Biofuels

Title

***Biofuels** are one form of bioenergy, liquid fuel produced from biomass and used for transport. Current biofuels are by far the least efficient form of bioenergy and they require huge amounts of land for feedstock cultivation. Some biofuels are made of waste streams and have a much better environmental record.*

The European renewable target for transport (10% of renewables in the transport sector by 2020) is driving mainly biofuels (projections up to 8.3% of European transport energy in 2020) with serious doubts about their sustainability both in terms of environment externalities and GHG savings. This 10% target was not meant to only drive first generation biofuels, but also other renewables in the transport sector such as renewable electricity, biofuels from waste and residues, etc.

Environmental impacts

Biofuels can have serious impacts on biodiversity and the environment if they are planted within natural habitats such as forests or high biodiverse grasslands. They can also cause damage if the demand for crops used for biofuels is leading the agricultural intensification (see agriculture section). The third impact is what is called: Indirect Land Use Change (ILUC), basically when the extra demand for biofuel crops is pushing extra agricultural land to be created in natural areas for food purposes since the biofuel crops have mopped up all the existing agricultural land.

Under the Renewable Energy Directive, there are sustainability criteria for direct land use change but they do not go far enough. Moreover, the issue of Indirect Land Use Change is only partially addressed as is further explained below.

Greenhouse Gas impacts

Biofuels need to show savings of 35% compared to fossil fuels and later 50-60%. As with the environmental impacts, currently we are only taking into account the direct impacts and not the indirect impacts. ILUC emissions just need to be reported on, not accounted for. ILUC signifies emissions by the extra arable land that is being created in natural areas, such as forests and peatlands. As long as these emissions have not been taken into account, the sustainability of biofuels is not secured and the least sustainable biofuels are being subsidised by taxpayers.

The way the decision makers have decided to deal with ILUC is by putting in place a cap on so-called first generation (food based) biofuels, adding some marginal incentives for the more advanced biofuels and asking for reporting on the indirect emissions. However, these are still very weak safeguards.

Without further safeguards running to 2020 and beyond, these policies will not stop the European Union's global hunger for the production of harmful biofuel crops. They will also contribute to an increase in net Greenhouse Gas Emissions and harmful environmental and social impacts. Current biofuels produced from food crops like maize, sugarcane, rapeseed and soybean oil are unsustainable and are causing worldwide environmental destruction.

The enthusiasm around biofuels as a solution to climate change and energy security must be balanced and the risks from biofuels seriously considered. Within the transport sector, governments should not only focus on first generation biofuels, but a whole range of solutions (including green electricity and biofuels made from waste and residues).

Industry
The industry plays a significant role in developing business and job opportuntities in the area of biofuels. It has invested significant amounts and, according to a study by Ecofys, 95% of the investments would be returned by 2017. Taking this into account, stringent criteria, including full ILUC accounting, should be put in place by that time to start driving investments into more sustainable forms of transport energy.

Carbon Accounting

Direct Land Use Change (DLUC)
DLUC are the emissions that come from changes in direct land use, such as emissions from converting a forest into agricultural land.

Indirect Land Use Change (ILUC)
ILUC are indirect emissions caused by market mechanisms. If a farmer previously was growing food on his land and now uses the land to grow fuel instead, we can ask how the demand for food is now met. This demand can either be met by growing the food somewhere else or food prices have increased so much that people will eat less and hence the demand for food "disappears".

See this explained in the 'Peter and Jane' video across on the right-hand side of this

page.

The way to calculate ILUC emissions is through **modelling**, as you have to estimate the emissions. We use models often in policy making, for example to calculate employment figures or inflation, so it is a normal procedure. The outcome of the models (so-called ILUC factors) are currently not taken into account in EU legislation and we continue to produce biofuels that are cheap but are not necessarily saving emissions.

Based on the **precautionary** principle, however, Europe should include ILUC emissions in its sustainability criteria. Otherwise it is ignoring a massive loophole in its climate policy and damaging people and the environment worldwide. The European Commission has proposed not to include the ILUC emissions, but instead to just report on the emissions and to cap the amount of biofuels that can count towards the target. This is with the intention of trying to limit the amount of first generation biofuels that are stimulated by the Member States. This was a very important signal to the rest of the world that Europe no longer sees first generation (so called food-based) biofuels as the future. However, it will also be important to further tighten the safeguards around biofuels after 2020.
Read the briefing NGOs wrote about the outcome of the ILUC legislation.

Carbon debt
Bioenergy is often presented to be carbon neutral, relying on the assumption that the carbon released when burning wood or other types of biomass is soon recaptured by trees, vegetation and soils. In reality it takes time (from years to decades, depending on the kind of biomass) for the carbon released to be recaptured again by plant and tree growth and by the soil.

It is also possible that all the carbon released will never be fully recaptured, for example in the case when an old growth forest is replaced by a forest with shorter rotation and smaller carbon stock. The concept of carbon debt refers to the delay in time for the carbon to be recaptured or the amount of carbon that actually never will be recaptured by regrowth. Currently, under EU climate targets carbon debt is ignored and all biomass is assumed to be fully carbon neutral.

Read about where we are in the adoption of the carbon debt principle into the current EU bioenergy policy.

Bioenergy section

- Biomass
- Bioenergy Policies of the EU
- Back to Bioenergy home

Biofuels: the butterfly effect

Peter and Jane: a short film about biofuels

Publications, Briefings and Position Papers

- The little book of biofuels (September 2014)
- Sustainable alternatives for land-based biofuels in the European Union (CE Delft report, 2013)
- Biofuels, at What Cost? A review of costs and benefits of EU biofuels policies (2013)
- Drivers and impacts of Europe's biofuels policy (2012) - Factsheet
- Analysis "Anticipated ILUC associated with expanded use of biofuels and bioliquids in the EU" (IEEP report, March 2011)
- Bioenergy: carbon accounting time bomb (2010)
- Biofuels: indirect land use change and climate impact - CE Delft Study, Bergsma G. C., Croezen H. J., Otten M. B. J. & van Valkengoed M.P.J. (June 2010)
- The end game on biofuels (April 2015)
- Joint NGO Open Letter to EU decision makers: EU biofuels policy comes at an unacceptably high economic, social and environmental cost – time to fix a failed policy (June 2013)
- Biofuels and Indirect Land-Use Change: the evidence keeps piling up (Briefing on latest science, Sept 2013)
- Putting EU green transport policy back on track (Joint EU NGOs briefing on the CE Delft report, 2013)
- Biofuels: handle with care (2009)