The Indirect Effects of Biofuels

A Submission to the RFA by HGCA

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Introduction

HGCA is part of a Statutory Levy-Body, charged with responsibility for improving the production and marketing of UK Cereals and Oilseeds. It has been involved with the preparations leading to the establishment of the RTFO and the EU Biofuels Directive. The HGCA role has been to establish needs and opportunities from market participants and then commission and publish relevant evidence-based material to assist decision-making in commerce and Government. It is in this role that we submit the following information. It is also important to acknowledge that the questions raised require both economic and scientific answers. The efficient allocation of resources is a key economic analysis that can be applied to the carbon economy as well as the money economy. The development of sustainable cropping is key, and must be done efficiently.

Addressing the Key RFA Questions

The questions on which the RFA is seeking evidence are as follows:

i. What are the key drivers of land use change and food insecurity and to what extent will increasing demand for biofuels affect these to 2020? What evidence is available on impacts upon areas of high conservation value and/or carbon stocks?

Over the last 10 years we have seen rising trends in demand for grains. Wheat demand is largely driven by population, but feedgrain demand (mostly maize) is more in demand, as rising living standards around the world increase demand for meat and therefore feedgrains.

There is a pre-occupation with the impact of biofuels on forestry despoliation and the disappearance of carbon sinks. The facts are that forests have, and continue to be, cleared for logging independently of biofuel demand, and the food and chemical industries demand for competitively priced palm oil is the real origin of the expansion of plantations in Asia. A salient figure is that a mere 3% of global palm oil is used for biodiesel production. The savannahs of Brazil and Africa will be cleared to provide competitively priced food, and to

bring income to the local population whether we develop biofuel or not. It is a function of expanding population and income.

As individuals, we seek hard, reliable information about the fundamental issues, but what we receive are often distorted, biased positions designed to suit a 'lobby position'. We now need a mature and transparent collaboration of interested parties to make progress. Biofuels grown and produced in the UK will be sourced primarily from wheat and oilseed rape, established rotational crops. The low prices seen until recently, resulted in some farmers leaving land fallow over and above the official setaside regime. In the UK, we are seeing the re-integration of this previously setaside rotational land into arable agriculture. This does not constitute a change of land use but a continuation of normal agronomic activities, and a response to increased prices. Constraints on the ploughing of permanent pasture ensure that the UK is essentially outside the 'change of land use for biofuels' debate.

Food security relating to UK crops grown for biofuel is not an issue. For the 2008 harvest, a wheat crop of over 16M tonnes is expected, providing wheat for domestic use plus around 3M tonnes of grain for export. Using some of the available feed wheat for biofuels will not impact on UK food security, nor will it displace food for other countries since the world wheat crop is expected to increase by 40M tonnes (IGC), to 642 million tonnes from existing arable land. Expanding crops are likely to enlarge the offer of wheat and feedgrain availability, improving food security. First generation biofuels are derived from crops currently grown for food. In the unlikely event of UK crop shortages, the crops targeted for biofuels can be temporarily diverted to food use, relieving market tensions and improving security of supply. It is important to note that in the USA, as consumption rates of maize for biofuel increased, US corn production increased, maintaining their exports at the 'normal' level. Thus there has not yet been a 'diversion' of food crops into biofuel, only expanded production.

As we move towards 2020, the current forward prices of grain are likely to expand crop production in land areas suitable for arable development. The FAO estimates that globally only 57% of land suitable for arable production is currently in use. The UK does not generally grow crops, nor is it likely to, in areas of high conservation. And across Central Europe, land made derelict by the demise of the Soviet Union is likely to be re-habilitated for crop production. Higher prices will also encourage investment in these areas.

Problems of deforestation and land degradation in developing countries are well documented, but these issues are not directly related to biofuels but to developing economies, such as Brazil and Africa, obtaining finance for improved infrastructure and the ability to develop the agricultural potential of large land masses. The emerging biofuels industry is establishing sustainability standards and these must eventually be imposed on food crops as well.

We are finding, from our own research, that the consumer – the person who will buy biofuels, pay taxes or suffer from climate change – whilst generally in

favour of biofuels, does not have enough reliable and accurate information about the issues. Awareness of biofuels is high, with more than eight out of ten consumers (84%) claiming to have heard of them. Less than a quarter of those interviewed are concerned about the introduction of biofuels (24%).
Once we have addressed this, we will find what society, as opposed to lobby groups, wants from agriculture. The current industry approach, as we approach 'Biofuels Day' in April, should help to clarify the issues via the website: www.biofuelsday.co.uk

For more information please see here

ii. How are GHG-savings of different biofuels affected by displaced agricultural activity and resulting land-use change? How may this be affected in the future by the introduction of advanced technologies, use of marginal land and other improvements in production?

If we accept the role of human activity as a causal factor in climate change, we must also acknowledge the importance of the damage from expanding transport emissions (25% of total UK GHG emissions and increasing). We therefore need to act now; waiting for new technology is not an option. We know that biomass can provide important sources of energy. Solid biomass has a massive demand from the heat and power markets that can comfortably absorb all the biomass we want to provide for it. Transport fuels will never be provided from lignocellulosic material as efficiently as from grain, whereas UK production from wheat starch and vegetable oils can be demonstrated today to be an important contributor to GHG reduction. In any event, the cash generated from the production of first generation biofuels will accelerate any move towards second generation via R&D. No-one will invest extensively and aggressively in unknown technologies, so a viable infrastructure based on first generation biofuels needs to established first. Let us be clear, first generation biofuels are not a 'silver bullet', but they can make an immediate contribution to the mitigation of climate change.

If crops are grown and processed in an environmentally sensible way, biofuels will deliver savings on greenhouse gas emissions. Research by the Central Science Laboratory has demonstrated that bioethanol made from wheat and biodiesel made from oilseed rape have the potential to reduce greenhouse gas emissions by 65% and 53% respectively compared to conventional fossil fuels. These savings can be increased if co-products are used as a source of fuel to replace fossil fuel in the processing. The development of a web-based GHG calculator for biofuel production by HGCA also aims to raise awareness of the main areas that farmers need to focus on to deliver lower carbon feedstocks.

We talk a lot about the Carbon Economy but we must also seek to transfer the concepts from money economics to carbon economics: the law of diminishing returns; marginal cost = marginal revenue; competitive advantage; comparative advantage. All these can help us provide an efficient carbon

system to improve our GHG position. Carbon and eco-management are new disciplines and we must be open and accommodating with each other if we are to achieve a rapid progress towards reducing transport emissions. We all know there are ‘good’ and ‘not so good’ biofuels according to the way crops are grown, transported and processed. So, as the recent Royal Society review on biofuels says, let us identify these and encourage best practice.

With the USA, Brazil, and elsewhere, expanding their crop production, this raises issues of sustainability. This makes the DfT insistence on sustainability and carbon efficiency within the development of the RTFO all the more important. However, displaced agricultural activity is difficult to identify. Crops grown for fuel in one area may displace those for food in another area, but causality is difficult to determine. An example is the import of palm oil to Europe in 2007/8. It is claimed that these are drawn in to replace rape oil used in biodiesel, but in fact a significant demand for rape oil is attributable to the extra demand for GM-free soft-oil food material, resulting from the shortage of sunflower oil from the poor 2007 EU sunflower seed crop. Additional palm was then drawn in to replace rape in other uses. Rather than assert ‘displacement’, it will be more constructive to identify the factors that make all crops ‘sustainable’, and ask for both the fuel and food industries to demonstrate that their sourcing of raw material is indeed acceptable.

The rigour associated with biofuel production is alerting the world to these important eco-risks, and is setting standards for sustainable development, which must now also be applied to food production. Farmers are now looking for ways to improve their carbon footprint, and fertiliser manufacturers are responding by introducing N_2O abatement technology. Without the advent of biofuels this would not be happening. You cannot legislate sustainability, it must be seen to bring value to society. The UK is the global leader in this field because the RTFO structure makes provision for sustainable and carbon targets. It is ingenuous to claim that the system is flawed because the targets are not immediately enforceable. The DfT has made it clear that it wishes to move briskly through ‘naming and shaming’ poor performers, to differential RTFO Certificate awards to encourage carbon-efficient distributors who source sustainably (moving from “carrot and stick” to “stick” system). We need to pursue this path, a reversal will now see an expansion of transport emissions, a lack of development of carbon reduction targets and sustainability criteria, and leave despoliation unfettered as the expanding demand for food in Asia clears virgin lands.

For more information please see here

iii. What are the relationships between demand for biofuel feedstock, commodity prices, land conversion and food insecurity? How might these be affected in the future by yield improvements and other factors?

Although climate change affects all of us, it is a scientific issue at heart and the people most interested in the fundamental issues have had little or no exposure to the way that commodity markets function. As raw materials for society, commodities are essentially driven by price. In general terms their characteristics can be easily defined, and this makes it possible to provide 'specifications', which can trade in transparency. Each commodity responds to a specific set of economic constraints affecting production and consumption. Because conventional commodity use is clear and specific, demand tends to be fairly rigid and this means that price moves are very sensitive to any supply dislocation.

Agriculture is an industry with slow lead times. Historically, forward contracting was difficult and this engenders a mentality of 'feast' and 'famine' as supply/demand imbalances interact. Crucially, the yield of crops is intrinsically difficult to predict, as weather and agronomy interact to produce continuous surprises. Ironically, in the debate about the value – or not – of biofuels, the very climate change that we seek to address may well be contributing to yield disruptions (e.g. via droughts or floods), which then cause increased movements in price. Low prices depress rural economies and discourage innovation and development. In contrast, higher prices can be expected to bring these to farming around the world, and this will bring improved security of supply. These current high prices will bring a 'supply response' and basic economics explains that demand shifts will stimulate prices to provoke higher production levels: 'Demand creates its own supply'! The current crisis in the rice and wheat markets has virtually nothing to do with biofuels and everything to do with supply shortfalls brought about by sustained periods of weak prices, diminishing farmer interest in growing these crops, and more recently, abnormal weather. History tells us, from Malthus to the Club of Rome, that arable agriculture has never failed to provide the supplies demanded of it. It is not unreasonable, with clearly defined parameters, to expect world agriculture to rise – sustainably - to the challenge of food and fuel demand. But to do this we must make clear definitions of sustainability criteria, and what the UK expects from its biofuel and food suppliers.

Changing markets develop new opportunities. Europe is deficit in protein for animal feed and biofuel production has the capacity to generate large quantities of protein (from rapeseed, maize and wheat) suitable for feed. Also, recent forecasts made by the EC* and the USDA* support the view that the medium term (to 2014/6) outlook is for larger crops, trade levels at similar levels experienced today, and lower prices than currently seen on the international and EU markets.
(see separate papers)*

We can also say that yield improvements, like all technology, will only be achieved from investment. A vibrant arable sector is more likely to promote better yields than one facing difficult financial circumstances. Higher costs of inputs such as fertiliser will encourage more precise applications, reducing collateral environmental damage from more intensive production. In addition, R&D is directed towards breeding varieties which more effectively utilise nitrogen with no reduction in yield (HGCA sponsored work: GREEN grain for wheat and an equivalent project for OSR). The industry can be expected to develop techniques for focused input controls, bringing both financial and environmental benefits.

Finally, there are two important factors relating to European/Developed Economy markets: Firstly, the base raw material cost of food commodities in supermarket products is very small, from 5 – 20 percent, but not more. Secondly, as was reported recently by WRAP, the amount of food waste that is currently endemic in Western society is very large – as much as 30%. Before we wind back the move to biofuels, we should consider how to improve the efficiency of the total food chain. We cannot claim to have a food crisis at the same time as an obesity crisis, whilst at the same time throw away nearly a third of our food!!!

For more information please see here

The HGCA work carried out over the last four years makes it clear that biofuels, grown and produced in the UK, can meet any reasonable sustainable criteria, and can provide significant reduction in GHG emissions from transport fuels.

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