

INTRODUCTION

The possible impact of indirect land use change (iLUC) emissions from an increasing biofuel demand has been widely discussed and caused controversies within the recent months. Several publications provided indications for a considerable impact of iLUC effects on the carbon footprint of biofuels. The impact of these effects might significantly decrease or even negate GHG emissions savings from the use of biofuels compared to fossil gasoline/diesel.

By the means of the Renewable Energy Directive (RED) and the Fuel Quality Directive (FQD) the commission introduced ambitious targets for the share of renewable energy in the European energy system and the European transport sector for 2020. Since one of the main drivers for the development of these goals was the willingness to reduce anthropogenic GHG emissions, it is highly important to consider the possible impact of iLUC effects on this strategy. Both, the RED as well as the FQD require the Commission to submit a report to the European Parliament and to the Council, reviewing the impact of iLUC on GHG emissions of biofuels. Furthermore, this report shall, if appropriate, address ways to minimize iLUC impacts and describe a methodology to calculate GHG emissions from iLUC effects within the general framework of the RED and FQD.

With this short response to the stakeholder consultation on iLUC effects of biofuels we would like to use the opportunity and address our opinion on some aspects referring to the questions raised by the commission.

RESPONSE TO THE QUESTIONS ADDRESSED IN THE CONSULTATION DOCUMENT

1) Do you consider that the analytical work referred to above, and/or other analytical work in this field, provides a good basis for determining how significant indirect land use change resulting from the production of biofuels is?

From our point of view, the analytical work launched and presented by the commission once more highlighted the importance of considering iLUC effects within the RED and the FQD framework. Even though there are huge uncertainties regarding to the actual amount of GHG emissions linked to iLUC effects, the work of the commission and former work presented by other authors (e.g. Searchinger 2008, Fargione 2008) clearly highlights that these effects exist and that they might have a significant impact on the biofuel and especially the GHG reduction targets of the European Union.

The approach to quantify iLUC effects from biofuels published by the commission seems to be one of the most comprehensive and sophisticated works available. However, we would like to encourage the commission to further support the work of the authors and to extend the level of detail of the models and to improve the data and assumptions applied.

We think that most of the assumptions behind the published approaches reflect the best available scientific evidence. However, since some of these assumptions significantly influence the result (e.g. crop yield growth respectively the degree of agricultural intensification as a response to increasing biomass demands or prices; the consideration of by-products which always has a region specific aspect and furthermore an area related

dimension), both the documentation of the level of uncertainty related to these assumptions and further work to decrease this uncertainty level are necessary to increase the overall robustness of the results.

Some of the work presented includes a discussion of the uncertainty related to the data and scenarios used to quantify GHG emission related to iLUC, but it seems highly important to extend this discussion to at least those assumptions that are input to the used models. At the same time the quality and higher resolution of data could be increased improving the assumptions made and reducing the uncertainties identified. As the extent of iLUC derives from the difference of a baseline scenario without an additional amount of biofuels and a scenario that considers the additional demand for biofuels and the corresponding LUC, a comprehensive discussion of the scenarios applied is needed. In this context the impact of iLUC mitigation measures and an iLUC factor should be examined within additional scenarios as well. The need for scenarios taking into account iLUC mitigation measures arises from the scenario approach of calculating iLUC.

2) On the basis of the available evidence, do you think that EU action is needed to address indirect land use change?

Science has shown that iLUC effects and the related GHG emissions significantly reduce or even negate the intended amount of GHG mitigation of the measures supporting the use of biofuels. As it is an indirect effect of biofuel production it seems impossible to actually quantify the exact amount of iLUC emissions referring to the production and use of a specific biofuel. Nevertheless, recent studies proofed that the amount of iLUC related GHG emissions varies between different biofuels. Therefore, GHG emissions from iLUC should be addressed to biofuels and LUC related GHG emissions should be taken into account by other land intensive activities.

3) If action is to be taken, and if it is to have the effect of encouraging greater use of some categories of biofuel and/or less use of other categories of biofuel than would otherwise be the case, it would be necessary to identify these categories of biofuel on the basis of the analytical work. As such, do you think it is possible to draw sufficiently reliable conclusions on whether indirect land use change impacts of biofuels vary according to:

- feedstock type?
- geographical location?
- land management?

The issues mentioned have an impact on iLUC and additional effort is required to differentiate between these aspects. This is very difficult as they affect each other. Different feedstock types are bound to suitable climatic, soil and other physiographic conditions and therefore the geographical location varies between different feedstocks. This also corresponds with differences in land management and the market response to an additional demand for a certain biofuel respectively feedstock. The market response could be (i) a price increase (2) an area expansion (3) or a yield increase or (4) a mixture of the three mechanisms. Hence, it is likely that the iLUC impact varies between different conversion routes and – considering barriers in international trade - their geographical location. Furthermore, the conversion efficiency and the use of resulting by-products vary according to feedstock used. Finally, the iLUC impact of co-products is related to the regional structures in which the biofuel facility is embedded and the conversion process itself. Thus, more effort is required in order to quantify the iLUC impact of certain interdependencies and in the analysis of their extent within certain scenarios.

4) Based on your responses to the above questions, what course of action do you think appropriate?

A. Take no action for the time being, while monitoring impacts including trends in certain key parameters and, if appropriate, proposing corrective action at a later date

We do not think that “Take no action” should be an option for the commission.

*B. Take action by encouraging greater use of some categories of biofuel
Please say which biofuels, why and what sort of encouragement should be given.*

We know that there might be some possibilities to reduce the risk of iLUC effects by supporting the use of “unused” residues or so called degraded lands for the biofuel production. In general, these promising possibilities and approaches should be investigated in a greater level of detail in order to determine (i) the possible potential of these “unused” residues and (ii) degraded or unused areas to produce biofuel feedstock. Such an assessment should also include an economic dimension in order to develop an idea of the additional costs that the production of biomass on “degraded” land might cause in comparison to an energy crop production on land already under cultivation. Such an assessment could lead to the conclusion that it might be favourable to encourage the use of residues or biomass produced on degraded lands in order to reduce emissions from iLUC. We think that the encouragement of conventional biofuel options with a potentially lower iLUC impact compared to others should be done very carefully. Since such an encouragement could lead to an increasing demand for the supported fuels and feedstocks, it would be highly important to develop an idea how this increasing demand could change the amount of iLUC emissions related to these fuels. In a first step, this could be done by the means of scenarios (e.g. the encouragement to use more of biofuel A and maybe less of biofuel B and how this would change the iLUC emissions related to these biofuels compared to a business as usual scenario) as an input to the models available to the commission.

*C. Take action by discouraging the use of some categories of biofuel
Please say which biofuels and why, as well as what sort of measure should be taken, for example:*

- attributing a quantity of greenhouse gas emissions from indirect land use change to all biofuels that use land

If the latter, please say how this should be calculated, and demonstrated – for example:

- a factor based on the estimated (modelled) land use change from a marginal extra quantity of crop production;*
- a factor based on the average land use change from crops over some recent period;*
- a factor based on any other consideration.*

The introduction of an “iLUC factor” in addition to the mandatory GHG calculation for biofuels in the framework of the RED sustainability requirements could be a useful first step in order to address the general issue of iLUC and avoid the risk of overestimating a possible contribution of biofuels to the overall GHG reduction targets of the European Union. In a first step this factor could be calculated following a deterministic approach (Tipper 2009, Fritsche 2007 and Bauen et al 2010 provided examples for such approaches). As an iLUC factor itself influences the future amount of iLUC, the calculation of such a factor should be based on a scenario considering the measures to mitigate iLUC. This factor could be replaced by a more sophisticated analytical approach as far as the modelling work is further improved.

If possible, it would be necessary to introduce a factor that allows a differentiation of the iLUC effects of the different biofuels. iLUC is not exclusive to biofuels produced from energy crops. The use of residues could also cause iLUC impacts if these residues have been in use already for other purposes.

Due to the incentives of such an iLUC factor, several measures to reduce iLUC related and non-iLUC related GHG emissions become more important. Amongst others these measures are an improvement of the overall efficiency of the biofuel production, the usage of co-products as substitutes for land intensive products and integrated production of biomass. With imposing an iLUC factor such measures need to be taken into account as they help to fulfil certain GHG avoidance criteria and to reduce the amount of iLUC.

Please also say

- whether it should be reviewed and if so how often

If a deterministic approach is used to introduce such a factor it is highly important to review this factor periodically. This allows to consider some dynamic processes in order to (i) update the amount of GHG emissions from iLUC effects for the different biofuel options and (ii) to develop an idea how the introduced factor might influence the system and therefore the actual amount of GHG emissions allocated to different biofuels. E.g.: such a factor could have some kind of “steering effect” towards biofuel options with rather low iLUC emissions. This could result in an increasing demand for these options which would again impact their specific iLUC emissions.

Furthermore, it is important to note, that the introduction of such a factor could not substitute the highly valuable analytical work (e.g. as presented by the commission) which is necessary also in the future in order to better understand the interactions between an increasing biomass demand for food, fodder, material use, bioenergy and resulting direct and indirect GHG emissions.

- whether it should be implemented with any accompanying measures

The introduction of a certain iLUC factor would lead to a reduction of the GHG mitigation potential from biofuels. The scientific evidence available showed that the quantities of GHG emissions from iLUC are also a function of the total amount for biomass to produce biofuels or bioenergy. Taking this relation into account, the GHG reduction targets defined in the framework of the FQD should be discussed once again within the context of the iLUC debate. The iLUC impact could otherwise lead to a situation where significantly more biofuels are needed in order to meet the overall GHG reduction targets of the EU RED.

Leipzig, 29.10.2010 Stefan Majer, Matthias Edel

References

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