

Indirect Land Use Change Impacts of Biofuels

IUCN Input for the Public Consultation Energy Directorate-General, European Commission

The International Union for Conservation of Nature (IUCN) welcomes the opportunity to provide the European Commission (EC) with views on the scale and characteristics of the issue of Indirect Land Use Change (iLUC) arising from the promotion and use of biofuels under the Renewable Energy Sources Directive (RES-D). IUCN supports the transition to energy systems that are ecologically sustainable, socially just and economically efficient.

IUCN's overall recommendation is that the EC require iLUC risks be mitigated through a policy that: a) enables mitigation through any combination of suitable measures within and beyond the biofuels value chain, and b) creates sufficient value to cover costs of mitigation (e.g. through credits for additional greenhouse gas emissions (GHG) reductions). Should mitigation measures not be adopted, IUCN recommends that GHG emissions from iLUC be accounted for in the lifecycle GHG emissions of unmitigated biofuels. Such an attribution of iLUC GHG emissions could be introduced after a period allowing for iLUC mitigation measures to be implemented.

The public consultation process¹ poses 4 questions and suggests specific issues to cover for each answer. IUCN sees a number of issues that are not adequately framed by the questions posed by the EC, and thus, our response consists first of a broader discussion of relevant topics followed by responses to the questions posed.

Transforming iLUC risks into opportunities

With specific regard to biofuels, IUCN's policy is framed by 2 Resolutions² from the Fourth World Conservation Congress (Barcelona, Spain 2008) which call on governments to "ensure that biomass energy reduces net emissions of GHGs as compared to alternatives", and that the production and use of bioenergy is "ecologically sustainable, socially appropriate and economically viable".

Replacing fossil fuels with biofuels does not automatically result in net GHG emission reductions. Emissions associated with direct and indirect land use change from biofuels production can significantly alter its GHG emissions reduction potential. Clear GHG emissions reduction targets in the transport sector would more effectively stimulate regulatory and market incentives for efficient technologies and sustainable resource use than a mandatory proportion for renewable energy.

From IUCN's view, analysis of and solutions for indirect land use change must not be driven solely by concerns around lifecycle GHG emissions. The ecological and social effects of indirect land use change are equally important. IUCN urges the European Union (EU) and its Member States to ensure iLUC mitigation is consistent with international commitments made under Agenda 21³ and the Convention on Biological Diversity (CBD), as well as taking into account the urgency of achieving the Millennium Development Goals (MDGs). IUCN recommends that iLUC mitigation be consistent with the ecosystem approach, as defined by the CBD. Given the EU's

For more information, please contact:

Key contact
Deviah Aiama
Programme Officer,
Bioenergy
IUCN World Headquarters
Rue Mauverney 28
1196 Gland
Switzerland
Tel: +41 22 999 0373
Fax: +41 22 999 0002
Deviah.Aiama@iucn.org
www.iucn.org/energy

Additional contacts
Juan Marco Alvarez
Director - Economy and
Environmental Governance
Group and
Head- Business and
Biodiversity Programme
IUCN World Headquarters
Rue Mauverney 28
1196 Gland
Switzerland
Tel: +41 22 999 0000
Fax: +41 22 999 0002
JuanMarco.Alvarez@iucn.org
www.iucn.org

Dr. Hans Friederich
Regional Director a.i.
IUCN Regional Office for
Pan-Europe
Rue Mauverney 28
1196 Gland
Switzerland
Tel: 41 22 999 0207
32 2 739 3000 (Brussels)
Fax: 41 22 999 0020
Hans.Friederich@iucn.org
www.iucn.org

¹ By the end of 2010, the RES-D and the Fuel Quality Directive (FQD) require the EC to submit a report to the European Parliament and to the Council reviewing the impact of iLUC on biofuel greenhouse gas (GHG) emissions and addressing ways to minimize that impact. During the summer of 2010 the EC released four studies which outline the magnitude of iLUC impacts from biofuels. The current public consultation process is based on the released studies and their implications for the report.

² Resolutions 4.082 and 4.083 were passed by more than 1000 members

³ In particular, Chapter 10, as well as 9 and 14. http://www.un.org/esa/dsd/agenda21/res_agenda21_00.shtml

commitment to the MDGs, iLUC mitigation should also address social issues by enabling communities to benefit from biofuel developments, and associated opportunities for enhanced livelihoods and rural development.

Proactively mitigating iLUC risks

Land use change is a leading cause of biodiversity loss and ecosystem degradation, and agricultural production is a major driver of land use change⁴. Biofuels-related iLUC is caused by increased demand for agricultural commodities for biofuels markets; therefore the main ways of mitigating against the risk of iLUC involve increasing supplies of these commodities without displacing existing production and ecosystem services to other lands, or by production systems that value and enhance ecosystem services. The best outcome is to ensure proactively that iLUC does not occur, as a result of biofuels, or any other agriculture expansion activities likely to take place as agricultural demand grows. There is evidence⁵ that mitigation measures are available at every stage of the biofuels value chain and beyond (i.e. broader land use management). But there are barriers to their implementation, including the lack of an incentivized approach for responsible behavior along the biofuels value chain.

Thus, IUCN recommends that the EC develop a policy mechanism to effectively address iLUC risks which includes the following elements: 1) creates sufficient value (e.g. through GHG credits) for mitigation measures to generate resources needed to overcome barriers (such as costs of rehabilitating land or developing co-product value chains) to their implementation; 2) assures that the value gained from mitigation is attributed to those bearing the costs of mitigation; 3) accounts for the GHG emissions associated with unmitigated iLUC in the attributed lifecycle emissions; and, 4) contributes to developing sustainable land use plans. To deliver such policy action, the EC must support research into the monitoring of iLUC impacts and effectiveness of proposed mitigation measures.

iLUC manifests itself in the absence of effective land-use planning globally but land use planning is beyond the control of biofuel

producers. Arguably, with robust land use planning at all levels and sustainability requirements for all land-based biomass commodities, iLUC would not occur. Yet such systems do not exist, nor will they exist for the foreseeable future. As iLUC-associated emissions have the potential of making biofuels a contributor to climate change rather than part of the solution, it is imperative that biofuel producers address iLUC in a meaningful and proactive way.

Responding to the EC Consultation Questions

1. Do you consider that the analytical work referred to above [the 4 EC studies], 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?

Yes. IUCN considers there to be sufficient evidence from analytical work released by the EC, and other studies⁶, which provide a good basis for determining that GHG emissions attributed to iLUC resulting from the production of biofuels is significant. Some of the EC studies likely underestimate the amount of additional land needed, as the ratio of bio-ethanol to biodiesel used in some studies (45:55) appears to be higher in reality (75:25) from the National Action Plans.

The evident variations between the models are inevitable as model outcomes are sensitive to underlying assumptions and accuracy of forecasted trends. But importantly, none of the EC studies report zero or negative iLUC-associated emissions from any land-based biofuel feedstock.

Climate change mitigation is a primary driver of biofuels policy in the European context, therefore it is critically important to determine whether diverting the photosynthetic capacity of land to biofuels from its present use results in net GHG reductions or not. Currently, the effects of iLUC cannot be adequately accounted for by project-based lifecycle analyses as they only account for emissions from direct land use change.

GHG emissions are not the only impact from iLUC. iLUC from biofuels production can have significant impacts on biodiversity, water and

⁴ UNEP 2007. Global Environmental Outlook 4

⁵ Based on outcomes of a multi-stakeholder iLUC workshop convened by IUCN & Shell in London, September 2010.

⁶ E.g. FAO 2008. The State of Food and Agriculture 2008; Gallagher et al 2008. The Gallagher Review of the Indirect Effects of Biofuel Production, Renewable Fuels Agency.

other natural resources, and on vulnerable groups. The four EC studies primarily consider GHG emissions impacts from iLUC, and are therefore insufficient as a basis for determining the full significance of iLUC impacts on other environmental and social aspects. Comprehensively addressing iLUC should mean that all associated indirect impacts are addressed.

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

Yes. IUCN recognizes that, as a small but rapidly expanding contributor to increased agricultural demand and associated production, biofuels promoted by EU biofuel mandates are influencing global land use change patterns both directly and indirectly. Results from the four EC studies consistently show that EU biofuel policies will impact agricultural commodity production, prices and trade flows. Sustainability criteria within the RES-D attempt to prevent some direct negative impacts from feedstock cultivation on biodiversity and carbon stocks, but do not address indirect negative impacts resulting from displaced land uses.

On the basis of available evidence, IUCN believes EU action is needed to prevent iLUC from occurring in the first place, thereby proactively addressing indirect impacts on GHG emissions, biodiversity, other environmental aspects and vulnerable groups.

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?

Impacts from biofuels-related iLUC vary according to a combination of aspects including feedstock type, geographical location, and land management. An important influence that IUCN recommends the EC considers in its analysis is the type of farming system utilized. For example in Brazil, some farming systems that integrate feedstock along with existing livestock production have

potentially limited to no displacement effects⁷. IUCN considers that there is sufficient evidence that indicates iLUC risk is not based on only one of the aspects of feedstock type, geographical location or land management⁸. IUCN considers that differentiating biofuels on any one of these aspects will be unfair to feedstock and biofuel producers, and such an approach would inaccurately represent evidence that indicates it is a combination of these aspects which determine the extent of the iLUC risk. Thus, it is crucial that opportunities to assess iLUC risks on a case-by-case, evidence-based manner are available so as to avoid unfairly penalizing responsible farmers and producers, and to accurately account for iLUC associated emissions. While models are useful for forecasting iLUC impacts at a global level, it will be important to adapt models based on what is taking place on the ground. Projects that monitor the influence of feedstock type, geographical location, and land management (including farming system) upon the risk of iLUC from biofuels will be useful in this context.

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

Amongst the specific options provided in the consultation document, IUCN recommends the following choices to be the most appropriate and effective:

C. Take action by discouraging the use of some categories of biofuel by:

- *increasing the minimum greenhouse gas saving threshold for biofuels*

No, as increasing the minimum GHG threshold does not reflect the iLUC risk associated with the biofuels.

- *imposing additional sustainability requirements on certain categories of biofuel (these could, for example, require the use of practices that can help mitigate indirect land use change impacts)*

IUCN is of the view that additional sustainability criteria in the form of requirements to mitigate iLUC for *all* biofuels

⁷ Ecofys 2010. Responsible Cultivation Areas: identification and certification of feedstock production with a low risk of indirect effects.

⁸ Ibid

would stimulate responsible behavior and mitigation on the ground.

IUCN is of the view that the EC should not be prescriptive about which mitigation measures are accepted, but rather should set out boundary conditions for mitigation options. This approach would allow for and stimulate innovative responses from industry. In order to ensure mitigation options are adequate and barriers for their implementation are overcome, there is a need for policy to enable mitigation opportunities and ensure that iLUC risks are mitigated on the ground. IUCN recommends the use of a framework for assessing appropriate iLUC mitigation options, in the form of the following success factors⁹:

1. Effective: will the mitigation option actually mitigate iLUC risks?
2. Scale of Impact: is the iLUC mitigation option material? Can it be taken to a scale that matters?
3. Measurable & Verifiable: can the iLUC mitigation option deliver measureable and verifiable outcomes?
4. Feasible: can the microeconomics of the iLUC mitigation option work?
5. Based on Best Available Science
6. Trigger Positive Change: does the iLUC mitigation option result in improved outcomes for the environment and people?
7. Resilience: does the iLUC mitigation option contribute to the resilience of human and ecological systems?

- *Attributing a quantity of GHG emissions from iLUC to all biofuels that use land.*
→ *a factor based on the estimated (modeled) land use change from a marginal extra quantity of crop production.*

IUCN recommends accounting for GHG emissions associated with unmitigated biofuels through the application of such a factor. But, recognizing that mitigation measures may take time to implement, IUCN proposes that factors could be applied after a period allowing for mitigation measures to be implemented.

In IUCN's view, a factor enables more accurate accounting of the lifecycle emissions of biofuels. The iLUC factor represents annualized emissions from carbon stock losses resulting from indirect land use change (in grams of CO₂equivalent/MJ), and should

be estimated (modeled) from a marginal extra quantity of crop production. Current models (including those used in the four EC studies) can extrapolate marginal iLUC emissions for small increases in consumption of specific feedstocks from geographical locations. This would yield feedstock-specific iLUC factors, which better reflects actual differences in feedstock emissions, and is more specific than a feedstock-neutral factor that would apply a single value across the board.

The environmental effect of feedstock-specific iLUC factors is that it fully accounts for lifecycle GHG emissions of all biofuels, and promotes the use of those biofuels that minimize or avoid iLUC risks and result in real GHG reductions compared to the fossil fuel baseline. Associated biodiversity and social impacts will also be reduced, so long as indirect land use change decreases. The calculation of iLUC factors must be transparent, based on best available data and models, and subject to review and updating at an appropriate frequency compatible with other data review periods.

Policy that includes iLUC factors must be implemented with accompanying measures that can adjust the lifecycle GHG emissions values to account for iLUC (based on feedstock-specific factors) in those biofuels which have not demonstrated iLUC mitigation. In this way, biofuels that have been produced responsibly with demonstrated mitigation measures will be strongly encouraged.

D. (And) Take some other forms of action

In addition to directly addressing iLUC risks, IUCN recommends broader EC policy measures are needed to: prioritize responsible land use expansion on degraded or underutilized land (e.g. via the Responsible Cultivation Areas process); apply sustainability criteria to all ecosystem-dependent sectors (e.g. agriculture, forestry); develop synergies with other land use GHG reduction approaches; and encourage global GHG reduction agreements covering all major GHG-intensive sectors.

⁹ Based on outcomes of a multi-stakeholder iLUC workshop convened by IUCN & Shell in London, September 2010. www.iucn.org/what/tpas/energy/key/biofuels/energy_iluc/