

Final report

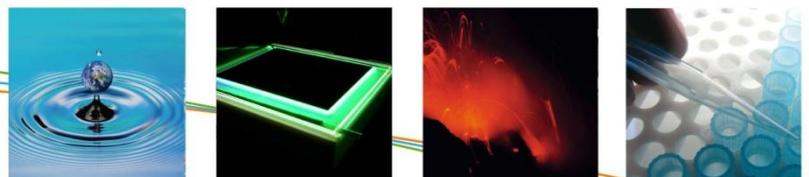
Prospective study: Implementation of sustainability requirements for biofuels and bio-energy and related issues for markets and trade

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SUMMARY

With all public debate in the past years on potential unsustainable consequences of biomass use for energy (or biofuels), the growth of bioenergy currently goes together with the implementation of a variety of sustainability systems, both mandatory and voluntary.

This report focuses on the implementation of mandatory sustainability requirements for biomass (liquid, solid and gaseous), and evaluates and summarises the experiences and issues seen or expected both for commercial and administrative actors on the basis of public information, partly provided by T40 members through a questionnaire.

The responses and input from the T40 members highlighted the following main barriers and concerns related to the implementation of mandatory sustainability certification schemes:

- *Proliferation of sustainability criteria & schemes.* While criteria for biofuels in the EU are directly related to the Renewable Energy Directive requirements, in terms of solid biomass, the main importing countries of biomass have started (or are planning) to develop their own national sustainability requirements. This variety of sustainability initiatives and requirements may lead to confusion, lack of confidence and acceptance among the stakeholders. A strong and common approach may help to reduce the concerns regarding origin and quality of the imported biomass.
- *Discrimination in the use of biomass.* Currently only the use of biomass for biofuels needs to fulfil sustainability requirements. This may diminish the willingness of the agricultural and forestry sector to deliver feedstock for biofuel markets if there is no higher value for these certified products. Criteria for sustainable production of liquid, solid and gaseous biomass should ideally be based on the same concepts, and should be meant for all uses of biomass.
- *Issues for administrations.* Coordination of the different standards and schemes and establishing a “one-stop-shop” approach focusing on one single standard, instead of a range of different standards and schemes, would allow for more efficient structures, save costs due to better management practices, ease administration tasks involved and make it unnecessary for industries to create new standards. However there is still the ongoing debate on how to solve some methodological issues related to the sustainability of bioenergy, such as the role of indirect land use, the competition of food versus fuel, or the concept of carbon debt. To ensure proper auditing, and compliance, the requirements will have to be based on precise and strong criteria that can actually be monitored by specifying quantitative or clear qualitative indicators. Another key question is whether sustainability requirements should be voluntary or mandatory. Voluntary initiatives are a necessary, but probably not a sufficient element in the mix of policy instruments to move towards the objective of sustainable bioenergy. Maybe the voluntary versus mandatory debate does not imply an “either/or” position, but rather the finding of a balance between regulation and voluntary schemes.
- *Issues for commercial actors.* On the producer side there is the risk that different markets have different requirements on the biomass production side, which leads to confusion. Important issue for investors in installations producing bioenergy is the uncertainty whether their biomass fulfils all current and future sustainability requirements. It is perceived as a huge problem by investors that methodological issues like the inclusion of

indirect land use change, or carbon debt remain unclear. The biofuels business has already shown that uncertainties in policies and regulations cause markets to stagnate. Another critical issue might be the administrative burden of legislative requirements and certification, especially for small players. Cross-compliance may be a step in the right direction to limit the administrative paper work. Stakeholders of solid and liquid biofuel markets have indicated a preference for governmental involvement regarding sustainability issues by providing clarity in long-term policy objectives especially regarding sustainability.

- *Developments in third countries.* The implementation of sustainable systems - as conceived by Northern countries - generally requires a much bigger leap for them to reach a certain threshold because of lack of technology and capital. Non-tariff barriers to international trade could result from that. Time, but also share in technology and investment, should be given to these countries to be able to catch up.
- *Good energy practices.* While markets and trade are mostly thinking in terms of commodities, the life cycle thinking for bioenergy (e.g. in terms of GHG impact and energy use) implies that end use of the biomass should also be considered. Biomass availability is limited and sustainability criteria for biomass and biofuels should therefore also take into account an efficient use of (bio)energy. Input energy must be minimized in all phases of the production system and the use of bioenergy should be as efficient as possible. Of course this should not only be valid for biomass, but also for other resources and energy carriers. If energy use (in general) would keep growing, the development of bioenergy would only chase a receding target.

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LIST OF ACRONYMS

CAP	Common Agricultural Policy
EC	European Commission
EISA	Energy Independence and Security Act
EPA	Environmental Protection Agency
EU	European Union
FSC	Forest Stewardship Council
GHG	Greenhouse gas
ISCC	International Sustainability and Carbon Certification
IWPB	Initiative for Wood Pellet Buyers
LCA	Life Cycle Analysis
MS	Member States
MW	MegaWatt
NGO	Non-governmental organisation
PEFC	Programme for the Endorsement of Forest Certification
RED	Renewable Energy Directive (2009/28/EC)
RFS	Renewable Fuel Standard
RSPO	Roundtable for Sustainable Palm Oil
RTRS	Round Table on Responsible Soy
RSB	Roundtable on Sustainable Biofuels
RSBA	Abengoa Bioenergy Sustainability Assurance
T40	IEA Bioenergy Task 40
2BSvs	Biomass Biofuel, Sustainability voluntary scheme

Country abbreviations:

AT	Austria
BE	Belgium
BR	Brazil
CAN	Canada
DE	Germany
FI	Finland
IT	Italy
NL	Netherlands
NO	Norway
SE	Sweden
UK	United Kingdom
US	United States

CHAPTER 1 INTRODUCTION

1.1. BACKGROUND

With all public debate in the past years on potential unsustainable consequences of biomass use for energy (or biofuels), the growth of bioenergy currently goes together with the implementation of certain sustainability safeguards. Within IEA Bioenergy Task 40 a worldwide overview has been made of systems dealing with sustainability certification of biomass (J. van Dam, 2010)¹.

Some sustainability criteria are actually integrated in legislation as a mandate, so all market actors dealing with biofuels and bioenergy for the specific market where the legislation is valid, will be confronted with the practical implementation of these requirements. The main example in Europe is the Renewable Energy Directive (2009/28/EC), which imposes sustainability requirements to biofuels for transport and bioliquids (for stationary bioenergy) marketed in the European Union. For solid and gaseous biomass for electricity and heating & cooling so far most sustainability certification initiatives are voluntary systems.

While it is currently too early to see clear impacts of sustainability regulations on worldwide markets, we can monitor how these sustainability requirements are implemented in national systems, how commercial and administrative actors are affected, and which problems they are facing.

1.2. AIM OF THE STUDY

The objective of the study is to make an inventory of views from Task 40 member countries on the implementation of sustainability criteria specific for biofuels or bioenergy, and the potential impact of these requirements on the way biomass markets operate. To do so, this report looks into three questions:

- what is the status and approach regarding the implementation of sustainability requirements?
- what are the related market issues?
- what are the experiences and problems faced?

The aim of this report is to summarize and evaluate the experiences and market issues seen or expected of the implementation of sustainability criteria for biomass (liquid, solid and gaseous) on the basis of public information, partly provided by T40 members through a questionnaire.

The study is prospective, meaning that it will not describe the markets in a comprehensive way, but it will indicate potential issues in relation to the implementation of sustainability requirements for biomass for energy and how it may impact markets and trade.

¹ <http://www.bioenergytrade.org/downloads/overviewcertificationsystemsfinalapril2010.pdf>

CHAPTER 2 NATIONAL SUSTAINABILITY SYSTEMS FOR BIOFUELS AND BIOENERGY

As mentioned before the study focuses on sustainability requirements specifically implemented for biofuels and bioenergy. Sustainability principles of biomass production are also embedded in other legislation, e.g. agriculture or forestry legislation. These are already active for a longer time but will not be subject of this study. For a more comprehensive overview of certification systems for biomass (also for other applications), we refer to van Dam (2010).

2.1. EUROPEAN UNION

2.1.1. RENEWABLE ENERGY DIRECTIVE

The main legislative driving force for sustainability of biofuels and bioenergy in the European Union is the Renewable Energy Directive. The European *Renewable Energy Directive 2009/28/EC* (RED) sets ambitious targets for all Member States: a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy in the transport sector (Art. 3). The RED also introduces sustainability requirements for biofuels (transport) and bio-liquids (electricity, heating and cooling). The RED was published in June 2009 and needed to be transposed by all Member States in national legislation by December 2010.

The sustainability requirements *for biofuels and bio-liquids* are laid down in Article 17(2) to 17(5) and Article 18(1) of the Renewable Energy Directive (2009/28/EC), as well as in Article 7b(2) to 7b(5) and Article 7c(1) of the Fuel Quality Directive (2009/30/EC). The requirements include:

- greenhouse gas (GHG) savings of at least 35% compared to fossil fuel (to be increased up to 50% from 2017 and 60% for new installations from 2018),
- no conversion of land with high carbon stock, like continuously forested areas, wetlands or peatlands,
- no raw material from land with high biodiversity value, like primary forest, nature protection areas, highly biodiverse grasslands,
- raw material coming from European agriculture need to be produced following 'good agricultural practises' as described in the Common Agricultural Policy (CAP).

In the EU, consignments of biofuels must comply with these sustainability requirements in order to be: (a) counted towards the country target of renewable energy in transport, and (b) eligible for financial support, or show compliance with market obligations (see Art. 17(1) of the RED). Member States will need to ensure that economic operators provide evidence that the consignments of biofuels comply with the sustainability requirements of the RED. Economic operators are required to use a mass balance system. In order to check compliance, Member States can make use of an adequate standard or independent auditing. The auditing shall verify that the systems used by economic operators are accurate, reliable and protected against fraud. It shall evaluate the frequency and methodology of sampling and the robustness of the data.

→ Voluntary schemes for biofuels

Economic operators in the EU may either choose to follow the procedures of an individual Member State where they market their biofuels, or to use a "voluntary scheme" that the Commission has recognized for the purpose of proving compliance with this regime (Article 18 (4) the RED).

A voluntary scheme can show partial or full compliance with the sustainability criteria of the RED. The EC assesses the voluntary schemes before proposing to recognise them through a Comitology process leading to a Commission decision. A partial compliance refers to the different subarticles of article 17 in the Directive (see before). Some existing schemes only take some of these criteria into account. This is especially true for the minimum required greenhouse gas emissions criterion, which does not appear in many feedstock certifications for forest and agricultural products.

Currently the Commission has recognised 7 voluntary schemes for biofuels and bioliquids (19 July 2011²):

- ISCC (German (government financed) scheme covering all types of biofuels);
- Bonsucro EU (Roundtable initiative for sugarcane based biofuels, focus on Brazil);
- RTRS EU RED (Roundtable initiative for soy based biofuels, focus on Argentina and Brazil);
- RSB EU RED (Roundtable initiative covering all types of biofuels);
- 2BSvs (French industry scheme covering all types of biofuels);
- RSBA (Industry scheme for Abengoa covering their supply chain) ;
- Greenergy (Industry scheme for Greenergy covering sugar cane ethanol from Brazil).

Another set of schemes is in the evaluation process at Commission level and recognition is expected in the first half of 2012.

In March 2011 the European Biodiesel Board (EBB) published a monitoring report on the RED Implementation in European Member States, with specific attention regarding the transposition of the sustainability criteria. The results are indicated in the Table 1.

The table shows that by the end of March 2011 only 10 of the 27 Member States have transposed the articles regarding sustainability criteria of the Renewable Energy Directive (obligated from 5 December 2010). Another conclusion from the table, is the fact that National and European policy makers are quite reserved in attributing a legal status to norms and schemes. Germany as a pioneer in Europe moved forward acknowledging two systems. The Netherlands are presenting their NTA 8080 norm and Belgium is going for the European EN norm. Other countries are open for other schemes and norms or are giving the indication to follow the German system. All countries were waiting for the European Commission's approval of voluntary systems on European scale.

² http://ec.europa.eu/energy/renewables/biofuels/sustainability_schemes_en.htm

Table 1: Overview of the status of implementation of the Renewable Energy Directive (RED) in March 2011 (EBB, 2011)

Country	Phase of transposition RED/sustainability criteria			Procedure
	Voted	Draft	In study	
Austria	X			
Belgium		X		Reference to prEN16214 (CEN TC 383)
Bulgaria		X		
Cyprus		X		
Czech Republic		X		Follow German model
Denmark	X			
Estonia	X			No exclusion of certification schemes
Finland		X		
France		X		'in good faith' system
Germany	X			ISCC, RedCert approved for German market
Greece			X	
Hungary			X	
Ireland		X		Accept other schemes
Italy	X			
Latvia			X	
Lithuania		X		
Luxembourg			X	
Malta	X			Accept other schemes
Netherlands	X			Assessment scheme to benchmark NTA 8080, other EU schemes
Poland		X		
Portugal	X			Biofuels certificates (TDB)
Romania	X			
Slovakia		X		Follow German model
Slovenia			X	
Spain			X	
Sweden	X			Report + audit
UK			X	RTFO Carbon & Sustainability reporting scheme (adaptation)
Total	10	11	6	

→ Requirements for solid and gaseous biomass for electricity and heat

So far the RED requirements do not apply for *solid or gaseous biomass* used for electricity or heat production. However it is clear that common discussions will arise, also for domestic feedstock, as cellulose based 2nd generation biofuels have to comply with these requirements, while using the same raw materials as for stationary bioenergy (solid & gaseous).

In Article 17(9) of the Directive the European Commission announced that it would report on the issue by end 2009 and make proposals on requirements for a sustainability scheme for energy uses of biomass, other than biofuels and bioliquids.

In February 2010 the EC published a Communication (COM(2010)11): "Report on requirements for a sustainability scheme for solid and gaseous biomass used for generating electricity, heating and cooling". In this Communication it was proposed that for the moment there would be no binding criteria at European level. However the EC provided the following recommendations in order to ensure greater consistency and to avoid unwarranted discrimination in the use of raw materials:

- same conditions on biodiversity and high carbon stock land as for biofuels;
- common GHG calculation (comparable to biofuels methodology), with adapted reference as the end use needs to be included as well now,

- no criteria for waste & residues,
- criteria only applicable for installations bigger than 1MW,
- differentiation of national support schemes in favour of installations that achieve high energy conversion efficiencies, and
- monitoring of the origin of biomass.

By end 2011, the EC committed to assess the implementation of its recommendations to Member States, including whether national sustainability schemes have sufficiently addressed the sustainability issues related to biomass for energy use, and whether these schemes have created barriers to trade and hampered development of bioenergy markets. At the time of editing of this report, the announced Commission Communication was not published yet.

The following paragraph will describe some national initiatives in the EU in relation to biofuels and bioenergy sustainability.

2.1.2. NATIONAL INITIATIVES

Pioneer for the implementation of sustainability criteria for biofuels and bioliquids in the EU is **Germany**. In 2006 the Ministry of the Environment and the Federal Environmental Agency launched a project aimed at defining the basis for a certification system of biofuels. The result was the proposed Biomass Sustainability Regulation (BSR). BSR defines sustainability criteria for biofuels, GHG methodology and default values regarding GHG emissions. The draft BSR was released end 2007, but with the Renewable Energy Directive in development at EU level, the initiative was abolished. Nevertheless Germany in early stage decided to follow the RED requirements and they were the first country to implement the sustainability requirements of the RED in their own legislation. Germany also supported the development of a scheme called ISCC (International Sustainability and Carbon Certification). This system was the first scheme to be recognized at country level to fulfil the RED requirements (in 2010). Later a second system was also recognized in Germany, REDcert (Lieback, 2011).

In **Belgium** the RED directive is only recently (November 2011) translated in a Royal Decree. The Decree specifically mentions the prEN16214 standard, developed within a European CEN working group, as one way for operators to prove compliance with the RED requirements. Most Belgian companies are currently operating with German certificates (ISCC, RedCert) because of their export to the German market.

For the Belgian biofuel producers the sustainability criteria are not completely new. In 2006 Belgium implemented a tax reduction system, coupled to quota assignment. In the tender system for the quota assignment (up to 2013) several sustainability criteria were used in the evaluation process to assign quota to biofuel producers. These operators need to report on these criteria every year to the Belgian administration.

While biofuels are competence of federal level, stationary energy (including bioliquids, but also solid and gaseous biomass) fall under responsibility of the regions (Flanders, Walloon Region, Brussel Capital District). The three regions introduced sustainability criteria directly into their supporting scheme. In the Flemish region certain biomass streams (e.g. wood (waste) streams that are still suitable for recycling in board or pulp and paper industry) are not entitled to receive green power certificates as a resource for the production of renewable electricity. Also the energy used for transporting and pretreatment of the biomass, is deducted from the green power certificates. In the Brussels and the Walloon region a greenhouse gas balance and reduction compared to a best available natural gas system is calculated to determine the amount of green certificates. All calculations must be proven by an audit of an independent organism (Pelkmans, 2011).

Under the **UK** system RTFO (Renewable Transport Fuel Obligation), the Renewable Fuels Agency (RFA) since April 2008 asks fuel suppliers to report on the specific type and origin of biofuels, the compliance of biofuel crops with existing environmental and social sustainability criteria and the greenhouse gas emission reductions achieved by using biofuels. While there are no strict consequences of not meeting the sustainability criteria, public disclosure may be an important argument for the reporting commercial companies .

A similar procedure was implemented for renewable electricity. From 2011, a well-founded report on the RED sustainability criteria is required for installations larger than 50kWe; from 2013, generators of 1MWe and above will need to actually meet the sustainability criteria.

This staged approach will also be considered by the Renewable Heat Incentive (RHI): from 2011, biomass installations with a capacity of 1 MW_{th} and above and all producers of biomethane will be required to report quarterly on the sustainability of their biomass feedstock. This requirement will apply to both feedstock sourced in the UK and imported from abroad. Smaller players will be exempted from this reporting requirement. Mandatory criteria will be introduced at a later stage, probably also starting from 2013 (DECC, 2011).

The **Netherlands** pioneered with examining sustainability criteria for all forms and applications of biomass. The Commission Cramer in 2007 published a list of sustainability principles for the use of biomass for energy (fuels, liquids, solid and gaseous). These principles are partially covered in the RED sustainability criteria, but not completely. The Netherlands are building further on their experience with a new commission, the Corbey Commission. The 'commission on sustainability issues of biomass' (official name) started in June 2009 and is concentrating on giving advice to the government on sustainable production and use of biomass. An important issue being discussed in this commission is the need for sustainability criteria for solid and gaseous biomass.

Based on the 'Cramer' principles NEN, the Dutch normalisation institute, developed standards NTA 8080 and 8081 for sustainable biomass for energy purposes. This is still a voluntary system, but is already used by commercial actors to demonstrate the sustainability of their biomass. The NTA 8080 was also sent to the European Commission to classify as a voluntary system for biofuels and bioliquids.

2.1.3. COMMERCIAL ACTOR'S INITIATIVES FOR EUROPEAN MARKETS

A number of schemes are developed by commercial actors, either to show compliance with national regulations, or to anticipate legislative and market demands in that area. These schemes are likely to be compliant with the national legislation, but may include additional (voluntary) topics, for example, social criteria. For these criteria, stricter standards may apply (for example, higher avoided GHG emissions). Some systems with high relevance for the European markets are mentioned here.

Laborelec and SGS developed a verification scheme for their solid biomass (wood pellets) being used in power plants. The verification scheme found its origin in the fact that the three regions in Belgium demanded a verification of different criteria (energy balance, GHG balance, etc.). In this verification scheme a yearly energy and GHG balance is checked. Also the traceability of the primary resources and final products is to be controlled on a yearly basis. A last report that should be made up independently but only once, is about the use of local resource management and respect of local and international legislation.

The **Green Gold Label** was established in 2002 by the Dutch energy company Essent and Skall International (now Control Union Certifications). At that time Essent initiated several research programmes at the University of Utrecht under the name of Fair Bio Trade. The objective of this research was the development of protocols for the import of sustainable biomass. Furthermore, these programs investigated the technical, environmental and economical aspects of conversion of clean biomass into sustainable energy. Over the years, the volumes of Green Gold Label certified biomass have increased up to over 750.000 tonnes in 2010. The next step in the development of Green Gold Label is to open the system to new third party participants and users. In parallel, Green Gold Label is establishing partnerships with emerging standards like the Dutch NTA8080 based on the Cramer Criteria and the EU CEN.

Drax introduced sustainability principles to ensure that the biomass consumed in their generation facilities is environmentally sustainable. The principles are designed to safeguard environmental issues like GHG reduction, biodiversity, soil/water/air quality and to safeguard some social issues like local prosperity, etc.

In 2010 a working group called '**Initiative for Wood Pellets Buyers' (IWPB)** was launched. The IWPB was initiated by 6 companies which are all large purchasers of wood pellets with the purpose of generating renewable electricity. The market of wood pellets has been growing in last years, triggered by the general awareness that (co)firing of wood pellets in power stations is a very cost efficient way to reduce carbon emissions and dependency on fossil fuels. With the increased demand of wood pellets, also the need to buy and sell ("trade") volumes of wood pellets has increased. Trade has now become essential to secure flexibility in supply and demand of pellets, e.g. power stations have unplanned maintenance periods, suppliers of pellets can have technical problems, investors want to hedge price risk, ships can be delayed etc. And trade is also essential for the suppliers. Therefore, it is important that the product be to a certain degree standardized. The more standardized the product is, the more transparent the market and the more competitive the product will be. The development of the coal market is a good example; that market has become much more standardized and transparent thanks to the so-called API2 and API4 standards. IWPB members are aware that the better the sustainability of biomass is assured and accepted by a wide range of stakeholders, the more robust and stable this "energy from biomass" industry becomes. This in return will attract new investments and enable a further growth of the biomass industry, which can be very important to contribute to the EU 2020 energy targets. This target is very significant for the power market since 34% of electricity is expected to come from renewable sources by 2020, of which biomass is expected to cover about one half.

Hence the IWPB was formed in June 2010 to facilitate the trading of wood pellets through the design of common product specifications and sustainability principles. Where for the standardization of most commodities it is sufficient to describe the technical/physical characteristics and the legal framework, in the case of wood pellets there is a third element being of utmost importance: sustainability.

On one hand, the sector acknowledges their responsibility as biomass industry to avoid and reduce potential negative impacts activities might have. On the other hand, public opinion through communities and NGO's plays a key role in the permitting process of the power assets. For those reasons, all IWPB members see a critical risk for every company itself but also for the whole biomass market if there is no common and transparent standard/definition for sustainable solid biomass like wood pellets. It is therefore very important to have a common understanding on "what is sustainable and how it has to be verified/documented".

Current status

The draft principles that the 'Initiative Wood Pellets Buyers' has defined for wood pellets are summarized below, see Table 2. In addition to the defined draft principles, the agreement of the State Berlin with Vattenfall on Sustainable Biomass Sourcing, constitutes an already applicable binding agreement with experience in respect to sustainable biomass, which is supported by various public and private stakeholders.

- Principle 1: Greenhouse gas balance,
- Principle 2: Carbon stock,
- Principle 3: Biodiversity,
- Principle 4: Protection of soil quality,
- Principle 5: Protection of water quality,
- Principle 6: Protection of air quality,
- Principle 7: Competition with local food and water supply,
- Principle 8: Local socio-economic performance,
- Principle 9: Corporate responsibility
(covered by *Corporate Codes of Conduct for Suppliers* of the member utilities)

The principles are numbered but there is no priority ranking related to their numbering. IWPB requests full transparency on the realization level of all principles for sustainable biomass.

Though, a distinction is made between "WILL" and "AIM TO" principles as follows:

The first three sustainability principles are fundamental issues: they are mandatory criteria listed in the RED Directive for bioliquids and biofuels. Wood pellets deliveries must always be consistent with those principles. Compliance with these sustainability principles must be verified by independent inspection companies. Those principles are therefore meant as "WILL". Inspection companies like SGS, Inspectorate and Control Union have been associated to the IWPB work.

The last six sustainability principles are important issues that must be considered for sustainable solid woody biomass but they appear to be more difficult to verify extensively. Therefore the IWPB aims for those principles to be taken into consideration, and that a report is made by an independent body providing transparency on the way those principles are fulfilled. The IWPB expects that feedback of this report to the suppliers will allow them to improve their performance over time. Those principles are therefore meant as "AIM TO". This does not mean that they are less important than those listed as "WILL". It does however mean that the thinking on those subjects is still evolving; it is therefore important to promote a continuous circle of improvement, rather than to adhere to a standard which is reasonable today, but outdated tomorrow.

Table 2: Overview of the sustainability principles proposed by the ‘Initiative Wood Pellets Buyers’ (IWPB, 2011)

IWPB	SUSTAINABILITY PRINCIPLES
WILL	<p align="center">Principle 1: GREENHOUSE GAS BALANCE</p> <p>The greenhouse gas balance of the production and supply chain and application of the biomass shows savings above 60% with respect to reference fossil fuels evaluated by the Fossil Fuel Comparator in the RED.</p>
WILL	<p align="center">Principle 2: CARBON STOCK</p> <p>Biomass production does not take place at the expense of significant carbon reservoirs in vegetation and in the soil.</p>
WILL	<p align="center">Principle 3: BIODIVERSITY</p> <p>Biomass production may not take place at the expense of protected or vulnerable biodiversity (or high conservation value areas).</p>
AIM TO	<p align="center">Principle 4: PROTECTION OF SOIL QUALITY</p> <p>Biomass production should maintain or improve the soil quality, such as to avoid negative impact or to significantly reduce impact on soil</p>
AIM TO	<p align="center">Principle 5: PROTECTION OF WATER QUALITY</p> <p>The production and processing of biomass takes care for efficient resource use and that ground and surface water quality should be maintained or improved</p>
AIM TO	<p align="center">Principle 6: PROTECTION OF AIR QUALITY</p> <p>With the production and processing of biomass the air quality should be maintained or improved, such as to avoid negative impact or to significantly reduce impact on air</p>
AIM TO	<p align="center">Principle 7: COMPETITION WITH LOCAL FOOD AND WATER SUPPLY</p> <p>Biomass production for energy should not endanger food and water supply or communities where the use of biomass is essential for subsistence</p>
AIM TO	<p align="center">Principle 8: LOCAL SOCIO-ECONOMIC PERFORMANCE</p> <p>Biomass production should respect property rights and contribute to local prosperity and to the welfare of the employees and the local population</p>
COVERED SEPARATELY	<p align="center">Principle 9: CORPORATE RESPONSIBILITY</p> <p>Generic sustainability issues not directly related to biomass are covered by the code of conducts of the utilities for all types of suppliers</p>

2.2. UNITED STATES

2.2.1. RENEWABLE FUEL STANDARD

US EPA (the Environmental Protection Agency) is responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel. The **Renewable Fuel Standard (RFS)** program regulations were developed in collaboration with refiners, renewable fuel producers, and many other stakeholders.

The RFS program was created under the Energy Policy Act (EPA) of 2005, and established the first renewable fuel volume mandate in the United States. As required under EPA, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012.

Under the **Energy Independence and Security Act (EISA)** of 2007, the RFS program was expanded in several key ways:

- EISA expanded the RFS program to include diesel, in addition to gasoline;
- EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022;
- EISA established new categories of renewable fuel, and set separate volume requirements for each one;
- EISA required EPA to apply lifecycle greenhouse gas performance threshold standards to ensure that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces.

The Act requires that the volume mandates be met through the use of renewable fuels that meet certain lifecycle GHG reduction thresholds when compared to the baseline lifecycle emissions of petroleum fuel. Determining compliance with the thresholds requires a comprehensive evaluation of renewable fuels, as well as of gasoline and diesel, on the basis of their lifecycle emissions.

On February 3, 2010, EPA issued its final rule regarding the expanded Renewable Fuel Standard (RFS2) for 2010 and beyond. Specific greenhouse gas emission thresholds for each of four types of renewable fuels were set, requiring a percentage improvement compared to a baseline of the gasoline and diesel. EISA required a 20% reduction in lifecycle GHG emissions for any renewable fuel produced at new facilities (those constructed after EISA enactment), a 50% reduction in order to be classified as biomass-based diesel or advanced biofuel, and a 60% reduction in order to be classified as cellulosic biofuel. EISA provides some limited flexibility for EPA to adjust these GHG percentage thresholds downward by up to 10 percent under certain circumstances.³

2.2.2. LOW CARBON FUEL STANDARD (LCFS) IN CALIFORNIA

This low-carbon fuel standard (LCFS) mandate was enacted by California in 2007, with specific eligibility criteria defined by the California Air Resources Board (CARB) in April 2009 but taking effect until January 2011. The LCFS calls for a reduction of at least 10% in the carbon intensity of California's transportation fuels by 2020. These reductions include not only tailpipe emissions but also all other associated emissions from production, distribution and use of transport fuels. The calculations include indirect land use change.

Several lawsuits were filed against the LCFS. In December 2011 a federal judge granted a preliminary injunction against the implementation of California's LCFS.⁴

2.3. LATIN AMERICA

In order to address potential negative environmental and social impact, several sustainability initiatives have been established during recent years. Such efforts have been initiated by stakeholders involved in the respective industries, including stakeholders from Latin America, as well as by Latin American governmental bodies. Currently, all sustainability initiatives addressing feedstock production for food, feed and biofuels operate on a voluntary basis. They, however, constitute important schemes for the improvement of economic, environmental and social sustainability of biofuel production and use in Latin America.⁵

Examples are:

- the Better Sugarcane Initiative (BSI / BonSucro);

³ <http://www.epa.gov/otaq/renewablefuels/420f09024.pdf>

⁴ http://en.wikipedia.org/wiki/Low-carbon_fuel_standard

⁵ R. Janssen, D.Rutz (2011) Sustainability of biofuels in Latin America: Risks and opportunities. Energy Policy 39(2011) p.5717–5725

- the INMETRO biofuel certification initiative in Brazil;
- the Sao Paulo State Green Ethanol programme. An applied tool of the Green Ethanol programme is the agro-environmental sugarcane zoning in the State of São Paulo. This tool is a map with several layers identifying potential sugarcane expansion areas and protected areas.
- Brazilian agro-ecological zoning for sugarcane. On national level in Brazil there is currently an agro-ecological zoning for sugarcane, including specific requirements regarding water use and atmospheric emissions. Investors who do not respect this zoning are not eligible for getting loans from public institutions. A similar system is currently developed for palm oil.
- the Social Biodiesel Programme in Brazil: the objective was to redistribute wealth, fight against rural poverty and to improve living conditions for poor farmers in north-eastern Brazil. Biodiesel companies that use and buy feedstock at fair prices from smallholders and family farmers gain tax benefits from the state. The programme did not meet its ambitious targets to promote family farmers and alternative feedstock so that the Brazilian biodiesel market is currently dominated by large-scale soy production.
- IDB (Inter-American Development Bank) Biofuels Sustainability Scorecard. The Scorecard has been designed specifically for the private sector at the project level to provide guidance on how to ensure compliance with environmental and social sustainability criteria for biofuels.
- Verified Sustainable Ethanol Initiative. Initiative by the Swedish company SEKAB to assure sustainability of bio-ethanol from Brazil for the Swedish market. In May 2009 SEKAB announced the termination of its sales of E85 fuel in Sweden. Nevertheless, this industry led sustainability initiative implemented by stakeholders from Europe and Latin America has provided valuable experiences for the implementation of schemes ensuring the compliance of biofuels production in Latin America with environmental and social sustainability criteria.
- Round Table on Responsible Soy (RTRS);
- Task Force Sustainable Soy: platform of a group of Dutch companies involved in soy production and marketing;

CHAPTER 3 TASK 40 MEMBER COUNTRIES' QUESTIONNAIRE RESPONSES

To get a better insight into the status of implementation, the experiences and the effects of sustainability requirements on the market a questionnaire was drafted and sent to all IEA Bioenergy Task 40 national team leaders to give an indication of the status in their respective country. This questionnaire addressed both the sustainability requirements for biofuels and bioliquids, and the – ongoing – development of sustainability criteria for solid biomass and biogas.

Questions were asked in relation to the following:

1. The current status of implementation of the RED at EU-level: approaches, experiences and impact (*part A.1 of the questionnaire*);
2. The current status of implementation of sustainability requirements for biofuels in non-EU countries: approaches, experiences and impact (*part A.2 of the questionnaire*);
3. The current status of implementation of sustainability requirements for solid biomass and biogas: approaches, experiences and impact (*part B of the questionnaire*).

The questionnaire, distributed mid July 2011, received 12 responses (AT, BE, BR, CAN, DE, FI, IT, NL, NO, SE, UK and US) in the period between mid September to mid December 2011.

This chapter provides an analysis of the T40 responses to this questionnaire. It presents the common answers that can be derived from the responses and the common issues that were put forward.

3.1. EVALUATION OF THE QUESTIONNAIRE RESPONSES

The analysis systematically reviews the responses to the questionnaire. In order to allow and enhance the comparison between the responses, a distinction is made between two categories of questions: i) multiple choice questions, and ii) open questions.

- i) Multiple choice questions ask for a specific response using predefined answers. This data is summarised in tables or diagrams. This allows an easy comparison and overview.
- ii) All other questions are open questions. For each open question the responses are analysed and compared to get an insight in common approaches and/or issues.

3.1.1. QUESTIONS PART A.1: BIOFUELS IN EU

These questions were only to be answered by T40 members in the EU as they relate to the implementation of the European Renewable Energy Directive (2009/28/EC).

→ **Question 1: What is the status of the RED implementation in your country?**

- a. voted, since...
- b. draft
- c. in study

The answers are summarised in Table 3. If we compare the answers provided in the questionnaires with the monitoring report of the European Biodiesel Board from March 2011, we see that the UK and Belgium by now fully transposed the RED into national legislation but that in Finland the transposition is still in its 'draft' phase. This indicates that still some Member States do not yet fully comply with Art. 27 of the RED which states that all Member States need to transpose this Directive into national legislation by 5 December 2010.

Table 3: Overview of the status of implementation of the RED

Country	Phase of transposition RED sustainability criteria		
	voted	draft	in study
Austria	x		
Belgium	x		
Germany	x		
Italy	x		
Finland		x	
Netherlands	x		
Sweden	x		
UK	x		

→ **Question 2: Which schemes are in place (or in preparation) in your country to be in line with the RED sustainability criteria for biofuels and bioliquids:**

- a. procedures foreseen in national legislation, controlled by the national regulator,
- b. voluntary schemes /norms on national level,
- c. voluntary schemes to be approved by the EC,
- d. voluntary schemes valid in other countries, e.g. the German ISCC, RedCert
- e. the prEN 16214 norm

All countries foresee either procedures in national legislation, either national voluntary schemes. 5 countries refer to the voluntary schemes approved by the EC, but in fact all Member States are obliged to accept voluntary schemes which are approved by the EC. 2 countries (AT, NL) refer to voluntary schemes valid in other member States. BE additionally refers to the prEN16214 norm to verify that the sustainability criteria set out in Article 17(2) to (5) of the RED are fulfilled.

Table 4: Overview of types of procedures/schemes in place to verify the RED sustainability criteria

Options	AT	BE	DE	FI	IT	NL	SE	UK	Total
a. procedures foreseen in national legislation, controlled by the national regulator	x	x	x		x		x	x	6
b. voluntary schemes /norms on national level		x		x	x	x	x	x	6
c. voluntary schemes to be approved by the EC		x		x	x	x	x		5
d. voluntary schemes valid in other countries, e.g. the German ISCC, RedCert	x				x	x			3
e. the prEN 16214 norm		x							1

→ **Question 3: How is stakeholder acceptance in your country for the RED sustainability requirements?**

- a. for fuel distributors,
- b. biofuel producers,
- c. administrations,
- d. biomass producers (agriculture, forestry)
- e. other: please explain

Figure 1 shows that most stakeholders, i.e. fuel distributors, biofuel producers and administrations, see the RED sustainability criteria as slightly positive to positive.

However for biomass producers opinions are divided. All respondents, except for NL and UK, indicate that biomass producers consider the criteria to be neutral to negative. The agricultural sector does not want additional requirements on top of the CAP (Common Agricultural Policy) requirements. Farmers who deliver their biomass to a biofuel installation need to be in line with the sustainability criteria set in the RED. But if this farmer would provide his biomass to a biogas installation to produce electricity and/or heat, there would be no need to fulfil these criteria.

The Dutch respondent adds that also biomass traders consider sustainability requirements as a priority: in a Dutch survey (Davy van Doren, 2010) 50% of traders indicated that there is a strong need to include sustainability requirements in trade contracts.

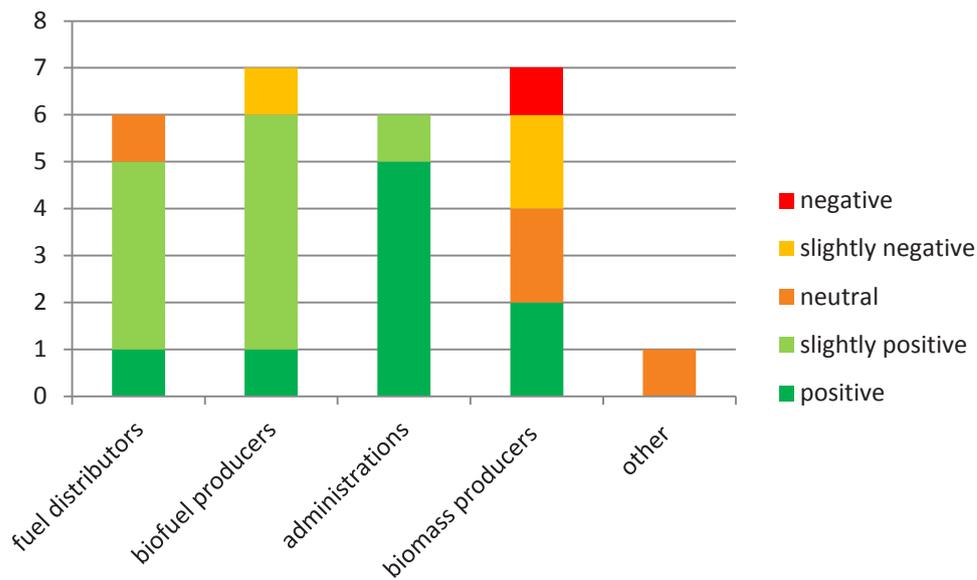


Figure 1: Overview of the degree of stakeholder acceptance for the RED sustainability criteria

→ **Question 4: What is the experience so far of the impact of sustainability requirements, in terms of biomass origin for biofuels (domestic vs. imports):**

- a. no change
- b. more focus on domestic production
- c. more import

Various Task 40 members indicated that sustainability requirements are having impact on the origin of biomass for biofuels.

Overall the sourcing pattern of biomass for biofuels seems to have shifted to the local market (DE, IT and FI) or EU market (BE since domestic potential remains low). AT and UK see no change. The other members who responded (NL, SE) answered that the effect is rather unclear at this moment. SE added that the uncertainty of the implementation negatively affected the market.

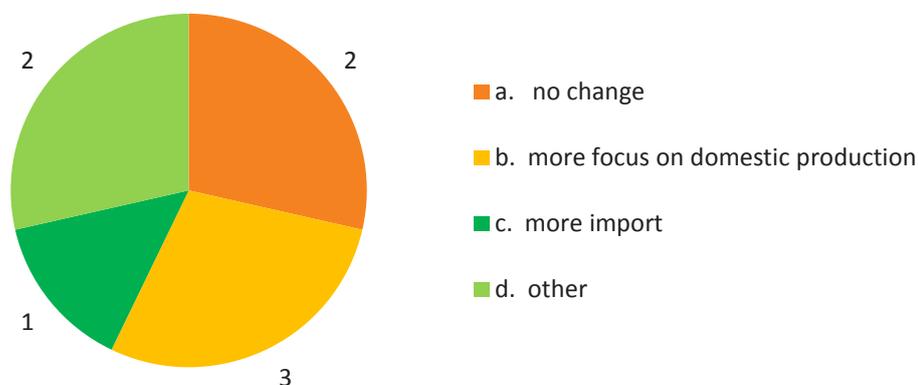


Figure 2: Overview of the experience so far of the impact of sustainability requirements in terms of biomass origin

→ **Question 5: What is the anticipated impact on biomass price?**

- a. increase in price of the biomass**
- b. decrease in price**
- c. no influence**

Most answers received indicate that the biomass price could (slightly) increase. This slight increase could be related to the certification procedure.

The Italian respondent indicates to anticipate no influence in the price.

The Belgian respondent added that they do not expect higher production costs as CAP requirements already apply for agricultural products.

→ **Question 6: How are the sustainability requirements in your country controlled?**

- a. audit by recognized body**
- b. self declaration**
- c. governmental organism**
- d. combination**

The majority of the respondents (AT, DE, IT, FI, NL) state that the sustainability requirements are controlled by a recognised body, i.e. authorised auditors. The other members, BE, SE and UK, report a combination of the given options, no further specification is given.

→ **Question 7: Is there a difference in approach between smallholders and producers of large amounts of biomass? If yes, which?**

Most respondents (BE, DE, IT, FI, NL) see no difference in approach between small and big producers of biomass. The respondents that do indicate a difference mention that there is a difference in the number of controls (AT) or refer to the difference in awareness of the implications of the RED (SE). The UK respondent did not give further details on the differences in approach.

→ **Question 8: What are the issues where the systems run difficult, can improve? Suggestions?**

The following issues are reported:

- the current system implemented in the Member State is not fully compatible with the EU RED requirements (i.e. EU requirements contain reporting requirements on social aspects, reported in Belgium);
- agreement on calculation methods (LCA): system boundaries and lack of suitable data, selection of the reference system and comparison with other land use types within the country and abroad, effect of by-products and allocation procedures, cultivation practices and fertilizer use, carbon storage calculation methods (FI);
- the uncertainty of implementation and the delayed process regarding EC recognised voluntary schemes (SE).

Furthermore it was proposed by the Belgian representative that the control system should be embedded in Common Agricultural Policy. The UK respondent suggests to improve the legislation since significant changes (to UK's Climate Change Sustainability Act 2006) are expected.

3.1.2. QUESTIONS PART A.2: BIOFUELS NON-EU

These questions focus on the approach taken by non-EU Task 40 members.

This part of the questionnaire was filled out by respondents from Canada, the United States, Brazil and Norway.

→ **Question 1: Are there specific sustainability requirements in legislation for biofuels in order to be counted towards a target, or to receive financial incentives?**

If yes:

- a. **Can you shortly describe these requirements (e.g. GHG, land use).**
- b. **Do you see/anticipate a significant impact on markets (agricultural or forestry), e.g. on domestic vs imports, and on biomass prices?**
- c. **Who controls the requirements?**
 - a. *audit by recognized body*
 - b. *self declaration*
 - c. *governmental organism*
 - d. *combination*

Only 3 respondents (CAN, BR and US) responded positive to this question. Regarding the requirements:

- the Canadian respondent states that the regulatory framework for forest management applies no matter what product is being produced. Biomass harvesting guidelines are being discussed because of the concerns about the effect on soil fertility. The requirements are controlled by a governmental organisation. Canada notices or anticipates a significant impact on the market.
- the US respondent states that the EISA requires a 20% reduction in life cycle GHG emissions for any renewable fuel produced at new facilities (those constructed after enactment), a 50% reduction in order to be classified as biomass-based diesel or advanced biofuel, and a 60% reduction in order to be classified as cellulosic biofuel. These requirements are controlled by a governmental organisation. Also the US respondent indicates to see or anticipate a significant impact on the market.
- In Brazil there is an agro-ecological zoning for sugarcane. Investors who do not respect this zoning are not eligible for getting loans from public institutions. These requirements are controlled by a governmental organisation. The respondent does not see or anticipates a significant impact on the market.

The respondent from Norway answered that they do not have specific sustainability requirements in their legislation for biomass.

→ **Question 2: Are external sustainability requirements (e.g. RED) and voluntary schemes for biofuels (e.g. RSB) or crops (e.g. RSPO, RTRS, ...) playing a role in the production of biomass for biofuels in your country?**

If yes:

- a. Can you explain this role.**
- b. Why did the market choose for one of these schemes?**
- c. What is the impact of these schemes on the biomass used for biofuels?**
 - a. no change
 - b. more focus on the domestic market
 - c. barrier to export to certain regions in the world (e.g. EU)
 - d. more focus on sustainable production of the biomass
 - e. exports shift to other regions

The respondents from Norway and the US replied that the sustainability requirements or voluntary schemes do not affect the local production of biomass for biofuels.

The Brazilian respondent indicates that European sustainability requirements and voluntary schemes are influencing the production of biomass for biofuels. He adds that ethanol producers are motivated to get certified to be able to export to Europe. The most commonly used certification schemes are BONSUCRO and ISCC because they are considered the best for them.

→ **Question 3: What is the impact of sustainability requirements on the price:**

- a. increase in price of the biomass**
- b. decrease in price**
- c. no influence**

The US and Brazilian respondents stated that the sustainability requirements have no influence on the price. The Canadian respondent indicated an increase on the price of the biomass.

→ **Question 4: How would you describe the control of these sustainability requirements / schemes in your country?**

- a. sufficient to guarantee compliance with the requirements**
- b. could be better (e.g. control frequency too low)**
- c. insufficient (explain in which area)**

Only the Canadian representative responded to this question, indicating that the control that the control is sufficient to guarantee compliance.

→ **Question 5: Is there a difference in approach between smallholders and producers of large amounts of biomass? If yes, which?**

The US respondent stated that there are no differences in approach, and adds that it is hard to imagine that small-scale production of low-cost feedstock could be economically viable.

The Canadian respondent indicated that only large producers of forest biomass have access to state forest, which accounts for almost 90% of the forested area in Canada.

The Brazilian representative replied that it is obvious that it is more expensive for small producers to get certified, but adds that all ethanol producers are large companies.

→ **Question 6: What are the issues where the systems run difficult, can improve ?
Suggestions?**

The Canadian respondent indicated both the economic viability in the context of intense competition from hydropower (in Quebec) and the social acceptability of biomass projects in respect to their environmental impacts (soil fertility, carbon debt, volatile organic components, biodiversity and land use).

The Brazilian respondent stated that the main issue is the lack of proper/complete information; e.g. for GHG balances, some companies do not have all required data.

→ **Question 7: Does (agricultural) legislation in your country contain sustainability requirements on land use, water, air and soil, which may have an impact on available biomass for biofuels?**

- a. **If yes, can you explain this impact.**
- b. **How would you describe the control of these legislative sustainability requirements in your country?**
 - a. *sufficient to guarantee compliance with the requirements*
 - b. *could be better (e.g. control frequency too low)*
 - c. *insufficient (explain in which area)*
- c. **Who controls these requirements:**
 - a. *audit by recognized body*
 - b. *self declaration*
 - c. *governmental organism*
 - d. *combination*

The responses indicate that some countries have (CAN and BR) and other countries (NO) don't have binding/mandatory requirements on land use, water, air and soil which could affect the availability of biomass for energy or biofuels.

The Canadian respondent refers to forest management regulations which includes regulations for soil quality, tree utilization etc. Furthermore all heat producing projects above a certain capacity are obliged to conduct an impact assessment.

Brazil has an agro-ecological zoning for sugarcane (and for palm oil this is on the way) includes specific requirements regarding water use and also regarding atmospheric emissions.

Norway uses the EU standards for agriculture (CAP). The Norwegian respondent also replied that it has agricultural restrictions but that in practise there is no biofuel production from energy crops, and thus no impact.

The Canadian, Brazilian and Norwegian respondent added that the control is considered sufficient and that this is done by a governmental organism.

The US representative did not respond to this question.

3.1.3. QUESTIONS PART B: SOLID BIOMASS AND BIOGAS

These questions relate to the initiatives taken regarding sustainability requirements for solid biomass or biogas. To be completed by all Task 40 member countries. Answers were received from 12 countries (AT, BE, BR, CAN, DE, FI, IT, NL, NO, SE, UK, US).

→ **Question 1: Are there specific sustainability requirements in legislation for solid biomass or biogas for electricity and heat, in order to be counted towards a target, or to receive financial incentives?**

- a. **If yes, can you shortly describe these requirements (e.g. GHG, land use,..)**
- b. **Do you see/anticipate a significant impact on markets (agricultural or forestry), e.g. on domestic vs. imports, and on biomass prices?**
- c. **Who controls the requirements?**
 - a. *audit by recognized body*
 - b. *self declaration*
 - c. *governmental organism*
 - d. *combination*

The answers to this questions show that here was some misinterpretation of the question: some members indicate specific sustainability requirements that are related to the production of green energy (as intended by the question), while others indicate measures that are more general.

The following representatives indicated that sustainability requirements for biomass or biogas for electricity and heat are in place:

- Austria: Minor financial investment bonus if GHG reduction from biogas plants >45%;
- Belgium: Green Certificate systems based on GHG performance or energy balance compared to fossil electricity and heat production. Flanders also limits the types of biomass which can be used for energy (not if usable by wood processing industry);
- Italy: There is a premium for power plants (biomass, biogas, bioliquids) > 1 MWe that source their feedstock within a radius of 75 km. This requirement favours the use of local biomass over the use of imported biomass for large operators and keeps the trend in the market focused on small decentralized plants rather than large ones;

Other respondents refer to measures that are not specifically linked to energy production:

- Canada: In Quebec, the policy is set to utilize 1,5Mtons of forest biomass to achieve a reduction of 1,1M tons of GHG emission yearly mainly through heat generation.
- Finland: Comprehensive forest legislation and practices for sustainable forestry for forest biomass production (end use purposes are not distinguished);
- Norway: Strong legislation on land use change. Restrictions regarding biodiversity in forestry.
- UK: GHG and land use criteria (according to RED);
- US: Initiatives on local level, designed to conserve forest landscape.

These requirements are controlled by a governmental organism (NO) or a combination of the options (BE, FI and UK). Austria and Canada did not provide further details on the control of the requirements.

Respondents from the other countries -BR, DE, NL and SE- replied to have no mandatory requirements for the assessment of solid biomass or biogas for energy. The Brazilian respondent adds that exporting companies use the sustainability requirements that are mandatory/requested in the respective countries.

Respondents from Belgium, Brazil, Norway and the UK mention that they see or anticipate an impact on the market, e.g. referring to the fact that most co-firing installations use imported biomass (BE). The Finnish and US respondent replied to not (yet) anticipate a significant impact.

→ **Question 2: Are external sustainability requirements (e.g. from big utilities) and voluntary schemes for biomass or sustainable forestry (e.g. FSC, PEFC, ...) playing a role in the production/sourcing of biomass as a feedstock for bioenergy in your country?**

- a. **If yes, can explain this role**
- b. **Why did the market choose for one of these schemes?**
- c. **What is the impact of these schemes on the biomass from your country used for electricity and heat (both domestic and abroad)?**
 - a. *no change*
 - b. *more focus on the domestic market*
 - c. *barrier to export to certain regions in the world (e.g. EU)*
 - d. *more focus on sustainable production of the biomass*
 - e. *exports shift to other region*
- d. **Do the schemes influence investments in solid biomass and biogas projects? Can you give examples?**

Most answers given indicate that sustainability criteria or voluntary schemes are used but that they do not (yet) play a role in the production or sourcing of biomass for bioenergy or the investments made in solid biomass and biogas projects. The US respondent further indicates that these schemes were introduced because the public participation requested it. In Norway the schemes were demanded by the EU forest industry.

The Dutch respondent indicates that based on the experience from Essent (biggest user of solid biomass for electricity) sustainability certification is considered as an advantage. The main concern according to the Dutch representative is the uncertainty regarding the financial support for co-firing/digestion, regardless of the fact that this support will be linked to sustainability requirements or not.

Regarding the impact (sub question c), both the Norwegian and Swedish respondents see no change, while the representatives from Brazil, Canada, the Netherlands and the UK report to see more focus on sustainable production of biomass. The other respondents did not respond to this sub question.

→ **Question 3: What is the impact of sustainability requirements on the price:**

- a. **increase in price of the biomass**
- b. **decrease in price**
- c. **no influence**

Respondents from Austria, Brazil and Germany did not reply to this question. The majority of the members that did respond (BE, IT, NL, NO, SE and US) reported no (or marginal) influence, except for Finland, Canada and UK who state that these requirements increase the price of biomass.

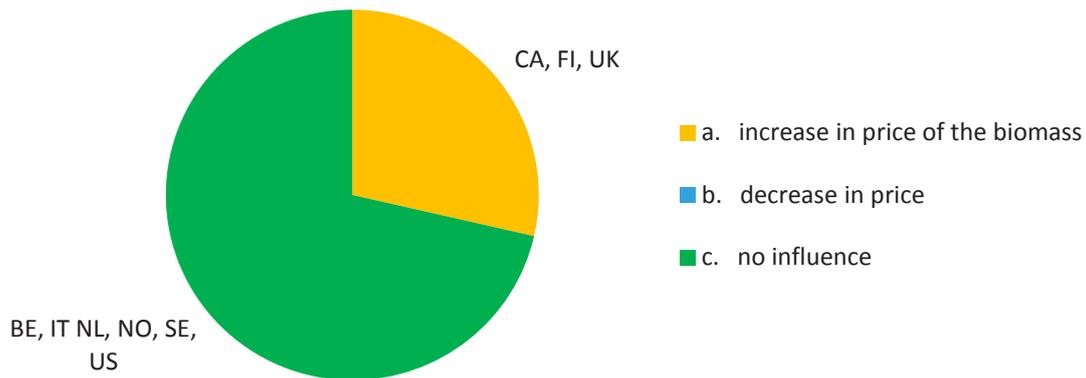


Figure 3: Overview of the impact of sustainability criteria on price

→ **Question 4: How does this system interact / is connected with the biofuels/bioliquids system?**

- a. no connection
- b. systems are aligned
- c. conflicting

As shown in Figure 4, the system for solid biomass or biogas seems to either have no connection (AT, BR, CAN, DE, IT, SE, US) or is/will be aligned (BE, NL, NO and UK) with the system for biofuels and bioliquids. Only Finland reports that both systems are conflicting.

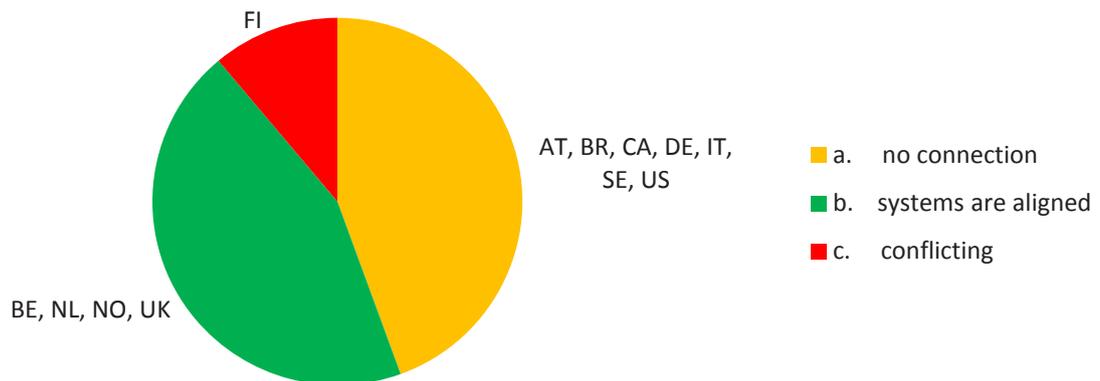


Figure 4: Overview of how the system for solid biomass and biogas interacts or is connected with the biofuels/bioliquids system

→ **Question 5: Are sustainability criteria influencing long term supply contracts of biomass? Examples?**

The majority of the answers indicate that there is no influence on long term contract (BR, FI, IT, NL, NO, SE and US). The Belgian respondent reports the influence of sustainability criteria on long time supply agreements referring to the contract that Electrabel has in North-America which includes

sustainability criteria. The UK respondent states that it does influence the supply contracts as the criteria require a better control on the feedstock you purchase. The Canadian respondent replies that the annual allowed cutting restriction is influencing how supply contracts (10 year) are managed.

Respondents from Austria and Germany did not reply to this question.

→ **Question 6: How would you describe the control of these sustainability requirements/schemes in your country?**

- a. sufficient to guarantee compliance with the requirements
- b. could be better (e.g. control frequency too low)
- c. insufficient (explain in which area)

All responses, except IT, FI and UK, indicate a sufficient control of the sustainability requirements and schemes. The Finnish respondent points out that the control on domestic biomass is sufficient, but for foreign biomass this could be better.

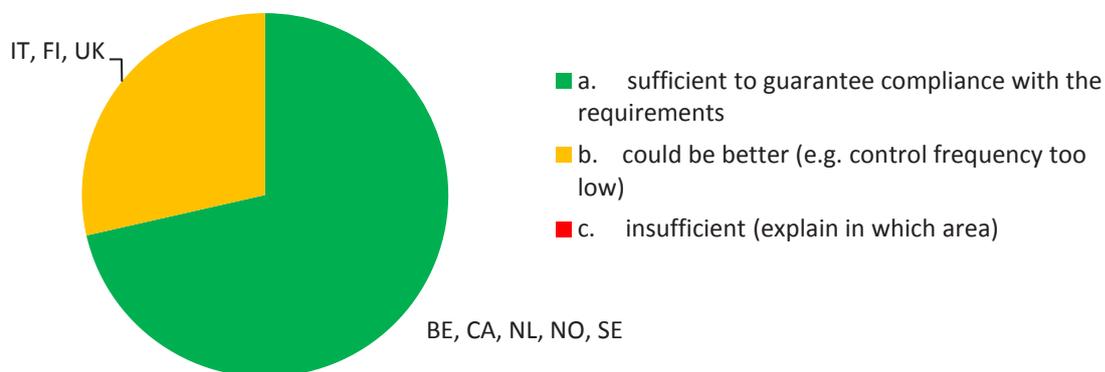


Figure 5: Overview of how the control of sustainability requirements is assessed

→ **Question 7: Is there a difference in approach between smallholders and producers of large amounts of biomass? If yes, which?**

Respondents from Belgium, Canada, Finland, Sweden and the UK indicate that there is a difference in approach, i.e. big producers are certified while the smaller are not and use self declaration (BE and SE), or that big producers use other sources (FI).

Respondents from Germany, Italy, the Netherlands and US report no difference.

The Brazilian and Norwegian members did not provide an answer.

→ **Question 8: What are the issues where the schemes run difficult, can improve? Suggestions?**

The following issues and suggestions are reported:

- Wood restrictions (preference wood processing industry) are only valid in certain regions, e.g. Flanders (BE). This creates market distortions and exports of biomass to neighbour countries;
- Large scale CHP vs. small scale heating, different operating efficiency and emission control, e.g. fine particles, food vs. energy use. Same procedures should be used, regardless of end-use; energy efficiency and climate mitigation efficiency should be included (FI);
- Education of the parties involved (NL);
- Some discussion on the level of environmental performance required. The main environmental discussion in forestry and biomass supply is forest conservation (NO);
- The administrative burden of voluntary systems are too high for small-scale producers. As the Swedish legislation is designed to minimize the risk to land-use and biodiversity (SE), the benefits for land-use, biodiversity etc. of a voluntary system are minor;
- The availability of large quantities of sustainable biomass, and too much secrecy in trading issues (UK).

→ **Question 9: Does legislation (excl. energy legislation) in your country contain sustainability requirements on land use, biodiversity in forestry, ... which may impact the amount of biomass available for bioenergy?**

- a. If yes: can you explain this impact**
- b. Who controls these requirements:**
 - a. audit by recognized body*
 - b. self declaration*
 - c. governmental organism*
 - d. combination*
- c. How would you assess the control of these legislative sustainability requirements in your country?**
 - a. sufficient to guarantee compliance with the requirements*
 - b. could be better (e.g. control frequency too low)*
 - c. insufficient (explain in which area)*

The results show that the mandatory sustainability requirements in other legislations are felt to have an impact on the availability of biomass. Most of the requirements are related to sustainable forestry and guidelines for harvesting biomass from forests. The answers indicate that these impacts will affect the supply as these ensure that the annual wood harvest volumes do not exceed the annual forest growth (e.g. SE) or that some lands may not be used for biomass harvesting (e.g. BE, CAN, FI). Respondents of the Netherlands, Norway and Italy reported that there were no sustainability requirements in other legislations having impact on biomass availability for bioenergy. Austria did not respond to this question.

Regarding sub question b (Figure 6), the replies indicate that the majority of countries has a governmental organism to control the requirements, the other either make use of audits by a recognized body (FI) or a combination of both (BR, DE and US). These controls are considered to be sufficient, except in the UK and CAN where the respondent states that control could be better. The UK respondent states that the UK is well advanced in this area but controlling the whole fuel chain is very difficult and requires greater international cooperation.

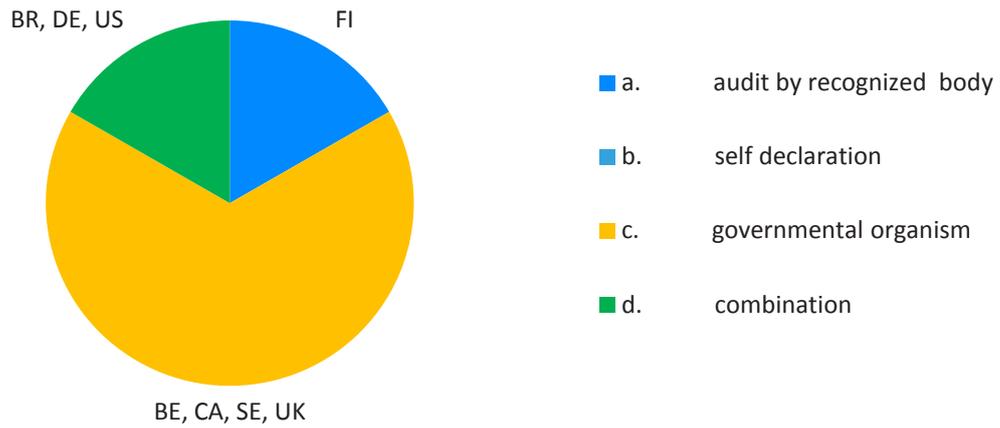


Figure 6: Overview of how sustainability requirements are controlled

3.2. IMPLEMENTATION OF SUSTAINABILITY CRITERIA: CONCLUSIONS AND SUGGESTIONS

Based on the results of the evaluation of the responses to the questionnaire, a list of conclusions and suggestions is presented.

3.2.1. IMPLEMENTATION OF SUSTAINABILITY REQUIREMENTS FOR BIOFUELS/BIOLIQUIDS, EU MEMBERS

The implementation of sustainability principles and certification for the production of biofuels aims to guarantee that the use of biofuels reduces the environmental impact of fuel consumption and ensure that the entire biofuels production and supply chain is sustainable.

At this moment the responses indicate a double dividend effect of the implementation of the RED. The focus indeed seems to have shifted to a more sustainable production of bioenergy. And also, for European producers and traders it generally has the benefit of receiving national public support such as tax relief for sustainably produced biofuels.

→ *EU Members*

According to the answers, most countries use voluntary schemes to certify the sustainability of biofuels (approved at national or EU level). Most stakeholders welcome these initiatives and regulations; only biomass producers are less positive. They are confronted with the different approach and procedures between biomass that goes to the production of liquid bioenergy on the one hand and biomass that goes to other applications (including solid or gaseous bioenergy) on the other hand.

The respondents indicate that the sustainability requirements and schemes for bioliquids and biofuels seem to shift the sourcing of biomass for biofuels more to domestic or EU markets. They do not see any change in the price setting. Large scale producing companies seem to adapt better to the regulations as they generally have a better awareness of the implementation and benefits are higher.

Still a couple of issues were raised:

- the agreement on the methodology for calculations (see [question 8 of Part A.1](#));
- the compatibility with the national system (not all criteria included);
- the uncertainty about which type of scheme to use; delay on approval of EU accepted voluntary schemes.

Good or better – in and outside EU borders - management of the sustainable production of bioenergy and its certification is thus the key factor to succeed.

→ *Non-EU Members*

Only limited replies were received from non-EU members, i.e. BR, CAN, US, NO. The replies indicate the use of regulatory forestry management systems (CAN) and agro-ecological zoning (BR), which contain requirements for land use, water, air and soil and the use of requirements that take into account a minimum lifecycle GHG emission reduction for any renewable fuel produced (US). These requirements do not seem to impact the local production of biomass for biofuels or bioliquids.

3.2.2. IMPLEMENTATION OF SUSTAINABILITY REQUIREMENTS FOR SOLID BIOMASS OR BIOGAS FOR STATIONARY BIOENERGY

The replies provided indicate various national systems and initiatives developed to guarantee the sustainability of solid biomass or biogas.

The scope of the initiatives differs. Most initiatives are developed to guarantee sustainable land use and sustainable agriculture and forestry management, not specifically for bioenergy purposes, e.g. referring to the voluntary schemes FSC and PEFC. These do not include greenhouse gas emissions along the product life chain in the criteria. Only a couple of systems for stationary bioenergy are developed (e.g. UK and Belgium) that include a life cycle GHG accounting, as also proposed by the European Commission.

In general these systems are not necessarily aligned with the systems in use for bioliquids and biofuels. These national sustainability requirements do not (yet) have an impact on the local production of biomass, price or investments made. The main influencing factor for the deployment of bioenergy seems to be the policy support system in place.

Furthermore there is some discussion about the availability of large amounts of sustainable biomass, forest conservation and need for transparency of the market. For small scale producers the administrative burden is considered too high compared to the benefits.

The respondents of the questionnaire indicate the need for a level playing field in the market, suggesting that the sustainability requirements would be extended to all biomass and all biomass usage.

Specific suggestions from the IWPB group on sustainability criteria for solid biomass:

Regarding the ongoing RED/sustainability discussion and some recent statements made by some European Member States, these are the views of the International Wood Pellet Buyers (IWPB) consortium:

- The binding criteria should be meant for all uses of biomass since producers of raw materials do not necessarily know about their end users.
- The implementation of sustainability criteria must avoid unnecessary burdens on companies and markets.
- Cross-compliance of available certification systems for forestry like PEFC/FSC or existing and well applied national legislation can be used to demonstrate conformity with some of our principles, but it is very important to note that they generally do not cover GHG balance and carbon stock change that are fundamentally important issues for bioenergy applications.
- In order to come to a level playing field and an efficient European market, the sustainability criteria should be uniform and set at European level.

An example: Poland wants to exclude high quality wood for the grant of green certificates. If this forbids pellets out of round wood, the pellet market will be split in two: 'round wood pellets' and 'non-round wood pellets'. You would also have to transport them separately, store them separately etc. This would of course be purely for paper reasons; it would increase the costs of biomass supply by making the value chain less efficient. Environment is not helped (on the contrary, more transport costs and hence CO₂ emissions) when e.g. round wood pellets from Latvia go to the UK and non-round wood pellets from Portugal go to Poland, purely due to the national rules. It is therefore of crucial importance that every country has the same sustainability rules, and that those rules are European rules.

- It is important to realize that non-binding (voluntary) sustainability criteria allow room for the use of non-sustainable biomass; and this is damaging the business by deteriorating the acceptance of biomass as a cost efficient substitute for carbon heavy fossil fuels. Therefore our working group recommends binding criteria on sustainability.
- As Eurelectric already pointed out in its position paper of May 2010, criteria for sustainable production of liquid, solid and gaseous biomass should ideally be based on the same concepts. However, mandatory sustainability criteria should be implemented in a very careful and practical way and based on clear and measurable indicators only. They should take into account the widely different environmental issues in different Member States and climatic zones, bearing in mind two key purposes – to ensure the sustainable production of biomass and an acceptable greenhouse gas balance for biomass utilized for energy production. Eurelectric considered that a useful basis was established with the guidelines in the EC report (SEC)2010, but also that those guidelines based on the criteria for liquid biomass set up in the RED would require significant modification in order to develop mandatory sustainability criteria for solid biomass.

CHAPTER 4 ISSUES IMPACTING BIOENERGY MARKETS AND TRADE

Biomass (solid, liquid and gaseous) is considered to play a key role in the reduction of greenhouse gas emissions, meeting carbon reduction targets, and increasing the energy supply diversity and security. In terms of biofuels for transport, several countries have introduced mandates and targets for biofuels uptake in the transport fuel system. Production, international trade and investment have increased rapidly in the past few years. This explains why biofuels have been a hot topic over the past years. On the one hand biofuels provide new opportunities for using agricultural markets. On the other hand there are environmental, social and economic concerns about the production of biomass feedstocks for biofuels. The sustainability of biofuels, food versus fuel, and land use change discussions overshadow the positive effects including CO₂-reduction and the potential to replace fossil fuels.

Sustainability criteria and certification systems are a response to these concerns. In general one has to take into account that there are obligatory (regulated) and voluntary systems operating at the same time, the first having high financial benefits and thus reaching far beyond the usual issues related to competition between certification systems, double-certification, endorsement, etc ⁶.

The discussion of using solid biomass for bioenergy (mainly for stationary energy like electricity and heat) follows with some delay the discussions around to biofuels for transport. While the discussion for biofuels focused on food vs fuel and land use change, the discussion for solid biomass focuses on risks for biodiversity and carbon stock loss in forests. Sustainability criteria and schemes are being developed for solid biomass for energy, but implementation in legislation is less developed than for biofuels.

The development of these sustainability criteria and certification schemes for biomass and biofuels has brought a lot of discussion on their drawbacks, limitations and impact on the bioenergy deployment and trade. This chapter provides a general discussion/brainstorm on the main issues highlighted by the Task 40 members.

The responses to the questionnaire highlighted some barriers and concerns related to the sustainability certification schemes and bioenergy growth and trade:

- proliferation of sustainability criteria & schemes;
- discrimination in the use of biomass;
- issues for administrations;
- issues for commercial actors;
- developments in third countries;
- good energy practices.

These issues and barriers are discussed more deeply in the following paragraphs.

⁶ M. Junginger et al., Opportunities and barriers for international trade, written for IEA Bioenergy Task 40, May 2010, p.76

4.1. PROLIFERATION OF SUSTAINABILITY CRITERIA & SCHEMES

In 2010 IEA Bioenergy Task 40 provided an overview of existing initiatives to guarantee sustainable bioenergy. The study by J. van Dam⁷ found 67 initiatives, with 27 of them covering sustainability criteria for biofuels/bioenergy. This indicates that a lot of work has been done across the globe in taking the necessary actions and measures to ensure and secure sustainable bioenergy in the future. It is clear that only sustainable production of biomass fuels will effectively contribute to more sustainable bioenergy system (including GHG emissions) and allow a stable market development.

Existing certification systems are developed for **specific sectors** (forestry, agriculture, specific biofuel feedstock, bioenergy production,..) with **different purposes** (sustainable management of forest, health and safety of products, energy security, climate change,..) and so the sustainability criteria and requirements are developed differently. The biofuels/bioenergy certification schemes require additional sustainability criteria compared to the certification schemes for agriculture and forestry, such as carbon stock, GHG emissions, land use changes and socio-economic demands, which were not considered relevant for sustainable agriculture or forestry.

Since some European Member States are mainly dependent on biomass imports for fulfilling their renewable energy targets and increasingly turn to sources outside the EU^{8,9}, concerns have been expressed that an expansion of international trade of biomass and increasing imports from third countries may lead to land use change and unsustainable production of biomass, both when it comes to biofuels for transport as well as stationary bioenergy¹⁰. While initiatives for biofuels are directly related to the Renewable Energy Directive requirements, in terms of solid biomass, the main importing countries of biomass have started (or are planning) to develop their own **national sustainability requirements**. At the same time industrial and market business-to-business schemes are being developed. This has led and will lead to **certification schemes (voluntary and mandatory)** which are **not necessarily complementary or compatible**.

This variety of sustainability initiatives and requirements, lack of coherence and considerable overlaps between standards is **leading to confusion, lack of confidence and acceptance** among the stakeholders which limit the effectiveness, lead to loss of meaningful participation and distortion of the market.

The exact impact remains to be seen in the future. There is the risk that countries will choose the model that requires the least change or efforts. There might be a tendency also from the industry side to use the **commercial cheapest system** with the least demanding auditing system, much to the disappointment of several NGOs. Poor performers could potentially hide in this confusing context and/or biomass crops will flow to markets that do not require certification.

⁷ van Dam J, et al. From the global efforts on certification of bioenergy towards an integrated approach based on sustainable land use planning. *Renew Sustain Energy Rev* (2010), doi:10.1016/j.rser.2010.07.010

⁸ Non-limitative list: Belgium, the Netherlands, the UK, Germany, Italy,... The Flemish Region (Belgium) estimates to import roughly 60% of its biomass energy needs by 2020 (IEE BAPdriver project, National positioning paper – Belgium/Flemish Region). The Dutch Corbey Commission on sustainability issues argues that a large part of the solid biomass resources in the Netherlands are, different from most other EU MS, being imported and likely to increase in the coming years to reach the 2020 targets.

⁹ Table 7 'biomass supply in 2006' and Table 7a 'Estimated biomass domestic supply in 2015 and 2020' of the *Template for National Renewable Energy Action Plans under Directive 2009/28/EC of the European Parliament and of the Council (2009/548/EC)*, will give an update status of the current and estimated import of biomass resources in the EU Member States.

¹⁰ In a joint position paper on sustainability criteria for biomass (ENV 901 - ENER 447) to the European Council, the Benelux countries state 'that the absence of a Commission proposal in this regard would be a missed opportunity'.

A **strong and common approach** may help to **reduce the concerns** regarding origin and quality of the imported biomass. They also **reduce transaction costs**, as they reduce the costs to get this information and thereby **facilitate trade**.

4.2. DISCRIMINATION IN USE OF BIOMASS

Biomass for energy can be produced from various crops, which can also be used for food, feed or materials. Currently **only** the use for **biofuels needs to be certified** on EU level. Other, similar commodities with similar environmental, social and GHG impact do not require certification.

Stakeholders producing biomass for biofuels on the one hand, for stationary energy on the other hand, or for other applications (food, materials) are thus currently facing a **discrimination** in conditions for being allowed to deliver their biomass. Farmers delivering their corn to a transport biofuel installation need to be in line with the obligated sustainability criteria. The same farmer providing his corn to a biogas installation (combined with electricity production) doesn't need to fulfil these criteria, nor when he delivers his product to the food and feed markets. While this gives feedstock producers a certain flexibility, choices will be made according to market prices and transaction costs, which are determined by the certification schemes.

An important issue is the **willingness and cooperation** of the biomass producers, especially from **agriculture** (for biofuels) **and forestry** (for solid biomass). The question is if additional auditing is needed for agricultural products going to biofuels (as compared to other agricultural markets), or for solid biomass used for energy (as compared to wood material market). This may diminish the willingness of the agricultural and forestry sector to deliver feedstock for biofuel markets, if there is no added value for these certified products. On the other hand if there is added value for products with guaranteed sustainability, this may **lead to indirect displacement effects** as non-sustainable products will be directed to markets which do not require proof of sustainability.

Criteria for sustainable production of liquid, solid and gaseous biomass should **ideally** be based on **the same concepts**, and should be meant **for all uses of biomass** since producers of raw materials do not necessarily know about their end users.

These **sustainability criteria** have to be implemented in a very careful and practical way, bearing in mind two key purposes: to **ensure the sustainable production of biomass and an acceptable greenhouse gas balance** for biomass utilized for energy production. They should be based on clear and measurable indicators, taking into account the widely different environmental and technical issues in different countries and climatic zones.

4.3. ISSUES FOR ADMINISTRATIONS

→ *Defining global common approach*

One of the main issues for administrations is to come to a **level playing field** and an efficient European/global market. To achieve this the sustainability criteria should be uniform and set at European/global level. **Coordination** of the **different standards and schemes** and establishing a common approach can become a major driver for the deployment of bioenergy and the acceptance of biomass as a cost efficient substitute for fossil fuels.

Implementation of global scale sustainability criteria and requirements that are relevant to all biomass feedstock cultivation and use will be challenging since at the moment there is no universally accepted definition of 'sustainable biomass/bioenergy' and how to measure this.

Although the life cycle approach to measure sustainability of biofuels is currently adopted by the European Commission, disclosure of sensitive supply chain information might violate the concept of free trade and could jeopardise abilities for joint-ventures. This could be countered by setting up nation-based systems for sustainability validation, by using bilateral agreements between countries as a declaration for sustainability (van Doren, 2010¹²).

Despite the drawbacks of the current situation, there are many similarities and synergies among the different existing schemes that can be exploited to **develop an effective and efficient EU/global approach**. Many schemes have comparable objectives and common requirements regarding the design and setting up of infrastructure to manage these schemes.

Linking biofuels and biomass sustainability certification with **climate change** policies, existing **codes of good practice** and guidelines for **agriculture and forestry** could contribute to gain acceptance, acquire experience and avoid trade barriers. Cross-compliance of available certification systems for forestry like PEFC/FSC or existing and well applied national legislation can be used, but it is very important to note **that they generally do not cover GHG balance and carbon stock change** that are fundamentally important issues for bioenergy applications.

CEN (the European Standardisation Institute) is currently elaborating a European standard for sustainable biofuels, in line with the RED requirements. At this moment there is a **European pre-norm prEN 16214**. This pre-norm is still in commenting stage, but may lead to a definitive norm in short term.

ISO is developing a global standard (ISO 13065) and harmonised criteria on sustainable bioenergy production, which will also address the social, environmental and economic aspects of production, supply and use. This process may take some time and the decision process is quite political.

At the same moment it is expected that **additional knowledge** will be gained about the improved sustainable production of biomass and biofuels, and certification through several well-developed pilot projects carried out in several EU countries. In the Netherlands two funds, the Global Sustainable Biomass Fund and Sustainable Biomass Import are carried out to get more experience on the field, with a total funding of more than 20 M€. The results of the pilot projects from these programs will become available throughout 2011 – 2013.

This uniform approach could gain credibility, acceptance and market penetration, and might be able to avoid different impacts/effects. A common EU/global market will create an **efficient market** with high liquidity and flexibility to move products across borders. Lack of a common long term strategy leads to competition of biomass resources, only based on prices and volumes. On policy level clear choices have to be made how resources can be optimally used and what is expected from the market. The main benefit for industry will probably be related to a **"one-stop-shop"** approach that focuses on one single standard, instead of a range of different standards and schemes. It would allow for **more efficient structures, save costs** due to better management practices, **ease administration tasks** involved and make it unnecessary for industries initiatives to create new standards. Costs derived of being part of a broader effort could be offset by a much greater market penetration.

However there might be a low acceptance from certain stakeholders because they might need to certify against this new global standard, and there is some risk that the criteria will not be implemented and applied in an equivalent and rigorous way at national level. There is also the still

ongoing **debate on** how to solve some **methodological issues related to the sustainability of bioenergy**, such as the role of **indirect land use**, the **competition of food versus fuel**, or the **concept of carbon debt**.

→ ***Control by clear auditing***

A key point is the **control of the criteria and requirements**. There is some risk that global sustainability criteria will not be interpreted the same way and will be applied differently at national level. Also the quality of institutional frameworks may vary among the different countries. Some developing countries lack a proper legal framework related to agriculture and forest management. Poor law enforcement may lead to reduced effectiveness.

On 10 June 2010 the European Commission presented a communication on voluntary schemes for biofuels. This document describes how the EC will assess the schemes and come to recognition. A voluntary scheme should ensure that economic operators are audited before allowing them to participate in the system and the auditors are to be recognised, preferably by an accreditation process. **Clear auditing processes and accreditation of auditors** will avoid fraud and give trust to the system.

To ensure **proper auditing, and compliance**, the requirements will have to be **based on** precise and strong criteria that can actually be monitored by specifying **quantitative or clear qualitative indicators**.

→ ***Mandatory versus voluntary requirements***

A key question is whether sustainability requirements should be voluntary or mandatory.

Voluntary systems have become an **important element in the mix of public policies and corporate strategies** to promote the sustainable production of biomass and biofuels due to the lack of proper regulations. However voluntary systems **still allow room for non-sustainable biomass and biofuels**, which is damaging for the credibility.

Voluntary initiatives are a necessary, but probably not a sufficient element in the mix of policy instruments to move towards the objective of sustainable bioenergy. Maybe the voluntary versus mandatory debate does not imply an “either/or” position, but rather the finding of a balance between regulation and voluntary schemes. Voluntary systems can be an **effective tool in complementing regulations** to improve the awareness, facilitate the discussion on the implications of certification and provide a forum for information sharing among various stakeholders.

*Arguments in favour of **voluntary requirements/standards** include¹¹:*

- Sustainability requirements are still young and evolving and will therefore require time to mature. Mandatory standards are less **flexible or easy to adjust**.
- Public regulators are often not acquainted with company or industry issues (e.g. market access, product quality and acceptability).

*Arguments in favour of **mandatory requirements/standards** include¹¹:*

¹¹ Carrots and Sticks for Starters : Current trends and approaches in Voluntary and Mandatory Standards for Sustainability Reporting, UNEP and KPMG’s Global Sustainability Services

- Not all companies will make use of voluntary schemes, and non-sustainable biomass can still be traded.
- The use of regulated requirements /standards can add to the **credibility and transparency** of the schemes.
- Mandatory requirements may encourage the **development of a central / comparable system** to be used by all stakeholders.

4.4. ISSUES FOR COMMERCIAL ACTORS

→ ***Common transparent standardisation***

On the producer side there is the risk that due to the **large set of certification schemes** they are not able to produce biomass, biofuels and bioliquids in the correct and sustainable way for all markets at the same time. As mentioned above this might also lead to confusion and to additional costs for producers. There is a critical risk for companies and the whole biomass market if there is no common and transparent definition for sustainable bioenergy; it is still not defined how the sustainability concept should be translated into practice, i.e. how to measure sustainability and which criteria/indicators should be included. It is therefore very important to come to a common understanding on “what is sustainable and how it has to be verified/ documented”.

Since most major users only use certified biomass/biofuels for trading reasons, corporate social responsibility reasons and subsidies, a uniform sustainability standard might help and boost actual trade. The more standardized a product is, the more transparent the market and the more competitive the product will be. The development of the coal market is a good example; that market has become much more standardized and transparent thanks to the so-called API2 and API4 standards. Where for the standardization of most commodities it is sufficient to describe the technical/physical characteristics and the legal framework, in the case of biomass also sustainability is important.

Stakeholders of solid and liquid biofuel markets have indicated a preference for governmental involvement regarding sustainability issues (van Doren, 2010¹²). However, as already mentioned above, the development of an internationally agreed certification system will be very complex due to differences in structure and complexity of supply chains and differences in sustainability foot print. The inclusion of irrelevant parameters could complicate track and tracing systems for certain biofuels, and lead to increased certification costs.

Another critical issue might be the burden of legislative requirements. On the one hand standards could function as a tool to facilitate companies to act above regulated limits and develop standardised contracts. On the other hand legislative requirement might be too heavy for small size markets and require a global alignment regarding sustainable behaviour.

→ ***Uncertainty about future policy/legislation***

Another important issue for **investors** in installations producing bioenergy is the **uncertainty** whether their biomass fulfils all current and future sustainability requirements. The European Commission is evaluating the situation year by year, but investors are taking investment **decisions**

¹² Van Doren D., Developing biofuels markets: the importance of standardisation in supply chain management, Utrecht University, the Netherlands, December 2010

now with long term contracts for their biomass. They need to be sure that their biomass will be sustainable following future definitions of the administrations. This creates an uncertainty and so a huge risk for investors. In that respect it is perceived as a huge problem by investors that the inclusion of indirect land use change in greenhouse gas calculations for biofuels (to be decided by the European Commission) remains unclear.

Questions are also arising from the **smallholders**. They fear the **administrative burden** that is growing with a certification scheme. For the agricultural sector in the EU the cross-compliance is a step in the right direction to limit the administrative paper work. The European forestry sector is also asking for a similar system instead of certification schemes.

Apart from the proliferation of certification schemes, principles, criteria and indicators, and the potential overlaps of the sustainability systems for the bioenergy sector with existing systems for agricultural and forestry products, there is also the issue of partial recognition of certification schemes. Partial recognition gives an opportunity for existing schemes, which were not set up for the bioenergy sector or which did not include all legislative sustainability criteria from the beginning, to participate and improve. This applies, for example, to some of the Round Table initiatives (RSPO, RTRS,...) and forest certification schemes like FSC and PEFC. A set-back of this partial recognition, however, is that **double certification** will be needed and that this might lead to increased financial and administrative burdens, especially for smallholders.

The biofuels business has already shown that **uncertainties in policies and regulations** cause markets to stagnate. Companies await upcoming decisions that will have an effect on their future strategies. These uncertainties should be avoided in the solid biomass market now, and soon for the rest of the biobased products. This is possible by providing clarity in long-term policy objectives especially regarding sustainability. A step by step approach can give the market a direction while the specific requirements are designed with transparency and with the collaboration of stakeholders along the way.

4.5. USE IN THIRD COUNTRIES

As with all certification schemes, Southern countries (on global level) are lagging behind because of financial, institutional and technical reasons. The implementation of sustainable systems - as conceived by Northern countries - generally requires a much bigger leap for them to reach a certain threshold because of lack of technology and capital. **Non-tariff barriers to international trade** could result from that. Time, but also share in technology and investment, should be given to these countries to be able to catch up. The experience of forestry has shown that the introduction of certification schemes can take years, i.e. only about 10% of the worldwide wood supply is certified (IEA Bioenergy ExCo65 workshop¹³).

4.6. GOOD ENERGY PRACTICES

While markets and trade are mostly thinking in terms of commodities, the life cycle thinking for bioenergy (e.g. in terms of GHG impact and energy use) implies that end use of the biomass should also be considered. A **sustainable bioenergy system** - from the energy obtained through bioenergy,

¹³ IEA Bioenergy, *Developing Sustainable Trade in Bioenergy; Summary and Conclusions from the IEA Bioenergy ExCo65 Workshop, Nara City, Japan (12 May 2010)*

back to the different sources of bioenergy feedstock - must be a **responsibly produced** (i.e. complying with ambitious social and environmental standards), **energy efficient and resource efficient** system that has a **high potential for mitigating climate change**. Input energy must be minimized in all phases of the production system and the use of bioenergy should be as efficient as possible¹⁴. Of course this should not only be valid for biomass, but also for other resources and energy carriers.

The **improvement of energy efficiency** is a **key objective** of the **European Community**, and the aim is to achieve a 20 % improvement in energy efficiency by 2020. In order to achieve this target each Member State is required to reduce the total consumption of energy and increase energy efficiency by considering an **optimal combination of renewable energy sources and high-efficiency technologies**. The RED (Art. 13. 6.) states that Member States should promote biomass conversion technologies for heating and cooling in buildings that achieve a conversion efficiency of at least 85 % (amount of energy produced as a percentage of the amount of energy consumed) for residential and commercial applications and at least 70 % for industrial applications. In its 2010 Communication (EC, 2010) the Commission stated "*Considerations for energy efficiency criteria for bio-energy installations have to take account of the wide range of energy conversion efficiencies which are significantly influenced by size, feedstocks, technology and end-use. For feedstock where different conversion processes are available, it is particularly important to encourage the more efficient conversion processes.*"

Sustainability criteria for biomass and biofuels should therefore also **take into account an efficient use of (bio)energy**. This should be embedded in an overall policy of energy efficiency. If energy use would keep growing the development of bioenergy would only chase a receding target.

The energy efficiency can be evaluated by measuring all relevant direct and indirect energy inputs during production of biomass, conversion to intermediate products, transport and the final conversion of energy. Combined heat and power (CHP) applications reach high conversion efficiencies in conditions where both electricity and heat are utilized, and should therefore be promoted. A promising concept is cascading, where higher value components or materials are produced first and the residues are used for energy production. This principle is already applied in the pulp and paper industry.

Some voluntary certification systems include issues of **energy efficiency** and defined some **indicators**, e.g.:

- The requirements of the *Swan* criteria for pellets indicate that the **energy consumption** for production and transport of 1 MJ pellets should stay below 0,4 MJ (only required for manufacturers).
- *BSI* says that "for the production of biofuels the energy input in biomass production, extraction and conversion should preferably be less than 50 % of the energy output". *BSI* requires that total net primary energy usage per kg product stays under 3000 kJ/kg.

¹⁴ Lena Niemi Hjulfors and Karin Hjerpe, Sustainable bioenergy production Defining principles and criteria, Swedish Board of Agriculture and the Swedish Forest Agency, Jönköping, Sweden, 2010

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