

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:

Fine as long as it provides a net GHG and energy benefit and doesn't compromise food security or other ecosystem services

Question 2

ANSWER:

1) Food versus fuel. The land base is limited 2) Ecosystem services provided by the land - these must not be compromised

Question 3

ANSWER:

Yes - I work in bioenergy research

Question 4

ANSWER:

Doing so without compromising food security - this will mean new crops that do not have food use (e.g. ligno-cellulosics) - so called second generation biofuels. Providing other products (e.g. a biorefinery approach) would add to the benefits. Still need to make sure they do not spill onto virgin land (forest, natural grasslands) otherwise biodiversity, the GHG balance and overall ecosystem services will suffer.

Question 5

ANSWER:

This really depends upon what land use you replace. If you replace cropland, the GHG balance is favourable, but if replacing grassland or woodland, the GHG balance is often poor (see St Clair, S., Hiller, J. & Smith, P. 2008. Estimating the pre-harvest greenhouse gas costs of energy crop production. *Biomass & Bioenergy* 32, 442-452. doi:10.1016/j.biombioe.2007.11.001. and Hillier, J., Whittaker, C., Dailey, G., Aylott, M., Casella, E, Richter, G.M., Riche, A., Murphy, R., Taylor, G. & Smith, P. 2009. Greenhouse gas emissions from four bioenergy crops in England and Wales: Integrating spatial estimates of yield and soil carbon balance in life cycle analyses. *Global Change Biology Bioenergy* 1, 267-281. doi: 10.1111/j.1757-1707.2009.01021.x.). The question is not which biofuels are most successful at reducing GHG emissions so much as where you decide to grow them - that is equally important.

Question 6

ANSWER:

No comment

Question 7

ANSWER:

No insights

Question 8

ANSWER:

Surely this is a question to the industry - I have no special insights here

Question 9

ANSWER:

From my perspective, it should be okay. But there would be widespread public opposition I think (as for GM food). The UK public (and the European public in general) wish to see "natural" landscapes I think.

Question 10

ANSWER:

I don't care at all about IPR.

Question 11

ANSWER:

Uncertainty about public acceptability of the outcome perhaps stifles large R&D budgets since it may never be commercialised, and smaller R&D budgets slow progress. Progress is largely proportional to the R&D resource input

Question 13

ANSWER:

Yes - the best GHG balance come from using cropland (low soil C) but this then compromises food security. Use of marginal land is likely to have negative biodiversity impacts. The best option is to use degraded land that cannot be used for food production and is also poor for other ecosystem services. Maximising the output (energy per hectare) minimises the competition for land with other uses.

Question 14

ANSWER:

Food security issues already more acute in developing countries (DCs). Add to that more climate variability and low resilience to adverse impacts and the potential negative impacts in DCs is proportionately higher. On the other hand, there are lots of degraded lands in DCs and using these could reinvigorate local economies and bring otherwise spend land back into production / economic benefit. So there are risks and benefits for DCs - probably both more than in developed countries

Question 15

ANSWER:

It is absolutely essential to do so. It can be done through global modelling and scenario approaches. Without accounting for iLUC, the life cycle analysis is incomplete and makes no sense at all.

Question 16

ANSWER:

No insight

Question 17

ANSWER:

Potentially - yes - see previous answers. Best GHG benefit is from growing biofuels on cropland but this is the land used to produce food. also displacements effects via iLUC must be taken into account.

Question 18

ANSWER:

See previous answers.

Question 19

ANSWER:

No insight

Question 20

ANSWER:

No insight

Question 21

ANSWER:

No insight

Question 22

ANSWER:

No insight

Question 23

ANSWER:

No insight

Question 24

ANSWER:

No - but the questionnaire took too long to complete. I fear you will get better answers at the beginning than the end - or potential respondents will simply be scared off by the number of questions. Good luck with it.