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Making Certification Work for Sustainable Development: The Case of Biofuels

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Contents

List of boxes

List of tables

Executive summary

Increasing fossil fuel prices, energy security concerns and environmental consciousness – especially related to climate change stabilization – have motivated countries to explore alternative energy sources. Biofuels, fuels derived from biomass, are among the alternatives which are being considered. Under careful strategies and appropriate regulations, biofuels could be instrumental to slowing down the process of global warming and enhancing energy security, as well as providing countries opportunities to diversify agriculture production, raise rural incomes and enhance access to commercial energy, especially for rural communities.

Global energy and environmental concerns combined with comparative advantage considerations are powerful motivating factors behind international trade in biofuels and related feedstocks.

In parallel with fast-growing biofuels use and trade, concerns are being voiced about the sustainability of biofuels and feedstock production, and interests in mechanisms to ensure it are intensifying. Discussions are ongoing on developing frameworks for certification schemes that encourage sustainable production. The numerous public and private initiatives being undertaken are in various stages of development ranging from the discussion phase to full implementation.

Increased production and use of biofuels indeed raise a number of concerns. Some shortcomings refer to the danger that rapid growth in demand for energy crops would divert too much cropland to fuel feedstock production, jeopardizing food security and resulting in socially detrimental increases in the prices of agricultural commodities. Concerns refer also to the risk that increasing biofuel demand will lead to the cultivation of previously uncultivated lands, including land having high biodiversity value or high carbon stock. Large use of water and pesticide for feedstock production could jeopardize the environmental advantages of biofuels. The process of transforming feedstocks into biofuels may also be environmentally unfriendly and possibly eclipse the greenhouse benefits of biofuels.

Certification is a form of communication along the supply chain that permits the buyer to be ensured that the supplier complies with certain requirements. Certification allows product differentiation and provides information about certain characteristics of a product, in this case, its sustainability. Depending on how sensitive a market is to certain product attributes, certification may have a significant market impact, affecting both domestic and imported products. Moreover, certification may be linked to tax breaks and other incentives, or it may be the precondition for products to be counted towards national targets. All this makes certification a crucial product attribute.

While there is a need to ensure that biofuels contribute to the achievement of energy and environmental goals, and certification may be instrumental to it, ongoing certification initiatives also raise a number of concerns.

Proliferation of individual sustainability schemes may damage the efficiency and credibility of certification, and create market segmentation and opacity.

The principles and criteria on which certification schemes are based are diversified and often far-reaching. All schemes put emphasis on greenhouse gas emissions reduction; others tackle in addition issues such as biodiversity preservation, land use changes, food security, social well-being and local prosperity. Evaluating the “macro effects” of biofuels production is inevitably an involved and lengthy process which may involve an aspect of subjectivity, depending on the evaluation methods employed. Hence, a balance should be struck between the comprehensiveness of the criteria included in the schemes, and the technical and administrative feasibility of applying them.

Sustainability certification will add significant costs to biofuels production. These expenses are associated with both meeting and proving sustainability criteria. The level of costs will be highly dependent on the number, strictness and inclusiveness of the criteria established by the certification system. Costs will likely be higher for developing countries as opposed to industrialized countries, and for smallholders as opposed to large-scale producers.

Concerns remain on developing countries' ability to effectively participate in the process of standard development and about the risk of domestic producers playing a disproportionately influential role in the establishment of sustainability requirements.

Certifying biofuels and distinguishing them on the basis of sustainability is a complex legal issue. Firstly, World Trade Organization (WTO) rules contain some loopholes and "grey areas" on issues of relevance for biofuels certification schemes, starting with the fundamental question of whether such schemes, when developed by private bodies, are covered by WTO rules or, conversely, should be regarded as private marketing schemes that escape from the scope of WTO rules. Secondly, the legitimacy of product differentiation based on how goods have been manufactured and on their impact through the life cycle is still an open issue under WTO rules. While WTO jurisprudence has proved increasingly flexible to allow product differentiation based on environmental and health considerations, doubts exist that it will consider favourably product differentiation based on how products and their manufacturing processes contribute to fulfilling a vast range of goals, including compliance with labour rights, rural development and food security.

Taking the following steps may contribute making certification work for sustainable biofuel production in all world regions. Efforts should be deployed towards the convergence of existing programmes and the formulation of internationally agreed principles and criteria that are flexible enough to accommodate the varying environmental and socio-economic conditions of different producing countries; that are quantifiable, verifiable and scientifically informed, and that are the result of an inclusive process where stakeholders from various regions are effectively represented. Existing forums and ongoing initiatives may be used for the purpose of developing genuine international standards. Certification programmes should make allowances for supporting small producers, especially in developing countries, to comply with sustainability requirements. In addition, compliance could be linked to certain benefits, such as access to microcredit or to support services, to encourage producers to engage in sustainable production. Equally, support is needed to improve developing country ability to issue credible declarations of conformity and test products. In order to assess the "macro effects" of biofuels production, it would be necessary to develop methods that are as accurate as possible as well as cost effective and practical to ensure that they can reasonably be implemented for certification purposes. A thorough reflection has to take place in order to assess which kind of product differentiation is suitable, WTO-consistent and instrumental to the fulfilment of sustainability goals.

Introduction

According to the International Energy Agency (IEA) World Energy Outlook reference scenario, economic growth and increasing population will lead to an annual increase in global energy demand of 1.8 per cent between 2005 and 2030.[1] While it is projected that fossil fuels will remain the dominate source of energy, increasing prices, energy security concerns and environmental consciousness have motivated countries to explore alternative energy sources.

Biofuels, fuels derived from biomass,[2] are among the bioenergy[3] alternatives which are being considered and are currently viewed, if carefully developed, as one of the means of slowing down the process of global warming and enhancing energy security, as well as possibly providing countries opportunities to diversify agriculture production and raise rural incomes.

While biomass has traditionally been used in the production of biofuels in the region it was produced, the comparatively low production costs in the developing world have created a price incentive that is driving an emerging international market in biofuels and related feedstocks. Additionally, imports are becoming a precondition for several developed nations that are interested in transferring to biofuels to meet their biofuel blending targets, considering that they do not have the land capacity to produce the needed amount of feedstocks. For small and medium-sized developing countries, exports may be a precondition to engage in biofuels production because of economies of scale.

In parallel with fast-growing biofuels use, concerns are being voiced about the sustainability of biofuels and feedstock production, and interests in mechanisms to ensure this are intensifying. Discussions are ongoing on developing frameworks for certification schemes that encourage sustainable production.

The issue of certification of biofuels has been raised in numerous meetings organized by the UNCTAD Biofuels Initiative and has been addressed in past reports by the agency. This current study has been authored by UNCTAD with the aim of providing policymakers with an overview of certification schemes that are already in place or being developed, analysing the benefits and drawbacks of such schemes, assessing the implications for developing countries, and reporting on the possible ramifications of certification in the context of WTO. Some suggestions on how to ensure that biofuels certification is indeed conducive to sustainable production in all regions are offered at the end of the study.

[1] International Energy Agency (IEA). *World Energy Outlook 2007*, found at: www.iea.org/Textbase/npsum/WEO2007SUM.pdf.

[2] The term "biomass" is used as defined by the United States Department of Energy: Biomass is "any derived organic matter available on a renewable basis, including dedicated energy crops and trees, agricultural food and feed crops, agricultural crop wastes and residues, wood wastes and residues, aquatic plants, animal wastes, municipal wastes, and other waste materials". Found at: www.energy.gov/energysources/bioenergy.htm.

[3] The term "bioenergy" as used in this paper refers to electricity and any solid, liquid or gaseous fuel that is produced through the processing of biomass.

Chapter 1

Overview of certification developments and comparison of schemes

A variety of stakeholders have been motivated in recent years to set standards and develop certification schemes with the aim to ensure that biofuels are produced in a sustainable manner. The aim of this chapter is to provide a brief overview of the current initiatives that have been developed or are being explored in relation to sustainable biofuel production. The intention is not to cover the minutiae of all the schemes but to familiarize readers with the actors involved in certification initiatives and to provide with a summaries of the action being taken in this area. (For an overview of the types of criteria proposed by existing sustainability schemes see appendix.)

1.1 Logistical framework for certification

The development of a certification schemes is an involved process. It requires an independent third party to assess quality based on a predetermined set of principles. Principles are usually established as general starting points that describe the objective of certification. These objectives are then translated into measurable requirements by criteria. Testing then utilizes indicators or verifiers which serve as quantitative or qualitative minimum requirements for certification. [4]

Box 1. Certification and labelling

Certification is a procedure by which a third party gives written assurance that a product, process or service is in conformity with certain standards. Certification can be seen as a form of communication along the supply chain which provides assurance that a product, process or service is in conformity with certain requirements. The certificate demonstrates to the buyer that the supplier complies with certain standards. A label is a symbol indicating that compliance with standards has been verified. While the certificate is a form of communication between seller and buyer, the label is a form of communication with end consumers.

Source: These definitions are adapted from FAO, The concepts of standards, certification and labelling, found at: http://www.fao.org/docrep/006/y5136e/y5136e07.htm

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The aims of certification schemes are dependent on the interests of the actors who are spearheading their establishment; the formulation of the mission and sustainability definition for certification is usually developed by these actors. However, formulation of sustainability criteria and indicators necessitates analysis of local conditions and the involvement of relevant stakeholders who will be impacted by certification. Ideally, stakeholders are consulted and their input integrated into certification schemes that take into account various local conditions. Once the criteria and indicators have been established, they must be tested to ensure that they are clear, appropriate and effective, as well as adequately understood and accepted by the users or stakeholders. These tests should be evaluated and used for modification and improvement of the scheme before the finalized criteria and indicators are implemented.

Box 2. Conformity assessment procedures

Conformity assessment procedures are any procedure used, directly or indirectly, to determine that relevant requirements in technical regulations or standards are fulfilled. These include, among others, (a) procedures for sampling, testing and inspections; (b) evaluation, verification and assurance of conformity; (c) registration, accreditation and approval as well as their combinations.

Source: Global Facilitation Partnership for Transportation and Trade (GFP), Standards and Conformity Assessment – Definitions, Found at: http://www.gfptt.org/Entities/TopicProfile.aspx?tid=fd7240bd-edf4-4c74-a6d7-1040da175680.

[4] Lewandowski I and A Faaij (2006). Steps towards the development of a certification system for sustainable bio-energy trade. *Biomass & Bioenergy* 30: 83–104; and *Testing framework for sustainable biomass*. Final report from the project group "Sustainable production of biomass". March 2007.

These are the ideal circumstances for the development of a certification scheme yet, as will be discussed later, this situation is not necessarily realized.

Box 3. Steps for developing certification schemes

Principle – General starting points that describe the objective of certification. A principle is usually formulated in an abstract and non-quantifiable way.

Criteria – Statements that translate objectives into substantive requirements that have to be complied with. A criterion is much more specific than a general principle.

Indicator/verifiers – quantitative or qualitative minimum parameters by which a criterion becomes testable.

Reporting – Information that is requested when testable indicators are not available. In reporting, information is requested, but no minimum requirements are set that have to be met.

Source: These definitions are adapted from van Bueren EL and Blom E (1996). *Hierarchical framework for the formulation of sustainable forest management standards*. The Tropenbos Foundation. Wageningen, the Netherlands. Found at: http://www.pienviroconsult.com/mswg_toolkit/mswg_toolkit/data/Tools/1-15/06_C&I_framework.pdf. These definitions are generally accepted in the field of certification and have been employed by the Cramer Commission.

Table 1. Examples of selected criteria with related indicators and reporting requirements developed by the Cramer Commission

Theme 1: Greenhouse gas emissions	
Principle 1: The greenhouse gas balance of the production chain and application of the biomass must be positive	
Criterion 1.1: In the application of biomass a net emission reduction of greenhouse gases must take place along the whole chain. The reduction is calculated in relation to a reference situation with fossil fuels.	**Indicator 1.1.1 (minimum requirement):** The emission reduction of greenhouse gases amounts to at least 50–70 per cent for electricity production and at least 30 per cent for biofuels, calculated with the method developed by the project group. These are minimum requirements. Here the basic principle must be that policy instruments should promote a higher percentage above the minimum requirement by differentiating strongly on the basis of the emission reduction of greenhouse gases.
Theme 3: Biodiversity	
Criterion 4.4: In new or recent developments, there is maintenance or recovery of biodiversity within biomass production units.	**Indicator 4.4.1 (minimum requirement):** If biomass production is taking place in recently cultivated areas (after 1 January 2007), room will be given to set-aside areas (at least 10 per cent).
	Reporting 4.4.2: If biomass production is taking place in recently cultivated areas (after 1 January 2007), it has to be indicated: - In which land use zones the biomass production unit can be found; - How fragmentation is discouraged; - If ecological corridors are applied; - If the restoration of degraded areas is involved.

Source: Testing framework for sustainable biomass. Final report from the project group "Sustainable production of biomass." March 2007.

1.2 Key actors in the development of biofuels certification schemes

The development of sustainable biomass certification systems can be described from the point of view of four stakeholder groups: (a) national Governments and regional groupings (the European Union in particular); (b) companies; (c) non-governmental organizations (NGOs); and (d) international organizations and initiatives.[5] The numerous initiatives being undertaken are in various stages of development, ranging from the discussion phase to full implementation.

It is noteworthy that the four categories of stakeholders have varying interests in certification of biofuels and their related feedstock. While they each aim to promote the sustainable production of biofuels, their motivations to develop certification schemes vary. Governments view certification as a policy instrument that will promote sustainable production and consumption, and provide information on which to base policies. International bodies and initiatives have similar interests, but also view certification as providing an opportunity for collaboration. Companies see certification as an instrument for environmental marketing and product differentiation, and as means of ensuring market access as well as product acceptability by consumers. Additionally, certification provides businesses with a tool for controlling the origin and quality of materials, products and or services as well as information to facilitate the optimization of the production process. For NGOs, certification is again viewed as a way of promoting sustainable management but also as a means of acquiring information on the impact of products and whether they meet established standards.[6]

1.2.1 National Governments and regional groupings

Currently, there are a number of countries active in biomass and biofuels certification, including Belgium, the Netherlands, Germany, the United Kingdom, Switzerland, Brazil, Canada and the United States. On the supranational level, the European Commission is active in the development of certifying biofuels and biomass.

European Commission

At the European Council of March 2007 in Brussels, European Union heads of State and Government reaffirmed the community's commitment to the development of renewable energies beyond 2010. They endorsed the European Commission's proposal for a mandatory target of a 20 per cent share of renewable energies in overall community energy consumption by 2020, and a mandatory 10 per cent minimum target for the share of biofuels in transport petrol and diesel consumption by 2020.[7] Ministers further agreed that the binding character of the biofuel target should be subject to production being sustainable, second-generation biofuels becoming commercially available, and the directive relating to the quality of petrol and diesel fuels being amended to allow for adequate levels of blending.[8] Hence, ministers invited the commission to propose a renewable energy legislative framework that could contain criteria and measures to ensure sustainable provision and use of biofuels.

[5] Van Dam J, Junginger M, Faaij A, Jürgens I, Best G and Fritsche U (2007). Overview of recent developments in sustainable biomass certification. Paper accepted for publication in a Special Issue on International Bio-energy Trade - *Biomass & Bioenergy*.

[6] Lewandowski I and Faaij A (2006). *op. cit.*

[7] As a reaction to recent reports that have warned of rising food prices and rainforest destruction from increased biofuel production, the European Union Environment Commissioner, Mr. Stavros Dimas, recently declared that it would be better to miss the target than achieve it by harming the poor or damaging the environment. He also stressed the need to have criteria for sustainability, including social and environmental issues, in order to ensure that there were benefits from biofuels use. See: *EU rethinks biofuels guidelines*, 14 January 2008, at: http://news.bbc.co.uk/2/hi/europe/7186380.stm.

[8] Considering that the main purpose of binding targets is to provide certainty for investors, it was decided that the binding nature of the target should not be deferred until second-generation biofuels became commercially available.

On 23 January 2008, the European Commission introduced the draft directive on the promotion of the use of energy from renewable sources,[9] which includes, among many other provisions, sustainability criteria for biofuels and other bioliquids.[10] The criteria included in the proposed directive (article15) are close to those sketched by the commission in early 2007 and submitted to public consultation exercises,[11] namely (a) the use of biofuels and other bioliquids shall lead to greenhouse gas emission saving of at least 35 per cent calculated through the life cycle of the product; (b) biofuels and other bioliquids shall not be made from raw material obtained from land with recognized high biodiversity value[12]; (c) biofuels and other bioliquids shall not be made from raw material obtained from land with high carbon stock[13]; (d) where biofuels and other bioliquids are made from raw material produced in the European Union, they should also comply with the union's environmental requirements for agriculture. Applying such criteria to imports from third countries is deemed administratively and technically unfeasible. Only biofuels that comply with sustainability criteria can count against national biofuels targets and renewable energy obligations, and are eligible for financial support. The actual "tracing" of the biofuels will require physical tracking, so that biofuels fulfilling the sustainability criteria can be identified and rewarded with a premium in the market.

The criteria proposed by the European Commission are environmental – "environmental sustainability criteria" according to the definition of the directive. The commission opted to leave aside social criteria as well as criteria that relate to macro level effects, likely because of considerations related to technical feasibility and WTO compliance. However, the draft directive includes monitoring obligations for the commission – for example on commodity price changes associated with the use of biomass for energy and any associated positive and negative effects on food security (article 20) – as well as reporting obligations for member States, for example on commodity price and land use changes associated with increased use of biomass and other forms of energy from renewable sources and the estimated impact of biofuel production on biodiversity, water resources and water and soil quality (article 19(h) and (j)).

Some tensions have already emerged between the intentions of the commission to limit the scope of the criteria to environmental issues and the views of some member countries, some members of the European Parliament (MEPs) and civil society that conversely would like to see the criteria cover a much broader range of issues, including deforestation, food price hikes and water shortages. As a consequence, at their meeting on 28 February 2008, the European Union's energy ministers gave their go-ahead for an ad hoc working group to draw up core sustainability criteria for biofuels within a strict time frame. The basis for the group's work is the criteria included in the proposed directive on renewable energies. Once developed, the same set of criteria would also be included in the directive on fuel quality[14] which is currently under revision.[15]

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[9] Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, at: http://ec.europa.eu/energy/climate_actions/doc/2008_res_directive_en.pdf.

[10] "Biofuels" means liquid or gaseous fuel for transport produced from biomass; "bioliquids" means liquid fuel for energy purposes produced from biomass.

[11] Some United Nations specialized agencies and programmes joined efforts and presented a common response to the consultation. See *Contribution from the United Nations (UNEP, FAO, UNDP, UN-HABITAT, UNIDO and WHO) to the consultation*, June 2007, at:
http://ec.europa.eu/energy/res/consultation/doc/2007_06_04_biofuels/non_og/un_en.pdf.

[12] The following are regarded as lands having high biodiversity value: (a) forest undisturbed by significant human activity; (b) areas designated for nature protection purposes; and (c) highly biodiverse grassland, that is to say grassland that is species-rich, not fertilized and not degraded.

[13] The following are regarded as lands having high carbon stock: wetlands and continuously forested areas.

[14] Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC sets EU-wide specifications for petrol, diesel and gas-oil used in cars, trucks and other vehicles in order to protect human health and the environment. The revision of the directive is at a much more advanced stage of the European Union's complex decision-making procedure than the directive on renewable energy sources.

Considering that the definition of sustainability criteria is likely to remain highly controversial and that a number of member States and MEPs seem reluctant to commit to blending targets before an agreement is reached on sustainability criteria – fearing that quantitative targets alone could encourage investments in biofuels which may not be sustainable – it is unclear when the proposed directive on the promotion of the use of renewable energies will come into force.

In parallel with the efforts carried out by the European Commission, several European Union member States are taking initiatives to develop certification schemes for biofuels. Member countries are more advanced in their programmes than the commission and this may create some tensions between national and EU-wide efforts.

The commission's aim is to set up a single and coherent framework for biofuels, including biofuels certification, and it expects to get the support of the European Council for its initiative. The proposed directive underlines that community-wide action in the field of biofuel sustainability is justified, because it avoids the development of multiple national schemes which might impede trade to and within the community (subsidiarity principle). Moreover, the directive spells out that for the purposes of complying with national biofuels targets, renewable energy obligations and for eligibility for financial support, member States shall not refuse to take into account biofuel and other bioliquids that comply with the environmental sustainability criteria contained in the directive, on other grounds of sustainability (Art.15.6). This seems to imply that once the EU-wide scheme becomes operational, it will replace national certification initiatives, including those already operational.

Belgium

Belgium has focused its efforts on "green" electricity production in establishing standards for sustainable biomass production and certification schemes. The country has established the aim of having 6 per cent of its total electricity consumption coming from renewable energy sources by 2010. To support this goal, the country has instituted a type of cap and trade system, minimum quota obligations combined with a system of tradable certificates.

Sustainable energy is a regional competence in Belgium; certificate systems have been implemented in all three regions of the country – Brussels, Flanders and Wallonia – for renewable energy sources and combined heat and power. Additionally, since the regions only exercise their competences within the boundaries of Belgian territory, the territorial waters are a federal competence; hence, a federal certificate system exists for the production of green power in the Belgian part of the North Sea. It is noteworthy that, while the certificate systems are supporting sustainable energy goals, the differentiation among the systems in the three regions currently prohibits effective harmonization. For example, complications are evident in the non-compatibility of certificates. Energy suppliers can use the federal certificates as well as the certificates issued by a certain region to fulfil their quota obligation in that region; however, certificates issued by another region do not apply.[16]

An extended sustainability certification has only been requested by law in Wallonia. There, the sustainability of the wood sourcing can be delivered according to (a) forest certificates such as Forest Stewardship Council (FSC); (b) a traceable chain management system at the suppliers end; or (in absence of such certification) (c) all public documents originating from independent bodies making a review of forest management or control in the considered country.[17] However, all regions require a traceable management system (imposed by the regional regulatory body) and a detailed energy balance of the supply chain. SGS International, accepted as an independent body by all Belgian authorities for granting green certificates, analyzes the global supply chain for each producer. SGS is the only company authorized to perform conformity assessments for the Belgium system.

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[15] *Energy Council: Ad hoc working group to elaborate on biofuels' sustainability*, 12 March 2008, found at: www.highbeam.com/doc/1G1-176650004.html.

[16] Verhaegen K, Meeus L, and Belmans R (2006). Towards an international certificate system – The stimulating example of Belgium. Electrical Energy Research Group. KUL, Leuven. Found at: www.esat.kuleuven.be/electa/publications/fulltexts/pub_1495.pdf.

[17] Van Dam J et al. (2007), *op. cit.*

It is important to note, since purchased pellets can be fired in power plants situated in one or the other region, for the sake of flexibility, Electrabel – a leading energy supplier in the country – has decided to implement the same procedure for the independent inspection and gathering of necessary documents. This policy results in sustainability being checked for pellets fired in regions other than Wallonia.

The Netherlands

The Dutch Government, in pursuing its interest in incorporating biofuel sustainability criteria in relevant policy instruments, has been very active in research into and development of certification schemes. In 2006, the Interdepartmental Programme Management Energy Transition established the project group "Sustainable Production of Biomass". The group is also popularly referred to as the Cramer Commission in reference to Jacqueline Cramer, the chair of the project group. The project group's aim is to "formulate a set of sustainability criteria for the production and conversion of biomass for energy, fuels and chemistry". The reports that the group has published have been influential in framing the discussion of certification and the development of various schemes. The final report from the project group – entitled "Testing framework for sustainable biomass" – was released in March 2007. Pending discussions at the European Union level on the proposed directive on the use of renewable energies, the obligation for companies supplying biofuels to the Dutch market or using biomass for power generation to report the information available to them on the carbon and sustainability performance of their products has been suspended.

The project group promotes the 3 P approach – people, planet and profit – and applies the developed standards regardless of the origin of the biomass. Additionally, the group examines the sustainability of biomass based on six themes: (a) greenhouse gas emissions; (b) competition with food and local applications of biomass; (c) biodiversity; (d) environment; (e) prosperity; and (f) social well-being. For each theme, the project group formulated principles, criteria and indicators. In doing so, the group made use of existing standards when possible.

The project group has explored the overlap with existing certification systems for sustainably produced biomass by examining the following standards: Sustainable Agriculture Network/Rainforest Alliance (SAN/RA), Roundtable on Sustainable Palm Oil (RSPO), Round Table on Responsible Soy (RTRS), Integrated Farm Assurance for Combinable Crops (EurepGAP), Forest Stewardship Council (FSC), International Federation of Organic Agriculture Movements (IFOAM), and Social Accountability International (SA 8000). The comparisons showed that SAN/RA, RSPO, RTS and FSC had the most overlap with the testing framework established by the Cramer Commission. Furthermore, the majority of similarities among the standards fell under the three themes of biodiversity, environment, and social well-being (with the exception of integrity). However, for the themes of greenhouse gas emissions, competition with food and local applications of biomass and prosperity, the comparison found that the principles developed by the project group shared little or no similarities with the existing standards examined. Accordingly, the project group established its own standards under these themes.

For calculating greenhouse gas balance, the project group has developed a methodology. On the basis of this methodology the group is currently developing an instrument that will facilitate the calculation of biomass flows and technologies with the aid of standardized values.

In establishing how reporting for certification purposes should be carried out, the Dutch project group has proposed that reporting occur at two levels: the company level and the macro level. At the macro level, reporting is the responsibility of the Government and will likely require intergovernmental cooperation. Macro level reporting is primarily concerned with shifts in land use which may impact biodiversity, the greenhouse gas balance, and competition with food. The project group calls upon the Dutch Government to "give shape to the testing framework at the macro level" as soon as possible. Additionally, the group has suggested that, in order to promote sustainable production of biomass, the Dutch Government attach "negative consequences" if the monitoring programme reveals adverse effects at the macro level.

When drawing up the overall testing framework for sustainable biomass, the Cramer Commission made use of a broad consultation process. It took care to involve parties from the private sector, social organizations, financial institutions and Governments. Additionally, numerous consultative meetings were held and the input from stakeholders was incorporated as much as possible. Also, the project group made an effort to cooperate closely with the United Kingdom Government; this resulted in an international alignment, as the United Kingdom and the Netherlands testing frameworks are very similar. However, it is important to note that foreign producers were not involved in the consultation process.

Table 2. Spotlight on the Cramer Commission report

Principles	**Theme 1: Greenhouse gas emissions**
	(1) The greenhouse gas balance of the production chain and application of the biomass must be positive.
	(2) Biomass production must not be at the expense of important carbon sinks in the vegetation and in the soil.
	Theme 2: Competition with food and local applications of biomass
	(3) The production of biomass for energy must not endanger the food supply and local biomass applications (energy supply, medicines, building materials).
	Theme 3: Biodiversity
	(4) Biomass production must not affect protected or vulnerable biodiversity and will, where possible, have to strengthen biodiversity.
	Theme 4: Environment
	(5) In the production and processing of biomass, the soil and the soil quality are retained or improved.
	(6) In the production and processing of biomass, ground and surface water must not be depleted and the water quality must be maintained or improved.
	(7) In the production and processing of biomass, the air quality must be maintained or improved.
	Theme 5: Prosperity
	(8) The production of biomass must contribute towards local prosperity.
	Theme 6: Social well-being
	(9) The production of biomass must contribute towards the social well-being of the employees and the local population.

United Kingdom

The Renewable Transport Fuel Obligation Programme (RTFO) is the United Kingdom's primary policy aimed at delivering on the objectives established by the European Union Biofuels Directive. RTFO will, from April 2008, place an obligation on fuel suppliers to ensure that a certain percentage of their aggregate sales are made up of biofuels. The effect of this will be to require fuel companies to sell a minimum of 2.5 per cent renewable transport fuels in the United Kingdom in 2008/09, increasing to 5 per cent in 2010/11. The United Kingdom, acknowledging the risk that biomass could be produced from highly unsustainable sources, has developed a reporting scheme alongside the obligation to encourage only the use of biofuels that are produced from sustainable sources.

In order to ensure compliance, the Government will issue Renewable Transport Fuel Certificates (RTFCs) according to the quantity of renewable fuel on which duty has been paid. To receive RTFCs, biofuel suppliers will be required to submit monthly and – if they apply for 450,000 or more certificates in an obligation period – annual reports on both the net greenhouse gas savings and the sustainability of the biofuels they supply. It will be possible for companies to trade certificates. If a company cannot produce enough certificates at the end of each compliance period, it will have to pay a buyout price which will go into a buyout fund.[18]

[18] United Kingdom Department of Transport, 2007.

In June 2007, the Government announced a package of measures on the sustainability of biofuels supplied under the RTFO. Additionally, Douglas Alexander, then United Kingdom Minister of Transport, simultaneously launched a public consultation on how carbon and sustainability reporting should operate under the RTFO.

Among the sustainability measures announced on 21 June 2007, the Government stated that it aims to reward biofuels under the RTFO in accordance with the carbon savings offered from April 2010 and to only reward biofuels if the feedstocks from which they are produced meet appropriate sustainability standards from April 2011.

Following consultation, the Government has set stretching indicative targets for the level of carbon and sustainability performance expected from all transport fuel suppliers claiming certificates for biofuels in the early years of the RTFO. The targets cover (a) the level of greenhouse gas savings expected from the biofuels used to meet the RTFO (40 per cent in 2008/09 compared to fossil fuels, 45 per cent in 2009/10, and 50 per cent in 2010/11); (b) the proportion of those biofuels expected to come from feedstocks grown to recognized environmental standards (30 per cent in 2008/09, 50 per cent 2009/10, rising to 80 per cent in 2010/11); and (c) the amount of specific information expected to be included in sustainability reports (50 per cent in 2008/09, rising to 70 per cent in 2009/10 and 90 per cent in 2010/11).

The main topics that the consultation covered were the scope and format of monthly and annual reports from biofuel suppliers, as well as carbon and sustainability reporting methodologies and default values. The public consultation closed in September 2007.[19] Current estimates are that the RTFO will save about 0.7–0.8 million tons of carbon a year.[20]

Germany

Germany is the world leader in biodiesel production, with a predicted production capacity of approximately 3.7 million tons in 2007.[21]

On 1 January 2007 the Biofuel Quota Act came into force. The act introduces a quota for the minimum addition of biofuels to petrol and diesel in Germany – progressively increasing the biofuels share from 6.25 per cent in 2009 to 8 per cent from 2015 on – and empowers the Government to establish sustainability criteria for biofuels that are eligible to participate in the quota system and benefit from tax relief.

On 5 December 2007, the German Government passed the Biomass Sustainability Ordinance (BSO) within the Integrated Climate and Energy Programme. The ordinance contains sustainability criteria which refer to (a) a minimum required level of CO_2 savings from biofuels as compared to fossil fuels through the life cycle of the product (30 per cent until 2010 and 40 per cent from 2011); (b) protection of natural habitats; and (c) sustainable cultivation of agricultural land. Macroeconomic effects – such as the impact on food safety and the consequences of indirect land utilization changes – were excluded from the ordinance for practical reasons, as well as to avoid possible inconsistency with WTO rules and in recognition of the sensitivity of such issues, especially within international trade. The BSO was notified both to the European Commission for review and to the WTO–Technical Barriers to Trade (TBT) Committee for comments.

While the Government would have preferred a sustainability framework to be based on international standards, it has acknowledged that, in the short term, this may not be possible; hence, it has developed its own sustainability criteria, especially to provide a rapid response to concerns voiced by civil society.

[19] A summary of the consultation responses and further information about the RTFO is available on the DfT website at www.dft.gov.uk/pgr/roads/environment/rtfo/.
[20] www.irbea.org/index.php?option=com_content&task=view&id=302&Itemid=44.
[21] Association of German Biofuel Industries. Sustainable Mobility with Biofuels: Key Points for the Advancement of the Biofuels Strategy in Germany and the European Union. 16 January 2007: www.ufop.de/downloads/Keypoints_260107.pdf.

Switzerland

Switzerland is a minor biofuels producer and consumer. Nevertheless, recent government decisions are playing a role in enhancing production and use. The most notable measure is the exemption that biofuels enjoy from the "mineral oil tax", Switzerland's main volumetric excise tax on fuels.[22]

In March 2007, the Swiss Government amended its Mineral Fuel Tax in a way that ties tax benefits for biofuels to a system based on various environmental and social criteria, which are under development. Under the new rules, both domestic and imported biofuels that benefit from a reduced fuel excise tax require "proof of a positive total ecological assessment that ensures also that the conditions of production are socially acceptable". Those that do not fulfil such requirements would bear the full tax. Specifically, a reduction of at least 30 per cent of greenhouse gases based on the life cycle of the product is expected to be required for a biofuel to be eligible for a partial tax reduction. Moreover, the total environmental impacts of the biofuel in question must not be greater than the impacts of using the corresponding petroleum fuel. However, in addition, the Government, "taking into account of the amount of domestically available renewable fuels, shall establish the quantity of renewable fuels that can be exempted from the tax at the time of the importation."[23]

Brazil

While the United States became the world's largest ethanol producer in 2006, Brazil remains a close second[24] and the world's largest ethanol exporter, with 3.4 billion litres exported in 2006. Brazil is in the process of developing a certification scheme for biofuels. The President has asserted that the country's biofuels will conform to environmental, social and labour standards through a national certification programme.[25] INMETRO[26] is in charge of developing such a voluntary programme. It has so far developed six preliminary principles and 10 indicators. Principles refer to (a) compliance with environmental and labour laws; (b) adequate work conditions; (c) sustainable use of natural resources; (d) biodiversity protection, recovery and conservation; (e) water, soil and air protection; and (f) socio-economic development of the areas surrounding the production fields.

Plans for certification are a clear response to concerns about possible negative impacts of the rapid expansion of sugar cane in Brazil and an effort to convince Europe (one of the key export markets for Brazilian ethanol companies) that Brazilian-produced ethanol provides an environmentally-sustainable option for the European Union to meet its biofuels targets.[27]

Some public–private initiatives meant to improve social and environmental conditions in the sugar industry have also taken place in the country. The Agro-Environmental Protocol, sponsored by UNICA (Brazilian Sugar Cane Association) and the Government of the State of São Paulo, entered into force in mid-2007. The main goals of the protocol are to anticipate (a) the legal deadline for the elimination of sugar cane straw burning; (b) the protection of riverside woods and the recovery of those near water streams; (c) the development of technical plans for soil and water conservation; and (d) the implementation of measures aimed at greenhouse gases (GHG) emissions reduction. By the end of 2007, more than 100 sugar mills (out of 150) had signed the protocol.

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[22] Steenblik R and Simón J (2007). *Biofuels: At What Cost? Government Support for Ethanol and Biodiesel in Switzerland*. The Global Subsidies Initiative (GSI) of the International Institute for Sustainable Development (IISD). Geneva, Switzerland: 1–2.

[23] Doornbosch R and Steenblik R (2007). *Biofuels: Is the cure worse than the disease?* Paper presented at the Round Table on Sustainable Development. Paris, 11–12 September. OECD, SG/SD/RT(2007)3: 39–40.

[24] In 2006, the United States produced 18.3 billion liters, while Brazil produced 14.9 billion litres.

[25] Stearns J. *EU Warns Brazil on Environmental Impact of Biofuels* (Update3). www.bloomberg.com/apps/news?pid=20601086&sid=as.BAOvRgfM4&refer=latin_america.

[26] INMETRO is the executive secretariat of the National Council for Metrology, Standardization and Industrial Quality within the Brazilian Ministry of Development, Industry and Foreign Trade.

[27] www.climatechangecorp.com/content.asp?ContentID=4874.

The UNICA–FERAESP (Union of State of São Paulo Rural Workers) Protocol was signed in February 2006 with the main objectives to enhance rural labour conditions in the sugar cane sector and develop best practices in some key areas, such as transport of rural workers and transparency in the calculation of their salaries.

Pending the completion of the certification programme, the Brazilian Government remains active in regulating the environmental impact of the sugar cane industry. Activities that the Government controls include: (a) sugar cane fields burning; (b) bagasse management; (c) soil quality; (d) herbicides and insecticides storage and usage; (e) liquid waste application for fertilizer, forest preservation, surface and ground water quality; (f) water usage; and (g) noise pollution. [28]

In 2003, the Brazilian Government created the Biodiesel Programme and designed one of its main targets to promote social inclusion and enhance environmental sustainability. The Social Fuel Seal has been developed as part of the National Biodiesel Programme. The seal, awarded by the Ministry of Rural Development, establishes conditions for industrial producers of biofuels to obtain tax benefits and credit. To do so, they must purchase feedstock from family farmers, enter into legally binding agreements with them to ensure specific income levels and guarantee technical assistance and training to the farmers.[29] More specifically, the progressive tax breaks are determined by (a) the kind of farmer the producer sources from; (b) the region where the farmer produces its feedstock; (c) the specific crop sourced (this distinction is made because some crops – such as castor or jatropha, which grow well in semi-arid zones – logically imply investments in particular regions associated with these agro-ecological conditions); and (d) the share of feedstocks sourced from the specific category of farmers as a percentage of the total amount of raw materials used by the biodiesel producer.[30]

Canada

Canada, which is a major producer and exporter of wood pellets and produces ethanol from grain, is currently relying on voluntary certification to promote sustainability in the biofuels industry.

Launched in 1988 as Canada's national eco-labelling programme, EcoLogo^{M} is an independent, third-party, green certification organization. The certification label serves to mark a wide range of products and services deemed preferable or less harmful to the environment. The label depends on consumer preference for environmentally-sustainable products, hence, providing a marketing advantage to companies who acquire certification. The EcoLogo^{M} has criteria for renewable energy sources with specific criteria for biomass and biogas.

United States and the State of California

On 19 December 2007, President Bush signed the Energy Independence and Security Act (EISA).[31] The Act is designed to increase energy efficiency and the availability of renewable energy. Among many other provisions, the law sets a modified Renewable Fuel Standard (RFS) which requires minimum annual levels of renewable fuel in United States transportation fuel. The previous standard was 5.4 billion gallons (approximately 20.4 billion litres) for 2008, rising to 7.5 billion by 2012 (approximately 28.35 billion litres). The new standard starts at 9 billion gallons in 2008

[28] Martines-Filho J, Burnquist H and Vian C (2006). Bioenergy and the rise of sugarcane based ethanol in Brazil. *Choices: A publication of the American Agricultural Economics Association*. JEL Classification: Q42,054,013 2(21): 91–96.

[29] Van Dam J et al. (2007), *op. cit.*

[30] Biopact. *An in-depth look at Brazil's "Social Fuel Seal"*. March 2007, found at: http://biopact.com/2007/03/in-depth-look-at-brazils-social-fuel.html.

[31] *Energy Independence and Security Act*. Public Law 110-140-Dec 19, 2007, found at: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_public_laws&docid=f:publ140.110.pdf. See also: CRS Report for Congress. *Energy Independence and Security Act of 2007: A Summary of Major Provisions*. 21 December 2007, Order Code RL34294, found at: http://assets.opencrs.com/rpts/RL34294_20071221.pdf; and Beveridge & Diamond, P.C. *Renewable Fuel Standard Program Update*. 4 February 2008, found at: http://www.bdlaw.com/news-270.html.

(approximately 34 billion litres) and rises to 36 billion gallons in 2022 (approximately 137 billion litres).

The EISA includes several important definitions: new land use and GHG reduction factors are introduced to the definition of "renewable fuel" and only fuels that comply with the new definitions will count towards satisfying the RFS.

More specifically, the term "renewable fuel" is defined to mean a "fuel that is produced from renewable biomass and that is used to replace or reduce the quantity of fossil fuel present in a transportation fuel."[32] The term "renewable biomass" is in turn limited to (a) planted crops that are harvested from agricultural land cleared or cultivated prior to 19 December 2007 and that is actively managed or fallow, and non-forested; (b) planted trees from actively managed tree plantations on non-federal land cleared prior to 19 December 2007; (c) animal waste material and animal by products; (d) slash and pre-commercial thinnings from non-federal forestlands that are not subject to a global or State ranking of "critically imperilled", "imperilled" or "rare"; (e) biomass obtained from the immediate vicinity of buildings or public infrastructure at risk from wildfire; (f) algae; or (g) separated yard or food waste.[33] Importantly, renewable fuel may no longer be produced from biomass that is harvested from newly cleared or cultivated land.

Moreover, the law distinguishes renewable fuels in four categories: (a) conventional biofuels, i.e. ethanol derived from corn starch that has life cycle greenhouse gas emissions that are at least 20 per cent less than baseline life cycle;[34] (b) advanced biofuels,[35] i.e. renewable fuels, other than ethanol derived from corn starch, that have life cycle greenhouse gas emissions that are at least 50 per cent less than baseline life cycle; (c) biomass-based diesel, i.e. renewable fuel that is biodiesel that has life cycle greenhouse gas emissions that are at least 50 per cent less than baseline life cycle GHG emissions; and (d) cellulosic biofuels, i.e. renewable fuels derived from any cellulose, hemicellulose, or lignin that is derived from renewable biomass, that have life cycle greenhouse gas emissions that are at least 60 per cent less than baseline life cycle.[36]

The law specifies a timetable beginning in 2009 for the mix of renewable fuels in transport fuels, including the annual escalating required volume of advanced biofuels: by 2022, 21 billion gallons (around 80 billion litres) of the overall RFS goal must come from advanced biofuels including cellulosic ethanol. Therefore, the law puts a cap on the use of corn-based ethanol, i.e. a maximum of 15 billion gallons (approximately 56.7 billion litres) by 2022.

The law requires the Environmental Protection Agency (EPA), in consultation with the Secretary of Energy and the Secretary of Agriculture, to report to Congress on the impacts of the RFS

[32] Section 211 (1) (J).
[33] Section 211 (1) (H).
[34] The term "baseline life cycle greenhouse gas emissions" means the average life cycle greenhouse gas emissions for gasoline or diesel (whichever is being replaced by the renewable fuel) sold or distributed as transportation fuel in 2005 (section 211 (1) (C)). The term "life cycle greenhouse gas emissions" means the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the administrator, related to the full fuel life cycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential (section 211 (1) (H)).
[35] More specifically, the types of fuels eligible for consideration as "advanced biofuel" may include any of the following: (a) ethanol derived from cellulose, hemicellulose, or lignin; (b) ethanol derived from sugar or starch (other than corn starch); (c) ethanol derived from waste material, including crop residue, other vegetative waste material, animal waste, and food waste and yard waste; (d) biomass-based diesel; (e) biogas (including landfill gas and sewage waste treatment gas) produced through the conversion of organic matter from renewable biomass; (f) butanol or other alcohols produced through the conversion of organic matter from renewable biomass; (g) other fuel derived from cellulosic biomass (section 211 (1) (B) (ii)).
[36] Section 211 (1) (E).

programme on environmental issues, resource conservation issues, the growth and use of cultivated, invasive and noxious plants and their impact on the environment and agriculture.[37]

The EPA is directed to promulgate regulations to implement the EISA, including development of accounting protocols and methodologies for determining life cycle GHG emissions. The implementing legislation is expected to be developed throughout 2008 and enter into force in 2009.

A number of critical issues are implicated by the new requirements to account for life cycle emissions and for the kind of land used for biomass production, including the possible need for a traceability and certification process such that renewable fuel purchasers can be assured that the renewable fuel meets the carbon standard as well the requirements related to land use, and the related possible need for third-party verification. In addition, an open question remains about how will life cycle carbon be calculated, i.e., what methodology will be used.

Turning to the specific initiative of the State of California, the California Biomass Collaborative is a state-wide collaboration of Government, industry, environmental groups and educational institutions. The aim of the collaborative is to enhance the sustainable management and development of biomass in California for the production of renewable energy, biofuels and products.[38]

In April 2006, Governor Schwarzenegger issued an executive order that called for actions by the State to meet targets for biofuel and biopower development: producing 20 per cent of its biofuels within California by 2010, increasing to 40 per cent by 2020 and 75 per cent by 2050, and producing 20 per cent of the renewable electricity generated from biomass resources within the State by 2010 and maintaining this level through 2020. This resulted in the California Biomass Collaborative being tasked with preparing a roadmap for biomass research and development. The roadmap published in 2006 includes examination of standards and best practices for sustainable feedstock supply, land use, environmental impacts and resource monitoring.[39]

National Governments and regional groupings play an important role in establishing the policy framework for biomass certification, setting biofuel sustainability criteria, and developing policy measures such as blending targets, taxes relief and support schemes to promote the sustainable production of biofuels.

1.2.2 Companies

The numerous developments in the field of certification of biomass and biofuels have motivated companies in the industry to initiate their own standards and certification schemes. Various companies involved in the biofuel and biomass supply chain are active in the discussion of biofuel and biomass certification. While nations and international actors tend to have a broader view of certification, corporate initiatives tend to focus on their own sectors when defining principles and criteria. Companies have taken steps to explore and establish certification schemes through international initiatives and collaborations with Governments as well as establishing their own standards.

Cargill B.V. and Cefetra – as traders and raw material suppliers of biomass – and the bank Rabobank International are among the members of the Dutch "Sustainable Production of Biomass" project group (see section above under Netherlands). The bank has recommended that bio-energy projects be judged on a case-by-case basis, taking ecological, social and economic criteria into account. Additionally, numerous companies – including Cargill B.V., Unilever, and BioX – are RSPO members. BioX has also joined the Green Gold Label programme and has developed its own code of conduct for energy generation. Additionally, BioX, in collaboration with Control Union, is evaluating RSPO criteria for auditing and certification purposes. Furthermore, BioX has initiated a study on the

[37] Section 204.
[38] http://biomass.ucdavis.edu/.
[39] Tiangco V et al. (2006). *Roadmap for Biomass Development*. The California Biomass Collaborative, found at: http://biomass.ucdavis.edu/materials/reports%20and%20publications/2006/2006_Biomass_Roadmap.pdf .

carbon dioxide emissions related to the growing, production and transport of palm oil, an issue that has not been covered by RSPO criteria.

It is through collaborations such as the Dutch project group, RSPO and the Roundtable on Sustainable Biofuels that many companies are pursuing certification efforts. Recognizing the certification will require a harmonization of standards and criteria, they have chosen to work in collaboration with other interested parties. However, several companies also continue to pursue sustainability standards on their own.

British Petroleum (BP) has been actively engaged with the United Kingdom Government in the formulation of the RTFO. In addition, through its membership of the Low Carbon Vehicle Partnership, it has continued to support the development of the United Kingdom Biofuels Assurance Scheme. BP participates in the Roundtable on Sustainable Biofuels. Shell is working with its suppliers to incorporate clauses in supply contracts that ensure biofuel components are not knowingly linked to violation of human rights (including child/forced labour) and recent clearing of areas of high biodiversity value as defined by feedstock specific multi-stakeholder initiatives and national regulations. The company encourages its suppliers to establish a supply chain traceability system and reserves the right to conduct independent audits of its suppliers and to terminate contracts. It has appointed a biofuels sustainability compliance officer and team to oversee and coordinate implementation of Shell's commitments on sustainable sourcing of biofuel components. Shell participates in the Roundtable on Sustainable Biofuels and the Roundtable on Sustainable Palm Oil.

Notable efforts in the area of biomass certification have been pursued by companies in the electricity supply chain. Renewable energy standards have introduced market mechanisms and trade in sustainable energy production. This has motivated electricity suppliers in Europe to develop their own biomass certification systems.[40]

Electrabel, a European energy company that is a leader on the Benelux market, has developed the Electrabel label certification procedure for imported biomass. The company has drafted a "Supplier Declaration" which details the requirements that biomass must meet in order to be accepted under Electrabel's standards. This document must be signed by the producer and verified and stamped by a certified inspection body. The inspection company SGS is responsible for checking the document and carrying out an audit of the pant and supply chain. (See section above on Belgium.)

Essent, the largest Dutch user of biomass, has developed the Green Gold Label (GGL) for certifying biomass. Initiated in 2002, the certification requires a track and trace system so that the product produced at the plant can be traced back to the sustainable source. No mixing is allowed in the system and written proof is required to ensure that GGL quality is being complied with at every stage. The complete biomass chain, from production to end use, is covered under six different standards in the system. While the GGL accepts existing certification systems for some standards (e.g. FSC standards), it has additional guidelines in the area of pellets manufacturing and transportation. The GGL is continually reviewing its established system and has explored the possibility of including social criteria into its certification system.

The key activities that companies have engaged in with relation to biofuel or biomass certification are focused on the sector-specific interests of the company. They have been able to gather experience in certification through company-specific certification and pilot studies, to promote coordination and cooperation between companies in developing certification schemes and to collaborate with Government and international initiatives and round tables to provide private sector viewpoints on the development of sustainability criteria and certification implementation.

1.2.3 Non-governmental organizations

Many NGOs have expressed concern that biofuels have been viewed in an overly positive light and that policymakers must recognize the disadvantages that pursuing the expansion of the

[40] Van Dam J et al. (2007), *op. cit.*

biofuels industry will bring. While most have acknowledged that biofuels may play an important role in the energy and climate change strategy of many nations, they have emphasized that policymakers must recognize their impact on food security, biodiversity, water and soil, as well as the fact that greenhouse gases emissions savings should be evaluated in terms of the life cycle of a product.

As a means of promoting the desirable goal of environmentally and socially sustainable production of biofuels, NGOs have often sited the need for a certification system. While there is a general consensus on the need to develop applicable criteria, NGOs have expressed different positions on the specific criteria that should be included in certification schemes. Additionally, NGOs have not come to a consensus on the priority (e.g. between environmental and socio-economic criteria), strictness (e.g. use of genetically modified organisms and GHG balance) and the level of detail given in criteria.[41] Van Dam et al. (2007) have compiled an overview of the sustainability criteria mentioned by various NGOs in reports and position papers.[42] The criteria referenced by NGOs are generally covered by those developed by various existing schemes as detailed in the appendix.

NGOs are active in certification on a number of levels, especially through the publication of position papers and research, but also through the participation in international networks and round tables.

Many NGOs have started pilot projects and case studies to explore the use of sustainability criteria, the feasibility of certification schemes and the impact on producing countries, particularly those in the developing world.[43]

A number of Dutch NGOs have collaborated on a research project that examined both the positive and/or negative impacts that the biomass industry has on producing countries, from an environmental as well as from a socio-economic point of view. They sought input from stakeholders in producing countries specifically examining sugar cane (Brazil), palm oil (Indonesia) and maize (South Africa). The project ran parallel to the development of criteria for sustainable biomass production by the Cramer Commission. The report reflects a comparison between results derived from this project and the criteria proposed by the commission, and it served as input for the drafting of said criteria.[44]

The development organization, Solidaridad, has partnered with the energy company, Essent to introduce a new form of biomass using coffee husks as raw material. Solidaridad has been active in the development of, among other enterprises, Max Havelaar, Utz Certified[45] and Café Oké and is an authority on development and fair trade with third world countries; Essent is the biggest producer of Green Electricity in the Netherlands. The two organizations have established a pilot initiative in order for Brazilian coffee producers that are Utz certified to provide coffee husks (a residual product from coffee cultivation) for replacement of coal or other fossil fuels to produce electricity in some of Essent's power stations. The project embodies the sustainability and fair trade goals of the two organizations. Furthermore, the cooperation between Essent and Solidaridad is also prompted by the desire to link the existing quality systems of the two parties: Essent Green Gold Label and Solidaridad's Utz Certified label.[46]

A number of other NGOs from the environment and development sector have been active in evaluating schemes and providing recommendations specifically related to approaches to establishing a certification system for biofuels and related feedstocks. The World Wildlife Fund (WWF) has been particularly involved on this front. WWF International – along with FSC, and the Dutch and United Kingdom Governments – commissioned the paper "Towards a harmonized sustainable biomass

[41] Van Dam J et al. (2007), *op. cit.*
[42] See Table 3 in Van Dam et al. 2007, *op. cit.*
[43] Van Dam J et al. (2007), *op. cit.*
[44] *Dutch import of biomass: Producing countries' point of view on the sustainability of biomass exports*, CREM Report, Amsterdam, November 2006.
[45] UTZ CERTIFIED is a worldwide certification programme for responsible coffee production and sourcing. UTZ CERTIFIED offers assurance of social and environmental quality in coffee production. www.utzcertified.org/index.php.
[46] www.essenttrading.com/Article.do?path=-news-pressreleases-news_press_releases_coffeehusks.

certification scheme". The report, published in June 2007 by Ecofys, promotes the "meta-standard approach." This scheme uses existing standards for agriculture and forestry that satisfy established requirements and hence become "qualifying standards" for certification. The authors assert that the benefits of the approach are that it "avoids reinventing the wheel" in that there are plenty of standards already in use or under development that address the sustainability of biomass production and can be applied to biomass used for bioenergy.[47] They also contend that the meta-standard would benefit from already established producer acceptance since it capitalizes on lengthy stakeholder processes that were employed by existing standards. Furthermore, the implementation of the scheme is practical in a relatively short time frame and is cost effective because it avoids producers having to be certified against multiple criteria in order for their products to be deemed "sustainable." Additionally, the report states that the meta-standard approach will extend the influence of the scheme beyond the bioenergy market to other sectors that utilize biomass and that it can potentially assist with the convergence of standards in the long run.[48] The paper also acknowledges the drawbacks of the scheme[49] and recognizes that important "macro" issues – displacement effects (leakage), local food security, and effects on global commodity prices – must be evaluated at a higher level. The authors recognize that the entire supply chain is not addressed so that GHG performance and other macro-effects require that the meta-standard be complimented by another mechanism to account for these concerns.

In conclusion, NGOs play an active role in forums for certification, engaging in research and publishing papers presenting proposals for principles and criteria for sustainable biomass and biofuels certification. They tend to not only present environmental concerns, but also champion the interests of the rural poor. Some NGOs have initiated pilot studies and suggested implementation strategies for certification systems.

1.2.4 International bodies, organizations and initiatives

International efforts in the area of certification can be examined from the points of view of international bodies and initiatives, and international networks and round tables. Their work ranges from policy guidance to principle and criteria development.

International bodies and initiatives

A number of international bodies have been active in exploring certification for sustainable biomass and biofuels. In the policy field there is some overlap of interests and many complementary initiatives.

United Nations-energy

United Nations-energy is an interagency mechanism aimed at promoting coherence in the United Nations system's multi-disciplinary response to the World Summit on Sustainable Development (WSSD) and engaging non-United Nations stakeholders. In April of 2007, United Nations-Energy published a paper titled "Sustainable Bioenergy: A Framework for Decision-Makers"[50] that addresses sustainability issues surrounding the production of bioenergy. The paper speaks of the need for an international certification scheme that ensures that bioenergy is produced

[47] For example, if the RSPO becomes operational and meets the established requirements to become a qualifying standard, companies that use RSPO palm oil could claim sustainable production according to the Meta-Standard norms.
[48] Dehue B, Meyer S and Hamelinck C (2007). Towards a harmonized sustainable biomass certification scheme. Ecofys.
[49] For example, changes in the Meta-Standard will not take direct effect because they must be reflected in the qualifying standards, under the Meta-Standard approach interaction between producers and standard administrators is more complicated. Additionally, existing standards that may serve as "qualifying standards" are generally very elaborate and may cover more criteria than needed under the Meta-Standard; hence making the approach complex and costly to comply with, especially for small producers.
[50] http://esa.un.org/un-energy/pdf/susdev.Biofuels.FAO.pdf.

using the most sustainable methods possible and that "includes GHG verification for the entire life cycle of bioenergy products, particularly biofuels".

UNCTAD Biofuels Initiative

UNCTAD launched its Biofuels Initiative in June 2005. The Biofuels Initiative seeks to provide technical analysis of issues related to biofuels production and trade that will impact member countries, especially with the objective of sharing experience and providing support to developing countries.

Certification of biofuels has been an issue raised in numerous meetings organized by the Biofuels Initiative and has been addressed in past reports by the agency. The analysis of labelling, certification and other market instruments fall within the core mandate of UNCTAD. The agency has provided along the years support to policymakers, especially from developing countries, on those issues.

Food and Agriculture Organization of the United Nations

In May of 2006, the Food and Agriculture Organization of the United Nations (FAO) launched the International Bioenergy Platform (IBEP). One of the activities IBEP seeks to tackle is to assist in the development of an international scheme to develop workable assurances and certification bases principles, methodologies, criteria and verifiable indicators. The agency has stated that, starting in December 2006, it would work to develop an analytical framework to assess the implications of different types of bioenergy systems for a set of different food security contexts. The result will be the formulation of national strategies, based on recommendations on how to undertake bioenergy development.[51]

The Forestry Department of FAO is also working on biomass certification. In cooperation with IEA task 31, they are evaluating principles, criteria and indicators for both biomass from forest used for energy, as well as for wood fuel and charcoal production systems. The study includes a review of existing forest certification schemes. Based on this, criteria are formulated to cover forest biomass for energy. The agency stated that these criteria would be tested in the field using case studies starting at the end 2006. Using the results of the assessment, a set of criteria covering ecological and socio-economic aspects of the production cycle will be developed and eventually be tested in the field.

United Nations Environment Programme

The United Nations Environment Programme (UNEP), through its involvement in the Roundtable on Sustainable Biofuels (RSB), is pursuing a multi-stakeholder approach in developing an international scheme to assure the sustainability of bioenergy. Such a scheme should fulfil several purposes: (a) provide Governments with guidance on how to ensure sustainable and therefore long-lasting use of their natural resources; (b) advise industry on managing risk, both reputational and financial; and (c) allow consumers to make an informed choice.

UNEP has asserted that the scheme should be formulated around a set of internationally-accepted principles and criteria, addressing the main risks and concerns while remaining manageable and avoiding excessive administrative burden on producers of biofuels. The organization has acknowledged that said principles and criteria will need to take into account and build on criteria used in existing national and commodity-based systems. UNEP has singled out biodiversity, climate change, land use, and water and labour issues as areas that must be addressed under a certification scheme.[52] UNEP, in collaboration with the RSB, is organizing joint regional outreach events to ensure involvement of different stakeholder groups in the different regions.

In collaboration with DaimlerChrysler, WWF, and the Ministry of Agriculture of Baden Wuertemberg, UNEP produced a set of preparatory documents. A working paper was published that

[51] V. Dam J et al. (2006), *op. cit.*

[52] http://www.uneptie.org/energy/act/bio/assurance_system.htm

reviews existing certification systems linked to biomass certification, compiles overviews of certification labels (forestry, bioenergy and palm oil, agricultural and trade labels), details the crop requirements for a number of utilized crops, and examines ongoing initiatives by the international communities and country policies on biofuels.[53]

Global Bio-energy Partnership

In the July 2005 Gleneagles Plan of Action, the G8 +5 (Brazil, China, India, Mexico and South Africa) agreed to "... promote the continued development and commercialization of renewable energy by: [...] d) launching a Global Bio-energy Partnership to support wider, cost effective, biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent". The Global Bio-energy Partnership (GBEP) was launched during the Ministerial Segment of the fourteenth session of the Commission on Sustainable Development (CSD14) in New York on 11 May 2006.[54] Partners of the organization are Governments, intergovernmental organizations and some private sector associations.[55]

Among the activities the partnership is carrying out is the task of developing methodologies for measuring the greenhouse gas (GHG) impacts of biofuels and, more specifically, focus work on the harmonization of such methodologies. A specific task force has been established to deal with this highly technical issue.

In June 2008 GBEP established a task force on sustainability with the aim to develop a voluntary framework of international sustainability principles for bio-energy.

IEA Bioenergy Task 40

The IEA Bioenergy Task 40 on International Sustainable Bioenergy Trade[56] is active in research and initiatives to investigate the requirements for the creation of a commodity market for bioenergy. Task 40 has made certification, standardization and terminology for sustainable biomass trade key priorities. Past studies from Task 40 members have covered the development of a certification system for sustainable bio-energy trade,[57] case studies on impacts of sustainability criteria on costs and potentials of bioenergy production in Brazil and Ukraine,[58] and overviews of certification developments.[59]

At this point in time, international bodies and initiatives have mainly been involved in supporting research and the publication of papers that address the development of criteria and indicators as well as the implementation of certification schemes. Additionally, they have been active in case studies, collaborating with other international initiatives and round tables, and providing country specific analysis.

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[53] Working Group on Developing Sustainability Criteria and Standards for the Cultivation of Biomass used for Biofuels. *Compilations of existing certification schemes, policy measures, ongoing initiatives and crops used for bioenergy*, UNEP. June 2007.

[54] http://www.globalbioenergy.org/progr_work.html.

[55] As of April 2008, GBEP partners are: Brazil, Canada, China, France, Germany, Italy, Japan, Mexico, Netherlands, Russian Federation, United Kingdom, United States, FAO, IEA, UNCTAD, UN/DESA, UNDP, United Nations Environment Programme (UNEP), United Nations Industrial Development Organization (UNIDO), United Nations Foundation, World Council for Renewable Energy (WCRE) and European Biomass Industry Association (EUBIA). Austria, India, Indonesia, Israel, Kenya, Mozambique, South Africa, Sweden, the United Republic of Tanzania, European Commission and the World Bank are participating in the activities of GBEP as observers.

[56] www.bioenergytrade.org.

[57] Lewandowski I and Faaij A (2006), *op. cit.*

[58] Smeets E. and Lewandowski I (2005). The impact sustainability criteria on the costs and potentials of bioenergy production. An exploration of the impact of the implementation of sustainability criteria on the costs and potential of bioenergy production applied for case studies in Brazil and Ukraine. Utrecht, the Netherlands, Utrecht University.

[59] Van Dam J et al. (2007), *op. cit.*

International networks and round tables

Eugene

European Green Electricity Network (Eugene) has created a standard of quality for green power to provide a benchmark for environmental labelling schemes. Eugene is an independent network that pursues no commercial interest and acts to bringing together non-profit organizations such as national labelling bodies, experts from environmental and consumer organizations, and research institutes.

The Eugene Standard applies to geothermal, wind, solar, electric, hydropower and biomass energy and is given to defined "eligible sources". Eligible sources for biomass include dedicated energy crops, residual straw from agriculture, etc. Specific criteria for eligible biomass resources, such as production methods, are not specified by the standard.[60]

The Intelligent Energy Europe project, "Clean Energy Network for Europe (CLEAN-E)", was designed to accompany the establishment of new green electricity product labels and the improvement of existing ones in selected European Union member States. The CLEAN-E project has supported the efforts of Eugene and correspondingly Eugene has served as the major point of orientation for the project. Among other things, the project has explored the development of ecological minimum standards for biomass. The studies undertaken by the project are meant to support the possible certification of biomass and included a proposal of biomass criteria for application by the Eugene Standard.[61] The project has also published a report evaluating the experiences with the pilot application of the developed biomass standards.[62]

Roundtable on Sustainable Palm Oil

The Roundtable on Sustainable Palm Oil (RSPO) is a multi-stakeholder platform, which aims to promote the production, procurement and use of sustainable palm oil. Dialogue among stakeholders has resulted in a set of Principles and Criteria for sustainable palm oil production which were adopted in November 2005, namely: (a) commitment to transparency; (b) compliance with applicable laws and regulations; (c) commitment to long-term economic and financial viability; (d) use of appropriate best practices by growers and millers; (e) environmental responsibility and conservation of natural resources and biodiversity; (f) responsible consideration of employees and of individuals and communities affected by growers and mills; (g) responsible development of new plantings; and (h) commitment to continuous improvement in key areas of activity.

The principles were applied for an initial pilot implementation period of two years from the date of adoption to enable field testing and thereby allow the indicators and guidance to be improved, including guidance for application by smallholders; national interpretations have also been commenced during this period. In June 2007, RSPO finalized its certification scheme and plans to review the system after two years.[63]

Ecole Polytechnique Fédérale de Lausanne RSB[64]

The Roundtable on Sustainable Biofuels is an international initiative by the Ecole Polytechnique Fédérale de Lausanne (EPFL) Energy Center. Its aim is to bring together farmers, companies, NGOs, experts, Governments and intergovernmental agencies concerned with ensuring the sustainability of biofuels production and processing.

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[60] Lewandowski I and Faaij A (2006), *op. cit.*

[61] Oehme I (2006). Development of ecological standards for biomass in the framework of green electricity labeling. WP 2.2 report from the CLEAN-E project, February.

[62] Tritthart W (2007). Evaluation report on the experiences with the pilot application of biomass standards. WP 2.2 report from the CLEAN-E project, January.

[63] http://www.rspo.org/Review_of_RSPO_Principles_and_Criteria_for_Sustainable_Palm_Oil_Production.aspx

[64] Ecole Polytechnique Fédérale de Lausanne Web site: http://cgse.epfl.ch/page65660-en.html.

In June 2007, RSB released its "Draft Global Principles for Sustainable Biofuels Production" for global stakeholder feedback and discussion, namely: (a) legality (biofuel production shall respect all applicable laws of the country in which they occur, and all international treaties and agreements to which the country is a signatory); (b) consultation (biofuel projects shall arise through fully transparent, consultative and participatory processes); (c) climate change and greenhouse gases (biofuels shall contribute to climate stabilization by reducing GHG emissions as compared to fossil fuels through their life cycle); (d) human and labour rights (biofuel production shall not violate human rights or labour rights, and shall ensure decent work and the well-being of workers); (e) socio-economic development (biofuel production shall not violate land or water rights, and shall contribute to the social and economic development of local, rural and indigenous peoples and communities.); (f) food security (biofuel production shall not impair food security); (g) conservation (biofuel production shall not directly or indirectly endanger wildlife species or areas of high conservation value); (h) soil (biofuel production shall not directly or indirectly degrade or damage soils); (i) water (biofuel production shall not directly or indirectly contaminate or deplete water resources); (j) air (biofuel production shall not directly or indirectly lead to air pollution); and (k) biotechnology (if biotechnologies are used in biofuels production, they shall improve the social and/or environmental performance of biofuels, and always be consistent with national and international biosafety and transparency protocols).

According to the RSB, the 11 draft principles are highly aspirational, and represent an ideal performance of biofuels. Their purpose is to indicate the ideal scenario towards which stakeholders should be progressing. RSB will develop mechanisms to encourage companies and supply chains to achieve progress towards these goals. Interested parties have also been invited to begin drafting criteria for meeting the draft principles through open working groups divided into four topic areas: GHG life cycle analysis, environmental impacts, social impacts, and implementation. By the end of 2008, RSB hopes to have available draft criteria and indicators to measure compliance with the principles. Because the working groups have proven popular, RSB has created "Expert Advisory Groups" which will meet separately to reach a consensus on controversial issues that can then be presented to the broader Working Groups.

Round Table on Responsible Soy[65]

The stated goal of the Round Table on Responsible Soy (RTRS) is to promote economically viable, socially equitable and environmentally sustainable production, processing and trading of soy. In November of 2006, a final draft of the principles of the RTRS was approved. It put forth three main principles – economic responsibility, social responsibility and environmental responsibility – each with a number of sub-principles. Currently, RTRS is inviting nominations for participation in the RTRS Principles, Criteria and Verification Development Group (DG). The DG is tasked with producing a set of verifiable principles, criteria and indicators that define responsible production and early stages of processing of soy beans and with developing a verification system.[66]

In summary, international networks and round tables serve a role in (a) facilitating discussions on biomass and biofuels certification among stakeholder groups; (b) promoting certification initiatives by providing a forum for developing principles, criteria and indicators; and (c) carrying out pilot studies to better understand the implication of certification implementation. Additionally, these efforts may have the advantage of being able to develop sustainability schemes and achieve results in relatively short time frames in comparison to multilateral/international processes, which are inherently long and complex.

[65] Previously called Roundtable on Sustainable Soy (RSS).
[66] http://responsiblesoy.org/eng/.

Chapter 2

Possible issues of concern in the implementation of certification schemes

The rapid expansion of the biofuels market has led to considerable concern from the international community and civil society that production may have harmful environmental and social effects. Certification offers a significant opportunity to qualify biofuels as a truly sustainable energy source. However, certification comes with its own troubling implications.

In order to fully understand the prospects for future sustainability certification of biofuels, it is necessary to analyze the possible issues of concern so that the implications can be fully understood and barriers to implementation of certification can be recognized and overcome.

2.1 Issues with measurable indicators

As many studies and stakeholders have acknowledged, many of the criteria necessary for certification of biofuels and related feedstocks are already employed in existing certification systems, with the notable exception of criteria which refer to GHG emissions. However, it is important to recognize that, for any biomass certification system to be effective, it will have to employ precise and strong indicators. The indicators should be formulated as specific and quantitative as possible to forestall misunderstanding or varied interpretations. Unfortunately, though many of the necessary criteria for environmentally and socially sustainable biofuels have been developed, not all the indicators that are necessary for assessing certification are well defined.

A study done by the Copernicus Institute of Sustainable Development and Innovation has inventoried the methods of evaluating sustainability that are employed by existing schemes. The authors found that for a majority of the criteria and indicators that are applicable for certification there are precedents in other existing schemes.[67] However, the authors determined that many of the applicable indicators found in the agricultural and forestry sector are not precisely formulated. Specifically, they point out that indicators such as those that assert that farmers, workers, etc. should not be "unnecessarily exposed to hazardous substances or risk of injury", that call for the "minimization of wastes" and that state that producers should "strive to avoid the use of chemical pesticides", leave ample room for discretion because the terms "unnecessarily", "strive to" and "minimization" can be widely interpreted. These types of "soft" indicators establish ambiguity in the system and therefore it is not always clear to the producer or the auditor what measures are specifically called for by the indicator.

Furthermore, there is an issue with a lack of quantitative indicators on a number of criteria found in existing certification systems. Several systems establish socio-economic criteria such as "the activity should contribute to strengthening and diversifying the local economy" and "generation of jobs", yet they fail to contain quantitative benchmarks applicable for assessment. Currently, the norm in the existing systems is to accept situations where the activity leads to any improvement against a status quo scenario.

Social sustainability criteria are particularly difficult to quantify because the formulation of indicators requires normative decisions. Criteria that call for "equitable land ownership", "fair and equal remuneration"" and for farmers to be "content with their social situation" cannot be described or evaluated in a scientific manner. These types of evaluations are inherently subjective and require detailed knowledge of the local context.[68]

Ecological criteria also commonly lack quantitative indicators. They call for the "avoidance of soil erosion" or "preservation of habitats"; however, they fall short of specifying measurement standards. Instead the certification systems generally outline management rules that articulate how to avoid or minimize unwanted effects.

[67] Lewandowski I and Faaij A (2006), *op. cit.*
[68] *Ibid.*

Lewandowski and Faaij provide a number of suggestions for clearly formulating indicators for biomass certification. Specifically, they call for the use of scientifically sound or legislative threshold values where available.[69] Currently, there are threshold values available for the loads ecosystems can bear (e.g. nitrate residues) and for the amounts of inputs, like slurry fertilization in agricultural production, that could be applied to criteria for biomass certification.[70] Additionally, they assert that for some indicators, such as the "acceptable" amount of soil erosion, it is impossible to articulate and apply an applicable threshold level. Therefore, such indicators in a biomass certification scheme will require clear and detailed instructions and management rules.

The Cramer Commission has also recognized that, even when a considerable effort is made, it is not always possible to use a "quantitative indicator as a yard stick" in sustainability certification.[71] As such, the Dutch project group has proposed relying on reporting in regards to certain criteria in order for sustainability to be judged. For example, under their proposed system, the effect of large-scale production of biomass on local prosperity would be difficult to quantify. Therefore, they require reporting on the issue that will serve as a measure of sustainability with regard to that particular theme.

Perhaps most significantly, Lewandowski and Faaij highlight the fact that no functioning certification system currently employs measurable indicators for leakage effects, food and energy supply security, local benefits of biomass trade, abatement of poverty, and greenhouse gas impacts. These are areas that many schemes that are under development are seeking to address.

Though improvements have been made to quantify the indicators of certification systems as much as possible, many criteria are simply impossible to evaluate in a numerical fashion. As a result, certification has an inescapable aspect of subjectivity, depending on the evaluation methods employed.

2.2 Greenhouse gas impacts

While one of the aims in transitioning to bioenergy is to reduce greenhouse gas emissions, bioenergy is not necessarily carbon-neutral. There are emissions associated with its production and transport and some aspects of biomass production may also contribute significantly to greenhouse gas emissions. Deforestation, the degradation of other conservation land, land conversion and fertilizer use are all issues of concern. Land conversion for the purpose of producing biomass may contribute to GHG emission because when forested and grasslands are cultivated, carbon that is stored in the plants and soil is released. There is also the forgone carbon sequestration that would have otherwise occurred in the absence of biomass production.[72] Additionally, nitrous oxide (N_2O) emissions resulting from fertilizer application and the production of fertilizers used in biomass cultivation could partially offset the benefits for reduced carbon emission.[73] As Searchinger et al. assert, if the additive GHG emissions that occur during biomass production are factored into estimates, there may be significant increase in GHG emissions resulting from biofuels production.

To counter such negative effects, a biofuels certification system should include indicators that accurately account for the greenhouse gas emissions. As previously noted, almost all certification schemes have prioritized the accounting of GHG emissions. The European Union-proposed directive on the use of renewable energies contains methodology for calculating greenhouse gas emissions from the production and use of transport fuels, biofuels and other bioliquids (annex VII of the directive). Annex 1 of the German Biomass Sustainability Ordinance contains principles of a method to be used in computing greenhouse gas reduction potential. Annex 2 provides a list of values to be used in cases

[69] *Ibid.*
[70] Merkle A and Kaupenjohann M (2000). Derivation of ecosystematic effect indicators – method. *Ecological Modeling*. 130: 39–46.
[71] *Testing framework for sustainable biomass*. Final report from the project group "Sustainable production of biomass". March 2007.
[72] Searchinger T, Heimlich R, Houghton R, Dong F, Elobeid A, Fabiosa J, Tokgoz S, Yu T (2007). *Factoring Greenhouse Gas Emissions from Land Use Change into Biofuel Calculations*.
[73] WWF Germany (2006). *Sustainability Standards for Bioenergy*. Found at: www.biofuelstp.eu/downloads/WWF_Sustainable_Bioenergy_final_version.pdf.

in which no specific values are documented. The Dutch project group developed a method for the calculation of GHG reduction by the use of biomass instead of fossil fuels in the entire chain of production up to and inclusive of the end use of biomass. France and the United Kingdom are equally working on methodologies for calculating biofuels related GHG emissions. The European Union Directive aims at including in the GHG calculations only those related to direct land use changes. Conversely, the United States Energy Independence and Security Act directs the Government, by December 2008, to develop a life cycle analysis for biofuels that must include GHG "emissions related to direct and indirect land use changes..." The German Biomass Sustainability Ordinance mandates for the time being the accounting of GHG emissions related to direct land use changes only. However, there are plans to amend the ordinance so as to include emissions related to indirect land use changes as well. The draft scheme developed by the Roundtable on Sustainable Biofuels aims at taking into account GHG emissions associated with direct and indirect land use changes.

There remains some ambiguity and uncertainty in how different biofuel GHG analyses are conducted, rendering it difficult for any reliable comparisons to be made between biofuels on the basis of their GHG performance. As already mentioned, GBEP has set up a task force that will review existing methodologies for measuring the GHG impacts of biofuels and develop a harmonized approach by which the results of GHG life cycle assessments can be compared on an equivalent and consistent basis. Within this framework, the issue of whether and how to take into account emissions related to indirect land use changes remains open.

2.3 Evaluating macro level effects

Several certification initiatives have noted that certification of individual production units may fail to take into account important macro level effects of biofuel production including so-called "leakage" effects (also called "displacement effects" or "indirect land use changes"), local food security and competition with other local applications, and effects on global commodity prices and the resulting effects on the purchasing power of different groups. How to test macro effects has not yet been worked out, but the Cramer Commission has suggested that the Dutch Government be responsible for accounting for such macro effects when assessing sustainability.

Leakage effects: assessment and prevention

Leakage effects occur when the production of biomass displaces activities to other areas where they may cause undesirable land use changes.[74] For example, suppose that a portion of the supply of palm oil that once used to enter the food market is instead used to meet the demands of the biofuel market and as a result an additional palm plantation is developed in a previously forested area in order to meet the extant food demand. Because biomass production can induce land use changes outside the area of production it can cause the carbon benefits gained in one area to be fretted away at another location. As such, leakage effects represent a serious threat to large scale biomass production for bioenergy.[75] Hence, such leakage effects in principle should be considered under any certification scheme for sustainable biomass.

The problem encountered is that leakage effects can reach global dimensions and therefore are particularly difficult to assess. Biofuel feedstocks such as palm oil, soy oil and sugarcane are commodities that are traded on the global market and therefore leakage effects that occur across borders are probable. While effective national land use policies may deal with local leakages, they are incapable of protecting against displacement effects on the global scale.

[74] There are two types of land use changes. One is direct: a new crop is planted in an area where this form of cultivation was not taken place before (e.g. grassland is ploughed to plant corn for ethanol; set-aside land is used for sugar cane production). The other is indirect: the displacement of food and feed crops on existing cropland by energy crops, which may result in expanding crop production in other parts of the world into native habitats to make up for the loss of food and feed, e.g. corn is grown on acreage previously planted in soybeans. To make up for the loss of soy-based animal feed, other countries plough savannahs or grassland or forests.

[75] Dehue B, Meyer S and Hamelinck C, *op. cit.*

Another complicating factor is that leakage effects act across different crops and land uses. An example that is often sited is the expansion of soy in Latin America. Such expansion may result in the replacement of cattle ranges and small farmers and these in turn encroach on the Amazon forest. So while soy does not replace the Amazonian forest directly, it may lead to deforestation indirectly.[76]

Several current studies demonstrate that indirect land use changes are much more difficult to model than direct land use changes. To do so adequately, researchers must use general equilibrium models that take into account the supply and demand of agricultural commodities, land use patterns, and land availability (all at the global scale), among many other factors. At this time, it is not clear what land use changes could occur globally as a result of biofuels production.[77] While scientific assessment of land use change issues is urgently needed in order to design policies that prevent unintended consequences from biofuel production, including calculations of GHG emissions related to indirect land use changes in the ongoing certification programmes may be premature and conformity assessment may become particularly difficult.

Food security

The large-scale production of biomass often elicits concern about local food security and competition with other local applications of biomass. Actors are apprehensive that increased production of biomass for bioenergy may directly compete with world food production, harming local food security and impacting other local sectors dependent on biomass for other uses. According to FAO,[78] rapid development of liquid biofuels for transport may have immediate impact on food security. Major agricultural producers – such as Brazil, the United States, the European Union and Canada – are expected to reduce exports of basic feedstock commodities, for example cereals or oilseeds, for use in domestic biofuels industries and/or increase imports of biofuels. This has serious food security implications for many developing countries, particularly countries that have large proportions of poor food-insecure people living in rural areas. This concern is especially relevant in relation to first-generation biofuels which are mostly processed from edible plant material, which should be less significant for second-generation biofuels which are being produced from lignocellulosic biomass, enabling the use of lower-cost, non-edible feedstocks, thereby limiting direct food vs. fuel competition. Nevertheless, some have pointed out that both first and second generation biofuel feedstock production compete with food/feed crops for land use and therefore impact food security.[79]

Another concern related to food security is that biomass production for bioenergy will drive up commodity prices, which will negatively impact the poor. Recent FAO research[80] notes that agricultural commodities prices have long been influenced by energy prices; however, increased production of biofuels will further link prices of fossil fuels with prices of biofuels feedstock. Prices of sugar and molasses already show high correlations with world oil prices. Prices for fossil fuels may then essentially establish floor and ceiling prices for agricultural commodities used as feedstock. While it is true that increased demand for a commodity may increase the price, such a scenario results in both winners and losers. Farmers producing and trading the crop may benefit from the increase in price and achieve a higher standard of living, while poor consumers may be worse off and their nutritional needs may suffer. Furthermore, while the bioenergy sector has influence on food prices and access to food, it is important to realize that the food prices and access is a complex phenomenon and demand from the bioenergy sector is merely one factor impacting food security.[81]

[76] *Ibid.*
[77] Wang M and Haq Z (2008). Response to the article by Searchinger et al. *Sciencexpress*. 7 February. "Use of U.S. Croplands for Biofuels Increases Greenhouse Gases through Emissions from Land Use Change".
[78] *Food Security and Bioenergy*, Concept Note presented at the First FAO Technical Consultation on Bioenergy and Food Security, 16-18 April 2007.
[79] Dehue B, Meyer S and Hamelinck C, *op. cit.*
[80] *Food Security and Bioenergy, op. cit.*
[81] Dehue B, Meyer S and Hamelinck C, *op. cit*: 42–43.

FAO analysis also highlights that there may be some incoherence between the biofuel blending requirements put in place by countries that are not efficient biofuel producers and the trade barriers erected by those same countries against biofuel imports. By impeding imports of more efficiently produced biofuels from abroad, those countries may divert more land from food production than would have been necessary to meet the blending requirements, with negative repercussions on food security.[82]

In conclusion, biofuel production can impact on food security in different ways, namely via food availability, food prices, energy prices, farm incomes, rural incomes and international trade. These developments will impact people in different ways.

Nonetheless, competition with food and other local applications of biomass is a real concern that certification schemes aim to address. At this time, there is no established system for tracking the effects of biofuel production on food security and accessing them for sustainability. One of the principles developed by the Cramer Commission is that "the production of biomass for energy must not endanger the food supply and local biomass applications (energy supply, medicines and building materials)". The Dutch project group has developed two criteria that track changes in land use and changes in the prices of food and land in the area of biomass production. However, they have not been able to develop testable indicators for these criteria and therefore propose reporting requirements at the request of the Dutch Government. Additionally, the project group has acknowledged that monitoring will necessarily need to take place at macro level and be the responsibility of the Government. The monitoring and evaluation of food security for the purposes of certification may prove to be extraordinarily complex and costly.

Competition with food and other local applications of biomass and leakage effects are two interrelated macro level concerns. In fact, the replacement of local food production by energy crop production which threatens local food security is simply a sub-type of displacement effect

In conclusion, evaluating the "macro effects" of biofuels production is inevitably an involved process. While considering such effects may greatly contribute to getting a precise picture of the overall impact of biofuels, a balance should be struck between comprehensiveness and technical and administrative feasibility. For macro effects to be included in certification schemes, it would be necessary to develop assessment methods that are as accurate as possible, as well as cost effective and practical, to ensure they can reasonably be implemented for certification purposes. Still, the question remains of who will be responsible for tracking such macro effects (Governments, certification bodies, etc.) and how accountability will be assured.

Table 3. Select examples of monitoring needed to evaluate macro level effects of biomass production as proposed by the Cramer Commission

Effect	Data	Information to be reported
Land prices	Price information on land at the national and regional level.	Prices for basic year (for the planting of biomass) and after the development. The use of public statistics (national).
Food prices	Price information about food, with a distinction between autonomous trends (e.g. in the world market) and more local effects deviating from this trend. Price effects caused by biomass production must be considered in relation with (autonomous) exchange rate developments and the prices of raw materials.	Prices of food products for producers (farmers) and for consumers. The use of public statistics (national, FAO).

[82] *Food Security and Bioenergy, op. cit.*

Effect	Data	Information to be reported
Availability of food	The mapping of food security, or the availability of food for the local population versus prices. Changes (especially decrease) of food products from the region. Make a distinction between autonomous trends and effects of the planting of crops for the production of energy.	Import/export and local balance for the major food products for consumers in relevant area. By regional authorities and national Government.
Deforestation and loss of nature reserves in relation to the supply of food, construction material, fertilizers, medicines, etc.	Monitoring of wooded acreage and nature reserves and effects on availability of food, construction material, fertilizers, medicines, etc.	Satellite data for the monitoring of (shifts in) land use and vegetation. By national Government and independent authority for higher scale levels and relevant regional organizations.

Chapter 3

Implications for developing country producers

Certifying feedstocks and biofuels bears implications especially for producers in developing countries.

3.1 Cost of certification and conformity assessment

Certification will add significant additional costs to the production of biofuels. These expenses are associated with additional costs to meet sustainability criteria for the production of biomass and biofuel processing, and the costs of monitoring compliance with established criteria. Additional costs are related to the chain of custody for segregating and tracking the shipments of certified feedstocks and biofuels.

The level of costs will be highly dependent on the number, strictness and inclusiveness of the criteria established by the certification system. The need to prove adherence to a broad set of social standards will considerably raise the cost of certification. Moreover, the cost of certification borne by producers will likely vary with the scale of the production company. Already, economies of scale considerations marginalize the production prospects for many producers. Second-generation biofuels, which benefit comparably more from large-scale production, are likely to exacerbate this. The cost burdens of certification may serve to intensify the competitive disparities between large and small producers.

Measures to ensure conformity can also act as powerful deterrent for small-scale producers and as non-tariff barriers in international trade if they impose costly, time-consuming and unnecessary tests or duplicative conformity assessment procedures. Developing countries have traditionally encountered difficulties in having the certificates issued by their domestic conformity assessment bodies recognized by the importing countries. In most cases, they have had to rely on the expensive services provided by international certification companies.

Some sustainability criteria and indicators may require laboratory tests (e.g. for soil or water quality assessment) and laboratories usually need to have an accreditation. The costs related to testing, the absence of accredited laboratories or the absence of laboratories altogether in a specific producing area may make compliance with certification requirements cumbersome. While laboratory capacity in developing countries has improved over the years, it still needs to be strengthened.

According to the Cramer Report, the additional costs for certification of small holders are estimated at about 20 per cent of production costs, but it may occasionally be more.[83]

The German Biomass Sustainability Ordinance recognizes that the costs of producing biofuels in compliance with sustainability requirements are likely to be higher than the costs of producing biofuels otherwise. This factor will contribute to an increase in market prices. Other costs include expenditures for biofuel certification. It is recognized that, to the extent that these costs are passed on by suppliers to fuel consumers, this is also likely to cause a slight increase in fuel prices.

Biofuel certification is a new issue; however, much experience exists on forest certification. As already mentioned, several ongoing initiatives on biofuels certification rely on the principles and criteria, and on the overall experience acquired in the forestry field.

Applying general equilibrium modelling under various scenarios representing tropical, temperate and global forest certification, Gan reaches the conclusion that certification incurs both direct and indirect costs.[84] The direct costs include the costs of assessing the forest for certification and monitoring the chain of custody. The indirect costs are associated with implementing a higher standard

[83] At page 5.

[84] Gan J (2005). Forest certification costs and global forest product markets and trade: a general equilibrium analysis. *Canadian Journal of Forest Research*. Vol. 35, Iss.7.

of management practices to comply with the certification requirements. The certification costs usually vary with the size of forest tracts, existing forest conditions and management practices, certification systems and geographical locations. The direct costs are generally between $0.5 and $1.0/ha. The cost of monitoring the chain of custody varies from 0.6 per cent to 1.0 per cent of the product value. This cost may be reduced for mandatory certification schemes. In general, the indirect costs constitute the major component of total certification costs. Despite the cost variations among regions, some general trends have surfaced. On average, as a result of certification, the total costs of forest management are expected to rise from 5 per cent to 25 per cent.[85]

Gan also makes simulations on regional differences in certification costs. Both direct and indirect certification costs (particularly in terms of percentage increases from existing management costs) are likely to be higher in developing than in developed countries. There are at least two reasons for this; (a) data and information on forest resources in developing countries, which are needed for certification, are generally lacking; and (b) existing forest conditions are less favourable to meeting certification standards in developing than in developed countries. In general, the percentage cost increases in developing countries are approximately twice that which exist in developed countries. Without considering too many scenarios while capturing the general situation, the percentage cost increase was assumed to be 50 per cent higher in developing countries than in developed countries.[86]

A recent survey carried out by the Organization for Economic Cooperation and Development (OECD) on conformity assessment reached the following main conclusions: where independent conformity assessment is performed on products traded internationally, a large proportion of the products concerned appear still to be assessed in the import market. Given that Governments, in an effort to minimize negative impacts of conformity assessment procedures on trade, have in recent years taken steps to promote the principle of "one product, one test, accepted everywhere", this continued high use of testing in individual destination markets suggests that multiple testing should be a cause for concern. An important contributing factor appears to be the failure by authorities in destination markets to recognize home-country accreditation of conformity assessment bodies in the producer country, despite many attempts by Governments and groups of cooperating accreditation bodies to facilitate such recognition. It also appears that the Supplier's Declaration of Conformity is not having a major impact in reducing third-party conformity assessment, contrary to the objectives of many government programmes.[87]

It is worth recalling that the WTO Agreement on Technical Barriers to Trade (TBT Agreement) mandates WTO members to take into account the special development, financial and trade needs of developing countries when preparing technical regulations, standards and conformity assessment procedures, to avoid creating unnecessary obstacles to exports from developing countries (article 12.3). The agreement also provides for technical cooperation to developing countries to ensure that the preparation and application of technical regulations, standards and conformity assessment procedures do not create unnecessary obstacles to the expansion and diversification of exports from developing countries (article 12.7).

The danger is that the additional costs associated with certification, testing and conformity assessment may mean that small producers are unable to afford to comply with certification, especially when price premiums cannot be charged or are not significant. The result would be a loss of market share for small farmers and companies and a dominance of the market by large corporations. Additionally, if certification costs inhibit the participation of small agents, such a scheme may fail to promote the economic interests and development of the local area and counter a country's rural development aims.

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[85] *Ibid.*: 1733.
[86] *Ibid.*: 1733–1734.
[87] OCED (2006). *Trends in Conformity Assessment Practices and Barriers to Trade: Final Report on Survey of CABs and Exporters*. OECD Trade Policy Working Paper No.37, TD/TC/WP(2006)6/Final.
The report presents findings from a survey conducted in 2005–2006 of conformity assessment bodies (CABs) and exporting companies from the OECD region.

Since such complications have been noted in past certification schemes and, as mentioned above, have been an issue with forest certification in particular, several proposed biofuels schemes have been proposed to address the issue. As such, they have proposed ways of providing opportunities for individual farmers, including the possibility of group certification. The Cramer Report has also suggested that buyers might support access to the market for small producers by stipulating as a condition that a certain part of the biomass should originate from small producers. The same approach is followed by Brazil in its social programme for biodiesel. Additionally, the Cramer Commission has proposed that sustainability requirements be simplified for small producers where necessary.

The extra costs of certification and conformity assessment may especially affect producers in developing countries. Certification requirements should be coupled with financing and technical assistance to improve developing country capacity to master and apply any certification scheme and enhance the technical capacity and credibility of their conformity assessment bodies.

This begs the question of who will supply such assistance and who will pay for such programmes. Will an established certification scheme make allowances for such support or flexibility to simplify the criteria based on the circumstances of the producer?

3.2 Establishing certification schemes and developing country participation

Concerns repeatedly expressed by developing countries about certification refer to the fact that certification schemes do not always tailor solutions to local conditions; they may apply a one-size-fits-all approach, failing to reflect that one process or production method may be appropriate in one part of the world, but quite inappropriate in another. Some schemes may favour particular process and production technologies that may be unavailable, unsuitable or prohibitively expensive for trading partners. Also, most certification and label schemes originate with significant input from domestic producers who may have vested interests in establishing particular requirements.[88]

To ensure that certification does not become an obstacle to international trade, especially for developing countries, sustainability principles and criteria should be developed through a transparent and fair process where countries, both producing and consuming, are effectively represented. By including in the formulation of the criteria producers who are knowledgeable about a specific producing region and its constraints, the certification schemes will likely be more easily understood and more effectively applied. While site-specific rules may tempt a level of discretion that complicates the standardization process, if applied with appropriate prudence, prioritized indicators could be articulated and quantified in a way that facilitates engagement in sustainable production in all regions.

A critical constraint to effective participation by developing countries in the development of criteria and indicators may refer to the lack of capabilities at the national level for the evaluation of draft criteria and the formulation of positions in consultation with all interested parties. This means that solutions such as sponsoring the participation of developing country stakeholders in plenary meetings where principles, criteria or indicators are formally approved are positive but not sufficient. The adequate and effective participation of developing countries in the criteria development process relies on their technical capacity to contribute to the process by proposing solutions and criteria that are consistent with their technological, agricultural and developmental conditions. To this end, support is needed to improve developing country capacity to evaluate proposed criteria and formulate national/subregional/regional positions. On the contrary, should efforts only be aimed at increasing the number of developing country representatives present at the meetings, it would be inadequate and even counterproductive for developing countries, since it would make it possible to define as "genuinely involving developing countries" activities which have not done so in reality.

The TBT Agreement states that members shall take measures to ensure that international standardization bodies and international systems for conformity assessment are run in a way that

[88] OECD (2007). CRS and trade: Informing consumers about social and environmental conditions of globalized production. TD/TC/WP(2006)17/FINAL, OECD Trade Policy Working Paper No. 47 - Part I, January: 14.

facilitate the effective participation of relevant bodies of all member countries, taking into account the special problems of developing countries (article 12.5).

Issues related to the implementation of the TBT Agreement have been discussed at length by the WTO Committee on Technical Barriers to Trade and developing countries have repeatedly expressed concerns about their ability to comply with a large and growing number of technical regulations and standards which are country-specific. They have stressed that voluntary measures may nevertheless have significant market impacts, and have emphasized that compliance with new requirements implies the development of new capacities and this may be a rather long and costly process. They have also stressed the serious problems they experience with testing and conformity assessment, and reported on the costs and delays that lack of recognition of conformity assessment declarations issued by their authorities imply. Moreover, developing countries have recalled that several among them are unable to effectively participate in the international standard setting process and, therefore, face difficulties when requested to meet requirements based on international standards in the importing country markets.

Sustainability certification will add significant costs to the production of biofuels. Those costs will likely be higher for developing countries as opposed to industrialized countries, and for smallholders as opposed to large-scale producers. Certification schemes should therefore make allowances for supporting small producers, especially in developing countries. Equally, support is needed to improve developing country ability to issue credible declarations of conformity and to test products. Concerns remain on developing country ability to effectively participate in the process of development of the certification schemes and about the risk of domestic producers to play a disproportionately influential role in the establishment of sustainability requirements.

Chapter 4

Implications of certification for the WTO

Global energy and environmental concerns combined with comparative advantage considerations are powerful motivating factors behind international trade in biofuels and related feedstocks. Indeed, international trade is expected to grow fast.

Government-sponsored certification programmes link certification with tax breaks and other fiscal incentives, and with the fulfilment of national or regional blending targets and renewable energy use obligations. As a consequence, certification is expected to become a crucial product requirement for both domestically produced and imported biofuels. Moreover, certified biofuels may be more acceptable to consumers than non-certified biofuels.

The above-mentioned elements raise the profile of WTO provisions relevant to biofuel certification. Indeed, when developing their certification programmes, Governments are aware of the obligations they have subscribed at WTO, and ensuring the "WTO consistency" of certification programmes is a goal they pursue.

The aim of this chapter is to analyze the provisions included in the WTO agreements that are specifically relevant for biofuel certification and, by going through relevant WTO jurisprudence, provide some general indications on those aspects of the present schemes that may prove particularly problematic under WTO law. It is, however, important to keep in mind that any enquiry under WTO law should proceed on a case-by-case basis, with careful scrutiny of the factual and legal context in a given case. Notwithstanding these remarks, we intend to proceed by examining how various key WTO concepts, such as "likeness", may be construed as far as biofuels are concerned, under the assumption that the overall conceptual framework may shed light on the specific issue.

4.1 WTO coverage of measures based on life cycle analysis

The TBT Agreement covers technical regulations and standards, including packaging, marking and labelling requirements, and procedures for conformity assessment. The Code of Good Practice for the Preparation, Adoption and Application of Standards (annex 3 of the TBT Agreement) refers to the activities carried out by any standardization body, including non-governmental bodies, which develop standards, i.e. rules, guidelines or characteristics for products and related processes and production methods with which compliance is not mandatory (as opposed to technical regulations with which compliance is mandatory). The code seeks to bring all standards within its purview and provides for transparency in the preparation, adoption and application of standards.

A "grey" area in the field of labelling remains the TBT coverage of labelling programmes that refer to the way goods have been produced, even though the production methods are not reflected in the final characteristics of the product (non-product-related processes and production methods (npr PPMs). The main concern about those measures is that, by establishing requirements on the way products should be manufactured, they limit the freedom of foreign producers to produce according to the technologies they have available and following the priorities and strategies set up by their Governments. They would then represent an undue interference of one country into the sphere of discretion of another. Moreover, npr PPMs could rather easily be used for protectionist purposes, creating barriers to international trade, which would negatively affect developing country producers in particular.

While a multiplicity of labelling programmes are based on the life cycle approach and therefore take PPMs into account, many WTO members keep the position that such programmes, by referring to processes and production methods that are not reflected in the final characteristics of the products, are not covered by the TBT Agreement.[89] If this were the case, they would then be

[89] "Familiar differences of views remain on what was characterized by one member as the root cause of controversy surrounding the labelling debate: the WTO compatibility of measures based on non-product-related

scrutinized under the General Agreement on Tariffs and Trade (GATT), in particular under articles I, III, XI and XX. This would, however, lead to the result that measures based on npr PPMs, despite their potential negative effects on international trade, would fall under a "general" agreement – GATT – while measures based on PPMs which are reflected in the final characteristics of the product would fall under a "specific" and stricter agreement – TBT. This is despite the fact that the former requirements are potentially more trade restrictive than the latter. Hence, this interpretation, which excludes npr PPMs from the TBT coverage, does not seem logical.

Another question in TBT coverage of labelling and certification initiatives concerns the case of standards developed by private bodies which have not accepted the Code of Good Practice (according to para. B, the code is open to acceptance by any standardization body, including non-governmental, but adherence to the code is voluntary), or which may not have the legal power to enforce the standards they have set up (according to para. 8 of annex 1 on terms and definitions, a "non-governmental body" is one which has legal power to enforce a technical regulation. The "legal power to enforce a technical regulation" is not defined by the code. It could possibly refer to the authority to grant or withdraw a label or to file complains for violation of national legislation on consumer protection in case of misuse of a label). Moreover, there is the case of "hybrid" entities – such as the Round Table on Sustainable Biofuels – composed of representatives of public and private entities, international organizations and NGOs. It is unclear whether such entities could be regarded as international standardization bodies[90] and the principles and criteria they develop as international standards then covered by a presumption of conformity with the TBT Agreement.

On the other hand, if those initiatives are regarded as private schemes which fall outside the scope of the TBT Agreement, they would escape from multilaterally-agreed trade rules – such as non-discrimination, abstention from creating unnecessary obstacles to trade, proportionality and transparency. Nevertheless, they would have a significant impact on trade flows. There is still the possibility that private standards be captured under GATT as governmental measure if there is a strong link between the private action and the Government in question, as in the case where a country decides to grant some incentives to certified biofuels and in doing so relies on the certification scheme developed by a private body.[91]

4.2 Transparency

A quite active debate took place in the 1990s regarding, among other issues, the transparency of eco-labelling schemes. Such schemes share several characteristics with biofuels schemes. They are developed by Governments, private non-commercial entities, industry associations or private companies, with basically two objectives: to give more information to consumers about the environmental effects of products they are consuming and to raise environmental standards in the manufacturing of specific products. In some cases, they are also meant to give producers in the country where the eco-label is issued a comparative advantage over foreign produce.

The concerns which prompted a debate on the transparency of eco-labelling schemes within the WTO committees on trade and environment and on technical barriers to trade were that eco-labelling schemes – by being voluntary and often developed by private bodies – would fall under the

processes and production methods (npr PPMs)" (para. 34). "Concern was expressed with regard to the concept of life cycle approach and the notion of agreeing on the "principle" of the legitimacy of such schemes under WTO rules; it was pointed out that any interpretation of voluntary eco-labelling programmes needed to come from the TBT committee" (para. 36). *Report to the 5th session of the WTO Ministerial Conference in Cancún - Paragraphs 32 and 33 of the Doha Ministerial Declaration*. WT/CTE/8, 11 July 2003.

[90] According to annex 1 of the TBT Agreement on Terms and Definitions, international bodies or systems are those whose membership is open to the relevant bodies of at least all WTO members. This definition is not detailed enough to be of practical use.

[91] See paragraphs 106 to 109 in *Japan – Trade in Semiconductors* (L/6309). Report of the Panel adopted on 4 May 1988, BISD 35S/116, where the panel found that it was not necessarily the legal status of the measure which was decisive in determining whether or not it fell under article XI:1.

transparency rules set by the Code of Good Practice, which are not very stringent.[92] Moreover, as mentioned above, the acceptance of the code by standardization bodies is optional. WTO members reached the agreement to make efforts on a voluntary and non-binding basis to maximize the use of the Code of Good Practice for eco-labelling programmes and to apply the notification obligations meant for mandatory measures to voluntary measures, including those developed by non-governmental bodies. A similar solution could apply to certification schemes of biofuel/feedstock, especially voluntary programmes developed by non-governmental bodies. The main benefit of such a solution is that producers and exporters would be informed in advance of the development of certification and labelling programmes and would have opportunity to provide comments on proposals as well a time to adjust to the new requirements before their implementation.

4.3 "Like" products and the general exceptions of article XX of GATT 1994

Defining "like" products

Multilateral trade rules apply to certain aspects of regulatory policies and impose some limits to the freedom of Governments in this field. Central to these rules is the concept of "like" products: in principle, regulations should not discriminate between products that compete with each other in a given market. However, some exceptions may be invoked to justify discriminatory treatments, including for environmental protection.

While the most favoured nation (MFN) principle incorporated into GATT article I requires equal treatment among different countries, the national treatment obligation incorporated into GATT article III requires the treatment of imported goods, once they have entered the country and cleared customs, to be no worse than for domestically-produced "like" goods, especially in regard of internal taxes and regulations. The purpose of the rule is to prevent domestic tax and regulatory policies from being used as protectionist measures and nullify the benefits of tariff concessions. The national treatment obligation is one of the most important and also one of the most contentious provisions of the WTO trading system. Consequently, it has been the subject of a large number of cases in the GATT/WTO dispute resolution system.[93]

Article 2:1 and annex 3, para. D of the TBT Agreement restate the principle of non-discrimination (i.e. MFN plus national treatment) set forth in article I:1 and article III:4 of GATT 1994.

The criteria being developed to single out sustainably-produced biofuels and related feedstocks and distinguish them from biofuels and feedstocks which lack these characteristics raise a fundamental question over whether such a distinction between products which share the same physical characteristics and final uses is consistent with multilaterally-agreed trade rules. In other words, the question is whether certified biofuels and non-certified biofuels may or may not be regarded as "like" products.

It is noteworthy that, despite being central to GATT article III and its note, the term "like products" is neither defined in GATT, nor has it been authoritatively interpreted by the WTO member countries. Its meaning has been clarified and has evolved through the practice of the panels and of the appellate body.

The working party report on border tax adjustments[94]identified three general criteria that would be relevant for analyzing the "likeness" of particular products on a case-by-case basis: (a) the products' properties, nature and quality; (b) the products' end-uses in a given market; and (c) consumers' tastes and habits, which change from country to country. Later jurisprudence added tariff classification as a supplementary consideration in this respect.[95] The appellate body in the *Japan* –

[92] WTO members, however, increasingly use them to make them more useful and relevant.
[93] Jackson JH (1989). National treatment obligations and non-tariff barriers. 10 *Michigan J. Int'l L.*:208.
[94] BISD 18S/97, adopted on 2 December 1970, para. 18.
[95] EEC – Measures on Animal Feed Proteins. Adopted on 14 March 1978, BISD 25S/49, para. 4.2; Japan – Customs Duties, Taxes and Labelling Practices on Imported Wines and Alcoholic Beverages. Adopted on 10

Taxes on Alcoholic Beverages case described the working party report on border tax adjustments as setting out "the basic approach for interpreting 'like or similar products', generally, in the various provisions of the GATT 1947".[96] In a subsequent case, *EC–Asbestos*, the appellate body confirmed that the mentioned general criteria provided a framework for analysing "likeness", but reiterated as well that they were "…simply tools to assist in the task of sorting and examining the relevant evidence. They are neither a treaty-mandated nor a closed list of criteria that will determine the legal characterization of products. More important, the adoption of a particular framework to aid in the examination of evidence does not dissolve the duty or the need to examine, in each case, all of the pertinent evidence."[97]An overall determination of whether the products at issue could be characterized as "like" requires, thus, that the evidence relating to each of those four criteria, along with any other relevant evidence, be examined and weighed.

In assessing whether products are "like", the product/process distinction has often been raised.[98] On the one hand, it has been argued that there is no real support in the text and jurisprudence of the GATT for the product/process distinction[99] and that the distinction is neither warranted nor useful in practice.[100] On the other hand, it has been suggested that there is a textual basis in GATT article III and the note ad article III for the product/process distinction and that the distinction should be retained to prevent protectionist abuses.[101] The product/process distinction is therefore an open issue. Jurisprudence related to GATT article XX (General Exceptions), on the other hand, has evolved to interpret article XX as covering measures that distinguish products on the basis of the production processes.[102]

In the *Asbestos* ruling, the Appellate Body made a significant finding concerning evidence relating to the health risks associated with a product, stating as follows: "We are very much of the view that evidence relating to the health risks associated with a product may be pertinent in an examination of 'likeness' under article III:4 of the GATT 1994".[103] Establishing links between the "likeness" of two products and their respective impact on health has important implications, especially if we assume that other non-trade concerns, such as environmental protection or climate change mitigation, could also be used as elements to be taken into account when assessing "likeness". As far as biofuels are at stake, this approach might allow a distinction based on the contribution of sustainable – as opposed to non-sustainable – biofuels and feedstocks to mitigating the environmental and health problems related to climate change. In the appellate body's reasoning in the *Asbestos* case, however, the health risk associated with a product may be pertinent to the extent that, reflecting on the physical properties of the

November 1987, BISD 34S/83, para 5.6; United States – Measures affecting Alcoholic and Malt Beverages. Adopted on 19 June 1992, BISD 39S/206-299, para 5.24 and 5.71;United States – Standards for Reformulated and Conventional Gasoline, Report of the Panel, WT/DS2/R, 29 January 1996, para 6.8 and 6.9.

[96] Japan – Taxes on Alcoholic Beverages. Report of the Appellate Body, adopted on 1 November 1996, WT/DS8/AB/R, WT/DS10/AB/R, WT/DS11/AB/R, p. 20.

[97] European Communities – Measures Affecting Asbestos and Asbestos-Containing Products. Report of the Appellate Body. Adopted on 5 April 2001, WT/DS135/AB/R, para 102.

[98] However, it has been stressed that the "trade policy elite has simply accepted the notion of a sharp divergence between measures on products and PPMs as if such a distinction had been written into the GATT all along, and not simply invented in the *Tuna/Dolphin* case": Trebilcock M.J. and R. Howse, *The Regulation of International Trade* (London and New York: Routledge, 1999): 413.

[99] Howse R and Regan D (2000). The product/process distinction - an illusionary basis for disciplining 'unilateralism' in trade policy. *European Journal of International Law* 11: 249 ff., at 264-268.

[100] Cosbey A (2001). The WTO and PPMs: time to drop a taboo. *Bridges* 5 No. 1-3: 11–12.

[101] Jackson JH (2000). Comments on shrimp/turtle and the product/process distinction. *European Journal of International Law* 11: 303–307.

[102] In the *US–Shrimp* case (*United States–Import Prohibition of Certain Shrimp and Shrimp Products*, Appellate Body Report adopted on 12 October 1998, WT/DS58/AB/R), the Appellate Body stated, "It appears to us, however, that conditioning access to a Member's domestic market on whether exporting Members comply with, or adopt, a policy or policies unilaterally prescribed by the importing Member may, to some degree, be a common aspect of measures falling within the scope of one or another of the exceptions (a) to (j) of Article XX.(para 121)."

[103] *EC–Asbestos*: 113.

product and affecting consumers' tastes and habits, it is likely to influence the competitive relationships between products in the marketplace. More generally, the line of reasoning in *Asbestos* seems to suggest that non-trade concerns may be pertinent in an examination of "likeness" under article III:4 when they impact on the "competitiveness" or "substitutability" of a product in relation to other products: "…a determination of 'likeness' under article III:4 is, fundamentally, a determination about the nature and extent of a competitive relationship between and among products".[104] Non-trade aspects are not relevant as such, but so far as they influence commercial factors.[105]

Hence, a particular emphasis should be put on how the domestic market treats the certified (presumably sustainable) biofuels and feedstocks and the uncertified ones, what is their competitive relationship in the marketplace, and whether consumers perceive them as distinct products. Market studies on cross-price elasticity of demand and any other evidence indicating to what extent the products involved are – or could be – in a competitive relationship in the marketplace, would be among the evidence relevant for determining "likeness" under GATT article III:4.

The case of biofuels and feedstocks certification presents, however, an additional complexity, since products may be distinguished not only on the basis of their possible impact on health or on the environment, but also with reference to labour and other social standards. The issue of trade and labour standards has been with WTO since its birth. However, at the first WTO Ministerial Conference in Singapore in December 1996, it was agreed that market access should not be linked with labour standards. While WTO jurisprudence has evolved to become more sensitive to non-trade concerns, especially in the health and environmental fields, it is highly questionable whether it would be equally open to accept trade discrimination linked to labour and other social conditions, especially considering that WTO member countries have expressed themselves against it.

Like products and domestic taxation

The "like products" issue may also be of relevance as far as domestic taxation is at stake, particularly because the government-sponsored biofuels certification initiatives reserve tax breaks and incentives only to certified biofuels.

According to GATT article III:2, regulations and taxation measures should not discriminate between "like" products. If different biofuels – such as certified and uncertified biofuels – fall into the category of "like" products, a country that apply to them different tax regimes may be considered to violate its multilateral trade obligations unless it has legitimate reasons for holding such a discriminatory system. We then go back to the issues of, first of all, whether sustainability, or the lack of it, would be enough to make products "unlike" and then lawfully subject to different tax treatments. Secondly, in case certified and uncertified biofuels were regarded as "like" products, whether the exceptions of GATT article XX (b) and (g) could be invoked to justify discriminatory tax treatments. These issues will be examined in the sections below.

"Less favourable treatment"

If products are found to be "like", two separate issues must be addressed to determine whether an internal regulatory measure is inconsistent with article III: (a) the imported and domestic like products are treated dissimilarly; and (b) the dissimilar treatment is applied so as to afford protection

[104] *Ibid.*: 99.

[105] Zarrilli S and Musselli I (2002). Non-trade concerns and the WTO jurisprudence in the asbestos case: possible relevance for international trade in GMOs. *The Journal of World Intellectual Property*. May. This reading of the report is opposed by those who believe that Governments have a right to discriminate between products on the basis of factors other than purely commercial ones, especially when they relate to physical characteristics. To hold otherwise, according to these analysts, is to remove almost all of government policymaking (as it applies to products) into an exception to GATT: not something its founders would have thought wise.

to domestic production.[106] Only if a "less favourable treatment" is detected – meaning a certain asymmetry between the group of imports as opposed to the group of domestics - the measure can be considered to be in violation of article III:4. "The term 'less favourable treatment' expresses the general principle, in article III:1, that internal regulations 'should not be applied…so as to afford protection to domestic production'….However, a member may draw distinctions between products which have been found to be 'like', without, for this reason alone, according to the group of 'like' imported products 'less favourable treatment' than that accorded to the group of 'like' domestic products".[107]

Assuming that certified and uncertified biofuels are found to be "like" products, there is a second element that must be established before a measure can be held to be inconsistent with article III:4: imported biofuels are accorded less favourable treatment than domestic biofuels.

In the *EC–Biotech* case,[108] the panel reached an interesting conclusion in this regard. It stated that, to hold a violation of article III, the "less favourable treatment" of imported products should be explained by their foreign origin, rather than by other reasons, such as a perceived difference between products in terms of their safety or other characteristics. More specifically, the panel held that the fact that biotech products and non-biotech products were treated differently in the EC market was not the central issue; what was more relevant was that the different sets of rules which applied to them were not linked to their origin. Indeed, imported and domestic biotech products were treated equally, as were imported and domestic non-biotech products. Though different rules applied to these two categories of products, they were not justified by the origin of the products. It is noteworthy that the panel decided to analyse the "no less favourable treatment" obligation before the "like products" element. Having reached the conclusion that the complaining country – Argentina – had not been able to prove its products had been treated "less favourably" than domestic EC products, it did not need to address the issue of likeness between biotech and non-biotech products.

It is unclear whether the approach taken by the panel in the *Biotech* case will be upheld by future WTO jurisprudence, especially by the Appellate Body. Should this be the case, it would represent a departure from rather consolidated views that put "likeness" at the core of the analysis under GATT article III. Emphasis would switch from "likeness" to "less favourable treatment", hence partially depriving the issue of "likeness" of its relevance.

Applying the panel's reasoning to biofuels could lead to the conclusion that different sets of rules could apply to certified as opposed to non-certified biofuels and this would be consistent with WTO law, so long as the same set of rules applies to domestic and imported certified biofuels, and to domestic and imported non-certified biofuels. Nevertheless, this conclusion would hold only if the measures at stake were not aimed at de facto discriminating foreign products under the disguise of distinguishing them on the basis of some differences unrelated to origin. The way biofuel certification schemes are developed and the opportunities which are given to foreign producers to be part of the process and to get their products certified without incurring into prohibitive and unjustified costs and delays would probably be highly relevant to assess whether a "less favourable treatment" is in place. Jurisprudence in the *Shrimp* case may support this view.[109]

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[106] *Japan—Taxes on Alcoholic Beverages*. Report of the Appellate Body, adopted on 1 November 1996, WT/DS8/AB/R, WT/DS10/AB/R, WT/DS11/AB/R, p. 24.

[107] *EC–Asbestos*, at para. 100.

[108] Panel Report, *European Communities – Measures Affecting the Approval and Marketing of Biotech Products (EC–Biotech)*, WT/DS291/R, WT/DS292/R, WT/DS293/R, 29 September 2006, at paragraphs 7.2511 to 7.2516.

[109] In the *Shrimp* case, the United States was found at fault for not consulting/negotiating with exporting countries and for imposing its own standards: "Another aspect of the application of section 609 that bears heavily in any appraisal of justifiable or unjustifiable discrimination is the failure of the United States to engage the appellees, as well as other members exporting shrimp to the United States, in serious, across-the-board negotiations with the objective of concluding bilateral or multilateral agreements for the protection and conservation of sea turtles, before enforcing the import prohibition against the shrimp exports of those other Members." (Para. 166).

The general exceptions of article XX of GATT 1994

If a measure is found to violate GATT article III, it requires justification under one of the specific subparagraphs of GATT article XX and under its chapeau. Article XX gives countries the legal means to balance their trade obligations with important non-trade objectives – such as health protection, the preservation of the environment or the protection of natural resources – which form part of their overall national policies.

Analysis will now turn to the possible application of article XX (b) and (g) to biofuels certification schemes, in particular as far as those schemes prioritize the accounting of GHG emissions and their reduction. Biodiversity preservation and more generally environmental protection are also among the goals that several certification initiatives pursue, however, they quite naturally fall within the range of policies covered by article XX (b) and (g).

To meet the requirements of article XX (b) – which refers to measures necessary to protect human, animal or plant life or health – the provision at stake should (a) fall within the range of policies designed to protect human, animal or plant life or health; (b) be necessary to fulfil the policy objective; and (c) fulfil the requirements of the chapeau of article XX.[110]

In the *United States – Gasoline* case, the panel held that "the policy to reduce air pollution resulting from the consumption of gasoline was a policy within the range of those concerning the protection of human, animal and plant life or health mentioned in article XX(b)".[111] Assuming climate change can be regarded an extreme form of air pollution which can have negative impacts on human, animal and plant life or health, measures aimed at mitigating climate change effects seem to fall within the range of policies under para. (b).

Turning to the second requirement – necessity – GATT/WTO jurisprudence has interpreted "necessary" as implying a "least-trade-restrictive test": a measure cannot be considered "necessary" if an alternative measure which is not inconsistent with GATT provisions or is less inconsistent with them is available and could reasonably be expected to be used. In the *Korean – Beef* case, the Appellate Body added some elements of clarification to interpret "necessary": it underscored that the "the word 'necessary' is not limited to that which is 'indispensable' " and held that "…determination of whether a measure, which is not 'indispensable' may nevertheless be 'necessary' within the contemplation of article XX(d)[112], involves in every case a process of weighing and balancing a series of factors which prominently include the contribution made by the compliance measure to the enforcement of the law or regulation at issue, the importance of the common interests or values protected by that law or regulation, and the accompanying impact of the law or regulation on imports or exports".[113] One aspect of the weighing and balancing process is the extent to which an alternative measure "contributes to the realization of the end pursued".[114] Moreover, according to the Appellate Body, "[t]he more vital or important those common interests or values are, the easier it would be to accept as 'necessary' a measure designed as an enforcement instrument".[115]

Recent jurisprudence has further developed the interpretation of the necessity test under article XX. In the *Brazil – Retreaded Tyres* case, the Appellate Body held that even measures which produced severe restrictions to international trade, such as import bans, could be regarded as necessary provided that they were apt to make a material contribution to the achievement of their objectives.

[110] *United States – Standards for Reformulated and Conventional Gasoline*. Report of the Panel, WT/DS2/R, 29 January 1996, para 6.21.
[111] *Ibid.*, para 6.21. It is noteworthy that while this case did recognize air pollution as a legitimate health and safety issue, the regulation at stake aimed at the intrinsic characteristics of the product, not at PPM.
[112] The necessity requirement under paragraph (b) has been interpreted as corresponding to the one under paragraph (d); see *Thailand – Restrictions on Importation of and Internal Taxes on Cigarettes*, adopted on 7 November 1990, BISD 37S/200-228, para. 74.
[113] *Korea – Measures Affecting Imports of Fresh, Chilled and Frozen Beef*. Report of the Appellate Body, WT/DS161/AB/R, WT7DS169/AB/R, adopted on 10 January 2001, para. 161 and 164.
[114] *Ibid*., para 166 and 163.
[115] *Ibid*., para 162.

Conversely, measures that made only marginal or insignificant contributions to the achievement of their objectives could not be regarded as necessary. However, the demonstration that a measure is apt to produce a material contribution to the achievement of its objectives "could consist of quantitative projections in the future or qualitative reasoning based on a set of hypotheses that are tested and supported by sufficient evidence". Interestingly, the Appellate Body added, "Moreover, the results obtained from certain actions – for instance measures adopted in order to attenuate global warming and climate change – can only be evaluated with the benefit of time."[116]

Applying these considerations to biofuels certification, we could draw some conclusions: (a) nobody can argue against the fact that climate change stabilization is at present a very important common interest; (b) in order to deal with climate change, countries may need to put in place a comprehensive policy and use several interacting measures whose effect may be appreciated only after a substantial period of time has elapsed. Therefore, certification aimed at encouraging GHG emissions reduction may in principle pass the "necessity" test. Moreover, labelling and certification are usually regarded as "soft" policy instruments, as opposed for instance to import restrictions and bans, therefore they should also pass the "least trade restrictiveness" test.

The additional criterion for a provision to meet one of the specific exceptions of article XX, including paragraphs (b) and (g), is that it fulfils the requirements of the chapeau of article XX. In the *United States – Shrimp* case, the Appellate Body stated that there are three standards contained in the chapeau: (a) the measure must not constitute arbitrary discrimination between countries where the same conditions prevail; (b) the measure must not constitute unjustifiable discrimination between countries where the same conditions prevail; and (c) the measure must not constitute a disguised restriction on international trade.[117] As far as biofuel certification is concerned, the issue seems to be whether distinguishing biofuels on the basis of their sustainability is a policy genuinely aimed at ensuring sustainability, or if it is a way to protect domestic producers who can more easily fulfil the principles and criteria set up in the certification schemes.

Next is the exception of article XX(g), which refers to measures relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.

According to panel practice, a country which wants its measure to be justified by paragraph (g) has to demonstrate that (a) the policy in respect of the measures for which the provision is invoked falls within the range of policies related to the conservation of exhaustible natural resources; (b) the measures for which the exception is invoked are related to the conservation of exhaustible natural resources; (c) the measures for which the exception is invoked are made effective in conjunction with restrictions on domestic production or consumption; and (d) the measures are applied in conformity with the requirements of the introductory clause of article XX.[118]

In the *Gasoline* case, the panel held that clean air was a resource, was natural and could be depleted; therefore, a policy to reduce the depletion of clean air was a policy to conserve a natural resource within the meaning of article XX(g).[119] Measures aimed at climate change mitigation could then be regarded as falling within the range of policies related to the conservation of exhaustible natural resources.

Turning to the second criterion – namely "relating to the conservation of exhaustible natural resources"– it has been interpreted in a series of panel decisions as "primarily aimed at" the conservation of exhaustible natural resources. In the *Gasoline* case, the Appellate Body clarified that to qualify under this criterion, a measure should exhibit a "substantial relationship" with the conservation of natural resources and should not be merely "incidentally or inadvertently aimed at" it.

[116] *Brazil – Measures Affecting Imports of Retreaded Tyres*. Report of the Appellate Body, WT/DS332/AB/R, 3 December 2007, para 150 and 151.
[117] *US –Shrimp*, para 150.
[118] *US – Gasoline*, para. 6.35.
[119] *Ibid.*, para. 6.37.

In the *Shrimp* case, however, the Appellate Body seems to have relaxed the "primarily aimed at" test, by allowing as well measures which are "directly connected" with the conservation policy to pass the test of paragraph (g).[120] Again, biofuels certification may pass this test, since certifying biofuels and encouraging producers to engage in sustainable production which is conducive to GHG emissions reductions seem sufficiently connected to the conservation of clean air. It seems, however, that the test would be more easily passed if biofuel certification were one of the several policy instruments put in place by a country to deal with climate change, and not the only one.

Turning to the condition that the contested measure shall be "made effective in conjunction with restrictions on domestic production or consumption", para. (g) clearly requires a link between the measure at stake and restrictions on domestic production or consumption, though it does not require identical treatment for imported and domestic products. Hence, we go back to the situation analyzed above where what is of relevance is whether the same set of rules applies to domestic and imported "sustainable" biofuels, and to domestic and imported "non-sustainable" biofuels.

Conformity with the chapeau of article XX has already been analyzed.

In conclusion, if distinguishing biofuels on the basis of their sustainability and applying different sets of rules to sustainable as opposed to non-sustainable biofuels is regarded to be in violation of article III, those measures may, however, find justification under either paragraph (b) or paragraph (g) of article XX and under its chapeau. This assumes that the final goal of such measures is indeed environmental preservation or health protection.

Things change radically, however, if the final goal of certification schemes is ensuring compliance with certain labour standards, enhancing food security or offering better income opportunities to feedstock producers. There is consensus on the fact that article XX contains a "closed" list of general exceptions, therefore the above mentioned considerations, despite their intrinsic value, do not fit into it and measure aimed at pursuing such goals, if otherwise inconsistent with WTO rules, could not find justification under GATT article XX.

Distinguishing biofuels and feedstocks on the basis of sustainability remains a complex legal issue. Firstly, WTO law contains some loopholes and "grey" areas on issues which would be of key relevance for biofuels certification schemes, starting with the fundamental question of whether such schemes, when developed by private bodies, are covered by WTO rules or, conversely, should be regarded as private marketing schemes that escape from the scope of WTO law. Secondly, and assuming that they are indeed within the scope of WTO rules, some crucial questions remain about the legitimacy of distinguishing products according to npr PPMs, especially if those npr PPMs are far-reaching and aim at addressing issues such as fair labour conditions, food security or rural development. The npr PPMs included in biofuels certification schemes are very different from those analyzed so far by WTO panels and by the Appellate Body which mainly refer to environmental preservation and public health protection. While WTO jurisprudence has proved increasingly flexible to accept the differentiation of products based on their environmental and health impacts through life cycle, doubts exist that it will prove sympathetic to consider favourably product differentiation based on how manufacturing processes may contribute to ensure adequate work conditions or provide development opportunities to farmers. The list of GATT article XX being a "close" list, this kind of consideration may not fit within that article. New emphasis put by recent panel jurisprudence (but not the Appellate Body) on the "less favourable treatment" element of GATT article III may deprive the issue of distinguishing products on the basis of manufacturing processes of some of its relevance.

If, from a legal point of view, some issues – such as the fact that article XX covers unilateral measures or that countries enjoy increased flexibility to use product differentiation – have been

[120] "This is, essentially, a requirement that a country adopt a regulatory programme requiring the use of TED by commercial shrimp trawling vessels in areas where there is a likelihood of intercepting sea turtles. This requirement is, in our view, directly connected with the policy of conservation of sea turtles." (para 140). See: Mavroidis PC (2000). Trade and environment after the *Shrimps–Turtles* litigation. *Journal of World Trade*. 34(1): 85.

clarified, it does not mean that those issues are settled from a market access point of view. On the contrary, these developments may lead to a situation where several countries implement simultaneously unilateral measures, including biofuel certification schemes, and all these measures may be WTO-consistent. The capacity of producers, especially developing country producers, to be aware of these measures and comply with them remains, however, highly questionable.[121]

[121] This point was made by Gabrielle Marceau at the September 2007 World Trade Institute (WTI) Forum.

Chapter 5

Making certification work for sustainable development: the way ahead

At the present time, a wide range of stakeholders has embarked upon various initiatives with the aim of establishing sustainability standards and biomass/biofuels certification systems. National Governments and regional groupings, companies, non-governmental organizations, and international organizations and initiatives, have begun to take action. The varied interests of stakeholders have led to a proliferation of individual standards that may damage the efficiency and credibility of certification. Therefore, it seems desirable for stakeholders to coordinate their efforts in a timely manner.

5.1 Coordinating the certification effort

If an inclusive certification system can be instituted, the question remains as to the appropriate strategy for implementing such a system.

A system of internationally-agreed standards would be an option worth considering. A single set of standards would be easier to get familiar with compared to a multitude of different standards. Additionally, such a scheme would increase transparency in the market and provide clear indicators for producers. Most importantly, an international process would allow wide participation, including from developing countries. The outcome of the process would then reflect the views and concerns of biofuels/feedstock producers in different regions, and such a participatory process would facilitate the establishment of sound criteria and enhance understanding and compliance. A broad participatory process would also ensure that environmental and other concerns are balanced with market access expectations and unnecessary costs and delays in international trade are avoided.

However, some foreseeable difficulties lie ahead of such a process. Namely, an international process is, by nature, long and complex. Issues related to biofuels are very sensitive and countries might easily reach different conclusions and hold divergent positions that would need time and patience to be resolved. Conversely, the Roundtable on Sustainable Biofuels, for example, has set a rather stringent time frame and hopes to be able to deliver a set of standards by the end of 2008.

A multilateral process conducted under the auspices of the United Nations would be ideal from a transparency, participation and fairness point of view. However, United Nations processes are particularly slow. On the other hand, while other international settings may have better chances to achieve results in a reasonably short time frame, they might encounter a problem of legitimacy, since membership would not be universal.

The longer it would take to set internationally-agreed principles and criteria, the more difficult it would be to merge existing national or private sector initiatives with an internationally-agreed programme.

5.2 Some ideas for moving ahead

These include:

(a) Some of the existing initiatives and forums – such as GBEP, the Roundtable on Sustainable Biofuels, the FAO International Bioenergy Platform or the UNCTAD BioFuels Initiative – could provide the basis for developing international principles and criteria for biofuels certification, provided that such initiatives include producers from different regions and find appropriate mechanisms to facilitate their effective participation in the standard-setting process;

(b) The launching of pilot projects of sustainable biofuels production may be instrumental to prove how feasible it is to produce according to sustainability criteria and the costs involved. Ideas could be developed through such projects on innovative business models, trade chains, adaptation, certification, verification procedures, etc. United Nations departments and

agencies and donor countries could facilitate the implementation of such projects, especially in developing countries;

(c) Analytical work could facilitate the decision-making process and ease the convergence toward a single set of principles and criteria. For example, the scientific assessment provided by the Intergovernmental Panel on Climate Change (IPCC) under the Kyoto Protocol represents an objective source of information that policymakers use as the basis for their policy decisions. The same may hold true for biofuels and feedstocks sustainability. For example, once it becomes scientifically certain the amount of emissions reductions that could be gained by using specific biofuels, produced with specific crops, using specific processes, it would be easier to set relevant requirements. Harmonizing the methodologies to calculate GHG performance would be very helpful, since the use of different methodologies leads to diverging and sometimes incomparable results. Scientific assessment of land use change issues is urgently needed in order to design policies that prevent unintended consequences from biofuel production. Following this approach, more technical and scientific work should be carried out;

(d) The credibility of certification schemes may be closely linked to the inclusion of criteria that are quantifiable and verifiable. Efforts should be deployed to develop this kind of criteria;

(e) Adherence to the schemes and truthful implementation may depend upon the ability of such schemes to accommodate the varying and unique environmental and socio-economic conditions of different producing countries. Hence, convening regional meetings to discuss the criteria and approaches that best suit a specific region seems a sound approach;

(f) The additional costs producers have to face to participate in the certification system could be spread along the chain, including traders and retailers. This solution would avoid putting all the cost burdens on farmers, especially smallholders, who tend to be the weakest segment along the production chain;

(g) Providing capacity-building for compliance, testing and conformity assessment may represent a constructive approach, especially to foster the involvement of producers in developing countries;

(h) In addition to capacity-building, compliance with sustainability principles could be linked to certain benefits to encourage producers to engage in sustainable production. A variety of measures could be implemented, such as enhanced access to financing, including microcredits, linkages to other support services such as health and education and the establishment of local and regional networks to support reduced inputs and transportation costs (through economies of scale), information exchange (especially regarding markets), and exchange among producers on experiences related to best practices. These incentives would motivate producers to assume the extra investments required to meet sustainability criteria;

(i) At the policy level, coherent strategies are needed for biofuels. Energy security, enhanced access to energy, rural development and climate change stabilization are objectives that could be pursued through a comprehensive approach. The specific measures put in place should be instrumental to achieving all these objectives. This also means that developing countries may need support to develop comprehensive strategies for biofuels where achieving one objective does not defeat the achievement of the others, or create negative side effects.

Conclusions

Present and predicted high oil prices, increasing pressure to mitigate climate change effects, along with efforts to diversify agricultural production and provide new opportunities for rural communities, are expected to sustain interest for biofuels. Hence, production and international trade of biofuels are expected to grow significantly in the years to come.

The international debate on biofuel is becoming vocal: doubts are increasingly being voiced about the overall positive impact of biofuels and some feel that the possible negative side effects of biofuels production and use – especially in relation to food security and environmental preservation – may eclipse the potential benefits. Certification is therefore seen as an instrument that can both encourage sustainable biofuels production and prove it. Certifying biofuels may then become a precondition for biofuels to be counted towards national fuel blending targets or for benefiting from tax breaks and other incentives. It may become a prerequisite for consumers' acceptance. These developments make certification an increasingly important issue, including in international trade.

In developing certification schemes, it may prove useful to keep in mind a lesson from past experience, namely that an inclusive process that takes into account varying and unique environmental, technological and socio-economic conditions of producing countries leads to schemes which generally are more easily acceptable, reflect a fairer balance among different interests and concerns, and have more chances to be implemented truthfully than schemes developed otherwise. An international process of standard development, possibly conducted under the aegis of the United Nations, would be ideal from legitimacy and inclusiveness points of view, but would inevitably be slow and complex. Existing forums and ongoing initiatives may be used for the purpose of developing genuine international standards. The availability of clear scientific data – for instance, on the actual contribution of specific biofuels to GHG emission reductions during their life cycle – and the development of a common methodology to calculate GHG emissions, would facilitate the process of standard development and make it less controversial.

Linking certification with capacity-building in the areas of compliance and conformity assessment would facilitate producers' engagement in sustainable production, especially in developing countries. Compliance could also be linked to incentives such as enhanced access to financing, linkages to other support services such as health and education, and the establishment of local and regional networks to increase productivity.

Differentiating products, including biofuels, on the basis of how they have been produced and of their impact through their life cycle remains, however, a complex endeavour, both from practical and legal points of view.

The criteria being included in the ongoing biofuel certification initiatives are diverse and often far-reaching. While all schemes put emphasis on greenhouse gas emissions reduction, others tackle in addition issues such as environmental protection, social well-being and local prosperity. The applicable indicators are often not precisely formulated. Sometimes there is a lack of quantitative indicators. Social sustainability criteria are particularly difficult to quantify. As a result, certification may have an inescapable aspect of subjectivity depending on the evaluation methods employed and proving adherence to criteria that tackle macro level effects may be complex.

From a legal point of view, while the WTO system has evolved, mainly through jurisprudence, to become progressively more responsive to non-trade concerns and then to product differentiation based on process and production methods, the kind of PPMs included in biofuels certification schemes goes far beyond those used so far and analyzed in various panel and Appellate Body's rulings.

This leads to the fundamental question of where it is appropriate to draw the line and which kind of product differentiation is legitimate and instrumental to reach sustainability goals. This is not at all a new issue in the international trade and development debate. What is new is that biofuels aim, among other goals, to tackle climate change, a phenomenon that ultimately can affect the development

prospects of all countries and may then deserve a bolder behaviour and new attitudes, including more flexibility within the international trade system.

The magnitude of the climate change challenge, however, is not a guarantee against possible protectionist abuses by countries and companies. The role that farmer lobbies are playing in several developed countries to secure a high level of subsidies for domestic biofuel producers confirms it. While trade measures may help supporting genuine climate change efforts, they may also be abused for protectionist purposes.

Yet, there is another dimension to consider. Would trade measures genuinely taken to address climate change challenges and developed in full conformity with multilaterally-agreed trade rules be effective in achieving the expected results? Coming back to the specific theme of this study, would the co-existence of several ambitious and far-reaching biofuels certification schemes be instrumental to ensure that climate change stabilization, energy security and rural development goals are achieved, while the potential negative side effects of biofuel production and use are minimized?

While it would be difficult to provide a conclusive answer to this question, it seems that certification schemes may play a positive role towards sustainability goals without having a disruptive impact on international trade, when they (a) are developed through a participatory process where producers from different countries and regions are effectively involved; (b) are based on scientific evidence; (c) are accompanied by support measures to encourage engagement in sustainable production and facilitate compliance, especially by smallholders in developing countries; (d) do not entail unnecessary costs and delays in international trade; (e) include criteria and indicators that can be evaluated in a quantitative fashion; (f) avoid reference to macro level concerns that would be difficult to evaluate with reference to a single product and better dealt with at another level.

If well-planned, biofuels and feedstock production may offer a unique opportunity for developing countries to enter a new market which appears profitable. Many of these countries enjoy the appropriate land and labour conditions for becoming efficient biofuel and feedstock producers and eventually exporters. Biofuels production may bring additional benefits to developing countries in terms of access to technology, financing and market information. An appropriately designed biofuels certification scheme should not be a hindrance to such developments; conversely, it should facilitate it.

Appendix – Overview of criteria with relevance for sustainable biomass production as proposed by existing sustainability schemes

Areas of concern	Criteria
Social criteria	
Labour conditions	• Freedom of Association and collective bargaining • Prohibition of forced labour • Prohibition of discrimination and equal pay for equal work • Least minimum wages • No illegal overtime • Equal pay for equal work • Regulations are in place to protect the rights of pregnant women and breastfeeding mothers
Protection of human safety and health	• Protection and promotion of human health • Farmers, workers etc. are not unnecessarily exposed to hazardous substances or risk of injury • A safe and healthy work environment, with aspects such as machine and body protection, sufficient lighting, adequate indoor temperature and fire-drills • Availability of document routines and instructions on how to prevent and handle possible near-accidents and accidents • Training of all co-workers is performed and documented; training ensures that all co-workers are able to perform their tasks according to the requirements formulated on health protection and environmental benign management or resources
Rights of children, women, indigenous people against discrimination	• Elimination of child labour: a minimum age and a prohibition of the worst form of child labour • Children have access to schools, work does not jeopardize schoo1ing • Indigenous people's and tribe's rights have to be respected • Recognizing and strengthening the role of indigenous people and their communities • Women should not be discriminated and their rights have to be respected • Spouses have the right to search work outside the entity where the husband works
Access to resources ensuring adequate quality of life	• Farmers are content with their social situation • Access to potable water, sanitary facilities, adequate housing, education and training, transportation, and health services • Promotion of education, public awareness and training • Market access for small farmers and producers • Equitable access to forest/farm certification among all forms of forest/farm users and tenure holders • Establishment of a communication systems that facilitates the exchange of information
Food and energy supply safety	• Enough food of sufficient quality is available. • Biomass production should not lead to severe competition with food production and the shortage of local food supply • Energy supply in the region of biomass production should not suffer from biomass trading activities

Areas of concern	Criteria
Capacity-building	• Local organizations, institutions or companies should be involved in the process, e.g. control and certification • Marginalized social groups should play an equitable role in certification processes • Jobs should be generated • Trade-related skills development and social justice-oriented capacity-building are facilitated through learning exchanges between trading partners • Building and use of local labour and skills
Combating poverty	• The activity should contribute to poverty abatement
Democratic participation	• Stakeholder involvement in the decisions that concern them
Land ownership	• Avoidance of land tenure conflicts • Land ownership should be equitable • Tenure and use rights shall be clearly defined, documented and legally established • Projects should not exclude poor people from the land in order to avoid leakage effects
Community (institutional) well-being	• Farms must be "good neighbours" to nearby communities and a part of the economic and social development • A basis is created for strengthening the mutual confidence between business and the society in which they are active • Involvement of communities into management planning, monitoring and implementation
Fair trade conditions	• Transparency and accountability of negotiations • Direct and long-term trading relationships • Fair and equal remuneration – all supply chain partners are able to cover costs and receive fair remuneration for their efforts through prices that reflect the true value of the product; risk sharing mechanisms are actively encouraged • Communication and information flow – supply chain partners communicate openly with each other showing a willingness to share information
Acceptance	• Acceptance of the production methods by producer and consumer • The activities do not lead to disadvantages for the local population like losses of jobs or food shortage • The activity carries advantages for the local population
Economic criteria	
Viability of the business	• The business has to be economically viable • Minimization of costs to ensure competitiveness • There is sustained and adequate funding for running the operation, i.e. the liquidity of cash flow to support infrastructure development, acquisition of machines and to meet day-to-day running of the operation
Long-term perspective	• Long-term commitments, contracts and management plans
Strength and diversification of local economy	• The activity should contribute to strengthening and diversifying the local economy • Local labour and skills should be usable • Professional and dedicated human resources are enhanced
Reliability of resources	• Minimization of supply disruptions • Supply security for the biomass consumer • No overdependencies on a limited set of suppliers should be created

Areas of concern	Criteria
Yields	• Sustainable rate of harvesting – forest should only be harvested at the rate that they regrow • Agricultural yields should be maintained on an economic viable and stable level • A management plan that describes the operational details of production is in place • A comprehensive development and research programme for new technologies and production processes is in place
No blocking of other desirable developments	• The activity should not block other desirable developments
Ecological criteria	
Protection of the atmosphere	• Reduction and minimization of greenhouse gas emissions • Efficient use of energy • Use of renewable resources • Low nitrogen emissions to the air • No use of persistent organic pollutants (POPs) and substances that deplete the ozone layer
Preservation of existing sensitive ecosystems	• Avoidance of pollution of natural ecosystems neighbouring the fields • Prevention of nutrient leaching • Plantations should not replace forests • Maintenance of high conservation value forests
Conservation of biodiversity	• No use of genetically modified organisms • Careful/no use of exotic species, their monitoring and control • Prevention of spreading of diseases • Environmentally sound management of biotechnology • Consideration of the needs of nature and species protection • The development and adoption of environmentally friendly non-chemical methods of pest management should be promoted and it should be strived to avoid the use of chemical pesticides • Preservation of habitats
Conservation and improvement of soil fertility – avoidance of soil erosion	• No impoverishment of the soil; nutrient balances should remain in equilibrium • Optimized utilization of the soil's organic nitrogen pool • Measures to prevent soil erosion are applied and described in a management plan • No accumulation of heavy metals in soil • No irreversible soil compaction; measures to prevent soil compaction are taken and described in a management plan • No pesticide residues in the soil
Conservation of ground and surface water	• No depletion of ground and surface water resources • Protection of the quality and supply of freshwater resources • Avoidance of pollution of ground and surface water • No eutrophication of surface water by phosphorus emissions • No pesticide residues in the water
Combating of deforestation	• Plantations should not replace forests • Sustainable harvest rates – harvest at the rate the forest regrows • Limitations for the size of the harvested areas • No logging activities in protected forests
Combating desertification and drought	• Measure to comate desertification and drought are taken and described in a management plan

Areas of concern	Criteria
Landscape view	• Increase and improvement of the variation of the landscape • Conservation of typical landscape elements
Conservation of non-renewable resources	• Efficiency in the use of natural resources, including energy • Positive energy balance • Minimization of the use of raw material, resources and land • Focus on increased efficiency by increasing filling rates, decreasing fuel consumption and by using transport modes that release less greenhouse gases • Minimization of phosphorus extraction from non-renewable deposits
Waste management	• Minimization of wastes • Sorting of wastes • Proper handling and disposal of waste • Recycling of waste where possible • Recycling of ashes from biomass combustion • Environmental training of employees, to facilitate waste sorting and initiate energy saving • Environmental checklist on waste management, training of employees, etc.
Environmental additionality	• Projects have to be environmental additional by improving the environmental situation against a baseline (status quo) scenario
General criteria	
Compliance with laws and international agreements	• Activities have to comply with national laws and international agreements • All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid • In signatory countries, the provisions of all binding agreements – such as the Convention on International Trade in Endangered Species, and the International Labour Organization Conventions – shall be respected
Traceability	• Biomass has to be traceable • Biomass from non-certified resources can not enter the trade chain • A chain-of-custody control system is in place
Avoidance of leakage effects	• (Negative) leakage effects should be avoided • People should not involuntarily be driven from their land • The biotrade activity provides local people with income opportunities that are at least equivalent in quality and quantity to the baseline situation (i.e. situation without biomass trade activity)
Strengthening the role of non-governmental organizations	• The role of non-governmental organizations should be strengthened
Improvement of conditions at local level	• Generation of jobs • Generation of education opportunities • Capacity-building • Support of infrastructure development • Enhancement of democratic development • Increase of (farmers) income • Improvement of environmental management at local level

Source: Lewandowski I and Faaij A (2005). Steps towards the development of a certification system for sustainable bio-energy trade. *Biomass & Bioenergy* 30: 83-106 (2005), table 3. The table has been compiled from existing sustainability certification systems, indicator sets and guidelines analyzed in the study.