

Biofuels in Europe

An analysis of the new EU targets and sustainability requirements with recommendations for future policy

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European Federation for
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future policy**

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Contact

Nusa Urbancic, Policy Officer
nusa.urbancic@transportenvironment.org

Editeur responsable

Jos Dings, Director

T&E – European Federation for Transport and Environment AiSBL

Rue de la Pépinière, 1 | B-1000 Brussels | Belgium

www.transportenvironment.org

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Context

In December 2008, the European Parliament and Member State representatives agreed on the Renewable Energy Directive, which sets a binding 20% target for renewable energy in the EU with a 10% sub-target for transport. The target date is the year 2020.

The stated purpose of the transport target is to reduce the CO₂ emissions caused by transport in the EU by reducing the amount of fossil fuels used in the sector.

It is widely assumed that the target will be largely met through use of biofuels. Indeed the target was initially referred to as a biofuels target and effectively replaces a voluntary target for biofuels to make up 5.75% of EU transport fuel by 2010.

In the background to the legislative discussion, biofuels hit the headlines worldwide last year as a number of important international organizations called into question the sustainability of their production. The International Energy Agency, the Food and Agricultural Organization of the UN, the OECD, the European Commission's Joint Research Committee, the European Economic and Social Committee and the Science Committee of the European Environmental Agency all published reports raising a variety of concerns.

Even before the biofuels issue became so hot, EU leaders had stressed that the targets should be "subject to production being sustainable".

The 'sustainability criteria' for biofuels thus became a part of the proposed law, and much of the legislative discussion centred on that issue. As biofuels supported under this Directive will get large amount of public support and money, this requires that their production is responsible and that they lead to proven and substantial environmental benefits.

T&E is not for, or against biofuels in principle. We believe that policies should focus on environmental outcomes, not targets for particular technologies. In the case of transport fuel, the EU has agreed, in parallel, a low carbon fuel standard which sets a greenhouse gas (GHG) reduction target for transport fuel lifecycle emissions. We believe this approach, if properly implemented, would achieve the desired goal without the need for a separate biofuel volume target.¹

However, now that a biofuels/renewable energy in transport target has been agreed, it is necessary that we assess whether or not it will be achieved sustainably. This briefing will therefore examine the political outcome of the debate over 'sustainability criteria' and assess whether the legislation can achieve the aim of reducing GHG emissions in transport.

¹ See: www.transportenvironment.org/News/2008/12/EU-dampens-market-for-high-carbon-oil/

Main conclusions and recommendations

Main conclusions

- Although the Directive's sustainability standards suggest that only biofuels that reduce greenhouse gas (GHG) emissions would qualify, in practice the law might increase just as well as reduce transport emissions. This is primarily because it does not control the carbon emission impacts of indirect land use change (ILUC) resulting from additional biofuel cultivation.
- The legislation is overly complex, sometimes contradictory and contains many uncertainties. This stands in the way of an environmentally and economically sustainable future for renewable transport fuels.
- The agreed sustainability standards do not mitigate the risk that the increased production of biofuels will lead to further biodiversity loss and environmental destruction. The lack of provisions regarding ILUC and numerous loopholes in the existing sustainability criteria are the main culprits.
- The process for calculating greenhouse gas emissions from biofuels and the 'default values' assigned to different types of biofuels is opaque and raises questions about the independence, credibility and validity of the process.
- Many significant, arguably fundamental uncertainties in the law will only be fully resolved as part of the so-called 'comitology' (technical committee) process, with little or no oversight from the European Parliament or other interested stakeholders. This also raises questions about the transparency of the process.

Recommendations for European policy

- European policy should aim to scrap the volume targets for renewables in transport (biofuels) and move towards GHG-reduction targets. The supposed benefits of quantity targets, i.e. investment security, have not materialised, while its disadvantages, i.e. significant uncertainty regarding GHG impacts, are paramount.
- Regardless of the way a future target is set, an absolute priority is to include estimates for the carbon impact of indirect land use change (ILUC) in the law. Only with scientifically robust calculation of ILUC, are current biofuels policies likely to reduce GHG emissions from transport.
- The Commission should ensure transparency and involvement of different stakeholders in the future legislative process, which has to clarify numerous uncertainties of the law. Only with openness and transparency will the law and its implementation regain credibility.

Recommendations for Member States

Given all the uncertainties, the upcoming review of the law, and the ongoing questions regarding land use impacts of many biofuels, the safest bet for Member States is to:

- Develop legislation, taxation policy and other measures that limit the energy demand in the transport sector in order to limit the environmental impact, increase transport efficiency and reduce the need to replace fossil fuels with other energy sources. These measures would also include promotion of modal

shift away from car-dependency, e.g. by improving the public transport system or making cycling more attractive.

- Set no or only very modest binding targets for biofuels for the next few years in order to avoid massive lock-in to biofuel streams that would become unviable in the long run.
- Promote non-biofuel renewable and low-carbon energy sources in transport including renewable electricity.

Recommendations for industry and investors

Given all the uncertainties, the upcoming reviews of the law, and the ongoing questions regarding land use impacts of many biofuels, the safest bet for industry is to:

- concentrate investment in areas that reduce energy demand in the transport sector. This creates the best conditions to meet a future with higher energy prices, larger demand for renewable energy and drastic sharpening of GHG emission reduction demands.
- only invest in biofuels that demonstrably do not pose significant land use issues and do not risk social and conservation conflicts.
- Avoid investments in biofuels that narrowly pass the threshold and pose ILUC issues – such investments might be lost once the EU includes ILUC effects in the law.
- cool down on other biofuel investments, also those that qualify as ‘second-generation’ until land use issues have been properly addressed in sustainability standards (by the end of 2012).
- invest in all types of other promising renewable and low-carbon energy sources in transport, including renewable electricity in transport (i.e. trains, ships, plug-in hybrids, etc.) These hold promise for real and lasting GHG emissions reduction.

How is the 10% target for renewable energy in transport calculated?

The law contains a legally binding target for 10% of transport energy to come from renewable sources by 2020 (Article 3.4).² In contrast to the overall renewable energy objective, which is subject to 'effort sharing', every Member State has to meet the 10% transport target individually.³

The target is defined as:

Renewable energy used in all forms of transport
_____ = *final target*

All energy used in road and rail transport

This means that only road and rail transport will be used to calculate the volume of the target in a Member State, but renewable sources in other transport modes can also count towards the target. For example, if a Member State decides to invest in renewable fuels in its aviation sector, it will still be able to count it towards its transport target, under the condition that these fuels are sustainable.

However, there are no provisions for how the renewable energy used in non road/rail sectors should be counted. In contrast there are detailed provisions on how biofuels and renewable electricity in road vehicles should be calculated. This is the first of a number of inconsistencies and uncertainties in the directive.

Double counting for 'advanced' biofuels

There is a specific extra incentive for biofuels produced from waste, residues non-food cellulosic materials and ligno-cellulosic materials (hereafter referred to as 'advanced' biofuels). These will count **twice** towards the target (Article 21.2), with the justification that they are more expensive to produce and hence need more encouragement.⁴ This means that in practice a Member State could decide to use 5% of such biofuels and thereby reach its entire obligation for renewables in the transport sector.

² The numbers of articles referred to in this document are based on the version of the Renewable Energy Directive adopted by the European Parliament in the plenary session on 17 December 2008. These might be subject to subsequent changes.

³ The 20% overall target is broken down among member states according to their GDP and potential for renewable energy growth. Sweden with currently the highest share of renewable energy (39.8%) also has the highest target for 2020 (49%). UK, which currently meets only 1.3% of their final energy consumption from renewable sources, will have to increase its share to 15% by 2020. However, both countries will also have to individually meet the 10% sub-target for renewable energy in transport. It is important to note that 10% transport target represents only around 2-3% of the overall 20% EU renewables target. Hence, more than 17% of the target will come from the heating and electricity sectors, where the use of biomass resources is also much more efficient. Another important difference between the overall renewable target and the transport target is that member states can trade their overall target (article 6). This is not possible with the transport target.

⁴ There are good reasons for the specific promotion of biofuels from waste and residues (including manure). If organic waste is not used for energy purposes, it will typically emit methane. If that methane is captured and burned the GHG benefit is larger than the possible replacement of the fossil fuel. However, this is not reflected in the Directive, where specific support depends more on the fact that these biofuels are not produced from food crops.

However, as the European Commission's Joint Research Centre (JRC) has argued (De Santi et al. 2008: 7), 'advanced' biofuels will not be competitive with first generation biofuels before 2020, so this is not likely to bring member states much further towards meeting their target.

Confused approach to renewable electricity in transport

Renewable electricity used in electric cars will count 2.5 times towards the target, to reflect the fact that the electric drivetrain is a much more efficient way to use renewable energy than burning biofuels in a combustion engine. As only road vehicles and not electric trains benefit from this incentive, the directive gives less incentives for member states to switch the electricity supply for trains to renewables.

The origin of the electricity can be presented in two different ways. This will give Member States an opportunity to choose the percentage of renewable electricity used for the electric car fleet or the trains. One option is to base it on the EU average, another to base it on the national average share of renewable electricity. In practice this means countries with a high level of renewable electricity like Sweden and Austria can use their own (relatively high) share. Meanwhile, countries with a low share of renewable electricity like the UK and Italy - will use the EU share, currently around 14% (EEA 2008) rising to around 35% by 2020. This means that the UK will be able to count electricity in transport in 2020 as if 35% of it were renewable, regardless of the real figure.

Another large uncertainty is how electricity consumed in road vehicles shall be estimated as there is no method to measure electricity for vehicles separately.

As a result of these conflicting provisions, it is currently very difficult to say, what role renewable electricity will play in reaching the transport target. Much will depend on the support policies in place in individual Member States.

Sustainability criteria (Article 17)

For the purposes of the target, biofuels and bioliquids (i.e. vegetable oil used in electricity generation) are subject to certain 'sustainability criteria' in order to be counted towards the renewable energy in transport target or eligible for national support schemes, such as tax exemptions, etc. The sustainability criteria are based on the EU's internal market rules, i.e. once a biofuel is approved as sustainable in one Member State, other EU states cannot reject this fuel to benefit from their national support schemes. However, Member States can still decide to differentiate between better and worse performing biofuels, by giving higher subsidies to 'better' biofuels.

When solid biomass is used in stationary applications to comply with the general 20% renewable energy target set by the Directive, the sustainability criteria do not apply. However, the Commission will have to report on sustainability scheme for biomass by the end of 2009 and, if necessary, propose modifications to the current Directive.⁵

GHG savings (Article 17.2)

Until 2017 biofuels and other bioliquids will have to be proven to contribute at least 35% GHG life-cycle savings overall compared to fossil fuels. From 2017, and subject to a review in 2014 (see page 17), this threshold will be increased to 50% for existing installations and 60% for new installations.

This GHG saving threshold was introduced because a volume transport target might lead to the use of cheapest biofuels with very low GHG savings, as companies would only strive to meet the 10% quantity target. If the GHG reduction target (such as the one set in the Fuel Quality Directive) would be a prevailing concept, the companies would naturally be steered to purchase biofuels with the highest GHG savings, in order to meet their GHG reduction target more efficiently. As already said, the EU decided to set both approaches in parallel, adding to the confusion and complexity of the legislation.

How do biofuels lead to GHG savings?

Much of the original attraction of biofuels lay in their perceived GHG neutrality. As crops grow, they absorb carbon from the atmosphere. When they are burned (as biofuel), this carbon is simply released back, so that over the lifecycle of the fuel, the net impact on atmospheric carbon is neutral.

But in reality, biofuels are not GHG neutral. There are emissions associated with all stages of their lifecycle, particularly if the crops are grown intensively, using nitrogen-based fertilisers and machinery, or if the refining process requires large inputs of (fossil) energy. Nevertheless, biofuels do not have to have zero GHG emissions to be of benefit; they only need to emit less than the fossil-fuel alternative. (Oxfam 2008)

⁵ The Parliament's Environment and Industry committees suggested in their reports that sustainability criteria for biofuels and bioliquids are extended to all energy uses of biomass, but has later withdrawn from this position.

Calculation of GHG savings (Article 19 and Annex V)

The Directive includes a list of default values for the GHG savings of different biofuel production pathways (Annex V of the directive).

Process for deciding on default GHG saving values for biofuels is opaque and not subject to independent monitoring

Default values and disaggregated default values come from the JEC⁶. These values were updated by the Commission at the closing stages of negotiations, after the Parliament's Industry committee had already voted on the Directive, demanding a higher GHG savings threshold.

At that point, the default GHG savings for almost all biofuels were revised upwards and as a result virtually all biofuels now meet both the 35% and 50% thresholds. Especially significant was the difference for sugar beet ethanol that was increased from 35% to 52% default GHG savings. According to the Commission this is due to improvements in processing and to the fact that following the sugar reform, sugar beet is now grown in more efficient regions. However, we know that only the most efficient factories in the UK produce sugar beet ethanol with 55% GHG savings. Therefore, 52% seems suspiciously high for a "conservative" default value.

Examples of failing fuels are diesel from soybeans (31% GHG savings), and certain production pathways of rapeseed biodiesel and wheat ethanol.

The process of obtaining default values is very opaque and is not subject to any independent monitoring. There has been no commitment by the Commission to open the process of obtaining these values to an independent review.

In principle the default values are 'conservative', though that can be disputed⁷. Suppliers can either use the default values or provide their own specific calculations (according to the formula provided in the Directive) to prove their fuels have higher GHG savings than the default.

Direct land use change

The Directive sets disincentives to directly convert land for the production of raw materials for biofuels. This is necessary because a large part of the carbon stored in undisturbed natural soils and forests is released as carbon dioxide when the land is cleared for agriculture and the soil disturbed.

In the law, this translates into special protection measures for high biodiversity areas, where no biofuel raw materials should be grown, and high carbon stock areas that should not be converted because this would lead to substantial release of emissions. In addition, there is also a disincentive against the conversion of carbon rich areas (in Annex V), as companies have to calculate emissions from direct conversion of land on which they grow biofuels.

⁶ JEC: the abbreviation stands for the first letters of JRC, EUCAR and CONCAWE, respectively the Commission's Joint Research Center, EUCAR (representing major European vehicle manufacturers) and CONCAWE (representing most oil companies operating in Europe)

⁷ Conservativeness of these default values can be disputed. The UK default values drafted by Renewable Fuels Agency (RFA) for their national Renewable Fuels Standard are mostly more conservative and also disaggregated according to the country of production (RFA 2008), which might be a more appropriate approach, considering large differences in cultivation emissions in different regions.

However, the devil is in the detail; high biodiversity and high carbon stock areas are defined in such a way that these types of land could still end up being converted for biofuels, with no penalty.

High biodiversity areas (Article 17.3)

The definition of high biodiversity areas is very restrictive and will guarantee protection of a mere 1-2% of global forests and only officially recognized nature protection areas. Many other high biodiversity areas fall outside the scope of protection, just as the EU struggles to meet its objective of putting a stop to biodiversity loss by 2010 (Euractiv 2008).

High biodiversity areas defined in the law are namely primary forest, nature protection areas, highly biodiverse grassland and areas with high numbers of endangered species or ecosystems. This excludes many other areas of high conservation value, such as semi-natural and natural forests, highly biodiverse savannahs, etc. Furthermore, many of those areas are not defined and the decision will be in the hands of the Commission through the comitology procedure. For this reason, it is difficult to say, what level of biodiversity protection will be guaranteed by this Directive.

High carbon stock areas (Article 17.4 and 17.5)

These two articles that should in theory protect high carbon stock areas from conversion for biofuels, in reality opens potentially up to 95% of global peatlands and 50% of global forests for conversion for the production of raw materials for biofuels.

High carbon stock areas should not be converted for agricultural use because high emissions released into the atmosphere, would nullify any GHG reductions achieved by biofuels (see Annex I of this document, page 20). In the law these areas are defined as forests with a canopy cover higher than 30%,⁸ wetlands and, under some conditions, peatlands. This is insufficient, as it excludes many other high carbon areas, while it creates many loopholes even for included high carbon areas.

Forest

With canopy cover defined at 30%, the EU is rejecting the internationally recognized forest definition of the Food and Agriculture Organization of the United Nations (FAO) and the Convention on Biological Diversity (CBD)⁹ and potentially opening 50% of global forested areas to conversion for biofuels.

It is important to clarify that this article would not prevent the use of wood or forestry residues for the production of 'advanced' biofuels. Producers would still be able to use as much materials as they can, as long as they do not convert the forest into a field or grassland. However, the problematic aspect is that only forest with a canopy cover above 30% will be surely protected against conversion and according to the graph by International Panel on Climate Change (see Annex III of this document, page 22) this represents less than 50% of global forest.

The protection of forests that have canopy cover between 10 and 30% will be conditional. They will be excluded from conversion, unless biofuels producers can

⁸ Most definitions of forest refer to canopy or crown cover, which is essentially the percentage of ground area shaded by the crowns of the trees, when they are in full leaf.

⁹ The definition recognized by FAO: Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agriculture or urban use (FAO 2006).

prove that their conversion does not lead to emissions higher than 35% (or 50% from 2017 on). This probably means that most biofuels with low GHG savings will not justify conversion of forests into fields. The most notable exception is probably ethanol from sugar cane, which has very high GHG savings and could potentially 'justify' conversion of large areas of i.e. savannahs in Brazil and other sugarcane ethanol producing countries. In the Annex I of this document, it is well illustrated that the conversion of carbon rich humid savannah for biofuels results in huge GHG emissions. It is not clear whether the law will protect such carbon rich areas. Another unclear aspect is whether natural areas will be protected against conversion for the production of cellulosic biofuels. As biofuels produced from wood have very high default GHG savings (starting at 70%), this might mean that they could still qualify for national support schemes, even though carbon rich areas were converted.

Peatlands

The Directive prohibits the production of biofuels on peatlands, unless a producer can prove that such cultivation did not involve the drainage of previously undrained soil. Although this constitutes a clear legal principle that would effectively prevent the use of peatlands, the definition of undrained peatland still has to be defined by the Commission.

The adjective 'undrained' was added in order to allow countries such as Sweden and Finland to continue draining their peatlands for biofuels production.¹⁰ Moreover, this provision creates a loophole in the Directive that will enable conversion or further draining of tropical peatlands in South East Asia, where emissions from drainage are ten times higher than in boreal zones. This is also the main area of the planet with huge peatlands; 50% of all new palm oil plantations (often for biofuel) are on peatlands. 95% of the peatland in Southeast Asia have already been drained to some extent,¹¹ which would allow plantation owners to argue that their new plantations were on formerly already drained peatlands and therefore their feedstock should be accepted as biofuel in the EU.

Allowing biofuels from drained peatlands causes major problems, especially in tropical zones. Emissions from tropical zones are around three times as high as in temperate zones and up to 10 times compared to boreal zones. Drainage in Southeast Asia is also much deeper compared to drainage for Scandinavian forestry. Currently, total peatland CO₂ emissions go up to 3,000 Mt/y, which equals more than 10 % of global CO₂ emissions – 2,000 Mt/y of these are in Southeast Asia only. These emissions have been rapidly increasing since 1985 and will increase further unless action is taken. Over 90% of these South East Asian emissions originate from Indonesia, which puts the country in 3rd place (after the USA and China) in the global CO₂ emission ranking (Wetlands International 2008). Palm oil production is the major driving force behind these disturbing figures.

If the carbon calculator for direct land use change in Annex V.C is used consistently, this problem could in theory be avoided. However, this calculator can only account

¹⁰ Finland and some other Member States lobbied for this wording also in order to open the market for peat used as energy source. According to IPCC, peat is defined as a fossil fuel, since it has been slowly stored in the soil since glacial age. Burning peat results in high GHG emissions from burning and from the soil, while its exploitation also causes great concerns for nature conservation and water management. However, the definition of biomass in the Directive would effectively prevent countries to use peat as renewable source.

¹¹ The currently drained peatlands in Indonesia and Malaysia were often drained for logging purposes. This is generally just a shallow drainage, leading to small emissions. Drainage for palm oil is by definition deep drainage (minimum 60 cm; often up to a meter deep). This means that further draining of already drained soils in South East Asia leads to emissions of up to 90 tonnes CO₂/yr/ha.

for conversion of peatlands.¹² Draining of peatlands also results in high and ongoing GHG emissions so biofuels produced on these areas should be disqualified because they don't pass the GHG savings threshold. However, it is unclear when and if the emissions from drainage of peatlands will be included into the life-cycle analysis. According to a 'recital' in the Directive, the Commission should develop methodologies that take into consideration the emissions from drainage of peatlands, but without a set deadline. Draining of peat land could therefore continue and lead to substantial emissions.

Indirect land use change (Article 19.6)

Indirect land-use change (ILUC) can occur when the production of biofuel feedstock displaces agricultural activities to other areas which may as a consequence cause land-use changes such as deforestation, thereby increasing emissions.¹³

Research increasingly indicates that the biofuels-related emissions released through land-use change could be substantial and **outweigh any savings from using biofuels as an alternative transport fuel** (see Annex II of this document, page 21). Since the support for biofuels is based on the argumentation that they bring environmental benefits and GHG savings, the fact that this might not be true should be thoroughly investigated and reflected in any public policy.

As it stands, the directive makes no provision for calculating the impact of indirect land use change on biofuel greenhouse gas emissions figures. For T&E and other environmental organisations, this is a fundamental, and dangerous flaw in the law.

The Commission will have to report to the Parliament and the Council on the emissions from ILUC by the end of 2010 and present a concrete methodology on how to measure and minimize them. This will then be decided through a co-decision procedure which should end in 2012. Given the exclusive right of initiative of the Commission and the lack of a 'fallback' correction factor for ILUC (which was suggested by the European Parliament), there is no legal or political certainty that this review will take place as planned.

Furthermore, the law contains an unfortunate and very large loophole that could imply that almost the entire EU target could be met with biofuels that do not take ILUC into account even if a methodology is developed and included in the Directive in 2012.

This is caused by a so-called 'grandfathering' clause, which applies to the capacity of installations at the end of 2012. Biofuels from these installations will be excluded from ILUC calculation for 5 years (from 2013 until 2017) provided that they achieve GHG savings of at least 45%. This represents a huge loophole, since there is no limit

¹² According to a recital in the Directive, the Commission should develop methodologies that take into consideration the emissions from drainage of peatlands into the life-cycle analysis calculations, but it is unclear when and if this will happen.

¹³ An example of this is where demand for palm oil for the biofuel market is met from existing plantations which previously supplied the food market. As palm oil is now supplied to the energy sector, the food sector is confronted with a shortage in supply. In the short term, this will lead to higher prices given that supply is slow to adapt to new market circumstances. In time, the higher prices will attract new producers and supply will be increased. This additional supply will require additional plantations. The location of these additional plantations is uncertain, and more importantly, will be out of the control of the energy sector. (Ecofys 2007)

on volumes of biofuels produced and since it applies to all installations around the world.

Indirect land use change emissions of 'advanced' biofuels could be even higher

In relation to the 'double counting' of certain biofuels, as mentioned previously, the Commission should also study ILUC impacts of 'advanced' biofuels. According to the Gallagher review these might be even higher because some feedstock used for 'advanced' biofuels require more land and do not have byproducts that avoid land use change (for example protein substitutes in animal feed that replace the need for soy cultivation) (The Gallagher review 2008).

Social criteria (Article 17.7)

The definition of sustainability also implies socially sound production. Since biofuels complying with sustainability criteria will get large amount of public support and money, they should also prove to be socially responsible.

However, there are no social standards within the mandatory sustainability criteria. Instead, the Commission is required to report on whether producer countries have ratified and implemented certain relevant International Labour Organisation (ILO) conventions. With regards to ensuring social sustainability, this is totally inadequate as it pays no attention to what actually happens at the level of the plantation. For example, it is quite possible that a particular producer country has ratified and implemented all relevant ILO conventions, but due to weak enforcement, biofuels are still produced on particular plantations at the expense of human rights. Brazil has ratified the ILO fundamental conventions 29 and 105 on the elimination of forced and compulsory labour, yet Amnesty International continues to report numerous cases of forced labour in the Brazilian sugarcane sector.¹⁴

There is a wording contained in Recital 40 of the directive, stating that in the absence of 'multilateral or bilateral agreements and voluntary international schemes' covering key 'environmental and social considerations', Member States 'shall require economic operators to report on these issues'. Although details of exactly what form this reporting should take and to what extent it is required, remain unclear. In other words, the 'guarantees' appear to be extremely weak and offer no concrete protection to exploited labour on biofuels plantations.

Other environmental criteria (Articles 17.6 and 17.7)

Environmental provisions for the production of biofuels crops in the EU are limited to so-called environmental cross-compliance rules¹⁵ under the Common Agricultural Policy (CAP). Some new provisions on environmental criteria for third countries (soil, water and air protection) were added to the final compromise. But they appear in article 18. This means that they do not translate into mandatory requirements, but

¹⁴ In March 2007, the Brazilian Ministry of Labour rescued 288 workers from forced labour at six sugarcane plantations in São Paulo State and 409 workers from an ethanol plant in Mato Grosso do Sul. Over 1,000 workers were released from 'conditions analogous to slavery' on sugarcane plantations owned by ethanol producer Pagrisa in Pará State in June (Amnesty International 2008).

¹⁵ Cross-compliance means that farmers' receipt of direct aids depends on their respect for environmental and other relevant legislation. However, the verification of this measure is very weak, as only 1% of farms have to be spot-checked in a year, which means that it is practically impossible to detect breaches.

have to be taken into consideration in international agreements, voluntary certification schemes and reporting by biofuels producers.

The Commission should report in 2012, if it is appropriate to introduce mandatory requirements for water, air and soil protection at a later stage, but this is very unlikely to be accepted due to “international (trade) obligations of the EU”.

Verification of compliance with sustainability criteria (Article 18)

Verification of compliance with sustainability criteria is based on the mass balance system,¹⁶ but this is to be evaluated by the Commission in 2010 and 2012 when other systems (that do not offer such traceability of biofuels feedstocks) could potentially be approved.

There are three different ways to verify the compliance with sustainability criteria:

- reporting by producers, which has to undergo an adequate standard of independent auditing;
- bilateral or multilateral agreements with third countries;
- voluntary national or international certification schemes.

Besides the information on mandatory sustainability requirements (set out in Article 17), all three procedures have to provide relevant information on measures taken for soil, water and air protection, the restoration of degraded land, the avoidance of excessive water consumption in areas where water is scarce and appropriate and relevant information concerning social issues. When concluding international agreements, due consideration will also have to be given to indirect land use changes (although these are usually outside of the control of individual countries and sectors) and to the conservation of areas that provide basic ecosystem services in critical situations.

In theory, the Commission shall only adopt the agreement or scheme, if they meet adequate standards of reliability, transparency and independent auditing. However, these standards are not defined more specifically in the directive, which again raises doubts about practical implementation of the sustainability criteria.

For producers, the Commission will establish a list containing information they have to provide and assure that this does not represent excessive administrative burden, especially for small producers. The information shall be published on a special transparency platform, established by the Commission (Article 24).

¹⁶ Mass balance system means that physical product and sustainability characteristics are linked, so biofuels that a consumer buys has to come from sustainable sources. However, the product can not be traced to the origin of biomass, i.e. to the field, where it was produced. Moreover, certified and non-certified products can be mixed throughout the supply chain, but remain separated at the administrative level. Other two systems are called book and claim and bulk commodity. The latter offers the highest traceability, but also the highest costs for the producer (Ecofys 2008).

Reporting and monitoring of the targets

Reporting by Member States (Article 22)

With respect to biomass there are weak reporting obligations for EU Member States. Every two years they will have to report on the development of biomass resources, commodity prices and land use changes within their territory, the impacts of biofuels production on biodiversity, water and soil resources, and the estimated GHG savings due to the use of renewable energy (for biofuels they can calculate this according to Annex V A).

Reporting by the Commission (Articles 23)

The Commission will have to issue regular biannual reports to the Parliament and Council, starting in 2012. In them, they will analyze national measures of significant biofuel producing countries for the respect of sustainability criteria, measures taken for soil, water and air protection and social sustainability (including food prices, land rights, wider development issues and ratification of ILO conventions).

They will also have to report on commodity prices, impacts of increased biofuels production on land use and displacement, economic and environmental impacts, including impacts on biodiversity, biofuels produced from wastes and residues, etc.

In the event that they detect adverse impacts, they should adopt corrective measures, although there is no specification, what these might be. Much will depend on the robustness of the reporting and compliance regime, which is highly questionable in light of all the uncertainties in the law.

Review (Article 23.8)

The sustainability of biofuels will be reviewed in the Commission's report in 2014 also with a view to the 10% transport target. The review will also affect the envisaged increase of GHG savings threshold from 35% to 50% in 2017.

The review will take into consideration cost-efficiency, sustainability impacts (including indirect effects and impacts on biodiversity), commercial availability of 'advanced' biofuels, the impact of the target on food security and availability of electric and hybrid cars. The evaluation will pay special attention to Member States that have to import most of their biofuels and are very dependent on transport fuels, as part of their final energy consumption (i.e. Luxembourg).

Next steps for the legislation at EU level

A special committee was established to assist the Commission during the comitology procedure, called the 'Committee on the Sustainability of Biofuels and Other Bioliquids' (Article 25). Many further decisions described in this paper will be in the hands of this committee, which will be presided over by the Commission and composed of representatives of Member States. Comitology procedure can be highly problematic because of the lack of oversight and transparency.

Here is the list of the most important issues that still have to be resolved and are largely in the hands of the Commission.

- Biomass sustainability criteria should be studied by the Commission and published in a report by the end of 2009, together with proposed modifications;
- The Commission shall report on indirect land use change and a methodology to address this in GHG calculation by the end of 2010, the Parliament and the Council shall endeavour to decide on this by 2012 in the co-decision procedure;
- The Commission shall publish templates for the drafting of National Action Plans by the Member States and templates for reporting on biofuels by the companies;
- The Commission will monitor implementation of the sustainability criteria and approve many decisions regarding verification scheme. The Commission will issue reports starting in 2012 and following every two years after that;
- Annexes can always be adapted to technical and scientific progress through the comitology procedure;
- The Commission will further develop the contribution of electricity and hydrogen to the transport target by the end of 2011 (i.e. how the whole amount of the electricity originating from renewable sources used to power all types of electric vehicles can be calculated);
- The Commission will report on a general review of the sustainability of biofuels with a view to the GHG savings threshold and transport target in 2014. At that point the Commission can suggest modifying the target, if it becomes obvious that it can not be reached in a sustainable way.

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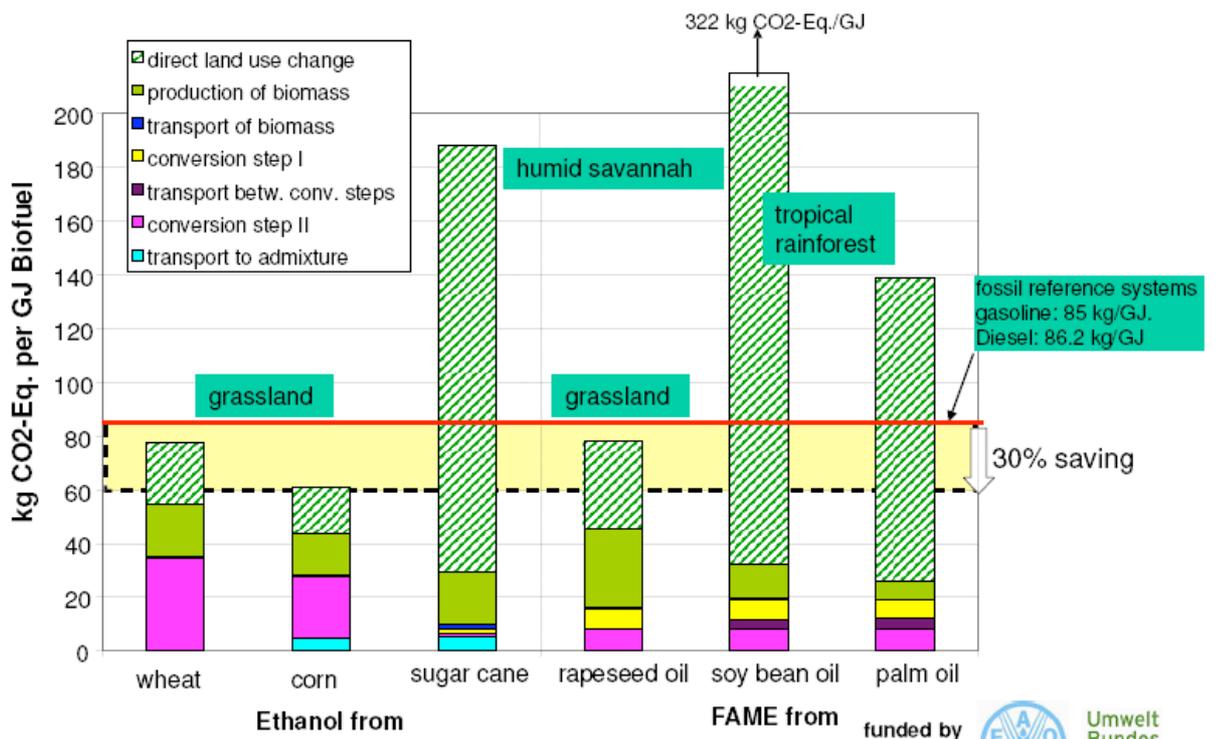
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Annex I: Emissions due to direct land use change (Fritsche 2008)

GHG Balance incl. direct LUC



Annex II: Emissions due to indirect land use change (O'Hare 2008)

GHG emissions due to indirect LUC appear to be very large, but are highly uncertain

Direct Emissions*	Gasoline	Midwest Corn Ethanol	CA Ultra Low Sulfur Diesel**	Canola Biodiesel**	Renewable Diesel** (Palm)
g/MJ	94	88	93	32	21
Indirect emissions by fuel and type of LUC***	Corn ethanol - CRP	Corn ethanol - tropical forest	Sugarcane ethanol - tropical forest	Canola biodiesel - tropical forest	Palm diesel - tropical forest
g/MJ	140	540	289	1031	197
Uncertainty: corn ethanol - tropical forest	20-yr, low emission factor	20-yr, mid emission factor	20-yr, high emission factor	100-yr, low emission factor	100-yr, high emission factor
g/MJ	420	540	826	84	165
*(California Alternative Fuels Plan, CEC-600-2007-004-REV)					
** No adjustment for drivetrain efficiency					
*** See posted spreadsheet. Assumes 20 year amortization period, among other things.					

Annex III: Canopy cover and percentage of global forest covered (IPCC 2000)

Globally, about 50 percent of wooded land has a canopy cover of less than 20 percent. This figure varies nationally, however, from 10 to about 70 percent. The amount varies greatly from region to region and country to country (Figure 2-1).

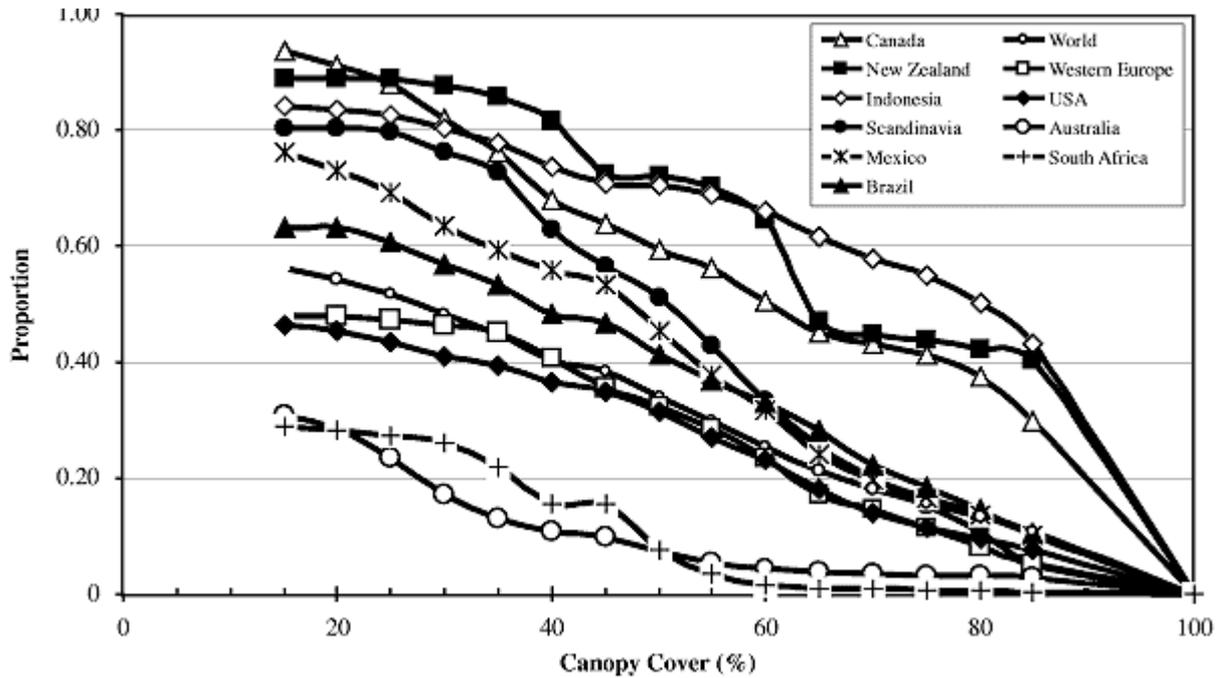


Figure 2-1: Proportion of wooded land captured by a percent canopy cover threshold (based on DeFries et al., 1995).