conflict and Climate Change*.

count toward their targets biofuels that do not fulfill the sustainability criteria set out in Articles 17(2) to (6).[35] These sustainability criteria apply "irrespective of whether the raw materials were cultivated inside or outside the territory of the Community."[36] Three of the criteria discourage certain direct land-use changes, namely Articles 17(3)-(5) which prohibit: (i) raw material obtained from land with high biodiverse value, such as primary forests, protected areas or certain grasslands;[37] (ii) raw material obtained from land with high carbon stock, such as wetlands and continuously forested areas;[38] and (iii) raw material obtained from peatland.[39] A fourth criterion upholds the rule of law by precluding raw material cultivated in violation of certain EU agricultural and environmental laws.[40] But none of these criteria reduce indirect conversion of forests and other natural areas, which is what happens when existing agricultural land is used for biofuels production. This was intended to be address through Article 17(2) on the basis of the report to be submitted in this consultation. Therefore, this is the sustainability criterion at issue here.

Article 17(2) requires biofuels to meet certain GHG savings compared to fossil fuels – also referred to as the "GHG-saving criterion." The GHG-saving criterion serves as a filter, promoting biofuels that achieve greater GHG savings over those that achieve less. This criterion could reduce ILUC impacts if associated GHG emissions are factored into the methodology. Under RED, the required GHG savings—or GHG-saving threshold—increases over time, starting at 35% in 2009 before ratcheting up to 50% in 2017 and to 60% in 2018 for new installations:

> Article 17
> Sustainability criteria for biofuels and bioliquids
>
> * * *
>
> 2. The greenhouse gas emission saving from the use of biofuels and bioliquids... shall be at least 35%.
>
>   With effect from 1 January 2017, the greenhouse gas emission saving from the use of biofuels and bioliquids... shall be at least 50%. From 1 January 2018 that greenhouse gas emission saving shall be at least 60% for biofuels and bioliquids produced in installations in which production started on or after 1 January 2017.
>
>   The greenhouse gas emission saving from the use of biofuels and bioliquids shall be calculated in accordance with Article 19(1).[41]

The term "installation" refers to any processing installation used in the production process.[42] The rules on calculating GHG savings provided in Article 19(1) and Annex V govern compliance with the GHG-saving criterion. Annex V provides methodologies for calculating total emissions

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[35] RED, Article 5(1) and Article 17(1).
[36] RED, Article 17(1).
[37] RED, Article 17(3).
[38] RED, Article 17(4).
[39] RED, Article 17(5).
[40] RED, Article 17(6).
[41] RED, Article 17(2).
[42] European Commission, Communication from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on country rules for biofuels (leaked circa April 2010), p. 7.

from biofuel use *except* for ILUC.[43] Those total emissions are then compared against average emissions from fossil fuels—called the fossil fuel comparator—to determine GHG savings. Unless ILUC is accounted for, a gaping loophole is created that will undermine the GHG-saving criterion and result in 10% target for renewables in transport resulting in the increase of emissions. That is the problem that this consultation will need to address.

The sustainability criteria are intended as a filter. Member States are responsible for ensuring economic operators meet the sustainability criteria when the biofuel: (i) counts toward their renewable energy targets;[44] (ii) is used for compliance with renewable energy obligations;[45] (iii) receives financial support for their consumption under a national support scheme;[46] (iv) counts toward FQD target for reducing GHG emissions;[47] or (v) receives investment or operating aid under Community guidelines on state aid for environmental protection.[48] The GHG-saving criterion sends clear signals to guide public and private investment.

Reliable accounting of the GHG savings for biofuels is therefore critical. There are two approaches for determining GHG savings in RED.[49] The first approach relies on pre-calculated GHG savings for each biofuel: the "default GHG saving." It is the simplest option for economic operators and Member States. Rather than calculate the GHG savings themselves, economic operators simply cite the default values in Annex V tables. The default GHG savings are supposed to be precautionary estimates. The second approach requires economic operators to calculate GHG savings themselves: the "actual/disaggregated values." Although more effort is required, the second approach allows economic operators to account for investments in clean technology that may render a biofuel more effective than the pre-calculated default GHG savings would otherwise do.

Both approaches—the default GHG saving and the actual/disaggregate value—rely on the same formula, which is comprised of nine different "factors" that cover the lifecycle GHG emissions to yield "total emission from the use of the biofuel" or E_B:

$$E_{[B]} = e_{ec} + e_{[d]l} + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr} - e_{ee},$$

where

$E_{[B]}$ = total emissions from the use of the biofuel;

e_{ec} = emissions from the extraction or cultivation of raw materials;

$e_{[d]l}$ = annualised emissions from carbon stock changes caused by [direct] land-use change;

e_p = emissions from processing;

e_{td} = emissions from transport and distribution;

e_u = emissions from the fuel in use;

[43] *See* RED, Annex V(C).
[44] RED, Article 17(1)(a).
[45] RED, Article 17(1)(b); see also RED, Article 2(l).
[46] RED, Article 17(1)(c).
[47] FQD, Article 7a.
[48] Notice OJ 2008/C 82/01.
[49] RED, Articles 17(2) and 19(1) and Annex V.

e_{sca} = emission saving from soil carbon accumulation via improved agricultural management;

e_{ccs} = emission saving from carbon capture and geological storage;

e_{ccr} = emission saving from carbon capture and replacement; and

e_{ee} = emission saving from excess electricity from cogeneration.[50]

The total emissions from the use of the biofuel is determined by adding lifecycle GHG emissions from cultivation through use—i.e., extraction, cultivation, processing, direct land-use changes, transport and distribution, and fuel use—and then subtracting any GHG savings from soil carbon accumulation, carbon capture and geographical storage, carbon capture and replacement, and excess electricity from cogeneration. Once total emissions for the biofuel are calculated, E_B, it can be plugged into another formula that compares it against the fossil fuel comparator, E_F, to determine GHG savings:

Greenhouse gas emission saving from biofuels and bioliquids shall be calculated as:

GHG SAVING = $(E_F - E_B)/E_F$,

where

E_B = total emissions from the biofuel or bioliquid; and

E_F = total emissions from the fossil fuel comparator.[51]

The fossil fuel comparator is reported under FQD and has a starting value of 83,8 gCO_{2eq}/MJ.[52] At present, this is the figure against which all biofuels are compared to determine GHG savings. This value will be superseded by the "latest actual average emissions from the fossil part of petrol and diesel in the Community" when that information becomes available from annual reports submitted under FQD – the first reporting taken place in 2011.[53] Under the starting value for the fossil fuel comparator of 83,8 gCO_{2eq}/MJ, in order to meet the GHG-saving threshold of 35%, a biofuel would have to emit 54,47 gCO_{2eq}/MJ or less, calculated as follows: *GHG SAVING* = (83,8 – 54,47)/83,8 = 35%. The key variable affecting the GHG savings for any given biofuel is its total emissions from use or E_B.

This overall methodological framework has several advantages. It provides flexibility when calculating GHG savings, allowing the economic operators to use either the default GHG savings or to calculate the actual GHG savings themselves. In combination with FQD, which incentivises higher levels of GHG savings, the approach is technology-forcing and rewards investments in clean technology. It is also adaptable to new entrants on the market. This if further demonstrated in the discussion in the Annex II, which shows how default and actual values work in practice.

[50] RED, Annex V(C)(1).
[51] RED, Annex V(C)(4).
[52] FQD, Annex IV(C)(19); see also RED, Annex V(C)(19).
[53] FQD, Article 7a

II. Incorporating ILUC into the Methodological Framework in RED and Article 17(2)

Thus far, it can be seen that biofuels have substantial marginal GHG emissions that, according to the legislative mandate, should be addressed by including those emissions into the total emissions from biofuel use. Therefore, the Commission will need to introduce an ILUC factor, e_{iluc}, into the formula for calculating total emissions. We turn to the form to achieve this below.

An ILUC factor would represent "annualised emissions from carbon stock losses from indirect land-use change" and join the other factors covering lifecycle emissions: $E_{[B]} = e_{ec} + e_{[d]l} + e_{iluc} + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr} - e_{ee}$. ILUC can be determined based on the modeling of predictable land-use change as a result of increased demand for biofuels driven by EU policies. The studies and underlying modeling produce reliable figures down to the feedstock level, as demonstrated in the IFPRI study and ISPRA study 2, which represent the best available scientific evidence on marginal ILUC emissions from EU biofuel policies.[54] Therefore, their results should serve as the basis for determining the values for differentiated ILUC factors for each feedstock.

In the face of uncertainty, the precautionary principle—a bedrock principle under international law and the Lisbon Treaty—would lead to the use of figures in the higher end of the spectrum.[55] Annex V(A), which contains the default GHG savings, should be amended to incorporate GHG emissions from ILUC and regularly updated to reflect scientific progress. Economic operators could adopt the default GHG savings for that biofuel listed in the table. A table would also need to be added to Annex V(D) and (E) with disaggregated values, which should list the feedstock-specific ILUC factors for when the economic operator elects to calculate actual emissions rather than rely on the default GHG savings. This would allow economic operators to rely on the disaggregated value when calculating total emissions should that be the preferred route toward showing compliance with Article 17(2). In short, by simply updating the existing framework with amendments to include ILUC emissions, the EU can promote less-damaging biofuels. In addition, it is important that the Commission review these figures periodically, revising them as necessary in order to reflect the best available scientific evidence.

The practical effect of introducing ILUC factors is to promote biofuels that use little land and reduce GHG emissions compared to a fossil fuel comparator. This has to be evaluated on a case-by-case basis. It is imperative to avoid a policy that is based on names, i.e. promoting biofuels for the mere fact that they are produced from second-generation feedstocks. Not all second-generation biofuels are created equal. Those produced from dedicated energy crops, such as ligno-cellulosic materials, also require land and cause ILUC if grown on agricultural land. But to the extent those feedstock can be produced on low-quality land that would otherwise not be used for agricultural production, i.e. due to slopes or soil conditions, their ILUC impacts can be significantly avoided.

This provides a blueprint for thinking about ILUC factors lower than the default or even zero. Options that would qualify would have in common that they do not lead, directly or indirectly, to carbon and biodiversity losses resulting from land-use changes, which means they should not compete with land that is currently in productive use or serves as a carbon stock or sink. This could be done for example by:

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[54] *See, e.g.,* IFPRI Study and JRC Study.
[55] CITE TO LEGAL BRIEFING.

- **Minimising the use of land** by using, for example, genuine wastes or residues or by achieving sustainable yield increase on existing agricultural land using environmentally and socially responsible methods.

- **Using marginal or degraded** land that does not compete with food production, does not have high biodiversity value or high value for ecosystem services or local communities, and that would otherwise not be used for other meaningful purposes.

In order to account for lower-than-default ILUC factors, the EU legislature must include a robust and precautionary methodology for determining them, a strong and efficient compliance mechanism which will need to be established prior to the application of these additional ILUC avoidance options, and an independent verification process. We can think of four possible categories, but these must be considered on a case-by-case basis.

Biofuels produced from genuine waste and residues. An ILUC factor may be zero when the raw material used as feedstock is derived from *real* waste and residues, i.e. with no alternative economic purpose. Since RED currently double-counts wastes and residues toward the 10% target, the Commission should consider removing the bonus upon inclusion of ILUC factors in the GHG methodology.

In order to avoid displacement effects and hence more ILUC, “waste” and “residues” must be defined to only include substances without any economically viable functions or useful purposes. This is because, for wastes and residues already used in other sectors, diversion to the biofuel market will likely result in their replacement with other substances with subsequent indirect impacts. One example is tallow that is currently used in heating in the meat processing sector. If this tallow is diverted to biofuel market, it is likely that fossil fuel will be used for heating purposes, which will lead to emissions increase.[56] The definition should also be flexible enough to account for the fact that what is a waste or residue today could change over time as new markets and technologies are created, leading to competition with the feedstock.

Agricultural and forestry residues could potentially count in this category under strict safeguards that must ensure ecological stability and preservation of carbon stocks. In particular, the growing practice of stump removal in forestry operations can have very negative effects on soil carbon levels and on biodiversity. Similarly, agricultural residues should be used as a priority for restoring soil carbon levels which are crucial for soil fertility, water retention and biodiversity, as well as for climate mitigation.

[56] It is important that the evidence (for example, research undertaken by the UK’s Department for Transport) on potential damaging displacement effects of waste use is taken into full account. Where waste oils which are currently used in industrial or oleochemical production, are diverted into biofuel production, this can lead to an increased demand for palm oil to replace it.

Advanced biofuels with minimal land requirements. When the raw material used as a feedstock does not require agricultural or productive land for production there is little prospect for the conversion of forests and other natural areas. Some feedstocks, such as algae, can be produced on non-agricultural lands, such as industrial or contaminated areas, and would likewise have no significant ILUC emissions. Of course it is necessary to check on a case-by-case basis whether this indeed happens.

Additional yield increases. ILUC could also—partly and potentially even wholly—be avoided by ensuring that farmers meet additional biofuel demand by increasing productivity on existing land instead of increasing land use. Yield increases should be measured over expected average future yields including autonomous growth, not over historic records. Yield increases should be proven to happen without environmental and social costs using environmentally and socially responsible methods and practices, which do not pose a threat to public health and safety, the environment, as well as social cohesion and local communities' rights and welfare.

Appropriate use of degraded and marginal lands. Biofuel production on degraded and marginal lands could be considered when those lands have no current productive function, no value for biodiversity, including for declining or rare species, and no ecosystem services or value to local communities. The actual value for production on degraded and marginal lands would need to be assessed on a case-by-case basis, again to ensure that the potential is fulfilled in reality.

The current sustainability criteria and their implementation will not deliver the required environmental and social protection because they contain important omissions and loopholes. For example, many designated Important Bird Areas (IBAs) and Key Biodiversity Areas (KBAs) are not currently protected by national legislation and, given current uncertainties in how other criteria are being implemented in Article 17(3)(b)(ii) of RED, those areas may be unprotected. Furthermore, the lack of social standards, and the extremely high vulnerability of social groups living on marginal lands makes for a very high risk of land grabs and forced evictions under the cover of "reclaiming " land considered "idle" or "unproductive." It is therefore paramount to apply robust sustainability criteria when identifying responsible cultivation areas to reduce ILUC emissions and hence encourage biofuels development on areas that would not interfere with other environmental and social issues.

In all other instances when the actual values of GHG emissions cannot be reduced or eliminated, the legislation must include feedstock specific ILUC factors that are updated every five years or so to take into account the best available scientific evidence.

Together, these amendments would ensure a concrete and robust methodology for emissions from ILUC-induced carbon stock changes, fitting seamlessly within the overall methodological framework in RED. The Commission should update these figures as the science on ILUC progresses. This periodic review should be timed to coincide with the other reporting requirements.

PART III

ILUC BEYOND CARBON

GHG emissions are not the only impact of ILUC. Biodiversity is also adversely affected by land conversion in the form of ecosystem degradation and habitat loss. Biodiversity and ecosystems—and the services they provide—are closely connected to each other and to the climate system. Biodiversity is crucial for both mitigation of and adaptation to climate change.

Often considered “nice to have,” biodiversity is actually essential for our continued existence on this planet. Put simply, biodiversity forms ecosystems and ecosystems provide services, such as clean air and water supply. Without biodiversity many of the ecosystems and their services will collapse. Ecosystem-based adaptation has been highlighted as a win-win strategy because it “can be cost-effective and generate social, economic and cultural co-benefits and contribute to the conservation of biodiversity.”[57] If ecosystems have been degraded or lost because of increased pressure from biofuel policies their assistance in adaptation is also lost. Therefore, the EU should refine its ILUC modelling to specifically protect biodiversity, not just carbon.

Furthermore, increased demand for biofuels also has social impacts. The latest OECD-FAO Agricultural Outlook concludes that food prices could rise by 40% by 2019, partly because of the increasing demand for biofuels. In 2019, 16% of the global production of vegetable oils would be used for biofuels, which is described as a conservative estimate.[58] With the demand for food also on the rise, conflicts over forests, land boundaries, and land-use will be heating up. And indeed tensions are already rising: the World Bank recently warned that EU and US biofuel policies have already resulted in land-grabbing. Investors around the world have begun a land rush in African and other developing regions of the world, squeezing out areas that had been previously used for food.

In this context, it is important to underscore an inconvenient, but not unsurprising, dilemma: modelling studies carried out for the Commission predict that increased biofuel demand leads to either substantial land-use change or substantial food-price increases. Economic theory shows that increased demand can be met either by increased supply, which leads to ILUC, or by higher prices. Commission analysis systematically ignore the fact that food price increases leading to lower consumption, which most models show, will not have an even effect but will hit hardest the most vulnerable and food insecure populations. One approach to meet the need for increased supply is to increase productivity—meaning that demand can be met by growing more on the same land—or the use of degraded or marginal land. This could limit both ILUC and food price increases if possible increases in GHG emissions associated with agricultural improvements are also factored in. The policy needs to be modified to encourage such practices and at the

[57] SCBD Secretariat of the Convention on Biological Diversity. 2009. Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. Montreal, Technical Series No. 41, 126 pages. http://www.cbd.int/doc/publications/cbd-ts-41-en.pdf
[58] http://www.agri-outlook.org/document/9/0,3343,en_36774715_36775671_45438665_1_1_1_1,00.html

same time prevent biofuels that increase GHG emission subject to the conditions outlined above.

CONCLUSION

A fundamental objective of RED is to combat climate change and increase use of energy from renewable sources.[59] The primary objective of FQD is to decrease the carbon intensity of transport fuels used in the EU. Both pieces of legislation constitute an important part of the climate package aimed at reducing GHG emissions and complying with international GHG reduction commitments.[60] Yet without accounting for ILUC, GHG reductions on paper will not correspond to the reality which is that under current policies, increased demand for biofuels will increase, not reduce, GHG emissions. This erodes EU's political credibility on climate, biodiversity and development issues. These issues must therefore be taken very seriously and addressed by proposing a robust set of feedstock-differentiated ILUC factors before the end of this year as the legislation stipulates.

Sincerely,

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[59] RED, Recital 1.
[60] RED, Recital 1.

Annex I: Marginal emissions from indirect land use change – Summary of Commission's modelling studies

This Annex provides an overview of the Commission modelling studies and how different biofuel feedstocks perform in terms of GHG emissions, when ILUC is added. The values provided are intended to provide an overview of marginal emissions from different modelling exercises. Note that different methodologies are used (i.e. marginal ILUC modelling in the case of JRC ISPRA and IFPRI and average ILUC factor in the case of IPTS report). Also note that in case GHG savings have negative values, it means that a specific biofuel will increase emissions compared to fossil fuels.

Scenario	ILUC emissions including emissions from peatlands	direct emissions from RED (default value)	GHG emissions from biofuels including ILUC	GHG savings (from the RED)	GHG savings (after ILUC is included)
LEITAP Biod EU-Deu*	352	44	396.2	47%	-373%
FAPRI Biod EU	99	44	143.3	47%	-71%
AGLINK Biod EU	40	44	84.2	47%	0%
AGLINK Biod US **	42	58	100.3	31%	-20%
GTAP Biod mix EU	73	44	117.2	47%	-40%
LEITAP Biod INDO***	326	29	355.1	65%	-324%
GTAP Biod Ind/Mal	79	29	107.7	65%	-28%
LEITAP Wht Eth EU-Fra	143	26	169.4	69%	-102%
FAPRI Wht Eth EU	69	26	95.0	69%	-13%
AGLINK Wht Eth EU	100	26	126.4	69%	-51%
IMPACT Wht Eth EU	39	26	65.0	69%	22%
GTAP Wht Eth EU	140	26	166.2	69%	-98%
IMPACT Wht Eth US	39	26	65.0	69%	22%
LEITAP Maize Eth US	151	43	194.0	49%	-131%
AGLINK Coarse Grain Eth US	89	43	132.2	49%	-58%
GTAP Coarse grains Eth US	37	43	79.6	49%	5%
IMPACT Maize Eth US	19	43	61.7	49%	26%
IMPACT Coarse Grains Eth EU	20	43	63.3	49%	24%
AGLINK Sugar cane Eth Bra	23	23	46.4	71%	45%
IFPRI BAU sugarbeet	16	40	56.1	52%	33%
IFPRI BAU sugar cane	18	23	40.8	71%	51%
IFPRI BAU maize	54	43	97.1	49%	-16%
IFPRI BAU wheat	37	26	63.3	69%	24%
IFPRI BAU palm oil	50	29	79.1	65%	6%
IFPRI BAU rapeseed	54	44	97.7	47%	-17%
IFPRI BAU soybean	75	58	133.4	31%	-59%
IFPRI BAU sun flower	61	41	101.5	51%	-21%
IFPRI BAU (JRC report)	34	21	65.0		22%
IFPRI FT (JRC report)	41	28	69.0		18%
IPTS AGLINK CG (JRC report)	63	48	111.0		-32%

IPTS AGLINK GM (JRC report)	64	48	112.0	-34%
Petrol (draft FQD)		85.8		
Diesel (draft FQD)		87.4		
Fossil fuel comparator in the RED		83.8		

** US biodiesel we assumed soy
*** Ind/Malay we assumed palm oil

Annex II: Discussion on the GHG calculation methodology of biofuels

Default Values for Biofuels

The default GHG saving is the simplest option. Economic operators claim the default GHG saving listed for each biofuel to determine compliance with the 10% target:

> [W]here a default value for greenhouse gas emission saving for the production pathway is laid down in part A or B of Annex V and where the e_l value for those biofuels or bioliquids calculated in accordance with point 7 of part C of Annex V is equal to or less than zero, [GHG savings may be calculated] by using that default value.[61]

In effect, economic operators claiming default GHG savings are relying on a typical calculation of total emissions from use of that specific biofuel, which then incorporates a margin of error before comparing it to the fossil-fuel comparator to determine its GHG savings. The GHG savings is pre-calculated and listed in an Annex V table. No other calculations are necessary. The table can be found in Annex V(A) of RED with default values for 24 different biofuel production pathways, ranging from a default value of 16% for "wheat ethanol (process fuel not specified)" to a default value of 83% for "waste vegetable oil biodiesel" (*abridged table set out for illustrative purposes*):

Typical and default values for biofuels if produced with no net carbon emissions from land-use change

Biofuel Production Pathway	***Typical GHG Saving***	***Default GHG Saving***
sugar beet ethanol	61%	52%
wheat ethanol (process fuel not specific)	32%	16%
wheat ethanol (straw as process fuel in CHP plant)	69%	69%
corn ethanol (natural gas as process fuel in CHP plant)	56%	49%
sugar cane ethanol	71%	71%
rape seed biodiesel	45%	38%
sunflower biodiesel	58%	51%
soybean diesel	40%	31%
palm oil biodiesel (process not specified)	36%	19%
palm oil biodiesel (process with methane capture at oil mill)	62%	56%
waste vegetable or animal oil biodiesel	83%	83%
hydrotreated vegetable oil from rape seed	51%	47%
hydrotreated vegetable oil from sunflower	40%	26%

For example, under the 35% GHG-saving threshold, economic operators relying on default GHG-saving values for "wheat ethanol (process fuel not specified)" would be precluded from counting

[61] RED, Article 19(1)(a).

that biofuel toward the 10% target because its GHG saving of 16% is under the 35% GHG-saving threshold. At a default value of 83%, however, "waste vegetable oil biodiesel" easily meets the 35% GHG-saving threshold and Member States may count the biofuel use toward their targets.

The default GHG savings may only be used when *direct* land-use change is zero.[62] Direct land-use change is the conversion between six land categories used by the Intergovernmental Panel on Climate Change—forest land, grassland, cropland, wetlands, settlements, and other land—plus a seventh category of perennial crops, which are multi-annual crops whose stem is typically not harvested such as short-rotation coppice and oil palm.[63] Therefore, when the biofuel feedstock is grown directly on forests or other natural areas that have been converted for that purpose, the GHG emissions of the conversion must be included in its GHG saving. Since the default GHG saving does not consider direct land-use change, it is rendered inapplicable. RED contains methodologies for calculating direct land-use change that rely on the work of the Intergovernmental Panel on Climate Change for standard values for the reduction of carbon stocks after conversion.[64]

But direct land-use change is only half the land-use problem. ILUC, by contrast, occurs when the biofuel feedstock is grown on existing cropland. Unless the default is adjusted to account for ILUC emissions, the default GHG-savings values will chronically underreport emissions thereby incentivizing reliance on them to avoid having to account for GHG emissions from direct land-use change. For this reason, the default GHG-saving values must be adjusted to take this scenario into account.

Actual Values and Disaggregated Values for Biofuels

In lieu of the default GHG savings, economic operators may engage in more arithmetic to calculate the GHG saving for the biofuel.[65] Rather than rely on a typical calculation in the default GHG saving, economic operators may determine the GHG emissions for each factor themselves. The sum of these factors is then compared to the fossil fuel comparator to determine the GHG saving for the biofuel. Economic operators select between two alternatives to calculate the factors: the actual-value alternative or the disaggregated-value alternative. Each is addressed in turn.

The actual-value alternative uses "an actual value calculated in accordance with the methodology laid down in part C of Annex V." [66] Most factors have an Annex V(C) methodology. For example, the methodology for the factor on emissions from processing, e_p, considers the "emissions from the processing itself; from waste and leakages; and from the production of chemicals or products used in processing" with further provisions outlining how to account for electricity not produced through co-generation.[67] These methodologies provide extensive guidance to Member States and economic operators on the relevant considerations for each factor.

[62] RED, Article 17(2)(a).
[63] European Commission, Communication from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on country rules for biofuels (leaked circa April 2010), p. 15.
[64] RED, Recital 71.
[65] RED, Article 19(1)
[66] RED, Article 19(1).
[67] RED, Annex V(C)(11).

The disaggregated-value alternative uses "disaggregated default values in part D or E of Annex V."[68] An economic operator might use the disaggregated-default alternative when calculating the actual value is too burdensome or impossible for all factors. The disaggregated values are found in tables in Annex V(D) and (E), and represent typical GHG emissions and sometimes include a margin of error (*abridged table set out for illustrative purposes*):

Disaggregated default values for cultivation: 'e_{ec}' as defined in part C of Annex V

Biofuel Production Pathway	***Typical GHG Saving (gCO_{2eq}/MJ)***	***Default GHG Saving (gCO_{2eq}/MJ)***
sugar beet ethanol	12	12
wheat ethanol	23	23
corn ethanol	20	20
sugar cane ethanol	14	14
rape seed biodiesel	29	29
sunflower biodiesel	18	18
soybean diesel	19	19
palm oil biodiesel	14	14
waste vegetable or animal oil biodiesel	0	0
hydrotreated vegetable oil from rape seed	30	30
hydrotreated vegetable oil from sunflower	18	18

Once each factor is determined—whether relying on its actual or disaggregated value—their sum yields the total emissions from use of the biofuel. For example, an economic operator using sunflower biodiesel may decide to use the disaggregated value for the cultivation factor (e_{ec} = 18 gCO_{2eq}/MJ) but choose to determine the actual values for the remaining factors according to the Annex V methodologies. The sum of all the factors will yield the total emissions from use of that biofuel, which is then compared to the fossil fuel comparator to determine its GHG saving. Because the disaggregated values are conservative estimates, calculating the actual values should produce a lower value for GHG emissions and make that biofuel more competitive. Economic operators are allowed to select among the two alternatives, subject to certain restrictions, in an effort to provide flexibility and reduce administrative burdens. Although there is a factor and methodology for direct land-use change, there is neither a factor nor a methodology for ILUC.

[68] RED, Article 19(1).