

The Bio Fuel Balance

Chris Roper
15 Dec 08

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Biofuel is a term used to describe the fuel obtained from living things or the waste product they produce, together known as 'biomass'. Biomass can be derived from a variety of sources, including wood, crops, methane (via animal waste and landfill sites) and waste oil, such as vegetable oil.

Biofuels don't contribute further to carbon dioxide in the atmosphere because the CO₂ produced is balanced by the amount absorbed by the biomass during its lifecycle. Burning fossil fuels however, releases carbon into the atmosphere that would otherwise be stored safely in the earth.

Methane is a far more destructive greenhouse gas – 23 times as damaging as carbon dioxide – so burning this for fuel instead of allowing it to reach the atmosphere reduces the environmental impact by a factor of 23.

Is it a new?

Scientists and engineers have experimented with biofuels for many years. In the early 1900's Henry Ford designed an engine to run on ethanol (a fuel produced from crops) as well as petrol, famously quoting in 1916: 'all the world is waiting for a substitute for petrol. The day is not far distant when, for every one of those barrels of petrol, a barrel of ethanol must be substituted'.

During the First and Second World Wars, UK fuel companies used a mixture of grain alcohol and petrol in their hopes to lessen dependence on imported oil. However, by the 1940's any long term aspirations for the biofuel industry ended when imported crude oil became a cheaper, easier option. That's why today we are still living in a society dominated by fossil fuels. Biofuels may be a hip buzzword, yet the truth is only about 4% of Europe's total energy consumption is met from biomass.

At present transport is responsible for 21% of all the EU's greenhouse gas emissions, and virtually all the energy is from oil which causes irreparable damage to the ozone. Oil is in very short supply, and increasingly difficult to get at. Governments must diversify; both to reduce harmful greenhouse gas emissions and to secure long-term energy supplies. Ford's prophecy may yet be fulfilled.

European countries are promoting biofuels and investing in biofuel technology in their attempt to reach the Kyoto emission targets, and are also encouraging biofuel use in developing countries.

In East Sussex, school staff at Beacon College won a prize at the South East Renewable Energy Awards in 2006 for the installation of a biomass boiler.

The boiler, which uses wood chippings sourced from sustainable woodland, has reduced carbon emissions by 600 tonnes per year compared to the oil fired system and saved the school money on fuel bills. As a consequence of this and other schemes, the Council announced that their carbon emissions are now 11% lower than they were four years ago.

Rye Bio-Fuels (Edible Oil), based in Rye, East Sussex, are a catering company that supply cooking oil to the restaurant trade. In addition to supplying the oil they also collect used oil which they then filter, heat and convert into biodiesel. The process results in 100% biofuel (as opposed to a mix with fossil fuel) which can be used in most vehicles – VW, Audi, Seat and Skoda have all confirmed 100% compatibility with pure biodiesel.

West Sussex County Council have successfully completed a trial of a biofuelled minibus and have plans to introduce similar initiatives across their fleet where buses and pool vehicles are to run on used cooking oil. A project is in development where inmates of Ford Prison in Arundel will make biodiesel from Ford cooking oil and also other prisons across the area. Although not a truly sustainable process the effects of saving the oil from landfill (thus avoiding the creation of methane) mean using the oil as fuel is highly beneficial to the environment.

These local success stories illustrate how successful biofuel can be as a way of reducing carbon emissions. Sugar cane, corn, soy, oil palm, algae, rapeseed, wheat and hemp can all be harnessed to make green energy, so are biofuels the answer? If only it were that simple...

Is it all good news?

Rising food prices and loss of natural habitats are strong arguments against biofuels. If governments encourage farmers to use too much land on energy-producing crops, food prices could rise as a result. The planet might be greener... but millions might go hungry.

For every hectare devoted to energy-producing crops, European farmers get a subsidy of EUR 45 (about £35) from the EC. In addition, Common Agricultural Policy reform allows set-aside land (once a haven for diverse animal and plant life) to be legally used for cultivation provided it is for energy-producing crops, leading to more intensive farming and the loss of natural habitats for local wildlife.

In America, corn is so heavily subsidised that soy production is moving from the United States to Brazil, adding to deforestation and increasing soy prices.

The European Commission has acknowledged the need to monitor food production and pledged to ensure energy-producing crops are not given sway over food crops, but as demand for biofuel increases this precarious balance may be jeopardised and our diverse wildlife threatened.

Palm oil production in Indonesia and Malaysia is already causing deforestation as large areas of forest are destroyed to make way for palm oil plantations. Greenpeace and Friends of the Earth both claim that the environmental damage caused by deforestation far outweighs any benefits obtained by cultivating biofuel crops.

The UK's Renewable Transport Fuel Obligation requires 5% of all fuel sold at the pump to be biofuel by 2010, with the EU target set at 5.75% for all transport fuels to come from biological sources. Barack Obama wants 60 billion gallons of advanced biofuels by 2030 and Asia is looking to increase production too.

It's clear the world sees biofuels as a feasible alternative to fossil fuel, but whether it's a long term solution to the global climate change crisis is unknown. Will we see governments increasing energy crops to the detriment of food production? Will wildlife species dwindle as habitats are destroyed to make way for large, uniform fields of grain? Will the environmental benefit of biofuel really make a difference – especially when one considers the added carbon emissions of converting the biomass and distributing the fuel?

The answers to these questions will fall on us and our governments. Action against climate change is a must, biofuel offers a short to medium term solution that may not be 100% effective but is still a step in the right direction. Although still in development, cellulosic biofuel could offer a more viable alternative to existing biofuels. Cellulosic biofuel uses lignocellulose (the structural material of plants), which is a diverse and plentiful resource and most importantly, can be obtained from non-food crops or the waste parts of food crops.

With investment in solutions offering green, environmentally and wildlife friendly methods of obtaining energy from biomass – with more efficient technological processes – and a safe, working balance between food and energy crops, we might slow global warming. The willing for change is clear, but we must balance the 'bio' with the 'fuel' and not allow this to be yet another way of extorting money from our tired earth.