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ICCT submission to the European Commission consultation on indirect land use change

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Since 2008, it has become increasingly clear and accepted that biofuels policies are likely to have indirect effects on land use change, and resulting carbon emissions, that must be considered if perverse outcomes of policies are to be avoided. We congratulate the European Union on its commitment to pursue best practice on regulating the indirect effects of biofuels, in particular indirect land use change. The work of the European Commission to date has been a valuable contribution to the iLUC debate not only in Europe but globally, and the expertise developed within the European Union can help regulators in the US and elsewhere develop improved regulations to deal with iLUC, just as the experience of the US Environmental Protection Agency and California Air Resources Board in designing regulations that include iLUC can inform the discussion in Europe.

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?

The ICCT believes that there is adequate evidence available, both from the EC's consultation documents and from other work in the field, to conclude that indirect land use change resulting from increased use of biofuels will be very significant. It is worth noting that the 'significance' of indirect land use change resulting from biofuel use is not primarily a question of the absolute area of land use change that occurs, but of the extent to which the greenhouse gas emissions resulting from that land use change affect the overall greenhouse gas balance of a biofuels policy. In this context, statements about the absolute quantity of land required for biofuels, or comparisons between the land required for biofuels and other agricultural uses (e.g. 'biofuels only use 1% of global land'), are of little relevance.

Studies to date show that the additional carbon emissions per liter caused by indirect land use change due to biofuels can be significant. The results of studies including the IFPRI study for DG Trade, the Aglink study for DG Agri (when carbon emissions are allocated under the new JRC methodology) and the marginal scenarios run for JRC as part of the ILUC modeling comparison study all suggest that land use emissions from biofuels are likely to be of the same order of magnitude as production emissions, and that in some cases land use change emissions will prevent increased biofuels use in the EU from delivering any climate benefits. If indirect land use change emissions are not either controlled or accounted for, it is plausible that EU biofuels policy will not deliver any net carbon saving by 2020.

As well as including iLUC in the short term, there remains a clear case for further research in the short and medium term as the discussion moves on from the question of whether iLUC is significant (it seems clear that it is) to the question of how it can be avoided or mitigated. The four consultation documents published by the European Commission are all valuable contributions to the discussion, but do not show a coherent sense of purpose. In particular, it was disappointing that the DG Agri driven study by JRC did not assign carbon emissions to land use change, while we have commented on some problems in the summarisation of the DG Energy Literature Review in an attached document. It would seem appropriate for the European Commission to consider putting control of all iLUC research moving on from this consultation directly in the hands of either the JRC or of an independent expert panel, to insure that work can continue to deliver excellent outcomes without political interference and so that future work streams are complementary.

The consultation called in particular for comments on several sub points. The ICCT would like to make the following observations in these areas:

- projected volumes of conventional and advanced biofuels in 2020

In general the modeling presented in the consultation documents have modeled lower levels of biofuel use in Europe than might be expected based on evidence including the National Renewable Energy Action Plans. The models used in these studies are approximately linear either by design or in practice, as noted in the ILUC modeling comparison study. Therefore, any continuing uncertainty about projected volumes of biofuels to be used by 2020 should not cast any fundamental doubt on the marginal ILUC factors reported from models.

- assumptions around EU vehicle fleet and infrastructure in 2020, including diesel/petrol split and pace of introduction of new technologies

We note that the National Renewable Energy Action Plans suggest that the biodiesel/ethanol split will not necessarily track the diesel/petrol split. Also, given the approximate linearity of modeling approaches, correctly forecasting the future biodiesel/ethanol split should not be necessary to the assessment of reasonable iLUC factors.

- models' treatment of crop yield growth "in the baseline" and in response to growth in demand;

Baseline crop yield growth will have a direct and noticeable impact on the magnitude of iLUC effects. The ICCT believes that baseline yield growth has

in general been treated within a reasonable range in existing models. There is potential for reality to either exceed or disappoint these expectations, however, we do not believe that the underlying character of the results is in doubt. The question of demand induced yield growth is a more difficult one in many ways, because there is a lack of adequate data to determine whether this effect will be significant, and if so what magnitude it might have. There is no convincing economic evidence in the literature that demand induced yield growth will be a significant effect. It is nevertheless included to some extent in most models. As with baseline yield growth, it seems possible that models could have either over or under estimated the ‘real’ magnitude of this effect. We do not believe that this uncertainty is such as to challenge the fundamental conclusion that iLUC emissions will be highly significant.

- the underlying land use data

Studies indicate that there are considerable uncertainties in the mapping of existing agricultural land use. This should not be taken to undermine the underlying logic of iLUC modeling exercises – that increased demand for a commodity in one region will lead to increased production of substitutable commodities elsewhere.

- the carbon stock values used in modeling and type of converted land

The carbon stock of converted land will make a significant difference to the iLUC emissions resulting from increased biofuel use. In the European context, the recent JRC work on assessing carbon emissions due to land use change represents an important landmark in developing a European model for assessing iLUC emissions. While such a model continues to be developed, it should be recognized that existing work with a range of approaches to this question has delivered consistently the same conclusion that iLUC emissions are significant.

- models’ treatment of co-products

It seems likely that the treatment of co-products in some models does not accurately reflect likely actual scenarios. Establishing what constitutes an appropriate treatment of co-products will be particularly important if Europe is to introduce feedstock specific iLUC factors in due course. The ICCT expects to publish a paper assessing appropriate by-product substitution rates in the New Year.

- significance of the results in terms of hectares of land use change and emissions

As stated above, the results show that if indirect land use change is not dealt with it is likely to cause emissions of a magnitude that would seriously threaten the goals of European biofuels policy.

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

Based on the evidence available in the consultation documents, and other evidence, the ICCT believes that if the EU desires to consider its biofuels policy as a climate change mitigation policy, regulatory action to address iLUC is appropriate. If no action is taken, the current best science suggests that it is likely that the RED and FQD will fail to achieve their stated greenhouse gas mitigation objectives – despite significant cost to European consumers and to the transport fuel supply business from implementing the policy.

It is possible to consider the financial impact of not dealing with iLUC by considering the 'real' cost per tonne of carbon abatement if iLUC emissions are not counted towards the RED thresholds. As an example, we have produced a graph showing how the cost per tonne of CO_2e would be affected as the amount of iLUC not accounted for increases. This is done (Figure 1) for a notional biofuel with a 50% direct carbon saving, comparing to an 86.4 gCO_2e/MJ fossil fuel comparator, with an 'iLUC free' carbon abatement cost of $150 per tonne (based on the JRC's 2008 report 'Biofuels in the European Context: Facts and Uncertainties').

As can be seen, if iLUC emissions of, for instance, 30g CO_2e/MJ were unaccounted for, the real abatement cost for this biofuel would be about $500 per tonne. This cost would rise non-linearly if the level of unaccounted iLUC emission were even higher (and of course if iLUC were higher than 43.2 gCO_2e/MJ, there would be no saving at all).

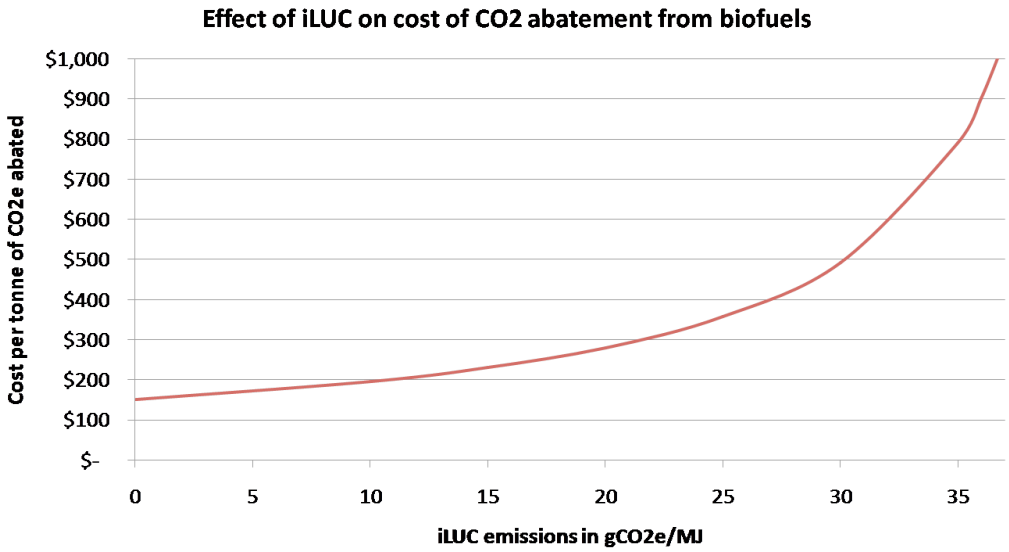

Figure 1 Effect of iLUC on the cost per tonne of CO_2e abatement (illustrative case)

When the true carbon abatement costs of the policy are considered in these terms, and given that the evidence suggests that iLUC emissions of 30 gCO_2e/MJ or more are plausible for most fuels, it is clear that even if a regulatory measure imposed moderate additional costs on the biofuel industry, such a measure if successful could still be very worthwhile in terms of bringing down the carbon abatement price of the policy. For instance, for the notional biofuel described above, if it was possible to avoid iLUC emissions of 30 gCO_2e/MJ at a cost of $30 per tonne of biofuel, this would reduce the cost per tonne of carbon abatement for that fuel from about $500 to about $170 – a reduction by nearly a factor of three.

To put this hypothetical cost in context, certificates to demonstrate that palm oil met the RSPO criteria were trading at under €10 per tonne as at the end of September 2010. We note that work by Ecofys (2010)[1] and others suggests that it should be possible to mitigate iLUC by use of the responsible cultivation areas mechanism, without incurring high additional production costs.

1 http://www.renewablefuelsagency.gov.uk/sites/renewablefuelsagency.gov.uk/files/_documents/Avoiding_indirect_land-use_change_-_Ecofys_for_RFA.pdf

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?

If so, please say which, and indicate the evidence used to reach your conclusion.

We believe that the evidence from existing modeling is strong enough to suggest that distinctions can be drawn between the indirect land use change impacts of different biofuels based on feedstock type. On this basis, feedstocks would be divided into sugars (primarily beet and cane), starches (e.g. corn and wheat), oils (palm, OSR, soy etc.) and cellulosic crops (fast growing grasses and tree plantations). This division is consistent with taking as a working assumption the existence of a single world market in each of these feedstock types. While it should in principle be possible to treat feedstocks completely separately, we do not believe that existing evidence is adequate to make robust distinctions.

Setting out a proposal based on feedstock type specific iLUC factors would give clear market signals about the direction of travel of European biofuels regulation, and indicate which categories of feedstock are considered to cause the lowest iLUC. By driving investment into feedstocks expected to cause lower iLUC emissions, adopting differentiated iLUC factors at this stage can deliver significant benefits that would not be delivered by adoption of, for instance, a flat rate iLUC factor.

An initial distinction of iLUC by feedstock type must be understood in the context of the grandfathering already built into the RED/FQD, under which an iLUC factor would not become applicable to fuel from existing installations until 2017. Setting iLUC factors based on feedstock type at an early stage will provide the market a clear signal that iLUC is being accounted for and addressed, while leaving the period to 2015 available for factors to be refined based on additional research before they become applicable to the existing

installations. If within the timeframe to 2015 it becomes increasingly clear that, for instance, the iLUC impacts of different oilseeds can be robustly determined, then it may be appropriate to introduce additional variation in default factors within this timeframe.

On the question of differentiating iLUC factors based on geographical location, we do not believe that there is sufficient evidence to discriminate between feedstock on that basis at the current time. We further note that geographically based approaches, even if based on sound analysis, might be more likely to be perceived as inappropriate barriers to trade, and hence subject to challenge at the WTO. We would not recommend that the Commission prioritizes investigation in this area moving forward.

On the question of differentiating land factors based on land management, we believe that there is good evidence that it is possible to implement specific actions at the project level that will allow iLUC to be avoided (for instance the Responsible Cultivation Areas methodology outlined by Ecofys, 2010). These options include project level approaches to land management. It is less clear whether regional approaches to land management can reduce iLUC for a specific feedstock, or whether given the interconnectedness of agricultural markets good regional practice should be understood as reducing only the overall impact. We note that large scale land management approaches that are adopted within the next few years can be included in future modeling and reflected in revisions to feedstock/feedstock-type specific iLUC factors.

Nevertheless, where a specific national or sub-national region is implementing land management practices that will reduce the overall risk of carbon emissions from land-use change, Europe might consider it appropriate to take this into account in the treatment of iLUC emissions for biofuels sourced from that region.

We note, however, that in general preventing land use change within a specific region does not imply that biofuels sourced from that region do not cause iLUC (as the indirect effects could be occurring in an entirely different region). Similarly, maintaining levels of exports from a given region is not, in and of itself, evidence that biofuels from that region are not causing iLUC.

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

The report of the European Commission on iLUC should recommend that iLUC

factors for each of the four categories mentioned above (sugars, starches, oils, cellulosic) should be introduced into the GHG calculation methodology under both the RED and FQD. The Commission should also outline a set of criteria based upon which a fuel might be exempted from the iLUC factor.

There are various bases upon which iLUC factors could be assigned. There is no single scientific answer to determine which approach should be taken – it is, fundamentally, a political decision. This will need to take into account the best understanding available form the existing scientific evidence of the likely distribution of the ILUC emissions; the degree to which an accurate representation of GHG emissions associated with different biofuels is important (both for assessing performance of individual fuels, and for understanding the impacts of the policy as a whole); the extent to which Europe wishes to protect existing investments; and the extent to which a precautionary approach is preferred to avoid undesired environmental consequences. Approaches to setting the recommended factors would include:

1. Choosing numbers based on the results of specific fuel-type scenarios. The results of ethanol scenarios could be applied to sugars and starches. The results of biodiesel scenarios could be applied to oils. Where scenarios have been run for only starch ethanol or only sugar ethanol, there might be scope to differentiate. It would be necessary to justify the choice of model.

2. Choosing numbers based on the results of specific marginal scenarios. If using marginal results, there would be a choice between applying the average of results in a feedstock type (e.g. sugars could be the average for sugar cane and sugar beet); or an average weighted by projected volumes; or choosing one feedstock as the representative value (e.g. wheat for starches); or choosing the highest or lowest marginal value in a category in order to be precautionary/conservative. It would be necessary to justify the choice of model.

3. Choosing numbers based arithmetically on more than one model. Some statistical combination (such as an average) of the outcomes of different models could be used to determine the result. Moving forward, it would be important to have a clear procedure for deciding which models to include.

4. Choosing numbers based on application of expert judgement to the outcomes of several models. Working from, for instance, the

JRC iLUC modelling study, values could be allocated based on a consideration of the 'most likely' outcomes. The numbers could be connected to a subjective assessment of likely iLUC risk – allowing, for instance, optimism/pessimism about future yields or land management for different crops to be considered. It would be important to ensure that any subjective process was highly transparent.

5. Choosing numbers based on a more sophisticated probabilistic assessment. Most existing iLUC model outcomes represent what the modellers responsible consider to be the most likely scenarios resulting from an increase in biofuel mandates. While one can choose to use the results of these central scenarios, it is also possible to consider in more detail the probability distribution for the results of iLUC modelling. The California Air Resources Board iLUC expert workgroup uncertainty subgroup has explored the possible alternatives to choosing the 'most likely' value for an iLUC factor[2]. They point out that the most likely scenario does not necessarily represent the expected outcome in the probabalistic sense of expectation, given uncertainty. They also point out that depending on political aims (whether to account for iLUC as accurately as possible, to minimise the risk of increasing GHG emissions, to minimise the risk of undermining sectoral development etc.) adopting different values might be appropriate. For instance one could undertake a 'cost of error' analysis, to attempt to determine iLUC factors that should be applied if one wanted to minimise the likely negative impacts (based on whichever metrics considered most important) of misassignation.

6. Whichever approach to determining values were chosen, a political decision might be made to systematically alter these values. For instance, if one was following the precautionary principle one might apply a systematic increase, a kind of safety margin, to iLUC factor estimates (analogous to the conservatism on default direct LCA emissions in RED). On the other hand, if one wanted to act conservatively and reduce the risk of over-penalising fuels, one could apply a systematic reduction to iLUC factor estimates. It would be important that the basis for taking this decision, and the method used, were transparent.

2 http://www.arb.ca.gov/fuels/lcfs/workgroups/ewg/101510uncertainty.ppt

While the evidence is compelling that iLUC is an important phenomenon and cannot be ignored, substantial uncertainty does remain in its quantification. In this context, we recommend that the proposal should also lay out a clear process for revision and amendment of the initially specified iLUC factors. This could put responsibility for determining revised factors in the hands of the JRC, or of an independent expert group assembled for the purpose. The experience of the Californian Air Resources Board in convening expert groups to discuss iLUC should be instructive here. The Commission's proposal could recommend that a specific model (such as IFPRI MIRAGE) is chosen to be refined and used as the primary tool to set EU iLUC factors, but could also recommend that the JRC/expert group should continue to take into account the results of a range of modelling processes. There is also scope to set in process the design of a new modelling system built specifically for the purpose of land-use modelling – however, such a project could be extremely challenging in the necessary timeframe.

There will be approaches to biofuel production that will avoid indirect land use change entirely, by ensuring genuinely additional production of biofuel feedstocks. One potential approach that could be used to identify fuels to be exempted from iLUC factors is the Responsible Cultivation Areas methodology developed by Ecofys for IUCN, WWF, Shell and the RFA. We suggest that serious consideration be given to including the RCAs methodology as an option to avoid an iLUC factor. An alternative way to include the RCAs model might be through double counting, as is currently applied to, for example, cellulosic biofuels.

We note that the RCAs methodology provides a route to avoid not only the negative carbon emissions consequences of iLUC, but also managing impacts on biodiversity, food prices and other social issues. This is because the RCAs methodology shifts all of these effects from the sphere of the indirect to the sphere of the direct (and hence more easily regulable).

Although we have specified the RCA methodology here, this need not be the only option to allow exemption from an iLUC factor. Given the clear benefits of avoiding iLUC, we would recommend that any **scientifically sound and robustly demonstrable** system that can be put in place to avoid iLUC should be seriously considered for inclusion as a route to exemption from an iLUC factor.