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## Sustainable Bioethanol for the future

Sustainability of bioethanol is generally, but not always, good, so Dr Jeremy Woods at Imperial College London. A rapid expansion thus calls for sustainability assurance schemes. Dr Wood is head of a group of researchers deeply involved in the assessment of renewable transport fuels both in Europe and Africa, and develops greenhouse gas, environmental and social assurance / certification systems for biofuels. Dr Woods is also in charge of evaluation in the European bioethanol project BEST.



### First of all - how sustainable are biofuels?

-- Biofuels for transport can both be good and bad from a sustainability perspective. Generally their good aspects outweigh the bad ones and technological developments are improving the situation all the time.

### So what criteria would you like to set to for a sustainable biofuel production?

--Reduction of greenhouse gas emissions should be at least 50 percent compared to the conventional fossil fuel being replaced on a full life-cycle basis. In addition, the biofuel produced should contain at least double the energy consumed when producing it. The ultimate goal is of course much higher greenhouse gas reductions, and we see processes that can / could deliver substantial improvements in both advanced

conventional biofuel supply chains and in emerging novel chains.

### Does today's biofuel production fulfil these criteria?

-- Sugarcane based bioethanol production performs very well, as do highly efficient modern cereal-based ones like the plants in ????. Promising for the future are the emerging 'next generation' of biofuels produced from existing and new lingo-cellulosic feedstocks. On the other hand some of the older US maize based plants for ethanol production are poor environmental performers from a greenhouse gas perspective.

-- Personally I have been involved in several bioenergy projects in Africa and the potential availability of land and people for biofuel production there is huge. Firstly, for domestic use but also for "fair" export using the investment to generate highly productive and beneficial systems.

-- So much new biofuel production capacity is being built right now. The important thing is to only reward sustainable production. This is a choice for the investors. It is also a task for society only to encourage sustainable technology and sustainable plants. This needs to be done with caution though as too rapid an increase in demand is likely to cause unsustainable supply options and possibly the competition for food in the short term.

### So what constitutes sustainable technology for biofuel production?

-- This is a big issue, but some general recommendations are to encourage efficient combined production of food, biofuels, electricity and heat where energy surplus from the production is used to substitute other energy production. It is also very important that the plants are fuelled by biomass residues where possible.

### How about biodiversity?

--Biodiversity for sure is an important factor. There is a huge potential for increased biofuel production. We have to make sure that we use land in a sustainable way, have efficient and sustainable agriculture and of course don't exploit important biodiversity hot spots such as those found in tropical rainforests in an irreversible and non sustainable way.

### But isn't this exactly what is happening in Brazil right now?

--The deforestation is a big problem both in South America and in Asia. But the main cause for this is not biofuel production. It is our high and ever growing meat consumption: we exploit the land to grow animal feed and vegetable oils ultimately for human consumption.

### There is also a debate that we take food from poor people to produce fuel for our cars

--The Tortilla crisis in Mexico was such an example. The demand grew too fast. Corn prices rose so high that the Mexicans couldn't afford their tortillas any more. If many countries expand their targets for biofuels and don't take care to control the market

and ensure that sustainable supplies are developed there will be problems. But in the long term, new biofuel markets will also give farmers options and generally raised incomes with which to reinvest in improved productivity. High demand and stable world markets foster efficient production which could increase yields.

**So how do you make sure that the use of biofuels does not ruin our planet**

-- First of all, with today's production methods it is not sustainable, or even possible, to produce all the energy we consume from bioenergy. We have to be much more efficient. Both in our energy use and in our biomass production. We must also encourage the other forms of renewable energy. If we manage that, there will not be any scarcity of biomass and no competition between energy use and fuel production. But a simple exploitation of biomass is likely to damage the environment, so we really have to be careful at the moment.

-- We need to establish a framework for ensuring sustainable and efficient production, complying with local and internationally agreed standards. But this is worthless unless we can introduce monitoring schemes that guarantee that the production is compliant. There are several initiatives now underway moving in this direction, e.g. the Better Sugar Initiative which is being developed by WWF, the Round Table On Sustainable Palm Oil is another. The UK, Netherland and German governments are cooperating right now to combine existing schemes to try to ensure that only one global standard emerges which is universally acceptable.

**So, finally, is it a sustainable step to go for biofuelled vehicles?**

--Yes certainly. I do recommend both private persons and companies to take that step when substituting old cars. And remember, if you buy a flexible car like an FFV (bioethanol AND petrol) or a bi-fuel (biomethane AND petrol) – you always have the choice – giving you more flexibility for the future. By Helene Carlsson