

1. How should a biofuel sustainability system be designed?

The Commission intends to bring forward a proposal for a simple incentive/support system for biofuels. Its objective is to further increase the greenhouse gas benefits of EU biofuel policy and to minimise environmental risks. The system could discourage:

- the conversion of land with high biodiversity value for the purpose of cultivating biofuel feedstocks;
- the use of environmentally harmful systems for biofuel production.

It should avoid any discrimination between domestic production and imports and should not act as a barrier to trade. Its operation should be monitored with a view to making it more sophisticated in future.

A possible way forward

One option for the initial design of the scheme (before it is reviewed and steps are taken to make it more sophisticated) would be as follows:

- a) The legislation would list the "sustainability criteria" to be fulfilled by the biofuels that are used to fulfil the biofuels target. There could be three of these criteria (see box 1).
- b) Biofuels that failed to meet one of these criteria would not count towards national biofuel targets. They would not count towards national "biofuel obligations"⁴. They would not be eligible for tax reductions and similar types of financial support.
- c) Member States would be responsible for ensuring that the criteria were respected. The legislation would set out some procedural requirements (for example on reporting, verification and monitoring).

The legislation would define types of evidence that Member States would have to accept as evidence that the sustainability criteria were fulfilled (see box 2).

BOX 1

POSSIBLE ENVIRONMENTAL SUSTAINABILITY CRITERIA FOR BIOFUELS

Sustainability criterion 1 – achieving a minimum level of greenhouse gas savings.

Biofuels used to fulfil the requirements of the legislation should not emit more greenhouse gases in production than they save by avoiding the use of petrol or diesel – or (to give a safety margin) should achieve at least a given amount of greenhouse gas savings (for example 10%). The directive would define 'default values' for net greenhouse gas savings from different types of biofuel. These could, for example, be based on the ranges given in the JRC/EUCAR/Concawe "well-to-wheel" study. They would cover greenhouse gases in general, not just carbon dioxide. Biofuel suppliers could choose to use these default values, or to provide more precise information on the savings from their particular production process.

Sustainability criterion 2 – avoiding major reduction in carbon stocks through land use change.

Biofuels used to fulfil the requirements of the directive should not use raw material from land that was in certain land uses before a certain date (for example, the date of the Commission proposal). These land uses would be those that are associated with high carbon stocks (for example, wetlands). IPCC guidelines could be used to identify them. The directive would define the land uses in question.

Sustainability criterion 3 – avoiding major biodiversity loss from land use change.

Biofuels used to fulfil the requirements of the directive should not use raw material from land that was in certain land uses before a certain date (for example, the date of the Commission proposal). These land uses would be those that are associated with exceptional biodiversity.

BOX 2

POSSIBLE TYPES OF EVIDENCE TO SHOW THAT ENVIRONMENTAL SUSTAINABILITY CRITERIA ARE RESPECTED

1. Some EU Member States and other countries are developing national schemes to measure greenhouse gas impacts. Once accredited for EU use through a comitology process, these would be evidence of greenhouse gas emissions in production (for sustainability criterion 1). The same approach could apply to international schemes that may be developed.

2. There are voluntary, international schemes setting standards for the production of agricultural and forest products. Some include requirements that would prevent land use change of the types described by criteria 2 and/or 3. Once accredited for EU use through a comitology process, these would be evidence that these criteria have been respected.

3. The European Community could negotiate bilateral or multilateral agreements with third countries, confirming that these countries have in place procedures to ensure that the types of land use change described by criteria 2 and/or 3 do not happen. The existence of such an agreement would be evidence that these criteria have been respected.

4. In the absence of these types of evidence, it would be for Member States to determine how to verify the fulfilment of the criteria. The directive could lay down minimum requirements for how this should be done.

This option is put forward as a starting point for discussion and to give an indication of how a system could work in practice.

General questions

Question 1.1:

Do you think the "possible way forward" described above is feasible?

Yes. Such a system should be easy to establish and adopt. It should be rigorous and fit with WTO rules on trade. It requires an internationally agreed standard for calculating and reporting the carbon intensity of fuels as well as assessment of other sustainability criteria. However, such standards are already well developed in some member states, for example UK and could easily be adopted across the European Union.

Once established as a basic requirement level, then fuels with enhanced greenhouse gas savings can be rewarded by offering economic incentives to those fuels with green credentials. For example, by offering multiple certificates for greener fuels in the case of the UK model. This encourages improved environmental practice throughout the supply chain.

Question 1.2

What do you think the administrative burden of an approach like the "possible way forward" would be? (If possible, please quantify your answer.)

Minimal. The additional requirement for reporting is softened by adopting proven standards. Such standards can be audited by suitably qualified and

experienced personnel, within an industry competence framework. Alternatively, it may be possible for the commission to make validation of reporting a Government Activity and hence minimize the cost to business directly. The bottom line is that any additional cost will be marginal when spread across the EU road transport fuel demand. As such any cost passed on to the consumer or born by Governments can be justified as small and appropriate in environmental terms.

Question 1.3

Please give your general comments on the "possible way forward", and on how it could be implemented. Does it give an adequate level of assurance that biofuels will be sustainably produced? If you think the problem should be tackled in a different way, please say how, giving details of the procedures that would be used.

The possible way forward should be implemented by passing EU Law requiring Member States to put in place suitable national legislation that complies with the proposed way forward. While the legislation should be passed as soon as practicable, suggesting Autumn 2007, the methodology and standards required for consistent reporting across members states are unlikely to be in reliable application across all member states before 2012. However, in order to enable investment plans to be modified where required and progressed in line with the proposed way forward a clear signal of intent and appropriate notice of action to investors looking to establish new business plans should be given such that business can adopt the standards required.

Questions relating to individual criteria in box 1

Question 1.4

Carbon stock differences between land uses would be taken into account under criterion 2. Should they also be taken into account under criterion 1? If so, what method should be used to determine how the land in question would have been used if it had not been used to produce raw material for biofuels?

Land Use Change is a critical element of concern relating to biofuels use and the risk of further large swathes of land being turned into biomass production must be mitigated as soon as practicable. It is recommended therefore, that land use change is included within the calculation of carbon intensity for a fuel. Where land is given over to a perennial crop, the previous land use should be

considered as the land use at a point in time. Where land is in active annual production already, it can be reported as crop-land. Where crop rotation results in environmental benefits, these should be factored into the environmental value of the crop that delivers the benefit. For example, Oil Seed Rape growth tends to hold Nitrogen in the harvested crop residues, for the following wheat crop in a rotational cycle, and the nitrogen saving associated with the immediately following wheat crop should be expressed in terms of a reduction in Nitrogen associated with the OSR crop. Such carbon savings reporting claims should be validated by independent, suitably qualified and experienced personnel performing audits of supply chains.

Question 1.5

As described in the "possible way forward", criterion 3 focuses on land uses associated with exceptional biodiversity. Should the criterion be extended to apply to land that is adjacent to land uses associated with exceptional biodiversity? If so, why? How could this land be defined?

It does not seem reasonable to extend such criterion to land adjacent to land associated with exceptional biodiversity, unless there is evidence that such extension delivers environmental benefits. The European Union Common Agricultural Policy in its implementation seems to be encouraging member states to manage biodiversity more actively. The results of such management techniques have not, it appears, extended into preventing land use for agriculture adjacent to sites of high bio-diversity. However, a study of such effects at an EU level could be considered before reviewing this thinking.

Question 1.6

How could the term "exceptional biodiversity" (in criterion 3) be defined in a way that is scientifically based, transparent and non-discriminatory?

No comment.

2. How should overall effects on land use be monitored?

The problem

Two of the sustainability criteria in the "possible way forward" in section 1 relate to the direct conversion of land for biofuel production from other uses. Increased demand for biofuels is also likely to have an indirect effect on land use, leading to an increase in the total amount of land devoted to forestry and crop production. This land use change will be associated with greenhouse gas savings from biofuel use. It will have other environmental effects. These could be positive or negative. The environmental effect of using land that would otherwise have been used for an out-of-town housing development is different from the effect of using land that would have been a biodiverse habitat.

It seems clear that these indirect effects cannot be linked to individual consignments of biofuel. But they should still be monitored.

Possible way forward

The legislation could ask the Commission to report regularly on:

- how land use would have developed if biofuel use had remained constant;
- how land use has in fact developed; and
- the estimated effect on overall land use of increasing biofuel use.

Question 2.1:

Please give your comments on the "possible way forward" described above. If you think the problem should be tackled in a different way, please say how.

The Possible way forward seems reasonable and appropriate. It would not be appropriate for individual companies buying agricultural commodities to be responsible for indirect land use change. However, these companies can advise the traders/ growers/ co-operatives/ farmers that they deal with about the developing requirements for carbon and sustainability reporting.

It seems entirely reasonable for the EU parliament, in conjunction with member states to monitor land use change and to report on it. Such reports can be considered at global for a, like the United Nations and G8. This should consider not only biofuels demand and use, but also other uses, as these all place a demand on land use. Once a full understanding of land use change is developed, it should then be possible to open discussion and negotiations around the practices and behaviours leading to gross land use change in order

to try and find alternative means to meet the demands placed on land use. This may, for example, develop alternative opportunities in agronomy know how and show how for European members.

Question 2.2

Do you think it is possible to link indirect land use effects to individual consignments of biofuel? If so, please say how.

It does not seem practical or accurate to link indirect land use effects to individual consignments of biofuel. These effects are generally outside of the control of individual companies and whilst robust sustainability assurance schemes are essential to retain public and political confidence in biofuels, they are not an effective substitute for good governance and regulation of natural resources.

3. How should the use of second-generation biofuels be encouraged?

The Commission intends to bring forward a proposal to encourage the production and use of second-generation biofuels.

Question 3.1:

How should second-generation biofuels be defined? Should the definition be based on:

- a) the type of raw materials from which biofuels are made (for example, "biofuel from cellulosic material")?**
- b) the type of technology used to produce the biofuel (for example, "biofuels produced using a production technique that is capable of handling cellulosic material")?**
- c) other criteria (please give details)?**

The above proposed definitions do not seem to adequately address the political driver for second-generation biofuels. These drivers do not seem to be associated with environmental performance; rather they are more directly associated with security of supply. For example, second generation fuels tend to be produced from crops other than the typical annual crops, Oil Seed Rape, Soy, Sunflower, Wheat and Corn or Maize from agricultural production. Neither are they produced from the typical perennial crops like Palm, Olive or Jetropha. They are more likely to be produced from alternative crops, like timber and grasses or from domestic refuse.

It has been shown that first generation crops can deliver very significant carbon savings when optimum use of co-products as energy vectors is established. For example, using ddgs from bio-ethanol production or the cake from seeds that have oil extracted for heat and or power generation delivers very significant life-cycle carbon reductions.

Therefore, the value in second generation is at least as much in security of supply. So perhaps the definition should be a list of materials that offer diversity of fuel supply. Given such a list may be difficult to draw up and by its very nature may prevent any future agronomic or plant development from getting onto an approved list, it may be more appropriate to define second generation as not first generation and list what first generation includes. In addition, second generation should deliver at least as much carbon saving per unit hectare of land as first generation. If it does not, then the ultimate limiting factor of land availability delivering secure, low carbon energy sources is not being delivered.

Possible way forward

The legislation could require Member States to give an advantage to second-generation biofuels in their support systems.

For example:

- Under national biofuel obligations, second-generation biofuels would count extra (for example, double) – this would mean that an obligation to achieve a 2% share of first generation biofuels could be fulfilled, instead, with a 1% share of second-generation.
- The legislation would confirm that second-generation biofuels may receive higher subsidies than first-generation biofuels (subject to Community state aid rules and applicable Community tax legislation).

Question 3.2:

Please give your comments on the "possible way forward" described above. If you think the problem should be tackled in a different way, please say how.

The possible way forward supports second generation without providing any criteria for second generation. Furthermore, the proposed definitions of second generation at 3.1 do not seem to really address the requirement for carbon

savings and security of supply. It is proposed that one suitable measure for assessment of second generation with first generation may be carbon intensity per unit land area of crop growth. Such carbon savings measures can then be used to structure European Union Intervention and support mechanisms. For example, a fuel with a carbon intensity per unit land area of X can be counted as twice as effective as a fuel achieving a carbon intensity of X/2. Noting earlier statements, the carbon intensity assessment should consider direct land use change.

Question 3.3

Should second-generation biofuels only be able to benefit from these advantages if they also achieve a defined level of greenhouse gas savings?

Yes. As indicated above, the greenhouse gas savings are key to progress and the European Union should encourage member states to make optimal use of land available for production of renewable fuels. This requirement stems from a drive for security of supply as well as environmental protection. Therefore, the European Union should consider measures that indicate the environmental efficiency of fuel production and carbon intensity per hectare may be one such measure.

4. What further action is needed to make it possible to achieve a 10% biofuel share?

The problem

The proposed target for biofuels is a 10% share, by energy content, in 2020. The easiest way to get biofuels into the market is by blending them directly with ordinary fuel and using them in low blends in ordinary vehicles. The most widely available biofuels today are ethanol (replacing petrol) and biodiesel (replacing diesel) – although other petrol and diesel replacers exist. The fuel quality directive (directive 98/70/EC) limits the direct blending of ethanol in petrol to 5% by volume. This equates to 3.4% by energy content. The diesel standard (EN590) limits the direct blending of biodiesel in diesel to 5% by volume. This equates to 4.4% by energy content.

If the 10% (energy content) target is to be met mainly by direct blending of ethanol and biodiesel, these limits will need to be changed. They will also need to be changed if the existing 5.75% (energy content) target for 2010 is to be met mainly by direct blending of these fuels.

The current situation

As a first step, the Commission has proposed amending the fuel quality directive to increase the maximum blending of ethanol in petrol to 10% by volume (6.8% by energy content). This proposal is under consideration by the Council and the European Parliament.

The Commission has given the European Committee on Standardisation (CEN) a mandate to amend the diesel standard to allow a 10% biodiesel blend (8.8% by energy content). This process may take a long time – perhaps 4 years – and may not lead to widespread availability of fuel containing 10% biodiesel.

Question 4.1:

Should the legislation include measures to ensure that diesel containing 10% biodiesel (by volume) can be placed on the market, and is in fact placed on the market?

As a minimum, yes. A clear signal of intent will help vehicle manufactures plan their technology platform and production processes going forward. It is reasonable to consider driving a higher biodiesel inclusion as it is easily substituted for fossil diesel and the European Union is generally short of fossil diesel. Therefore coupled with measures to assure the provenance of bio-diesel supplied into the market, this simple measure directly meets the political requirements of environmental benefit and security of supply.

It can be argued that setting a 10% level is not sufficient and that, given some vehicle manufacturers already warrant vehicles to run on 30% bio-diesel or 100% bio-diesel, then the blend inclusion minimum should be higher than 10%. It is suggested that a 20% target for 2020 is a reasonable compromise that can be easily met by vehicle manufacturers and is likely to be met by agricultural commodity supply chains with minimal market development.

Other options for solving the problem

Even if the changes described in the last section come to fruition, they will not be enough for the 10% target to be met – if it is to be met mainly by direct blending of ethanol and biodiesel.

The term "biodiesel" in this section refers to the fuel also known as FAME (Fatty Acid Methyl Ester).

The target could be met through other means than the direct blending of ethanol and biodiesel:

1. More ethanol can be added to petrol in the form of the fuel additive ETBE. However, limits on ETBE blending in the fuel quality directive mean that even with maximum use of ETBE, the 10% target will not be reached.
2. Ethanol and biodiesel can be used in high blends – 85% or 95% ethanol, 100% biodiesel, for example – outside the scope of the fuel quality directive and the diesel standard. However, unlike low blends, these fuels need specialised vehicles and distribution systems.
3. Other biofuels that can be used are biomethane (made from biogas), methanol (made from biomass-based synthesis gas) and dimethyl ether (DME). However, these fuels also need specialised vehicles and distribution systems.
4. New types of biofuel or ways of using them could avoid the blending constraints in the fuel quality directive and the diesel standard. An example is the second-generation biofuel "BTL" ("Biomass-to-liquid" or Fischer-Tropsch diesel). However, it is not certain when or if these fuels and technologies will come onto the market on a wide scale.

Question 4.2:

Should the legislation include measures to encourage the use of ethanol and biodiesel in high blends? If so, what?

Yes. Vehicles that can use high blends of bio-ethanol and bio-diesel are already in place. Such measures can be linked to consistent measures like carbon intensity per hectare per vehicle kilometer for a fuel delivered into a vehicle. In this way, a high blend fuel is worth more in carbon savings per hectare per kilometer than a low blend fuel, depending on the provenance of the fuel. This maintains the drive to adopt lower carbon fuels and encourage fuels that deliver better energy security, while encouraging use in high blends. Intervention mechanisms can be postulated for intervention to support such fuels though

these may not be consistent across member states due to the varying degrees of fuel taxation and vehicle taxation.

Question 4.3:

Should the legislation include measures to encourage the use of biomethane, methanol and DME in transport? If so, what?

Such fuels are not perceived to be mainstream and vehicles that can use such fuels are not widely available. The fuelling infrastructure is not established for such fuels and it is not understood whether they can deliver large benefits in terms of carbon savings per unit hectare of land or at a vehicle level in terms of carbon intensity per unit hectare per vehicle mile.

Possible way forward

If none of these methods can be relied on to ensure that the target will be met, it will be necessary to allow a further increase in the share of ethanol that can be blended in ordinary petrol – up to 20%, for example – and perhaps also to allow a further increase in the share of biodiesel that can be blended in ordinary diesel – up to 15%, for example.

For manufacturers to take these requirements into account in designing the vehicles that will be on the roads in 2020, a decision should be made soon.

Question 4.5:

Should the legislation ask the Commission to review, by a given date, whether it is possible to be confident that the 10% target can be achieved through:

- a) rules that allow 10% blending by volume of ethanol in ordinary petrol, plus
- b) rules that allow 10% blending by volume of biodiesel in ordinary diesel, plus
- c) the four options listed under 'other options for solving the problem';

If so, what should the date be? If the review were to conclude that the target is unlikely to be met, what action should the Commission take?

Yes. The date should be January 2008. It is suggested that the assessment considers measures like carbon intensity per hectare of land.

Question 4.6

More generally, what role should taxation play in the promotion of biofuels (considering different situations such as low blends, high blends and second-generation biofuels)?

Taxation of fuels, vehicle and road use across member states is not uniform and therefore, a consistent approach to biofuels taxation is difficult to achieve. However, this does not preclude policy mechanisms like obligation being established across the European Union. Such an obligation could be structured to enable fuels to be grown, processed and used within member states and traded across the European Union within a common trading framework. This may extend to include trading of transport carbon across member states as well as physical product movements. An obligation could be delivered with a consistent penalty price across the member states.

The carbon trading system is an example of how trading can be established though it is not suggested that transport fuel carbon should be traded directly with carbon savings from the power sector without some consideration of the complex fuel quality requirements of the transport sector when compared with other sectors.