



NL Agency
Ministry of Economic Affairs

Sustain-
able

Handbook on Sustainability
Certification of Solid Biomass
for Energy Production

mass

Colophon

Handbook on Sustainability Certification of Solid Biomass for Energy Production

Version of November 2013

This version replaces version: n.a.

This Handbook was developed in the framework of the Netherlands Programmes Sustainable Biomass.

Contact

Netherlands Programmes Sustainable Biomass

NL Agency

NL Energy and Climate Change

Mr J. Winkel

Ms E. van Thuijl

P.O. Box 8242, 3503 RE Utrecht

The Netherlands

Email: jobert.winkel@agentschapnl.nl

Phone: +31 88 602 79 69

www.agentschapnl.nl/biomass

Author

Brinkmann Consultancy

Mr A. Brinkmann

Tel: +31.6 13 61 78 83

P.O. Box 67, 3870 CB Hoevelaken

The Netherlands

E-mail: arjen@brinkmann-consultancy.nl

Although this report has been put together with the greatest possible care, NL Agency and the author do not accept liability for possible errors.

Content

By clicking on one of the module titles below, you will automatically be directed to that particular module in this document.

Module 100 - Introduction

Module 200 - Sustainability certification of biomass – background and objectives

Module 300 - Certification schemes

Module 400 - Practical tools for assessing sustainability impacts

Module 500 - Related legislation (EU Timber Regulation)

Module 600 - Other sustainability aspects (carbon debt, indirect effects)

Module 700 - Glossary of terms and abbreviations

Factsheets

Module 340 - NTA 8080

Module 345 - International Sustainability and Carbon Certification Scheme (ISCC)

Module 350 - Roundtable on Sustainable Biomaterials (RSB)

Module 355 - Green Gold Label (GGL)

Module 360 - Initiative Wood Pellet Buyers (IWPB)

Module 365 - Forest Stewardship Council (FSC)

Module 370 - Programme for the Endorsement of Forest Certification (PEFC)

Module 375 - Canadian Standards Association – Sustainable Forest Management (CSA-SFM)

Module 380 - Sustainable Forest Initiative (SFI)

Module 100: Introduction (Version – November 2013)

Contents of this module

This module explains the background, objectives and target audience of the Handbook. It also explains the modular structure of the Handbook, and how this structure may be used by the reader.

This module is in particular useful for readers first starting to work with the Handbook.

Background and objective of the Handbook

Sustainability certification of solid biomass is gaining increasing interest, in particular for biomass used for bio-energy production. Sustainability certification is used as an 'independent stamp' showing that biomass has been produced, processed and/or used sustainably.

There are numerous and fast developments in this area: market players work on voluntary certification of biomass they produce, supply or use for energy production. Certification schemes are being developed and further detailed, in many cases with the involvement of a variety of stakeholders. Last but not least, both European and national governments are considering proposals for (mandatory or voluntary) sustainability requirements for solid biomass used for energy production.

For market players and other stakeholders it is often difficult to obtain and maintain an accurate overview of these developments, in particular in relation to the individual choices they should or could make.

The objective of this Handbook is to facilitate market players and other stakeholders in information gathering and informed decision-making in relation to sustainability certification of solid biomass, as well as a number of related issues.

More specifically, this Handbook aims:

1. To provide **general background information on sustainability certification** of solid biomass, objectives of certification, and on how certification works. It also explains the relation between certification and current (and possible future) legislation on sustainable use of biomass;
2. To provide **an overview of the most common certification schemes** available for sustainability certification of solid biomass, and the key features of these schemes;
3. To provide **decision trees** that can be used to (a) decide whether certification is necessary or useful in a particular situation, and (b) to select a certification scheme;
4. To provide **references to existing tools and guidance documents**, which may help companies in implementing sustainability certification in their operations;
5. To provide **background information on some broader sustainability issues** related to the use of solid biomass, most notably the issue of carbon debt and indirect effects.

The primary target audience of this Handbook includes market players in (inter)national chains of solid biomass production, processing and use (bio-energy producers). Besides, this Handbook also contains relevant information for other stakeholders in sustainability certification of solid biomass, e.g. policy makers, non-governmental organizations (NGO's), consultants and researchers.

How to use this Handbook?

This Handbook has a modular structure. Each module has a number and a title, and represents a 'chapter' in the Handbook. Depending on your existing knowledge and information needs, you may read only one or some of the modules.

In principle, each module can be read independently from the other modules. The box at the beginning of each module summarizes the objectives and contents of that module, and specifies how it relates to the other modules in the Handbook. This will guide you to modules that specifically meet your information needs.

The Handbook comprises seven main categories of modules (numbered as hundreds), under which individual modules have been structured. The modular structure is as follows:

200 General

These modules are for readers who wish to learn:

- About the biomass sustainability debate in general;
- About solid biomass sustainability requirements in European legislation and other legislation;
- About the potential role of certification in ensuring sustainable production and use of solid biomass for bio-energy;
- If and when certification is necessary or useful (in a particular situation).

300 Certification schemes

These modules are for readers who wish to learn:

- How certification works in general, and what the structure of a certification scheme looks like;
- Which schemes are available for sustainability certification of solid biomass;
- What the key features are of these certification schemes, and how schemes can be compared (e.g. scope and contents of the schemes' standards, cost aspects);
- How to choose a certification scheme (decision tree);

- What the detailed characteristics are of the certification schemes covered in this Handbook.

400 Practical tools for assessing sustainability impacts

These modules are for readers who wish to learn:

- How the assessment of sustainability criteria shall be done in practice;
- Which tools and guidance documents are available to assist with the sustainability assessment.

500 Related legislation

These modules are for readers who wish to learn:

- What the EU Timber Regulation entails, and in particular what the practical impacts are on wood to energy chains.

600 Other sustainability aspects of biomass use for energy production

These modules are for readers who wish to learn:

- What is meant by 'carbon debt', and why it is a relevant issue;
- What are 'indirect effects' of biomass production and bio-energy production.

700 Glossary of terms and abbreviations

- This module provides a glossary of terms and abbreviations used in this Handbook.

Updates of this Handbook

Developments in the area of sustainability certification of solid biomass go fast. This may require regular updating of (elements of) the Handbook. The modular structure allows to amend individual modules regularly, without having to change the full contents of the Handbook. It also allows to add new modules when appropriate. The latest version of the modules in this Handbook are available as separate pdf-documents from the NL Agency website. Also future modules will be made available as separate pdf-documents. This allows readers to download and update individual modules as appropriate.

It is also possible to download the full Handbook as one pdf-document.

About the preparation of the Handbook

Version 1.0 of this Handbook was written in the period June – October 2013. The Handbook was written by Mr. A. Brinkmann (Brinkmann Consultancy) on behalf of NL Agency.

The information for this Handbook was compiled with the utmost care. The author and NL Agency cannot be held responsible for the consequences of any errors or mistakes in the Handbook.

Comments or suggestions on the information presented in this Handbook are highly welcomed: please contact NL Agency to share your views (duurzamebiomassamondiaal@agentschapnl.nl, subject 'Biomass Certification Handbook').

Acknowledgements

The preparation of this Handbook would not have been possible without the support and efforts of a number of individuals and organizations. NL Agency and the author of this study would like to thank everyone involved for his or her cooperation.

In alphabetical order:

Mr. S. de Boer (Eneco), Ms. N. Block (SFI), Mr. K. Boon (AVIH), Mr. J. Bronsvort (Quality Services Certification), Ms. V. Buytaert (VREG), Ms. A. van Dijk (Bosschap), Mr. A. Feige (ISCC), Mr S. Haye (RSB), Mr. B. de Hue (IWPB), Mr. R. Nozeman (FSC The Netherlands), Mr. H. van Veen (PEFC The Netherlands), Mr. B. Verkerk (GGL Foundation), Mr. H. Willemsen (NEN), Mr. P. Wooding (CSA).

Modules 200: Sustainability certification of biomass – background and objectives

(Version – November 2013)

The increasing use of biomass for energy production has led to growing concerns over possible negative environmental and socio-economic impacts of biomass use. These concerns have led to action at various levels to guarantee the sustainability of biomass, including legislative requirements and voluntary actions from the biomass industry and other stakeholders (e.g. sustainability certification of biomass).

The following Modules elaborate:

- The background of the biomass sustainability debate, and how this debate has led to legislative and other initiatives (Module 210);
- The key principles and objectives of sustainability certification of biomass (Module 220);
- Legal requirements on sustainable biomass, and the relation with certification (Module 230).

Module 240 presents a decision-tree, which helps operators understand whether biomass certification is required or useful in their particular situation.

100 Introduction

200 Sustainability certification of biomass – background and objectives

300 Certification schemes

400 Practical tools for assessing sustainability impacts

500 Related legislation (EU Timber Regulation)

600 Other sustainability aspects (carbon debt, indirect effects)

700 Glossary of terms and abbreviations

Module 210: The biomass sustainability debate

(Version November 2013)

Contents of this module

This module provides some background information to the biomass sustainability debate. It assesses how increased demand for biomass (for bio-energy applications) has led to concerns about negative side-effects and sustainability risks. It also summarizes how these concerns have led to action at various levels, including legislative requirements and voluntary actions from the biomass industry and other stakeholders, and the role of certification.

Finally, this module concludes that although biomass certification is available and increasingly being used, the biomass sustainability debate is far from over. This debate will continue to include new aspects and dimensions in the future.

1. Bio-energy potential and concerns over sustainability

Energy from biomass is considered a key element of a sustainable energy supply, alongside other options such as solar energy, wind energy and hydro energy. Bio-energy is a versatile energy source: it can be used to produce power and heat, as well as solid, liquid and gaseous fuels.

Bio-energy is currently the most important renewable energy source. Traditional bio-energy use, meaning small-scale combustion of solid biofuels for cooking, heating and lighting, constitutes approximately 80% of global bio-energy consumption and is concentrated in developing countries. Modern bio-energy use, i.e. commercial production of energy from biomass for heat, power generation and transport fuels, is much lower but growing rapidly. Scenario studies indicate that the use of modern bio-energy will increase rapidly over the next decades, to a total of between 100 EJ and 400 EJ in 2050 [5].

The increasing use of biomass for energy production has led to growing concerns over possible negative environmental and socio-economic impacts of biomass chains. In many cases, concerns were first raised by non-governmental organizations (NGOs) and – following sufficient mainstream media attention – subsequently became part the agendas of policy makers in industry and government.

In the past decade, a variety of potential negative impacts of biomass chains have been highlighted, including but not limited to the following examples [4]:

- Loss of biodiversity, e.g. as a result of unsustainable forest management or converting natural areas to plantations;
- Destruction of valuable peat lands by expanding palm oil plantations;
- Land right conflicts between commercial biomass (plantation) companies and local communities, including indigenous peoples;
- Competition between 'food and fuel'. The increasing use of 'food crops' for fuels, e.g. vegetable oils or grains, has been blamed by certain stakeholders for causing higher world prices for these commodities.

2. Addressing sustainability concerns – government initiatives and other initiatives

In response to the growing concerns over biomass sustainability there have been a variety of initiatives to ensure that biomass production and use is sustainable. Initiatives include both government-driven initiatives (Section 2.1), and initiatives from the private sector and from multi-stakeholder groups (Section 2.2).

2.1 Government initiatives

The Netherlands was among the first European countries to initiate national-level initiatives on biomass sustainability, along with the United Kingdom and Germany. In 2006, a multi-stakeholder commission was established by the Dutch government, which included representatives from the biofuel and biomass industry, NGOs, science & research, and the banking sector. In 2007, the commission published its report: 'The Dutch assessment framework for sustainable biomass' [1]. The assessment framework, generally referred to as the 'Cramer Criteria' (named after the chair of the commission Professor J. Cramer), specifies six sustainability categories, i.e.:

1. Greenhouse gas emissions and carbon stocks;
2. Competition with food production and local applications of biomass;
3. Biodiversity;
4. Environmental impacts on water, air and soil;
5. Prosperity of the local economy; and
6. Social well-being of the local population and of employees.

Under each sustainability category, principles & criteria for sustainable biomass production were specified.

At the time of publication, the Cramer Criteria were internationally considered as the standard set of sustainability criteria for biomass. Initially, the Cramer Criteria were also used as a framework for benchmarking/assessing specific biomass projects, although the Criteria were never developed to be used for that kind of practical application (and were not suitable for that purpose either). In 2009, the Dutch normalization institute NEN used the Cramer Criteria as basis for the development of their NTA8080 biomass certification scheme (refer to Module 320 and the NTA 8080 factsheet in Module 340).

On a European level, the 2009 Renewable Energy Directive [3] specified sustainability requirements for biofuels and bioliquids, and was the first piece of legislation to set mandatory sustainability requirements for biomass at a European level. Module 230 provides more background information on European and other legal requirements on biomass sustainability.

2.2 Private and multi-stakeholder initiatives towards biomass certification

Internationally, there have been a variety of initiatives aimed at setting standards for sustainable biomass production and use. These can be categorized as follows:

Sustainable forest management schemes. In response to concerns over large-scale logging and unsustainable forest management practices, global schemes such as FSC (Forest Stewardship Council) and PEFC (Programme for the Endorsement of Forest Certification) were developed in the 1990s. Initially focused on biomass used for timber products and for paper pulp, the schemes are increasingly being considered to certify forest biomass used for energy.

Crop-specific certification schemes. Examples include the Roundtable for Sustainable Palm Oil (RSPO), the Roundtable for Responsible Soy (RTRS) and BonSucro (for sustainable sugarcane). These schemes were developed from 2003 onwards, with an initial focus on certification of feedstocks for food, feed and

oleochemical applications. With the increased interest in using oil and sugar crops for (transport) biofuels, the schemes are now also used for certification of biofuels.

Bio-energy schemes. Examples include the NTA8080, the Roundtable for Sustainable Biomaterials (RSB) and the International Sustainability and Carbon Certification Scheme (ISCC). These schemes were developed from 2010 onwards specifically for the certification of biomass used for energy production (both biofuels and electricity/heat production).

Other schemes such as Rainforest Alliance, FairTrade etc. These schemes focus on specific products and/or on specific (niche) markets. In practice, these schemes play a small role in certification of biomass for bioenergy.

The factsheets in Module 340 - 380 include details on the most relevant sustainability schemes for certification of solid biomass for bio-energy.

2.3 The ongoing biomass sustainability debate

There is general consensus amongst stakeholders, including NGOs, that certification of biomass has the potential to at least reduce sustainability risks associated with the use of biomass for energy production. However, stakeholders disagree about the level of assurance which certification provides and/or the credibility of individual certification schemes.

Firstly, some stakeholders believe that the current set of sustainability criteria covered by biomass certification schemes is insufficient, or that methodologies used are incorrect. For example, there is increasing debate as to whether 'carbon debt' shall be included as a separate criterion or be included in the existing greenhouse gas balance criteria. Module 610 provides further background information on carbon debt.

Secondly, there is debate about the level of robustness of individual certification schemes. This does not only relate to the contents of the sustainability requirements, but also to the way in which they are verified (i.e. the quality of the auditor's work).

Finally, there are 'indirect effects' of biomass production, which certification alone cannot tackle. Indirect effects include in particular indirect land use change (ILUC), and competition between biomass for food and other applications (e.g. materials). Module 620 provides some further background information on 'indirect effects'.

Another development is that biomass certification schemes are expanding their scope. Various schemes originally developed for bio-energy applications are now aiming to also include biomass for material applications and other (bio-based) applications. Examples include RSB, ISCC and NTA 8080.

The scope, contents and credibility of certification schemes are issues which are further being researched and debated, and may lead to additional developments in standards. Other issues might also come up, and lead to new perspectives on biomass sustainability. In other words: the biomass sustainability debate is and will be ongoing. Although the current biomass certification schemes have the potential to take away some of the concerns on biomass sustainability, it is not by everyone considered a complete solution for guaranteeing sustainability. Consequently, project developers, biomass supply chain operators and other operators are recommended to keep an open eye on developments in the biomass debate, and act accordingly where appropriate.

References

- [1] Cramer J. et al. (2007). Dutch Testing Framework for Sustainable Biomass. Utrecht (the Netherlands), November 2007.
- [2] Dam van, J.M.C. (2009). Sustainability of bioenergy chains: the result is in the details. PhD Thesis. University of Utrecht (the Netherlands), 2009.
- [3] Directive 2009/28 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. Brussels (Belgium), 23 April 2009.
- [4] FAO (2013). Biofuels and the sustainability challenge: A global assessment of sustainability issues, trends and policies for biofuels and related feedstocks. Rome (Italy), 2013.
- [5] Jussi Heinimö, J. (2011). Developing markets of energy biomass- Local and global perspectives. pHD Study at Lappeenranta University of technology. Mikkeli (Finland).

Module 220: Key principles and objectives of sustainability certification of biomass

(Version November 2013)

Contents of this module

This module explains the key principles of sustainability certification of biomass, and it elaborates on the various objectives companies may have for biomass certification. Finally, it also highlights inherent limitations of biomass certification.

1. Introduction

Over the past years, there has been an increasing recognition that certification of biomass chains is a suitable instrument to ensure sustainability of biomass used for energy and for other applications. This module explains the key principles of biomass certification (Section 2), elaborates on objectives which companies may have for biomass certification (Section 3), and highlights some of the inherent limitations of biomass certification (Section 4).

2. Principles of biomass certification

According to the International Standards Organisation (ISO), **certification** is 'an attestation (i.e. issue of a statement) by a third-party that specifies that requirements related to products, processes, systems or persons have been fulfilled' [5].

A **certification scheme** is the framework and the set of rules that ensure that sustainability requirements are met. The requirements can vary from one single criterion or process, to a range of **principles & criteria** along the whole chain from the field to the consumer. The main function of the certificate is to signal to the purchaser that the product complies with certain qualities or that the production process follows specified procedures.

To be effective, certification schemes rely on successful **traceability**, i.e. a reliable means to track biomass (products) through the supply chain in order to determine if production is really sustainable.

Typically, the certification process is handled by a specialized **certification body** – a third-party intermediary between buyers who demand certification and sellers who comply with it. To oversee the work of certification agencies and to monitor and access the entire process, there is also an accreditation body, which can be a government body or semi-autonomous body.

Accreditation bodies approve certification bodies and their certification practices, typically meaning that they are competent to test and certify third parties, behave ethically and employ suitable quality assurance.

Figure 2-1 below represents a schematic representation of how biomass sustainability certification works.

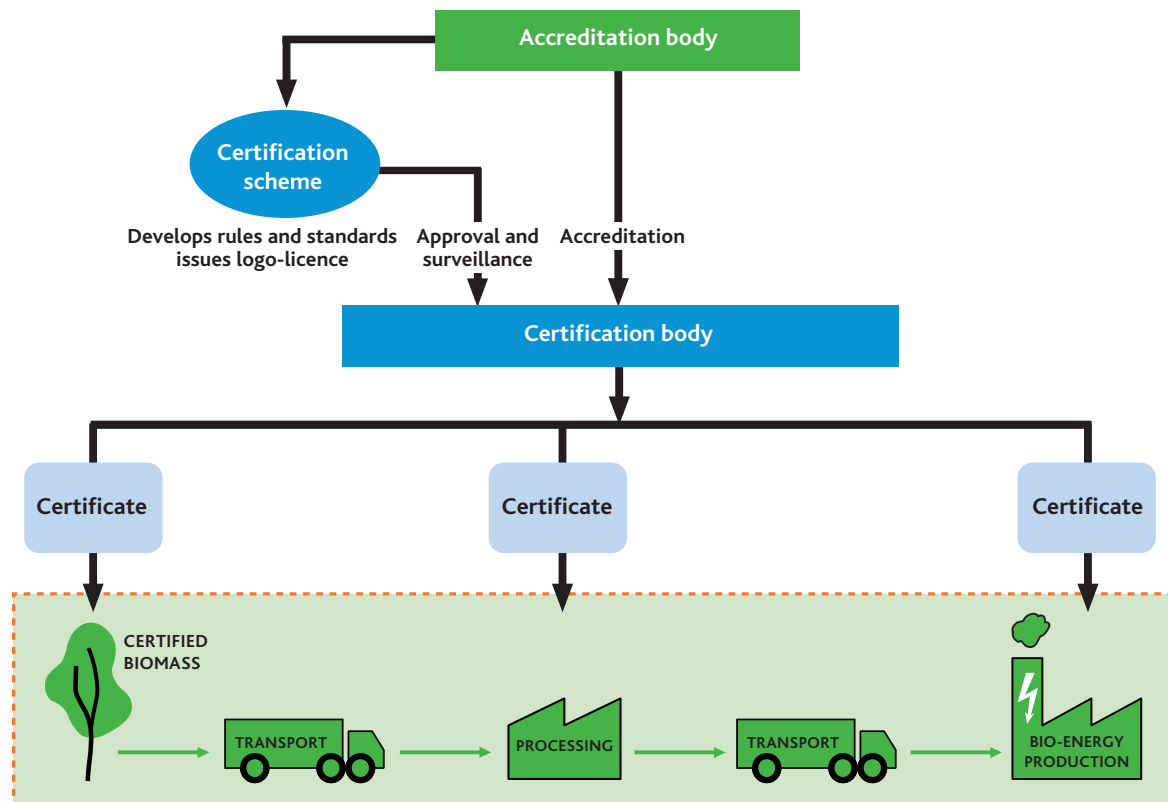


Figure 2-1 Schematic representation of biomass certification. Certification of biomass cultivation – supply chain certification – final claim.

Biomass certification schemes include a set of principles and criteria and are meant to ensure that bio-energy is sustainably produced, processed, transported and applied. Biomass certification allows companies along the supply chain to claim that their biomass (product) is 'sustainable'.

Criteria for sustainable biomass cultivation typically include a combination of environmental criteria, social criteria, economic criteria, and criteria on technical/managerial aspects. Environmental criteria include e.g. requirements with respect to protection of biodiversity, or maintaining the quality of soil, water and air. Social criteria relate to issues such as workers' rights, and respecting rights of local communities. Economic criteria include e.g. long-term business planning.

In addition to the criteria for sustainable biomass cultivation, biomass certification schemes also contain rules for **tracing sustainable (certified) biomass through the supply chain**, up to the biomass' final application in the bio-energy plant (chain of custody requirements). Furthermore, biomass certification schemes include rules and guidelines in relation to aspects such as the **certification process, audit quality, and claims** that can be made by certified operators.

Module 310 elaborates the structure and content of biomass certification schemes in more detail, while Module 320 discusses and compares key features of relevant solid biomass certification schemes.

3. Objectives of biomass certification

Companies may have many different objectives to certify their biomass cultivation, processing and or bio-energy production, and related activities and services. Generally, objectives can be categorized as follows[1]:

1. Compliance with regulatory requirements;
2. Compliance with market requirements, or developing new market opportunities;
3. Corporate Social Responsibility;
4. Quality assurance.

These objectives are discussed in more detail in sections 3.1 – 3.4.

3.1 Compliance with regulatory requirements

Certification of biomass production may be required to comply with certain government regulations.

The EU Renewable Energy Directive (EU-RED, [2]) has specified sustainability requirements for biofuels and bioliquids, however not for solid biomass used for bio-energy production. It is likely that in the not too far away future also mandatory sustainability requirements for solid biomass used for energy production will be implemented, either at European level or in individual European countries [3]. Module 230 provides more background on (the development of) legal sustainability requirements for solid biomass.

What is important here is that compliance with these government requirements is likely to be regulated by the use of approved biomass sustainability certification schemes (sometimes referred to as 'co-regulation'). In other words, biomass which has been certified against an approved certification scheme, automatically complies with (all or some of) the legal requirements.

This means that bio-energy producers who have to meet the legal sustainability requirements, will have to use biomass which has been certified against an approved certification scheme. In turn, they will request certified biomass feedstocks from their suppliers.

3.2 Compliance with market requirements, or developing new market opportunities

Certification of biomass cultivation, forest management and/or biomass processing may also be a requirement from **market actors** (biomass buyers) further down the supply chain. These actors may include companies such as raw product buyer (e.g. timber sawmills), traders, end product manufacturers (e.g. pelletizers) and bio-energy producers. Suppliers wishing to keep or open supply contracts with these supply chain actors will need to become certified.

Alternatively, certification may also be an attractive option for biomass suppliers not (yet) confronted with sustainability requirements from their current buyers, but wishing to broaden their potential buyers and to develop new markets.

A widespread misunderstanding is that when market actors ask for sustainable, certified biomass and biomass products, this automatically entails the payment of a 'sustainability premium' to the supplier of that sustainable biomass. This is often not the case. In practice, reasonable premiums for certified products are only being paid in specific market niches, most notably 'organic' and 'fair trade' types of markets. For all other market segments, payments of premiums is uncommon, or premiums are very low. In these markets, sustainability certification is increasingly considered a 'license to operate or supply'.

N.B. Market requirements for sustainable, certified biomass may (indirectly) stem from regulatory requirements as specified in Section 3.1: if bio-energy producers will be obliged to comply with mandatory (legal) sustainability requirements, they will 'pass on' to their suppliers the responsibility to provide the required evidence.

In addition to the biomass buyers mentioned above, also other stakeholders may request biomass certification. These include in particular the financing sector, and civil society.

Banks and other financing institutions may request sustainability certification of biomass as a precondition for funding biomass cultivation projects (including forestry projects), and biomass processing and bio-energy facilities. From a bank's perspective, sustainability certification reduces risks associated to a project. Sustainability risks may include direct credit risk (if there is insufficient long-term perspective for the project) or image risks (if the bank is publicly associated with non-sustainable activities). Today, a sustainability assessment is a standard requirement when a biomass project is considered by a bank's credit committee (or its sustainability advisors).

Civil society, most notably **non-governmental organizations** (NGOs) do advocate sustainability certification of biomass projects. However, there are different levels of support for biomass certification amongst NGO's: while some consider certification as a powerful tool to achieve their broader objectives (e.g. protection of biodiversity or improving workers' conditions), others are more critical. Critical NGO's focus on the different levels of credibility of certification schemes (with some considered as 'greenwashing'), and on the limits of what certification by nature can achieve. Module 320 provides more information on the scope and contents of selected biomass certification scheme.

3.3 Corporate Social Responsibility

Companies may apply certification as a tool in their Corporate Social Responsibility policy (CSR), without an immediate regulatory or market requirement requesting them to do so. In this case, certification may be part of an intrinsic motivation of a company, and of the people working in the company, to do business in an ethical and responsible way and to address environmental, social and economic issues in a balanced way. Certification might also be used as a PR-instrument profiling a certain company image, without the aforementioned intrinsic motivation being a guidance factor.

3.4 Quality assurance and management

In a situation where neither regulatory requirements (3.1), market requirements (3.2) or a company's CSR policy (3.3) demand biomass certification, working towards biomass certification might still be a sensible option, namely to contribute to the company's quality assurance and management.

Assessing sustainability aspects of biomass cultivation and processing in a systematic way, including documenting evidence following the certification system's requirements, helps a company to build a quality assurance and management system. For example, most biomass certification systems require that different sorts of operational data are systematically recorded (e.g. on impacts on soil quality and on greenhouse gas emissions), but also that liaison with relevant stakeholders is documented.

In this situation, obtaining the certificate may not be the first priority. The added value here is in the process of working systematically with a biomass certification system, as a framework for (part of) the company's quality assurance and management.

4. Limits of biomass certification

Sustainability certification of biomass focuses on a specific biomass production/cultivation units or forests, and on specific biomass processing units and bio-energy facilities. These are the 'units of certification'. Biomass certification focuses on reducing sustainability risks associated with the *activities in the unit of certification*, i.e. activities which are in the sphere of influence of the operator of the unit.

Thus, biomass certification is by nature not concerned with the broader impacts of (increased) use of biomass for bio-energy applications, e.g. indirect land use change (ILUC) or increased prices of food and other products in which biomass is used. In other words, certification of biomass does not cover indirect sustainability risks of biomass production and use.

There is a general recognition that these indirect impacts cannot be attributed to individual operators (as they are largely outside his sphere of influence) but rather an issue for policy makers at regional, national, and supra national levels. Module 620 provides more background information on some of the indirect effects.

5. References

[1] Brinkmann Consultancy (2012). How to select a biomass certification scheme? – A guidance note. Hoevelaken (the Netherlands), September 2012.

[2] Directive 2009/28 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. Brussels (Belgium), 23 April 2009.

[3] European Commission (2010). Report from the Commission on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling. SEC (2010) 65.

[4] FAO (2013). Biofuels and the sustainability challenge: A global assessment of sustainability issues, trends and policies for biofuels and related feedstocks. Rome (Italy), 2013.

[5] <http://www.iso.org/sites/ConsumersStandards/en/5-glossary-terms.htm>

Module 230: Legal requirements and the relation with biomass certification

(Version November 2013)

Contents of this module

This module explains the legal framework for sustainability criteria for biomass for bio-energy in Europe, and which role legislation attributes to sustainability certification of biomass.

Section 1 explains the sustainability requirements for transport biofuels in the EU Renewable Energy Directive, and how these relate to potential future sustainability requirements for solid biomass for bio-energy'. Section 2 addresses national schemes for sustainability criteria, most notably in the United Kingdom and Flanders. Section 3 outlines developments in the Netherlands.

1. European Union – Renewable Energy Directive

1.1 General

The main legislative driving force for sustainability of biofuels and bioliquids in the European Union is the Renewable Energy Directive 2009/28/EC (commonly referred to as EU-RED or RED). The EU-RED sets ambitious targets for all Member States, including a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy in the transport sector.

The EU-RED also specifies sustainability requirements for transport biofuels and bioliquids (for electricity, heating and cooling). Currently, EU-RED sustainability requirements do not apply to solid or gaseous biomass used for electricity or heat production.

In future sustainability requirements may also apply to solid and gaseous biomass used for electricity or heat production. If implemented, it is likely that sustainability requirements for solid biomass and the way in which they are verified, will have similarities with the existing requirements for biofuels.

Against this background, Section 1.2 below first outlines the existing requirements for biofuels. This may form a useful reference in understanding what future requirements for solid biomass would mean in practice. Section 1.3 then explains relevant European developments in relation to the development of sustainability requirements for solid biomass.

1.2 EU sustainability requirements for biofuels

The sustainability requirements for biofuels and bioliquids have been laid down in Article 17(2) to 17(5) and Article 18(1) of the EU-RED [6] (and also in the EU Fuel Quality Directive 2009/30/EC and in relation EC 'Communication documents [REF]). The requirements include the following:

- Greenhouse gas (GHG) savings of at least 35% compared to the fossil fuel alternative (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 practices' as described in the Common Agricultural Policy (CAP).

Consignments of biofuels must comply with these sustainability requirements in order to be counted towards the national and/or company-specific targets for biofuels or be eligible for financial support. Economic operators shall use a mass balance system to trace biofuel (feedstocks) through the supply chain (chain-of-custody).

EU Members States need to ensure that economic operators provide evidence that the consignments of biofuels comply with the sustainability requirements in the EU-RED. Economic operators can provide this evidence through the use of 'voluntary schemes'. Voluntary schemes are national or international certification schemes for biomass, biofuel feedstocks and biofuels [7].

Before a voluntary scheme can be used to show compliance with EU-RED sustainability requirements, it first needs to be formally recognized by the European Commission. The recognition follows a standardized procedure:

1. The voluntary scheme owner submits its scheme to the European Commission;
2. The European Commission evaluates if the scheme meets all or part of the EU-RED requirements, i.e.:
 - o The factual sustainability requirements with respect to greenhouse gas balance, land use and biodiversity;
 - o The chain-of-custody requirements;
 - o The audit quality requirements, meaning that the system is accurate, reliable and protected against fraud.
3. The scheme is recognized by the European Commission to show compliance with all or part of the EU-RED sustainability requirements. Following formal publication of the Commission's decision, the voluntary scheme may be used for a period of up to five years, after which a resubmission and re-approval is required.

As per September 2013, 15 voluntary schemes have been approved by the European Commission, including schemes specifically developed for biofuels and bio-energy (e.g. ISCC, RSB and NTA8080), and crop-specific schemes (e.g. RTRS-RED for soybean oil and RSPO-RED for palm oil). Most schemes have been recognized for compliance with all EU-RED sustainability criteria. An exception is BioGrace, which is a CO₂-calculation methodology & tool, and consequently only has been recognized to show compliance with EU-RED Article 17-3 (on greenhouse gas balance).

Note:

A voluntary scheme which has been approved by the European Commission will automatically be accepted by all Member States. In other words: an EU approved scheme has EU wide coverage.

Alternatively, voluntary scheme may decide not to apply for EU approval but instead only for national approval in one or more EU Member States. After approval, such scheme may only be used in the country in which it has been approved.

1.3 Sustainability requirements for solid and gaseous biomass for electricity and heat

The EU-RED does not include sustainability requirements for solid or gaseous biomass used for electricity or heat production. In Article 17(9) of the Directive the European Commission announced that it would report on the issue by the end of 2009 and make proposals on requirements for a sustainability scheme for energy used of biomass, other than biofuels and bioliquids.

The 2010 Communication from the European Commission

In February 2010, the Commission published a Communication (COM(2010)11) [8]: 'Report on requirements for a sustainability scheme for solid and gaseous biomass used for generating electricity, heating and cooling'. In this Communication, the Commission concludes that solid biomass streams vary widely in composition and in the sustainability risks they may entail, and that that makes it difficult to specify harmonized sustainability criteria at EU level.

Instead of proposing criteria at EU level, the Commission makes recommendations to Member States which wish to develop sustainability criteria for solid biomass at national level, i.e. that Member States ensure that these sustainability criteria are in almost all respects the same as those laid down in the EU-RED. In other words: that national sustainability requirements for solid and gaseous biomass resemble the EU-RED sustainability requirements for biofuels and bioliquids.

However, the Commission also recommends that 'Due to the characteristics of the production and use of solid and gaseous biomass used in electricity, heating and cooling', some of the requirements for solid and gaseous biomass would need to differ from EU-RED requirements for biofuels. More in particular:

1. The greenhouse gas criterion shall not apply to biomass classified as waste, but only to products derived hereof. For these products, Annex II of the Communication provides default values (e.g. wood chips, biogas from manure digestion, bagasse briquettes);
2. The greenhouse gas calculation methodology shall be adapted to comply with the requirements detailed in Annex I of the Communication;
3. To stimulate higher energy conversion efficiency, Member States shall in their support schemes for electricity, heating and cooling installations differentiate in favour of installations that achieve high energy conversion efficiencies, such as high-efficiency cogeneration plants as defined under the Cogeneration Directive.

In addition, the Commission recommends that sustainability schemes apply only to larger energy producers of 1 MW thermal or 1MW electrical capacity or above. This is to avoid undue administrative burden on small-scale producers.

Current status of EU sustainability requirements for solid biomass

In October 2013, the Commission announced that there will be no proposal for binding sustainability requirements for solid and gaseous biomass used for electricity and heating & cooling before the 2014 elections for the European Parliament. The Commission also announced that it will publish an update of the 2010 Communication in early 2014.

Since the 2010 Communication from the European Commission, only few countries have actively worked on the development of national schemes for sustainability requirements for solid biomass. The United Kingdom has introduced a comprehensive scheme of reporting requirements, while also the Belgian region of Flanders have introduced a set of criteria related to renewable energy subsidies. Both schemes are elaborated in Section 2.

2. National schemes with sustainability requirements for solid biomass

2.1 United Kingdom

Since 1 April 2011, biomass electricity generators over 50KW have been required to report against the following sustainability criteria [4]:

General criteria	Specific requirements
GHG lifecycle criteria	<ul style="list-style-type: none"> - An assessment of the lifecycle GHG emissions associated with the biomass electricity produced, including its cultivation, processing, transport and any direct land use change - Confirmation of whether the biomass met the 60% reduction target of 285.12 kg CO₂eq per MWh or lower
Land criteria (as set under the EU RED)	<ul style="list-style-type: none"> - Confirmation that biomass was not sourced from land with high biodiversity value – including primary forest or areas designated by law for nature or environmental protection purposes - Confirmation that biomass was not sourced from land with high carbon stock value, including wetlands, continuously forested areas or peatlands
Profiling criteria	<ul style="list-style-type: none"> - Material type; form, mass/volume used - Country of origin - Whether a by-product of a process or an energy crop? - Details of the use of the land since November 2005 - If an environmental quality assurance scheme has been met, and if so the name of the scheme?

The above criteria resemble the sustainability requirements in the EU-RED. In other words: the UK government have followed the recommendations in the EC 2010 Communication on sustainability criteria for solid biomass.

In late 2012 and early 2013, the UK Department of Energy and Climate Change held a public consultation on proposals to change some of the criteria [2,3]. In August 2013, the Department published its response to the consultation, and its decisions with respect to the implementation of further legislation [5]. Key aspects include the following:

Mandatory sustainability criteria from April 2015 onwards

Under the Renewable Obligation (RO), renewable electricity generators will be required to report against the amended set of sustainability criteria from April 2014 onwards. The sustainability criteria will become mandatory from April 2015. This means that from April 2015 onwards, renewable energy generators of 1 MWe capacity and above are required to demonstrate that solid biomass and biogas feedstocks meet the sustainability criteria in order to be eligible for support under the RO.

Greenhouse gas reduction requirements

For existing facilities, a 60% greenhouse gas emission savings requirement will apply until 1 April 2020, equaling an emission of 285 kg CO₂eq/MWh. For new facilities (after implementation date of legislation), this requirement will be 240 kg CO₂eq/MWh. From 1 April 2020, both existing and new facilities shall meet 200 kg CO₂eq/MWh, and from 1 April 2025 this shall be 180 kg CO₂eq/MWh.

Land use and sustainable forest management criteria

Land criteria will apply to all biomass, except biomass waste and feedstocks wholly derived from waste. Land criteria will be different for virgin wood and all other non-waste biomass including energy crops.

For feedstocks made from virgin wood, requirements on sustainable forest management will apply, based on the UK Timber Procurement Policy principles. For all other biomass, the land criteria will cover the land criteria specified in the EU-RED for transport biofuels and bioliquids.

The decision includes also requirements in relation to the chain of custody (i.e. the mass balance methodology), independent auditing etc. Supply chain operators and other stakeholders with UK interests are recommended to study the recent decision of the UK government [5], and to follow the process towards implementation in national legislation.

2.2 Flanders (Belgium)

Legislation in Flanders specifies a number of requirements for biomass used for electricity generation, as a prerequisite for obtaining green electricity certificates [11, 12]. Although these requirements are formally not referred to as 'sustainability requirements', they do effectively exclude certain types of ('less sustainable') biomass from incentives for renewable electricity generation.

First of all, the legislation specifies that only the following types of solid biomass shall be used for electricity generation eligible for renewable energy certificates:

- Wood which does not have an alternative use as 'industrial feedstock';
- Waste which has no commercial value for recycling to material re-use (e.g. as animal fodder);
- Wood pellets shall be made from (chemically) untreated wood, from forests certified against a sustainable forest management standard such as FSC, PEFC or equivalent;
- Technical requirements for solid biomass installations, most notably in relation to efficiency and emissions.

Another relevant aspect in the Flemish legislation is the energy balance. In the Flemish system for green electricity certificates, the energy balance forms the basis for calculating the number of certificates that shall be assigned to a certain facility using a certain type of biomass. The energy balance is calculated by deducting the energy required for pre-treatment and transport of biomass from the gross electricity production by the facility. The energy balance is expressed as (net) number of MWhs, which are eligible for green electricity certificates.

The origin of the biomass, the transport means used, the type of pre-treatment etc. shall be determined by an independent verification body. The energy balance (and number of green electricity certificates) is subsequently calculated by the Flemish Energy Agency, using the data collected by the verification body.

3. Developments in the Netherlands

Established in 2009, the multi-stakeholder 'Commission on Biomass Sustainability' (also referred to as 'Corbey Commission', after its chair Mrs D. Corbey) has advised the Dutch government on a variety of issues related to biomass sustainability, including on sustainability requirements for solid biomass. The multi-stakeholder composition of the Commission, including representatives from industry, NGOs, science and others, makes it an influential player in political and societal discussions on biomass sustainability.

In the past four years, the Commission has published a number of reports in relation to solid biomass sustainability requirements. The latest report 'three times sustainable' (April 2013, [1]) focuses on co-firing of biomass in power plants, but effectively includes solid biomass sustainability as a whole. The advice is summarized in the box below:

Corbey Commission advice 'Three times sustainable' [1] - Summary

In its advice, the Commission concludes that: *'It is essential that sustainability criteria are included in policy, in order to provide sufficient clarity to the market. New sustainability discussions, such as carbon debt, must be included in this. Policy in the Netherlands must preferably march in step with future European policy. [...]*

The Corbey Committee recommends the following:

1. Take responsibility for the sustainability of biomass, by pleading, on a European level, for the establishment of the sustainability criteria mentioned below.
 - Considering the utilization of biomass for achievement of the sustainable energy objectives, it is crucial that the criteria mentioned below are implemented in the Netherlands, in anticipation of European legislation.
 - Close dialogue with neighboring countries and mutual recognition of sustainability systems are very important in this regard. Recognize the sustainability schemes of other countries, in the Netherlands, if these are equal in comparison. The criteria included in the 'report from the European Commission to the Council and the European Parliament on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling from 2010' can be used as the minimum requirements for this test on equality.
2. The Corbey Committee is of the opinion that sustainability criteria should, at least, elaborate on the following aspects:
 - Reduction of net greenhouse gas emissions: the Corbey Committee proposes a minimum reduction of 70% for a coal fossil reference; 50% for a natural gas fossil reference (co-firing in gas fired power stations) and 60% for biogas. Up to 2017, market parties will be able to deviate from these percentages, and maintain lower reduction percentages (respectively 60% - 35% and 50%), if motivation is provided in support thereof.
 - In time, carbon debt will have to be incorporated in the calculation of this reduction percentage. At present, the calculation methods have not been worked out sufficiently – for that reason, a positive list of approved biomass, or a negative list of banned biomass, should be compiled with great care by experts, based on the latest scientific findings. Examples of no regret biomass streams are waste streams that cannot be utilized in any other useful applications. These could be industrial or agricultural waste streams, or waste streams from the forestry sector. The carbon debt for these no regret biomass streams is sure to be zero, or very low.
 - Guarantee that biomass does not originate from illegal deforestation. The EU Timber Regulation ((EU) no 995/2010) must serve as the basis, in order to guarantee the legality of wood products for biomass.
 - Forests rich in biodiversity should be protected, by excluding primary woods, forests and woodland areas with High Conservation Value from biomass utilization purposes. Semi-natural woodlands and plantations may also fall under this.

Under the current RED it is, after all, possible for (semi-) natural woodlands to be converted to monocultures.

- Principles for sustainable forest management (such as FSC, PEFC and SFI) must be implemented. Harvesting of biomass may not have a negative influence on the essential ecosystem services provided by the forest.*
- Social criteria are also important. Also refer to our recently published recommendation regarding biofuels for transport, in which it is pleaded that the principle of Free, Prior and Informed Consent (FPIC) be incorporated in European legislation.*
- Protection of areas with high carbon stock, such as thick woodlands or peat land.*
- Conservation of soil quality. Agrarian waste streams, in particular, have huge potential for utilization in electricity production. Agricultural waste streams are, however, also required, in part, for fertilizer, in order to guarantee soil quality.*

3. Stimulate efficient utilization of biomass and ensure that the objective for bioelectricity is therefore not set too high. Sustainable biomass is scarce, after all. For this reason:

- Set realistic long-term objectives for bioenergy, in consultation with the sector. Take the abovementioned sustainability requirements into consideration when establishing an objective. This will prevent downgrading of biomass.*
- Stimulate innovation to make the application and utilization of biomass more efficient. Collaboration between sectors, leading to cascading and upgrading of biomass, new initiatives, and more efficient applications, must be promoted. Earmark part of the revenue from fossil fuel levies, for this purpose.*
- Where possible, also promote residual heat utilization when biomass is utilized for electricity production. This can lead to a doubling of the energy efficiency.*
- We trust that, in this manner, policy in the Netherlands can already include sustainability criteria, in a rather simple manner. Policy and experiences in the Netherlands can contribute, in a positive way, to the establishment of European sustainability criteria. Moreover, we are convinced that policy directed at promotion and remuneration for efficient utilization and cascading of biomass, will make an important contribution to climate objectives, as well as to the sustainable growth of the Dutch economy.*

In September 2013, the Social and Economic Council of the Netherlands (SER) published the '**Energy Agreement for Sustainable Growth**' [10]. This is an agreement between a multitude of Dutch stakeholders on a transition towards a less fossil fuel dependent energy infrastructure, and on policy measures to achieve such a transition. The Energy Agreement is expected to form the key framework for the further detailing and implementation on policies for renewable energy, including on bio-energy from solid biomass.

With respect to sustainability criteria for solid biomass, the Energy Agreement states that biomass used for co-firing shall meet sustainability criteria. Sustainability criteria shall include criteria comparable to NTA 8080 requirements, and in addition criteria on carbon debt, ILUC and sustainable forest management. Further detailing of these requirements shall be completed by 31 December 2014, followed by implementation in 2015. The Energy Agreement does not specify if (part of) the sustainability requirements will also apply to solid biomass used for bio-energy production other than co-firing.

4. Reference list

- [1] Commission on Biomass Sustainability (2013). Three times sustainable – advice for sustainable co-firing of biomass. Haarlem, April 2013.
- [2] Department of Energy and Climate Change (2013). Personal communication Ms. E. McDonnell.
- [3] Department of Energy and Climate Change (2012). Biomass Electricity & Combined Heat & Power plants – ensuring sustainability and affordability. Consultation on proposals to enhance the sustainability criteria and to ensure affordability for the use of biomass feedstocks under the Renewables Obligation (RO). DECC (United Kingdom), 2012.
- [4] Department of Energy and Climate Change (2011). Explanatory Memorandum to the Renewables Obligation (Amendment) Order 2011. 2011 No. 984. DECC (United Kingdom), 2011.
- [5] Department of Energy and Climate Change (2013). Government Response to the consultation on proposals to enhance the sustainability criteria for the use of biomass feedstocks under the Renewables Obligation (RO).
- [6] Directive 2009/28 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. Brussels (Belgium), 23 April 2009.
- [7] European Commission (2010). Communication 2010/C 160/02 from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and in counting rules for biofuel.
- [8] European Commission (2010). Report from the Commission on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling. SEC (2010) 65.
- [9] Pelkmans L., N. Devriendt, L. Goovaerts and P. Schouwenberg (2012). Prospective study: Implementation of sustainability requirements for biofuel and bio-energy and related issues for markets and trade. IEA Bioenergy Task 40 and VITO. Mol (Belgium), February 2012.
- [10] Social and Economic Council of the Netherlands (2013). Energy Agreement for Sustainable Growth. The Hague (the Netherlands), September 2013.
- [11] VREG (2013) www.vreg.be/mededelingen
- [12] VREG (2013). Personal communication Ms V. Buytaert.

Module 240: Is certification necessary or beneficial to your organization? – A decision tree

(Version November 2013)

Contents of this module

This module contains a decision tree which helps operators decide whether biomass certification is necessary or beneficial for (part of) their operations. The decision tree starts by defining the operator's position in the biomass supply chain. Subsequently, the decision tree contains a number of questions related to the operator's geographic scope, its (envisaged) markets, client requests, etc.

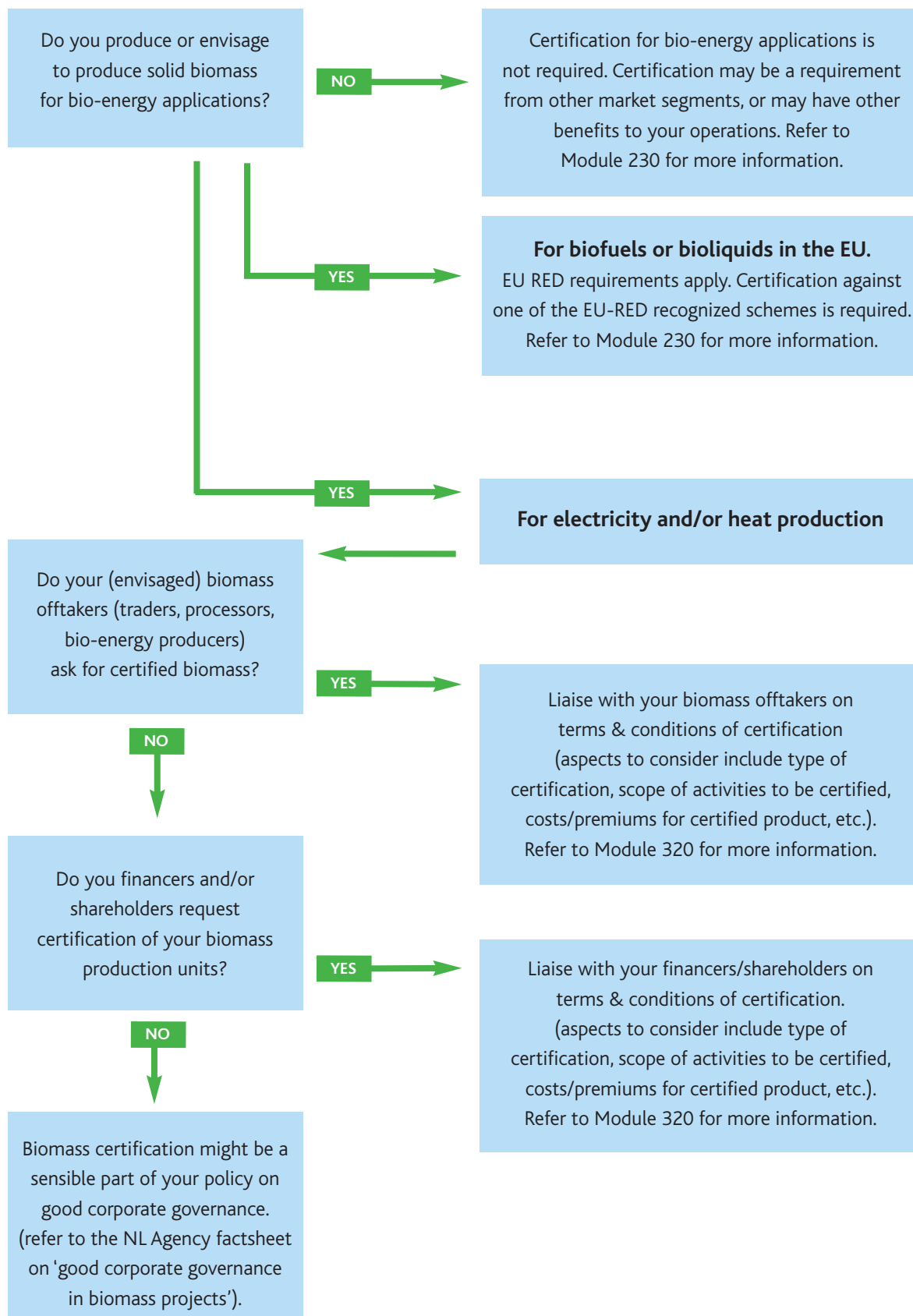
Categories of supply chain operators

The decision tree identifies five categories of supply chain operators. For each category, a separate set of questions and guidance has been developed.

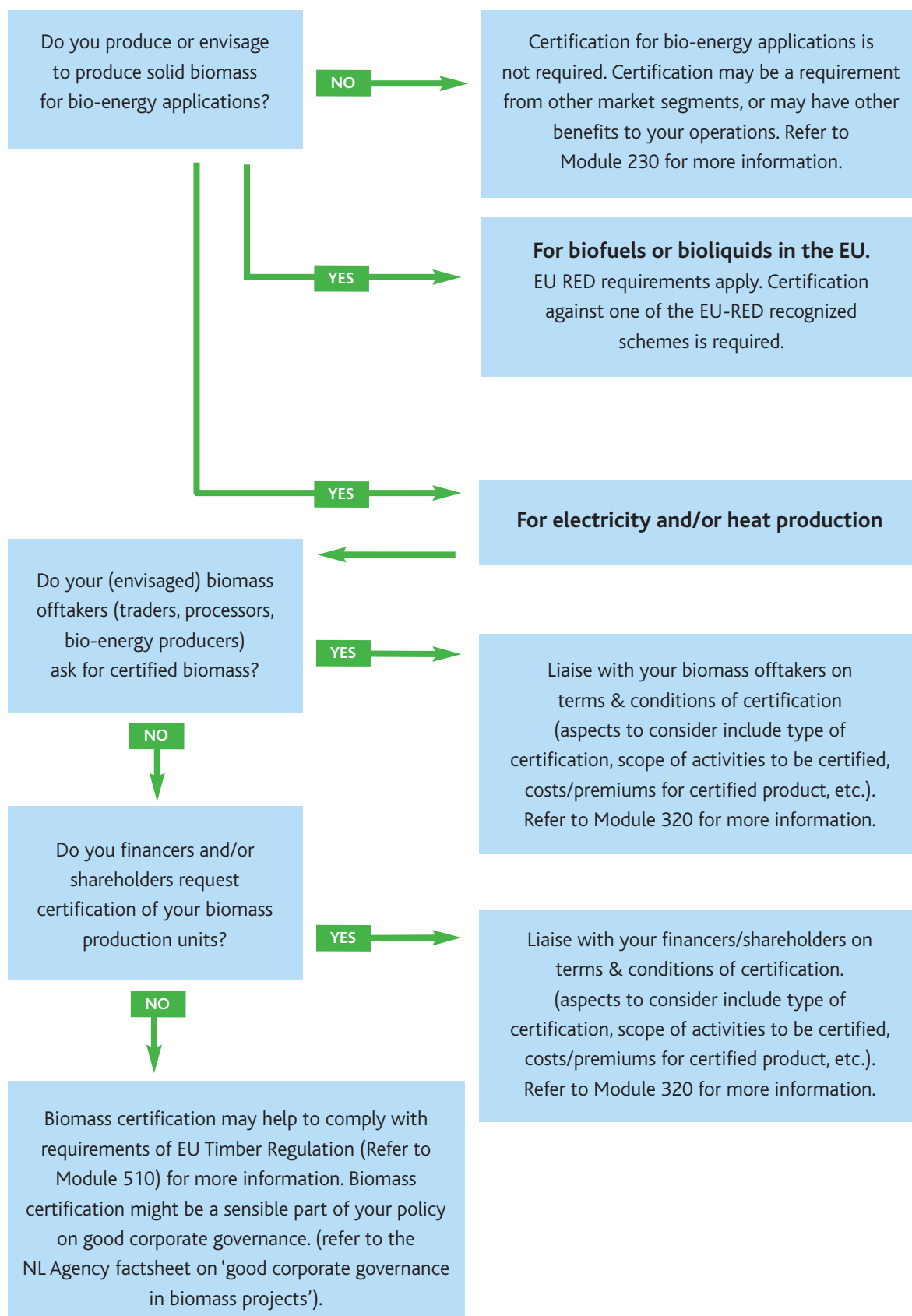
The five categories are as follows:

- forest manager -> Refer to page 22
- biomass producer (other than forestry, i.e. plantation owner or agricultural) -> Refer to page 23
- processor of biomass -> Refer to page 24
- transporter/trader of biomass -> Refer to page 25
- bio energy producer -> Refer to page 26

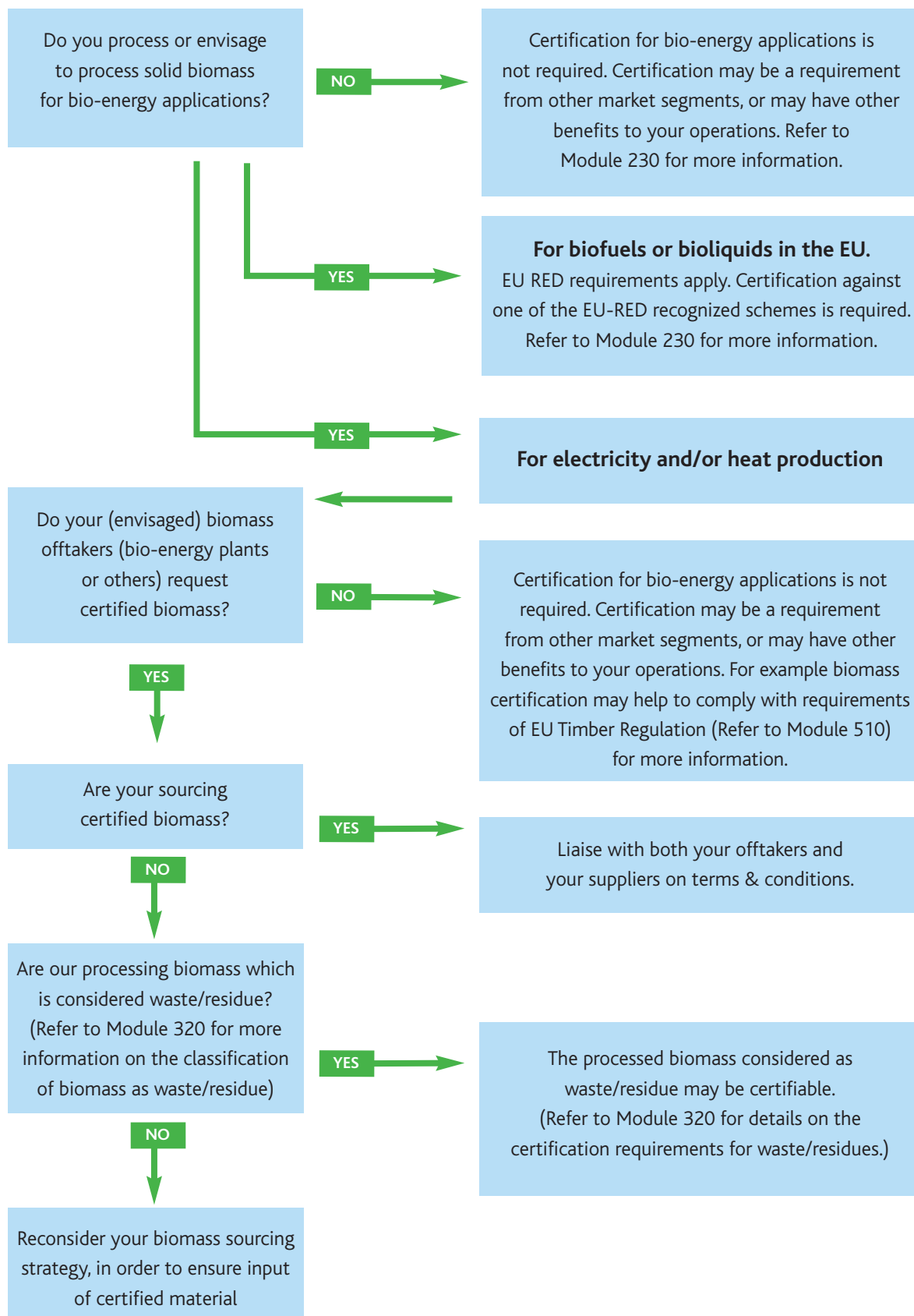
Forest manager



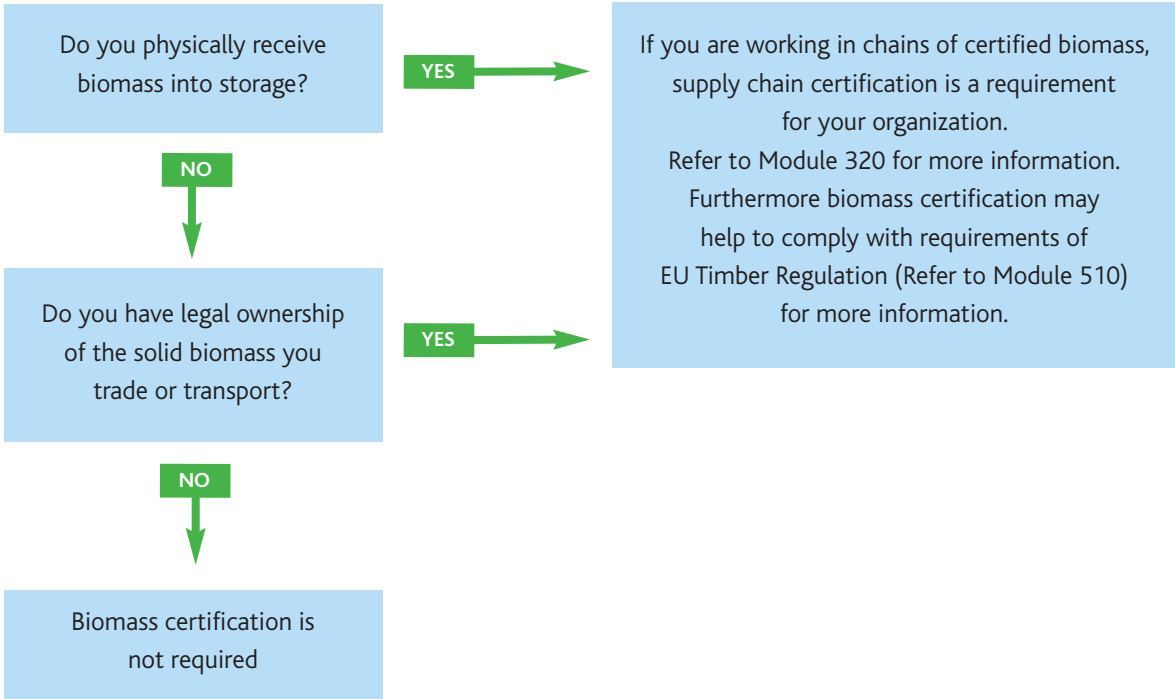
Biomass producer (plantation or agriculture)



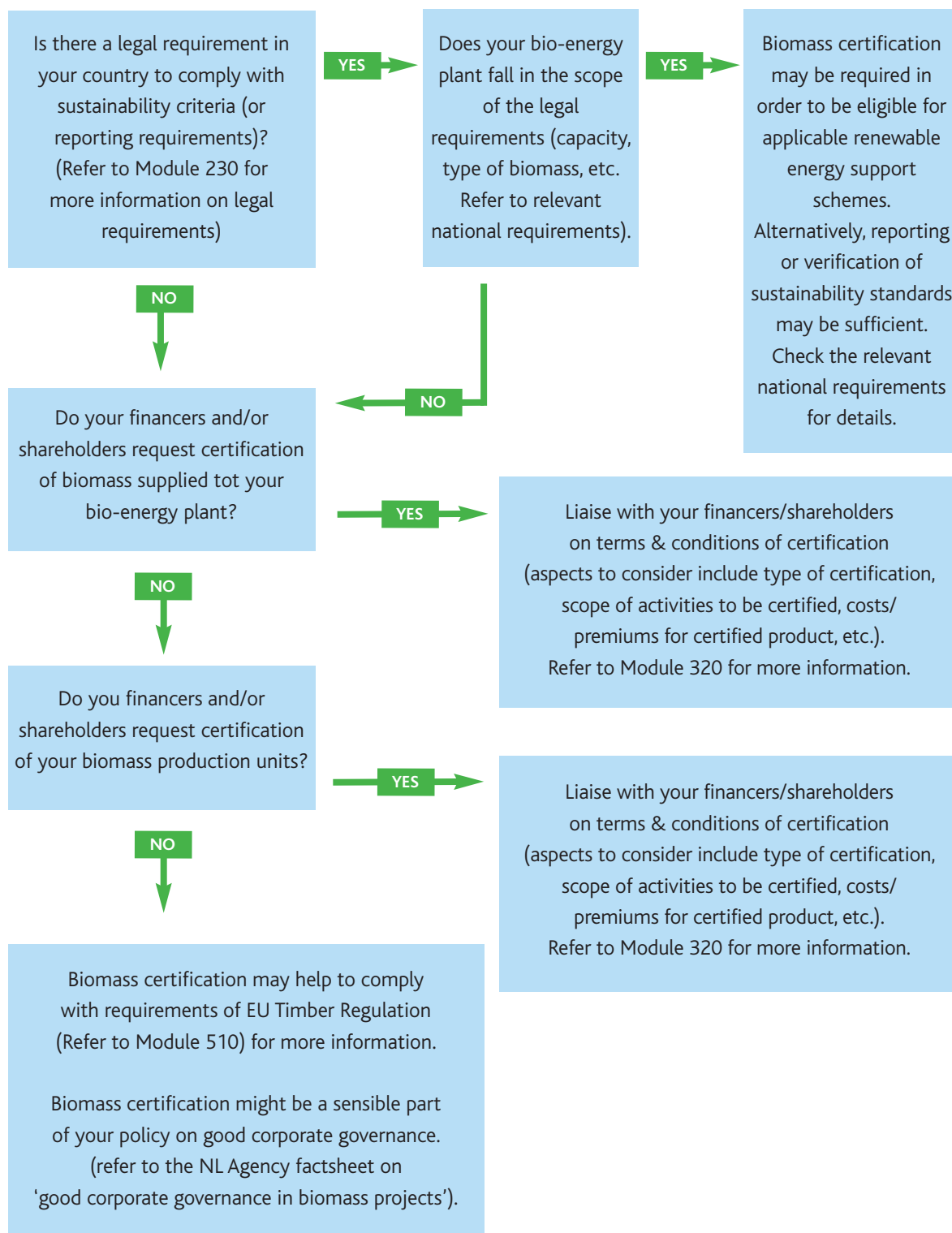
Biomass processor



Traders and transporters



Bio-energy producer



Modules 300: Solid biomass certification schemes

(Version – November 2013)

Over the past years, there has been an increasing recognition that certification of biomass chains is a useful instrument to ensure sustainability of biomass used for energy and for other applications. Whereas Modules 210 – 240 concentrate on the background and objectives of biomass certification, the following Modules focus on solid biomass certification **schemes** and the way in which they operate.

Module 310 explains the **structure** of a solid biomass certification scheme.

Module 320 discusses **key features** of nine selected solid biomass certification schemes.

Module 330 presents a **decision tree** which is meant to assist market operators in selecting a suitable certification scheme.

Modules 340 – 380 provides further and more detailed information (**factsheets**) on the nine selected solid biomass certification schemes.

- 100 Introduction
- 200 Sustainability certification of biomass – background and objectives
- 300 Certification schemes**
- 400 Practical tools for assessing sustainability impacts
- 500 Related legislation (EU Timber Regulation)
- 600 Other sustainability aspects (carbon debt, indirect effects)
- 700 Glossary of terms and abbreviations

Module 310: General structure of a biomass certification scheme

(Version – November 2013)

Contents of this module

This module explains the general structure and key elements of a biomass certification scheme, i.e. (1) the principles & criteria, (2) the chain of custody, (3) certification requirements, (4) rules on claims and communications, and (5) the governance structure of a scheme.

1. Key elements of a biomass certification scheme

The general structure of a biomass certification scheme has been depicted in Figure 3.1 below, and comprises of the following key elements:

1. **Principles & Criteria** for sustainable production of biomass or for sustainable forest management;
2. A chain of custody which allows tracing of certified material through the supply chain (from producer up to the bio-energy plant), and which ensures that no more sustainable material is claimed than has been produced/harvested;
3. **Certification requirements**, which specify the rules of play for verification of the biomass by independent auditors, as well as the certification process. Certification requirements include both the production of biomass/forest management, and the chain of custody;
4. **Rules on claims and communications** that can be made by certified operators;
5. The **governance structure** of the scheme, i.e. the way in which the scheme is governed and managed.

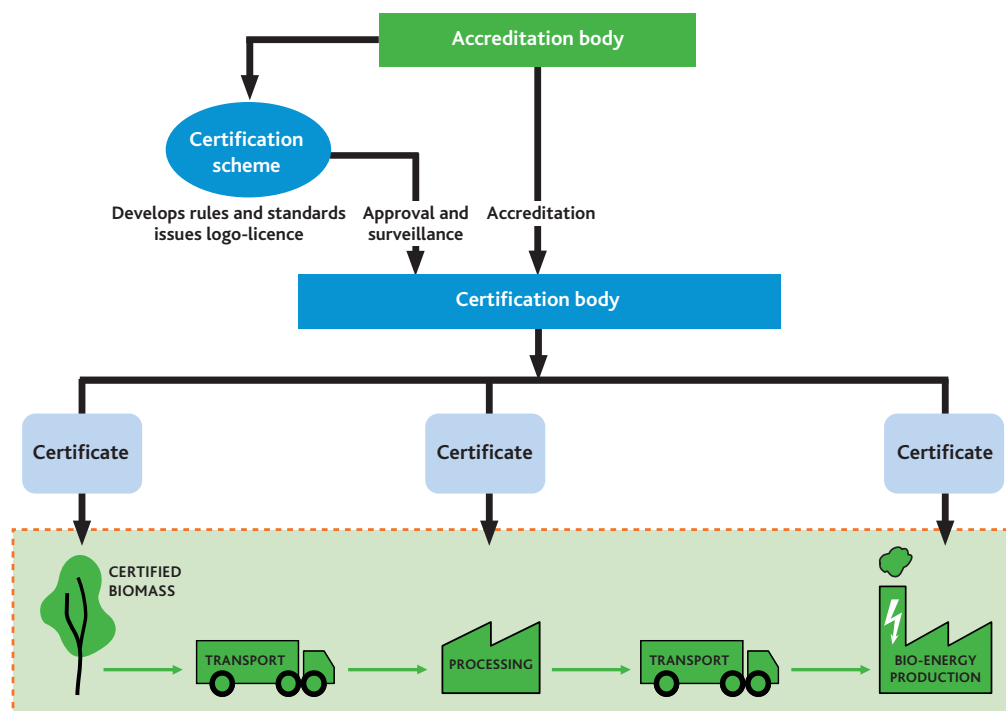


Figure 3.1. Schematic representation of a biomass certification scheme.

The key elements are discussed in more detail in Sections 2-6 below. Much information in these sections has been compiled from [2] and [3] and information from scheme websites, while specific information on chain of custody was primarily derived from [1].

2. Principles and Criteria

2.1 General

The Principles & Criteria specify the scheme's definition of 'sustainable production of biomass', or 'sustainable forest management'. In biomass certification schemes, Principles & Criteria typically include a combination of environmental aspects, social aspects, economic aspects, and technical/managerial aspects. The box below contains three examples of Principles applied in biomass certification schemes.

Examples of Principles applied in biomass certification schemes

FSC - Principle 6 Environmental Impact: *'Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest'.*

NTA 8080 Principle 9: *'The production of biomass contributes towards the social well-being of the employees and the local population'.*

RSB Principle 2: *'Sustainable biofuel operations shall be planned, implemented, and continuously improved through an open, transparent, and consultative impact assessment and management process and an economic viability analysis'.*

Biomass certification schemes differ in the Principles & Criteria they cover. Module 320 discusses differences between schemes, while further scheme details have been highlighted in the schemes' factsheets (Modules 340-380).

2.2 Specifying Principles & Criteria further : Indicators & Guidance

A scheme's sustainability requirements are generally structured in **a hierarchy** of principles, criteria and indicators, while guidance provides additional information.

A sustainability Principle is generally formulated as 'specific objectives', or as fundamental statements about the desired outcome. The corresponding sustainability **Criteria** specify the conditions that need to be met in order to achieve a Principle (the content)

Both Principles and Criteria are not designed to be verified (audited): they are too generic and leave too much room for interpretation. For the purpose of verification, **Indicators** are required for each criterion. Indicators are specific pieces of objective evidence that must be in place to demonstrate or verify that the Criterion is being met. Indicators can be assessed in practice.

In addition, a scheme may provide **Guidance** with each criterion. Guidance consists of useful information to help the producer and auditor understand what the Criterion means in practice.

The Box below contains two examples of how the hierarchy of Principles- Criteria – Indicator- Guidance works out in practice.

Examples of the hierarchy of Principles – Criteria – Indicator – Guidance

Example 1 – Taken from RSB

Principle	<i>'RSB Principle 8: Biofuel operations shall implement practices that seek to reverse soil degradation and/or maintain soil health.'</i>
Criterion	<i>'RSB Criterion 8.a Operators shall implement practices to maintain or enhance soil physical, chemical, and biological conditions.'</i>
Indicator	<i>'Soil erosion shall be minimized through the design of the feedstock production site and use of sustainable practices in order to enhance soil physical health on a watershed scale.'</i>
Guidance	<i>'Impacts on soil should be assessed through a Soil Impact Assessment.'</i>

Example 2 – Taken from NTA 8080

Principle	<i>'NTA 8080 Principle 4: Biomass production does not affect protected or vulnerable biodiversity and will, where possible, strengthen biodiversity.'</i>
Criterion	<i>'NTA 8080 Criterion 4.1: No violation of national laws and regulations that are applicable to biomass production and the production area.'</i>
Indicator:	<i>'The organization shall prove that, as far as applicable, the national laws and regulations are known in general and the laws with respect to [...] protected areas, wildlife management [...] and the rules arising from signing of international conventions in particular.'</i>
Guidance	<i>'"Convention on biological diversity" (CBD) and "Convention on international trade in endangered species" (CITES) can be considered in case of international conventions.'</i>

2.3 Adapting Criteria & indicators to specific situations

A scheme's standard set of Principles – Criteria – Indicators – Guidance may not be suitable to cover all types of biomass production systems or forest management operations. It may be necessary to adapt scheme requirements for certain biomass streams (e.g. waste & residues), for geographic conditions (e.g. national interpretation of scheme requirements) or for specific business models (e.g. for small farmers).

Schemes vary in the way they deal with adaptations to specific situations a residue). Section 320 and the schemes' factsheets (Module 340-380) provide details on specific scheme provisions.

3. Traceability of biomass: Chain of custody

3.1 General

The chain of custody is the mechanism which allows tracing of certified biomass throughout the supply chain, all the way from the producer or the forest up to and including the bio-energy plant. A chain of custody system ensures that no more biomass is claimed than has been produced/harvested. In other words: it prevents 'over claiming' of sustainable products.

Chain of custody is about administration of biomass supplies, storage and deliveries at every point in the supply chain. Biomass certification systems have specified their chain of custody requirements in a 'supply chain standard' or 'chain of custody standard'.

Chain of custody requirements do apply to all operators along the supply chain which physically receive in storage and/or take legal ownership of biomass (products), although some differences between certification schemes exist (e.g. with respect to subcontractors). Supply chain operators will need to become supply chain certified before they can claim deliveries of certified material.

Module 320 elaborates on scheme-specific chain of custody requirements.

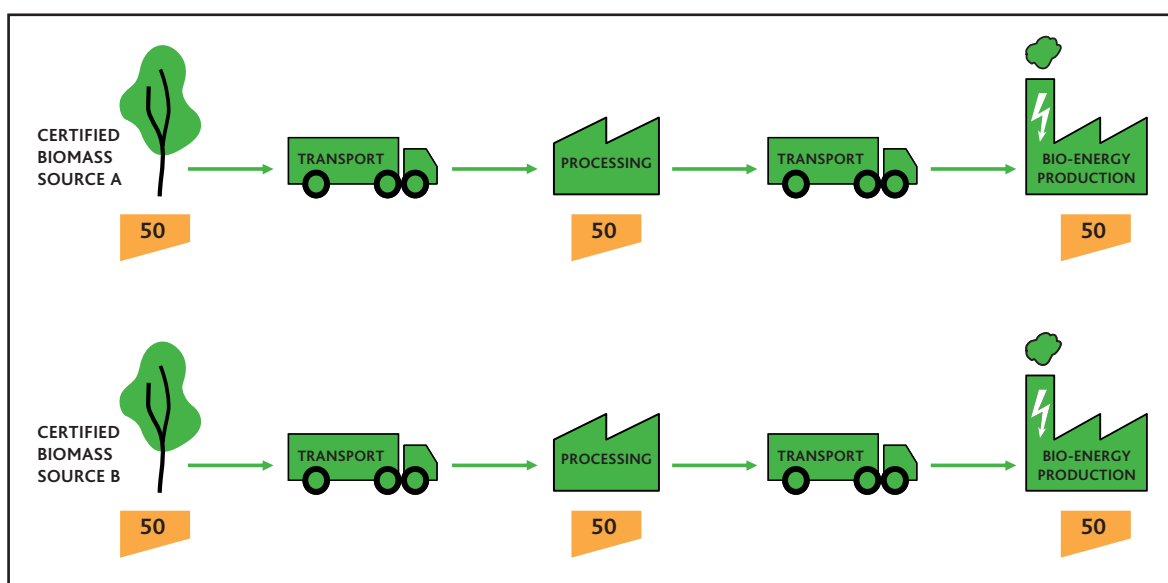
3.2 Chain of custody models

In biomass certification, four types of chain of custody can be distinguished. Three models follow physical biomass through the supply chain, i.e. the identity preserved model, the segregated model, and the mass balance model. The fourth model is the so called 'book and claim' model. This model is based on certificate trading and does not trace physical biomass through the supply chain.

Key characteristics of the different models are highlighted below:

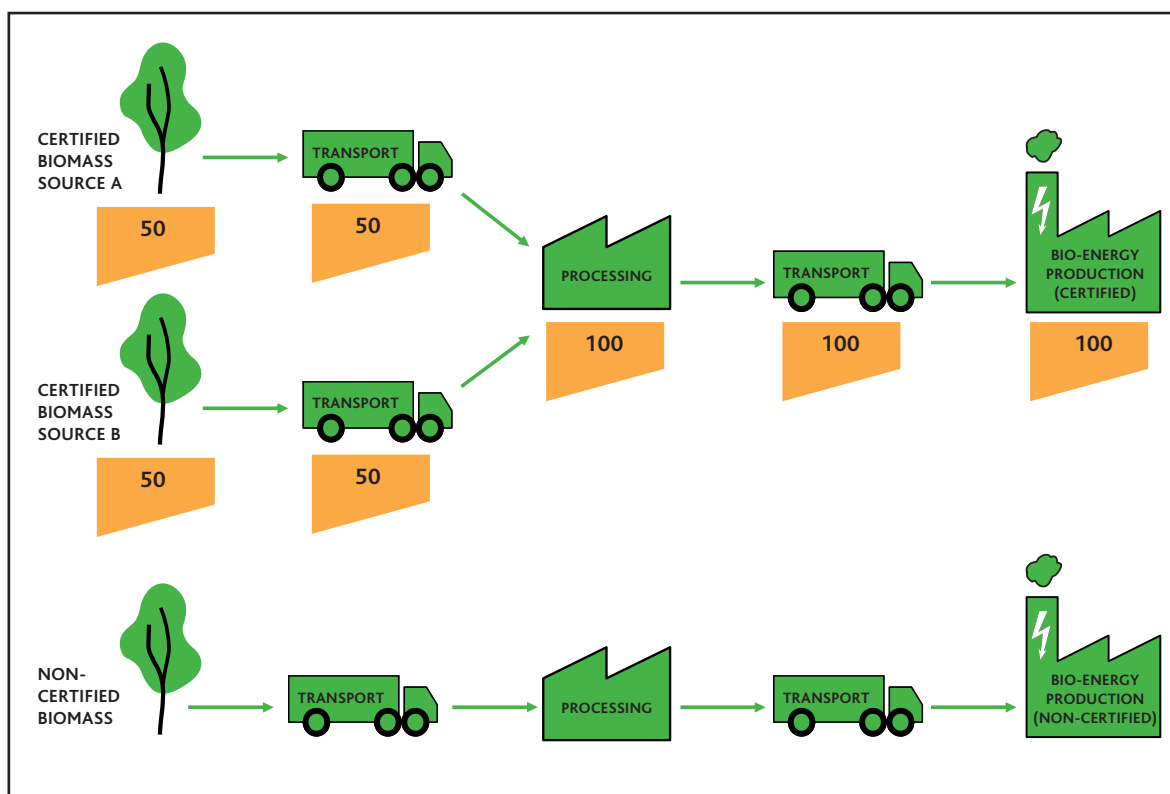
Identity preserved (track-and-trace)

In this chain of custody model, certified products are physically segregated from non-certified products throughout the supply chain, while the system also provides traceability back to the origin of the product.



Segregated

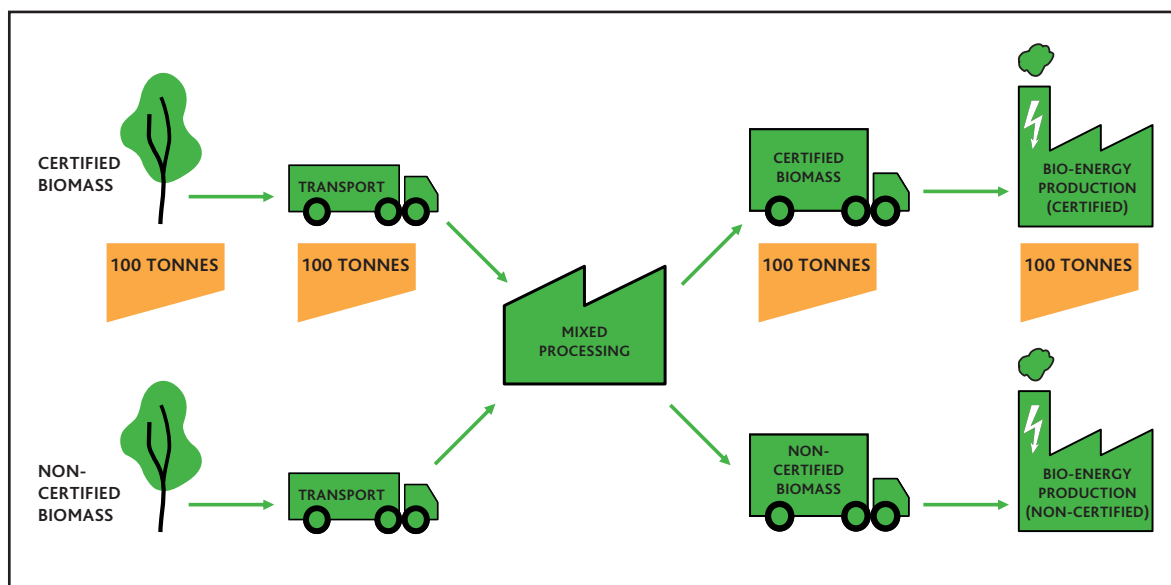
In this chain of custody model, certified products are physically segregated from non-certified products throughout the supply chain (either in time or place), while the approach does not aim to provide traceability back to the origin of the product



Mass balance

In the mass balance model, products with different sustainability characteristics can be physically mixed, but are kept administratively segregated. The mass balance model can be further characterized as follows:

- The administrative segregation ensures that for the volume of products for which claims are made at the end of the supply chain, sufficient certified material has been added to the supply chain, taking into account relevant conversion factors;
- Physical product and sustainability information are coupled when they are traded between parties. There cannot be trade in sustainability information between parties without trading physical products between the same two parties (as is possible in a book and claim system);
- Each actor in the supply chain keeps track of the amount of product with certain sustainability characteristics it sources and sells, in which each company can never sell more certified products than it sourced, taking into account relevant conversion factors;
- Sustainability characteristics of batches of biomass cannot be 'averaged', but need to be administratively segregated. For example two batches of biomass with distinct carbon intensity figures may be mixed, as long as the carbon intensity figures remain attached to an equivalent quantity of biomass (i.e. the figures cannot be averaged).



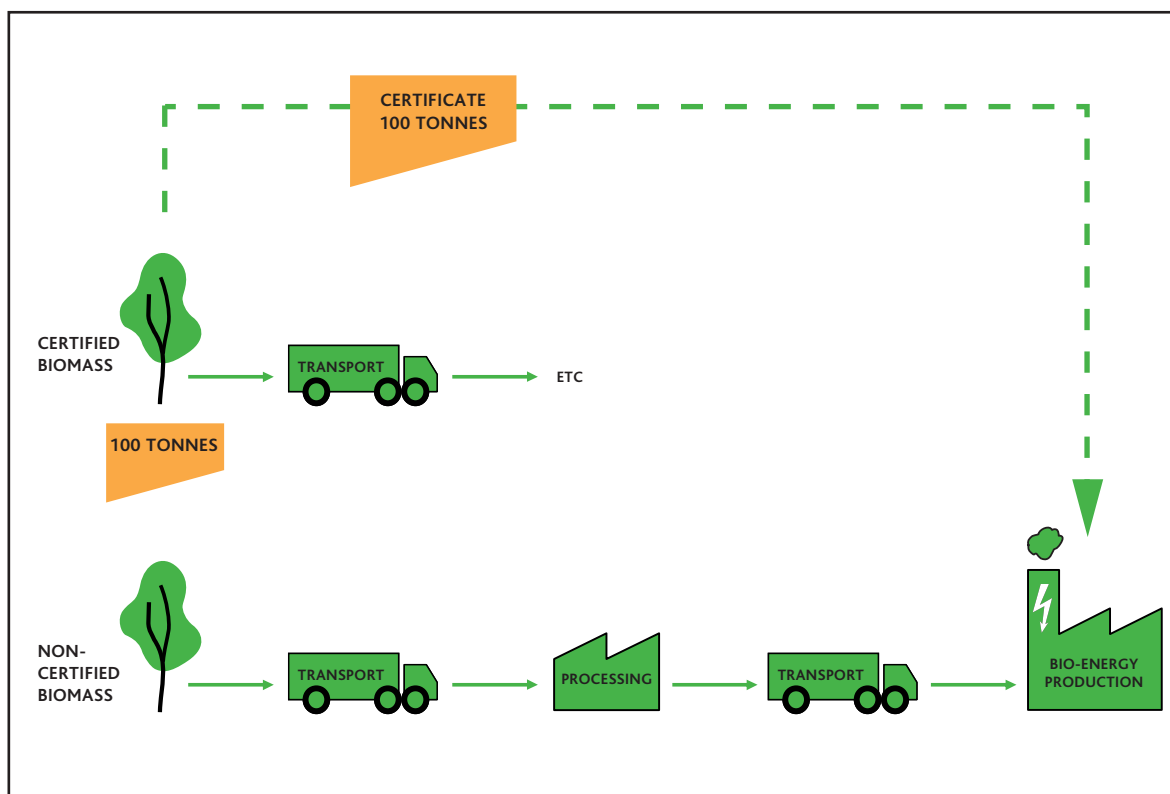
In practice, significant differences exist in the way certification schemes have defined their mass balance requirements. This relates in particular to:

- Mass balance with or without traceable transport;
- Level at which the mass balance system operates (e.g. site or company level);
- Transfer of sustainability information between different feedstock derived products;
- Aggregation of multiple consignments;
- Timeframe over which the mass balance is operated;
- Proportionate feedstock reporting;
- Validity of claims (banking and forward allocation).

Book and claim

In the book and claim model, trade in physical products is completely decoupled from the trade in sustainability certificates. This system is comparable to the trade in green electricity certificates, where also the green claim is detached from the physical electricity delivered to a particular place in the grid.

A key difference with a mass balance system is that it can only be claimed that the sustainable feedstock has been added to the overall market. It cannot be claimed that sustainable feedstock has been added to a specific biomass supply chain.



3.3 Content and claims of biomass deliveries

Table 3.1 below summarizes for all four chain of custody models the 'content' of biomass deliveries, and possible 'generic' claims with biomass deliveries. Certification schemes have specified guidelines as to the exact wording that shall be used to claim 'sustainable deliveries of biomass'.

Table 3.1 Summary of key features of chain of custody models.

	Identity preserved (track-and-trace)	Segregated	Mass balance	Book and claim
Biomass deliveries contain	100% certified product from uniquely identifiable source	100% certified product, potentially from different sources.	Product may contain both certified and non-certified material.	Uncertain if product physically contains certified material
Possible claim	All biomass physically contains 100% certified material from identifiable sources	All biomass physically contains 100% certified material from certified sources.	Biomass products come from supply chains to which an amount of certified biomass feedstock has been added that equals the amount needed to produce these biomass products.	Certified products support the production of certified sustainable material. An amount of certified feedstock has been produced that equals the amount needed to produce the certified products.

In practice, the segregated model and the mass balance model are most widely used to ensure solid biomass traceability. The identity preserved model is not commonly used because of the technical complexity (and costs) related to physically separating batches of biomass from different sources throughout the supply chain. The book & claim model is not commonly used as certain stakeholders perceive it as less credible, due to the decoupling of physical biomass and sustainability claims.

4. Certification requirements

The certification requirements of a biomass certification scheme include the 'rules of play' for verification of the biomass producer/forest management requirements and the chain of custody requirements by independent auditors, and the certification process.

The objective of the certification requirements is to ensure that only those operators that demonstrably comply with the scheme's sustainability requirements are certified, and that certification activities are only carried out by independent and qualified auditors, following standardized procedures.

Certification requirements comprise a diversity of aspects, including but not limited to the following:

- Requirements for certification bodies (e.g. in relation to accreditation);
- Requirements for individual auditors (independence, qualifications, expertise);
- Requirements on the audit methodology (on-site versus desk-top, research methods);
- Level of assurance that is required to qualify for certification, i.e. the number of major non-compliances and minor non-compliances which are allowed;
- Validity of certificates, and requirements on follow up audits;
- Procedures for group certification (for small biomass producers/forest owners);
- Procedures for multi-site auditing and certification;
- Requirements on stakeholder consultation during the certification process;
- Complaints procedures.

It is beyond the scope of this Handbook to discuss technical details of these certification requirements. Instead, the certification schemes' factsheets (Modules 340 -380) highlight key certification requirements of individual certification schemes.

In addition, the box below explains some of technical terms used in biomass certification (requirements).

Biomass certification terminology

Accreditation – the procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks. In the case of biomass certification: accreditation of certification bodies.

Auditor – person with competence necessary to conduct an assessment

Audit team – one or more auditors conducting an audit, if needed supported by technical experts. One auditor of the team is appointed as the audit team leader or lead auditor

Audit type – the method followed for the audit, i.e. desk audit or field audit.

Certification decision – granting, maintaining, renewing, reinstating, refusing or withdrawing certification

Certificate holder – the operator which holds a valid scheme certificate

Certification report – report on the certification evaluation process, certification evaluation findings and conclusions, and certification decision.

Certification scope – a comprehensive description of all aspects of the operations under the control of an operator which are affected by the scheme requirements.

Desk audit – evaluation of an operator for compliance with a scheme's requirements, based on documentation provided by the operator.

Field audit – evaluation of an operator for compliance with a scheme's requirements, executed at the operations, sites and facilities of the operator.

ISO/IEC Guide 65 – general requirements for bodies operating product certification systems

ISO 19011 – guidelines for auditing management systems

Non-compliance (non-conformity) – failure to comply with one or more of the requirements specified in a certification scheme. Generally, 'major' and 'minor' non-compliances are distinguished.

Self assessment (self evaluation) –assessment against a certification scheme's requirements, conducted by an operator, of its own operations.

Stakeholder – persons, groups or organisations who are directly or indirectly affected by or who can affect and activity, but also includes people and organizations who have concerns about the activity, or who might be responsible agents.

5. Rules on claims and communications

Certification schemes have specified rules on claims and communication guidelines, to provide clarity on what claims certified operators and other stakeholders are allowed to make, and what these claims mean.

Claims can relate to the benefits of the product, the certification status of a company, membership of the certification scheme, etc.

In addition, scheme may have specified rules for the use of a (trademark) logo.

Supply chain operators and other stakeholders are recommended to study the certification scheme website for detailed information on claims and communication guidelines.

6. Governance structure

The governance structure refers to the way in which the scheme is governed and managed. This includes the development (and review) of the scheme itself, the development (and review) of the scheme's procedures and policies, and the operational management of the scheme.

Most biomass certification schemes apply a multi-stakeholder approach for their governance, meaning that different groups of stakeholders have a say in strategic policy making. Schemes vary in the way in which the multi-stakeholder process is organized, and the level of influence which stakeholder groups have.

On an operational level, schemes generally have a 'secretariat' or 'bureau' which deals with all day-to-day matters and is also the first point of contact for the scheme's members and other stakeholders.

7. References

[1] Ecofys (2013). Analysis of the mass balance system and alternatives. Utrecht (the Netherlands), March 2013.

[2] NL Agency (2011). Selecting a biomass certification system – a benchmark on level of assurance, costs and benefits. Utrecht (the Netherlands), March 2012.

[3] NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011.

Module 320: Key features of selected solid biomass certification schemes

(Version – November 2013)

Contents of this module

This module describes and compares key features of selected sustainability certification schemes for solid biomass. This is a further elaboration of the information provided in 'The general structure of a certification scheme' (Module 310).

The information provided in this Module helps to understand the decision-tree 'Selection of a solid biomass certification scheme', as outlined in Module 330.

A more elaborate description of each individual scheme is provided in the schemes' factsheets (Modules 340 – 380).

1. Introduction

This module describes key features of nine selected solid biomass certification schemes. These include schemes which already have acquired a market position in the certification of solid biomass used for bio-energy production, or which are likely to obtain such a position in the future. The latter is an expert judgment by NL Agency and the author of this Handbook, and will also depend on developments in government or market requirements for sustainable biomass. Future revisions of the Handbook will revisit the list of schemes covered, and may add other schemes if appropriate.

The schemes have been listed in the box below:

Biomass certification schemes covered in this Handbook

NTA 8080 – a certification scheme focusing on biomass for all types of bio-energy application. Currently the leading scheme for the certification of solid biomass (residues) in the Netherlands.

International Sustainability and Carbon Certification Scheme (ISCC) – a biomass certification scheme, currently focusing on (feedstocks for) transport biofuels. Market leader amongst schemes that can be used for biofuels in the EU.

Roundtable on Sustainable Biomaterials (RSB) – a certification scheme focusing on biomass for all types of bio-energy applications, as well as other bio-based applications (food, feed, chemicals, etc.). Certification activities are in the infant phase. Scheme is being hailed for its robustness.

Green Gold Label (GGL) – scheme focusing on traceability of certified solid biomass for large power plants. Uses a meta-standard approach for certification of biomass production/forest management.

Initiative Wood Pellet Buyers (IWPB) – this scheme is under development, and includes sustainability criteria for wood pellets.. It is an initiative from seven major power utilities in Europe, and expected to play a major role in wood pellet trade.

Forest Stewardship Council (FSC) – one of two leading forest management schemes with global coverage (together with PEFC). Focus is on certification of forest biomass, regardless of the application of the biomass.

Programme for the Endorsement of Forest Certification (PEFC) – one of two leading forest management schemes with global coverage together with FSC). Focus is on certification of forest biomass, regardless of the application of the biomass.

Canadian Standards Association – Sustainable Forest Management (CSA-SFM) – A Canadian sustainable forest management scheme. Covered in this Handbook because of the expected importance of wood pellet imports from Canada and USA for use in European power plants.

Sustainable Forest Initiative (SFI) – A US/Canadian sustainable forest management scheme. Covered in this Handbook because of the expected importance of wood pellet imports from Canada and USA for use in European power plants.

The scheme features discussed in this module have been categorized as follows:

- Background and scope of the schemes (Section 2);
- Key elements of the sustainability standard of the schemes (Section 3);
- Certification requirements and certification costs (Section 4);
- Other scheme features, e.g. the track record, governance structure and perceived credibility (Section 5).

Although various aspects of certification schemes are compared, the intention of this module is not to qualify schemes as good, better or bad. Which scheme is most appropriate in a particular situation depends on a number of factors. The decision tree in Module 330 is intended to assist with the scheme selection process in a particular situation.

Verification schemes – the Laborelec example

This Handbook focuses on sustainability certification (schemes) for solid biomass. In addition to the **certification schemes**, there are also **verification schemes**. Whereas certification focuses on the evaluation of compliance against the requirements in a sustainability standard (the certification scheme), verification is about checking the sustainability claim of an operator without using a certification standard as a pre-set framework.

Another key difference between certification and verification is the structure of audits. In certification schemes, a successful certification audit is required before an operator is allowed to participate in the scheme (followed by regular surveillance audits checking actual performance). In verification, a compliance check is only performed afterwards (i.e. after activities have been undertaken).

An example of a solid biomass verification scheme is the Laborelec scheme (www.laborelec.be), which was developed by service provider Laborelec for energy company GDF Suez in response to biomass

sustainability requirements set by the Flemish and Walloon governments in 2003. It focuses on the verification of three key sustainability aspects: the origin of the biomass (resource, country), the CO₂-/energy balance of the biomass chain, and whether the biomass comes from sustainably managed forests.

The verification process includes a regional risk assessment of sustainable forest management, a yearly inspection of the pelletizer (on-site audits) and an administrative control of the pellet transporter. SGS Belgium is the exclusive accredited verification body, based on a bilateral agreement with Laborelec, and they may hire local accredited verifiers for pelletizer on-site audits.

SGS Belgium delivers the reports prepared on the basis of the scheme developed by Laborelec to the Belgian regional market regulator who approves them and grants Flemish or Wallonian green electricity certificates. Their number is proportional to CO₂-/energy balance of the pellet supplier. It is expected that in 2014 the Laborelec scheme will be incorporated in the IWPB certification scheme, and will then cease to exist as an independent verification scheme.

2. Background and scope of the schemes

2.1 Background of the schemes

The nine biomass sustainability schemes discussed in this Handbook can be categorized in three groups: (a) forest management schemes, (b) power utilities' schemes, and (c) 'generic' bio-energy schemes.

Sustainable forest management schemes

These schemes focus on certification of pieces of (sustainably managed) forested land, and cover biomass harvested from that forest, regardless of the application of the biomass (e.g. wood for furniture, paper or bio-energy). In addition, these schemes may also cover waste wood applications. Sustainable forest management schemes covered in this Handbook include FSC, PEFC, CSA-SFM and SFI.

Power utilities' schemes

These schemes focus on biomass for bio-electricity generation, in particular wood pellets. The schemes have been developed by power utilities, while other stakeholders play a role in scheme governance. Power utilities' schemes covered in this Handbook include GGL and IWPB.

Generic bio-energy schemes

These schemes focus on biomass for *all types* of bio-energy applications, including transport biofuels, electricity and heating. The scope of biomass included is broad, and may include solid, liquid and gaseous biomass.

The generic bio-energy schemes do include sustainability criteria for the production of the biomass, in plantations/agriculture as well as in forests. Sustainable bio-energy schemes covered in this Handbook include NTA 8080, ISCC, RSB.

N.B. A key difference between these categories of schemes is that sustainable forest management schemes take *the forest management unit* as starting point, whereas power utilities schemes and generic bio-energy schemes take the *application of biomass* as a starting point.

2.2 Scope of the schemes

The scope of biomass certification schemes can be defined on the basis of the types of biomass covered, the schemes' geographic coverage, and/or the elements of the supply chain covered:

Table 3.2 below summarizes types of biomass and biomass applications, geographic scope and supply chain coverage by the respective schemes.

Table 3.2 Summary of types of biomass, geographic scope and biomass applications covered by the respective solid biomass certification schemes.

	NTA	ISCC	RSB	GGL	IWPB	FSC	PEFC	CSA	SFI
Type of biomass	All	All	All	All	Wood pellets	Forest biomass; Timber residues/waste	Forest biomass; Timber residues/waste	Forest biomass	Forest biomass
Application of biomass	Bio-energy	Bio-energy	Bio-energy	Bio-energy	Bio-energy	All	All	All	All
Geographic scope	Global	Global	Global	Global	Global	Global	Global	Forest management: Canada Supply chain: global	Forest management: Canada /US Supply chain: global
Supply	Full coverage	Full coverage	Full coverage	Full coverage	Supply chain including end use	Full coverage	Full coverage	Forest management; PEFC standard used for chain of custody	Forest management; PEFC standard used for chain of custody

1. The type of biomass covered and the application of the biomass

A limited number of schemes cover all biomass suitable for bio-energy. Forest management schemes focus on forest biomass, while they also include provisions for waste and residues. IWPB focuses on wood pellets for bio-electricity.

2. The geographic coverage of the scheme

Geographic coverage relates both to the origin of the biomass, and the trade/transport and application of the biomass (chain of custody).

Most schemes have a global coverage of both the origin and the chain of custody of biomass.

CSA-SFM focuses on biomass from Canadian forests. SFI focuses on biomass from Canadian and US forests.

These two schemes use the PEFC chain of custody standard to allow global tracking of biomass.

3. The elements of the supply chain covered

Schemes differ in the extent of supply chain coverage:

- Most schemes have 'full supply chain coverage' meaning that the scheme covers the complete biomass chain from biomass production/forestry up to and including the bio-energy plant;
- The IWPB scheme will not include biomass production/forestry, but will instead approve the use of other schemes for that purpose (meta standard approach). While GGL does include standards for forestry and biomass production, in practice it also works via this meta-standard approach;
- The CSA-SFM and SFI scheme do only include forestry management, and use the PEFC chain of custody standard to cover the supply chain.

3. Key elements of the sustainability standard of the schemes

3.1 Coverage of sustainability requirements (Principles & Criteria)

Schemes differ in their **coverage of sustainability principles**: some schemes include more sustainability principles than other schemes. For example, the principle of 'a positive greenhouse gas balance' is a requirement which is not covered by all schemes.

Furthermore, the **actual content of a principle** may differ at the level of criteria and indicators (refer to Module 310 for an explanation of the hierarchy of principles – criteria – indicators). Consequently, schemes which 'score' comparable at the level of principles, may differ substantially in robustness and credibility (depending on the contents of criteria and indicators).

Schemes also use **different terms** to define (sets of) certain sustainability requirements. Whereas one scheme specifies 'soil protection', 'water protection' and 'air protection' as separate requirements, another scheme may cover this under 'environmental responsibility'. This complicates the comparison of schemes' sustainability requirements further.

As a result of the above, it is not easy to compare the sustainability requirements of schemes in detail. Operators who wish to make such a detailed comparison are recommended to study the schemes' principles, criteria and indicators, including any further guidance which the scheme documentation may contain. The factsheets of the schemes (Modules 340 - 380) provide information on relevant scheme documentation.

In Table 3.3, a high-level comparison of schemes has been made. Principles used in the various biomass schemes have been grouped in seven main 'categories'. This has been done to reduce the variety in (names of) principles.

Table 3.3 Summary of sustainability principles covered by certification schemes.

	NTA	ISCC	RSB	GGL	IWPB	FSC	PEFC	CSA	SFI
Respecting laws and regulations Legality	+	+	+	+	+	+	+	+	+
Greenhouse gas balance	+	+	+	+	+	-	-	-	-
Protection of carbon stocks	+	+	+	-	+	+	+	+	+
Environmental responsibility Protection of biodiversity; protection of soil, water, air; land conservation/rehabilitation	+	+	+	+	+	+	+	+	+
Local socio-economic performance Social well-being of employees and local population; human rights; labour rights; land rights; community relations; local prosperity; rural development	+	+	+	+	+	+	+	+	+
Good management practice Management planning; monitoring/assessment; continuous improvement	+	+	+	+	+	+	+	+	+
Avoid competition with local food security and other biomass applications	+	+	+	-	-	-	-	-	-

+ The principle is covered by the scheme (significant differences may exist in the contents of the principle (criteria and indicators))

- The principle is not covered by the scheme

What appears from the table, is that all schemes cover most of the 'common' sustainability principles, with the exception of the 'greenhouse gas balance' and the 'competition with local food security'. In addition, there is a principal difference in how schemes deal with the principle of 'carbon stock protection'.

The background and consequences of these differences is further discussed below:

Greenhouse gas balance

The principle of a positive greenhouse gas balance is not covered by forest management schemes. The primary reason is that these schemes were and are primarily focused on material applications of forest biomass, and less on energy production. Obviously, this was quite the opposite for the bio-energy schemes and the power utilities' schemes, which included the greenhouse gas criteria as a key element from the start.

Future sustainability requirements, set by governments, the energy sector or otherwise, are likely to include some sort of greenhouse gas balance requirement (refer to Module 220). This means that forest management

schemes will not be fully compliant with these requirements. Forest management schemes may respond by adding a 'greenhouse gas principle', or developing a separate set/module of criteria specifically for forest biomass intended for bio-energy applications.

Alternatively, operators may use a forest management scheme to show compliance with most government or market sustainability requirements, e.g. in relation to biodiversity, and in addition use a separate audit/scheme to show compliance with the greenhouse gas requirements. Government or market sustainability requirements may specify how this would need to work in practice.

Note: The major forest management schemes covered in this Handbook indicate that currently they have no plans to develop additional criteria or an additional module to cover greenhouse gas requirements. This may change in future, e.g. if EU requirements would request this (refer to Module 220 for more information).

Competition with local food security and other local biomass applications

This principle is covered by schemes which currently tend to focus on production of biomass feedstocks for biofuels on agricultural land (in particular vegetable oils and sugar crops). The background lies in the discussion on 'food versus fuel': increased land uptake for biofuel feedstock production may have an adverse effect on local food security and on local and global food prices.

For solid biomass for bio-energy, this issue is currently less debated but may become a concern when global biomass uptake for bio-energy increases further. In that case, the discussion will not focus on food (as wood is not edible) but rather on the competition with material applications for wood, or local use as an energy source versus export (Refer to Module 620 for more information on 'indirect effects').

Protection of carbon stocks

In relation to carbon stocks it is important to note that forest management schemes on one hand, and bio-energy schemes on the other hand, currently have a fundamentally different approach to carbon stocks.

The bio-energy schemes and power utilities' schemes have developed their carbon stock criteria on the basis of the EU Renewable Energy Directive, and the Commission Communication on sustainability criteria for solid biomass (refer to Module 230). The Directive states that biomass shall not come from areas with high carbon stocks, unless certain requirements have been met to ensure that carbon stocks remain intact (This is the 'No, unless' approach).

On the contrary, forest management schemes do allow to harvest from high carbon stock areas, provided that management practices do ensure long term conservation of carbon stocks (This is the 'Yes, provided that' approach).

3.2 Biomass traceability: chain of custody requirements

As explained in Module 320, the mass balance model and the segregated model are the most commonly used chain of custody models for tracing certified solid biomass. In the mass balance model, biomass from certified and non-certified sources can be mixed, as long as administration ensures that not more certified material is claimed than has been produced. In the segregated model certified material and non-certified material are

physically segregated in all stages of the supply chain.

All schemes discussed in this Handbook include both a mass balance model and a segregated model. The models used by the schemes vary in technical specifications and requirements, e.g. in relation to which operators need to be certified, at which level the administrative requirements do apply, and how reporting shall be done. Technical differences may have an impact on the complexity of the administration associated with ensuring biomass traceability. Understanding these differences requires in-depth study of the chain of custody requirements of the respective schemes. Most schemes have made these requirements available in separate documentation.

It is beyond the scope of this handbook to compare technical aspects of the schemes' chain of custody models.

Another aspect which impacts biomass traceability (and claims made on 'sustainable biomass') is the mutual recognition of biomass certification schemes. This aspect is dealt with in Section 3.4 below.

3.3 Provisions for waste & residues

Biomass schemes have categorized certain types of biomass as 'residues' or 'waste'. For biomass classified as residues or waste generally less sustainability criteria apply than for biomass which is not waste or residue. The reasoning is that for residues and waste sustainability risks are less diverse and less significant than for biomass which has tentatively been produced (e.g. on cropping land).

In practice it means that certification of biomass classified as waste or residue is easier than biomass which is not classified as waste or residue.

Overall, the following categories of (solid biomass) waste & residues can be distinguished:

- Residues from forestry and agriculture: residues directly from the forest or from agriculture. This includes e.g. branch and top wood;
- Residues from wood and other biomass processing activities: residues which arise when these materials are processed. In the case of wood this may include sawdust, bark or unusable parts. Other biomass residues may include residues from the agrifood processing industry;
- Waste wood: this is waste which arises after a wooden product has been discarded. Waste wood can be clean, or can be contaminated (e.g. with paint)
- Other organic waste: organic waste other than wood, e.g. organic waste from households or grass cuttings from road maintenance activities.

The table 3.4 below presents which biomass streams are considered as waste or residues by the respective schemes, meaning that for those materials less sustainability criteria apply.

Table 3.4 Classification of biomass as waste & residues, in selected biomass certification schemes.

	NTA	ISCC	RSB	GGL	IWPB	FSC	PEFC	CSA	SFI
Residues from forestry and agriculture	X		X						
Residues from biomass processing activities	X	X	X	X	?				
Waste wood	X	X	X	X	X	X	X	X	X
Other organic waste	X	X	X	X	X	X	X	X	X

Operators are recommended to study the schemes' detailed requirements on waste and residues. The schemes' factsheets (Module 340-380) provide some further background information.

3.4 Recognition of other schemes

A certification scheme (scheme A) can recognize another certification scheme (scheme B), and thereby allow biomass certified against that other scheme (B) to be accepted by a supply chain operator certified against the first scheme (A), while maintaining its status as 'certified biomass'. Recognition between schemes leads to 'chain of custody efficiencies', as material certified against different schemes can be mixed while maintaining a sustainability claim on the total mixture.

The example in the box below explains how this works.

Recognition of forestry schemes by GGL

GGL has recognised FSC. This means that biomass from a FSC certified forest can be accepted by a GGL certified supply chain operator and 'travel' further down the supply chain using the GGL chain of custody model (while also maintain the FSC producer certificate).

GGL has also recognised PEFC, meaning that the same applies to PEFC certified biomass.

Say that for example 10 tonnes of FSC certified biomass, 10 tonnes of PEFC certified biomass and 20 tonnes of non-certified biomass are accepted by a GGL certified biomass trader, and subsequently traded further as one batch of biomass. The claim which can be attached to this batch is that 50% is GGL certified biomass, and that of the certified biomass 50% is from FSC certified sources and 50% is from PEFC certified sources.

Currently, the recognition amongst biomass schemes is still very limited, with GGL being the only operational scheme recognizing a number of other (forestry) schemes. It is expected that (mutual) recognitions will increase with increasing use of certified solid biomass for bio-energy, as the need for chain of custody efficiencies then becomes more apparent. Table 3.5 below provides an overview of the current recognitions amongst solid biomass certification schemes.

Table 3.5 Recognitions amongst solid biomass certification schemes.

Scheme which recognizes	Schemes which have been recognized						PEFC	CSA	SFI
	NTA 8080	ISCC	RSB	GGL	IWPB	FSC			
NTA 8080	n.a.	-	-	-	-	-	-	-	-
ISCC	-	n.a.	-	-	-	-	-	-	-
RSB	-	-	n.a.	-	-	+	-	-	-
GGL	-	-	-	n.a.	-	+	+	+	+
IWPB ¹	?	?	?	?	n.a.	?	?	?	?
FSC	-	-	-	-	-	n.a.	-	-	-
PEFC	-	-	-	-	-	-	n.a.	+	+
CSA	-	-	-	-	-	-	+	n.a.	-
SFI	-	-	-	-	-	-	+	-	n.a.

¹ Currently it is still unknown which schemes will be recognized under the IWPB standard.

The aspect of 'other scheme recognition' is something to consider for supply chain operators wishing to become certified: certification against a scheme that recognizes other schemes allows the supply chain operator to accept biomass certified against all these schemes, without having to obtain multiple certifications himself.

4. Certification requirements

The certification requirements of a biomass certification scheme include the 'rules of play' for verification of the biomass chain by independent auditors, and for the certification process.

As elaborated in Module 320, certification requirements comprise a diversity of (sometimes very technical) aspects, e.g. the verification methodology, auditor requirements, validity of certificates, etc..

The schemes' factsheets (Module 340 – 380) include details on each scheme's certification requirements. An in-depth comparison of the schemes' certification requirements is beyond the scope of this Handbook. The report referenced as [10] contains a thorough assessment of some of the major schemes' certification requirements.

It is important to note that in practice the rules of play do leave some room for the professional judgment and interpretation by the individual auditor. This means that the robustness of certification requirements does not only rely on written standards and guidelines, but also on how they are applied in practice.

5. Certification costs and benefits

Costs for certification include both direct and indirect costs.

Directs costs generally comprise two components:

1. Costs related to external verification, i.e. the costs associated with hiring a third-party auditor. These costs are payable to the auditing company;
2. Costs related to participation in the certification scheme. This may comprise of a membership fee, a fee per certificate and/or a fee based on volume of biomass or company size. These costs are payable to the certification scheme owner (sometimes via the auditor).

Indirect costs relate to costs which an operator needs to make in order to achieve compliance with the certification scheme requirements. Generally, these costs comprise:

1. Costs related to preparation for certification. This includes e.g. man hours of internal staff, or costs related to hiring external consultants. Also, costs for setting up administrative systems (e.g. document management) systems belong to this category
2. Costs related to investments required to comply with sustainability criteria. This may include very different sorts of costs e.g. additional costs for protective clothing & equipment, investments in waste water treatment facilities. A separate type of costs are opportunity costs, e.g. when a piece of land is set aside for biodiversity enhancement it will not generate revenues from biomass grown on that land.

The overall costs related to solid biomass certification can vary significantly, and depend i.a. on:

1. The type of certification which an operator wishes to achieve. Generally, direct and indirect costs of chain-of-custody certification are lower than for certification of biomass production or forest management, as less requirements do apply for chain-of-custody certification;
2. The size and complexity of the operations subject to verification (this relates both to biomass production/forest management and chain-of-custody certification);
3. The certification scheme. Requirements of certification schemes vary, which impacts on the indirect costs of certification. Furthermore, the direct cost structure of schemes varies, depending on the type, size (and sometimes location) of the operations.

As a consequence of the above, it is not possible to make in this Handbook a detailed (quantitative) comparison of schemes' certification costs. The reader is recommended to review the schemes' websites for the latest information on certification costs in their particular situation.

Benefits of certification

Sustainability certification of solid biomass for energy applications does generally not lead to market premiums (that could cover part or all of the costs related to certification). Certified biomass is increasingly considered as part of biomass chain actors' licenses to operate, without premiums being paid by buyers of that biomass (refer to Module 220 for more information on objectives of sustainability certification).

Consequently, benefits of certification are primarily indirect, and the financial (benefit) component is often difficult to quantify. Some of the indirect benefits of certification include:

1. Improved operational practices, leading to more efficiency and/or cost reductions;
2. Improved stakeholder relations, as certification schemes request consultation/dialogue with relevant stakeholder groups;
3. Better access to capital, as certification may reduce project risks for financiers.

6. Other scheme features

This section includes a description of various other scheme features, i.e. the schemes' track records, scheme governance, perceived credibility of certification schemes, and availability of tools and guidance for scheme users.

Track record

Table 3.6 below provides a general summary of the track record of the various scheme. Details on the number of certificates issued (Status August 2013) can be found in the schemes' factsheets (Module 340 to 380), and on the respective schemes websites.

Table 3.6 Key features of schemes' track records

	Approximate time of operation	Principal types of biomass certified, and applications of that biomass production ¹	Geographic coverage of certification of biomass
NTA 8080	Since 2009	Solid biomass residues for electricity/heat generation (primarily wood)	Netherlands
ISCC	Since 2009	Primary production of feedstocks for transport biofuels (vegetable oils, sugar crops, etc.)	Global
RSB	Since 2011	Primary production of feedstocks for transport biofuels (e.g. jatropha)	Global
GGL	>10 years	Solid biomass for electricity/heat generation (primarily wood)	Global
IWPB	Not yet operational	n.a.	n.a.
FSC	>20 years	Forest biomass (wood), mainly for non-energy applications (paper, furniture, etc.)	Global
PEFC	>20 years	Forest biomass (wood) , mainly for non-energy applications (paper, furniture, etc.)	Global
CSA	>20 years	Forest biomass (wood) , mainly for non-energy applications (paper, furniture, etc.)	Canada
SFI	>20 years	Forest biomass (wood) , mainly for non-energy applications (paper, furniture, etc.)	Canada/USA

¹ This relates to the location where biomass was produced. Generally, the (certification of) supply chains has a more international character.

Perceived credibility of certification schemes

It is difficult to objectively compare the credibility of certification schemes: the credibility of a scheme depends on many factors, and also on which stakeholder you ask.

It is beyond the scope of this Handbook to discuss and potentially evaluate the credibility of biomass certification schemes in detail. Instead, operators who are considering biomass certification are strongly recommended to talk to their stakeholders on certification scheme credibility, and to weigh the perceived credibility against aspects such as costs, track record, flexibility, etc.

Operators are also recommended to take notice of the ISEAL Credibility Principles and the ISEAL Standard Setting Code [5] (also refer to the box below).

Of the schemes considered in this Handbook, RSB and FSC are full ISEAL member, meaning that these schemes have been independently assessed against the ISEAL requirements as outlined above, and do comply with these requirements. The fact that the other schemes discussed in this Handbook are not an ISEAL member does not mean that these schemes are less or not credible. Schemes may have other reasons not to become a ISEAL member.

The ISEAL Alliance, ISEAL Credibility Principles and ISEAL Standard Setting Code

The ISEAL Alliance

The ISEAL Alliance is a non-governmental organization whose mission is to strengthen sustainability standards systems or, more specifically, to:

- Improve the impacts of standards;
- Define credibility for sustainability standards;
- Increase the uptake of credible sustainability standards;
- Improve the effectiveness of standards.

ISEAL membership is open to all multi-stakeholder sustainability standards and accreditation bodies that demonstrate their ability to meet the ISEAL Codes of Good Practice and accompanying requirements, and commit to learning and improving. Through membership in ISEAL, standards systems show a commitment to supporting a unified movement of sustainability standards. ISEAL also has a non-member, subscriber category to engage with governments, researchers, consultants, private sector organisations, non-profit organisations and other stakeholders with a demonstrable commitment to the ISEAL objectives.

ISEAL Credibility Principles

Sustainability Standards scheme owners clearly define and communicate their sustainability objectives and approach to achieving them. They make decisions that best advance these objectives.

Improvement Standards scheme owners seek to understand their impacts and measure and demonstrate progress towards their intended outcomes. They regularly integrate learning and encourage innovation to increase benefits to people and the environment.

Relevance Standards are fit for purpose. They address the most significant sustainability impacts of a product, process, business or service; only include requirements that contribute to their objectives; reflect best scientific understanding and relevant international norms; and are adapted where necessary to local conditions.

Rigour All components of a standards system are structured to deliver quality outcomes. In particular, standards are set at a performance level that results in measurable progress towards the scheme's sustainability objectives, while assessments of compliance provide an accurate picture of whether an entity meets the standard's requirements.

Engagement Standards-setters engage a balanced and representative group of stakeholders in standards development. Standards systems provide meaningful and accessible opportunities to participate in governance, assurance and monitoring and evaluation. They empower stakeholders with fair mechanisms to resolve complaints.

Impartiality Standards systems identify and mitigate conflicts of interest throughout their operations, particularly in the assurance process and in governance. Transparency, accessibility and balanced representation contribute to impartiality.

Transparency Standards systems make relevant information freely available about the development and content of the standard, how the system is governed, who is evaluated and under what process, impact information and the various ways in which stakeholders can engage.

Accessibility To reduce barriers to implementation, standards systems minimise costs and overly burdensome requirements. They facilitate access to information about meeting the standard, training, and financial resources to build capacity throughout supply chains and for actors within the standards system.

Truthfulness Claims and communications made by actors within standards systems and by certified entities about the benefits or impacts that derive from the system or from the purchase or use of a certified product or service are verifiable, not misleading, and enable an informed choice.

Efficiency Standards systems refer to or collaborate with other credible schemes to improve consistency and efficiency in standards content and operating practices. They improve their viability through the application of sound revenue models and organisational management strategies.

ISEAL Standard Setting Code

Requirements on the standards development process include:

- Clearly defining the objectives of the standard and justifying its need
- Identifying affected stakeholders and providing them opportunities to participate
- Having public consultations and ensuring a balance of interests
- Making the standard publicly available and reviewing it on a regular basis

Requirements on the structure and content of the standard include:

- Ensuring that the standard's requirements contribute directly to achieving the objectives
- Ensuring the content of the standard is clear, relevant to the market and builds on regulations
- Ensuring that the standard is locally applicable, while also globally consistent in its interpretation
- Working to harmonise standards where content or scope overlaps

6. References

- [1] CSA-SFM. Scheme documentation from www.csasfmforests.ca
- [2] FSC. Scheme documentation from www.fsc.org
- [3] GGL. Scheme documentation from www.greengoldcertified.org
- [4] ISCC. Scheme documentation from www.iscc-system.org
- [5] ISEAL Alliance. Scheme documentation from www.iseal-alliance.org
- [6] IWPB. Scheme documentation from www.laborelec.be
- [7] NL Agency (2012). When is biomass a residue? – An inventory of definitions used in legislation and certification schemes (in Dutch). Utrecht (the Netherlands), October 2012.
- [8] NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011.
- [9] NL Agency (2012). Selecting a biomass certification system – a benchmark on level of assurance, costs and benefits. Utrecht (the Netherlands), March 2012.
- [10] NTA 8080. Scheme documentation from www.nta8080.org
- [11] PEFC. Scheme documentation from www.pefc.org
- [12] RSB. Scheme documentation from www.rsb.org
- [13] SFI. Scheme documentation from www.sfiprogram.org

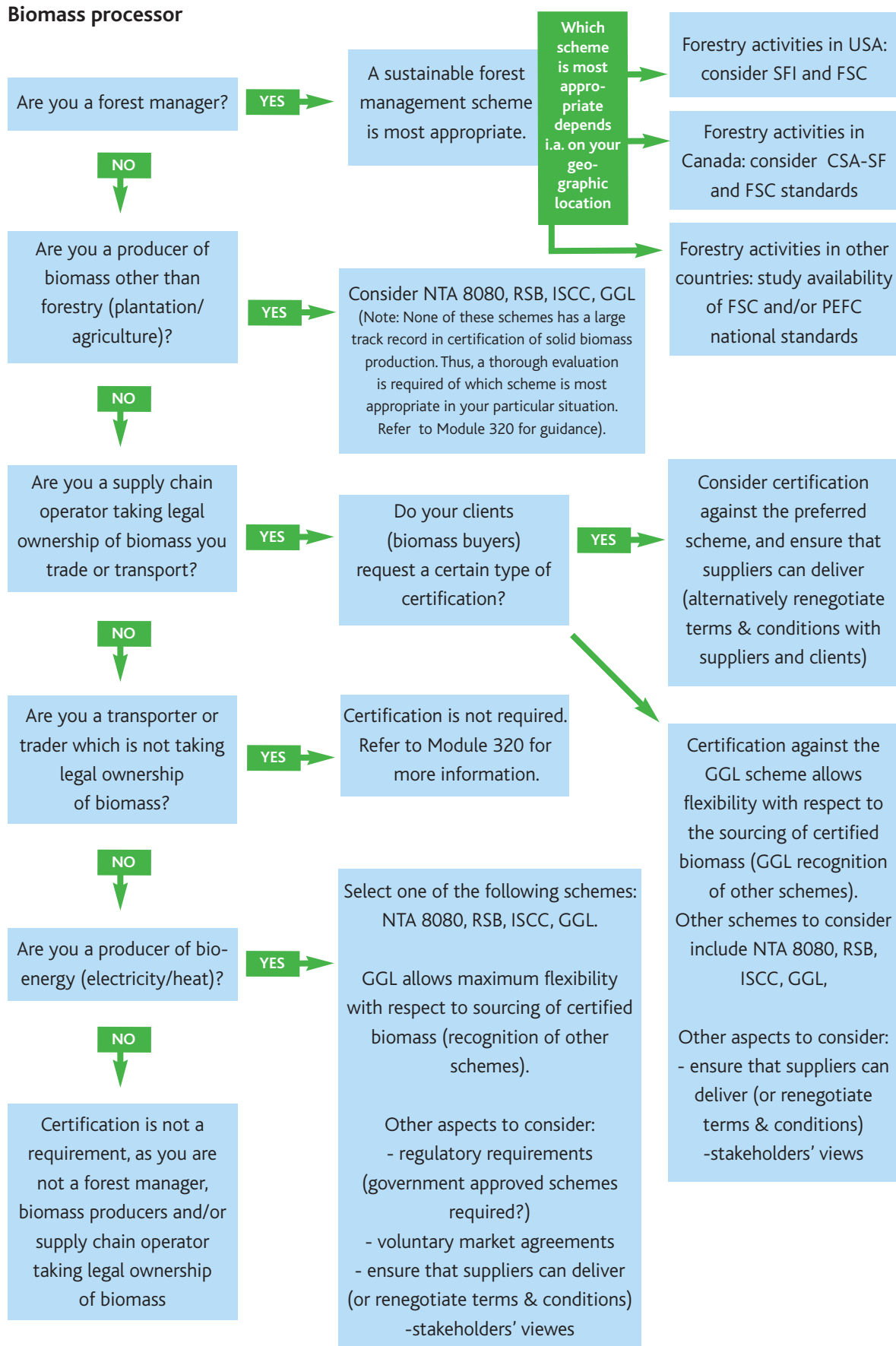
Module 330: How to select a biomass certification scheme?

(Version – November 2013)

Contents of this module

This module provides practical guidance to operators in selection a sustainability certification scheme for solid biomass. It includes a decision tree which helps an organization decide which certification scheme is necessary or most appropriate in a particular situation.

Biomass processor



Modules 340-380 Factsheets on selected biomass certification schemes

Fact sheets on nine selected biomass certification schemes have been included at the end of this document (i.e. after Module 710). This comprises the following modules:

Module 340 - NTA 8080

Module 345 - International Sustainability and Carbon Certification Scheme (ISCC)

Module 350 - Roundtable on Sustainable Biomaterials (RSB)

Module 355 - Green Gold Label (GGL)

Module 360 - Initiative Wood Pellet Buyers (IWPB)

Module 365 - Forest Stewardship Council (FSC)

Module 370 - Programme for the Endorsement of Forest Certification (PEFC)

Module 375 - Canadian Standards Association – Sustainable Forest Management (CSA-SFM)

Module 380 - Sustainable Forest Initiative (SFI)

Modules 400: Practical tools for assessing sustainability impacts

(Version – November 2013)

Companies producing, processing and/or using biomass may wish to assess how their particular project 'scores' against a certification scheme's set of sustainability criteria. For this purpose, a company can execute **a sustainability self-assessment**. A company may do this in-house, or hire external expertise to assist them with the assessment.

Module 410 explains the objective of sustainability self-assessments, and presents two examples of self-assessment tools.

Module 420 provides references to a variety of guidance documents and tools for assessing specific sustainability aspects of biomass projects.

100	Introduction
200	Sustainability certification of biomass – background and objectives
300	Certification schemes
400	Practical tools for assessing sustainability impacts
500	Related legislation (EU Timber Regulation)
600	Other sustainability aspects (carbon debt, indirect effects)
700	Glossary of terms and abbreviations

Module 410: Self-assessment tools

(Version – November 2013)

Contents of this module

This module explains the objective of a sustainability self-assessments by a biomass project or operator. It presents two sets of tools which may facilitate operators in executing a self-assessment, i.e. the RSB Self-Assessment Tools and the NTA 8080 System Plans.

1. General

Companies producing, processing and/or using biomass may wish to assess how their particular project 'scores' against a certification scheme's set of sustainability criteria. For this purpose, a company can execute **a sustainability self-assessment**.

Sustainability self-assessments are often executed in the process towards certification: the assessment provides an indication as to what extent the company would be in compliance with the scheme requirements, and helps the company understand which aspects require improvement before the certification process can be successfully completed.

Self-assessments provide *an indication only* of the score in a certification audit. It is by no means a guarantee that a company will indeed comply; ultimately the auditor will decide independently on the achieved level of compliance.

In sustainability self-assessments, a certification scheme's sustainability criteria and indicators are assessed in practice, i.e. 'on the ground'. This requires a 'translation' from a sustainability standard on paper to a particular situation in the field. This is not always easy, as it requires both a thorough understanding of (the background of) the sustainability requirements (principles, criteria and indicators), and the skills to assess these requirements in practice.

There is no standard approach or procedure for executing a self-assessment. Depending on the level of in-house expertise, a company's own staff may perform the assessment, or alternatively hire external expertise to assist them with the assessment. It is essential that the company's higher management supports the self-assessment such as to ensure cooperation from all operational and administrative levels required.

A self-assessment is best organized as a specific project, including a clear assignment of tasks & responsibilities to staff involved, a project plan, a budget, and reporting requirements.

As in a formal certification audit, a self-assessment may include various research forms, i.e. on the ground checking of practices (e.g. working conditions), assessment of data (e.g. environmental reports), and interviews with stakeholders (e.g. employees or local communities).

The result of the self-assessment is a report which summarizes the assessment findings, and provides recommendations for remediation of potential non-compliances and for further steps towards certification.

N.B. Self-assessments are generally executed when an envisaged certification scheme has already been chosen. Alternatively, a self-assessment may also be executed in a situation in which an operator has not yet decided on certification, or on the envisaged certification scheme: in this case, the self-assessment will allow the operator to get a general understanding of his project's sustainability performance, and areas where

improvement is required. It may also help to decide on the certification scheme which is most appropriate or feasible in the particular situation.

2. RSB and NTA 8080 self-assessment tools

Both RSB and NTA 8080 have developed tools to facilitate operators with a self-assessment against their respective scheme requirements:

The RSB self-assessment tools (available from: www.rsb.org)

RSB has four related self-assessment tools.

- **Screening Tool:** this is an exercise to help operators identify areas that need to be more closely monitored or to determine if a more detailed study or assessment of a particular aspect of the standard is required;
- **Self evaluation:** a checklist to evaluate the operator's compliance with RSB Principles & Criteria;
- **Environmental and Social Management Plan (ESMP) Instructions and Template:** a living document that operators can use and modify on an ongoing basis;
- **Greenhouse Gas (GHG) Calculator:** online tool to calculate an operator's greenhouse gas emissions.

Use of the RSB self-assessment tools is a formal RSB requirement for operators preparing for a RSB certification audit.

NTA 8080 System plans (available from: www.nta8080.org)

In the NTA 8080 scheme, self-assessment tools are referred to as 'system plans'. NTA 8080 has six system plans for different categories of operators:

- **A1 Producer:** Companies that wish to produce biomass for energy purposes and to sell this as sustainably produced. To this type of producers (including groups) all requirements apply.
- **A2 Small-holder producers,** i.e. smallholders that are not part of a group-certification.
- **A3 Collectors of residual flows** Organizations that only collect residual flows, as described in annex A of NTA 8080, for energy purposes and to sell this as sustainably produced.
- **B: Processor** Organizations that process or convert biomass and sell this as sustainably obtained and sustainably processed.
- **C: Trader** Organizations that wish to trade biomass and shall demonstrate that (a part of) the load has been produced, processed and obtained as sustainable.
- **D: End-user:** Organizations that wish to use (processed) biomass for generation of energy or as transportation fuel (neat or blended) and shall demonstrate that (a part of) the biomass is produced, processed and obtained as sustainable.

Under NTA 8080 requirements, use of the system plans is not obligatory.

Objectives of usage of the self-assessment tools

The use of the RSB self-assessment tool is not necessarily limited to operators and projects considering RSB certification. It may also be used in a situation in which an operator has not yet decided on certification, or on the envisaged certification scheme: the structure of the RSB self-assessment tools allows any operator to get a general understanding of his project's sustainability performance, and areas where improvement is required.

The NTA 8080 system plans are specifically designed for self-assessing the NTA 8080 requirements, and are less suitable for obtaining a general understanding of a project's sustainability performance.

In addition to the self-assessment tools mentioned above, there are also a variety of guidance documents and tools available to assess specific sustainability aspects or criteria. Module 420 provides more information on these guidance documents and tools.

Module 420: Practical tools and guidance documents for assessing specific sustainability impacts

(Version – November 2013)

Contents of this module

This module provides references to background documentation on (assessing) **specific** sustainability impacts of biomass projects. The references include literature from a variety of international sources, in particular *guidance documents and tools*.

The guidance documents and tools may help biomass supply chain operators and other stakeholders to assess specific sustainability impacts of a particular biomass project (e.g. biomass production, processing and/or use). The information provided in these documents helps operators to understand 'how to assess sustainability in practice'.

The references in this module have been organized according to sustainability theme.

Introduction

Biomass certification scheme owners and other organizations have published a variety of guidance documents and tools for assessing specific sustainability criteria in practice. These documents help companies and other stakeholders understand what certain criteria mean in practice, and how they shall be assessed. The guidance documents and tools may also be used in the framework of a sustainability self-assessment by an operator, and also by certification bodies.

This module contains references to guidance documents and tools from a variety of international sources. Not all individual sustainability criteria have been covered: guidance documents and tools tend to exist only for criteria which assessment causes difficulties in practice.

The references have been organised according to the sustainability theme or criterion they cover, i.e.:

- Greenhouse gas balance calculations, including carbon stock changes;
- High Conservation Value Assessments;
- Social and Environmental Impact Assessment Studies;
- Stakeholder consultation;
- Benefit sharing;
- Free Prior and Informed Consent.

In this document, you find a brief description of the sustainability theme or criterion, followed by a web link to the list of documents. The documents can also be found directly on <http://english.agentschapnl.nl/topics/sustainable-entrepreneurship/sustainable-biomass>.

Greenhouse gas balance calculations, including carbon stock changes

A key element of sustainability requirements for biomass used for bio-energy is the greenhouse gas balance. A greenhouse gas balance shall be positive, meaning that the application of biomass as feedstock for bio-electricity or bio-heat leads to a net emission reduction of greenhouse gases compared with a relevant fossil fuel alternative. Depending on the certification scheme and/or specific government regulations, the exact requirements vary (e.g. threshold/minimum percentage of emission reduction).

A specific issue related to greenhouse gas balance calculations is carbon stock change, i.e. the change in carbon stock which occurs when a piece of natural landscape is transformed into a plantation or agriculture, or when biomass is harvested from a particular piece of land.

Greenhouse gas emissions shall be calculated following a prescribed methodology. While various tools are available for greenhouse gas balances for electricity and heat from solid biomass, the 'SenterNovem-tool' is the most accepted. Currently, the SenterNovem tool is adapted into the BioGrace II calculation tool. The BioGrace II calculation tool will follow the formal European calculation methodology specified in the European Commission's 2010 Communication document on '*sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling. SEC (2010) 65*' (Refer to Module 230 for more information). It is expected that the SenterNovem tool will no longer be operational once the BioGrace II calculation tool has been finalized and published.

(Note: The Biograce II tool shall not be confused with the Biograce I tool, which includes the formal European calculation methodology for greenhouse gas emission reductions from transport biofuels and bioliquids as laid down in the EU-RED. The BioGrace I tool has been recognized by the European Commission for demonstrating compliance with the EU-RED greenhouse gas criterion for biofuels).

[Go to the references on greenhouse gas balances and carbon stocks.](#)

High Conservation Value Assessments

High Conservation Values are biological, social and cultural values of outstanding significance or critical importance at the national, regional or global scale. HCV assessments identify both the values and the areas in which these values are found.

Sustainability standards and certification schemes require project developers and operators to maintain HCV values. This does not necessarily mean that HCV areas are always strictly protected for conservation: appropriate HCV management may range from complete protection to extractive uses such as selective harvesting of natural products, as long as these are managed according to an appropriate plan, and monitored for any negative effects on HCV.

The reference list provides a number of background documents on HCV methodologies, together with guidance notes on assessment and management of HCV in practice. More information on HCV can also be found on www.hcvnetwork.org.

[Go to the references on High Conservation Value Assessments.](#)

Social and Environmental Impact Assessment Studies

A Social and Environmental Impact Assessment (SEIA) study systematically identifies the direct and wider environmental and social aspects of the development and operation of a project, e.g. a biomass project. It also identifies project design alternatives which reduce the project's risks and/or enhance its benefits.

Whereas a SEIA covers both environmental and social aspects, an EIA (Environmental Impact Assessment) focuses on a project's environmental aspects and a SIA (Social Impact Assessment) focuses solely on its social aspects.

If used appropriately, SEIA, EIA and SIA are strong tools to support decision making in a biomass project's planning phase. For this reason, SEIA (and in some cases EIA) has also become a requirement under many biomass sustainability certification schemes.

The reference list provides a number of documents with guidelines and/or guidance for the execution of SEIA, EIA and SIA processes, and the contents of the reports from those assessments studies.

[Go to the references on Social and Environmental Impact Assessment studies.](#)

Stakeholder consultation

Stakeholder consultation is an essential element of developing, implementing and operating a biomass project. It plays a critical role in raising awareness of the project's impacts and gaining agreement on management and technical approaches to maximise benefits and reduce negative effects.

Stakeholder consultation is also a requirement for social and environment impact assessment studies (SEIA), and a precondition for certification of biomass under several certification schemes.

Handbooks and guidance documents on stakeholder consultation processes have been published by a variety of organisations. A number of these documents have been included in the reference list.

[Go to the references on Stakeholder consultation.](#)

Benefit sharing

Sustainability certification of biomass projects generally requires that the project contributes to the social well being and/or economic development of local stakeholders, including employees, outgrowers and local communities. This principle is often also referred to as 'benefit sharing'.

The principle of benefit sharing can be operationalized in many different ways, depending on the scale, type and location of the project, the business model applied, and the type of stakeholders considered. Some consider benefit sharing the principal responsibility of the biomass producer, while others focus on the shared responsibility of all value chain players.

The reference list provides a variety of documents that deal with (elements of) benefit sharing. Most documents are not guidance documents let alone templates, but do provide the reader with different options and suggestions for successfully applying benefit sharing in a specific biomass project.

[Go to the references on benefit sharing.](#)

Free Prior and Informed Consent

The phrase 'Free Prior and Informed Consent', and the acronym FPIC, refers to the right of indigenous peoples to give or withhold their free, prior and informed consent to proposed measures that will affect them. The right is affirmed in the UN Declaration on the Rights of Indigenous Peoples and in international jurisprudence.

The principle of Free Prior and Informed Consent is also included as an element in many biomass sustainability certification schemes, meaning that biomass project developers will have to adhere to the principles of FPIC when considering the development or expansion of a biomass project.

The reference list provides a number of documents from a variety of sources, outlining the principles of FPIC and how it can be applied in practice.

[Go to the references on Free, Prior and Informed Consent.](#)

New tools and guidance documents

Regularly, new guidance documents and tools are being published. NL Agency may refer to these publications on its sustainable biomass website (<http://english.agentschapnl.nl/topics/sustainable-entrepreneurship/sustainable-biomass>). In addition, the reader is suggested to check websites which contain a comprehensive database of such documentation (e.g. www.rsb.org, www.fao.org).

Modules 500: Related legislation (Version – November 2013)

Modules 500 cover legislation which is (indirectly) related to sustainability certification of biomass.

Module 510 covers the EU Timber Regulation, and provides practical guidance to operators on how to comply with the Regulation requirements.

- 100 Introduction
- 200 Sustainability certification of biomass – background and objectives
- 300 Certification schemes
- 400 Practical tools for assessing sustainability impacts
- 500 Related legislation (EU Timber Regulation)**
- 600 Other sustainability aspects (carbon debt, indirect effects)
- 700 Glossary of terms and abbreviations

Module 510: The European Timber Regulation

(Version – November 2013)

Contents of this module

The objective of this Module is to help bio-energy industry players and other stakeholders to understand the requirements of the European Timber Regulation, and in particular the practical implications on biomass trade and use.

1. Introduction

The EU Timber Regulation came into force on 3 March 2013. This Regulation prohibits placing illegally harvested timber on the EU market. To achieve this, the Regulation sets out procedures which those trading timber within the EU must put in place to minimize the risk of illegal timber being sold.

This Module provides guidance on the practical implementation of the Regulation on biomass trade and use, with specific references to wood used for bio-energy generation. The contents of this Module have largely been based on a document 'EU Timber Regulation – preparing for the Regulation', prepared by ProForest [3]. More detailed information on the Regulation can be found on the websites listed in the reference section at the end of this Module, and in particular in the EU's 'Guidance document for the EU Timber Regulation' [1].

2. The EU Timber Regulation in brief

2.1 Scope of the Regulation

The Regulation covers trade in timber products on the EU market and applies to both imported and domestically produced timber. The exact scope of products covered by the legislation is listed in an annex to the Regulation and covers most timber products commonly traded in the EU except for recycled products.

In relation to forest biomass for energy, the following categories have to comply with the Regulation requirements:

'4401 Fuel wood, in logs, in billets, in twigs, in faggots or in similar forms; wood in chips or particles; sawdust and wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms'

and

'4403 Wood in the rough, whether or not stripped of bark or sapwood, or roughly squared.'

Used timber and timber products that have completed their lifecycle, and would otherwise be disposed of as waste, are excluded from the scope of the Regulation.

Note: The Regulation uses the terms timber and timber (products). This includes material which may be

referred to as wood fuel, wood biomass for energy, etc. In this Module, the terminology of the Regulation is followed.

2.2 To whom does the Regulation apply?

The regulation applies to two types of organizations within the EU timber supply chain. This has schematically been depicted in Figure 5.1.

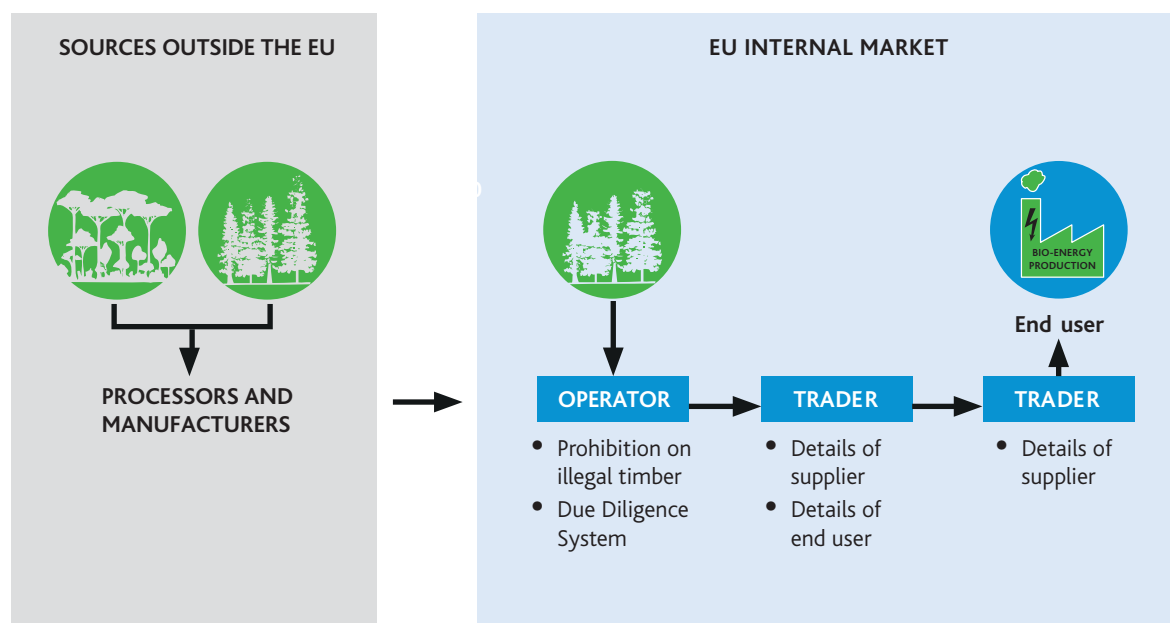


Figure 5.1. Schematic representation of a wood to bio-energy supply chain

The bulk of the requirements apply to whoever first places the timber product on the EU market. This organization is referred to as the **operator**. In addition to requirements for operators, there are also requirements for traceability for all the other participants in the supply chain prior to sale to the final consumer. These organizations are all referred to as **traders**.

2.3 Regulation requirements in a nutshell

Requirements for operators

It is prohibited to place timber on the EU market if it was illegally harvested. Anyone placing timber or timber products onto the EU market for the first time must implement a due diligence system to mitigate the risk that the timber was illegally harvested. The regulation sets out the basic components of the due diligence system which must be in place. The due diligence system consists of three main components:

- **Information.** There are specific requirements for the type of information which must be available including information on the product and supplier, the country where the timber was harvested and information on compliance with applicable forestry legislation in the country of harvest. It is important to note that the operator does not have to have all this information directly, but needs to have ready access to it in order to make a risk assessment.
- **Risk assessment procedure.** Each operator is required to have a risk assessment procedure which takes

into account the information collected about the product and also relevant risk criteria. Risk criteria include indicators of high risk such as prevalence of illegal harvesting in the country of harvest or long and complex supply chains, as well as indicators of low risk such as certification or credible verification of legality.

- **Risk mitigation procedures.** Where the risk assessment indicates that there is some risk of a product containing illegally harvested timber, risk mitigation procedures must be put in place. The regulation does not provide much guidance on what these should be but does indicate that they should be adequate and proportionate and might involve requesting further information.

Requirements for traders

Any trader purchasing and selling timber products which have already been placed on the internal market, must keep records for five years, which identify:

- The operator or trader who supplied the timber and timber products;
- Where applicable, the trader to whom the timber and timber products were sold.

3. Implementing the regulation

Complying with the regulation will be very straightforward for some organizations, while for others it will be more challenging. This section provides answers to three key questions involved in biomass to bio-energy chains, i.e.:

- What is the definition of an operator and a trader?
- What do traders have to do?
- What do operators have to do?

3.1 What is the definition of an operator and a trader?

The starting point for any organization in the EU is to decide whether it is an operator or a trader since it is only operators which need to implement a due diligence system. Operators are defined as the organization which first places a timber product on the EU market, whether the timber was imported or grown domestically.

Or, more specifically:

- An EU based company buys timber in a third country and imports it into the EU. The EU based company becomes an 'operator' when timber enters the EU;
- An EU based company buys timber in a third country and uses an agent for importing it into the EU. The EU based company becomes an 'operator' when the timber enters the EU;
- An EU based company orders timber in a third country from a non-EU based supplier who imports it into the EU. The EU based company becomes an 'operator' when the timber enters the EU (even if the ownership does not formally transfer until the timber is delivered to the EU based company);
- A non-EU based company imports timber into the EU, obtains the release for free circulation and then seeks a buyer. The non-EU based company becomes an 'operator' when the timber enters the EU (because the non-EU company has made the timber available on the EU market);
- A non-EU based company sells timber from a third country directly to non-commercial end-users in the EU. The non-EU company becomes an 'operator' when the timber enters the EU.

Box 1 Examples of 'operators' in biomass to energy supply chains

Example 1:

Power company E purchases wood chips directly from a third country outside the EU and imports the feedstock into the EU, where it is used to produce energy subsequently sold to a EU Member State National Grid. Although the wood chips are within the scope of the EU Timber Regulation the final product, energy, which the company sells is not:

- power company E becomes an operator when it imports the woodchips into the EU for use in its own business. Therefore the obligations are imposed to the energy company.

Example 2:

Timber merchant F purchases wood chips directly from a third country outside the EU and imports the feedstock into the EU, where it is sold on to power company E. Energy company E then uses these wood chips in the EU to produce energy subsequently sold to a Member State National Grid:

- timber merchant F becomes an operator when he imports the woodchips into the EU for distribution through his own business. Therefore the obligations are imposed on the timber merchant who acts as an operator. His client E will be regarded as a trader.

3.2 What do traders have to do?

If you are a trader then you need to keep information on who you buy timber products from and who you sell to. Almost all organizations keep records of this information anyway so it is unlikely to require additional work. Note that information is only needed up to the last point of sale within the trade. No information is needed on sales to end consumers. More detailed information on requirements for traders is available in the EU Guidance Document [1].

3.3 What do operators have to do?

Operators need to put in place **a due diligence system** which includes the **three elements required by the EU timber regulation**. This needs to be done for every timber product traded (except those not covered by the Regulation). The due diligence system has schematically been depicted in Figure 5.2, and is explained in more detail below. More detailed information on requirements for traders is available in the EU Guidance Document [1].'

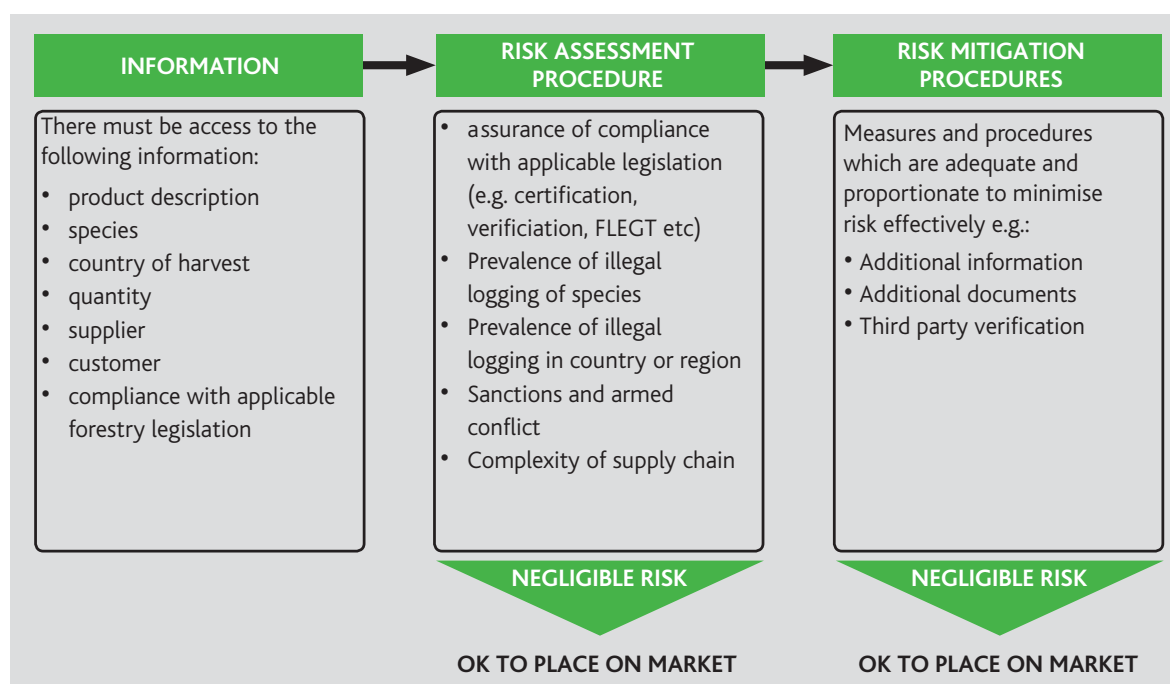


Figure 5.2. Key elements of a due diligence system.

Due diligence element 1 - Information

The first stage is to look at what information you already have for each product which you buy. The regulation requires that you either have, or can access, two types of information:

- information on the product: the quantity supplied, name of supplier, name of customer to whom product is sold, description of the product. Most companies already routinely keep this type of information.
- information on the species and forest: the common name of the tree species, the country of harvest (and the scientific name, region or concession if applicable) and evidence of compliance with applicable legislation in the forest. This information is not routinely supplied with all products and is likely to require more work.

Due diligence element 2 – Risk assessment procedure

The risk assessment procedure can be very basic or may need to be relatively complex depending on the complexity of the supply base. There are two components the risk assessment procedure needs to address:

- **legal harvesting** – is there evidence to show that there is negligible risk that the timber was illegally harvested from the forest of origin?
- **traceability** – is there evidence showing that there is sufficient control throughout the supply chain to ensure that the timber really is from the forest of origin identified?

Products from low-risk timber can be placed on the market without further work. Products with higher risks require risk mitigation procedures being put in place. The boxes below summarize products which may be classified as low-risk, and products which shall be classified as higher risk.

Box 2: Categories of low-risk products

1. The product is certified to a scheme which delivers the requirements of the regulation

If the product is certified under a certification scheme which provides adequate assurance of compliance with applicable legislation then the risk is low. Both the FSC and PEFC schemes are likely to provide assurance of low risk.

National schemes, particularly those in countries with high levels of illegality, may be less reliable and may not provide chain of custody certification. ISO 9000 and 14001 do not provide assurance of legal harvesting. FSC and PEFC certification schemes certify both forest management and chain of custody thus addressing both legal harvesting and traceability.

Note: many suppliers have FSC or PEFC chain of custody certificates but not all the products they sell are certified. It is important to ensure that the product is certified and not just the supplier. This is best done by including the requirement for certification in the purchasing documents and ensuring it is stated on the invoice.

2. The timber in the product is verified as legal by a scheme which delivers the requirements of the regulation

If the product is made with timber from a forest verified by a legality verification scheme which provides adequate assurance of compliance with applicable legislation then the risk is low. There are a number of different schemes available only some of which provide adequate assurance. It is important to check the scope of laws which are assessed (this must be all relevant legislation, not just the right to harvest) and the quality of verification. Schemes run by international accredited certification bodies are likely to include robust verification. Not all verification schemes include chain of custody control so this may be needed.

3. The product is made with FLEGT-licensed timber or timber with a CITES permit

The regulation states that timber with a FLEGT-licence or CITES permit automatically meets the requirements of the legislation. FLEGT-licences and CITES permits are checked at the point of import to the EU after which it is necessary to provide for traceability in the supply chain within the EU .

4. The product is made with timber harvested in a country with negligible levels of illegality

There are many countries where law enforcement is robust and the risk of timber being harvested illegally is very low. Where this can be shown (e.g. via a credible independent review of legal enforcement) then products made with timber from that country can be considered low risk. adequate chain of custody controls will be needed. There are many countries where law enforcement is robust and the risk of timber being harvested illegally is very low. Where this can be shown (eg via a credible independent review of legal enforcement) then products made with timber from that country can be considered low risk. adequate chain of custody controls will be needed.

5. The product is accompanied by original documentation demonstrating legality

There are some situations where it is possible to collect documents demonstrating legality in the forest of origin (e.g. concession agreement, management plan and government inspection reports) and evidence of

control of the supply chain. This approach works best where the timber is coming from a single source (e.g. one forest concession) and the supply chain is short (e.g. one sawmill).

Box 3: Categories of products which require risk mitigation

1. The species from which the product is made is subject to illegal harvesting

There are some species, particularly rare or valuable species, which are particularly subject to illegal harvesting. Examples include mahogany and rosewood. If the product is made with a species which has a risk of illegal harvesting then more information will be needed to prove it was legally harvested. More information is available from www.illegal-logging.org and www.globalforestregistry.org

2. The country where the timber was harvested has a risk of illegality

There are some countries which are known to have high levels of illegality. Sometimes country governments themselves highlight this while in other cases it is external observers. If the timber was harvested in a country with a risk of illegal harvesting then more information will be needed to prove it was legally harvested. More information on risk of illegal harvesting is available from www.illegal-logging.org and www.globalforestregistry.org. Where no information is available it is also possible to assess potential risk from indices such as the Transparency International Corruption Perceptions Index.

3. There are sanctions against the country of harvest

Occasionally the UN or EU institute sanctions against particular countries which include timber. This is usually because income from timber sales is being used to fund civil wars or oppression. Timber from countries with current sanctions should not be placed on the EU market.

4. The supply chain is long or complicated

Timber often goes through many processing stages between the forest and final product, frequently involving several different owners and countries. Where the supply chain is long or complex it is much more difficult to be sure of the origin of the timber since each additional link in the chain is one more point where illegal timber could have been mixed – accidentally or knowingly – into the supply chain. If the supply chain is long or complex it will be necessary to have robust evidence that there is adequate control throughout the chain to be sure where timber in the final product comes from. Chain of custody certification provides assurance that the supply chain is being controlled. This is usually associated with forest management certification schemes, but many certification bodies also provide chain of custody certification for non-certified timber (e.g. legally verified or FLEGT-licensed).

5. The product is a composite made with timber from many different sources

Many timber products are made with timber from several different sources. This ranges from solid wood products such as furniture to panel products (plywood, MDF) and paper. For composite products it will be necessary to work with suppliers to find ways of identifying the source of all the different components. Certification is one option since this provides assurance without having to collect individual information about each source. another option is to buy from mills which have a robust policy of requiring legal supply in all contracts with suppliers and have a system to verify that these contract conditions are fulfilled.

6. No information is available on the source of the timber in the product

There are inevitably going to be many cases where suppliers are unable to provide any information on the

source of the timber used in a product since they do not require this information from their own suppliers. In this case there are two options:

- Stop buying from suppliers who are unable to provide adequate information;
- Work with suppliers to help them to understand and manage their own supply base so they can provide low risk products.

Due diligence element 3 – Risk mitigation procedures

The approach taken to risk mitigation will vary depending on the type of product, the complexity of the supply chain and the origin of the timber. In some cases it is straightforward, but in other cases it is not since suppliers often do not have the information themselves.

If adequate information on legality of the product is not available then there is a risk that the product may have been illegally harvested. Because of the prohibition on illegal timber in the regulation, an operator risks prosecution if the product is placed on the EU market. Therefore, the operator has to decide whether to discontinue that product from that supplier, or to work with the supplier to understand the supply chain for the product and provide evidence that the timber used is from legal sources.

In the past years, already many companies have actively been working to exclude illegal and unsustainable timber from their products, e.g. in response to customer demand or internal policy commitments. From this experience, the following practical approaches appear towards risk mitigation:

- **Requesting more information:** sometimes, particularly for products with a relatively short supply chain, suppliers can provide more information such as documents proving timber came from a legal source quite easily. Some examples are provided in the accompanying scenarios.
- **Using certified and verified products:** a widely used option is to preferentially purchase certified or verified timber products. Some suppliers sell both certified and uncertified so it is possible to switch from one to the other without changing supplier. In other cases it involves changing supplier or even changing product ranges.
- **Third-party checks:** in some cases, particularly for high-value or 'one-off' purchases it may be effective to hire an independent third party (e.g. a certification body) to check both legality in the forest and control of the supply chain for a specific consignment of timber or product line. Ensuring that all products are low risk can take some time so it is important to begin preparing for the new regulation as soon as possible in order to have time to work with existing suppliers or, if necessary, to find and change to new suppliers.

4. References

[1] European Commission Guidance Document on the Timber Regulation:
http://ec.europa.eu/environment/eutr2013/_static/files/guidance/guidance-document-5-feb-13_en.pdf

[2] European Commission websites:
<http://ec.europa.eu/environment/eutr2013> and
http://ec.europa.eu/environment/forests/timber_regulation.htm

[3] ProForest (2011). EU Timber Regulation – preparing for the Regulation'. Oxford (United Kingdom), June 2011.

[4] ProForest (2012). Main report – Assessment of certification and legality verification schemes. Oxford (United Kingdom), December 2012.

Modules 600: Other sustainability aspects of biomass use for energy production

(Version – November 2013)

Modules 610 and 620 provide background information on two key sustainability aspects of solid biomass, i.e. 'carbon debt' and 'indirect effects' of biomass production. While these aspects are currently outside the scope of sustainability certification, further policy developments and standard setting may lead to additional sustainability requirements covering these aspects.

The objective of the respective Modules is to help bio-energy industry players and other stakeholders to understand the basics of the issue of carbon debt and of indirect effects.

Module 610 explains what is meant by carbon debt, why it is a relevant issue, and how it may impact on future sustainability requirements.

Module 620 elaborates on indirect effects of biomass production and bio-energy production, and how this relates to the concept of the biobased economy. It provides definitions of Indirect Land Use Change (ILUC), Indirect Wood Use Change (IWUC) and Indirect Fuel Use Change (IFUC).

- 100 Introduction
- 200 Sustainability certification of biomass – background and objectives
- 300 Certification schemes
- 400 Practical tools for assessing sustainability impacts
- 500 Related legislation (EU Timber Regulation)
- 600 Other sustainability aspects (carbon debt, indirect effects)**
- 700 Glossary of terms and abbreviations

Module 610: Carbon debt

(Version – November 2013)

Contents of this module

The objective of this Module is to help bio-energy industry players and other stakeholders to understand the basics of the issue of carbon debt. It is not the intention of this Module to explain in detail the contents of the scientific issues and the debate, nor to present a specific opinion. More details and stakeholders' views can be found in the documents provided in the reference list at the end of this Module.

1. What is carbon debt?

CO₂ emissions from burning of fossil fuels are part of the so called **long-term CO₂ cycle: carbon** which was stored in the underground for millions of years is emitted, thereby increasing the net CO₂ concentration in the atmosphere.

On the contrary, CO₂ emissions associated with burning biomass are part of the so called **short-term CO₂ cycle** of the atmosphere. As a tree grows it sequesters CO₂, and when that tree dies from disease, old age, forest fire or human removal it releases it previously captured carbon back into the atmosphere. Even if a human does not remove the tree, it will naturally fall and decompose releasing its stored CO₂. Each tree can only release as much carbon as it had already sequestered and therefore has a net zero impact on the total amount of CO₂ in the atmosphere within its lifetime (**'carbon neutrality'**).

This principle of carbon neutrality of biomass becomes more complicated when e.g. forests stands, forest landscapes or wood plantations are considered. These 'pools of trees' can be carbon neutral, carbon positive or carbon negative. For example, if a forest has less growth (carbon – sequestration) than removal (carbon–release) then there is a net carbon increase in CO₂ released from the forest within the given time period. The opposite is also true – if the forest is adding more biomass than is being removed, then it is acting as a carbon sink. Whether a forest is a net carbon sink or net carbon source depends on a number of factors, e.g. the age and typology of the forest, the harvest rate, etc.

When forest biomass is harvested and burned for bio-energy generation, a forest may become a temporal carbon source: CO₂-emissions from burning are released immediately, while 'offsetting' the CO₂-emissions by forest regrowth (carbon sequestration) takes time. This temporal imbalance between carbon emission and carbon sequestration is referred to as **'carbon debt'**. The carbon debt needs to be 'paid back' before the forest bioenergy system is a net contributor to climate change mitigation.

The relation between carbon debt and the greenhouse gas balance

A key sustainability criterion for biomass for energy is a minimum reduction of greenhouse gas emissions over the complete biomass chain (also refer to Module 310). This means that all greenhouse gas emissions from cultivation up to and including use of biomass in a power plant need to be taken into account, and that these (biomass related) summarized emissions need to be (substantially) lower than emissions from a specified fossil fuel reference. Generally, the minimum reduction of greenhouse emission is expressed as a percentage of the fossil fuel reference emissions, e.g. 60%.

In methodologies used for calculating greenhouse gas reductions, the use of biomass for energy production is assumed to be climate neutral. This means that the CO₂-emission factor from burning biomass in a power plant is set at zero. The reasoning is that the CO₂ emitted at the power plant has previously been taken up by growing biomass (short-term CO₂ cycle).

The concept of carbon debt puts this climate neutrality of biomass burning at doubt. Depending on the type of biomass and the associated carbon debt, burning of biomass may lead to more or less net greenhouse gas emissions.

If carbon debt is considered relevant, current greenhouse gas calculation methodologies may lead to over-optimistic results for greenhouse gas reduction percentages. This could be overcome by including carbon debt figures in greenhouse gas calculations. However, this would require more insight into the magnitude of carbon debt effects for various types of biomass (refer to Section 2).

2. The magnitude of carbon debt

The magnitude of carbon debt is dependent on many factors including forest characteristics (tree species, forest ecosystem, etc.) and forest management methods (method and timing of harvesting, and whether the wood harvested originates from intermediary thinning, from the final felling of round wood, or from the use of harvest residues). Also the future use of the land is relevant, in particular when longer time frames are considered. The issue is complicated further by the fact that carbon balances can be analyzed on various levels, e.g. on stand level and on landscape level, which also has an impact on the quantification of carbon debt.

The magnitude of carbon debt is not only dependent on (assumptions on) the forest system (management), but also on (assumptions on) the fossil fuel reference system. The fossil fuel reference system (and thereby the carbon intensity of that system) may change over time, and have to be accounted for. For example a gradual shift from coal to natural gas means a shift in the carbon intensity of the fossil reference system.

In literature, a large variety in carbon debt figures and payback times can be found [1,4,5]. This variety is caused by non-consistent modeling assumptions and approaches: methodologies to quantify carbon debts are still the subject of scientific research and debate. Secondly, the variety in results is caused by the many different characteristics of the biomass systems compared.

The European Commission's Joint Research Centre [1] has executed an extensive literature review on the magnitude of carbon debts, the results of which have been summarized in the box below:

Estimated magnitude of payback times as a result of carbon debt [5]

- Using harvesting residues for bioenergy produces a relatively small carbon debt and requires payback times (after which the actual emission reduction starts) of around 2 to 15 years when the wood replaces coal, between 20 and 50 years when it replaces gas, and 5 to 25 years when oil-based transport fuels are replaced. Extracting too many of those forest residues may have negative side effects on the soil carbon content;
- Using woody wastes for bioenergy produces a carbon debt that can be very small in some cases, but this is strongly dependent on the reference situation. Landfill may provide effective carbon storage in pieces of

waste wood, because this hardly degrades. However, once relevant parts of wood waste are degraded, the methane emission levels can be high. Avoiding this situation would lead to relevant greenhouse gas reductions;

- Dead wood also can be considered a wood residue. The additional positive element of harvesting dead trees is the stimulus or growth of new trees, thus reducing payback times;
- Using (additional) round wood from final harvests in many forests (e.g. those in Europe) directly for bioenergy would result in large carbon debts (over a certain time span, more than twice that of fossil fuel), and require payback times of many decades, up to more than a century;
- Using wood from thinning for bioenergy produces a significant carbon debt and requires payback times of between 40 and 135 years, when used for replacing coal. If thinning is necessary to produce high quality wood for other applications, the wood from thinning can be considered as residue, unless it is used for other purposes. Furthermore, thinning in forest plantations may have much shorter payback times;
- Starting up the cultivation of wood for future bioenergy production would contribute to building a carbon credit, because of the uptake of CO₂ in the years before the wood is harvested and the CO₂ is emitted. It also requires land and – similar to agricultural crops for energy – has the related ILUC risks of contributing to a carbon debt. Data (from studies or model simulations) that quantify the total net effect could not be found.
- The reviewed studies indicate that the use of stemwood from dedicated harvest for bioenergy would cause an actual increase in GHG emissions compared to those from fossil fuels in the short- and medium term (decades), while it may start to generate GHG savings only in the long-term (several decades to centuries), provided that the initial assumptions remain valid. The harvest of stemwood for bioenergy purposes is not common today, however, it is becoming a more common practice that is expected to expand in the future.
- The emissions increase of the forest bioenergy systems are more limited (in size and/or duration) with forest residues, thinnings and salvage logging (if not otherwise used for other purposes). For these feedstocks GHG savings are achievable in the short term (except for stumps in boreal climate, because of the very long time required for the natural decay). The GHG saving can be immediate if in the counterfactual scenario the wood would be burnt at roadside. This feedstock is expected to provide most of the additional increment of biomass for bioenergy by 2020.

3. The carbon debt debate

In the past two years, the issue of carbon debt has caused a political debate about the desirability of certain forms of wood bio-energy [e.g. 2,6,7]. There is an increasing recognition that biomass systems which lead to carbon debt payback times longer than climate policy time horizons are not desirable: considered over the climate policy time horizons (typically 50-100 years), these systems are a net emitter of CO₂, thereby increasing climate change rather than reducing it. Or in other words: the biomass system's potential future contribution to reducing net CO₂ emissions lies beyond the horizon of current climate policies.

The political debate focuses on types of biomass with suggested very long payback times, in particular stem wood from forests in the USA and Canada. Some stakeholder groups, in particular environmental groups, have suggested to exclude these biomass streams for bio-energy applications [6]. Others argue that variation in forest types and management requires a case by case evaluation of carbon debt risks. This may be done by including carbon debt criteria in (a separate module of) biomass sustainability certification schemes (e.g. NTA 8080 is currently exploring this approach), and/or working with positive or negative lists of (un)acceptable biomass streams.

There is a general consensus amongst stakeholders that the issue of carbon debt needs to be translated into specific policy measures and/or additional requirements in sustainability certification schemes. The current key question is what is the most appropriate approach, given the many scientific uncertainties on methodologies for quantification of carbon debt, and magnitude of effects in specific situation.

It is expected that in the coming 1-2 years further scientific insights, policy instruments and practical tools for dealing with carbon debt will be developed. This is also emphasized in 'Energy Agreement for Sustainable Growth', published in September 2013 by the Social and Economic Council of the Netherlands (SER) [7]. Amongst other sustainability requirements for biomass used for co-firing, it specifies that detailing of requirements on carbon debt shall be completed by 31 December 2014, followed by implementation in 2015.

4. Recommendation for supply chain operators

Biomass supply chain operators and other stakeholders are recommended to follow developments in the debate on carbon debt, and to assess how (future) standards impact upon their situation and projects. This relates in particular to those operators involved in forest biomass chains, as forest biomass is most debated in relation to carbon debt.

Those readers who wish to obtain a more detailed insight in the various aspects of carbon debt, may refer to the literature listed below. The box below may help to understand some of the terminology used in this literature.

It is envisaged that this Module will be updated and elaborated when further insights on carbon debt appear.

Terms and definitions commonly used in carbon debt studies and discussions

This section provides a list of definitions which are commonly used in carbon debt studies and discussions. Definitions have been taken from [1,2]

Afforestation: the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human-induced promotion of natural seed sources.

Biomass: organic material both above ground and below ground, and both living and dead, e.g., trees, crops, grasses, tree litter, roots etc. Biomass includes the pool definition for above – and below –ground biomass.

Carbon neutrality: net zero carbon emissions to the atmosphere during the energy production process (infrastructures excluded)

Carbon pool: a component of the climate system which has the capacity to store, accumulate or release carbon. Oceans, soils, atmosphere, and forests are examples of carbon pools.

Carbon Sequestration Parity: the moment in time when the bioenergy system has displaced the same amount of fossil C as would be absorbed in the forest if this was not harvested for bioenergy Carbon stock The absolute quantity of carbon held within a carbon pool at a specified time.

Clearfelling: the felling of all the trees forming an area of forest, usually as part of wood harvesting.

Dead wood: includes all non-living woody biomass not contained in the litter, either standing, lying on the ground or in the soil. Dead wood includes wood lying on the surface, dead roots and stumps, larger than or equal to 10 cm in diameter.

Deforestation: the direct human-induced conversion of forested land to non-forested land.

Forest: land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ. May consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground; or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 percent. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 10 percent or tree height of 5 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest.

Forest management: any activity resulting from a system applicable to a forest and aimed at improving any ecological, economic or social function of the forest

Forest residues: tops, branches, bark, defective stems and other portions of trees produced as a byproduct during the normal course of harvesting stemwood as sawlogs, pulpwood or cordwood. Forestry The management of a forestland

Growing stock: this term refers to the standing, living trees forming a stand or forest, expressed as (for example) number of stems, total tree biomass, or more commonly as standing volume. Measures of growing stock are sometimes used as indicators of sustainability of forest management.

Harvest residues: the wood usually left in the forest after stem wood removal, such as stem top and stump, branches, foliage and root.

Sequestration: the process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological sequestration includes direct removal of CO₂ from the atmosphere through land-use change, afforestation, reforestation, carbon storage in landfills and practices that enhance soil carbon in agriculture

Sink: any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas or aerosol from the atmosphere.

Source: mostly refers to any process, activity or mechanism that releases a greenhouse gas, an aerosol, or a precursor of a greenhouse gas or aerosol into the atmosphere. Source can also refer to e.g. an energy source.

Stand, forest: a group of trees of similar properties which may include those of species (or species mix), tree age (or age distribution), numbers of tree stems per unit area and management history. A stand is a sub-set of forest.

Stemwood: wood from the main part of a tree; not from the branches, stump, or root. Salvage logging wood, thinnings, landscape care wood and other similar sources of wood that can be considered as by-products/residues are not included in this category of wood. Stumps The part of a plant and especially a tree remaining attached to the root after the trunk is cut

Stocking/stocking density: usually the number of trees in a given area (expressed on a per hectare basis).

Thinning: the periodic harvesting of trees in a forest stand, involving the removal of some trees for commercial utilization and the retention of others for future production or long-term retention.

5. References

- [1] European Commission - Joint Research Centre (2013). Carbon accounting of forest bio-energy. Conclusions and recommendations from a critical literature review. Luxembourg, 2013.
- [2] Forest Research and North Energy Associates Limited (2012). Carbon impacts of using biomass in bioenergy and other sectors: forests. DECC project TRN 242/08/2011 – final report, No. URN 12D/085. Farnham, Surrey (United Kingdom), April 2012.
- [3] IPCC (2003). Good Practice Guidance for Land Use, Land-Use Change and Forestry. Report IPCC National Greenhouse Gas Inventories Programme.
- [4] Lamers P. and M. Junginger (2013). The debt is in the detail: a synthesis of recent temporal forest carbon analyses on woody biomass for energy. Biofuels, Bioproducts and Biorefining, DOI 10.1002/bbb.1407.
- [5] PBL Netherlands Environmental Assessment Agency and Alterra (2013). Climate effects of wood used for bioenergy. PBL Publication Number 1182. The Hague (the Netherlands), August 2013.
- [6] RSPB, Friends of the Earth, Greenpeace (2012). Dirtier than coal? Why government plans to subsidise burning trees are bad news for the planet. United Kingdom, 2012.
- [7] SER (2013) Social and Economic Council of the Netherlands (2013). Energy Agreement for Sustainable Growth. The Hague, September 2013.

Module 620: Indirect effects of increased biomass use for bio-energy

(Version – November 2013)

Contents of this module

This module explains what are possible 'indirect effects' of increased use of biomass for energy. It provides definitions of Indirect Land Use Change (ILUC), Indirect Wood Use Change (IWUC) and Indirect Fuel Use Change (IFUC).

It also explains how the development of a biobased economy may put increasing pressure on biomass sources and will further enhance the need for sustainable biomass (supply chains).

1. Indirect effects of increased use of biomass for energy

Increased demand for solid biomass for bio-energy may have unintended consequences well outside the area where the biomass is harvested, i.e. the forest or the plantation. These are so called **indirect effects**, which cannot be directly attributed to a particular operation or a specific location.

Indirect effects are currently not covered by biomass certification schemes, as these schemes always have a specific production unit or forest as the 'unit of certification', and focus on effects directly attributable to that unit.

The most cited indirect effects are indirect land use change (ILUC), indirect wood use change (IWUC) and indirect fuel use change (IFUC). Below, each of these three effects is introduced.

Indirect Land Use Change: competition for land

In this example ILUC occurs when an existing plantation (see circle B) is used to cover the feedstock demand of additional bio-energy production. This displaces the previous productive function of the land (e.g. food production). This displacement can cause an expansion of the land use for biomass production to new areas (e.g. to forest land or to grassland, see circles B' and B'') if the previous users of the feedstock (e.g. food markets) do not reduce their feedstock demand and any demand-induced yield increases are insufficient to produce the additional demand.

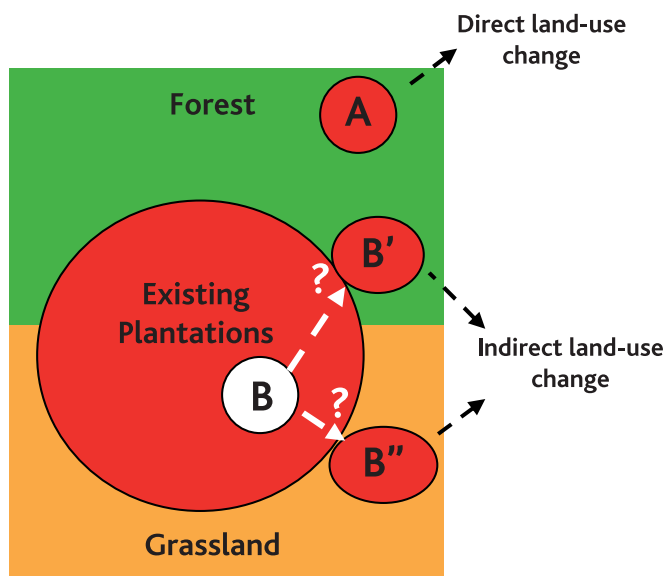


Figure 6.1 Graphic representation of Indirect Land Use Change. [2]

The ILUC impact may offset the positive (direct) impact of the new forest or plantation, e.g. when the carbon stock of the converted forest is large or when it contains valuable biodiversity (e.g. primary forests).

The environmental and social impact of indirect land use change varies widely according to the specific circumstances in which biomass is produced. The most significant effects may be felt with energy crops (e.g. willow, poplar, or miscanthus for solid biomass), as they are often planted on agricultural land, and may indirectly cause virgin land to be brought into cultivation to replace the lost food production.

Forest biomass tends to have less impact than energy crops, because forest biomass generally comes from exploited established forest resources, and therefore usually does not displace agricultural production. However, increased use of biomass for energy may lead to an overall increased pressure on (sustainable management of) forests and to increased competition with other wood applications.

In [2], a so called Low Indirect Impact Biofuel methodology is presented that allows individual operators to assess potential indirect land use change impacts of their operations, and take mitigating measures if appropriate. This methodology allows to bring indirect effect assessments within the framework of certification of individual biomass units. While the methodology has primarily been designed for transport biofuels, it may also be used for solid biomass grown on plantations. Currently, it is still less suitable for application to forest management.

The Box below summarizes approaches to mitigate risks on indirect land use change, as proposed in [2].

Options for mitigating risks on indirect land use change

The Low Indirect Impact Biofuel (LIIB) methodology [2] presents a practical and cost-effective approach for companies, policy makers and certification schemes that wish to stimulate low-ILUC biofuel production. The methodology contains detailed mitigation approaches in four different solution types:

1. Biofuel feedstocks produced from yield increases, where the producer must demonstrate yield increases above the trendline. This trendline is calculated based on a producer's own data for the last 5 years or based on data from similar producers in the last 10 years.
2. Biofuel feedstocks produced by increasing the overall system efficiency, e.g. integrating sugarcane and cattle.
3. Biofuel feedstocks produced on unused land with low carbon stocks and low biodiversity values, in countries with an excess or growing amount of unused arable land. This project category requires carrying out a Responsible Cultivation Area (RCA) assessment according to the RCA methodology among other requirements.
4. Biofuels produced from end-of-life products (waste), which would normally be disposed of and which is not used for alternative purposes in the region.

Indirect Wood Use Change: displacement of wood products

Increased demand for wood for bio-energy may lead to competition with other applications for that wood, most notably in wood products. This may result in higher costs of wood products, and wood products being replaced by other (cheaper) materials with a higher environmental footprint (e.g. plastics). This undesired effect is referred to as Indirect Wood Use Change (IWUC).

IWUC can significantly be reduced when wood is used in a cascaded model, meaning that wood is first used for materials, then re-used and recycled before the wood is ultimately used for energy generation. For example wood is first used in furniture, then recycled in softboard, and finally used as a fuel pellet.

In many situations cascaded use of biomass coincides with the economic value chain, meaning that biomass applications higher on the cascade represent a higher economic value than bio-energy applications (e.g. wood use for furniture versus for bio-energy). In other situations, government incentives for bio-energy (quota, subsidies) may 'artificially' increase the value of biomass fuels to a level where it competes with the economic value of material applications for that same biomass.

More information on IWUC can be found in [4].

Indirect Fuel Use Change: displacement of wood from other energy sectors

Increased global demand for wood for bio-energy may put pressure on local energy security in areas where wood for export is grown. For example:

- Designated areas for the production of wood biomass for export (e.g. energy wood plantations) displace land uses that have a significant role in feeding local energy needs (e.g. open land with trees, orchards etc.) or in ensuring local income;
- Wood biomass that currently feeds local energy needs (either from forests or from plantations) is redirected to export and therefore no longer available for the local population.

This effect is most immediate in areas where a large proportion of the population depends on wood biomass as primary energy source, e.g. in Sub-Saharan African and developing Asia.

This effect, referred to as Indirect Fuel Use Change (IFUC) may lead to sharply increasing wood prices in affected areas, causing a serious negative economic impact and potentially also an increase of pressure on other local forests. More information on IFUC can be found in [4].

2. The biobased economy: increased demand for (sustainable) biomass

Both the European Union [3] and various individual EU Member States [5] have the ambition to move from an economy that is primarily based on fossil raw materials, to an economy based on sustainable biomass. The latter is generally referred to as **a biobased economy**.

The European Commission describes a bio-based economy as *'an economy that integrates the full range of natural and renewable biological resources – land and sea resources, biodiversity and biological materials (plant, animal and microbial) – and the processing and consumption of these bio-resources. The bio-based economy encompasses agriculture, forestry, fisheries, food and biotechnology and industrial sectors, ranging from the production of energy carriers and chemicals to buildings and transport'*.

A bio-based economy makes more widespread use of biomass to replace fossil-based resources in all sorts of industrial production, e.g. synthetic materials such as bio-plastics, and timber as replacement of concrete and steel. In addition, a bio-based economy makes comprehensive use of biotechnology in the production of fine chemicals and pharmaceuticals. The latter is a development that is economically an important issue, but is likely to have minor impacts on the amounts of raw materials used for the manufacturing of products.

All together, the development of a bio-based economy will strongly increase demand for biomass resources. In 2012, the Dutch PBL institute carried out a quick-scan analysis based on the available literature on the implications of this development [6]. This analysis was focused on the balance between supply and demand for biomass and the impact of large-scale use of biomass on net greenhouse gas emissions and the area of land required for its production. It evaluated to what extent a bio-based economy fits within the limits imposed by sustainability.

Also in 2012, the Dutch multi-stakeholder Commission on Biomass Sustainability submitted its advice *'Biobased Economy: sustainable and transparent. Recommendation for Solid Biomass Sustainability Criteria'* to the Dutch government [1].

In its advice, the Commission concludes that increasing use of biomass in a biobased economy strengthens the need to guarantee the sustainability of biomass. The Commission analyses that in a biobased economy, biomass will increasingly be used for different applications, with biorefinery enabling the use of high-quality fractions in high-value processing (e.g. the chemical industry) and the residues in low-value processing (e.g. electricity production). Consequently, the sustainability debate must *'centre on sustainable land use, and not the type of biomass or its employment'*. According to the Commission, this shall be facilitated by one generic set of sustainability criteria for biomass, which is not dependent on the application of the biomass.

The need to certify biomass regardless of its application has also been recognised by certification schemes. RSB, ISCC and NTA 8080 are currently in the process of specifying standards that allow certification of biomass used for bio-based applications other than bio-energy. Sustainable forest management schemes do already allow certification of forest biomass independent of its application (bio-energy or other). Modules 340-380 contain more information on schemes' options to certify biomass for other biobased applications.

It is expected that in the coming 1-2 years further policy instruments and practical tools for dealing with indirect effects of biomass for energy will be developed. This is also emphasized in 'Energy Agreement for Sustainable Growth', published in September 2013 by the Social and Economic Council of the Netherlands (SER). Amongst other sustainability requirements for biomass used for co-firing, it specifies that detailing of requirements on Indirect Land Use Change shall be completed by 31 December 2014, followed by implementation in 2015.

3. Recommendation for supply chain operators

Biomass supply chain operators and other stakeholders are recommended to follow developments in the debate on indirect effects of biomass production and use, and to assess how (future) standards impact upon their situation and projects.

Those readers who wish to obtain a more detailed insight in the various aspects of indirect effects, may refer to the literature listed below.

It is envisaged that this Module will be updated and elaborated when further insights on indirect effects appear.

4. References

- [1] Commission on Biomass Sustainability (2010). *Biobased Economy: sustainable and transparent. Recommendation for Solid Biomass Sustainability Criteria*. The Netherlands, 2010.
- [2] Ecofys, Roundtable for Sustainable Biomaterials and WWF (2012). *Low Indirect Impact Biofuel Methodology*. Utrecht (the Netherlands), July 2012.
- [3] European Commission (2012). Communication *Innovating for Sustainable Growth: A Bioeconomy for Europe*. COM (2012) 60 Final. Brussels (Belgium), February 2012.
- [4] Joint Research Centre of the European Commission (2013). *Carbon accounting of forest bioenergy – Conclusions and recommendations from a critical literature review*. JRC Technical Reports, 2013.
- [5] Ministry of Agriculture, Nature and Food Quality (2007). *Government vision on the biobased economy-closing the circle*. The Hague (the Netherlands), 2007.
- [6] PBL and CE (2012). *Sustainability of biomass in a bio-based economy - A quick-scan analysis of the biomass demand of a bio-based economy in 2030 compared to the sustainable supply*. PBL publication number 500143001. PBL (the Netherlands), February 2012.

Module 700: Glossary of terms and abbreviations

(Version – November 2013)

Contents of this module

This module contains a glossary of terms and abbreviations used in this Handbook.

- 100 Introduction
- 200 Sustainability certification of biomass – background and objectives
- 300 Certification schemes
- 400 Practical tools for assessing sustainability impacts
- 500 Related legislation (EU Timber Regulation)
- 600 Other sustainability aspects (carbon debt, indirect effects)
- 700 Glossary of terms and abbreviations**

Relevant terms

Accreditation – the procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks. In the case of biomass certification: accreditation of certification bodies.

Agricultural Residue - Agricultural crop residues are the plant parts, primarily stalks and leaves, not removed from the fields with the primary food or fiber product. Examples include corn stover (stalks, leaves, husks, and cobs); wheat straw; and rice straw.

Anaerobic digestion - Decomposition of biological wastes by micro-organisms, usually under wet conditions, in the absence of air (oxygen), to produce a gas comprising mostly methane and carbon dioxide.

Auditor – person with competence necessary to conduct an assessment.

Audit team – one or more auditors conducting an audit, if needed supported by technical experts. One auditor of the team is appointed as the audit team leader or lead auditor.

Audit type – the method followed for the audit, i.e. desk audit or field audit.

Biodiesel - Fuel derived from vegetable oils or animal fats. It is produced when a vegetable oil or animal fat is chemically reacted with an alcohol.

Biodiversity – variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Bioethanol - Ethanol produced from biomass feedstocks. This includes ethanol produced from the fermentation of crops, such as corn, as well as cellulosic ethanol produced from woody plants or grasses.

Biogas - A combustible gas derived from decomposing biological waste under anaerobic conditions. Biogas normally consists of 50 to 60 percent methane. See also landfill gas.

Certification decision – granting, maintaining, renewing, reinstating, refusing or withdrawing certification.

Certificate holder – the operator which holds a valid scheme certificate

Certification report – report on the certification evaluation process, certification evaluation findings and conclusions, and certification decision.

Certification scope – a comprehensive description of all aspects of the operations under the control of an operator which are affected by the scheme requirements.

Chain of custody – chain of evidence through which products are processed and distributed from their origin to their end-use.

Desk audit – evaluation of an operator for compliance with a scheme's requirements, based on documentation provided by the operator.

Energy crops - Crops grown specifically for their fuel value. These include food crops such as corn and sugarcane, and nonfood crops such as poplar trees and switchgrass.

Field audit – evaluation of an operator for compliance with a scheme's requirements, executed at the operations, sites and facilities of the operator.

Forestry residues - Includes tops, limbs, and other woody material not removed in forest harvesting operations in commercial hardwood and softwood stands, as well as woody material resulting from forest management operations such as pre commercial thinnings and removal of dead and dying trees.

Heating value - The maximum amount of energy that is available from burning a substance.

ISO/IEC Guide 65 – general requirements for bodies operating product certification systems.

ISO 19011 – guidelines for auditing management systems.

Non-compliance (non-conformity) – failure to comply with one or more of the requirements specified in a certification scheme. Generally, 'major' and 'minor' non-compliances are distinguished.

Protected area – area on land and/or water, designated by national law or otherwise, for the preservation and protection of the ecosystem function and biodiversity or cultural values of the area.

Pulpwood - Roundwood, whole-tree chips, or wood residues that are used for the production of wood pulp.

Self-assessment (self-evaluation) – assessment against a certification scheme's requirements, conducted by an operator, of its own operations.

Stakeholder – persons, groups or organizations who are directly or indirectly affected by or who can affect and activity, but also includes people and organizations who have concerns about the activity, or who might be responsible agents.

Whole-tree harvesting - A harvesting method in which the whole tree (above the stump) is removed.

Relevant abbreviations

CB	Certification body
CBD	Convention on Biological Diversity
CEN	European Committee of Standardization
CITES	Convention on International Trade in Endangered Species
CoC	Chain of custody
CSA	Canadian Standards Association
CSR	Corporate Social Responsibility
EC	European Commission
EU	European Union
EIA	Environmental Impact Assessment
EU-RED	European Renewable Energy Directive
FAO	Food and Agriculture Organization of the United Nations
FLEGT	EU Action Plan for Forest Law Enforcement, Government and Trade
FMU	Forest Management Unit
FQD	European Fuel Quality Directive
FSC	Forest Stewardship Council
GGL	Green Gold Label
GHG	Greenhouse gas
GRI	Global Reporting Initiative
HCV	High conservation value
ILO	International Labour Organization
ILUC	Indirect Land Use Change

ISCC	International Sustainability and Carbon Certification
ISO	International Standards Organization
NGO	Non-Governmental Organization
NTA	Nederlands Technische Afspraak (Dutch Technical Agreement)
PEFC	Programme for Endorsement of Forest Certification
RSB	Roundtable on Sustainable Biofuels
RSPO	Roundtable on Sustainable Palm Oil
RTRS	Roundtable on Responsible Soy
SFI	Sustainable Forestry Initiative

Modules 340-380 Factsheets on selected biomass certification schemes

Modules 340-380 contain fact sheets on nine selected biomass certification schemes:

Module 340 - NTA 8080

Module 345 - International Sustainability and Carbon Certification Scheme (ISCC)

Module 350 - Roundtable on Sustainable Biomaterials (RSB)

Module 355 - Green Gold Label (GGL)

Module 360 - Initiative Wood Pellet Buyers (IWPB)

Module 365 - Forest Stewardship Council (FSC)

Module 370 - Programme for the Endorsement of Forest Certification (PEFC)

Module 375 - Canadian Standards Association – Sustainable Forest Management (CSA-SFM)

Module 380 - Sustainable Forest Initiative (SFI)

Module 340: Factsheet NTA 8080

(Version – November 2013)

Factsheet NTA8080

This factsheet aims to provide accessible and factual information on the NTA8080 scheme. The information has been validated by NEN, the scheme owner of the NTA 8080 certification system. This factsheet presents the actual status of the scheme in August 2013. For more detailed information on the scheme, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official NTA 8080 standards and procedures.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	The scheme is generally referred to as 'NTA 8080' or sometimes as NTA 8080/8081' Full name is: Netherlands Technical Agreement 8080 (NTA 8080): Sustainability criteria for biomass for energy purposes and Netherlands Technical Agreement 8081 (NTA 8081): Certification scheme for sustainably produced biomass for energy purposes.
1.2 Website	www.nta8080.org or www.sustainable-biomass.org (both available in English and Dutch)
1.3 Scheme owner details	NEN, the Netherlands Standardization Institute. The certification scheme is formally managed by NEN Scheme Management, the NEN division which is responsible for the management of certification schemes and all related activities.
1.4 General objective	The NTA 8080/8081 aims to set robust sustainability criteria for all types of biomass used for energy production (electricity, heating & cooling, transportation fuels).
1.5 Scheme governance	NEN is the entity in charge of the implementation and management of the NTA 8080/8081 standards. It provides the systems' information and the register of certified companies and maintains the system's administration. The management of the certification

	<p>scheme (NTA 8081) is carried out by the Committee of Experts ('Commissie van Deskundigen') reporting to the NEN Scheme Management Committee. The NEN Scheme Management Manual, available on the NEN website, provides the details on the composition and the procedures used by different committees to develop and manage schemes.</p> <p>The underlying NTA 8080 standard, containing the sustainability criteria, has been developed and will be maintained by the NTA 8080 working group.</p> <p>The Dutch Accreditation Council (RvA) has accepted NEN as scheme manager and the NTA 8080 certification system. The Dutch Accreditation Council complies with the requirements of ISO/IEC 17011. These requirements are met by participation to peer reviews in the frame of the EA (European cooperation for accreditation) and IAF (International Accreditation Forum). Certification bodies that enter into agreement with NEN shall be accredited for the application of the NTA 8080 certification system within one year by an IAF member.</p>
2. THE STANDARD	
2.1 Types of biomass covered	Solid, liquid and gaseous biomass from all types of origin, including wastes & residues, used for energy purposes (electricity, heat & cold and transportation fuels). The NTA 8080 standard is currently being revised to incorporate the practical experiences in the past years including recognition by the European Commission, to allow inclusion of biomass for other biobased applications and to address a number of topical sustainability issues and developments (revised standard expected end of 2013).
2.2 Geographic coverage	Global
2.3 Chain coverage	Biomass production (incl. cultivation), processing, conversion, transportation up to and including end use.
2.4 Sustainability criteria covered	<p>The NTA 8080 standard covers environmental, social and economic criteria, organized under nine main Principles:</p> <ol style="list-style-type: none"> 1. The greenhouse gas balance of the production chain and the application of the biomass is positive; 2. Biomass production is not at the expense of important carbon sinks in the vegetation and in the soil; 3. The production of biomass for energy shall not endanger the food supply and local biomass applications (energy supply, medicines, building materials); 4. Biomass production does not affect protected or vulnerable biodiversity and will, where possible, strengthen biodiversity; 5. In the production and conversion of biomass, the soil and soil quality are retained or even improved; 6. In the production and conversion of biomass, ground and surface water are not depleted and the water quality is maintained or improved; 7. In the production and conversion of biomass, the air quality is maintained or improved; 8. The production of biomass contributes to local prosperity; 9. The production of biomass contributes towards the social well-being of the employees and the local population.

2.5 Chain of custody standard	<p>Biomass shall be traceable throughout the complete supply chain (from production up to and including end use). Operators may use a mass balance system or segregation system to physically trace material through the chain. Book and claim is not allowed.</p> <p>All supply chain operators taking ownership of biomass need to be NTA 8080 certified. Supply chain operators may be certified as 'producer' (this includes the collector of residues), 'processor', 'trader' or 'end-user', depending on the scope of their activities. An operator may be certified for multiple scopes, e.g. as producer and processor.</p>
2.6 National standards & interpretations	NTA 8080 has no national standards or interpretations, nor has it crop-specific standards.
2.7 Provisions for waste & residues	<p>For wastes and residues, less sustainability criteria apply than for biomass which is not waste or residue.</p> <p>NTA 8080 defines a residue as 'a biomass stream that is released in the production of other (main) product, representing an economic value less than 10% of the main product's value'. This means that the organization shall not deliberately modify its processes to produce the residual flows. Annex A of the NTA 8080 document contains a 'list of exceptions', biomass streams which automatically qualify for the 10% criterion. In other words: the biomass streams listed in Annex A qualify as waste or residue under NTA 8080 definitions. Waste and residues only need to fulfill a limited part of the NTA 8080 sustainability criteria (i.e. document management, legality, greenhouse gas criterion, traceability and in some cases soil quality).</p> <p>Note: The specific provisions for waste & residues have made NTA 8080 particularly attractive for solid residues used for bio-energy production (mainly in the Netherlands, also refer to 4.1 'Track record')</p>
3. CERTIFICATION REQUIREMENTS	
3.1 General	The certification requirements have been laid down in the NTA 8081 document.
3.2 Audit process requirements (including stakeholder consultation)	<p>The initial audit comprises of two stages, i.e. a pre-audit (preliminary investigation) and an on-site audit. The pre-audit may be done by desk research, but can include a site visit as well.</p> <p>Upon successful completion of the initial audit, a NTA 8080 certificate is issued with a validity of five years. Annual surveillance audits are conducted to monitor the operator's performance, and his remediation of previously identified non-compliances. After five years, a full re-certification audit is required.</p> <p>NTA 8081 provides detailed guidance in relation to the number of audit days required for initial certification audits, annual surveillance audits and re-certification audits (after five years).</p>

	Stakeholder consultation is required during the initial certification audit and during re-certification audit. There are various exemptions to this requirement (e.g. in the case of smallholders or waste/residues, or if the permit procedure contained a complaint procedure.)
3.3 Certification Body and Auditor requirements	<p>Certification bodies shall enter into agreement with NEN and shall comply with ISO/IEC 17065. Certification bodies shall be accredited by an accreditation body that is an IAF member.</p> <p>The certification audits shall be carried out and reported in accordance with ISO 19011 by an audit team with demonstrable knowledge on all NTA 8080 requirements. As of September 2013, three certification bodies have operational agreements with NEN, i.e. Control Union Certifications, DEKRA Certifications and Quality Services Certification.</p>
3.4 Minimum level of assurance	<p>NTA 8081 defines major and minor non-compliance:</p> <ul style="list-style-type: none"> - A major non-compliance is the failure to meet a legal requirement or a specified requirement that causes an immediate increase in risk. A 'major' also arises if a minor non-compliance detected in a previous audit has not or insufficiently been corrected. - A minor non-compliance is failure to satisfy a requirement that exceeds legal requirements and which causes an increased risk over time. <p>In case of major non-compliances, the certification body shall not issue a certificate. Major non-compliances need to be corrected within three months otherwise a new audit is necessary, or the existing certificate will be suspended. In case of suspension the organization has three months to correct the non-compliance to avoid withdrawal of the certificate. For minor non-compliances, the organization shall provide a plan with corrective measures within two weeks after the audit. The implementation of this plan is reviewed during the next annual surveillance audit.</p>
3.5 Costs of certification	<p>There are three types of costs direct attributable to NTA 8080 certification:</p> <ul style="list-style-type: none"> - An annual scheme membership fee, or an annual payment per metric tonne; - An annual fee per certificate (collected by the certification body on behalf of NEN); - Auditing costs. <p>An up-to-date overview of the fee structure can be obtained from www.nta8080.org.</p>
4. OTHER ASPECTS	
4.1 Track record	Approximately 25 certificates issued. Vast majority is for solid waste & residues collectors & processors in the Netherlands, as well as producers of biogas.
4.2 Stakeholder perception	NTA 8080 is generally perceived by Dutch stakeholders as a robust and credible standard. NGOs have directly been involved in the design of the scheme (and are currently involved in its revision).

	In 2012, NTA 8080 was approved by the European Commission as a voluntary scheme to show compliance with EU-RED sustainability requirements for biofuels and bioliquids.
4.3 Availability of help desk, tools & guidance	<ul style="list-style-type: none"> - The 'Interpretation document' provides a further detailing and clarification of the requirements laid down in the NTA 8080 document - NEN have published System Plans, i.e. self-assessment tools - The website contains a section with Frequently Asked Questions, as well as an online form that can be used to establish contact. - The Dutch Association of Biowaste Processors has developed a toolbox, specifically in relation to NTA 8080 requirements for Dutch solid biomass residues. This toolbox is available from www.bvor.nl/certificering/duurzaamheidscertificering.
4.4 Recognition of other schemes	NTA 8080 has not yet recognized other schemes as being equivalent. Due to the way in which the NTA 8080 scheme itself has been accredited, the NTA 8080 certification system could only accept other schemes that are recognized by an EA or IAF member body.
5. REFERENCES USED FOR THIS FACTSHEET	
	<ul style="list-style-type: none"> - www.nta8080.org and scheme documentation on that website - NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011. - Personal communication with Mr. H. Willemse – NEN

Module 345: Factsheet ISCC

(Version – November 2013)

Factsheet ISCC

This factsheet aims to provide accessible and factual information on the ISCC scheme. The information has been validated by ISCC Association e.V., the scheme owner of the ISCC certification scheme. This factsheet presents the actual status of the scheme in August 2013. For more detailed information on the system, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official ISCC standards and procedures.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	<p>The scheme is generally referred to as 'ISCC'. Full name is: 'ISCC – The International Sustainability and Carbon Certification System'.</p> <p>'ISCC-EU' stands for the ISCC scheme requirements as recognized by the EU Commission for biofuels 'ISCC-DE' stands for the ISCC scheme requirements specifically focusing on compliance with German biofuel regulations (German Sustainability Ordinances BioNachV). 'ISCC-Plus' is the ISCC scheme for biomass applications in feed, food, chemicals, bioplastics and solid biomass. The basic scheme requirements are equivalent to ISCC EU and DE.</p>
1.2 Website	www.iscc-system.org, available in English, German, Spanish and Portuguese.
1.3 Scheme owner details	The ISCC Association (ISCC e.V.) is the overall multi stakeholder governing body of ISCC. The executive power and the operational management of the scheme are assigned to the ISCC System GmbH (ISCC limited liability corporation).

1.4 General objective	The ISCC objective is 'the establishment of an internationally oriented, practical and transparent system for the certification of biomass and bio-energy'.
1.5 Scheme governance	<p>The General Assembly of the ISCC Association (ISCC e.V.) incorporates all stakeholders and interested parties. The Board of ISCC Association is composed of members of the General Assembly, representing the different stakeholder groups participating in ISCC. Day-to-day management is the responsibility of the Executive Board, which in turn may appoint Technical Committees to provide support in the handling over specific subjects and regional adaptation. The day-to-day operations of the ISCC system are carried out by ISCC System GmbH.</p> <p>More details on the governance of ISCC can be found on the ISCC website.</p>
2. THE STANDARD	
2.1 Types of biomass covered	Solid, liquid and gaseous biomass from all types of origin, including wastes & residues
2.2 Geographic coverage	Global
2.3 Chain coverage	Biomass production (incl. cultivation), processing, conversion, transport up to and including end use.
2.4 Sustainability criteria covered	<p>The ISCC Sustainability Requirements for the Production of Biomass comprises six sustainability principles:</p> <ol style="list-style-type: none"> 1. Biomass shall not be obtained from land with high biodiversity value or high carbon stock and not from peat land; 2. Biomass shall be produced in an environmentally responsible way. This includes the protection of soil, water and air and the application of Good Agricultural Practices; 3. Safe working conditions through training and education, use of protective clothing and proper and timely assistance in the event of accidents; 4. Biomass production shall not violate human rights, labour rights or land rights. It shall promote responsible labour conditions and workers' health, safety and welfare and shall be based on responsible community relations; 5. Biomass production shall take place in compliance with all applicable local and national laws and shall follow relevant international treaties; 6. Good management practices shall be implemented.
2.5 Chain of custody standard	<p>Biomass shall be traceable throughout the complete supply chain (from production up to and including end use), following the rules laid down in document ISCC 203 'Requirements for traceability'. Operators may use a mass balance system or segregation system to physically trace material through the chain. Book and claim is not allowed.</p> <p>All supply chain operators taking ownership of biomass need to be ISCC certified.</p>

2.6 National standards & interpretations	<p>ISCC have established rules for adapting the ISCC standard to local conditions (ISCC document 102 on National and Regional Initiatives). Under these rules, a National or Regional Technical Working Group can be established to adapt the standard to local conditions by means of a further specification. National or regional adaptations of the ISCC standard are subject to board approval and in the case of biofuels of RED relevant issues subject to recognition by the EU Commission (ISCC EU) or BLE (ISCC DE).</p> <p>At present, working groups related to regional specifications are active in North America and South East Asia .</p>
2.7 Provisions for waste & residues	<p>ISCC has defined regulations for waste & residues feedstocks for biofuels, including for SRC and wood.</p> <p>Specifically for sustainability questions in relation to wood, ISCC has established a technical committee wood (Technisches Komitee Holz), which so far has not provided guidance as to when solid biomass (including wood) shall be considered as sustainable. ISCC indicates that it is waiting for the European Commission's further guidance on solid biomass sustainability requirements.</p>
3. CERTIFICATION REQUIREMENTS	
3.1 General	The certification requirements have been laid down in the ISCC documents categorized no. 201.
3.2 Audit process requirements (including stakeholder consultation)	<p>Prior to each first audit, the certification body must conduct a risk assessment for the relevant operator and classify its operations according to one of the three ISCC risk categories (regular, medium, high). For this classification, the auditor shall use standard risk indicators (e.g. level of expertise of employees, risk of corruption). The outcome of the risk assessment determines the sample size (farms/plantations, warehouses) and scope of the audits.</p> <p>ISCC has one type of certificate, which is verified annually.</p> <p>Stakeholder consultation is not in general a requirement during the certification process.</p>
3.3 Certification Body and Auditor requirements	<p>Certification bodies have to fulfill the requirements laid down in the document 'ISCC 251 Requirements on Certification bodies':</p> <ol style="list-style-type: none"> 1. For CB's working under ISCC DE, recognition by the German Authority BLE; 2. For CB's working under ISCC EU or ISCC PLUS, accreditation for product certification (ISO 45011), or recognition by the German Authority BLE; 3. Execution of audits following the requirements of ISO 19011; 4. Notification by the ISCC certification system. <p>The audit team shall have demonstrable knowledge on all ISCC requirements. Auditors shall have followed the 3-day ISCC auditor training course. As of September 2013, 23 certification bodies have operational agreements with ISCC.</p>

3.4 Minimum level of assurance	The ISCC Sustainability Requirements for the Production of Biomass comprise six principles with underlying criteria. The criteria have been classified as 'Major Musts' and 'Minor Musts'. An operator must comply with all 'Major Musts' in order to qualify for certification. 'Minor Must' non-compliances are allowed, but need to be remediated before the next audit. On agricultural level at least 60% of the minor musts shall be complied with.
3.5 Costs of certification	<p>There are four types of costs direct attributable to ISCC certification:</p> <ul style="list-style-type: none"> - Registration fee: initial fee, payable to the certification body; - Certificate fee: fee due upon issuance of a certificate or statement of conformity. Height of fee is based on tonnage and turnover. Fee is payable to certification body - Quantity dependend fee: fee payable for each ton of biomass or biomass product produced or received. This fee shall be paid directly to ISCC. - Auditing costs. <p>An up-to-date overview of the fee structure can be obtained from www.iscc-system.org.</p>
4. OTHER ASPECTS	
4.1 Track record	For sustainability certification of biofuels and biofuel feedstocks, ISCC is the international market leader, with over 3.600 certificates being issued (status as of September 2013) ISCC has not yet issued certificates for solid biomass for electricity/heat (ISCC indicates that it is waiting for further guidance on solid biomass from the EC).
4.2 Stakeholder perception	ISCC has been very successful in obtaining a position as market leader for the EU biofuel market: the number of ISCC certificates issued exceeds by far the number of certificates of any other biofuel scheme. This has led to questions on the credibility and robustness of the ISCC scheme, though primarily by critical NGOs.
4.3 Availability of help desk, tools & guidance	<ul style="list-style-type: none"> - ISCC have developed a variety of guidelines and tools for producers and supply chain operators, which are available from the website. It needs to be noted that these are primarily oriented at liquid biofuels, and not specifically aimed at solid biomass. - ISCC organizes auditor trainings around the world, as well as information sessions/seminars for other interested parties - The website contains a section with Frequently Asked Questions, as well as an online form that can be used to establish contact. - The website also contains a client login section which provides additional information, updates and tools for ISCC users and members
4.4 Recognition of other schemes	<p>ISCC automatically accepts biofuel schemes which have been approved by the European Commission. This acceptance is restricted to biomass used for transport biofuels and bioliquids supplied to the European Union.</p> <p>For double counting material (i.e. waste and residues) acceptance of other schemes is depending on the results of a benchmark exercise executed by ISCC.</p>

5. REFERENCES USED FOR THIS FACTSHEET

- www.iscc-system.org
- NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011.
- Personal communication with Mr. A Feige – ISCC

Module 350: Factsheet RSB

(Version – November 2013)

Factsheet RSB

This factsheet aims to provide accessible and factual information on the RSB scheme. The information has been reviewed by Sébastien Haye, Standards Director of the RSB. This factsheet presents the actual status of the scheme in August 2013. For more detailed information on the scheme, the reader may visit the website of the certification scheme (www.rsb.org) or contact the scheme owner (info@rsb.org).

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official RSB standards and procedures.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	The scheme is generally referred to as 'RSB'. Full name is: Roundtable on Sustainable Biomaterials (formerly known as Roundtable on Sustainable Biofuels).
1.2 Website	General website of RSB: www.rsb.org ; Website of the RSB Services Foundation: www.rsbservices.org
1.3 Scheme owner details	The Roundtable on Sustainable Biomaterials Association is registered as a non-profit association under Swiss law.
1.4 General objective	RSB has defined its mission as follows: <ul style="list-style-type: none">• To provide and promote the global standard for socially, environmentally and economically sustainable production and conversion of biomass;• To provide a global platform for multi-stakeholder dialogue and consensus building;• To ensure that users and producers have access to credible, practical and affordable certification;• To support continuous improvement through application of the standard.

1.5 Scheme governance	<p>The Roundtable on Sustainable Biomaterials is governed by an Assembly of Delegates and a Board of Directors elected from the seven stakeholder Chambers. Each Chamber may elect up to three Delegates to the Assembly and has one Director seating on the Board. As per the Articles of Association, the Assembly of Delegates elects the Board of Directors (candidates are nominated by Chambers) and financial auditors, decides upon the articles of association, decides upon membership rights and duties, and approves the development and modification of standards. The Board of Directors is responsible for the management of the Association and has all the powers necessary to realize its objects.</p> <p>The RSB Secretariat is based in Geneva, Switzerland.</p> <p>The RSB also convenes Expert Groups made up of RSB members and outside experts to study certain issues (e.g. GHG accounting, indirect impacts, implementation, etc). Expert Groups remain active until the specific issue has been adequately addressed, at which point they are deactivated.</p> <p>The full Articles of Association are available at http://rsb.org/about/organization/rsb-members/</p> <p>In January 2012, the RSB Services Foundation was established as a United States based non-profit organization charged with implementing the RSB certification scheme and managing a broad range of activities on behalf of the RSB Standards Body. These include the certification process and oversight of licensing and use of the trademark. RSB Services Foundation also develops and manages the tools that facilitate the global adoption of the RSB standard. In August 2013, Accreditation Services International (ASI) became the official accreditation body of the RSB.</p>
2. THE STANDARD	
2.1 Types of biomass covered	<p>Solid, liquid and gaseous biomass from all types of origin, including wastes & residues, and all its derived products (e.g. biofuels, biochemical, textiles, food additives).</p> <p>Note: RSB started as the 'Roundtable on Sustainable Biofuels'. In November 2010, the scope of its vision and mission was broadened to "biomass" and on March 18, 2013, it changed its name to the 'Roundtable on Sustainable Biomaterials', with the intention of also covering other biomass-derived products (than biofuels only). Currently, certification of biomaterials is based on the RSB Standard for Certification of Bio-product (RSB-STD-02-001) describing how to transpose the generic RSB Standard for biofuels in the context of other bio-based products. In 2013 and 2014, most of the RSB Standard will be updated to replace "biofuels" by "biomaterials" and add specific requirements wherever needed. In the meantime, RSB will consult with key stakeholders on specific aspects such as greenhouse gas accounting or chain-of-custody for bio-based products.</p>
2.2 Geographic coverage	Global
2.3 Chain coverage	Biomass production (incl. cultivation), processing, conversion into biomaterials, transport up to and including final application/end use.

2.4 Sustainability criteria covered	<p>The RSB standard covers environmental, social and economic criteria, organized under 12 main Principles:</p> <ol style="list-style-type: none"> 1. Legality (national and international laws and regulations); 2. Planning, monitoring and continuous improvement (transparent and consultative impact assessment, free prior and informed consent, and economic viability); 3. Greenhouse gas emissions 4. Human and labour rights; 5. Rural and social development 6. Local food security (direct impacts); 7. Conservation (conserve and protect important conservation values, ecosystem services and functions); 8. Conserve and protect soil; 9. Conserve and protect water; 10. Conserve and protect air; 11. Responsible use of technology, inputs, management of waste (risks, chemicals, waste); 12. Land rights (respect land rights and land use rights). <p>To guide operators throughout the process of compliance with RSB sustainability criteria, the RSB develops and maintains guidance documents, guidelines and other user-friendly tools. It is also working on a specific adaptation of the certification process for smallholders.</p>
2.5 Chain of custody standard	<p>Biomass and its derivatives (incl. biofuels, bioplastics, etc.) shall be traceable throughout the complete supply chain (from production to and including end use). RSB has developed four standards for four different chain of custody models:</p> <ul style="list-style-type: none"> • Identity of product preserved chain of custody standard; • Segregation of product chain of custody standard; • Mass balance of product chain of custody standard; • Content ratio accounting of product chain of custody standard. <p>Any operator legally or physically controlling biomass at any point in the supply chain, needs to be certified against the RSB chain-of-custody requirements.</p>
2.6 National standards & interpretations	<p>RSB have developed procedures for interpretations of the generic RSB Principles & Criteria, i.e. requirements which stakeholders have to follow when adapting RSB Principles & Criteria to:</p> <ul style="list-style-type: none"> • Crop-specific conditions • Geographic conditions; • Biomass production standards (benchmarking). <p>An adaptation process starts with a needs assessment done by an entity with demonstrated interest in the specific conditions.</p>

2.7 Provisions for waste & residues

The RSB has defined specific compliance and certification processes for biofuels based on end-of-life products (e.g. municipal solid waste), by-products (e.g. animal fats or cereal straws) or residues ('RSB policy for certification of biofuels based on by-products and residues' and 'RSB policy for certification of biofuels based on end-of-life products and wastewater').

The 'RSB policy for certification of biofuels based on end-of-life products and wastewater' is applicable to 'municipal solid waste', used cooking oil and wastewater. For the purpose of RSB certification, municipal solid waste is defined as:

- Domestic waste and comparable commercial waste, including fractions thereof;
- Green waste;
- Construction and demolition waste.

For the purpose of RSB certification, a fuel made out of solid municipal waste is considered a biofuel if:

- At least 50% of all carbon in the material is of biological origin;
- Recyclable materials have been reclaimed prior to the production of the fuel

The 'RSB policy for certification of biofuels based on by-products and residues' defines by-products and residues in general as: 'secondary products from agriculture/forestry/livestock/meat/poultry/fish/food production and processing, as well as certain industrial processes'.

Chapter 2 of this document specifies a limitative list of biomass categories which are considered to be by-products or residues. For some biomass categories the list all specifies certain conditions that need to be fulfilled in order to be eligible for RSB certification. In particular the category by-products and residues from agriculture' are of importance:

- Harvest residues only classify as residue if the producer complies with RSB Criterion 8, i.e. that the soil quality does not deteriorate, or improves;
- Residues from the processing of agricultural products do only classify as residue if the quality is insufficient for use in food processing, or in other applications.
- Forestry residues need to come from certified origin (FSC or equivalent)
- Palm oil residues need to come from certified origin (SAN or RSPO)
- Animal fats need to come from slaughterhouses or rendering units located in a country where laws on humane treatment of animals and environmental protection are enforced.

Whenever EU Member States implement additional rules on waste and residues (e.g. on the origin of feedstock), the RSB will issue specific guidance to operators.

3. CERTIFICATION REQUIREMENTS

3.1 General

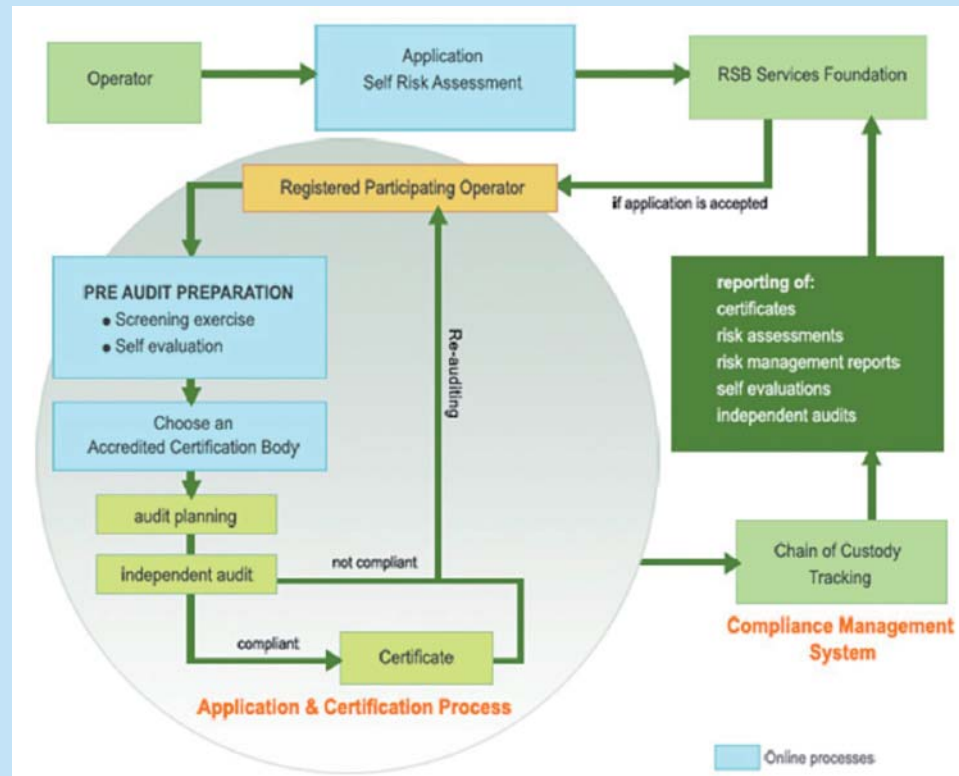
RSB has two sets of standards against which operators might get certified:

- The RSB Consolidated EU RED Standards (for transport biofuels in the EU)
- The RSB Global Standards (for other geographic regions).

As of March 18, 2013, the RSB has a specific standard for certification of bio-products other than biofuels (RSB-STD-02-001), which is applicable worldwide.

3.2 Audit process requirements (including stakeholder consultation)

The following graphic presentation, taken from www.rsb.org describes the RSB certification process. More details can be found on the website.



3.3 Certification Body and Auditor requirements	<p>Certification bodies shall hold and maintain accreditation to ISO/IEC Guide 62, ISO/IEC Guide 65, ISO/IEC Guide 66, ISO 14065 and ISO 4064-3 or equivalent by an independent accreditation body which is either member of the ISEAL or the IAF. Certification bodies must be accredited through the official RSB accreditation process. Since August 2013, the RSB accreditation process is being implemented and monitored by Accreditation Services International (ASI). To date, three certification bodies have been accredited by RSB.</p> <p>RSB document RSB-STD-70-002 specifies requirements for audit teams and for individual auditors. RSB audits shall be carried out by a team comprising of local and international auditors, qualified for the particular type of evaluation, and, in certain context determined by the operator's risk class, including at least one person with social impacts expertise or environmental impacts expertise.</p> <p>The RSB assurance system is based on a risk approach. Operators with higher risk classes undergo audits more frequently and with a larger auditing team. Risk classes are calculated out of many risk factors, which take the general context of operations as well as the complexity of supply chains into account. More details about the RSB Risk Management Standard (RSB-STD-60-001) can be found on the RSB website.</p>
3.4 Minimum level of assurance	<p>The RSB assurance scheme is aligned with best practices and should be evaluated shortly for compliance with ISEAL Assurance Code. Requirements for accreditation bodies and certification bodies (see above) are available on the RSB website.</p>
3.5 Costs of certification	<p>Certification costs comprise three elements: 1) compliance cost (i.e. the investment needed from the operators to upgrade its operation to the level of performance required by the RSB Standard; 2) certification cost, which depends on the location of the operator and risk class (i.e. travel and working time of auditors); and 3) licensing cost, which depends on the size and nature of the operators. The specific licensing costs can be obtained by contacting info@rsbservices.org</p>
4. OTHER ASPECTS	
4.1 Track record	<p>As of July 2013, RSB have issued 7 certificates for operations on 5 continents, including waste and residues (in particular used cooking oil), sugar cane and jatropha).</p>
4.2 Stakeholder perception	<p>RSB is generally considered as a very thorough and credible scheme. This is also attributable to the multi-stakeholder based approach which RSB follows in its standard-setting and standard-review processes, as illustrated by its member status at the ISEAL Alliance (www.isealliance.org).</p>
4.3 Availability of help desk, tools & guidance	<ul style="list-style-type: none"> - RSB have published a number of 'guidance documents' and guidelines on its website which help operators and other stakeholders to understand the RSB scheme and standard requirements better; - RSB's contact details are available on the website. There is a dedicated digital form to submit questions/messages to the RSB Secretariat.

	<ul style="list-style-type: none"> - All RSB documents, including standards, procedures and meeting reports, are available on the website or upon request at no cost.
4.4 Recognition of other schemes	<p>RSB aims to collaborate with other certification schemes for the best interest of economic operators. It has established simplified audit processes for operators certified by other schemes, who are willing to acquire RSB certification. Currently, the following schemes have been recognized by RSB:</p> <ul style="list-style-type: none"> • Sustainable Agriculture Network (SAN); • Forest Stewardship Council (FSC). <p>In addition, an RSB-certified operator using material certified by another EU-recognised scheme may attach an on-product "EU-compliant" claim. However, no "RSB-compliant" claim can be used in such case.</p>
5. REFERENCES USED FOR THIS FACTSHEET	
	<ul style="list-style-type: none"> - www.rsb.org and relevant scheme documentation included on this website; - NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011; - Personal communication with Mr Sébastien Haye, standards director of RSB.

Module 355: Factsheet GGL

(Version – November 2013)

Factsheet GGL

This factsheet aims to provide accessible and factual information on the GGL scheme. The information has been validated by GGL Foundation, the scheme owner of the GGL certification system. This factsheet presents the actual status of the scheme in August 2013. For more detailed information on the scheme, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official GGL standards and procedures.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	The scheme is generally referred to as 'GGL', or 'Green Gold Label'.
1.2 Website	www.greengoldcertified.org
1.3 Scheme owner details	The scheme is owned by the Green Gold Label Foundation, a private non-profit organization registered in the Netherlands.
1.4 General objective	The general objective of GGL is facilitate the traceable supply of sustainable biomass to power plants, in particular all agricultural products and residual products from vegetable origin as well as forestry products and residual forestry products.
1.5 Scheme governance	<p>The GGL Executive Board is responsible for strategic decision-making and is responsible for the Green Gold Label Foundation initiative. The Executive Board comprises of representatives of primary producers, traders, end users and NGOs, and is chaired by an independent chairman.</p> <p>The Advisory Board advises the Executive Board in its strategic decision-making process, including the structure and targets, the practical implementation as well as the applicability of the Green Gold Label Programme. The Advisory board currently comprises a</p>

	<p>NGO, a University and two industry representatives.</p> <p>The Secretariat is carried out by Peterson Consultancy in the Netherlands.</p>
2. THE STANDARD	
2.1 Types of biomass covered	Agricultural products and residual products from vegetable origin as well as forestry products and residual forestry products. In the past GGL has done projects with vegetable oils as well, and GGL Foundation indicates that this might come back in the future.
2.2 Geographic coverage	Global
2.3 Chain coverage	<p>The chain coverage of the GGL scheme works as follows:</p> <ul style="list-style-type: none"> • The central point in the biomass supply chain is the processor who converts biomass into pellets. This operator has to be certified against the GGL standard 'GGLS1 Chain of Custody and Processing Standards'; • The GGLS1 certified operator has to prove that his biomass feedstocks originates from sustainable sources (either forestry or agriculture). Sources may have been certified against one of the GGL approved certification schemes (meta-standard approach) or may have been certified against the GGLS 2 or GGLS 5 standard (also refer to item 2.4 below); • Further transport of the GGLS1 certified material through the supply chain is regulated by the 'GGLS4 Transaction Certificate' standard. This standard includes requirements on administration, registration and mass balance calculations. • The power company receiving biomass fuels shall comply with GGL standard GGLS 6 Power Company Criteria. GGLS 6 specifies requirements for policy, administration, mass balance calculation, etc.. <p>More recently, GGL have developed the following additional standards:</p> <ul style="list-style-type: none"> • The 'CRM 1 Chain of Custody and Processing Standards', comparable to GGLS 1 but specifically focused on torrefied material; • The 'CRM 2 Transaction Certificate', comparable to GGLS 4 but specifically focused on torrefied material; • The 'GGLS8 Greenhouse gases and energy balance calculation' focused on greenhouse gas calculations along the supply chain.
2.4 Sustainability criteria covered	<p>The Green Gold Label uses a meta-standard approach, meaning that it uses certificates from other certification schemes to assess if biomass complies with sustainability criteria. GGL has approved a number of forestry management certification schemes (FSC, PEFC, CSA-SFM, SFI, FFCS) and agricultural certification schemes (Organic, EUREPGAP) for use in their meta-standard approach.</p> <p>Alternatively, if no certificate from one of the approved schemes is available, a producer may be assessed against GGL's own standard for agricultural or forestry biomass (Standards 'GGLS2 Agricultural Source Criteria', and 'GGLS5 Forest Management Criteria').</p> <p>Standards 'GGLS2 Agricultural Source Criteria' includes 6 sustainability principles and underlying criteria. The principles can be summarized as follows:</p>

	<ol style="list-style-type: none"> 1. The agriculture management system is part of an integrated long term planning program (either individually or organized in a group), aimed at development and sustainability; 2. The agriculture management system is based on land-use planning; 3. The agriculture management is aimed at land conservation and rehabilitation; 4. The agriculture management is aimed at the insurance of freshwater supply can quality for sustainable food production and sustainable rural development; 5. The agricultural management has implemented integrated pest management and control; 6. The agricultural management system has implemented sustainable plant nutrition to increase food production. <p>Standards 'GGLS5 Forest Management Criteria' includes 6 sustainability principles and underlying criteria. The principles can be summarized as follows:</p> <ol style="list-style-type: none"> 1. Long term tenure and use rights to the land and forest resources; 2. Management plan; 3. Environmental impact; 4. Monitoring and assessment; 5. Plantations; 6. Other sources than natural forests and plantations (woods < 5 ha, lanes and parks).
2.5 Chain of custody standard	<p>Biomass shall be traceable throughout the complete supply chain (from production up to and including end use). Operators may use a mass balance system or segregation system to physically trace material through the chain. Book and claim is not allowed.</p> <p>Starting from the pellet mill, all downstream operators that take legal ownership of the product are to be certified.</p>
2.6 National standards & interpretations	GGL has no national standards or interpretations, nor has it crop-specific standards. Note: In case the GGLS5 standard is applied for a specific region, the GGL Technical Committee will assess for this specific region the level of compliance.
2.7 Provisions for waste & residues	Currently, GGL does not include specific provisions for biomass considered waste or residue. Only for GGLS8: the usage of residue biomass from sawmills for instance doesn't include the full upstream GHG implications.
3. CERTIFICATION REQUIREMENTS	
3.1 General	The certification requirements have been laid down in the document 'Green Gold Label Certification Requirements'.
3.2 Audit process requirements (including stakeholder consultation)	An operator wishing to become certified under GGL shall submit an application for certification to a certification body recognized by the GGL Foundation. The certification body records all relevant documentation of the application, and shall make these documents available to the GGL Foundation upon request.

Audits are carried out according to GGL standards and the GGL Certification Requirement, and EN45011 requirements. The audit shall take place on the registered location.

Upon successful completion of the audit, a GGL certificate is issued with a validity of 16 months. Follow up audits shall take place annually.

The following types of GGL certificates can be granted, depending on the scope of the audit and the applicable standards:

Option	Criteria Green Gold Label Standards	Target group	Minimum verification frequency	Scope/product certificate	Remarks
GGL 1	GGLS 1 Chain of custody processing standards	Producers of fuels	Once per year	Scope certificate	
GGL 2	GGLS 2 Agricultural source criteria	Suppliers of agricultural input products for fuels	Once per year	Scope certificate	Required if input is not certified under one of GGL approved agricultural certification systems.
GGL 5	GGLS 5 Forest management criteria	Suppliers of input products from forestry for biofuels	Once per year	Scope certificate	Required if input is not certified under one of GGL approved forest management certification systems.
GGL 6	GGLS 6 Power company criteria	Producers of electricity	Once per year	Scope certificate	

Under GGL requirements, there are no requirements on stakeholder consultation during the audit process.

3.3 Certification Body and Auditor requirements

The certification body shall be EN45011/ISO65 accredited for GGLS1 and GGLS6, or become accredited not later than one year after applying to the GGL Foundation for recognition as a certification body. The accreditation body shall be a member of the European Accreditation/Multilateral Agreement (EA/MLA), or be a member of the International Accreditation Forum.

	<p>Audits shall be planned and carried out in accordance with EN 45011/ISO65.</p> <p>The auditors shall comply with the requirements laid down in the document 'Green Gold Label Certification Requirements'.</p>
3.4 Minimum level of assurance	<p>Green Gold Label distinguishes 'major non-conformities' and 'minor points':</p> <p>A major non-conformity is defined as 'the absence of, or ineffective implementation of, one or more required elements insuring product integrity (with regards to the applicable standards), or situation which raises significant doubt that products or services will meet specified requirements';</p> <p>A minor point is defined as 'a lapse of either discipline or control during the implementation of procedural requirements, which does not compromise product integrity or raise doubt that products or services will meet requirements'.</p> <p>Certificates will be granted on the following grounds:</p> <ul style="list-style-type: none"> • No major non-conformities have been identified during inspection; • The applicant has taken corrective actions and has communicated these to the certification body within one month after identification of a major non-conformity. The certification body must have concluded that the corrective actions to be sufficient to close/settle the major non-conformity; • Minor points do not obstruct certification. However, if the number of minor points is 20% or more of the total number of applicable items, the certification body shall maintain the rule that 20% (or more) minor points result in one single major non-compliance, and shall be treated as such. <p>Corrective actions are verified by the certification body (by visiting a location or in another way, e.g. by document review).</p>
3.5 Costs of certification	No details on certification costs have been obtained.
4. OTHER ASPECTS	
4.1 Track record	Currently, approximately 30 companies have been certified, including both pellet producers, traders and power companies. No companies have been certified against GGLS2 or GGLS5 criteria for sustainable agriculture respectively sustainable forest management.
4.2 Stakeholder perception	
4.3 Availability of help desk, tools & guidance	The website contains a contact form for questions per e-mail. No telephone contact details are provided.
4.4 Recognition of other schemes	<p>Green Gold Label has approved the following forest management certification schemes:</p> <ul style="list-style-type: none"> • FSC (Forest Stewardship Council), including 'FSC Controlled'; • PEFC (Pan European Forest Certification);

	<ul style="list-style-type: none"> • CSA-SFM (Canadian Standards Association's Sustainable Forest Management); • SFI (Sustainable Forest Initiative), including SFI Fiber Sourcing; <p>ATFS (American Tree Farm System) certification</p> <ul style="list-style-type: none"> • Approved pre-scope certificate of one of the endorsed forest management certification systems, with the intention of full certification. <p>Green Gold Label has approved the following agricultural certification systems:</p> <ul style="list-style-type: none"> • Organic; • EUREPGAP.
5. REFERENCES USED FOR THIS FACTSHEET	
	<ul style="list-style-type: none"> - www.greengoldcertified.org and system documentation contained in this website - NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011. - Personal communication with Mr B. Verkerk – Secretary of GGL Foundation

Module 360: Factsheet IWPB

(Version – November 2013)

Factsheet IWPB

This factsheet aims to provide accessible and factual information on the IWPB system. The information has been validated by Mr B. de Hue of NUON Vattenfall, who is closely involved in the development of the IWPB scheme. This factsheet presents the actual status of the system in August 2013. For more detailed information on the system, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official IWPB standards and procedures.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	The scheme is generally referred to as 'IWPB' or Initiative Wood Pellet Buyers. The final scheme is expected to have a different name.
1.2 Website	www.laborelec.be/ENG/services/sustainability/biomass-analysis/initiative-wood-pellet-buyers-iwpb
1.3 Scheme owner details	The scheme is currently under development. An entity which holds scheme ownership is under development.
1.4 General objective	<p>The original objective of IWPB was to facilitate trading of wood pellets between utilities, by standardizing utilities' approaches to (1) procurement contracts for wood pellets, (2) technical specification of wood pellets, and (3) the sustainability principles applicable to wood pellets/woody biomass sourcing and trading. For this purpose, a standard contract including technical specifications has been developed. Currently, the work of the IWPB is focused on developing a Standard and Assurance System for Sustainable Solid Biomass for large scale heat and power production.</p> <p>IWPB is currently in the process of drafting standards and the scheme lay out, as well as detailing the scheme's governance structure. IWPB distinguishes a two phase process:</p> <ul style="list-style-type: none"> • In phase 1 (up to Q4 2013), a scheme will be developed to demonstrate legal compliance with in particular UK and Belgium

	<p>legislation on sustainability of biomass (unification of existing standards, development of a certification scheme, and the establishment of a non for profit organization)</p> <ul style="list-style-type: none"> • In phase 2, the scheme and standard will be developed further using a multi-stakeholder dialogue.
1.5 Scheme governance	<p>1.5 Scheme governance The IWPB scheme development is led by a Board, comprising representatives of all seven participating utilities (Eon, RWE/Essent, Vattenfall, GDFSUEZ, Drax, Dong and Eggborough). The Board is in the process of installing a Director to lead the Standard and Scheme development process. Thereby the Director is assisted by the Steering Committee, consisting of experts of the 7 Members.</p> <p>IWPB is currently in the process of establishing a Sounding Board. The Sounding Board shall comprise of various stakeholders from civil society, science and industry, and provide advice to the Steering Committee in its strategic decision-making and the development of associated multi-stakeholder processes.</p>
2. THE STANDARD	
2.1 Types of biomass covered	Solid biomass for electricity/heat production, with an initial focus on wood pellets.
2.2 Geographic coverage	Global
2.3 Chain coverage	Aim is to cover the full supply chain.
2.4 Sustainability criteria covered	<p>IWPB has developed a draft set of 'Sustainability principles for woody biomass sourcing and trading' ('Version after joint meeting Schiphol, 5 June 2012), which includes 9 principles:</p> <ol style="list-style-type: none"> 1. Greenhouse gas balance: the greenhouse gas savings along the entire life-cycle, taking into account the whole supply chain including production, processing, transport and end-use are at least 60% with respect to reference fossil fuels; 2. Carbon stock: production of woody biomass does not take place at the expense of significant carbon reservoirs in vegetation and soil; 3. Biodiversity: production of woody biomass may not take place in areas with high biodiversity value, unless evidence is provided that the production of the raw material did not negatively interfere with nature protection purposes; 4. Protection of soil quality: production of woody biomass should maintain or improve the soil quality; 5. Protection of water quality: production of woody biomass should not exhaust ground and surface water and should avoid or significantly limit negative impacts on water; 6. Protection of air quality: production of woody biomass should avoid negative impact or significantly reduce impact on air quality; 7. Competition with local biomass use: production of wood biomass should not endanger food, water supply or subsistence means of communities where the use of this specific biomass is essential for the fulfillment of basic needs; 8. Local socio-economic performance: production of woody biomass should respect property rights and contribute to local prosperity

	<p>and to the welfare of the employees and the local population</p> <p>9. Ethics: ethical issues that the organization should uphold include at least health & safety, respect of internationally proclaimed human rights, freedom of association and the right to collective bargaining, elimination all forms of forced and compulsory labour, effective abolition of child labour, elimination of discrimination in respect of employment an occupation, promotion of greater environmental responsibility, high standards of business integrity, including the work against corruption in all its forms.</p> <p>IWPB envisages that a next version for consultation will be ready in Q4 2013.</p>
2.5 Chain of custody standard	IWPB envisages to establish a chain of custody system which allows traceability throughout the complete supply chain (from production up to and including end use). Operators may use a mass balance system or segregation system to physically trace material through the chain. Book and claim is not allowed.
2.6 National standards & interpretations	IWPB does not envisage to develop national standards or interpretations, nor has it crop-specific standards.
2.7 Provisions for waste & residues	<p>In the draft set of 'Sustainability principles for woody biomass sourcing and trading' ('Version after joint meeting Schiphol, 5 June 2012), IWPB has specified (draft) requirements for waste and residues:</p> <p><i>'Biomass produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues, need only fulfil Principle 1 (GHG balance). This is to encourage the use of waste for useful energy.</i></p> <p><i>According to the European Waste Directive, sawmill residues are processing residues and carry an EURAL number. In so far the sawmill are verified having not the deliberate intention to produce these materials or increase their volume and/or modify their quality, the by products can be regarded as residues.</i></p> <p><i>Forestry residues (for which all Principles) do apply do not include residues from related industries or processing (e.g. a sawmill) and are based on virgin wood that would not be exempted from sustainability principles for the purposes of IWPB. According to EU legislation, 'virgin wood' includes the woody parts of trees including branches and bark derived from forestry works, woodland management, tree surgery and other similar operations (it does not include clippings or trimmings that consist primarily of foliage). It is also timber from virgin wood processing (e.g. wood offcuts, shavings or sawdust from sawmills) or timber product manufacture dealing in virgin timber'.</i></p> <p>In addition, IWPB indicates that for post-consumer waste only the GHG-requirement will apply. For other residues it is still uncertain which sustainability criteria will apply.</p>

3. CERTIFICATION REQUIREMENTS	
3.1 General	IWPB has not yet specified certification requirements. IWPB expects to have a version ready for consultation in Q4 2013.
3.2 Audit process requirements (including stakeholder consultation)	IWPB has not yet specified audit process requirements.
3.3 Certification Body and Auditor requirements	IWPB has not yet specified certification body and auditor requirements.
3.4 Minimum level of assurance	IWPB has not yet specified a 'minimum level of assurance'
3.5 Costs of certification	No data available, as scheme is not yet operational.
4. OTHER ASPECTS	
4.1 Track record	The IWPB scheme is currently under development.
4.2 Stakeholder perception	IWPB envisages to involve stakeholders in its scheme development, by way of a Sounding Board and (in a later phase) an Advisory Board. The exact governance model for Track 2 is still under development. Stakeholders' perceptions of the scheme are likely to depend on how the Sounding Board and the multi-stakeholder dialogue is organized and executed in practice, as well as the ultimate contents of the scheme.
4.3 Availability of help desk, tools & guidance	Comprehensive documentation on the IWPB scheme is currently only available from the Laborelec website. The website section also contains documents from IWPB Steering Committee and Sounding Board meetings, which do provide some insight in the progress of scheme development.
4.4 Recognition of other schemes	Not yet applicable.
5. REFERENCES USED FOR THIS FACTSHEET	
<ul style="list-style-type: none"> - www.laborelec.be/ENG/services/sustainability/biomass-analysis/initiative-wood-pellet-buyers-iwpb - Personal communication with mr B. de Hue (NUON Vattenfall), member of the IWPB Steering Committee 	

Module 365: Factsheet FSC

(Version – November 2013)

Factsheet FSC

This factsheet aims to provide accessible and factual information on the FSC scheme. The information has been validated by FSC the Netherlands. This factsheet presents the actual status of the scheme in August 2013. For more detailed information on the scheme, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official FSC standards and procedures.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	The scheme is generally referred to as 'FSC'. Full name is: Forest Stewardship Council
1.2 Website	www.fsc.org
1.3 Scheme owner details	FSC is an international membership association.
1.4 General objective	FSC has defined its mission as: 'the Forest Stewardship Council A.C. (FSC) shall promote environmentally appropriate, socially beneficial, and economically viable management of the world's forests.
1.5 Scheme governance	<p>FSC is an international membership organization. Members may be organizational or individual. Members are from diverse background and include representatives of environmental and social NGOs, the timber trade, forestry organisations, indigenous people's organisations, retailers, forest owners, etc.</p> <p>The General Assembly of Members is FSC's highest decision-making body. The FSC Board of Directors is accountable to the FSC Members. It is made up of nine elected representatives, with three elected from each of the chambers for a three-year term.</p>

	<p>The day-to-day operations are executed by the IFC International Center in Bonn, Germany. In addition, FSC has network partners (national offices) in over 35 countries.</p> <p>Network partners represent FSC in their respective countries and have several tasks and responsibilities, amongst which are:</p> <ul style="list-style-type: none"> - Enhance FSC certification in the country - Protect the intellectual property rights and licensing rights of FSC in the country - Provide information on internationally approved interpretation for the use of the FSC systems in the country. - Coordinate the development and ongoing management of the national FM standard - Support the development and revision of international policies and standards. - Contribute to the implementation of FSC policy directed at National Offices (e.g. National Risk Assessments for Controlled Wood categories) , - Conduct market development activities
2. THE STANDARD	
2.1 Types of biomass covered	<ul style="list-style-type: none"> - Wood, including bamboo, and wood fibre products from forests (tropical, subtropical, boreal and temperate forests). - Reclaimed wood material (chain of custody certification only)
2.2 Geographic coverage	Global
2.3 Chain coverage	All stages of the supply chain from the forest up to the consumer. Starting from the production (forestry) and including all successive stages of processing, transport, manufacturing and distribution.
2.4 Sustainability criteria covered	<p>The generic FSC Principles & Criteria for sustainable forest management have been laid down in the FSC-STD-01-001 (version 4-0) document, and include the following 10 principles:</p> <ul style="list-style-type: none"> • Principle 1: Compliance with laws and FSC Principles; • Principle 2: Tenure and use rights and responsibilities; • Principle 3: Indigenous peoples' rights; • Principle 4: Community relations and worker's rights; • Principle 5: Benefits from the forest; • Principle 6: Environmental impact; • Principle 7: Management plan; • Principle 8: Monitoring and assessment; • Principle 9: Maintenance of high conservation value forests; • Principle 10: Plantations.

	<p>The generic FSC Principles & Criteria must be adapted into national, regional and locally applicable verifiers by National Standards Development Groups (refer to 2.6 below).</p> <p>N.B. In addition, there is the 'FSC Controlled Wood' certification requirements. FSC Controlled Wood is designed to allow organizations to mix FSC-certified wood with uncertified wood thereby avoiding the categories of wood considered unacceptable. The five categories of unacceptable wood include: illegally harvested wood, wood harvested in violation with traditional and civil rights, wood in which High Conservation Values are threatened by management activities, wood harvested in forests being converted to plantations or non-forest use, and wood from forests in which genetically modified trees are planted.). FSC Controlled Wood can only be mixed with FSC certified wood in the so-called percentage and/or credit system and are labeled as FSC Mix Products.</p>
2.5 Chain of custody standard	<p>The requirements for the chain of custody have been elaborated in the standard 'FSC-STD-40-004 Version 2-1 – FSC Standard for Chain of Custody Certification .</p> <p>The FSC Chain of Custody Program sets standards for three types of chain of custody certifications that companies can choose from depending on their scale and type of operation:</p> <ul style="list-style-type: none"> • Individual chain of custody certification; • Multiple-site chain of custody certification; • Project certification. <p>Operators may use a mass balance system or segregation system to physically trace material through the chain. Book and claim is not allowed.</p> <p>The Chain of Custody Program also provides additional standards that may be combined with the chain of custody certificate according to the scope of the organization seeking certification, including:</p> <ul style="list-style-type: none"> • The FSC Controlled Wood Standard is for companies that source non-certified material to be included in the production of FSC Mix products. The non-certified material is controlled to avoid mixing of wood from unacceptable sources with FSC certified material in FSC Mix products. Also refer to 2.4 • Reclaimed forest-based materials can be used as components in FSC certified products and projects. The Chain of Custody Program sets the requirements for purchasing, verification and classification of these materials. Also refer to 2.7.
2.6 National standards & interpretations	<p>Currently, there are approximately 40 national and regional FSC Forest Management Standards.</p> <p>An FSC National Standard is an adaptation of the international standard to the regional or national level, in order to reflect the diverse legal, social and geographical conditions of forests in different parts of the world.</p> <p>The process for developing the FSC Forest Stewardship Standards (FSS) follows standardized procedures, and are led by National Standards Development Groups, advised by the (international) FSC Forest Program.</p>

2.7 Provisions for waste & residues	<p>The FSC standard 'Sourcing reclaimed material for use in FSC Product Groups or FSC Certified Projects' (FSC-STD-40-007 (V2-0) EN) details under which conditions (non-certified) wood residues can be used in FSC certified products. It also specifies which type of wood residues are acceptable. These materials are classified as 'Materials accepted as reclaimed wood', and have been specified in Annex I of the aforementioned document (note that the list in the annex contains examples and is not exhaustive):</p> <p>Materials accepted as reclaimed wood material (non-exhaustive summary from Annex I) [15]</p> <ul style="list-style-type: none"> • Post-consumer wood sources (e.g. municipal sources, commercial, construction and demolition debris, material from waste facilities, etc.) • Post-consumer wood material (e.g. commercial transport packaging (e.g. pallets), construction and demolition debris, sawdust and the like generated during the re-milling of post-consumer wood products, deconstructed building materials, or wood reclaimed from C&D debris). • Pre-consumer wood sources (e.g. municipal sources, commercial, process waste from converters and secondary manufacturing onwards). • Pre-consumer wood material (e.g. damaged stock, rejected products, overstock, discontinued items not used for their intended purpose. Offcuts, shavings, sawdust, and the like, generated during secondary manufacture or subsequent steps in manufacturing an end product). <p>Not accepted as reclaimed wood material</p> <ul style="list-style-type: none"> • Wood material in the form of off-cuts produced from virgin parent materials that are discarded by a primary or secondary production process but that has properties allowing it to be reused on site by being incorporated back into the same manufacturing process that generated it. • Co-products from virgin parent materials (example: offcuts, shavings, sawdust, and the like, generated during primary manufacture of logs). • Forestry waste: Any virgin material considered as forest or urban waste. (e.g. branches, small or rotten pieces of wood, trunks of old trees and palms planted for food production, salvaged urban trees and underwater salvaged trees).
3. CERTIFICATION REQUIREMENTS	
3.1 General	FSC distinguishes four types of certification i.e. (1) forest management certification, (2) supply chain certification, (3) controlled wood and (4) special options for small, low intensity and community forest operations. Controlled wood is designed to allow organizations to avoid the categories of wood considered unacceptable.
3.2 Audit process requirements (including stakeholder consultation)	The certification body normally carries out a brief pre-assessment to allow them to flag up any areas where management may not meet the applicable requirements. Once the forest manager/supply chain operator is sure they have filled any gaps, they can apply for a full evaluation.

	<p>The main evaluation process is an in depth review of the forest management systems/chain of custody systems and their results on the ground. The certification body sends a team of experts to assess social, economic and environmental conditions at the operations being evaluated.</p> <p>At the end of the evaluation, the assessment team reports to the operator any areas where management does not meet the applicable requirements, known as 'non-conformities'. If these are minor non-conformities, the certification body can issue a certificate, on condition that actions will be taken to deal with the non-conformities. If these are major non-conformities, the certification body will not issue a certificate until the non-conformities have been solved.</p> <p>FSC certificates are valid for 5 years, with annual surveillance audits to verify continued compliance with FSC certification requirements. After 5 years, a recertification audit is required.</p>
3.3 Certification Body and Auditor requirements	<p>FSC standards certification bodies need to be FSC accredited.</p> <p>FSC certification bodies must operate in accordance with procedures set out in the FSC Accreditation Manual 'FSC general requirements for FSC accredited certification bodies – application of FSC-STD-20-001 (Version 3-0), similar to ISO/IEC Guide 65:1996. Accreditation Services International (ASI) is responsible for checking certification body compliance with FSC rules and procedures through a combination of field and office audits.</p> <p>Currently, there are approximately 20 FSC accredited certification bodies.</p>
3.4 Minimum level of assurance	<p>FSC identifies major and minor non-compliances (reference document: FSC-STD-20-011 V1-1 EN).</p> <p>A major non-compliance is a non-compliance which, either alone or in combination with other non-compliances, results in, or is likely to result in a fundamental failure to achieve the objective of the relevant requirement in the Chain of Custody operation(s) within the scope of the assessment. Such fundamental failure shall be indicated by non-compliance(s) which:</p> <ol style="list-style-type: none"> Continue over a long period of time; or, Are repeated or systematic; or, Affect a wide range of the production; or, Are not corrected or adequately responded to by the responsible managers once they have been identified.
3.5 Costs of certification	<p>Auditing costs (payable to auditor) and annual administration fee (payable to FSC).</p>
4. OTHER ASPECTS	
4.1 Track record	<p>As of 1 July 2013, approx. 181 million ha of forest was FSC certified. More than 26,000 Chain of Custody certificates issued.</p>
4.2 Stakeholder perception	

4.3 Availability of help desk, tools & guidance	<ul style="list-style-type: none"> - FSC has online stakeholder portal which allows the user to easily access further resources. The large resources database includes i.a. annual reports, case studies, technical guides, factsheets, research documents, documents for users and a photo and video gallery. - The FSC website provide a section with 'help' and frequently asked questions - The FSC website provides contact details for both the FSC international office, and the national FSC offices - info.fsc.org: with amongst others a database with all valid certificates, FSC Certificate Holder Portal Login (e.g. label generator)
4.4 Recognition of other schemes	FSC has not recognised other schemes.
5. REFERENCES USED FOR THIS FACTSHEET	
	<ul style="list-style-type: none"> - www.fsc.org and scheme documentation on the website - NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011. - Personal communication with Mr. R. Nozeman – FSC The Netherlands

Module 370: Factsheet PEFC (Version – November 2013)

Factsheet PEFC

This factsheet aims to provide accessible and factual information on the PEFC scheme. The information has been validated by PEFC The Netherlands, one of the endorsed national PEFC schemes. This factsheet presents the actual status of the PEFC scheme in August 2013. For more detailed information on the scheme, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official PEFC standards and procedures.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	<p>The scheme is generally referred to as 'PEFC', which stands for Programme for the Endorsement of Forest Certification schemes.</p> <p>To be more precise, there are different PEFC forest certification schemes with distinctive names, 'PEFC Nederland Scheme' (the Dutch national PEFC forest certification scheme), 'PEFC Germany Scheme' (the German national PEFC forest certification scheme). These schemes have been endorsed by PEFC provided that they meet the requirements of PEFC International scheme (the international umbrella scheme),</p> <p>There is only one PEFC certification scheme for the chain after the forest (Chain of Custody certification), of which PEFC International is the scheme owner.</p>
1.2 Website	<p>www.pefc.org (in English)</p> <p>www.pefcnederland.org (in Dutch)</p> <p>Refer to http://pefc.org/about-pefc/membership/national-members for websites of other national PEFC schemes</p>
1.3 Scheme owner details	<p>PEFC International is an international, non-profit, non-governmental organization, which works as an umbrella organization of national forest certification schemes it endorses (e.g. PEFC The Netherlands).</p>

1.4 General objective	'To promote good practice in the forest and to ensure that timber and non-timber forests products are produced with respect for the highest ecological, social and ethical standards'
1.5 Scheme governance	<p>PEFC International is an international membership organization representing a wide range of stakeholder interests. PEFC distinguishes two categories of members with voting rights:</p> <ul style="list-style-type: none"> • National members ('National Governing Bodies') are independent, national organizations established to develop and implement a PEFC system within their country; • International stakeholder members are international entities including NGOs, companies, and associations committed to supporting PEFC's principles. <p>PEFC has three decision-making bodies:</p> <ul style="list-style-type: none"> • The General Assembly is the highest authority of PEFC. It includes both national members and international stakeholder members with voting rights, and extraordinary members as observer; • The Board of Directors supports the work of the General Assembly and the organization as a whole. It is accountable to all members. Board members are elected by the General Assembly. Board members are chosen to ensure a balance between the major stakeholders supporting PEFC, the geographical distribution of members, annual cutting categories, and gender. • The Secretary General is responsible for the work of the PEFC Secretariat in Geneva, Switzerland. <p>National PEFC schemes have their own governance structure. The governance structure of national schemes will be evaluated in the endorsement process by PEFC international (the so called: PEFC's sustainability benchmark, see below)</p>
2. THE STANDARD	
2.1 Types of biomass covered	<ul style="list-style-type: none"> - Forestry biomass; - Recycled biomass material (refer to 2.7 for definition)
2.2 Geographic coverage	<ul style="list-style-type: none"> - Global. - National PEFC schemes cover certified forest areas in that particular country, and may include national or international supply chains.
2.3 Chain coverage	Forested areas, harvesting, transport, processing up to and including use in application.
2.4 Sustainability criteria covered	<p>The PEFC International Standard 'Sustainable Forest Management – Requirements '(PEFC ST 1003:2010) contains the following seven key criteria:</p> <ol style="list-style-type: none"> 1. Maintenance and appropriate enhancement of forest resources and their contribution to the global carbon cycle 2. Maintenance of forest ecosystem health and vitality 3. Maintenance and encouragement of productive functions of forests (wood and non-wood)

	<p>4. Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems</p> <p>5. Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water)</p> <p>6. Maintenance of other socio-economic functions and conditions</p> <p>7. Compliance with legal requirements</p> <p>Each criterion is further specified via a set of indicators. Annex I of the document contains the interpretation of the requirements for forest plantations.</p> <p>Furthermore the national scheme has to be set through a multi-stakeholder process (details on this process can be found in the PEFC document Standard Setting (PEFC ST 1001:2010)).</p>
2.5 Chain of custody standard	<p>Biomass shall be traceable throughout the complete supply chain (from forest up to and including the final application). Operators may use a mass balance system or segregation system to physically trace material through the chain. Book and claim is not allowed.</p> <p>All supply chain operators taking legal or physical ownership of biomass need to be PEFC certified.</p>
2.6 National standards & interpretations	<p>PEFC International is an umbrella organization, which endorses national forest certification schemes. National certification schemes that have developed standards in line with PEFC requirements can apply for PEFC endorsement (at PEFC International). To achieve endorsement, a scheme needs to meet PEFC's rigorous 'Sustainability Benchmarks', which includes detailed requirements for the endorsement process.</p> <p>Currently, there are some 32 endorsed national PEFC schemes, which can be found on the PEFC International website (www.pefc.org).</p>
2.7 Provisions for waste & residues	<p>PEFC supports recycling as it 'stimulates the careful use of our forest resources'. The PEFC chain of custody standard includes a specific clause for recycled material: recycled material (other than products delivered with the "PEFC certified" claim) can be sold as PEFC certified.</p> <p>PEFC defines recycled material as forest based material that is:</p> <p>(a) diverted from the waste stream during a manufacturing process. Excluded is reutilisation of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it. Excluded are by-products such as sawmilling by-products (sawdust, chips, bark, etc.) or forestry residues (bark, chips from branches, roots, etc.) as they do not represent "waste stream".</p> <p>and</p> <p>(b) generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.</p> <p>Note 1: The term "capable of being reclaimed within the same process that generated it" means that the material generated in one</p>

	<p>process is continuously returned to the same process at the same site. An example is residue generated by a press line in a panel board production which continuously re-enters the same press line. This is not considered as recycled material.</p> <p>Note 2: Material classified under the grades of recovered paper according to EN 643 is recognised as meeting the definition of the recycled material.</p> <p>Note 3: The definition is based on definitions of ISO 14021:1999.</p>
3. CERTIFICATION REQUIREMENTS	
3.1 General	<p>The certification requirements have been laid down in the document 'Annex 6 - Certification and Accreditation Procedures' and 'Certification Body Requirements – Chain of Custody (PEFC ST 2003:2012)'.</p>
3.2 Audit process requirements (including stakeholder consultation)	<p>The main assessment process is an in-depth review of the forest management systems/chain of custody and their results on the ground. The certification body sends a team of experts to assess social, economic and environmental conditions at the operations being evaluated.</p> <p>At the end of the evaluation, the assessment team reports to the operator any areas where management does not meet the applicable requirements, known as 'non-conformities'. If these are minor non-conformities, the certification body can issue a certificate, on condition that actions will be taken to deal with the non-conformities. If these are major non-conformities, the certification body will not issue a certificate until the non-conformities have been solved.</p> <p>'Certification Body Requirements – Chain of Custody (PEFC ST 2003:2012)' defines the requirements for certification bodies carrying out PEFC chain of custody certification.</p> <p>'Group Forest Management Certification (PEFC ST 1002:2010)' defines the general requirements for forest certification schemes which include group forest management certification and allow the certification of a number of forest owners/managers under one certificate.</p>
3.3 Certification Body and Auditor requirements	<p>PEFC International has laid down requirements to which all certification bodies approved by national PEFC schemes shall adhere:</p> <ul style="list-style-type: none"> • Independence from the standards development process and the entity they are certifying; • Compliance with ISO/IEC 17021: 2006 and/or ISO Guide 65: 1996. • Technical competence in forest management and its economic, social and environmental impacts and/or in forest-based product procurement and processing, and material flows in different stages of processing and trading; • Auditors of certification bodies must meet the criteria for quality and environmental management systems auditors as defined in ISO 19011: 2002; • Must be accredited by national accreditation bodies. <p>PEFC requires that national accreditation bodies comply with ISO/IEC 17011: 2004 to ensure that they operate in a consistent, comparable and reliable manner worldwide. Accreditation bodies need to be member of the International Accreditation Forum (IAF).</p>

3.4 Minimum level of assurance	Minor and major non-conformities are defined in Section 3.3 and 3.4 (and its consequences in Section 12.1)) of 'Certification Body Requirements – Chain of Custody (PEFC ST 2003:2012)'.
3.5 Costs of certification	National Governmental Bodies (NGB's) of PEFC (e.g. PEFC Netherlands, PEFC Germany, etc) have their own contribution fees for certified companies and forest owners. The fee is always independent from the amount of PEFC certified material that is bought or sold. Other costs of certification are determined by the certification bodies themselves, thus PEFC or the NGB's have no influence on those costs.
4. OTHER ASPECTS	
4.1 Track record	Globally, a total forest area of 244 million ha has been certified (> 750,000 forest owners), and over 15,000 companies have been chain of custody certified.
4.2 Stakeholder perception	PEFC is generally considered to be one of the two leading credible schemes in sustainable forest management (together with FSC).
4.3 Availability of help desk, tools & guidance	<ul style="list-style-type: none"> - The PEFC international website contains a comprehensive 'Help & Support' section. This section guides the user to contact either PEFC International, or a national PEFC scheme. - There is no separate (international) help desk
4.4 Recognition of other schemes	PEFC International has currently endorsed 32 national forestry certification schemes. Other biomass certification schemes have not been recognised by PEFC.
5. REFERENCES USED FOR THIS FACTSHEET	
	<ul style="list-style-type: none"> - www.pefc.org and scheme documentation on that website - www.pefcnederland.org for information on PEFC The Netherlands - NL Agency (2011). How to select a biomass certification scheme? Utrecht (the Netherlands), May 2011. - Personal communication with Mr. H. van Veen (PEFC The Netherlands).

Module 375: Factsheet CSA-SFM (Version – November 2013)

Factsheet CSA-SFM

This factsheet aims to provide accessible and factual information on the CSA-SFM scheme. The information has been validated by the CSA SFM User Group. This factsheet presents the actual status of the scheme in August 2013. For more detailed information on the scheme, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official CSA SFM standards and procedures

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	The scheme is referred to as 'CSA SFM' or sometimes 'CSA' . The scheme's full name is: CAN/CSA Z809-08 Sustainable Forest Management
1.2 Website	www.csasfmforests.ca
1.3 Scheme owner details	The scheme owner is CSA Group, which is not for profit membership-based association for development of standards and codes.
1.4 General objective	1To achieve sustainable forestry management in Canada, by implementing standards that are complementary to Canada's legislative framework for forestry, and with a strong involvement of local stakeholders.
1.5 Scheme governance	The scheme owner is CSA Group(CSA). Standard development and review is done by the CSA SFM Technical Committee, comprising of representatives of timber producers (forest owners), scientists, provincial and federal governments, as well as environmental, consumer, union and Aboriginal representatives.

2. THE STANDARD	
2.1 Types of biomass covered	Forest based biomass (wood)
2.2 Geographic coverage	Canada
2.3 Chain coverage	Forest management in 'Defined Forest Areas' (DFA). Forest planning, wood harvesting, processing, , transport to primary manufacturing facility, reforestation.
2.4 Sustainability criteria covered	<p>The CSA SFM standard includes three related key elements:</p> <ol style="list-style-type: none"> 1. Public participation requirements; 2. Performance requirements; 3. System requirements. <p>The CSA SFM includes elaborate and specific requirements on public participation processes (Clause 5 of the CSA SFM standard). The need for public consultation is strongly emphasized in the Standard itself. The Standard requires operators to seek comprehensive, continuing public participation and to work with Aboriginal people at the local community level. The public identifies forest values of specific importance to environmental, social and economic concerns and needs. The public also takes part in the forest planning process and works with the operator to identify key sustainability objectives, indicators and targets to ensure that these values are addressed.</p> <p>'SFM System requirements' focus in particular on continual improvement processes.</p> <p>The 'performance requirements' comprise a combination of 6 key criteria and underlying elements. The key criteria can be summarized as follows:</p> <ol style="list-style-type: none"> 1. Conservation of biological diversity: conserve biological diversity by maintaining integrity, function, and diversity of living organisms and the complexes of which they are part; 2. Maintenance and enhancement of forest ecosystem condition and productivity: conserve forest ecosystem condition and productivity by maintaining the health, vitality, and rates of biological production; 3. Conservation of soil and water resources: conserve water and soil resources by maintaining their quantity and quality in forest ecosystems; 4. Forest ecosystem contributions to global ecological cycles: maintain forest conditions and management activities that contribute to the health of global ecological cycles; 5. Multiple benefits to society: sustain flows of forest benefits for current and future generations by providing multiple goods and services; 6. Accepting society's responsibility for sustainable development: Society's responsibility for sustainable forest management requires that fair, equitable, and effective forest management decisions are made.

2.5 Chain of custody standard	<p>Biomass shall be traceable throughout the complete supply chain (from forest up to application in the final product). Operators may use a 'physical separation method' or 'percentage based method' (mass balance system) to physically trace material through the chain. Book and claim is not allowed.</p> <p>Organizations certified to the CSA SFM standard use the PEFC International chain-of-custody standard PEFC ST 2002:2010 (to be replaced by PEFC ST 2002:2013 by February 2014).</p> <p>All supply chain operators taking ownership of biomass need to be supply chain certified.</p>
2.6 National standards & interpretations	CSA SFM is a Canadian sustainable forestry management standard. CSA SFM does not include standards or interpretations for sustainable forestry management in other countries.
2.7 Provisions for waste & residues	<p>The CSA SFM does not include specific provisions for waste and residues from forestry management.</p> <p>Under the public participation requirements, public discussion is required on biomass utilization – the Standard expects that these discussions initially focus on the immediate uses of non-timber biomass (e.g., left on site, burned, removed for energy or other purposes). Subsequent discussions are to examine future expectations for biomass use, with emphasis on the ecological and cultural impacts of such biomass removals. If the organization intends to remove biomass, it should develop clear operational guidelines for the sustainable removal of bio-mass from forest ecosystems.</p> <p>Under CSA SFM, all biomass from sustainably managed forests automatically qualifies as CSA SFM certified biomass.</p>
3. CERTIFICATION REQUIREMENTS	
3.1 General	Certification requirements
3.2 Audit process requirements (including stakeholder consultation)	<p>The initial audit comprises of two stages, i.e. a preliminary assessment/documentation review and a certification audit. Both stages shall include audit time at the forestry unit (field visit).</p> <p>Upon successful completion of the initial audit, the certificate is issued. Annual surveillance audits are conducted to monitor the operator's performance, and his remediation of previously identified non-conformance. A full re-certification audit is required every three years, in accordance with the requirements of the Standards Council of Canada.</p> <p>The CSA SFM Standard includes elaborate and specific requirements for stakeholder consultation (also see 2.4 above)</p>
3.3 Certification Body and Auditor requirements	<p>Certification bodies shall be accredited by the Standards Council of Canada.</p> <p>Individual auditors employed or contracted by the certification body shall have the required forestry expertise and shall be certified as environmental auditors.</p>

3.4 Minimum level of assurance	<p>CSA SFM distinguishes major and minor non conformances. While minor non conformances do not necessarily prevent certification, major non conformances will normally disqualify an organization from certification or lead to de-certification. A major non conformance is any one or combination of the following:</p> <ul style="list-style-type: none"> • One or more numbered requirements of the Standard have not been addressed; • One or more number requirements of the Standard have not been implemented; or, • Several (minor) non conformances exist that, taken together, lead the auditor to conclude that one or more numbered requirements of the Standard have not been addressed.
3.5 Costs of certification	<ul style="list-style-type: none"> - While there are no required fees for forest certification, there is a voluntary contribution to support the CSA SFM Standard. - CSA SFM auditing costs are payable to the auditor - Recognition by PEFC requires payment of a PEFC Canada notification fee. - Annual fees for chain-of-custody certification are collected by PEFC Canada.
4. OTHER ASPECTS	
4.1 Track record	As of December 2012, over 44 million hectares of Canadian forests were certified against the CSA SFM standard.
4.2 Stakeholder perception	The CSA-SFM standard has a strong emphasis on involvement of local stakeholders during all phases of certification (process). It includes more than 50 formalized public advisory groups. The CSA SFM standard claims this provides the standard with excellent stakeholder support.
4.3 Availability of help desk, tools & guidance	<p>The website contains scheme information and some further guidance for stakeholders wishing to become involved.</p> <p>The website does provide a general e-mail address that can be contacted for further information.</p>
4.4 Recognition of other schemes	CSA-SFM has not recognised other schemes. The CSA SFM standard uses the PEFC International COC standard PEFC ST 2002:2010 (to be replaced by PEFC ST 2002:2013 by Feb 2014).
5. REFERENCES USED FOR THIS FACTSHEET	
	<ul style="list-style-type: none"> - www.csasfmforests.ca - Personal communication with Mr. Paul Wooding, PEFC Canada Secretary, CSA Group and advisors to the CSA SFM User Group.

Module 380: Factsheet SFI

(Version – November 2013)

Factsheet SFI

This factsheet aims to provide accessible and factual information on the SFI scheme. The information has been validated by SFI Inc., the scheme owner of the SFI certification system. This factsheet presents the actual status of the scheme in August 2013. For more detailed information on the scheme, the reader may visit the website of the certification scheme or contact the scheme owner.

Disclaimer: the information contained in this factsheet is for informational purpose only and cannot be used in replacement of the official SFI.

SCHEME FEATURE	DESCRIPTION
1. GENERAL	
1.1 Name of scheme	The scheme is generally referred to as 'SFI Inc'. Full name is: Sustainable Forestry Initiative Inc.
1.2 Website	www.sfiprogram.org (available in English, French and Spanish)
1.3 Scheme owner details	SFI Inc., an independent, non-profit, charitable organization registered in the United States 'dedicated to promoting sustainable forest management in North America and supporting responsible procurement globally'.
1.4 General objective	SFI Inc. is an independent, nonprofit organization that is solely responsible for maintaining, overseeing and improving the internationally recognized Sustainable Forestry Initiative® (SFI®) program. It promotes sustainable forest management across North America and responsible fiber procurement globally.
1.5 Scheme governance	SFI Inc. is an independent, non-profit, charitable organization. SFI Inc. directs all elements of the SFI program including the SFI forest standard, chain of custody certification, responsible fiber sourcing requirements, and labeling and marketing.

	<p>SFI Inc. has a three chamber Board of Directors representing environmental, social and economic interests equally. The program addresses local needs through its grassroots network of 37 SFI Implementation Committees across North America.</p> <p>In addition, the SFI has established an External Review Panel, including representatives from environmental/conservation NGOs, science and public/government organizations, which provides an ongoing independent review of the SFI program and advises its Board of Directors.</p> <p>The SFI Standard is revised every five years in an open, public process. The transparent standard review process is overseen by the SFI Board of Directors and the board's Resources Committee.</p> <p>SFI's External Review Panel ensures the development and revision of the SFI Standard embodies an open, fair and inclusive process that addresses the ideas and concepts forwarded through comments submitted. All comments submitted during the public review periods and Workshops are reviewed by the External Review Panel to assess how these comments have been addressed.</p>
2. THE STANDARD	
2.1 Types of biomass covered	All forest biomass
2.2 Geographic coverage	<ul style="list-style-type: none"> -forest certification in the United States and Canada -global certification of SFI certified sourcing and chain of custody
2.3 Chain coverage	From the forest through the supply chain. This includes Forestry, harvest, and processing up to final product.
2.4 Sustainability criteria covered	<p>The SFI standard includes 20 objectives for sustainable forestry, which can be summarized as follows:</p> <ol style="list-style-type: none"> 1. Forest management planning; 2. Forest productivity; 3. Protection and maintenance of water resources; 4. Conservation of biological diversity including forests with exceptional conservation value; 5. Management of visual quality and recreational benefits; 6. Protection of special sites; 7. Efficient use of forest resources; 8. Landowner outreach; 9. Use of qualified resource and qualified logging professionals; 10. Adherence to Best Management Practices; 11. Promote conservation of biological diversity, biodiversity hotspots and high-biodiversity wilderness areas; 12. Avoidance of controversial sources including illegal logging; 13. Avoidance of controversial sources including fiber sourced from areas without effective social laws;

	<p>14. Legal and regulatory compliance; 15. Forestry research, science and technology; 16. Training and education; 17. Community involvement in the practice of sustainable forestry; 18. Public land management responsibilities; 19. Communications and public reporting; 20. Management review and continual improvement.</p> <p>These 20 objectives can be categorized as follows:</p> <ul style="list-style-type: none"> • SFI Standard land management objectives 1-7 provide measures for evaluating program participants' conformance with the SFI 2010- 2014 Standard on forest lands they own or control through long-term leases. • SFI Standard fiber sourcing objectives 8-10 provide measures for evaluating program participants' conformance with the SFI 2010- 2014 Standard through their fiber sourcing programs within the United States and Canada. • SFI Standard fiber sourcing objectives 11-13 provide measures for evaluating program participants' conformance with the SFI 2010- 2014 Standard through their fiber sourcing programs outside the United States and Canada. • SFI Standard land management and fiber sourcing objectives 14-20 provide measures for evaluating all program participants' conformance with the SFI 2010-2014 Standard for research, training, legal compliance, public and landowner involvement, management review and continual improvement.
2.5 Chain of custody standard	<p>Biomass shall be traceable throughout the complete supply chain (from production up to and including end use). Operators may use a mass balance system or segregation system to physically trace material through the chain. Book and claim is not allowed.</p> <p>In the mass balance standard, material from SFI certified forests can be mixed with material from non-SFI certified forests. It is a requirement however, that all material from non-SFI certified forests must be from non-controversial sources, pre or post consumer recycled content or fiber that complies with the SFI fiber sourcing requirements (objective 8-20 listed under '2.4 sustainability criteria').</p> <p>The SFI Chain of Custody Standard is based on the internationally recognised PEFC Chain of Custody requirements.</p>
2.6 National standards & interpretations	<p>SFI has no national standards or interpretations.</p> <p>The SFI standard is a single standard applicable in both the U.S. and Canada. Standard interpretations are publicly available on the SFI website.</p>
2.7 Provisions for waste & residues	<p>SFI has not detailed specific provisions for waste & residues.</p>

3. CERTIFICATION REQUIREMENTS	
3.1 General	Section 9 of the SFI Program specifies 'SFI 2010-2014 Audit procedures and Auditor Qualifications and Accreditation'.
3.2 Audit process requirements (including stakeholder consultation)	<p>Audits shall include examination of operating procedures, materials relating to forestry practices and on-the-ground field performance, and through meetings with employees, contractors and other third parties (e.g. government agencies, community groups, conservation organizations), as appropriate.</p> <p>A certificate is issued only after the independent certification body determines a specific operation conforms to the SFI requirements – for forests, chain of custody or certified sourcing. Annual surveillance audits are mandatory on all certified operations, and a full re certification audit is required for forest operations every three years and every five years for chain of custody and certified sourcing for secondary producers.</p>
3.3 Certification Body and Auditor requirements	<p>Certification bodies must be accredited by the American National Standards Institute (ANSI), the ANSI-ASQ National Accreditation Board (ANAB) or the Standards Council of Canada (SCC).</p> <p>Auditors must comply with ISO 19011 requirements and, in addition, SFI audit members shall have competency in and comprehension of forestry operations and natural resource management, sustainable forestry management systems and performance standards, and certification requirements of the SFI program.</p> <p><i>Certification bodies and auditors</i> must follow International Standard ISO 19011:2002, Guidelines for Quality and/or Environmental Management Systems Auditing, in auditing to the SFI 2010-2014 Standard and International Organization for Standardization (ISO) 17021:2006 conformity assessment requirements for bodies providing audit and certification of management systems; and all SCC and ANAB requirements.</p> <p><i>Certification bodies</i> must successfully complete annual witness audits to maintain accreditation status from ANAB or SCC.</p>
3.4 Minimum level of assurance	SFI distinguishes major and minor nonconformities.
	<p><i>Major non-conformity:</i> One or more of the SFI 2010-2014 Standard performance measures or indicators has not been addressed or has not been implemented to the extent that a systematic failure of a Program Participant's SFI system to meet an SFI objective, performance measure or indicator occurs.</p> <p><i>Minor non-conformity:</i> An isolated lapse in SFI 2010-2014 Standard program implementation which does not indicate a systematic failure to consistently meet an SFI objective, performance measure or indicator.</p> <p>The consequences of major and minor nonconformities are defined as follows:</p>

	<p><i>'If a major nonconformity is found, a certificate of conformance shall not be issued until the certification body verifies that corrective action approved by the lead auditor has been implemented. A revisit may be required to verify implementation of corrective action.'</i></p> <p><i>'If a minor nonconformity is found, a certificate of conformance may be issued only after the lead auditor approves a corrective action plan that addresses the conformity within an agreed-upon period, not to exceed one year. Verification that the corrective action has been effectively implemented shall occur during the next surveillance audit.'</i></p>
3.5 Costs of certification	<p>Forest management Organizations and primary manufacturers pay an annual fee to SFI Inc. and they must support SFI Implementation Committees in the state(s), province(s) or region(s) where they operate. They are responsible for the cost of the audit and any improvements needed to meet the standard requirements.</p> <p>There is no fee that needs to be paid to SFI Inc. for chain-of-custody certification. Companies are responsible for the cost of the audit. For cost estimates, companies need to contact an SFI-accredited certification body.</p> <p>There is no fee that needs to be paid to SFI Inc. for the use of the label.</p>
4. OTHER ASPECTS	
4.1 Track record	<p>Across the United States and Canada, over 247 million acres/100 million hectares are certified to the SFI forest management standard. There are currently 1,038 chain of custody certificates covering 2,736 locations.</p>
4.2 Stakeholder perception	<p>It is difficult to assess the stakeholder support of the SFI scheme from the Dutch perspective. The following points are worth noting:</p> <ul style="list-style-type: none"> • The SFI has established an External Review Panel, including representatives from environmental/conservation NGOs, science and public/government organizations, which provides an ongoing independent review of the SFI program and advises its Board of Directors; • The SFI chain of custody scheme has been endorsed by PEFC International. • The SFI Standard is recognized by governments, corporations, and social and environmental groups across North America and globally. For example, the UK's Central Point of Expertise on Timber (CPET) includes the SFI program among those that met its government's requirements for "legality" and "sustainability".
4.3 Availability of help desk, tools & guidance	<p>The SFI website provides contact details of both US and Canada based SFI offices</p>
4.4 Recognition of other schemes	<p>The SFI program recognizes PEFC-endorsed standards in North America by accepting fiber certified to the SFI, ATFS and CSA CAN/CSA Z809 standards for the SFI on-product label. As a result, the SFI program has access to fiber from 70 percent of certified forests in North America.</p>

5. REFERENCES USED FOR THIS FACTSHEET

- www.sfiprogram.org and scheme documentation on this website
- Personal communication with SFI Inc. Staff



John Veerkamp

This is a publication of:

NL Agency
NL Energy and Climate Change
Croeselaan 15
Postbus 8242 | 3503 RE Utrecht
The Netherlands
T +31 (0) 88 602 24 58
www.agentschapnl.nl/biomass

© NL Agency

No rights may be derived from this brochure, or from any of the examples contained herein, nor may NL Agency be held liable for the consequences arising from the use thereof.

NL Agency is an agency of the Dutch ministry of Economic Affairs responsible for the implementation of sustainability, innovation and economic development programmes for various governmental bodies. NL Agency is a department of the Dutch Ministry of Economic Affairs that implements government policy for sustainability, innovation, and international business and cooperation. It is the contact point for businesses, educational institutions and government bodies for information and advice, financing, networking and regulatory matters.