



NL Agency
Ministry of Economic Affairs

Sustainability certification for biomass

Shaping the biomass market

>> Focus on energy and climate change

Though we produce and use biomass for energy, sometimes biomass itself can have an impact on the environment. Sustainable ways of producing biomass have been developed, but aren't always applied. This is why certification is currently being developed: to guarantee the sustainability of biomass products, for consumers and public authorities. Industry and policy makers agree that certification is essential to ensure the sustainability of biomass chains, especially in fast-growing markets.



Negative impacts of unsustainable biomass

Bio-based businesses gradually create new and better food, industrial and energy products from biomass. But biomass flows, of various origin and processed through various conversion routes can have serious environmental and social impacts.

This is why biomass has at times been strongly debated:

- 1 the impact causes doubt as to the potential of biomass to actually reduce greenhouse gas emissions, and
- 2 land used to cultivate biomass can put pressure on other arable land, on peat lands, on forested regions, on biodiversity and on water use for irrigation. Unsustainable biomass production can also negatively impact labour conditions, land rights, and food prices, especially in countries where law enforcement is weak.

The origin of sustainability certification

Over the past ten years, responsible companies involved in biomass have joined organisations in civil society to form various roundtables to discuss these issues. These multi-stakeholder initiatives led to the development of sustainability principles and criteria, later translated into certification standards. Examples are the Round Table for Sustainable Palm Oil (RSPO) and Bonsucro. These have been major steps towards a sustainable bio-based economy.

The development of certification to guarantee sustainable biomass is still very much underway, though a lot has been done. Certification of biomass is now implemented in the supporting European policy framework for biofuels and bio-liquids in the European Union for example. Companies that adopt principles of sustainability will certainly have better chances of successfully importing their product into the European Union, for example, and better chances at surviving in the industry.

In focus

In Europe in 2009 alone, the bio-based economy showed an annual turnover of 2 trillion (2x10¹²) Euros. The industry employed 21,5 million people, half of them in agricultural activities. Dedicated programs implemented in the EU, the US, and other regions such as Canada, Japan and Malaysia are promoting crops for the industrial production of high-value biobased materials. At the same time South America and Africa have started to develop themselves as supply regions.

Business-to-business standards of biomass sustainability are either being scaled up or developed new in anticipation of future policy developments.

What is a biomass certification system?

A biomass certification system is an independent seal showing that biomass or biomass-based products satisfy a certain sustainability standard. Certification systems give all those participating in the biomass chain precise information on how to comply with regulations to ensure the result will meet sustainability criteria. The main elements of a biomass sustainability certification system are:

- The sustainability standard
- The Chain of Custody
- The rules managing the system

Certification systems are being developed by different parties: governments, NGOs, associations or companies. These of course have their own interests and priorities. Therefore the scope, approach and complexity of these systems may vary. Some systems exist on national level; others are internationally endorsed. Certification systems are classified according to the feedstock they govern:

- Forest certification systems;
- Agricultural certification systems;
- General biofuel/bioliquid certification systems;
- Solid biomass for bioenergy certification.

The sustainability standard

Sustainability standards show a number of similarities in terms of coverage of sustainability principles/criteria, but there is a variation in the way these criteria are measured. The most often cited sustainability criteria are found in the People, Planet, Profit (PPP) approach. Examples of these criteria are:

- Environmental (Planet): greenhouse gas emissions reduction; water use; pollution; biodiversity; GMO; soil fertility; erosion; emissions to the air;
- Economic (Profit): Competition for land, water, end use; cost effectiveness; security of supply;
- Social (People): Competition with food production; land rights; employment conditions; creation of prosperity.

The Chain of Custody

Certification of biomass or biobased products must meet sustainability criteria from feedstock to final product. The method connecting sustainability information or sustainability claims between feedstock, intermediate products and final products is known as the Chain of Custody (CoC). In practice, this is about implementing and verifying control mechanisms for each economic operator in the chain. Each party in the supply chain must comply with this process, otherwise the Chain of Custody is lost.

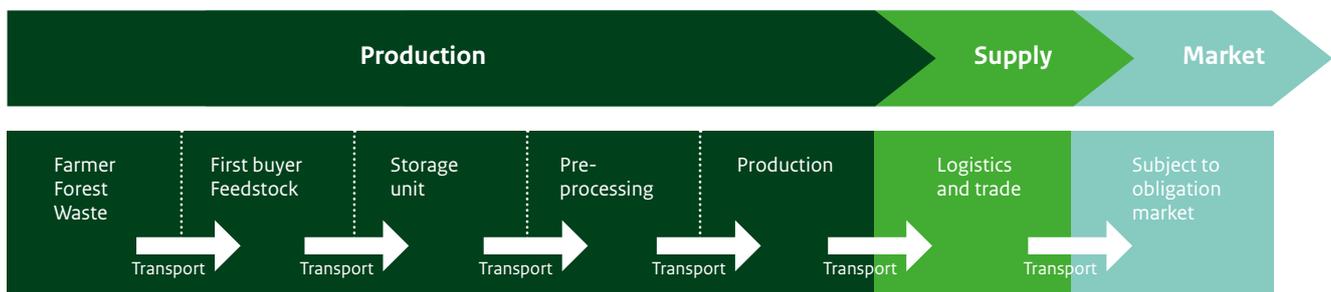


Fig. 1 Typical Chain of Custody including all stages

In general there are four ways to implement these control mechanisms (from higher to lower level of strictness and traceability):

- Identity preserved: This method assures that the certified products originate from identifiable sources. The product cannot be mixed with any other product (certified or not);
- Physical segregation: Only certified products are delivered to the end user. The 100% certified product flow is kept physically segregated from other product flows and can be mixed only with other certified products;
- Mass balance: This method administratively monitors the trade of certified products throughout the supply chain. It allows for mixing certified and non-certified products at any stage in the supply chain, provided that overall company quantities are controlled;
- Book-and-claim: This method consists in tradable certificates. It does not offer any traceability, since the direct link between physical product flows and the sustainability characteristics is absent.

The management of the system

The management of the system includes the rules that govern audits, the level of transparency and accessibility, the level of stakeholder engagement, and complaints handling.

Audit system rules

Audit rules have strong impact on the level of assurance of a certification system. The rules here refer to aspects of auditing procedures:

Audit frequency and validity

Auditors determine audit frequency and validity of certificates using a clear and public risk-based approach procedure, made available in the certification system documentation.

Audit types

There are different types of audits. They range from mere self-declarations to full field audits. The rules to determine which one applies for each case should be clear to the auditor.

Audit management

Audit management refers to the specific procedures for planning and execution. It is important to realise that auditors are there to assess compliance with criteria stipulated in the available standard documentation.

Sanctions for non-compliance

Sanctions for non-compliance should be clearly defined. Failure to meet the standard requirements leads to a non-conformity. Procedure needs to be in place determining how and how soon major non-conformities are to be corrected and that the certificate may be suspended and ultimately withdrawn if non-conformity persists

Transparency and accessibility

To ensure the transparency and accessibility of a system, certain types of information should be publicly available. This information usually includes:

- Rights and duties of certified companies
- Certification system documentation
- List of certified companies
- Summary reports of company assessments
- List of non-compliant companies

Stakeholder engagement

Certification systems should ensure that stakeholders receive information about where they may comment on (or participate in) the auditing assurance process. Stakeholder involvement should be possible during an audit: either as participants in evaluation and review or as observers. Stakeholders should be given the opportunity to comment on relevant issues to the auditor.

Complaints system

Certification systems should have an easily accessible and responsive complaints system and should ensure that auditing providers have a complaints system in place. The complaints system should allow for complaints levelled by any person.

How to select a certification system?

It is important that companies carefully weigh the characteristics of a certification system against their supply chain characteristics and their sustainability goals.

Two recent studies from NL Agency: *How to select a biomass certification scheme* (May 2011), and *Selecting a biomass certification system; a benchmark for level of assurance, costs and benefits* (March, 2012) offer the most comprehensive approach to help companies to select their certification system.

How to select a biomass certification scheme

The first study gives a characterisation of 18 most relevant biomass certification systems. This study guides companies in answering three questions:

- 1 Is biomass certification appropriate for your business?
- 2 Which certification system(s) to select?
- 3 Making a final choice and engage

The set of criteria for the selection of a certification system is based on:

- The organisational and biomass chain characteristics;
- Trade characteristics and trade requirements of your product;
- Legal requirements;
- Credibility of the system;
- Easiness to comply with the standard's requirements;
- Willingness to pay for the system benefits;
- The customer needs and requirements.

Selecting a biomass certification system; a benchmark for level of assurance, costs and benefits

The second study inventories important correlations between eight different certification systems: 2BSvs, Bonsucro, ISCC, NTA8080, REDcert, RSB, RSPO, RTRS.

- *Chain of Custody*: Farmers are included in the audits of all systems, but only the RSB, RTRS, NTA8080, and in some cases ISCC treat them as first certificate holders, ie. as first link in the chain. In other systems the first gathering point is often the first certificate holder in the supply chain;
- *Operators audited and certified*: Certification systems vary largely here. REDcert and ISCC accept self-declarations from farmers; 2BSvs and Bonsucro accept self-declarations to a limited extent. For 2BSvs, the auditor determines whether a field or a desk audit to the farm is necessary;
- *Level of assurance*: Differences exist in level of verification, accreditation, stakeholder consultation, sampling requirements, complaints procedures, transparency, or recognition of other certification systems;
- *Costs of certification*: There are important differences in direct costs for certification. Indirect costs for meeting the system's sustainability requirements can be significant for a company, though highly variable. The most reliable certification systems are often the most expensive;
- *Benefits of certification*: Operators at the end of the supply chain will receive most of the external benefits; farmers will receive most of the internal benefits. Internal benefits refer to efficiency and management improvements within a company; external benefits refer to improved market access or price premiums.

Understanding the EU sustainability regulation for biofuels and bioliquids

Regulation in the European Union

The EU Renewable Energy Directive (RED) introduced in 2009 sustainability criteria for biofuels and bioliquids as a condition for their inclusion in national targets and for eligibility to financial support. Certification systems can be used to prove that RED regulation is met.

The obligatory criteria for biofuels and bioliquids are:

- Full-chain greenhouse gas emissions reduction higher than 35% and increasing over time to 50% in 2017 and 60% for new installations;
- Exclusion of lands with high biodiversity value;
- Exclusion of lands with high carbon stock that have recently been converted into e.g. cropland;
- Exclusion of peat land unless proven that drainage of previously un drained soil is not involved;
- Condition of good agricultural practice for feedstock produced in the EU;
- Obligation to the Commission to report on soil, water and air impacts and social impacts in regions that are a significant source of feedstock.

Harmonization

Harmonization of schemes occurs in part through the assessments that lead to their recognition. Further harmonization occurs when systems acknowledge and adopt certificates from other systems.

For example, the EU Renewable Energy Directive has chosen the Mass Balance method as the minimum Chain of Custody method used for certification. The certification systems offer also different Chain of Custody methods. An example of coverage for some systems is shown in the next table.

Coverage of Chain of Custody options

Items	2BSvs	Bon-sucro	ISCC	NTA8080	REDcert	RSB	RSPO	RTRS
Identity of product preserved								
Segregation								
Mass balance								
Book and claim								

Implementation

Further sustainability requirements related to indirect land use changes effects are under discussion as of 2012. Some EU member States have implemented RED as early as January 2010. This implementation process has continued and it is expected to reach completion 2013.

Sustainability criteria are not binding at the moment for solid and gaseous biomass; and they do not exist for other uses of biomass such as for the chemistry or health industries.

Voluntary certification systems recognized by the European Commission

As of September 30th 2012, 12 voluntary certification systems have been recognized by the European Commission:

- 2BSvs
- Bonsucro
- Ensus
- ISCC
- Greenergy
- NTA 8080
- RBSA
- REDcert
- Red Tractor
- RSB
- RTRS
- SQC

Not all recognized certification systems cover the full supply chain. Red Tractor and SQC only apply to the first delivery point of specific crops produced in the United Kingdom and in Scotland respectively.

Regulation in other world markets

The situation in the US

The US Renewable Fuel Standard (RFS2) puts down sustainability requirements related to the reduction of greenhouse gases (GHG) emissions for biofuels. The RFS2 also sets limits to combinations of feedstock and production processes; in other words, feedstock must come from specific land types. For example, non-federal forest land may be taken into agricultural production no later than December 2007. Blenders must keep detailed records on feedstock and fuel producers to allow tracing of origins.

EU and US biofuel legislative frameworks have differences in their overall structure, definitions used, sustainability requirements, reporting methodology and reporting requirements. NL Agency has studied the differences in both systems, and found out that most important differences are related to the GHG emission reduction targets and calculation methodology.

Comparison EU – US regulation on biofuels sustainability

	European Union	United States
Legislation	Renewable Energy Directive (RED), and Fuel Quality Directive (FQD)	Renewable Fuel Standard RFS2
Greenhouse gas emissions reduction	<ul style="list-style-type: none"> • 35% in 2010 • 50% in 2017 • 60% after 2017 for installations started from 2017 onwards Temporary exemption for installations that were in operation in January 2008 until April 2013	Phase-in pathway by 2022 <ul style="list-style-type: none"> • 20% for “conventional biofuels” up to 15 billion gallons • 50% for regular “advanced biofuels” at least 5 billion gallons • 60% for “cellulosic biofuels”, at least 16 billion gallons

Regarding woody biomass, the Lacey Act prohibits trade for illegally sourced plants and their products, including timber and wood products. It requires importers to declare country of harvest and species name for all plants used in their products. This Act is similar to the EU Timber Regulation.

For bio-based products, no quantification or qualification of sustainability criteria exists yet. The US “Bio-based Product Labeling Program” identifies bio-based products based on its bio-based content.

Developments in third countries

Countries outside the EU increasingly adopt policy instruments either to establish biofuel mandates, incentives and feed-in tariffs for biomass for electricity, or to establish biomass sustainability frameworks into their legislation. Countries aiming at integrating the supply chain of EU biofuels must take into consideration the RED sustainability requirements. However, countries aiming to develop their own internal biomass or biofuels market may also need to focus on criteria such as sustainable employment, food security and pricing.

Mozambique is an example of such positive developments. Mozambique is the first African nation that stands to introduce mandatory blending for biofuels, based on a sustainability framework co-developed with NL Agency. This framework includes environmental sustainability criteria combined with strong socio-economic ones, such as not compromising the local food security. Once approved, Mozambique will be the first African country with a biofuel sustainability framework.

Solid biomass markets in an uncertain certification policy context

The market for solid biomass, especially for energy uses (heat and electricity) has been growing rapidly and steadily since 2005. Wood pellets consumption in the EU went from about 3 million tons in 2005 to 12 million tons in 2011. Different forecasts project demand consumption for 2020 between 20 million tons to 80 million tons. Currently, more than 25% of this biomass is imported from outside the EU; Canada, the US and Russia, and also exports from South America, Africa and Australia. The chemistry industry and the nascent advanced biofuels industry will soon compete with energy utilities for the supply of woody biomass.

Despite this growth, regulation with respect to product quality specifications and sustainability requirements are lacking. The market is anticipating policy developments however, along with several voluntary initiatives for certification underway.

Sustainability policy developments at European and member state level

A European Commission Consultation in early 2011 found large support from both market players and the general public for the introduction of binding sustainability criteria for solid and gaseous biomass used to produce heat and electricity. The European

Commission will therefore revisit its decision regarding binding sustainability criteria for these uses.

EU Timber Regulation

The EU Timber Regulation, which is set to enter into force in 2013 will require producers in forestry to take concrete steps that minimize the risk of illegally harvested timber and timber products entering the EU market. Producers will have to ensure traceability for their product, so the EU can ascertain legality. The forestry sector already has a long tradition of certification with systems like the Forest Stewardship Council (FSC) and the PEFC as internationally recognized standards, and several national-level schemes.

Certification initiatives

Certification systems may play a similarly important role in upcoming policy requirements and in general for solid and gaseous biomass for energy and non-energy uses. The NTA8080 and ISCC systems, for example, can already be used to certify solid biomass products. Other certification systems are being developed to offer this possibility.

Utilities have also developed certification systems. Well-known examples are the Green Gold Label by RWE/Essent, the Drax sustainability requirements or the Laborelec system by GDF/Suez. A joint effort by seven European utilities constituted in 2011 the International Wood Pellet Buyers initiative (IWPB) with the development of a single common biomass certification system as the stated goal.

Support, studies and tools available

NL Agency services

NL Agency offers extensive knowledge on biomass certification through a number of continually updated studies, project assessments, and presentations on the topic. NL Agency also offers support through various programs focused on sustainable biomass development around the globe. Check more information at: www.agentschapnl.nl/biomass

Studies

At www.agentschapnl.nl/biomass (section publications) you can find:

1 Report Certification Schemes

This report contains a selection model for biomass certification schemes

2 Report Selecting a biomass certification system

A benchmark on level of assurance, costs and benefits

3 Assessing sustainability aspects of biomass projects

Experiences in the NL agency project portfolio.

4 Sustainability requirements in the EU and the US biomass legislation

5 Trade barriers and traded volumes of sustainable biomass in the Netherlands

6 Climate finance for biomass

An inventory of climate finance options and a review of overlaps with biomass sustainable certification

7 Various country and crops factsheets

Useful tools for companies that help certification

Biograce

The Biograce projects I and II aim at harmonizing bioenergy greenhouse gas (GHG) emission calculations in Europe, by developing tools for biofuel as well as for electricity, heating and cooling GHG calculations. The tools can be downloaded from www.biograce.net

GBEP

The Global Bioenergy Partnership has developed a number of tools with the aim at increasing the understanding of issues related to bioenergy development. Available tools are a Clearing House on methodologies to calculate GHG emissions for bioenergy, and two search engines on analytical tools to assess and unlock sustainable bioenergy potentials and on financing options for bioenergy projects and programs. These tools can be downloaded from <http://www.globalbioenergy.org/toolkit/en/>

ISO

ISO is developing an International Standard to address sustainability issues linked to bioenergy. The standard is produced by ISO project committee, ISO/PC 248, Sustainability criteria for bioenergy. The future sustainability standard is expected to be a key tool for the production, supply chain and application of bioenergy. This standard includes terminology and aspects related to the sustainability (e.g. environmental, social and economic) of bioenergy. More information available at: www.iso.org



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