British Sugar response to the European Commission's consultation on Indirect Land Use Change due to the impacts of biofuels

British Sugar is the world's second largest sugar producer with operations in the UK, Spain, Africa and China, using both sugar beet and sugar cane. In 2007 it opened the UK's first bioethanol production facility at its Wissington sugar factory in Norfolk, producing 55000t/year bioethanol, and has a joint venture, Vivergo Fuels, which is constructing a large scale plant at Saltend, Hull to produce 330000 t/year bioethanol and 500000t /year protein rich animal feed.

Questions and answers

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?

No, the work referred to above does not provide a good basis for determining the levels of ILUC from biofuels. There are several fundamental limitations in the models used on behalf of the Commission, some of which were identified in DG ENER review and nearly all of which lead to an overestimate of the amount of ILUC. These arise because the models used in the studies were not developed for modeling ILUC from biofuels or any other agricultural product.

There is however, other recent work, which has been peer reviewed and which is based on sound science, which provides a better basis for determining the scale of ILUC impacts.

Recently published modeling work by E4 Tech, sponsored by UK Department for Transport uses a cause- and-effect model to estimate ILUC[1]. This is based on data and methods, developed from extensive consultation with industry, academia and NGOs and has been peer reviewed by the UK DEFRA scientific panel. This modeling work avoids most of the problems identified in the DG ENER review of other models referred to above. This work shows that, bioethanol produced from wheat, where the co-products are used for animal feed, gives an ILUC credit.

We support the full critique of the studies in the response from ePure while summarising below the limitations of the ILUC models referred to in the consultation with further comments:

1. **Base assumptions.**

   The assumptions made in the models and the input data used vary between the studies. For example there is a wide variation in the estimates of transport fuel demand which will result in different conclusions.

2. **Accounting for biofuel co-products**

[1] HTTP://WWW.DFT.GOV.UK/PGR/ROADS/ENVIRONMENT/RESEARCH/BIOFUELS/PDF/REPORT.PDF

- Biofuel co-products used for animal feed displace other crops and provide a substantial credit to the GHG emissions from ILUC. None of the models properly take account of biofuel co-products and the crops that they displace, either not accounting for co-products at all, or, more often, not recognising the protein content of the cereal biofuel co-products, and just replace crops on a weight basis. The importance of this issue is highlighted by DG ENER in their literature review.

- ***This lack of proper accounting for high protein biofuel co-products causes a substantial overestimation of the GHG emissions from ILUC.***

3. Modelling of oilseeds market

- In many models oilseed crops are aggregated together or are represented by aggregate vegetable oil and oilseed meals. However, most oilseeds are grown primarily for the oil, with a lower value meal by-product, while soybean is primarily grown for the meal and is the marginal source of high protein meal for animal feed**.** Therefore the oilseeds markets must be disaggregated to allow for soybean meal to be modelled as the marginal source of high protein animal feed and hence show the land change credit of the biofuel co-products.

- ***The aggregation of oilseeds will therefore lead to an overestimation of the ILUC impact.***

4. Modelling land area and yield changes

- The macro-economic models assume that all the increase in demand above the estimated yield growth is met by land area change, and without any evidence to support this hypothesis. However, the crop demand growth for use as biofuels will lead to an increase in crop yield growth. Most models do not account for the increased yield growth due to increased demand growth and the yield growth estimate is often an exogenous value based on historic data.

- ***The lack of modelling of the proportion of demand growth from yield growth and area growth will cause an overestimation of the GHG emissions from ILUC.***

5. Change to trade of biofuel crops

For crops, such as cereals, which are widely grown locally, the transport costs are high compared to the value of the crop and therefore many regions maintain a self sufficiency of these crops and the crop output is adjusted to meet demand. Any increased demand for these crops will therefore primarily be made up by increased production in that region. Most models use arbitrary elasticity factors to determine the amount of increased biofuel crop demand that will be provided by increased imports or reduced exports. These factors do not take account of logistics cost and their applicability to cereals crops has never been justified.

The models overestimate the proportion of EU demand for cereals that will be met by EU imports or reduced EU exports. ***This results in the replacement cereals being modelled as being grown at lower yields than in the EU and gives an overestimation of the land use change and GHG emissions from ILUC.***

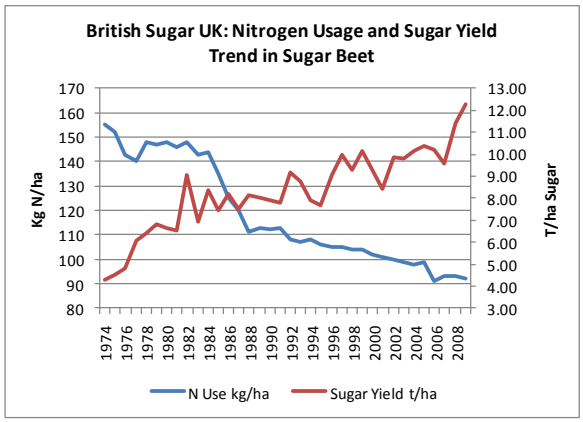
6. Type of land changes

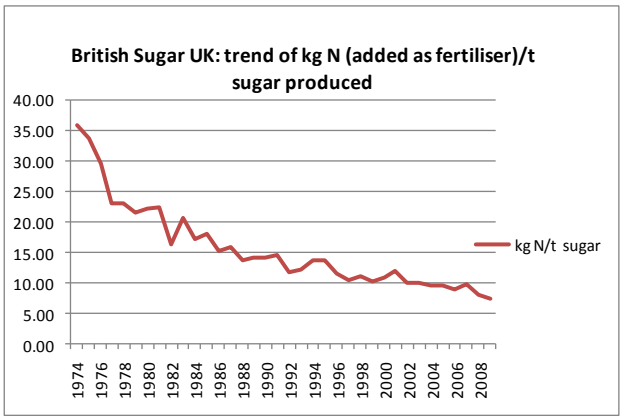
The methods for determining land use changes determine the amount of pasture and forest that will be displaced by extra cropland, but rarely include unused and idle land in the EU and FSU. When the re-use of idle land is included, the factor used for foregone carbon sequestration is far too high since it is primarily based on carbon accumulation by afforestation, instead of by natural succession.

The lack of inclusion of unused and idle land and high factors for foregone carbon sequestration will cause an overestimate of the GHG emissions from ILUC of biofuel crops grown in the EU.

7. Agriculture responses and best practice

IFPRI claim that there is more opportunity for increasing agricultural productivity in South America than in the EU. However, the experience of the UK sugar beet sector does not support this. Yield has increased by 50% since 1987, resulting in a sugar yield of over 10t/ha, which has been achieved with reduced nitrogen use. The average yield is well below the genetic potential (without the use of GM seed) based on trials from the UK industry research body (BBRO).





In addition, based on our experience, the impact and opportunity arising from good agricultural practice on yield improvements is probably underestimated in the considerations of yield response.

7) Effect of the sustainability criteria of the RED

The sustainability criteria of the RED restrict the land types from which biofuels can come from if they are to count towards the national targets. The GHG threshold also increases to 50% from 2017 (and to 60% for production which started on or after 1 January 2017). There has been no assessment of the impact of these factors.

In conclusion, studies commissioned by the EC do not give a good basis for determining the significant indirect land use change impacts resulting from the production of biofuels. However, there is a wider body of evidence that demonstrates that some biofuels have a negligible ILUC effect.

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

On the basis of what is stated under Q1 we do not believe that indirect land use change represents a material risk arising from the production of bioethanol from cereals and sugar beet, as long as the co-products are used for animal feed and so the answer to question 2 is therefore NO.

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.

If the limitations of the models that were commissioned are taken into account along with the conclusions from the E4tech work, this would lead to the conclusion that indirect land use change impacts of biofuels do vary according to feedstock type, and that the effects can be very low.

With regard to geographical location, cereals and sugar beet used for biorefining in the EU are grown in the local market where they are used. Any increase in demand will primarily be met by increased growth within the country or local region. Therefore for biofuel from EU cereals and sugar beet, the ILUC impact will only relate to cultivation in the EU.

Land management has substantial environmental benefits but is mainly an issue for direct land use change. It is only relevant to indirect land use change for land management changes at an international scale. It is assumed that any biofuel supplier that includes the direct land use change for a consignment of biofuel will not also incur an ILUC penalty. It may well be possible to reduce direct land use change impacts by good land management practices, but this is not an ILUC issue. (see point 7 above in response to Q1)

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

Based on the foregoing comments the appropriate course of action is 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.'

The modeling limitations identified must be overcome and any of these models must be subject to more transparency and industry peer review. If this takes place it should be possible to develop a risk based approach to ILUC mitigation according to feedstock using the approach being developed by the UK's Low Carbon Vehicle Partnership currently based on the E4Tech study for the DfT.