

This response was submitted to the consultation held by the Nuffield Council on Bioethics on *New approaches to biofuels* between December 2009 and March 2010. The views expressed are solely those of the respondent(s) and not those of the Council.

QUESTIONS ANSWERED:

Question 1

ANSWER:

I'm quite apprehensive. While every resource we use, eventually, will have to be completely renewable or recycled, I feel that using biofuels as a means for transport, for example, distracts from some of the other damaging aspects of private motoring, such as the construction of roads and cars. By making motoring more 'environmentally friendly' it means that people will not be as inclined to change their transport habits and shift to far more efficient, and less damaging, modes of transport such as bicycle and mass public transport. However, by utilising biofuels in the public transport sector, it can become the single most environmentally form of transport which, if personal carbon allowances were introduced, would provide an even greater incentive for people to change their habits. The use of biofuels in any sector, however, must comply with strict ethical and environmental criteria in their sourcing to ensure that we don't move from fossil fuel dependance, to dependance on foreign agriculture, contributing to the increasing inequalities in global food distribution and leaving to mass starvation and environmental destruction due to deforestation.

Question 2

ANSWER:

First generation biofuels have the implication of requiring large areas of land (in fact more land than is available) which is contributing to the pressure on global land useage fuelling deforestation. Also, due to the way international food markets work any decrease in global food production is most accutely felt in the global south where financial resources to deal with spikes in food prices leads to mass starvation, seen in the food riots of 2008. A mass roll-out of first generation biofuels, coupled with a rising world population, is only going to increase the severity of this isse, while the multinational commodities traders become ever richer, and car use remains unconstrained. The genetic modification of crops to enable easier conversion of fedstock into ethanol also raises pertinent questions regarding the patenting of biological genetic codes which provides multinational compaines with further control over natural resources raising the issue over democracy and how much the technology is being developed for need as opposed to profit. This also links in with other questions regarding genetic modification such as the generation of superweeds through the extensive application of a single herbicide, the stacking of genes designed to tie farmers into using one manufacturers products accross the farming process, the fierce liscencing conditions that penalise farmers whose crops have been contaminated and the propriation of monoculture farming which has a massive negative impact on biodiversity and hence environmental integrity.

Question 3

ANSWER:

I would consider myself relatively well informed. I read a number of articles in The Ecologist on first generation biofuels last year but have since obtained most of my information the technological developments through Chemistry World - the magazine of the Royal Society of Chemistry, of which I am a youth member. I am also following the development of anaerobic digestion. I have been closely following environmental issues for a couple of years now and consider myself to carry a deep green philosophy - that we must live with nature, rather than fighting against it, in order to live in a truly sustainable society. That means a society whose activities can be continued indefinitely which requires an almost painstakingly holistic view of almost every issue, factoring every environmental factor accross the entire lifecycle of a product or industry.

Question 4

ANSWER:

Strong government intervention is going to be essential to ensure the proper ethical sourcing of biofuels and a comprehensive reform of the way the economy and society is organised to ensure that any biofuel use can be appropriate and not hinder wider environmental progress. Government intervention can also limit the potential for exploitation of a drive for environmentalism, leading to greater corporate profits while limited progress towards sustainability. Large funding in research will also be required in order to ensure development of the most environmentally beneficial technologies, that may not be the most commercially economical. Governments are also best placed to develop highly capital intensive infrastructures, such as a heat distribution network for combined heat and power, without concerns over shareholder revolts over low profit margins.

Question 5**ANSWER:**

The use of agricultural waste has large potential for biofuel use - notably in anaerobic digestion. However, it is also important for the sustainability, and future security in light of peak oil, to ensure that we reduce the need for oil and gas based inputs into our farms. This will mean moving to a cyclical agricultural system which will deem agricultural 'waste' as an important fertiliser. It must therefore be ensured that any process that turns agricultural waste into a biofuel (be it methane, ethanol etc.) also produces a highly nutritious and fibrous by-product that can be used as an agricultural fertiliser, thus alleviating other resource constraints. Biofuels generated from waste products are most likely to have the greatest ghg reducing potential. Diverting food waste from landfill to an anaerobic digester, for example, will result in a reduction in methane production from the landfill site, and displace natural gas creating a saving in emissions at two levels.

Question 6**ANSWER:**

Energy security will be best delivered by utilising waste sources of biomass as feedstocks since, in the UK, we do not have the land mass to grow large scale biofuel crops.

Question 10**ANSWER:**

University research should play a large role in the generation of sustainable technologies as one tool in overhauling intellectual property rights to ensure public ownership of socially necessary technology. We need to move away from the monopolised forms of intellectual property that allow multinationals to patent indigenous knowledge and control technological developments necessary to transition our society away from fossil fuels. Greater public ownership of publically funded research to ensure benign applications controlled by democratic consensus will allow us to achieve more engrained social change that the general populace can be in control of and feel a collective ownership towards as opposed to quick, potentially impermanent, technological fixes imposed from above.

Question 12**ANSWER:**

R&D should be targeted at biofuels that aren't dependant on farmland, for example algal biofuels. R&D should be conducted through a mix of commercial and government funded projects where companies are given clear guidelines as to what constitutes an ethically and environmentally sound outcome in order to ensure that biofuels do not hinder attempts to reduce our environmental impact.

Question 18**ANSWER:**

The world food markets are skewed in favour of the developed world so any shortage in food production is likely to hit the developing world hardest. Indeed the number of overweight people in the developed world is currently rising, as is the number of people going to bed hungry in the developing world. Any decrease in global food production is going to impact those with the lowest financial resources most, especially those who are at the bad end of biased international trade agreements. An increase in the cultivation of biofuel crops is going to reduce the dwindling food sovereignty of the global south and lead to elevated levels of starvation, akin to, but more intense than, those seen during the recent spike in food prices.

Question 19

ANSWER:

The developed world continues to demand more than its fair share of resources meaning we have to utilise the resources of other countries in order to sustain our lifestyles. Any biofuel that requires a crop to be grown especially for its production is going to compound issues surrounding the rights of agricultural labourers. Due to continued consumer demands for oil to be cheap, increasing the use of biofuels will require that they are grown and produced in countries with minimal environmental and employment welfare standards in order for the companies to externalise as many costs as possible and increase the profit margin on the product. Also, due to the nature of oil production and distribution I imagine it would be nearly impossible to implement a fair trade standard on biofuels in the way it has been achieved for sugar and cotton. This would make it very difficult for consumers to ensure that the fuel they are putting in their tanks has not caused the destruction of a natural habitat or lead to the effective slave labour and associated trafficking in order to produce their fuel. Furthermore, by forcing third world farmers to switch from food production to biofuel production an element of self-sufficiency is lost since the farmer can no longer eat some of their crop, they are further dependant on the global food market which all too often means they cannot afford to eat sufficient quantities of food. An increase in global biofuel crops will only escalate this atrocity. The use of GM seeds will tie farmers in to using seeds from a monopolised market that are likely to contain terminator genes preventing the farmers collecting seeds whilst also involving contracts making the farmer dependant on proprietary fertilisers and pesticides resulting in large profits for the few transnational companies that will consolidate their share of the global seed and agricultural markets. Furthermore, low environmental regulation in developing countries will result in poor working conditions for workers in the chemical processing plants who are likely to live near to the plant and experience chemical waste being dumped into their water supplies (Dow chemical, for example, still hasn't cleared up after the Bhopal disaster over 25 years ago). Like any other industry governed by multinational companies, facilities will migrate to any country that lowers their environmental or labour standards in order to reduce costs and increase corporate profit. This will result in low wages and potentially dangerous conditions for plant workers in countries whose governments have little democratic accountability and are at the whim of large corporations due to a desire for growth and industrialisation. Approaches that utilise waste (agricultural, food, sewage) are likely to pose fewer issues for workers in developing countries since the plants will be best situated near the production of the waste to maximise ghg savings. This means that a large proportion of the biofuels produced from wastes will be within the countries using them so with proper government involvement, in the UK we could have a democratically controlled biofuel production system free from overt corporate interests allowing for environmental and workers needs to be put above profit. In developing countries the best way to minimise adverse effects on workers is again to produce biofuels predominately from waste using internal, localised industries in order to increase the democratic, community control over the new industries and ensure they meet the needs of local people. One example of this is biogas digesters using human excrement to produce a fuel for stoves, reducing the need for wood (decreasing deforestation, soil erosion as well as ghg emissions) as well as alleviating some of the problems associated with poor sanitation. However, this means we will not be able to pillage the land resources of the developing world in order to fuel our vehicles requiring a revolution in our transport infrastructure and social organisation.