

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.

Professor Jim Lynch

QUESTIONS ANSWERED:

Question 1

ANSWER:

We still need more information on many issues affecting the sustainability - especially full life cycle assessment.

Question 2

ANSWER:

The major ethical issues are concerned with how much we are prepared to compromise land use and food supplies.

Question 3

ANSWER:

I consider myself well informed. For 17 years until the end of 2007 I coordinated the OECD Programme in agricultural sustainability, and for the following 2 years I chaired the investigation into biofuels, the summary with my co-author Martin von Lempé is currently in press in *Biomass & Bioenergy*.

Question 4

ANSWER:

The production systems are not difficult and can be improved. The issues are the economics of production and sustainability. Systems Biology is new but not likely to have big impacts in the short term.

Question 5

ANSWER:

The major factor is feedstock for second generation biofuels. Wood is the most available source and in Scandinavia and Russia, this abundant. This is not the case in the UK. Wood can be and is being used for co-firing of power stations which is sensible. Use for biofuels would compromise this.

Question 6

ANSWER:

I am not convinced that biofuels will make a big impact on energy security but I am very happy that this is fully evaluated.

Question 7

ANSWER:

There is prospect that economic development, including the SME sector, could benefit. We do need innovation and algal biofuels look particularly attractive.

Question 8

ANSWER:

These issues still pose R&D questions. Realistically we are probably looking at a minimum of 5 years for commercialisation. We do not know the risks without full LCA.

Question 9

ANSWER:

Most of these technologies are interesting but as yet have delivered little in other areas for massive financial inputs. I would not invest heavily in them until we are clear that biofuels have real prospect, but we need to keep the options open.

Question 10

ANSWER:

IP is a big issue here because the opportunities are great. Protection of rights of inventors is critical - the UK is generally on top of this, particularly in the university sector. This is not true in some European countries.

Question 11

ANSWER:

We need integrated engineering/scientific/systems approaches.

Question 12

ANSWER:

We must have some basic science interfaced with exploitable practice. The government and its agencies such as the Technology Strategy Board should be controlling this with advice from the Royal Society, Royal Academy of Engineering etc.

Question 13

ANSWER:

Yes very definitely - it will compromise agriculture for food production and forestry.

Question 14

ANSWER:

The general problems are similar but the issues have to be interpreted at the local level. What is right of East Africa may not be right in the UK, and vice versa. Each needs to be studied as a separate case.

Question 15

ANSWER:

Yes with LCA being the main driver for analysis.

Question 16

ANSWER:

Possibly the carbon footprint will be improved but compromising land use is a massive threat.

Question 17

ANSWER:

This I have already covered above - there is massive threat to food security in both the developed and developing world.

Question 18

ANSWER:

The developed world has totally different and generally larger food production systems but the issues are the same.

Question 19

ANSWER:

Yes 'contracts' need to be negotiated with farmers with national control.

Question 20

ANSWER:

The big differences are the same as on farming systems themselves. Subsistence farming is the norm in the developing world and this is where forestry has already been compromised with illegal logging etc.

Question 21

ANSWER:

We need all the inputs listed but the thrust must be on the systems approach.

Question 22

ANSWER:

At present there is little international policy other than EU insisting on the blending mandate.

Question 23

ANSWER:

We need OECD and FAO to promote the ideas and this will influence countries and the EU

Question 24

ANSWER:

No