



PUBLIC CONSULTATION ON INDIRECT LAND USE CHANGE AND BIOFUELS

POSITION PAPER

31 October 2010

Introductory considerations

APPA Biocarburantes represents the Spanish biodiesel, bioethanol and biogas producers. One of its key objectives is to ensure that EU sustainability requirements are adequately implemented in order to take full advantage of biofuels' enormous potential to reduce greenhouse gas (GHG) emissions.

The Renewable Energy Directive (RED) establishes the most ambitious and stringent biofuels sustainability scheme in the world, which will guarantee the use of better GHG performing biofuels, while also protecting areas of high environmental value. These strict requirements are yet to be implemented by the EU Member States. **Indirect Land Use Change (ILUC) cannot become an additional sustainability criterion for biofuels** unless the technical and scientific community reaches a consensus on a **verifiable, rigorous and indisputable methodology** to determine its existence and quantify its effects.

Strongly believing that good policy cannot be based on unproven and biased science, *APPA Biocarburantes* will further argue that **no policy action should be taken for the time being**, as the modelling work presented so far is merely work in progress and not "best available science".

This document will further outline *APPA Biocarburantes'* response to the four questions posed by the European Commission in the framework of the public consultation on ILUC, which takes place until 31 October 2010.

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?

APPA Biocarburantes believes that the three studies attached to the consultation and elaborated at the request of the European Commission **are not an acceptable basis for unequivocally quantifying the ILUC effects of biofuels**.

The great discrepancy between the results obtained by the various modelling studies clearly indicates that there are serious flaws as regards the key assumptions, data and the methodologies used, leading to a gross overestimation of the impact of ILUC caused by biofuels production. The same conclusion seems to have been reached as well by the comprehensive literature review performed by DG ENERGY¹, which outlines a wide range of inconsistencies found not only in the studies attached to the consultation, but also in 19 others.

Generally agreeing with the scientific flaws highlighted in the aforementioned review, *APPA Biocarburantes* would like to point out to the following **major inconsistencies** that make the modelling work carried out for the Commission completely inadequate for regulation purposes:

A. Methodology: too many limitations that question the scientific value and objectivity of the studies

- Equilibrium models are inaccurate analytical tools to assess biofuels' ILUC effects. The eight models analyzed in the studies attached to the

¹ European Commission (DG Energy), July 2010, "The impact of land use change on greenhouse gas emissions from biofuels and bioliquids".

consultation are either **general or partial equilibrium models which, by definition, have several inherent weaknesses when assessing ILUC impacts:**

- Their theoretically-derived results depend on the assumptions made: the studies presented use arbitrary assumptions and empirical data (for instance, elasticity factors for yields for converted lands, carbon stock values for different types of land etc.) which inevitably lead to deviating results.
- Equilibrium models oversimplify complex economic and political processes and do not take into account the interdependencies between critical regulatory developments that define the scale of biofuels' ILUC impact: the agricultural, trade and fiscal policies that will impact upon energy and agricultural markets, future bio-energy mandates in the EU and the rest of the world, technological developments etc. This flaw is even more evident in the case of the five partial equilibrium models presented, which only analyze developments in the agricultural sector, without modelling the supply and demand in the energy market.
- Most models were not designed for assessing ILUC from biofuels in the first place and therefore, should be adapted to adequately model ILUC: the GTAP model from the IFPRI study², for instance, was not specifically developed to model agricultural trade or ILUC changes.

Consequently, there is a **strong need to go beyond equilibrium models when assessing ILUC impacts for biofuels**. Some very recent scientific studies have already started to do that. A modelling work sponsored by UK Department for Transport³ employs a *causal descriptive methodology* to model ILUC, avoiding thus most of the methodological drawbacks signalled above and in the DG ENERGY review. This study can constitute a good first basis for ILUC modelling in the near future, and other similar initiatives should be encouraged and supported.

- The models provide theoretical predictions and results that have not been tested

One of the very basic requirements of any respectable scientific work is to test the hypotheses/predictions that are being developed. The studies attached to the consultation limit themselves to making mere “educated guesses” about the magnitude of the ILUC effects of biofuels production, without testing any of their predictions. Given that the models presented are being considered for serving as a basis for future EU policy, **it is unacceptable that none of the analytical studies presented tested their predictions**. Adopting policies that would affect a great number of stakeholders on the basis of these unproven hypotheses would undoubtedly be an irresponsible political act.

- The objectivity of the analytical work presented is doubtful

² IFPRI, 2010, “Global Trade and Environmental Impact Study of the EU Biofuels Mandate”.

³ E4tech, 2010, “A causal descriptive approach to modelling the GHG emissions associated with the indirect land use change impacts of biofuels”, available at <http://www.dft.gov.uk/pgr/roads/environment/research/biofuels/>

A common practice in the scientific community which guarantees the objectivity and accuracy of any work is to have it assessed by an independent third party. **None of the three studies presented have been peer-reviewed** and therefore the validity of their results is questionable. The **complexity and opacity of most models** (as regards the empirical data used, modelling choices, algorithms etc.) makes it very difficult for both external experts and non-experts to fully understand and reproduce their results.

What is more, the methodology and data used were not made available for scrutiny by interested parties so that the assumptions made by the modelling teams could be seen and questioned. Had stakeholders been consulted during the elaboration of this analytical work, many of the research limitations and inaccuracies in the models presented would have been avoided.

B. Some of the data and assumptions used are inaccurate or arbitrary, while several relevant variables are not considered by the models

- Due to the incomplete and partly outdated land use databases used, some models assign **arbitrary carbon-stocks values for various land types**.
- The **estimations for key parameters** such as future biofuel demand, future land use for the raw materials for biofuels production, yields increases in 2020, ratio between first and second generation biofuels in 2020, etc. vary significantly between the models presented and the choice of the values is not always adequately justified.
- Another common feature of all studies is the **inadequate treatment given to co-products**: some do not account for co-products at all (LEITAP), while others (e.g., AGLINK-COSIMO,) do not properly consider the high protein biofuel co-products such as DDGS and rape meal, which are used for animal feed.

The incorrect accounting of co-products is one of the main causes for the gross overestimation of GHG emissions from ILUC across all studies and needs to be addressed.

- The **yield growth estimates and predictions used by the models are highly disputable**, given that they consist in values based on historic data and do not account for future technological developments in agriculture. Furthermore, no justification is given either as to why newly converted land is considered to have a lower yield than land already in use (IFPRI study). The ratio of substitution between biofuels co-products and replaced products is also highly uncertain.

Moreover, no consideration is given to the fact that the crop demand growth for use as biofuels will lead to an increase in crop yield growth, without necessarily entailing a change in land area. A recent study by the US Department of Energy's Oak Ridge National Laboratory⁴ has found that *"minimal to zero indirect land use change was induced by use of corn for ethanol over the last decade"*, as feedstock for ethanol expansion was

⁴ DOE, OAK Ridge Laboratory, October 2010, "Decomposition Analysis of U.S. Corn Use for Ethanol Production from 2001-2008,"

mainly derived from domestic reallocations (85%) and increased yields (6%). Another scientific paper by Ensus Ltd.⁵ argues as well that *"If the EU cereal grain output matches projected global demand growth, future yield growth can be expected to account for over 100% of output growth resulting in a continuing reduction in EU land area required for cereal production"*.

- The **vast idle lands that are currently available in different parts of the world are not taken into account** by the models presented, causing as well an overestimation of the GHG emissions from ILUC.
- Surprisingly, all models ignore the **potential positive effects of the sustainability criteria** (related to GHG performance and land-use) established by the RED on the reduction of ILUC emissions.
- The **models do not take into account the dynamics of EU and global policies** as regards critical sectors such as trade and agriculture. ESIM and AGLINK-COSIMO⁶, for instance, assume that CAP will be implemented as established by the Health Check reform of November 2008, while it is well known that the CAP is currently undergoing a complex process of revision.

C. ILUC emissions for biofuels should be assessed against the direct and indirect externalities of fossil fuels

An essential scientific flaw of the analytical work presented is that the biofuels' GHG emission savings (including ILUC) are assessed using as a benchmark the emissions from conventional sources of crude oil, instead of considering as well the emissions of nonconventional sources of oil. This puts biofuels in an absurd situation in which their GHG emissions caused by ILUC are artificially increased as a result of using the wrong comparator.

APPA Biocarburantes considers that **any modelling work on the ILUC impacts of biofuels production must take into account both direct and indirect emissions of fossil fuels**, in order to make sure that the same benchmark is used. An adequate methodology needs to be developed in order to quantify both direct and indirect emissions from fossil fuels. Indirect externalities include carbon emissions related to refinery co-products (which are often toxic), oil spills, land displacement during oil extraction, the use of military forces and equipment to protect the Middle East oil supply, etc. These indirect emissions would undoubtedly dwarf the supposed GHG emissions from ILUC that would be attributable to biofuels, should a scientifically sound modelling work be developed.

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

APPA Biocarburantes believes that, on the basis of the analytical work available, **no EU action is needed on indirect land use change**.

⁵ Warwick Lywood, John Pinkney, Sam Cockerill, 2009, "The relative contributions of changes in yield and land area to increasing crop output", GCB Bioenergy (2009), 1, 360-369.

⁶ As presented in the JRC-IPTS study, June 2010, "Impacts of the EU biofuel target on agricultural markets and land use: a comparative modelling assessment".

The multiple methodological limitations, the numerous inaccurate data and assumptions, and the fact that indirect effects from fossil fuels extraction, transport and refining are not yet accounted for by any of the studies, clearly show that the current modelling work available to quantify the ILUC impact of biofuels cannot constitute a reliable basis for policy-making. The EU should not rush into turning unproven science into law, negatively affecting various industrial sectors across Europe and beyond.

More time is needed to perform an adequate modelling of biofuels' ILUC effects. However, this modelling work cannot be adequately performed without involving stakeholders from all interested sectors. Active stakeholder participation would increase the transparency of the whole process and it would highly improve the quality and the availability of the data.

Furthermore, an immediate action that the EC needs to take is to develop analytical work for modelling both the direct and indirect externalities of fossil fuels. This is the first, *sine qua non* condition for any scientifically sound assessment of biofuels' ILUC effects.

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?

As mentioned above, *APPA Biocarburantes* reiterates that **no action should be taken at EU level at this stage**.

The aforementioned flaws and limitations of the current analytical work indicate that it is currently **impossible to draw sufficiently reliable conclusions with regards to the magnitude of ILUC effects depending on feedstock type, geographical location or land management**. *APPA Biocarburantes* believes that, in the absence of scientific consensus on the parameters, assumptions and data to be used for quantifying ILUC, no reliable and scientifically robust distinction can be made between the ILUC impacts of different biofuels for the moment. In the case of feedstock types, for instance, there is currently no reliable model to evaluate and predict the evolution of the patterns of the substitution relationships among individual raw materials.

This does not exclude the possibility that, in the near future, once the analytical work is further refined and the indirect emissions of fossil fuels are properly integrated into the ILUC models, reliable conclusions can be drawn with regards to the influence of feedstock type, geographical location or land management on the scale of ILUC emissions.

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.

- B. Take action by encouraging greater use of some categories of biofuels.
- C. Take action by discouraging the use of some categories of biofuel.
- D. Take some other form of action.

APPA Biocarburantes strongly believes that, taking into account the evident uncertainties in the current models used to quantify ILUC effects and the fact that all public policy must be based on sound science, **Option A is the only adequate course of action**. The four studies clearly show that a “*satisfactory level of understanding on the ILUC effects of biofuels*” has not been achieved yet, due to the insufficient empirical data, the inadequate models and numerous arbitrary assumptions that inevitably distort the theoretically-derived results.

No legislative action should be taken for the moment, while the **monitoring of ILUC impacts should not be limited only to biofuels, but also to all land-based products**.

Option B (incentivising certain categories of biofuels) is already covered by Art. 21(2) of the RED according to which biofuels produced from waste, residues, lingo-cellulosic material and non-food cellulosic material count double towards national consumption targets. The Directive also introduced a bonus for biomass cultivated on degraded land (29g CO₂eq/MJ). Any further incentives need to be based on sound scientific evidence on biofuels’ ILUC effects, which is not yet available.

***APPA Biocarburantes* rejects Option C in the absence of rigorous scientific data**. It must be emphasized that the RED already established an ambitious set of criteria that will prevent the production of biofuels from areas with a high environmental value and will ensure significant GHG emissions savings. Introducing additional sustainability requirements or increasing the minimum GHG saving threshold is unnecessary, as they would only create a high administrative burden for stakeholders without clear environmental benefits. Priority should be given to the swift implementation of these criteria into national law and to evaluating the impact of RED implementation in third countries.

The **introduction of an ILUC factor** should also be rejected given that it would impose a significant penalty upon the producer on the basis on incomplete models and arbitrary assumptions. In the absence of a consensual, rigorous and scientific methodology to quantify GHG emissions from ILUC, no ILUC factor can be defined nor imposed.

Conclusions

- **The analytical work attached to the consultation cannot be considered as a good basis for policy-making**, given its basic scientific flaws, inadequate models, disputable data and assumptions, and diverging results.
- In the view of *APPA Biocarburantes*, the **EU should not take any legislative action for the moment**, as good policy can only be based on rigorous science.
- For this reason, **no ILUC factor, additional sustainability criteria or higher GHG emissions thresholds should be introduced**.

- The current models can be improved in the future and there are several recent studies that can bring added value to the ILUC debate. Nevertheless, **any modelling exercise should be transparent, objective and actively involve all interested parties.**
- No modelling work on ILUC will be scientifically rigorous and complete without adequately integrating the **direct and indirect effects of fossil fuels** and without **monitoring and assessing the ILUC and land use change effects of other land-use products and industries.**