Sustainable Biomass

Selecting a biomass certification system – a benchmark on level of assurance, costs and benefits

NL Agency

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

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Guidance for the Reader

This document aims to provide guidance to organizations and operators involved in the production of biofuels and biomass for energy purposes to select a reliable and cost-effective sustainability voluntary certification system.

The objective of this study is to provide a deeper understanding of the differences between voluntary certification systems for biofuels and biomass for other energy purposes; this in terms of their level of assurance, their scope, and their benefits and costs of certification. The outcomes of this study provide all background information on these systems for market parties to make their selection according to their specific sustainability goals and their supply chain characteristics.

This study has been carried out in the period from December 2011 to January 2012 and was funded by the Netherlands Programmes for Sustainable Biomass of NL Agency. The study builds on the outcomes of the report How to select a biomass certification scheme? (NL Agency, 2011)

Chapter 1 gives an introduction and background information to explain the reasons why this study is implemented. Chapter 2 presents the objective and approach followed in this study. Chapter 3 on "scope of study" presents a first introduction of the voluntary certification systems, followed by an introduction on the coverage of the selected certification systems in terms of Chain of Custody and principles and criteria in Chapter 4. Chapter 5 discusses in detail the level of assurance of the selected certification systems and the differences between them. Chapter 6 and 7 present an overview of the direct costs, indirect costs and benefits of voluntary certification systems. Differences between the evaluated systems are discussed as well. Chapter 8 presents conclusions of our findings.

Annexes provide more detailed information about the findings on level of assurance, presented in benchmark tables, and costs.

Factsheets for the individual voluntary certification systems are available as well. These factsheets are presented in online annexes that can be separately downloaded from the website of NL Agency: http://www.agentschapnl.nl/en/programmas-regelingen/publications-sustainable-biomass.

This report expresses the opinion of the authors, and not necessarily NL Agency's views.

The information for this report was compiled with the utmost care. Comments or suggestions on the information presented in this report are highly welcomed: please contact the authors to share your views.

The authors cannot be held responsible for the consequences of any errors or mistakes in the report.

List of abbreviations

Relevant abbreviations:

CB	Certification Body
CoC	Chain of Custody
EC	European Commission
EU-RED	European Renewable Energy Directive
FGP	First Gathering Point
GHG	Green House Gas
ISCC	International Sustainability and Carbon Certification
NEa	Dutch Emissions Authority
NTA	Nederlandse Technische Afspraak (Dutch Technical Agreement)
RSB	Roundtable on Sustainable Biofuels
RSPO	Roundtable on Sustainable Palm Oil
RTRS	Roundtable on Responsible Soy

Acknowledgements

Executive Summary

The objective of this study is to provide a deeper understanding of the differences between voluntary certification systems used for biofuels and biomass for other energy purposes; this in terms of their level of assurance, their scope, and their benefits and costs of certification. The outcomes of this study provide all background information on these systems for market parties to make their selection according to their specific sustainability goals and their supply chain characteristics.

The following certification systems are evaluated: Bonsucro, ISCC, NTA8080/81, REDcert (German version), Roundtable on Sustainable Biofuels (RSB), Roundtable on Sustainable Palm Oil (RSPO), Roundtable on Responsible Soy (RTRS) and 2BSvs. In all cases, with exception of REDcert, the EU versions of these systems were evaluated. The evaluated systems deal differently with how to include the RED requirements in their system. For some systems the EU-RED version is stricter than their original version (e.g. ISCC) while this is the opposite for other systems (e.g. NTA8080).

This study did not look at the differences in sustainability requirements between systems. More information on this aspect can be found in the report: How to select a biomass certification scheme? (NL Agency, 2011).

Chain of Custody
The studied systems offer different methods for the coverage of the Chain of Custody (CoC). The most versatile systems are RSB and RSPO because they are prepared for all the four CoC methods (identity preservation, physical segregation, mass balance and book and claim). It must be noted that using the book and claim method is not allowed under the EU-RED because it does not require traceability; ISCC can apply the three methods that require traceability; RTRS cannot enforce the identity of product to be preserved, and NTA8080 allows for segregation and mass balance options.

Systems differ in the *coverage* of the supply chain. Although farmers are included in the audits of all certification systems, they are not necessarily the first certificate holder. The first certificate holder for Bonsucro and RSPO is the mill; for 2BSvs and REDcert it is the first gathering entity. Farmers are in principle the first certificate holders for RSB, RTRS and NTA8080.

The form of auditing (field or desk audits, sampling conditions) farmers shows large differences between systems, and therefore on the level of assurance. REDcert and ISCC make use of self-declarations of farmers. Bonsucro, RSPO and 2BSvs make use of a self-declaration to a limited extent, mainly for demonstrating compliance for a specific criterion (e.g. historic land use in the case of 2BSvs). Other data are to be monitored through an internal control system or audited on the field. For 2BSvs, the auditor uses risk analysis to determine whether or not it is necessary to perform a field audit on the farm. A field audit is not necessary when documentation provided by the farm offers sufficient assurance. In this case, the audit is called a desk audit.

The Chain of Custody requirements apply to all producers that physically handle and/or own a product in the chain. Exceptions exist for paper traders, outsourced activities and re-blenders. It is important to note that not all sustainability principles in a certification system are equally applicable to the stakeholders in the value chain. Generally, the principles and criteria (e.g. on biodiversity, water, soil, etc.) apply to the raw material producers only. In general, subsequent stakeholders only need to apply the GHG reduction requirement and a proper mass balance to the rest of the Chain of Custody. Distinctive from the other systems is the RSB that explicitly also requires compliance with e.g. labour conditions to biofuel processors.

Level of assurance

A selection of six topics for assessing and benchmarking the level of assurance of voluntary systems is used in this study. These topics are based on requirements and guidelines set by the draft of the ISEAL Assurance Code, and by the Dutch assessment protocol for voluntary sustainability systems for biofuels. Topics' requirements in this assessment are broader and stricter than under the EU-RED.

The benchmark is developed to show the relative differences between the systems on level of assurance. The benchmark does not intend to give a judgment on the systems.

The benchmarking between systems has been performed for the following six topics:

1. Management of the system including transparency of information, stakeholder engagement and availability of a complaints system. 2BSvs has limited coverage of these, whereas RSB covers them well. Stakeholder consultation is well covered under RTRS, RSPO, RSB and Bonsucro.
2. Quality requirements for auditors. Personnel competencies of auditors are required in all systems. ISO accreditation requirements are not explicit under 2BSvs.
3. Auditing procedures. The evaluated systems differ in their definition on verification procedures. RTRS checks in the field if farmers are on the payroll while ISCC assumes compliance when international agreements are recognised. RSB and 2BSvs are the only systems that may make use of *desk audits*. RSB provides the option for a desk audit only under restricted conditions, which does not seem to risk the level of assurance. The approach from 2BSvs is different and is based on the auditor's opinion if documentation provides sufficient proof to ensure compliance. All systems still have very limited experiences on non-compliance (or even fraud) and clear procedures on how to communicate non-compliance of companies to other buyers in the supply chain are not clearly described (with the exemption of RSB and RTRS and RSPO to some extent).
4. Sampling, group and multi-site certification procedures. Sampling requirements and conditions differ strongly per system. 2BSvs and REDcert have the most lenient conditions in terms of requirements related to sampling, although due to different reasons. Conditions under RTRS and NTA8080 are the strictest.
5. Chain of custody requirements and procedures. The continuous balancing method is considered more accurate than the fixed inventory period. The continuous method is required by RSPO and RSB. This method is also possible under RTRS, Bonsucro and ISCC. 2BSvs, NTA8080 and REDcert only require the fixed inventory period of their operators.
6. Recognition or affiliation of system and acceptance of other systems. ISCC accepts certificates from all other EU recognised systems. 2BSvs and REDcert accept other EU recognised systems as well although implementation so far is limited; 2BSvs requires officially a Multi Lateral Agreement and gap analysis in order to do so. NTA8080, RSB, RTRS, RSPO and Bonsucro only accept certificates from other systems in case there is a level playing field in requirements. A clear risk identified on the acceptance of systems, is that the claim of the end user does not necessarily represent all the sustainability requirements of the system, as it is the case for ISCC when accepting a certificate of 2BSvs.

Issues like accreditation, sampling requirements, level of verification, stakeholder consultation, complaints procedures, transparency, or recognition of other EU systems, are not mentioned as requirements in the EU-RED or are only generally defined. This study shows that there is a variation in assurance requirements between systems for those points where the EU-RED lacks guidance or provides room for interpretation (e.g. sampling, outsourcing activities). More harmonization exists for those points where the EU-RED gives clear procedures and rules (e.g. third party evaluation and mass balance).

Market parties are in general not familiar with the specific details and requirements of a voluntary certification system. They rely, in that respect, on the reputation and communication

of the systems, assuring a good level of assurance. Trustworthiness of a certification system is important for the market, as well as costs, practicality and market acceptance.

Costs of certification
The analysis of costs for certification includes direct and indirect costs. Complying with the sustainability requirements of a system causes the following direct costs: certification fees and auditing costs. Although large differences have not been found, there are some differences in auditing costs per system, i.e. required auditing days are generally lower for 2BSvs and REDcert compared to the rest of the evaluated systems. The cost structure of the system has large influence on the total direct certification costs and may be substantial in some cases – depending on the characteristics of the operator. Indirect costs are the costs for meeting the requirements of the certification system; they can be significant for a company, especially in the first year of certification. There are administrative indirect costs and indirect costs related to sustainability compliance. All systems result in a similar level of indirect costs, except 2BSvs for which the indirect costs are expected to be lower.

Generally, required auditing costs and indirect costs per year are highest at the start of the supply chain: at the farmer or the plantation. Indirect costs for certification will depend on the preparedness of an operator. Which actors in the chain have the highest and lowest certification costs in €/tonne per year depends largely on product volumes. Certification costs can be reduced substantially when a producer decides to handle larger product volumes or to merge his product with other product flows.

Certification cost seems to be relatively small in comparison to the total production cost – especially when larger volumes are handled. This does not mean that yearly (investment) costs may not be substantial for operators, especially for those with limited financial capacity.

Benefits of certification
Two types of benefits can be distinguished: internal company benefits and external benefits. Internal benefits may be visible in a company on a medium term and after certain investments to meet sustainability are done. External benefits relate to meeting demands of the market, legal compliance or receiving a price premium. It is expected that the actors at the end of the supply chain will receive most of the external benefits. Farmers/plantations will receive most of the internal benefits, largely enforced through the systems' requirements.

Concluding remarks
There is a relation between costs, benefits and level of assurance between voluntary certification systems. At the same time, there are also many external factors that influence the costs and benefits of a system.

There is a discrepancy in balancing costs and benefits in terms of time and place in the chain.

It can be concluded that the systems that are most compatible with the requirements as benchmarked in this study, are also the more expensive ones. 2BSvs is cheaper but is also the system that complies the least with the requirements as benchmarked in this study.

It is very important that companies select the certification system that best suits their supply chain characteristics and their sustainability goals. When selecting a certification system, a company will need to make a thorough assessment based on expected costs and benefits, on its own strategy, company structure and its position in the market.

1   Introduction

The European Renewable Energy Directive (EU-RED) requires that biofuels and bioliquids for heat and power should meet the sustainability requirements in that Directive in order for them to be counted towards national targets of each Member State, to be used for complying with obligations on the supply of renewable energy, and to be eligible for financial support (Article 17.1). The biofuel or bioliquid must have a valid proof of sustainability from a voluntary sustainability system (either a certification or a verification system), which is recognised by the European Commission (EC) or temporarily recognized by a Member State. Alternatively, the biofuel or bioliquid is accepted as sustainable by the national verification system in those Member States where such systems have been established or the sustainability claim can be made on biofuels and bioliquids coming from countries with bilateral or multilateral agreements with the EU.

The position of the economic operator with the responsibility to prove the sustainability claim to the authorities differs from country to country. Current national legislations impose this responsibility to the producer or importer (Belgium and most likely Austria and Portugal), or to the supplier to the national market (e.g. Netherlands, Sweden, UK), (CNE, 2012). It is generally the first party in a country intending to place biofuels and other bioliquids on the market.

The sustainability information handed over to the national authorities differs from Member State to Member State (CNE, 2012). In the Netherlands, economic operators with a registration duty must submit a biofuels balance to the national regulator. This balance includes information about the used sustainability system, the country of origin and the GHG reduction requirement with respect to the fossil reference (Regulation, 2011).

The voluntary sustainability systems that companies are allowed to use to prove sustainability of biofuels are those ones recognised by the EC or that have been approved (temporarily) by a national government. On 19 July 2011, the EC has approved 7 certification systems for biofuels and other bioliquids. Twenty more systems are currently in the evaluation process for recognition. Apart from these systems, eight additional voluntary systems have been temporarily approved in the Netherlands for demonstrating the sustainability of biofuels until July 2012. These are (NEA, January 2012): NTA8080/81, Biograce, the Verification Protocol Double Counting Better Biofuels[1], Green Gold Label, ENSUS, REDcompliance Inspectie Protocol, REDcert and RSPO. Germany has also approved REDcert as additional system to prove compliance with its Biomass and Biofuel Sustainability Ordinances.

Besides choosing between these voluntary systems, companies also have the option to proof sustainability of their product through a national verification system. Countries that are currently developing a national verification system are for example Spain, Italy, France and Belgium (CNE, 2012). It is expected that the use of voluntary systems will in the future also play an important role in Europe to proof the sustainability of solid biomass for heat and power.

1.1   Effectiveness of certification systems

The European Commission allows for the first time in history for the use of voluntary, market-based sustainability systems to prove compliance with legislation for biofuels and other bioliquids. Mechanisms to ensure the effectiveness of voluntary sustainability systems are therefore of importance, especially as national authorities are obliged to follow the European Commission's decisions and judgment on this matter.

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1 In the Netherlands, an accredited verification declaration is needed for proving the double counting of biofuels, using the Verification protocol Double Counting of Biofuels (Regulation, 2011).

To assure the effectiveness of certification systems, the EU-RED states that the certification systems to be recognised by the EC should have fraud resistant auditing and independent auditors should inspect compliance along the entire chain from the farmer to the trader and the fuel supplier (Article 18). The EC requires that the systems implement third party certification across the supply chain in order to assure compliance. Systems do not need to provide information about the accreditation of the third party certification bodies to be competent to carry out the certification for EU recognition. The Commission has set general conditions for ensuring the quality of enforcement and verification mechanisms. As they are not specific, different levels of assurance may occur between voluntary certification systems.

General differences between voluntary certification systems are known. A comparison between voluntary systems can be found in the report: How to select a biomass certification scheme? (NL Agency, 2011). This study makes a thorough analysis on the differences between systems in terms of effectiveness, level of assurance, information requirements, expected cost levels and benefits for certification. This information helps companies in their decision process to select for a reliable and cost effective system.

The objective and approach of this study are elaborated further in the next Chapter. Chapter 3 outlines the selection of the voluntary certification systems to be evaluated and benchmarked in this study, and also describes the general characteristics of the selected systems.

2 Objective and approach

The **objective** of this study is to provide a deeper understanding of the differences between voluntary certification systems for biofuels and bioliquids; this in terms of their level of assurance, their scope, and their benefits and costs of certification. The systems selected in this study are benchmarked regarding these topics. In this way, differences among systems as well as *relative* strengths and weakness of individual systems are identified.

The information in this study gives guidance to economic operators and projects to be able to make a well-substantiated decision on the choice for a specific sustainability certification system. Moreover, it allows national regulators to more specifically develop their inspection and enforcement strategies.

This report discusses four different aspects of the certification systems:

• Coverage of the system in terms of chain of custody, principles and criteria;
• Level of assurance;
• Costs of certification;
• Benefits of certification;

Based on these outcomes, the relation between costs, benefits and level of assurance is discussed as well.

The level of assurance of a system provides an indication of the extent to which compliance with a standard (the set of principles and criteria) can be guaranteed through certification and accreditation procedures in a system. Assurance serves thus as a tool to create trust between the producer and end-user. In order to generate that trust, the assurance process must exhibit certain qualities or principles, which are detailed further in Chapter 5.

The method by which a connection is made between information or claims concerning raw materials or intermediate products and claims concerning final products is known as the chain of custody (CoC). The CoC includes all the stages from the feedstock production up until the release of the biofuels for consumption and is a key element of the system. The requirements on the traceability of a product and on how to design the CoC relates to the level of assurance and, consequently, the credibility of a company's sustainability claim. The CoC characteristics of the selected systems are further analysed in Chapter 4.

Information for this project is collected through an analysis of documentation of the voluntary certification systems, assessment documents of the European Commission and through additional literature. Basis of this study is the report "How to select a biomass certification scheme?" (NL Agency, 2011), which provides general guidance to organisations and projects involved in the production of biofuels and biomass for energy purposes to select a sustainability certification system.

As this project focuses on the practical implementation of assurance and cost aspects in the field, part of the information is also collected through interviews with auditors and market parties. System owners have been interviewed to get more insight in their field experiences and to verify information on the benchmarking of the systems.

3   Scope of study

The study includes the analysis of 8 voluntary certification systems for biofuels and other bioliquids and their feedstock. The systems covered in this report are (in alphabetical order):

- Bonsucro;
- ISCC (EU version)
- NTA808/81;
- REDcert (German version)[2];
- Roundtable on Sustainable Biofuels (RSB);
- Roundtable on Sustainable Palm Oil (RSPO);
- Roundtable of Responsible Soy (RTRS);
- 2BSvs.

Five of these systems (Bonsucro, ISCC, RSB, RTRS, 2BSvs) are recognised by the European Commission. Greenergy and RBSA (Abengoa RED), both EC-recognised systems, are not included in this study. The final selection of the systems is based on the (expected) usage in the Dutch market and their (anticipated) recognition by the European Commission and approval by national governments.

Detailed individual factsheets of each system are included in the online annexes[3]. A brief overview about the scope and key characteristics of the systems is presented below.

Name system	Bonsucro (including the RED module)
Scope feedstock	Sugar for bioethanol and food market; for the moment the emphasis is on sugar for the food market
Geographical scope	Global (focus on sugarcane regions)
Fully operational since	2010
EU-recognised	Yes, since 19 July 2011 for 5 years
How are RED requirements included in the system?	EU-RED version is an "add-on" RED module and must be used in conjunction with the Bonsucro standard.
Approved on national level	Yes, as EC -recognised system
Principles	Five principles (social, environmental and economic principles)
Type of system owner	Multi-stakeholder association, Bonsucro is a not for profit company limited by guarantee, registered in the United Kingdom
Number of certificates	12 mills, 2 supply chain companies (as of 6-1-2012)

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2 • At the moment of performing this study, the EU version was not public)
3 The factsheets of the individual factsheets can be downloaded from the NL Agency website as separate online annex of this report.

Name system	ISCC (RED version)
Scope feedstock	ISCC is a system for all biomass-based materials; its focus is on biofuels and bioliquids for RED compliance, but also for other uses). ISCC is currently developing an extension of the existent ISCC system to other feedstocks
Geographical scope	Global
Fully operational since	2010
EU-recognised	Yes, since 19 July 2011 for 5 years (Important: Not to be confused with the ISCC-DE version).
How are RED requirements included in the system?	There are two separate standards: The ISCC-EU version (EU-recognised) and the ISCC-DE version, used to proof sustainability compliance in Germany. Compared to the EU version, the DE version uses a smaller sample size for farmers, fewer actors in the supply chain can be certified and there is no group sampling. The 2 versions have differences in rules related to self-declarations of farms, mass balance, the proof of sustainability, and the recognition of auditors.
Approved on national level	Yes, as EU-recognised system. Separately accepted by the German government to prove compliance with its Ordinances (Biokraft-NachV and BioSt-NachV)
Principles	6 principles (social, environmental and economic principles)
Type of system owner	ISCC association (e.V.), represents the ISCC stakeholders. The ISCC System GmbH is responsible for the operations. The ISCC pilot phase and the beginning of the regular operations was supported by the German Federal Ministry of Food, Agriculture and Consumer Protection.
Number of certificates	For ISCC as a whole (DE and EU versions combined) 851 certificates, over a 1000 registrations (as of 13 January 2012), Based on statistics from 8-12-2011, less than 10% of registrations of ISCC is from Germany, 71% is from the European Union (ISCC 2011)

Name system	NTA 8080/81: Sustainability criteria for biomass for energy purposes
Scope feedstock	All biomass feedstock for all types of biomass end-uses (electricity, heat & cold and transportation fuels)
Geographical scope	Worldwide
Fully operational since	2011
EU-recognised	In procedure
How are RED requirements included in the system?	Step-in approach: The RED version is a step-in version to the NTA 8080 version. The RED version is less demanding than the NTA8080 version. The system does not allow operators anymore after 1 January 2013 to obtain a new RED certificate; with prolongation of the certificate, an organization shall comply with the NTA 8080 requirements (NL Agency, 2011).
Approved on national level	Yes, from July 2011 to July 2012 by the Netherlands.
Principles	Covers environmental, social and economic principles and criteria. It contains 9 principles, which are adapted from the Testing framework for sustainable biomass (Cramer, 2007)

Type of system owner	Independent, non-profit
Number of certificates	As of January 14 (2012), 14 certificates have been issued

Name system	**REDcert (German version; EU-RED version not public yet)**
Scope feedstock	Biomass for bioenergy
Geographical scope	EU, with a strong focus on Germany. Ukraine has recently been added to the list, however it is not expected that the scope of the system will be extended beyond the EU and neighbouring countries in short and mid-term future.
Fully operational since	2010
EU-recognised	In procedure
How are RED requirements included in the system?	REDcert has developed a separate version for compliance with the RED, which is submitted to the EC for approval. (this is not the version analysed in this report)
Approved on national level	Yes, from July 2011 to July 2012 by the Netherlands. Also accepted by the German government to prove compliance with its Ordinances (Biokraft-NachV and BioSt-NachV)
Principles	The future EU version will be based on the RED criteria, but will also include social criteria as well as GAP criteria (good agriculture practice). The REDcert (EU version) will thus go beyond the minimum RED requirements.
Type of system owner	REDcert GmbH is a company founded by leading associations and organizations in the German agricultural and biofuel sector. The company has a non-profit policy
Number of certificates	916 (per 1 January 2012), 1022 contracts between operator and REDcert (which is the first step towards certification), of which 132 outside Germany. Around 2350 sites are REDcert covered

Name system	**Roundtable on Sustainable Biofuels (RSB) – EU RED system**
Scope feedstock	All feedstock for liquid biofuels
Geographical scope	Worldwide
Fully operational since	2011
EU-recognised	Yes, since 19 July 2011 for 5 years
How are RED requirements included in the system?	RSB has developed separate RSB-EU standards for compliance with RED. Most of the documents listed below are excerpts of the RSB standards.
Approved on national level	Yes (as EU-recognised system).
Principles	Covers environmental, social and economic principles and criteria. It contains 12 principles.
Type of system owner	Independent, not-for-profit

Number of certificates	Four participating operators have successfully undergone a due diligence process by the RSB Revision Committee. The first RSB Certificate was issued on 09 February 2012

Name system	Roundtable on Sustainable Palm Oil (RSPO)
Scope feedstock	Palm oil for food and biofuel market
Geographical scope	Global, with a focus on palm oil regions
Fully operational since	2007, established in 2004
EU-recognised	In procedure
How are RED requirements included in the system?	EU-RED version is an "add-on" module and must be used in conjunction with the RSPO standard.
Approved on national level	Yes, from July 2011 to July 2012 by the Netherlands.
Principles	The standards address the legal, economic, environmental and social requirements of producing sustainable palm oil. There are in total eight principles. National interpretations of the international indicators and guidance are developed.
Type of system owner	Non-profit association
Number of certificates	Based on 30 November 2011: SCC Companies: 131, SCC Facilities: 255, Numbers of growers, certified: 29, Numbers of palm mills, certified: 135

Name system	RTRS – Roundtable on Responsible Soy
Scope feedstock	Soy for food, feed and biofuel market
Geographical scope	Global (focus on soy regions)
Fully operational since	2010
EU-recognised	Yes, the variant RTRS EU RED (Round Table on Responsible Soy EU RED): "RTRS EU RED system" has been recognised by the EC on 19 July 2011 for 5 years
How are RED requirements included in the system?	The RTRS Executive Board has developed the RTRS EU RED Requirements as an add-on to the RTRS Standard. The RTRS EU RED Requirements must be used as part of the RTRS certification system (EC, 2011)
Approved on national level	Yes (EU-recognised)
Principles	5 principles (each with extensive set of criteria); GHG reduction, land use and carbon savings are additional for EU RED requirements. RTRS-endorsed National Interpretations available.
Type of system owner	An international multi-stakeholder initiative, association
Number of certificates	Ten certified producers and 4 certified chain of custody companies (as of 3 January 2012)

Name system	2BSvs (Biomass Biofuels Sustainability voluntary system)
Scope feedstock	All feedstock for biofuels and bioliquids under the scope of RED
Geographical scope	Global (focus on EU-RED only)
Fully operational since	First Certificate emitted on 29/07/2011
EU-recognised	Yes, since 19 July 2011 for 5 years
How are RED requirements included in the system?	This system only has one version: the RED version
National approved	Yes (as EU-recognised system)
Principles	9 principles for Standard 01 (Biomass production) and 3 principles for Standard 02 on the verification process; the standard is designed to cover all fundamental and essential sustainability elements specified in the RED
Type of system owner	Consortium of 7 French organizations involved in biofuel and biomass production
Number of certificates	401 (as of 25 January 2012): 323 first gathering point + storage, 20 first gathering point + storage + trader, 23 Traders, 35 Transformers

The systems show differences in terms of feedstock scope. Roundtable initiatives such as RTRS, RSPO or Bonsucro are developed for a specific agricultural commodity, which can be used for various end-uses (food, feed, fuel). Voluntary systems such as REDCert, RSB or ISCC are – on the other hand – applicable for a wide range of feedstock options to be used for a limited number of end-uses (biofuel and bioliquids). Note that ISCC is currently also developing a "plus" version to be used for a wider range of end-uses.

The evaluated systems deal differently with how to include the RED requirements in their system. Basically, there are four approaches:
- The system itself is the EU-RED version (this is the case for 2BSvs);
- The EU-RED version is an "add-on" module and must be used in conjunction with the main system (RTRS, RSPO, Bonsucro);
- The system has 2 separate versions; an EU-RED version and a general version (REDCert, ISCC, RSB);
- The system uses a step-in approach, where the producer has to comply over time from the EU-RED standard to the general standard (NTA8080).

For some systems the EU-RED version is stricter than their original version (e.g. ISCC) while this is the opposite for other systems (e.g. NTA8080)

The principles and criteria of the systems differ in terms of their level of sustainability requirements. Table 1 gives a general overview of principle coverage for the 8 selected voluntary systems. This overview shows that REDcert and 2BSvs restrict themselves to the requirements of the EU-RED while other systems include a wider range of sustainability requirements.

Even when a principle is included in a system's standard, requirements may differ between systems in terms of scope of the principle, their level of strictness and verification requirements (see also Chapter 4: Coverage of systems).

Table 1: General coverage of system's standard by principles and/or criteria for a selected set of topics. Note that level of strictness between principles can differ substantially (V included, ≈ recommended or partially included, - not included):

Topics	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Planning, improvement	V	V	V	V	V	-	-	V
Legal compliance	V	V	V	V	V	V	V	V
GHG	V	V	V	V	V	V	V	V
Soil carbon (formulated in RED) or beyond	V	V	V	V	V	V	-	V
Biodiversity	V	V	V	V	V	V	V	V
Best agro-environmental practices	V	V	V	V	≈ [1]	V	V	V
Soil Quality	V	V	V	V	≈ [1]	V	-	V
Water quality	V	V	V	V	≈ [1]	V	-	V
Air quality	V	V	-	V	≈ [1]	V	-	V
Waste	V	V	V	V	-	V	-	V
Land tenure / property rights	V	V	V	V	-	V	-	V
Local prosperity / rural and social development	V	V	V	-	-	V	-	V
Social well-being / human and labour rights	V	V	V	V	-	V	-	V
Local food security	V	-	-	-	-	V	-	V

[1] Several principles are included in 2BSvs, but only as recommendation: "This criterion of the RED is not a requirement for the 1st gathering entity. This is the reason why this Principle is worded as a recommendation and is indicative only."

Three examples are given on how systems can deal differently with the same sustainability requirement:
- Biodiversity principle: 2BSvs restricts itself to the exclusion of highly biodiverse areas for biomass production (following the EU-RED). Systems as RTRS and ISCC require, additionally that natural vegetation areas around springs and natural watercourses are maintained or re-established.
- GHG emission reduction: RSB requires that "Biofuel blends shall have on average 50% lower lifecycle GHG emissions relative to the fossil fuel baseline. Each biofuel in the blend shall have lower lifecycle GHG emissions than the fossil fuel baseline". NTA8080 uses for biofuels a comparable threshold as RSB. The rest of the evaluated systems require a minimum GHG emissions saving of 35% at this moment (increasing over time according to EU-RED).

- Training requirement for employees: ISCC requires that records are kept for training activities by employees including the topic covered, the trainer, the date and attendees; training must be suffficient (criterion defined as minor must). Bonsucro requires, on the other hand, that >90% of employees should be trainined on health and safety issues. Information is to be given on the training expense of workers as a percentage of payroll expense.

Additional information on this topic can be found in the reports of CIFOR (2011) on the coverage of social indicators and in the article from (Dam et al, 2010) on indicator requirements. A general overview of principles covered by different sustainability certification systems can be found in the publication: How to select a certification system? (NL Agency, 2011).

Note that some respondents in our interviews indicated that some criteria, covered by a system, are more prone to a risk for low level of assurance than others. The following example illustrates this:

- Social criteria are generally more difficult to audit (risk for poor level of assurance); in these cases, the auditor has to be able to interpret the surroundings of the company and be able to collect relevant and honest information from stakeholders on for example: labour conditions, integrity or local prosperity. Stakeholder identification and a balanced representation of the stakeholders (e.g. gender equality) are important elements;
- Property transfer, storing and trading usually have high level of assurance, as it all is verifiable with documentation accompanying the products.

Also, certain type of criteria covered by a system may also be prone to a higher level of investments needs for meeting the standard's requirements.

Experiences in certification for biofuels and other bioliquids are still limited and also differ per system. RSB released its first certificate in the beginning of February 2012, while RSPO has already several years of experience in operating as a system for certifying sustainable palm oil. Consequently, some standard procedures or guidelines are not yet fully elaborated in some systems, although the EC may already have recognised the system. Practical experience on certification in practice differs from system to system as well.

This, combined with the different level of sustainability requirements, has its influence on the level of assurance of the different voluntary certification systems – as will be discussed in Chapter 5: Level of assurance.

4 Coverage of systems: the Chain of Custody

Companies need to prove the sustainability of their products from the feedstock to the final product entering into the market to demonstrate compliance with the EU-RED sustainability criteria. The method by which a connection is made between information or claims concerning feedstock or intermediate products and claims concerning final products is known as the Chain of Custody (CoC). The CoC includes all the stages from the feedstock production up until the release of the fuels for consumption (EU-RED, 2010).
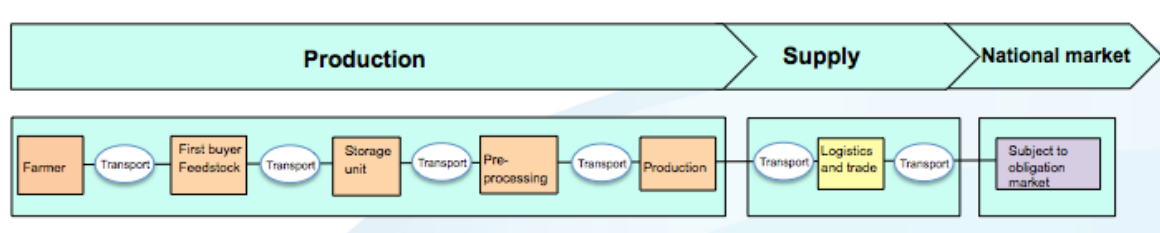
Figure 1: CoC includes all the stages from feedstock production up until the release of fuels for consumption

There is a range of ways in which a CoC can be implemented; in practice the basis is to implement and verify a control mechanism for each economic operator in the chain (farmer/plantation, first gathering point, conversion agents, warehouses and traders, etc). There are four main relevant elements in this control mechanism (Proforest, 2005):
• Control of product sourcing
• Control of production process
• Control of sales and dispatch
• Control of logos and claims

There are generally four different methods to apply these control mechanisms. From higher to lower level of strictness and traceability these methods are:
• Identity preserved
• Physical segregation
• Mass balance
• Book-and-claim.

The only method that is allowed in the EU-RED (Article 18.1) is the mass balance system (EU-RED, 2010), although stricter methods are acceptable as well since they don't break any of the principles of mass balance. The mass balance system administratively monitors the trade of certified products throughout the supply chain. It allows for mixing certified and non-certified products at any stage in the supply chain, provided that overall company quantities are controlled.

At the highest level of traceability we have the identity preserved method, which assures that the certified, sustainably products delivered to end users, originate from identifiable sources. This means that the product cannot be mixed with any other product (certified or not). The buyer has the assurance that the products he sourced have come from no other than the specified sources. This way the identity is preserved throughout the supply chain.

The segregation method assures that certified products are delivered to the end user. The 100% certified product flow is kept physically segregated from conventional product flows and can be mixed only with other certified products flows. There is a drive in the food chain towards this method. For example: Ahold considers RSPO mass balance as an intermediary CoC option to go fully to segregation in 2015 (Leegwater, 2011).

The identity preserved and the segregation methods are used in biomass feedstock production but they are not applicable to the logistics reality of biofuels, bioliquids and their blends with conventional liquid fossil fuels.

The book and claim method is not allowed in the EU-RED because it does not offer traceability, since the direct link between physical product flows and the sustainability characteristics is absent.

Coverage of the CoC methods by 8 eight studied voluntary systems is shown in Table 2. The most versatile certification systems are RSB and RSPO as they are prepared for all the four CoC methods (using the Book and Claim method is not allowed under the EU-RED); ISCC can apply the three methods that require traceability, while RTRS cannot enforce the identity of product to be preserved. NTA8080 still allows for segregation and mass balance options.

Table 2 also shows that Bonsucro, 2BSvs, and REDcert only offer the possibility of the mass balance method in their standard.

Table 2: Coverage of Chain of Custody options

Items:	RSB	RSPO	RTRS [2]	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
Identity of product preserved	■	■						■
Segregation	■	■	■			■		■
Mass balance	■	■	■	■	■	■	■	■
Book and claim [1]	■	■	■					

[1] Book and claim system is not allowed under EU-RED
[2] RTRS recognises multi-site certification and EU-RED certification as separate CoC modules. Multi-site certification is in other systems not considered as a separate module but considered as a sampling option for multiple sites (see Ch. 5).

The coverage of the Chain of Custody for the 8 voluntary systems is presented in table 3 and further explained for the individual systems below.

All systems include auditing of the farmers or plantations. However, the approach taken and the type of audit for farmers show large differences between the systems. Table 4 provides information on the type of auditing at the biomass production level only for those systems that have the first point of certification at the mill or at a first gathering point (see also Chapter 5: Level of assurance).

Table 3 shows two starting points for the formal certificate holder for ISCC: Farmers can be certified individually or as a group with a central managing office. The central office can be e.g. a cooperative, storage unit or warehouse and can be considered to be the First Gathering Entity or Point (FGP) – given that a contract is signed between the farmer and the central unit. This is not possible for RSB, RTRS and NTA8080: First certificate holder for these systems is the individual farmer, unless the same company owns *legally* both the Farm and the First Gathering Point (e.g. central managing office, storage unit or warehouse).

The *EU version of the ISCC system* covers all economic operators along the supply chain from the farm or plantation through conversion into biofuel or bioliquids, to biofuel and bioliquids traders. The following elements of the supply chain have to register: Farms or plantations, first gathering points, conversion units (oil mills, refineries, biofuel plants, sugar mills, ethanol plants, and other conversion units), traders and warehouses (ISCC 2011f). For transport of sustainable product, normally no additional audit is necessary (ISCC 2011h).

Table 3: Supply chain coverage of certification systems (■ = included in system and CoC audit required, X = included in system, no CoC audit needed, 0 = under discussion, # = first point of the formal certificate holder)*

Processes	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Farmer	■ [3] #	■ [4]	■ #	■ [10]	■ [9] [10]	■ #	■ [7]	■ # [15]
First gathering point [#]	■	■ #	■	■ #	■ # [14]	■	■ #	■ # [15]
Processing units [1]	■	■	■	■	■	■	■	■
Transportation	■	■	■	■	X	■	X	■
Trader (physical)	■	■	■	■	■ [9] [13]	■	■ [12]	■
Biofuel plant	■	■	■	■	■	■	■	■
Biofuel blender	■	■	■	■ [11]	X [12]	■	■ [8], [12]	■
Re-blending [2]	0 [4]	X	0 [4]	■ [11]	X [12]	X [6]	X [8], [12]	■ [12]

* Table with all explanatory footnotes per system can be found in annex 1 (table A.1).
[#] First gathering point can be a storage unit, warehouse, central managing office of farmers, etc.
[1] Referring to intermediate processing units as crushing facilities or mills
[2] Example: re-blending biofuels from 7% to 2%

Bonsucro has developed 2 standards, including a specific CoC Standard. The Bonsucro Production Standard refers to the sustainable production of Bonsucro sugarcane and all sugarcane derived products in the cane supply area and in the milling operations. This includes the transport from cane to the mill. The CoC Standard refers to the tracking of claims on the sustainable production of Bonsucro sugarcane (all end-products) along the entire supply chain after the mill and its cane supply; through production (e.g. conversion, processing, etc), warehousing, transportation and trade (Bonsucro 2011a).

The *NTA8080* certification system starts at the feedstock producer: "the actor that produces the primary biomass or collects residual flows". The end-user is defined as the actor that "uses the (processed) biomass for the generation of electricity and heat or production of biogas or biofuel (neat or blended)" (NTA8080, 2011).

REDcert follows the minimum requirements of the RED. Farms do not have to be part of a certification system; however, they have to at least comply with the requirements of the certification system. The biomass producer or farmer has to prove compliance through the first gathering point (in REDcert the term "primary distributor" is used). Four sections of the supply chain are identified in REDcert: producers, primary distributors (also called first gathering point), suppliers and interfaces (converters of biomass), (REDcert, 2011d).

Any operator in the value chain handling intermediary and final products may seek certification for the *RSB system*, from farmer to the final retailer. The RSB certification system applies to both operators and products. Certifiable products include biomass products processed biomass, biofuels or any mixture of biofuels blended together (RSB, 2011)

For the *RSPO system*, the unit of certification of the first operator is the unit of palm oil production – the palm oil mill and its supply base. Both direct managed estate and supply from smallholders and out-growers are part of the supply base. The last operator is the end product manufacturer; the manufacturer or processor that uses palm oil based products for manufacturing products designed and intended for consumption or end-use in any way. Only retail companies that do not manufacture […] consumer goods in any way are exempt from the

certification requirement (RSPO, 2007). For bio-energy, the same exemption applies to supply chain operators, which do not manufacture the product, allowing re-blending of biofuels downstream of the biofuel production, without requirements for supply chain certification (RSPO-RED, 2011).

RTRS defines the first unit of certification as "the farm on which soy is cultivated and is delimited by the farm boundaries. This includes fields where soy is cultivated, but also all non-soy growing areas, non-cultivated areas, infrastructure and installations and other areas that form part of the farm". The soy supply chain includes the following operators: producers (growers), crush, refining, esterification and blending, and takes into account storage and transportation up until the point the product is delivered to the market (RTRS, 2011).

The *2BSvs system* covers the whole biofuel industry's supply chain, from the biomass producer to the final biofuels distributors under custom duty. Within 2BSvs, the certified part of the supply chain starts at the First Gathering Entity, which acts as group manager. The biomass producers that supply to the First Gathering Entity are group members and included within the certification unit. The Central Office of the first gathering entity is generally the site that collects and centralizes all relevant information needed for certification (2BSvs 2011c).

The Chain of Custody (C0C) requirements adhere to all producers that physically handle and/or own a product in the chain. Exceptions exist for paper traders, outsourced activities and re-blenders (see also Chapter 5). It is important to note that not all sustainability principles in a standard are equally applicable to the stakeholders in the value chain. Generally, the principles and criteria (e.g. on biodiversity, soil, etc) apply to the raw material producers only. Subsequent stakeholders in the value chain generally only need to apply the GHG reduction requirement and a proper mass balance for the CoC audit. Distinctive from the other systems is the RSB that explicitly also requires compliance with e.g. labour conditions to biofuel processors.

Table 4: Only for certification systems having 1st point of certification at the mill or the first gathering point (= covered, ≈ partially covered, X not included, o not applicable)*:

Processes	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
System makes use of self-declaration farmers	o	X	o	≈ [5]	≈ [4]	o	= [2]	= [6]
On-site field audits farm are included	o	=	o	=	≈ [3]	o	=	=
Desk audits are allowed	o	X	o	X	= [3]	o	X	X
Individual farm field audits are possible	o	X [7]	o	X [7]	X	o	X	= [6]
Sampled on-site farm field audits are standard procedure [1]	o	X	o	=	≈ [3]	o	=	=

* Table with all explanatory footnotes per system can be found in annex 1 (table A.2).
[1] This does not refer to sampling procedures relating to smallholder group certification or to multi-site certification (see Chapter 5)

Table 4 provides insight in the how farmers are audited in case the first certificate holder is the First Gathering Point. The table shows that REDcert and ISCC make use of self-declarations of farmers. "Self-declaration" is the practice where a member of a group submits a document to the central management office of that group (often the first gathering point), in which is stated that the group member complies with certain sustainability criteria specified in the document.

Bonsucro and 2BSvs make use of a self-declaration to a limited extent, mainly for demonstrating compliance for a specific criterion (e.g. historic land use in the case of 2BSvs). Other data are to be monitored through an internal control system or audited on the field.

For 2BSvs, the auditor uses risk analysis to determine whether or not it is necessary to perform a field audit on the farm. A field audit is not necessary when documentation provided by the farm offer sufficient assurance. In this case, the audit is called desk audit.

The different structures for auditing at the beginning of the supply chain have consequences for the sample level and for the way compliance is controlled. This affects the level of assurance of the various certification systems (see also Chapter 5).

Figure 2 gives an indication on how audits are handled in the beginning of the biomass supply chain; at the farmer and / or at the first gather point. The Y-axis shows whether an audit of a system generally starts from the FGP or not. When audited from the FGP, there is generally sampling of multiple locations (compared to individual audits). The X-axis shows whether a system makes use of field audits or desk audits, or a combination of them; generally, a field audit leads to a higher level of assurance.
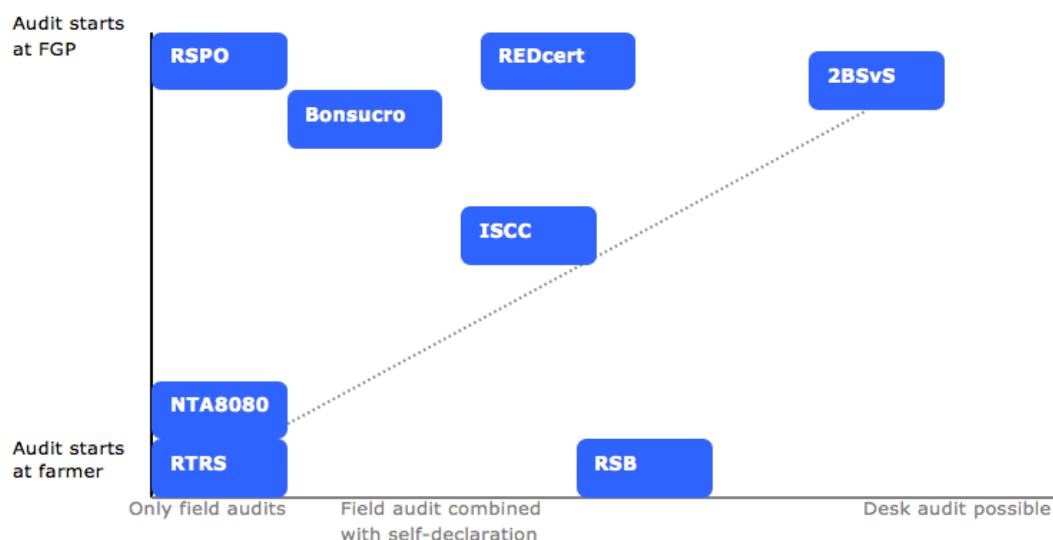
Figure 2: Figure showing the different structures for auditing requirements of the system at farmer and FGP level, affecting the level of assurance of systems.

The impacts on the different structures for auditing requirements at farmer and FGP level is discussed in more detail in Chapter 5: Level of assurance.

4.1   Intermediary conclusions

The evaluated systems differ in:
- Scope (feedstock and end-use);
- Coverage of sustainability principles;
- How principles are monitored and verified;
- Years of experience and amount of certificates;
- Difference in coverage of Chain of Custody especially in the beginning and end of the chain;

Due to these differences, systems show variation in issues like the room for interpretation that is given in systems' requirements or the availability of documentation, which is still partly under development for recently established systems. This may affect the level of assurance of a system.

5   Level of assurance

The level of assurance does not only include the conformity assessment requirements as described by the standard, but mostly to how this is achieved in practice. The key question of this Chapter is whether systems can sufficiently ensure sustainability in practice. Subsequently, the systems are benchmarked in order to clearly show their differences and to indicate which ones perform better in the areas related to the level of assurance.

5.1   Approach

In this study, indicators for assessing and benchmarking the level of assurance of voluntary systems are based on requirements and guidelines set by the ISEAL Assurance Code (ISEAL, 2011) and by the Dutch assessment protocol for voluntary sustainability systems for biofuels (NL Agency, 2012).

The study did not look at the differences in sustainability requirements between systems, although it is generally discussed in Chapter 3. More information can be found in the report: How to select a biomass certification scheme? (NL Agency, 2011).

The Dutch Assessment Protocol is developed by the Dutch government to objectively and transparently assess voluntary systems developed by market parties against the requirements at EU level with regard to sustainability, audit quality and traceability (chain of custody). The Protocol provides more concrete guidelines on audit quality and chain of custody than the EU-RED. Some assessment criteria also go further than the EU-RED (for example accreditation of verification bodies is required).

The *draft* version of the ISEAL Assurance Code provides normative requirements for carrying out assurance of compliance with social and environmental standards systems. It goes further in terms of strictness and scope of assurance requirements than the RED requirements.
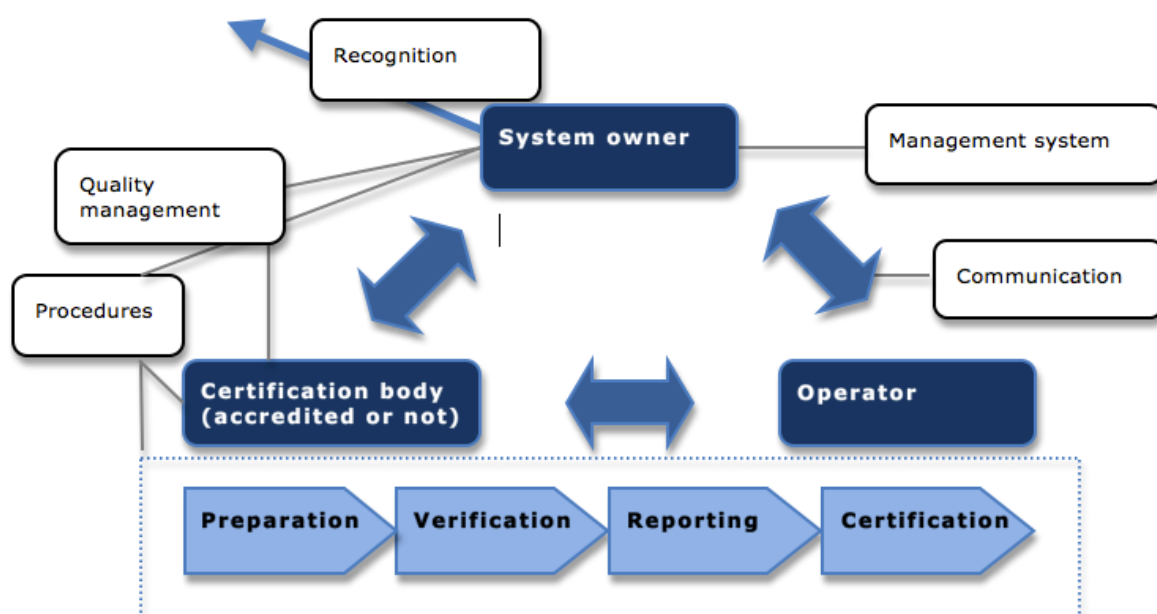
Figure 3: System description and its certification procedures with characteristics that influence the level of assurance

In addition, specific risk examples in terms of assurance are provided by the Dutch Emissions Authority, based on their first practical experiences in monitoring the sustainability of biofuels on the Dutch market. These cases are integrated in the topics of the benchmarking tables.

In this Chapter, the level of assurance of systems and the differences between them is discussed in six different sections, based on the characteristics of a system as described above:

- (5.2): The management of the system itself
- (5.3): Quality requirements for auditors
- (5.4): Auditing procedures
- (5.5): Sampling, group and multi-site certification procedures
- (5.6): Chain of custody requirements and procedures;
- (5.7): Recognition or affiliation of system and acceptance other systems

Information for the benchmarking is collected through literature, reviews of system documentation (when needed also made available by the system owners) and interviews (see also Chapter 2). Feedback on the benchmark is received from all system owners and their comments are processed.

The coverage of the system with the requirements on the level of assurance is marked in the tables with the following symbols:

=   Topic is included in system, compatible with requirement as described in the benchmark
≈   Partially covered by the system / under development
X   Not included in the system, not compatible with requirement as described in the benchmark

This Chapter discusses the key differences between the systems and main outcomes. It presents therefore only the most relevant benchmark tables. All the complete benchmark tables can be found in Annex 1 of this report.

The benchmark is developed to show the relative differences between the systems on level of assurance. The benchmark does not intend to give a judgement on the systems.

5.2   The management of the system itself

The management of the system itself includes the level of transparency and accessibility, the level of stakeholder engagement and the design of the complaints system.

Transparency and accessibility

To ensure transparency and accessibility of a system, ISEAL (2011) recommends that certain type of information is publicly available for members and for non-members. This also relates to the public acknowledgement of responsibility of operators to share their results. Regarding the transparency and accessibility the following indicators have been analysed for all systems:
- Rights and duties of companies;
- Availability of system documentation;
- Publication of certified companies on the website;
- Availability of summary reports of company assessments
- Availability of a list of non-compliant companies

All systems, except Bonsucro, have a description on the rights and duties of companies on their website. All systems have as well a published a list of certified companies published on their website; system documentation is publicly available on the system website for most systems, Bonsucro and NTA8080 documentation is only partially available online. Not all systems make

the summary reports of the audit assessments publicly available. This information is not shared by Bonsucro, 2BSvs, REDcert and ISCC-EU.

Only a limited number of systems maintain a public list of non-compliance companies or a list of companies with high risk for non-compliance. ISCC-EU publishes online certifications that are withdrawn for specific reasons. RSB makes a public list of participating operators with a "very high" risk class. Various systems have developed a procedure on dealing with non-compliance of companies (see 5.4); the issues of non-compliance are also to be visible in the published summary reports.

Non-company related information (list of recognised CBs, rights and duties) is relatively well accessible in all systems. Company related information (e.g. summary reports of assessments, list of high risk companies) is less transparent and only RSB makes both items publicly available. A detailed benchmarking table is presented in Annex 1, table A.3.

Stakeholder engagement

(ISEAL, 2011) indicates that system owners shall ensure that stakeholders are informed of the points where they may comment (or participate in) the auditing assurance process. System owners shall involve stakeholders in the auditing process; as participants in the evaluation and review, or as observers. Stakeholder consultations during the audit aim to ensure that a range of representative stakeholders is consulted. They are given the opportunity to present their comments about relevant issues in relation to the standard to the auditor.

The level of stakeholder engagement differs strongly from system to system. The Roundtable initiatives (RSB, RSPO, RTRS, Bonsucro) have all included stakeholder engagement on different levels: on audit level on the field, on the review of policies and procedures for the system itself and on application level. The latter includes for example for the RTRS that "Two weeks prior to the assessment, the Certification Body shall publish their intention to carry out an assessment of the operation […] on their website and inform the RTRS. There is invitation to submit comments".

2BSvs, on the other hand, has not included any stakeholder consultation in its system procedures and REDcert only to limited extent. See also table 5 below.

Table 5: Processes for which stakeholders have the possibility to be involved in (summarized list from ISEAL, 2011)*:

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Commenting on company applications for becoming recognised / certified by system	= [8]	= [6]	= [1]	=	X	X	X	≈ [13]
Audits: Stakeholder consultations on-site	= [4]	=	=	=	X	=	X	=
Review of policies and procedures system	= [5]	= [7]	= [3]	= [11]	X [10]	= [2]	≈ [9]	= [12]

* Table with all explanatory footnotes per system can be found in annex 1 (table A.4).

Complaints system

(ISEAL, 2011) indicates that the system owner shall have an easily accessible and responsive complaints system and shall ensure that auditing providers have a complaints system in place.

For system-owners, the complaints system shall facilitate complaints from any person. These aspects have been analysed in this study for all systems (see Annex 1, table A.5).

All systems require that certification bodies have a procedure in place to handle complaints from operators. Most systems also have a procedure in place to handle complaints about the system itself – from operators or from the public. This includes for example a grievance procedure or a dispute resolution.

2BSvs has no official procedure for complaints about the system itself. A formal REDcert complaint procedure is not defined, but a complaint procedure s in place within ORGAINVENT's management system, which performs all business operations of REDcert (see also table A.5 in Annex 1).

5.3   Quality requirements for auditors

Certification bodies and auditors play an important role in the certification procedure of companies; Auditors are doing the inspection, generally followed by a certification decision by the certifier. The granting of the certificate is based on an auditing report.

Certification bodies may differ in their experience with a selected system, coverage of countries or quality assurance. System owners may therefore set requirements for ensuring a good competence of certification bodies and auditors.

In this section, we will discuss the following aspects relating to the requirements for auditors: impartiality and independence, personnel competence on auditor quality and accreditation and monitoring requirements for certification bodies (CBs).

Impartiality and Independence

Third party auditing is required by the Commission for approving sustainability certification systems. (ISEAL, 2011) also indicates that system owners shall ensure that auditing assurance providers do not provide any product or service that could compromise the confidentiality, objectivity or impartiality of the assurance process; unless the assurance provider has clear procedures to ensure that such compromise cannot occur.

All evaluated systems require a third party level evaluation by certification bodies – and their auditors. Most systems also require a written procedure from certification bodies to guarantee their independence. As this is also a requirement under ISO 65 accreditation, NTA8080 decided not to explicitly mention this requirement in the standard.

2BSvs only requires a written agreement by a certification body with a "commitment to fulfil all requirements of the system in particular concerning impartiality, integrity and competence, including staffing qualified auditors and personnel". As ISO 65 accreditation is not required under 2BSvs either (see also table A.6 in Annex 1), this can be considered as a weak point in level of assurance.

Personnel Competence on Auditor Quality

(ISEAL 2011, NL Agency 2012) indicate that the system should require explicitly a set of skills and proofs of expertise from the auditing team, possibly specified to the lead auditor, and certification bodies. These include for example demonstrable knowledge related to the standard, training requirements or ISO accreditation.

Table 6 shows only those requirements of personnel competence on auditor quality where the benchmark shows relevant differences between the systems. The complete table (with footnotes) can be found in Annex 1, table A.7.

All systems require a "demonstrable knowledge related to the standard" and a training to learn about the systems (see table A.7, Annex 1). Specific requirements on these topics, however, differ. 2BSvs has a training of two days without exam. Bonsucro, on the other hand, requires a three-days training with exam.

Differences are similar when looking at demonstrable knowledge related to requirements on CoC auditing. NTA8080 requires to auditors a "demonstrable knowledge on sustainability of the production and processing and conversion of biomass flows, CoC and GHG calculations". This is defined by 2BSvs as having an "academic qualification or professional experience in traceability, chain of custody or similar". Specifications differ, although both remain quite general.

Respondents in the interviews stressed the importance on requiring *specific knowledge* of biofuel production as crop techniques and technical knowledge of the conversion process. Lack of knowledge of the auditor may result in not being able to judge if the audited data makes sense. An example of this is the GHG calculation: submitted data could be lower than technically possible and the auditor may not even realise. Result could be a fraudulent GHG balance being certified.

One respondent indicated that auditors are generally required to have expertise in audit methodologies and not so much in production processes or specific cultivation knowledge. This, combined with different approaches (and requirements) in auditing techniques, has already resulted to some different evaluations in the market.

Table 6: Requirements on personnel competence auditors and personnel certification bodies in systems*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
CB has procedures on defining roles audit team [1]	✓	✓	✓	✓	✗	≈ [1]	✓	✗
Language skills	✓	✓	✓	✓	✗	✓	✗	✗
Educational requirements	✓	✓	✓	✓	✗	≈ [3]	≈ [3]	✓
Supervised period of practical auditing [1]	✓	✓	✓	✓	✗	✗ [4]	✗	✓
ISO 19011 accredited	✓	✗	✓	✓	≈ [7]	✓	✓	✓
ISO 65 accredited	✓	✓	✓	✓	≈ [6]	✓	✓ [5]	✓

* Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.7).
[1] Also covered by ISO 65

Most systems require language skills, educational requirements and a supervised period of practical training for auditors. The last two aspects are not specifically required by NTA8080, though indirectly covered by requiring accreditation of auditors by ISO 19011 and by ISO65.

An accredited ISO 65 certification body needs to ensure independence, transparency, quality and the definition of procedures on defining the roles of the audit team. Certification bodies of REDcert must satisfy the requirements of the ISO Guide 65:1996 *or* EN 45011 (the European equivalent); certification bodies of 2BSvs must be accredited against ISO guide 65 *or* against ISO 17021. ISO 65 sets general requirements for certification bodies operating product certification systems, and ISO 17021 sets these for certification bodies operating management certification systems. A norm on management certification does not prescribe a norm on

product certification (sustainability level); they have to be developed by the organization itself and are not controlled externally.

It is important to note that larger international certification bodies generally have their own *internal quality control system* for the whole company including e.g. senior supervision, yearly evaluations, peer review, etc; a certain level of quality is thus ensured, unrelated to the individual requirements of the systems. This is, however, not always the case for the smaller certification bodies.

Accreditation and monitoring requirements for certification bodies

According to the EU-RED, accreditation is a choice for certification bodies, not an obligation and the fact that a certification body is not accredited does not, by itself, mean that it is not a reputable organization. However, many certification bodies choose to seek accreditation, even when it is not compulsory, in order to demonstrate an independent confirmation of their competence (ISO, 2012).

Though not required under EU-RED, all systems require at least a form of accreditation for certification bodies for the type of audits they undertake. There is, however, a difference between the systems by which type of organizations the certification bodies are accredited, see also table 7 below (table A.8 in Annex 1 for detailed information).

These are:
- All systems (with exception of REDcert) recognise certification bodies that are accredited by an accreditation organisation that is associated with IAF. The IAF is the world association of Conformity Assessment Accreditation Bodies and other bodies interested in conformity assessment. Dutch member of IAF is the 'Raad van Accreditatie' (RvA).
- RSB, RTRS, RSPO and Bonsucro also lean on ISEAL, a global association for social and environmental standards, recognizing certification bodies that are member or full associate;
- Most systems (not indicated by REDcert or Bonsucro) also recognise certification bodies that comply with ISO 17011[4] or equivalent.

Table 7: Accreditation and monitoring requirements certification bodies in systems: Certification bodies are accredited or recognised by: *

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
A national accreditation body that is associated with IAF	= [4]	= [5]	=	=	=	=	X	= [11]
A full or associate member of ISEAL	= [4]	=	=	=	X	X	X	X
A relevant national authority of one of the EU member states	≈ [6]	X	X	X [12]	X	X	=	=
An accreditation body committed to comply with ISO 17011 or equivalent	=	=	=	X	=	= [3]	X	=

* Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.8).

4 ISO/IEC17011: 2004 specifies general requirements for accreditation bodies assessing and accrediting conformity assessment bodies. The norm sets requirements on the accreditation body itself (legality, impartiality, confidentiality), the process, human resources and management (e.g. documentation, record keeping) (ISO, 2012). It also includes for example that a contract with the client has to be signed before starting with the audit. Accreditation also checks the qualification of the auditor. In case of no accreditation, it may for example be tempting for CBs to use a non-qualified auditor in case of lack of personnel.

REDcert and ISCC also accept certification bodies that are recognised by a relevant national authority of one of the EU member states. The Bundesanstalt für Landwirtschaft und Ernährung (BLE) is the German government body that recognises certification bodies for ISCC and for REDcert. BLE is not a member of IAF (IAF, 2012).

Most systems also require that there is a continuous monitoring of the performance of the certification bodies – by the system and / or the accreditation body. Bonsucro, 2BSvs and RSB do not (explicitly) mention this in their system documentation.

5.4 Auditing procedures

This section will discuss the following aspects relating to auditing procedures and their level of assurance: Frequency of auditing and validity certificate, type of audits, management of the audits and sanctions for non-compliance

Frequency of auditing and validity certificate

Based on the EU-RED, (NL Agency, 2012) requires that the voluntary system shall ensure at least annual regular retrospective audits of a number of claims that have been made under the voluntary system. (ISEAL, 2011) indicates that system-owners that use a risk-based approach to determining audit frequency and intensity shall develop a risk-based sampling procedure for use by auditors and shall make it public.

The validity of a certificate is for all systems 5 years or less. Most systems require annual assessments; REDcert and RSB use a slightly different approach. REDcert only works with full re-audits, which is annual for mid and large size operations and every 3 years for small operations, and every 5 years for very small operations. The frequency of auditing under RSB is based on risk classes (from 1 to 5) but will never exceed 12 months.

RSB, RTRS, NTA8080 and ISCC mention in their system documentation a procedure about the extent of auditing at individual farm level (not be confused with requirements on sampling for group auditing), based on risk assessment.

The complete benchmark table (with footnotes) can be found in Annex 1, table A.9.

Type of audits

Most of the evaluated systems make use of on-site field audits in the assessments with two exceptions: RSB and 2BSvs. See also Figure 1 in Chapter 4.

RSB provides the option of desk audits under very restricted conditions: This is only an option for outstanding operations or operations with low risk in case the desk audit is in between a defined limited time period of a field audit.

Depending on risk analysis, 2BSvs has the options of a site audit or a desk audit. Based on risk analysis, the auditor determines whether or not it is necessary to perform a field audit on the farm. A field audit is not necessary when documentation provided by the farm offers sufficient assurance. When the first gathering entity is able to demonstrate that all potential risk is controlled, the certification body can decide to reduce the sampling level accordingly. The farmers of the remaining sites send all required documentation to the auditor (or to the first gathering point, if the farmers give consent). In any case the minimum required sampling level is 3% to be verified through site audits.

Respondents to the interviews indicate that an audit by 2BSvs can in practice be quite easily fully performed with deskwork with no visit to the field for real verification – also in high-risk countries or areas. Documents may be sufficient proof to demonstrate cross-compliance on

agricultural practices within the EU. However, this cross-compliance is non-existent outside the EU because of different legislation on agricultural practices. This may lead either to errors by either omitting documents (e.g. suppliers information) or declaring imprecise information (e.g. land location coordinates).

Note that a desk audit (or also called documentation audit) is not similar with making use of self-declarations (see also table 4). A "self-declaration" is the practice where a farmer in a group submits a document to the central management office of that group (often the first gathering point), in which is stated that the group member complies with certain sustainability criteria specified in the document.

The farmer provides a self-declaration to the first gathering point (FGP). The FGP's auditor uses the self-declaration for risk analysis, in order to choose which farms to include in the sample during an annual audit. In case of a desk audit, all required documentation of the farmers is made available to the auditor, who will perform the audit from his own office or from the FGP, and no site or field visit are included.

Bonsucro and 2BSvs make use of a self-declaration to a limited extent, mainly used for demonstrating compliance for a specific criterion (e.g. historic land use in the case of 2BSvs). Other data are to be monitored through an internal control system or audited in the field.

For the case of REDcert and ISCC, self-declarations of the group members play a significant role in the risk analysis forming the basis of the choice of the auditor on which group members to sample. For example, the ISCC self-declaration for farmers/plantations within the EU requests farm records (precision farming), GHG calculation and data, relevant contracts with subcontractors (e.g. for spraying, harvesting etc.), or other available documents to prove the land status before 2008.

RTRS, Bonsucro and 2BSvs (for exceptional cases only) have included unannounced audits in their procedure. The detailed benchmark table is included as table A.10, Annex 1.

Management of the audit

Management and process requirements for an audit are defined by all systems and the specific requirements on this topic (as included in this benchmark) are well covered. All systems require that:

- Companies are audited before allowing them to participate in the system;
- Audits are to be adequately planned, conducted and reported;
- There is a clear procedure on how audits are conducted;
- The auditing plan includes a risk analysis of the scope and complexity of the activities undertaken by the company;

It is important to realise that auditors are *checking compliance* of a company to the standard based on the available standard documentation. This aspect strongly relates to the principles, criteria and verification requirements of a system (see also Chapter 2 and Chapter 6 on costs).

Box 1: In Argentina, labour conditions are many times not respected, though they are fully embedded in Argentinean legislation; a common problem is that farm workers are not in the payroll. RTRS and ISCC require both that these labour conditions are respected; however ISCC does not require checking this in the field if the country where the farm is located has signed specific treaties and agreements. Argentina has recognised those required treaties and agreements; consequently no check is needed for ISCC. RTRS does, however, require this check in the field and deals with this issue in more detail. The auditor will follow the procedure as defined by the system.

Weakly defined verification requirements hamper the level of assurance on compliance of a sustainability requirement. An example is given in box 1.

Respondents have indicated that in some cases the criteria and guidelines in a system's documentation are not clearly defined, and therefore further communicated by the system through additional *unofficial interpretations*. An example is given for defining waste for biofuels, where lack of guidance is missing and interpretation is left to the auditor. Strictly speaking, auditors are not allowed to give advice or extend a compliance check beyond the official system's documentation.

Table 8: Management and process requirements for the audit, as defined by the system (only substantial differences between systems are presented*)

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
The audit includes a peer review and/or independent decision on outcome report	▮ [5]	▮ [6]	▮ [9]	▮	▮	▮	▮ [11]	▮
The standard has entry-level certification	✗ [4]	▮	✗ [1]	▮	▮	≈ [2]	✗ [8]	▮

* Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.11).

There are differences in the extent to which a system specifically requires that an audit include a peer review of the certification report or an independent decision of the outcome of the report (see table 8).

Sanctions for non-compliance

Auditors evaluate the level of compliance of a company with the system's requirements. Failure of a company to meet these requirements leads to non-conformities. A system usually defines major and minor non-conformities. Major non-conformities need to be corrected; if not, the certificate can be suspended and ultimately be withdrawn.

(ISEAL, 2011) indicates that system owners shall define the repercussions or sanctions for different levels of non-conformance for companies. Major non-conformities shall result in suspension or termination from the certificate.

All systems have a definition or description of non-compliances (major and minor), a description of actions leading to suspension or withdrawal of a certificate and a procedure for corrective actions – although this last procedure is limited for REDcert.

Substantial differences between the systems are however found on the following three aspects (see also table 9):
• Defined suspension period (maximum)
• Procedure defined on communicating withdrawal certificate to other companies
• Time period for notification suspension / withdrawal of certificates (in days)

Note also that most systems have just *recently started* with the submission of certificates. Consequently, practical experiences in the procedures on suspending or withdrawal of certificates are still very limited for longer operating systems. Practical experience is null for recently operating systems (e.g. RSB, RTRS, NTA8080) as the first year generally includes an audit to check whether the company is capable of meeting the administration and implementation requirements. Control follows after a year.

Clear procedures on how to communicate non-compliance of companies to other buyers in the supply chain are limited and not clearly described (with the exception of RSB and RTRS and RSPO to some extent). In general, in case of important findings, the buyer is informed immediately about non-performance of suppliers.

Table 9: Requirements on procedures and sanctions for non-compliance as defined by systems*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Suspension period (max) [1]	90 days [4]	Undefined [8]	60 days	1 month	Full withdrawal [14]	3 months	Full withdrawal [11]	Withdrawal [15]
Procedure defined on communicating withdrawal certificate to other companies	= [5]	= [6]	≈ [7]	≈ [17]	X [19], [12]	≈ [2]	X [12]	≈ [16]
Time period for notification suspension / withdrawal certificates (in days)	3 days [5] X		3 days [3]	1 day	X [19]	14 days [9]	[13]	Immediate

* Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.12).
[1] Maximum suspension period in which the major non-conformity shall be corrected before the certificate will be withdrawn and a new initial certification audit will be necessary.

In addition, one respondent indicated that all systems, as currently developed, have a possibility for fraud; an audit methodology is never robust enough to prevent this. Auditors are generally not trained for fraud detection in any of the systems. *Fraud detection* requires qualification and experience that systems do not require, the topic is neither included in the trainings (e.g. not for ISCC, 2BSvs and NTA808). Grievance procedures and communication procedures on non-compliance do, however, support transparency and fraud detection to a certain extent.

5.5   Sampling, group and multi-site certification procedures

This section includes the following aspects: sampling possibilities in a system, requirements for group and multi-site certification and sampling conditions.

Sampling possibilities in a system

Sampling of production units for auditing and verifying compliance is a common procedure for all systems. Sampling possibilities and requirements differ however between systems. Roughly, the following three main types of sampling possibilities can be distinguished:

- *Smallholder group audits* are primarily intended for smallholder farmers, producer organisations and cooperatives. In such cases, verification of all units concerned can be performed based on a sample of units, taking into account relevant standards developed for this purpose where appropriate. To take part in a group certification is perhaps the only possibility for many smallholders to benefit from opportunities in those markets where certification is asked for – nationally and worldwide. By doing this they can significantly reduce external certification costs.

- *Multi-site certification* is a term generally used for certification of groups of plantations; farms, mills, warehouses or refineries that are managed together by a Central Office and administered using an Internal Control System (as described by RSPO, 2011).
  - o The certificate is held by a single (legal) company and covers all sites participating in the multi-site group (as described by RTRS, 2010);

o The certificate is held by a First Gathering Point and participating sites are officially connected through a contract or agreement.

- *Grouped sampling* is common practice under some of the evaluated systems: In this case, systems start their auditing procedure from the First Gathering Point. Farms or plantations are integrated with the mill (e.g. Bonsucro or RSPO) or the biomass producer or farmer has to proof compliance through the FGP (e.g. 2BSvs or REDcert).

Table 10 shows the sampling possibilities for the different systems. It is important to realize that sampling is standard procedure for some systems, while this is more exceptional for systems that start their certification per definition from the farm level (RTRS, NTA8080, RSB).

Table 10: Sampling possibilities in different systems, specified to ownership models*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Grouped sampling (together with the first gathering point)	X	=	X	=	=	X	=	≈ [10]
Individual farm certification unless requirements are met for multi-group or smallholder certification	=	X [4]	=	X	X	=	X	≈ [10]
Smallholder group audits is a specific possibility in the system [1]	= [2]	= [3]	=	≈ [7],[8]	≈ [5]	=	≈ [5]	=
Multi-site certification is a specific possibility for farmers or plantations [1]	=	=	=	≈ [8]	≈ [5]	=	≈ [5]	=
Multi-site certification is possible for the CoC audit	=	=	=	= [2]	=	=	= [9]	= [6]

* Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.13).
[1] Referring here to specific conditions, requirements and sampling methods for smallholders or groups of plantations (owned by one farmer). Note that some systems apply sampling for all farmers supplying to a first gathering point, without distinguishing between these farmer ownership models.

Some Roundtables (RTRS, RSPO, Bonsucro) have producer and/or smallholder support initiatives for supporting small-scale farmers and farm workers and for preparing them for certification.

Requirements for (smallholder) group sampling and multi-site certification

Requirements for group and/or multi-site certification are basically developed to ensure:
- That the group entity is sufficiently capable to record, process and monitor the sustainability of the product on various sites;
- That the sampling and auditing procedure is sufficient to control and verify the compliance of the group members, based on its composition and variation.

Note that these requirements have to be placed in relation with the sampling possibilities of a system (see also table 10) to get a good indication of its impact on the level of assurance.

Requirements on group sampling are limited for RSB. The concept of "participating operator" is defined: a group of stakeholders can apply to group certification, provided that they constitute a legal entity. A more defined group certification policy is in development to clarify related aspects.

Table 11: Requirements for group certification as defined by systems (requirements relate to the options for ALL group certifications in the systems)*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Requirements for multi-site or group certification are defined	≈ [4]	=	=	=	= [6]	=	=	=
Requirement that the audited group has a legal status	=	=	=	=	=	=	X	X
A central management unit is required	≈ [4]	=	=	= [9]	= [6]	=	=	=
Internal control system required and to be audited	≈ [4]	=	=	= [9]	=	=	=	=
Requirements on homogeneity land or production type	≈ [11]	≈ [12]	= [5]	X	X	= [13]	X	= [8]
There is a procedure for risk based sampling	=	≈ [2]	=	X	=	=	≈	=
Requirement that at least all sites need to be visited during validity certificate	X	= [3]	= [1]	= [10]	X	X	X	X [7]
It is explicit that mass balance is on site level within the total administration of multiple sites	≈	=	=	=	=	=	=	=

 Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.14).

All systems require that the mass balance (see also 5.6) is on a site level within the total administration of multiple sites, although differences exist whether this is explicitly stated in the system's multi-site certification requirements itself or whether these make a reference to the general CoC requirements for covering this aspect.

Main differences for the remaining systems (excluding) can be found in:
- Requirement that the group is a legal entity: This is <u>not</u> a requirement for REDcert and ISCC meaning that production units can group themselves based on the availability of contracts or agreements, which is often an option for crushers or mills that receive their feedstock from multiple suppliers;
- Requirement that at least all sites are visited during the validity of the certificate;
- Requirements on homogeneity land or production type of farmers: Not all systems have defined requirements on homogeneity land or production type. When defined, there are e.g. differences in strictness between ISCC (degree of similarity of the production systems and the crops within the group) and RTRS (shall be located near each other and in the same ecological region).

These three different requirements have considerable consequences for the possibility of sampling under various practical situations. Different requirements on homogeneity of land result for example in different sampling requirements (and level of assurance) in those areas where crop production is spread over a large area or feedstock is supplied from areas with different agro-ecological characteristics. The issue is whether sampling is desirable and sufficient to cover the variability and/or compliance risks under production units in all situations.

Sampling for multi-site certification

(ISEAL, 2011) indicates that, where system owners incorporate random sampling of multiple sites, they shall determine the desired confidence level and confidence interval and shall use standard sample size calculations to define the appropriate sample size. The specific sampling conditions of systems for multiple sites are presented in table A.15 of Annex 1.

RSB, RTRS and ISCC use a variation in sampling conditions for auditing at the farm or plantation, based on the risk assessment: Sites with a higher risk have a higher sampling rate. RSB uses a similar risk assessment for the Chain of Custody audit.

When looking at *an initial certification audit* for a biomass producer with 16 sites plus a main office (based on medium risk), samples range from 0.5 samples (based on 3%, REDcert German version) to 6 samples (based on 1.5 * root square for ISCC). *CoC sampling audits* for a storage and trading location with 16 sites plus a main office (based on medium risk) range from 5.3 samples (33% under certain conditions, Bonsucro) to 4 samples (based on root square; various systems), while for some systems as 2BSvs it is undefined. Note that differences in sampling are larger on producer / first gathering point level than for the Chain of Custody audit.

Box 2: Procedures for group auditing and sampling possibilities differ between the *ISCC-DE (German) and ISCC-EU version*, which creates (based on our interviews) some confusion in the market – also because the German version is still used by the majority of ISCC registered companies[5]. Although this report focuses on the EU version, it is important to understand they key differences between the two versions:
- Sample of farms is 5% of farms (can be reduced to 3%) under the ISCC-DE version while this is root square under the ISCC-EU version;
- Groups of farmers can be certified by the ISCC EU system, if they have a central management unit. This unit can be a farm, cooperative or first gathering point (certifying individual farms or a plantation is also possible). In the ISCC DE system, farmers can only be part of the certificate of the first gathering point they supply
- Group certification and multi-site certification is possible for farmers and logistical networks by the ISCC EU system. In the ISCC DE system, group certification is not possible.
- Other differences relate to the self-declarations of farms, mass balance, the proof of sustainability, and the recognition of auditors (ISCC 2011g).

The differences in sampling conditions of systems should be seen in relation with its sampling possibilities (table 10) and requirements (table 11) to be able to assess the level of assurance on this topic. Two examples are given:

- Sites considered to be of high risk under ISCC (high sampling condition) may be excluded for group sampling at all under RTRS because of the variety in production systems;
- A sampling condition of square root for 2BSvs is comparable with other systems. However, this may include only 3% of field audits (remaining desk audits) for a group of production units that are not legally united. A sampling condition of RSPO may seem lower but – given the underlying requirements for e.g. being a legal entity – will at the end be more strict.

Responsibility for random sampling lies largely with the auditor. There is a risk that the identified samples select locations already certified by other systems, which can be considered of being low risk (e.g. ISCC considers RTRS certified locations as being low risk). In case a stricter system audits a weaker system or non-EU accepted system still additional issues may

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5 Some facts based on November 2011: ≈ 950 registered companies (850 certificates) of which ≈ 150 companies are ISCC-EU registered. > 90% of the system users are located outside Germany. 71% of the ISCC registrations are from companies in EU; 29% located outside Europe (ISCC, 2011).

need to be audited for compliance to the stricter system. This may require from an auditor also extensive knowledge about other certification systems.

5.6 Chain of Custody (CoC) requirements and procedures

Chapter 4 has discussed the differences in scope and coverage of chain of custody between the evaluated systems. These differences impact the CoC requirements (transfer of certificate, level of documentation, self-declaration or not, auditing control required) and consequently the reliability (and cost level) of the certification system in guaranteeing the traceability of the sustainable biomass throughout the CoC.

This section discusses the system's requirements on the Chain of Custody and its management system, the rules on the mass balance CoC system, and how transfer of sustainability information is dealt with along the chain;

Requirements on the Chain of Custody and its management system

A product or company can claim to be sustainable when it complies with the system's requirements and procedures. A procedure on claims sets mandatory rules for all market communications related to the production, procurement, use and sales of the certified product. It also includes requirements for the use of the system's trademark and how to deal with inappropriate use of this claim.

All systems have defined the content of the system's certificate in their documentation and most systems have a procedure on how to deal with claims. This procedure is not available at the 2BSvs and guidance on how to communicate a claim or logo is limited available for NTA8080 and REDcert (see also table A.16 in Annex 1).

Requirements on the Chain of Custody for a company in terms of traceability and administrative procedures and records are mentioned in all systems. More specifically, all systems require or define rules for the company on:
- A traceability system that is available in the company;
- Record keeping and documentation;
- Record keeping to be kept for 5 years or longer;
- A procedure for identification of inputs and outputs (under development for Bonsucro).

Table 12: Chain of custody and tracing requirements for company, as defined by the system – only differences are shown*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Skilled personnel and management in company	=	=	=	≈ [7]	X [6]	X	=	=
Company has procedure for identification of inputs and outputs	=	=	=	≈ [7]	=	= [2]	=	=
Critical control points to be identified by company	≈ [3]	X	=	X	X [5]	X [4]	X [8]	X [9]

*Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.17).

There are differences between systems about requirements on skilled personnel and management in the company. Only RTRS – and RSB to some extent- require explicitly the identification of critical control points by the company, see also table 12.

Rules on the Mass balance system

The EU-RED obliges economic operators to use a mass balance system. This mass balance system is a chain of custody system linking the "sustainability characteristics" with specific consignments of raw material and biofuels.

The balance in a system can be continuous in time, in which case a 'deficit', i.e. that at any point in time more sustainable material has been withdrawn than has been added, is required not to occur. Alternatively the balance could be achieved over an appropriate period of time and regularly verified. In both cases it is necessary to ensure that the balance is respected (EU-RED, 2010).

The fixed inventory period basically only updates the ending mass balance after a certain time period. In the meantime, the balance continues to show what was recorded as of the last inventory. In accounting, the fixed inventory period is considered most useful for smaller operators. A more accurate alternative is the continuous balancing method; this method aims to account real time inventory on inputs and outputs of products.

All systems require that the "volume out is not allowed to exceed the volume in", this is to prevent that more sustainable material than has been added in a system is withdrawn.

The *continuous balancing method* is required under the RSPO and RSB, which only require this method of their operators. This method is also possible under the RTRS, Bonsucro and ISCC. This method is for various systems combined with (the development of) a separate IT-tracking system to trace the certified volumes throughout the supply chain from the first point of certification to the end-user.

2BSvs, NTA8080 and REDcert only require the *fixed inventory period* of their operators. RTRS, Bonsucro and ISCC provide for this option as well. Where a fixed inventory period is in operation, it is important that the quantity of certified product inputs and outputs are balanced over a maximum timeframe; this to avoid the allocation of product flows to different time periods and accounting risks. This time frame is defined by all systems applying the fixed inventory period method, except by NTA8080.

A detailed benchmark table on this topic is included as table A.18 in Annex 1.

Transfer of sustainability information along the chain

According to the logistics of production and trade of biomass, biofuel and bioenergy products, volumes are constantly incoming and outgoing, creating a situation where the product is continuously flowing between storage tanks, vessels or trucks. Generally, the following situations may occur in the supply chain:

• Operators that own the product <u>and</u> physically trade or process the product;
• Operators that own the product and do <u>not </u>physically trade the product (e.g. paper traders);
• Operators that do <u>not</u> own the product but physically handle it (e.g. outsourcing storage);

The first example is most common and straightforward and generally requires a CoC audit in all systems (e.g. a biodiesel plant, a crushing facility or a trader shipping, on- and offloading the product). The second option refers to paper traders for example. A string of paper traders are involved in the supply chain in those situations where several parties are involved in trading of the product and take legal ownership of the physical product but do not actually take receipt of the physical product; see figure 4 as example.
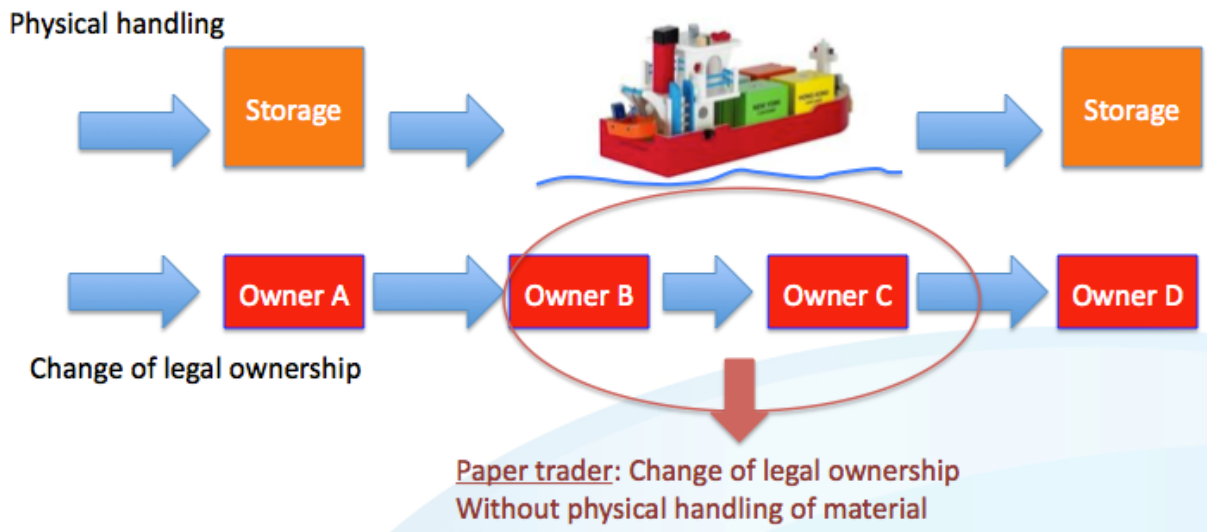
Figure 4: Example on the position of the paper trader in the Chain of Custody for biofuels: a batch of certified biofuels is transported overseas and changes several times from owner during this transport

The third option refers for example to excise goods locations that store biofuels, directly imported from abroad, and of which they are not the owner (see figure 5). These storage locations are not obliged to register these biofuels to the Dutch Emissions Authority (NEa) and to provide the related sustainability information. The excise good locations cannot be held responsible for the accurate reporting of the biofuels. The owner of the biofuels, having outsourced the storage facilities, is in this case the responsible party for reporting the biofuels balance and for reporting of the sustainability information (Ministry I&E, 2011).

In case of outsourcing activities, the administration and responsibility of the certified product lies at the owner of the product. An auditor will check in this case whether the information exchange is sufficient and whether there is a clear connection between the certified product and the information (e.g. by visiting the outsourced storage facility). A storage facility may opt for certification for practical reasons to avoid multiple visits in a year by auditors of their clients.
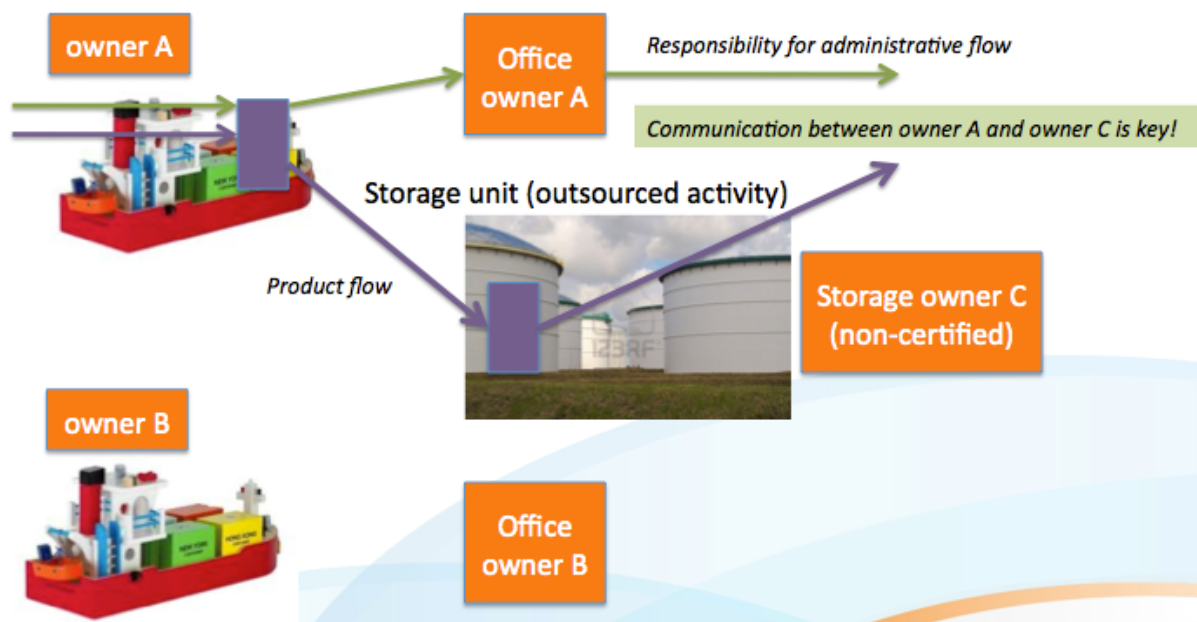
Figure 5: Example on outsourcing activities in the Chain of Custody for biofuels

For ensuring a sufficient level of assurance along the supply chain under various conditions, it is important that systems have procedures on how to handle the three options as described above (see table 13).

Table 13: Procedures systems for handling change of ownership under different circumstances*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Change of legal ownership: A new chain of custody audit is required	= [4]	= [6]	= [1]	=	=	=	≈ [9]	=
Chain of custody audit is required for 'paper traders'	≈ [5]	X [7]	X [2]	= [13]	X [11]	≈ [3]	X [10]	X [12]
Standard has specified rules on outsourcing activities	= [8]	=	=	≈ [13]	X	X	X	X [14]

*Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.19).

A chain of custody audit for paper traders is not required under the RSPO, RTRS, ISCC, 2BSvs and REDcert and most likely not for RSB and NTA8080. In this case, the relevant RSPO documents will go directly from the first physical buyer in the chain (for example the shipper) to the final buyer (for example the operator that off-loads the certified material). Bonsucro requires a Chain of Custody audit for paper traders.

Specified rules on how to deal with outsourced activities are mentioned by RTRS, RSPO and RSB and under development by Bonsucro. No guidance or requirements are provided on outsourcing activities by the other systems.

Several systems allow for the use of various Chain of Custody options (e.g. mass balance, segregation or book and claim), see also Chapter 4. Consequently, the situation that one company is *accommodating for various CoC systems* may occur. The risk of uncontrolled mixing and therefore the importance of clear product groups is mentioned by RSB, RTRS and RSPO to some extent (see table 14).

Table 14: For preventing uncontrolled mixing of materials, the system entails the following requirements*:

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Use of more tracking models by company considered	= [2]	≈ [1]	= [3]	0 n.a.	0 n.a.	X	0 n.a.	X
Use of more sustainability systems considered by the system	X	X	X	X	X	= [4]	X	X

* Table (complete) with all explanatory footnotes per system can be found in annex 1 (table A.20).

In addition, companies may use various voluntary certification systems (e.g. RTRS and RSPO) to accommodate for the demand of the market. A certification of a product does not mean that a company is 100% certified for its biofuel streams. It only means that there is certified material in the company (this can for example be a 66% RTRS certified biofuel stream and a 33% RSPO certified biofuel stream). An RTRS auditor will check the mass balance of the RTRS certified products and will only make a relation with other certified products in case there is rightful reason to do so. See also figure 6 as an example.
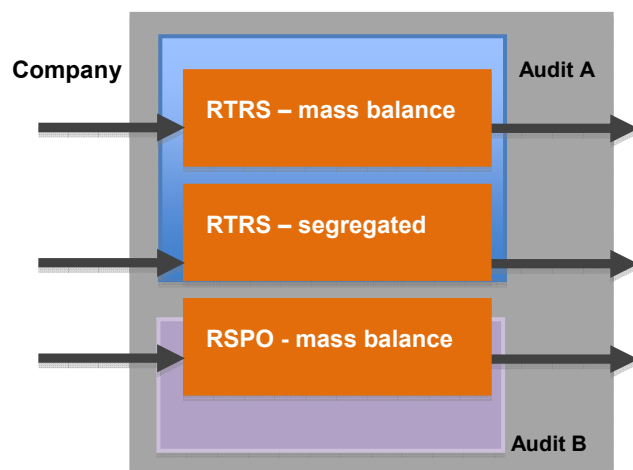
Figure 6: Example of the use of various voluntary systems or chain of custody systems by one company.

The certification and the audit of a company are limited by the *defined audit scope* (e.g. RTRS standard for RTRS certified soy and names of the locations covered). Auditors are not allowed to extend the audit scope to other product streams or locations[6], unless there is reason to assume that compliance of the certified product flow in relation to the standard is at risk or specifically at the request of a company.

Only the *NTA8080* requires a balance of the NTA8080 sustainability claims in relation to other claims of the company, which improves the level of assurance of a company as a whole. Other systems do not make reference to the multiple uses of certification systems in one company.

5.7   Recognition or affiliation of system and acceptance of other systems

The acceptance of a system by other organizations or government bodies may give an indication (although not per definition) about the level of assurance of a system. All evaluated systems are recognised by the EC or in the assessment procedure with the objective of obtaining EC recognition. This means that all systems (will) meet the minimum level of requirements from the European Commission in terms of level of assurance. All systems are recognised by one or more (or all in case of EC recognition) European Member States; see also Chapter 3 and table A.21 in Annex 1.

The Roundtables (RSB, RTRS, Bonsucro) are all member of ISEAL, or in the process of being a member (RSPO). NTA8080 is indirectly linked to ISEAL, as its system owner NEN is member of ISO that is full member of ISEAL. . Full and associate members have committed or are in process to commit to the ISEAL Alliance Code of Ethics (ISEAL, 2012) and to meet requirements of good practice in either their international standard setting or in international accreditation practices.

The NTA8080 is the only system that is recognised by an accreditation body – as being accepted by the Dutch Accreditation Council (RvA), see table 23. If a system is recognised by an accreditation body, this assures a certain quality level in the system's procedures. Different or no commitment of systems to certain process or accreditation requirements may limit the mutual recognition of system certificates along the supply chain.

Acceptance of other systems: recognition

An operator that delivers a EU-RED certified biofuel to the market could only claim it as such if all previous steps in the supply chain are certified as well. Without acknowledging other

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6 This is also an accreditation requirement for certification bodies

certificates, certification is limited to the compliance of one system only. If a system recognises certificates from other systems, the supply base extends to products from other certified systems as well.

Based on interviews, experience in transposing certificates (e.g. RTRS certificate as input to ISCC certification chain) is still limited. At this moment there are, however, two different approaches on the recognition of certificates from other systems (see table A.22 in Annex 1):
1. Some systems accept certificates from all other systems which are EC-recognised (ISCC, 2BSvs, REDcert);
2. Other systems only accept certificates from other systems in case there is a level playing field in requirements (accreditation, requirements in principles and criteria). This approach applies to RSB, RSPO, RTRS, Bonsucro and NTA8080.

2BSvS requires a mutual agreement and a gap analysis (only under specific circumstances) when recognizing another EU-recognised certification system. No gap analysis or Multi-Lateral Agreement (MLA) is required for ISCC acceptance. Note that systems as RTRS, RSPO or RSB have indicated that they have not officially accepted other systems at this point.

Both options and their advantages and disadvantages are discussed below.

Option 1: Acceptance of certificates from all other systems when EU-recognised

The first option is presented in figure 7 below. Clearly the recognition of other systems allows for a wider supply base for traders (more *flexibility*) and the claim of compliance does not easily break in case one of the actors in the supply chain chooses to opt for another EU-recognised system.

Disadvantage is clearly that the claim of the certified operator in the chain does not necessarily represent the sustainability requirements of the system itself. Consequently, buyers may presume that they buy a certified biofuel that guarantees the social conditions of the biomass producers. In practice, this may not be the case when this element is not included in an accepted standard, such as in the case of 2BSvs (see also Chapter 3).

There are also differences in requirements in level of assurance between systems. The *claim of the certified operator in the chain may be misleading* to some extent for buyers who consciously opt for a certain standard because of its requirements. Respondents to the interviews confirm that the level of assurance may be challenged in case, for example, 2BSvs is used for the farm and another system for the rest of the supply chain.
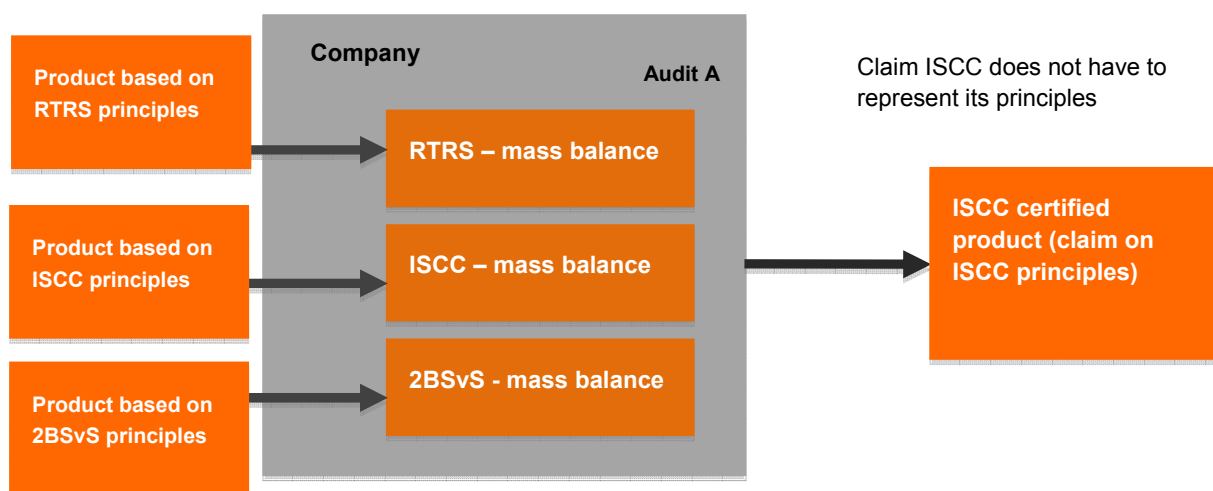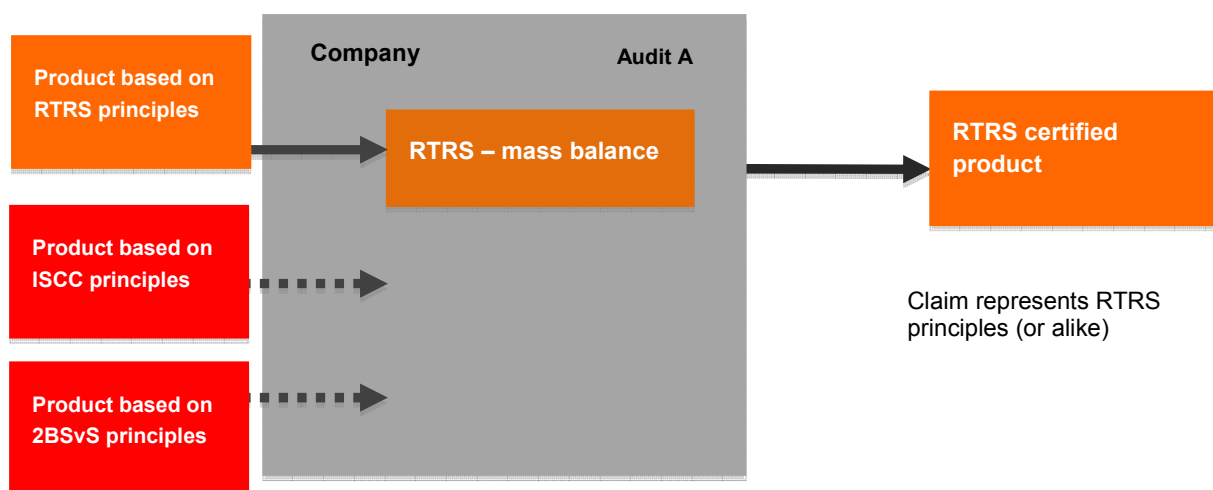

Figure 7: An example of acceptance of EU-recognised systems and transfer of certificates and claims

In practice, auditors accept certified and audited streams after a check on the validity and completeness of the certificates (e.g. country of origin, GHG emission data). Respondents indicate that certification bodies have to rely on the assurance of these declarations (just as the EC or individual countries accept these systems for being EU-RED compliant).

Option 2: Acceptance of certificates from other systems in case of level playing field

The second option assures to the buyer that the product claim represents the principles and criteria of the voluntary system (or a system with similar requirements). In practice, these systems have currently not yet recognised other systems. Various systems are performing benchmarks in order to assess the level playing field and coordination activities for harmonization. RSB participates for example in an on-going benchmarking activity called the "Sustainability Standards Transparency Initiative", which is coordinated with ISEAL and the international German cooperation (Gesellschaft für Internationale Zusammenarbeit, GIZ). RTRS is discussing the option for cooperation with systems as AAPRESID and Proterra.

The interviews show that systems as RSB or RTRS attach great value to *holding to the quality level and norm of their system*. They have been developed in a multi-stakeholder forum under mutual agreement. At the same time, it is recognised that these quality levels (e.g. on accreditation or principle requirements) may result in a *current limited uptake of the system* by the market (see figure 8).

Figure 8: An example of acceptance of other voluntary systems based on level playing field requirements

In Europe, many trades occur before the duty point with pure bio-components, partially blended or completely finished fuels. These trades may occur with economic operators who are not certified or who do not use a specific certification system. In this case, the RTRS claim breaks with the last RTRS certified member and the product would no longer be RED-compliant. A similar situation occurs with other roundtable initiatives or NTA8080 (Morton, 2011).

From a mass balance perspective, an RTRS or other roundtable member can use some of this biofuel in case the supply chain is entirely controlled. However, this will be the minority of cases. Further, due to the requirement to have mass balance at site level (also an EU requirement), storage of small amounts of a particular certified product and control in a 'dedicated' supply chain will likely increase the logistics costs in case various companies (i.e. legal owners) are involved as it reduces the flexibility of traders (Morton, 2011).

The current strict approach to claims with respect to biofuels has likely the consequence from a switch away from stricter systems to more easier or flexible systems (e.g. 2BSvs or ISCC).

5.8 Intermediary conclusions

The systems have been evaluated against six topics that relate to level of assurance:
1. The management of the system itself
2. Quality requirements for auditors
3. Auditing procedures
4. Sampling, group and multi-site certification procedures
5. Chain of custody requirements and procedures;
6. Recognition or affiliation of system and acceptance other systems

Table 15 provides a summary of the outcomes. The results should be interpreted with care and should be read in relation with the background information provided in Annex 1. Still, some general conclusions can be drawn about i) the main items that are not or only limited covered by the evaluated systems, and ii) those systems that cover less items to assure compliance than other systems (see table 15).

Table 15: Summarized outcome of benchmark between evaluated systems on level of assurance, [++] System covers all items; [+] 1 item is not covered, partially or under development; [0] 2 items are not covered, partially or under development; [-] 3 items are not covered, partially or under development; [--] 4 items are not covered, partially or under development, (or no items covered in case less than 4 items are benchmarked). Note that i) number of discussed item differs per issue, which creates some diffusion in the comparison.

	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
1. Management of system itself								
Transparency	++	+	+	-	-	0	0	+
Stakeholders	++	++	++	++	--	+	--	+
Complaints	++	++	++	++	+	++	+	++
2. Quality requirements for auditors								
Impartiality	++	++	++	++	+	+	++	++
Personnel competence [1]	++	+	++	++	--	+	0	0
Accreditation [2]	+	++	++	+	+	++	+	+
3. Auditing procedures								
Frequency certificate	++	0	+	0	0	+	-	+
Type of audits	0	+	++	++	--	+	++	++
Process requirements	+	++	+	++	++	+	+	++
Sanctions	++	+	+	+	0	+	0	+
Sampling, group and multi-site certification procedures								
Sampling options [3]	++	+	++	-	-	++	-	+
Requirements	--	0	++	0	0	+	-	0
Sample size	+	0	+	+	+	+	--	+
Chain of custody requirements and procedures								
Claims	++	++	++	++	+	+	+	++
Requirements tracing	+	+	++	-	0	0	+	+
Mass balance [4]	++	++	++	++	++	+	++	++
Procedures change ownership	+	+	+	+	0	0	--	0
Prevent uncontrolled mixing	+	+	+	+	+	+	+	--
Recognition or affiliation of system and acceptance other systems								
Level of recognition	+	-	+	+	0	0	-	0
Recognition other systems [6]	+	+	+	+	-	+	-	-

[1] Items that overlap with ISO 65 requirements are considered as covered by the system, [2] considered as partially covered, in case accreditation is possible by national government authority, [3] group sampling by FGP not considered to make this summary, (see table A.13), [5] considered as complied in case system applies continuous or fixed inventory, the use of an IT tracking system not considered for this overview table.

To safeguard the level of assurance in the evaluated systems, the following points are limited covered by several of the evaluated systems:

- Weak sampling conditions, requirements and options on both farm/plantation and CoC level;
- Limited requirements in accreditation for certification bodies;
- Low proof of verification (e.g. allowing desk audits) at the farm or plantation;
- The mutual recognition of other EU-recognised systems without clear conditions or transparency on the claims;
- Vague or undefined procedures (e.g. lack of claims procedure, no guidance on outsourcing activities, weakly defined verification requirements);
- No stakeholder consultation

6   Costs and benefits of certification

Besides the reliability of a system, its cost-effectiveness is also an important factor to take into account by a company when selecting a system. The market players interviewed during the execution of this study confirmed this with their answers. While certification offers on one hand various benefits to the market (see also 6.4), certification costs, on the other hand, will have an important impact in the total cost structure of sustainable biofuels and bioliquids – especially for the production of the feedstock.

Certification costs can be classified in direct and indirect costs. Direct costs are the costs of the certification issuance and its corresponding audits. Indirect costs are the costs related to the changes that may be needed in management planning and practices to meet the requirements of the certification standards.

This Chapter will provide an indication of the benefits and costs (direct and indirect) of certification putting emphasis on the following questions:

- What are the indicative cost differences between certification systems?
- What are the key factors determining cost levels of certification;
- What is the impact of these costs on various stakeholders in the biofuel value chain?
- What are the benefits of certification for different stakeholders in the value chain?
- What stakeholders in the value chain receive the costs and benefits?

Information for this Chapter is largely based on existing literature resources and on interviews. Numbers are indicative but do provide a general insight on the questions above. In addition, four practical cases (see 6.3) are included in this Chapter to compare the certification costs between systems:
- Palm oil from Indonesia for biodiesel;
- Jatropha production in Tanzania for biodiesel;
- Soybean production in Argentina for biodiesel;
- Sugar cane production in Brazil for bioethanol;

This study does not look into the sustainability requirements of the evaluated systems. They are, however, of importance for both the direct costs (how many, which aspects are to be certified) and for the indirect costs (level of compliance), see also Chapter 3.

6.1   Direct costs

Complying with the sustainability requirements of a system causes the following direct costs:
- Certification fees, being the cost structure of adopting a system
- Auditing costs
Both costs are inherently company specific and therefore at the end difficult to estimate. Table 16 shows the characteristics of the cost structure for the eight voluntary systems in this study.

Certification fees for a system can be split into two components, a membership fee and / or a quantity-dependent fee. *Membership fees* are generally based on property sizes, amount of feedstock processed or yearly financial turnovers (Pacini and Assunção, 2011). Some systems require companies to become members in order to access the certification services.

The most expensive membership fees are from Bonsucro, RSB, NTA8080 and 2BSvs. Large companies will pay 13000 GBP/year (15346 €/year) membership fee for Bonsucro, 10.000 US$/year (7425 €/year) for RSB, 5000 €/year for NTA8080 and 4000 €/year for 2BSvs. Medium size companies will between 2000 and 3000 €/year for membership in most systems. REDcert

offers the less expensive membership fees: 250 €/year for large companies. Small companies will pay between 150 and 250 €/year and 250 €/year for their membership fees[7].

Table 16: Characteristics of the cost structures for the eight voluntary systems*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
System has a membership fee	▤	▤	▤	▤	▤	▤ [1]	▤	▤
Possibility for certification without being member	▤	✗	▤ [4]	✗	▤	▤	✗	▤
System has a producer fee	≈ [6]	▤	▤	✗	▤	▤ [1]	▤ [6]	▤
System provides guidance on auditing days required	≈ [2]	≈ [2]	≈ [3]	✗	▤	▤	≈ [5]	✗

* Table (complete) with all explanatory footnotes per system can be found in Annex 1 (table A.23).

The certification fee also varies with size of the company or with the number of sites certified. This is also called *a quantity dependent fee*. Quantity dependent fees are in the range of 50-500 €/certificate. In most cases, operators are required to pay a fee per metric ton of biomass or biofuel certified (see table 17).

Pacini and Assunção (2011) have looked at the average membership costs and quantity-dependent fees for different levels of annual production. Their results show that membership and quantity dependent fees vary depending on feedstock used and scale of production.

Auditing costs include the costs that a company has to pay for an external audit to become or remain certified. Covered in these costs are preparation, field audit and reporting costs. Different types of information requirements and audit procedures determine the direct costs of certification.

Auditing costs are usually reflected by man-days needed to perform an audit. The day tariff for an audit is a market price that varies between countries and certification bodies. The day tariff for an audit is usually not affected by the selection of a certification system. The number of days of an audit, however, does depend on the selected system.

Factors that may increase the number of days for an audit, *independent of the system*, are:
- Difficult access to the location (travel days)
- Size of the company (e.g. number of storage facilities, distance between units)
- Complexity of the company
- Total number of producers in the group
- Actions in a new country/region

Factors that may increase the number of days for an audit, *dependent of the system*, are:
- Difficult stakeholder context (affects the success of the stakeholder consultations)
- Large subcontracted labor
- Significant number of complaints/non-compliances
- Sampling requirements by the system
- Documentation requirements (detail of forms, amounts of forms, information to be checked)
- Scope and verification requirements for sustainability principles

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7 Currency conversion is based on currency conversion ratios from 27 February 2012 – this also applies to other conversions in this report.

Table 17: Certification costs (in Euros, exc. VAT)*

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080[8]	REDCert[8]	ISCC
Annual membership fee	186-7428 € (250-10.000 US$)[1]	Regular: 2000€ Small: 500€ Affiliate[2]: 250€ Associate[3]: 100€	Regular: 2500€[4] Small: 250€[5]	Large: 9446 € (8000 GBP), Medium: 4723 € (4000 GBP); Small: 767 € (650 GBP) End users and intermediaries: 4369-15351 € (3700-13000 GBP). NGOs: North: 2362 € (2000 GBP); South: 236 € (200 GBP) [12]	Gathering: 500€ Processing operators[7]: 150-4000 € Traders: 3000€	50-5000€[9]	150-250€[9]	Companies: 250-3000€[9] NGOs: 250 € Individuals: 50€
Certification fee	Under development	-	-	-	-	Or: Regular: 200€ Small[10]: 50€	50 €/site Lower fee from 4th site on	One time Registration: 50-500 €[9] Certificate: 50-500 €[9]
Fee per metric ton biomass	Under development	1,5 €/MT (2 US$/MT) UTZ certification; 0,74 €/MT (1 US$/MT) to RSPO	For feedstock producer: 0.30€/ton certified soy	0,06 €/ton (0,075 US$/ton) of finished product (sugar/ethanol)	-	0,03 € per metric tonne	Ethanol: 0,027 FAME: 0,035 Biomethane: 0.5	Interfaces / ton liquid product[11]: 0,02€ members 0,03€ non members

* Currency conversion is based on currency conversion ratios from 27 February 2012

[1] Fee depends on annual operating costs or annual revenues. Fee for public or non-profit organizations is 250-1000 US$

[2] It refers to individuals or organizations with an indirect involvement or interest in the palm oil supply chain, they don't have voting rights and don't have the right to claim membership

[3] Supply chain associates are organizations that are active in the supply chain of RSPO certified palm oil that do not purchase more palm oil products than 500 MT/year. They do not have voting rights at the RSPO General Assembly. They are allowed to publicly state they are Associate member of the RSPO

[4] Producers >10000 ha; international NGOs from developed countries and with an annual budget > 250000 €; industry

[5] Producers <10000 ha and all other NGOs

[6] Large >5 Mio tons sugarcane crush capacity; Medium >1-5Mio>; Small < 1Mio

[7] < 2500 tons, 150€; <2500-10000> tons, 500€; >10000-100000> tons, 2000€; >100.000 tons, 4000€ - estimated over a year

[8] Either annual fee **or** certificate fee+fee per metric ton of biomass

[9] It depends on company's annual turnover (see annexes)

[10] < 250 ha

[11] First gathering points and warehouses are exempted

[12] Based on yearly crushing capacity (for mills) and annual turnover (for other actors); Crush Capacity: < 1 million: 650 GBP £, 1-5 million: 4,000 GBP £, > 5 million: 8,000 GBP £. End user/intermediary, varies according to turnover: < 0.5 billion US$: 3,700 GBP £, 0.5 – 1 billion US$: 6,600 GBP £, > 1 billion US$: 13,000 GBP

NL Agency

Differences in required auditing days in the Chain of Custody chain are limited and range between 1 to 2,5 days. Main differences can be found on the producer side of biomass production, which show variation depending on the number of sites to be audited, the area size of a company and the system to be audited. Typical indicative numbers of man-days used for single audits for the eight voluntary systems are shown in Annex 2; note that this information is largely based on interviews.

Table 18 shows the auditing days required for the situation that 10 farmers, grouped under one legal entity and, a storage facility (also grouped first gathering point under some systems) are to be audited. Group auditing is cheaper than on the same scale single auditing. This is because group auditing is based on sampling while single auditing requires farm visits to all farms individually. Annex 1 (table A.15) shows the current sampling options for group auditing; see also Chapter 5 on conditions for group sampling.

Table 18: Indicative number of man-days needed for situation that 10 farmers, grouped under one legal entity and, a storage facility (also grouped FGP under some systems) are audited

	Farmers + FGP	Farmers individual + storage	Farmers multi-site + storage unit
RSB	-	10*4 days + 2 days = 42 days	3.2*4 days + 2 days = 14 days
RSPO	20 (indicative)	n.a.	n.a.
RTRS	-	10* 3 days+ 2 days = 32 days	3.2*3 days + 2 days = 11 days
Bonsucro	15 (indicative)	n.a.	n.a.
ISCC	-	10* 3 days+ 2 days = 32 days	3.3*3 days = 10 days
NTA8080	-	10* 3 days+ 2 days = 32 days	3.2*3 days + 5 additional days + 2 days = 16 days
2BSvs	2 (1 to 3) [1]	n.a.	n.a.
REDcert	Indicative: 3-4 farmers/day (excl FGP)	n.a.	n.a.

Although this overview is indicative and differs from site to site, it shows that sampling requirements (and conditions) have influence on the number of needed auditing days. This also explains the low number of auditing days for 2BSvs.

For 2BSvs, the auditor will need significantly less time to complete a document audit than a field audit, therefore the total amount of man days needed to audit a first gathering point (FGP) for 2BSvs can be significantly less than systems relying on field audits of farmers, if the FGP can show it has a robust management system for all collection sites used. In any case the minimum required sampling level is 3% to be verified through site audits. Note that audit days for 2BSvs increase if the farmers are large (e.g. sugar beet) and days go down 0.5 day for surveillance audits and 0.5 day for farmers with good management systems.

The man-day tariff for auditing varies per country and per certification body. This tariff currently ranges from 500-1500 €. Audits in Asia and South America are generally charged with lower tariffs than audits in Europe or North America. The man-day tariff for auditing in the

Netherlands varies usually between 800 and 1200 €. From the interviews made, we know that there have been cases where man-day tariff in Germany has reached 1500 €.

6.2 Indirect costs

Indirect costs can be significant for a company, especially in the first year of certification. From the market study and testimonials during the interviews performed, it has been found that indirect costs can vary largely and can increase the product cost up to 30% in some cases. There are two types of indirect costs:

- *Administrative indirect costs:* The first type of costs is the one incurred at adapting the company or farm administration to adequate traceability tools and systems and man-days to ensure the correct (and documented) implementation of the mass balance.

- *Indirect costs related to sustainability compliance:* The second type of costs is the one incurred at closing the gap between sustainable and non-sustainable practices. This type of costs can be very significant especially at the biomass production side. These costs also have high dependence on the company culture, compliance or non-compliance with local legislation affecting environmental and social sustainability, level of knowledge and professionalism of its workers, relations with the community, etc.

6.2.1 Administrative indirect costs

Regarding administrative indirect costs, there is not so much difference between systems. All systems require having in place adequate *traceability tools* within all the CoC operators (feedstock producers, gathering points, processors, traders, etc). ISCC has for example more detailed requirements than REDcert, however all these requirements cause at the end more or less the similar amount of work (and costs) to implement them within the respective operators at the CoC. These requirements are in general related to information and document handling and bookkeeping systems.

These costs can be relatively large at the biomass production side, especially when the farm administration is poorly equipped with proper *management and bookkeeping tools*. Implementing these tools may require hiring extra personnel and providing skills training to current personnel. All these costs could be more expensive during the first year of certification until they are fully implemented in the company or farm's management procedures.

A second large cost for a company may be the set requirements on collection of *samples* to prove compliance with indicators.

A differentiation with respect to water quality is for example:
- NTA8080 requires amongst others: "An organization shall carry out measurements yearly to monitor the soil, water and air quality";
- ISCC requires documentation of water management plan including: Efficient water usage; Responsible use of agro-chemicals and waste discharge.

This study does not look in detail at the sustainability requirements of the evaluated systems (which ones, level of strictness and control). However, clearly, indirect costs are related to the systems' requirements: As example, yearly samples provide a better proof of compliance but they also result into higher costs.

Traders have low administrative indirect costs. In general some extra man-hours are needed to revise/assess the handling of information along the supply chain, and checking if traceability is well guarded in the company.

Indirect costs related to sustainability compliance

For a plantation, the indirect costs related to sustainability compliance can be very significant. These costs are usually related to the upgrading of facilities to allow them to comply with certification and/or audit requirements. Even when not getting certified but only audited, the plantations must comply anyway with national legal considerations.

Several examples of this situation may be described.

- For example in Malaysia, housing is a legal requirement that is many times not observed unless a certification process obliges the plantation to take action;

- In Brazil, evolving legislation and compliance with it is an important issue. Experiences at RTRS show that compliance with the Forest Code is considered difficult (will also be the case for other systems). Currently, there are discussions to adapt the forest code. This change will make it easier to show compliance with certification systems;

- The differences in checking compliance on labour conditions between ISCC and RTRS; see also box under 5.4 about weakly defined verification requirements, where this example is discussed more in detail;

- Other important cost in this classification is the cost for technical training of the farm personnel. Training on soil management by instance could result expensive depending on the size of the farm.

Experiences from other certification systems, not subject of this study, give an indication of the range of indirect costs for sustainability compliance. Indicated indirect costs for FSC certification range from 18.84 €/ha per year (Finland, $9*10^5$ ha) to 1.81 €/ha per year (Norway, $4*10^3$ ha). Other indications for additional costs found in literature are around 8% for FSC certification, 44% for meeting strict sustainability criteria for Eucalyptus produced in Brazil, 14% for willow production in Ukraine, 45–55% for organic sugar production in Brazil and up to 65% for Indian food products to meet GlobalGAP criteria (Dam et al, 2011).
An ISCC and RTRS certified soy producer indicated an investment of around 148,457 € (US$200,000) for required management improvements. Total certification costs were estimated between 35 to 40% of the production costs, at least for the first year (based on interviews).

Note that some short-term indirect costs for certification, as technical training, may result into efficiency improvements for a company on the longer term.

Box 3: Indirect costs and company size of farmer
A survey from (ICONE, 2011) indicated amongst others the following costs for RTRS compliance in Brazil.
- Rural Environmental Registry is estimated at 6 BRL / ha (≈2.6 €/ha).
- Consulting for a health and safety program (Mato Grosso) is around BRL 1,100 (≈480 €) for one month .
Only considering this cost, this will result in a cost of 7 BRL (3 €) / ton soy* for a farmer owning 50 ha. Costs will be for a farmer owning 200 ha will be 2.9 BRL (1.3 €) / ton soy* *(* based on a yield of 4 t/ha soy)*

Findings from interviews and literature research indicate that:

- Indirect costs are largely variable; though can be substantial;
- Indirect costs are related to the sustainability requirements of the evaluated systems (which ones, level of strictness and control)
- Sustainability requirements, and therefore management improvements and its costs, largely refer to the farmer or plantation;

- Indirect costs are, partly depending on the requirement, relatively higher for smallholders than for large companies;
- Some systems include less stringent requirements for smallholders (e.g. RTRS), see also the individual online factsheets.

6.3 Case studies

In this report, four case studies are presented as examples to give an indication of the certification costs in the supply chain and to facilitate a comparison of costs between systems. The analysis and results of these examples have been built on the responses from different market players during the interviews performed for this study.

The case studies are also used to analyse the impact of certification costs on total cost and price levels in the supply chain. This information will provide general insight in the impact of certification costs over time when product prices and costs are changing. Additionally, this exercise will also facilitate analysing the various costs and benefits for the total and for the various companies within in the biomass chain.

For making a cost comparison among all systems, factors such as the size and location of the farm, the total number of producers in the group (in case of group auditing), the distance between farms and logistic costs are set similar to ensure sensible comparison. The tariff used for auditing per man-day is assumed to be 700 € / day for all cases; excluding travel cost.

The case studies focus on the cost differences for a certifying unit that succeeds and complies with the standard. The examples provide therefore a quantitative indication of the direct costs including auditing costs, certification fees and quantity related fees. Membership fees and indirect costs are excluded as they also apply to enabling companies. A qualitative indication of the indirect costs is included though.

Note that information on production costs and prices for the various processing steps in the supply chain are general and indicative and largely based on interviews – asking for an estimation of required man-days for each case study based on current status of countries situation and certification systems development; therefore the information can fluctuate strongly over time. However, the overview does give a general indication on the impact of certification costs over various supply chains.

The case studies start with a general description of the processing steps and actors in the supply chain, followed with a general overview table of costs and prices (excluding certification). After this, a discussion on the impact of certification on the overall costs and prices follows.

6.3.1 Palm oil from Indonesia

This case starts with the production of Fresh Fruit Bunches (FFB) in Indonesia. In this case, we compare the production of FFBs for two different farm ownerships:
- Large-scale plantation, owned by the mill (private estate); Yield levels are 16 t FFB/ha
- Smallholders, grouped in a cooperative of 100 smallholders, integrated with the mill, Yield levels are 16 t FFB/ha; smallholders are grouped relatively close together;

In both cases, yield levels are 16 t FFB/ha over an area of 500 ha. After harvesting, the fresh fruit bunches are transported to the mill for further processing over a distance of 50 km. In the mill, the FFBs are processed in various steps to extract the crude palm oil (CPO). A second product is the palm kernel, which is further processed. The CPO is transported over short distance for transesterification into methyl esters (Global Biopact, 2011). Then it is transported overseas to Rotterdam.
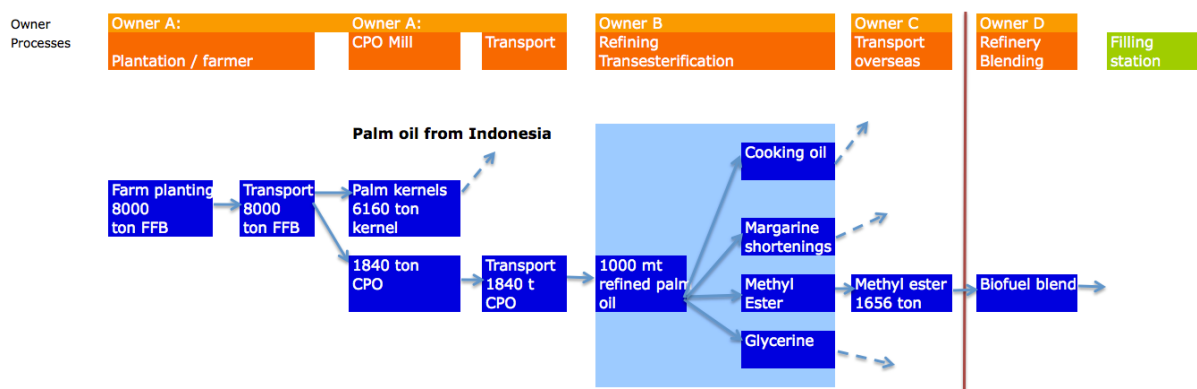
Figure 9: Supply chain case study palm oil Indonesia – owners, processes and product flow

In this example, we compare the following three certification systems: ISCC, RSPO and 2BSvs. In practice, all three systems will integrate the auditing of the plantation with the audit for the mill.

Indication of indirect costs , based on different requirements systems (* = small, ** = medium, *** = high)

RSPO	***	*	*	*
ISCC	**	*	*	*
2BSvs	*	*	*	*
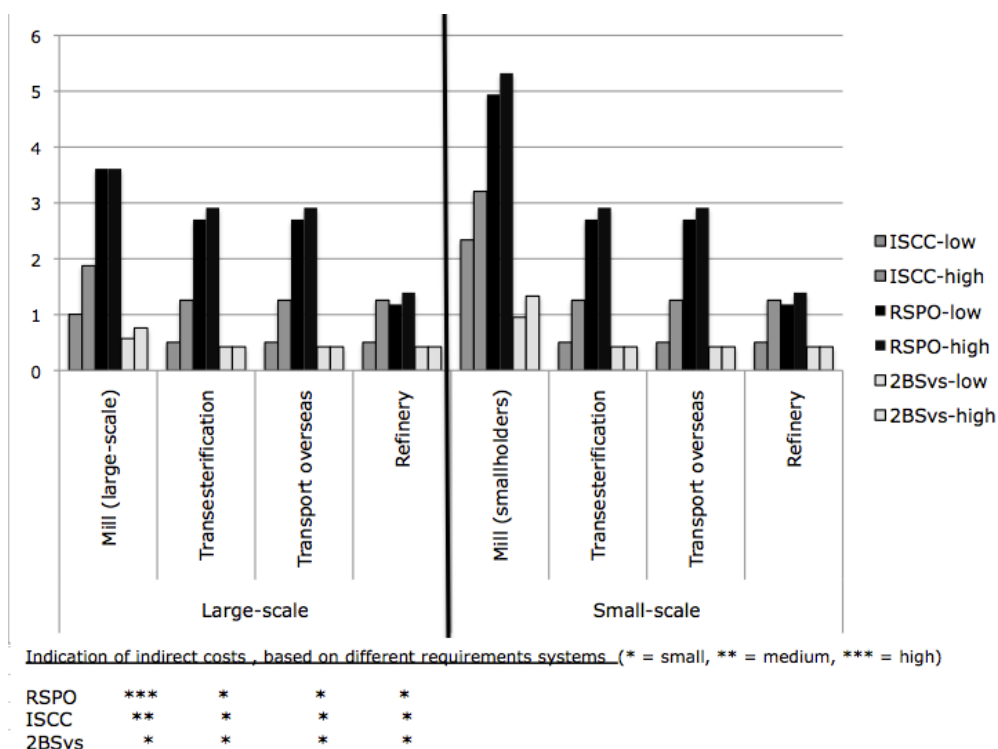
Figure 10: Indication of total direct costs (in €/tonne/ year) for certification systems – with upper ("high") and lower bound ("low") of cost range - distinguished for different actors along the supply chain. Information is based on interviews and based on volumes of this specific case. Estimation of relative indirect costs between the systems and actors is marked with *

The cost results in figure 10 are based on the volumes of this case study; clearly costs decrease substantially when larger volumes are handled. In this example, 2BSvs generally results into the lowest costs, followed by ISCC and RSPO (see also figure 10). Total direct certification costs are slightly higher for the mill compared to the up-following actors in the chain.

Indirect costs are expected to be highest for RSPO, especially on the level of the farm and plantation, followed by ISCC and 2BSvs. The differences between indirect costs for a small-scale and large-scale plantation are difficult to define as it depends largely on the preparedness of a company. The capability of a smallholder group for making investments depend on its resources, access to the market or support. RSPO requires for example that the mill develops

and implements a plan to ensure that 100% of associated smallholders and out growers are of certifiable standard within 3 years.

Figure 11 gives more detail about the cost items that cause the differences in direct certification costs between the three systems:

- ISCC excludes FGPs from a quantity related fee, while this cost item is relatively high for RSPO (also covering its IT-traceability system with this fee);
- 2BSvs only asks for a membership fee (not included in the comparison) and does not have a certification fee or quantity related fee. The cost structure of the system is thus relatively low compared to ISCC and RSPO. At the same time, it must be noted that this also result into lower capacity of the system in terms of secretariat capacity and e.g. development of traceability systems;
- There is a difference in required auditing days per system; this can be explained by the system's auditing requirements and coverage of principles.
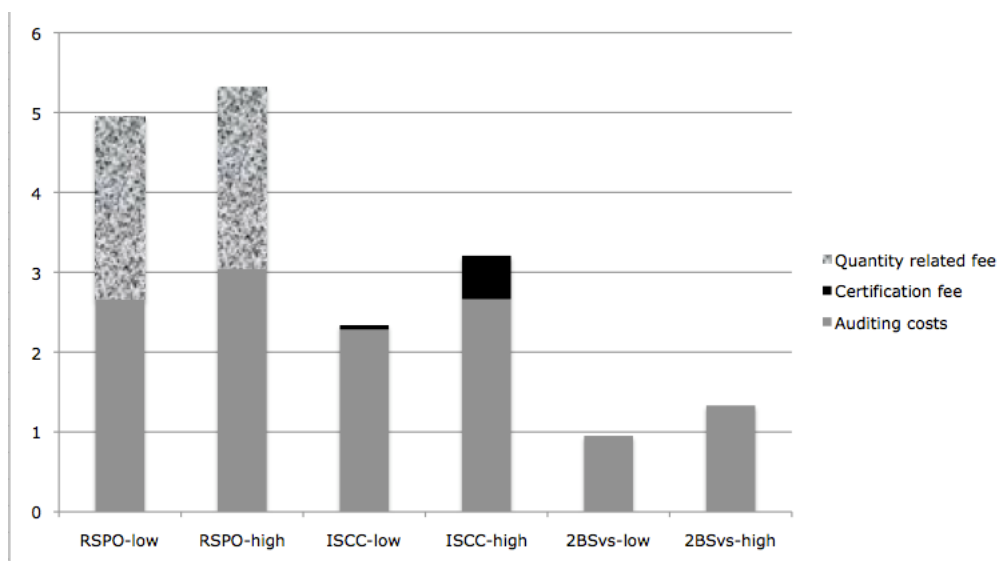
Figure 11: Total direct costs for ISCC, RSPO and 2BSvS certification of the mill (based on smallholders) – with upper ("high") and lower bound ("low") of cost range - differentiated to cost structure of the system and auditing costs in €/tonne/ year for volumes as described in this case.

The costs for certification, as included in this comparison, should be placed in relation with the total production costs and prices and its variations in the market. Figure 12 shows the relative impact of certification costs on a range of total production costs at the mill (based on data in Annex 3) for smallholder certification. Although certification of a mill that is supplied by smallholders is, considerably more expensive than when supplied by a limited number of plantations, relative costs remain below 2% of total production costs and can be substantially further reduced when handled volumes increase.
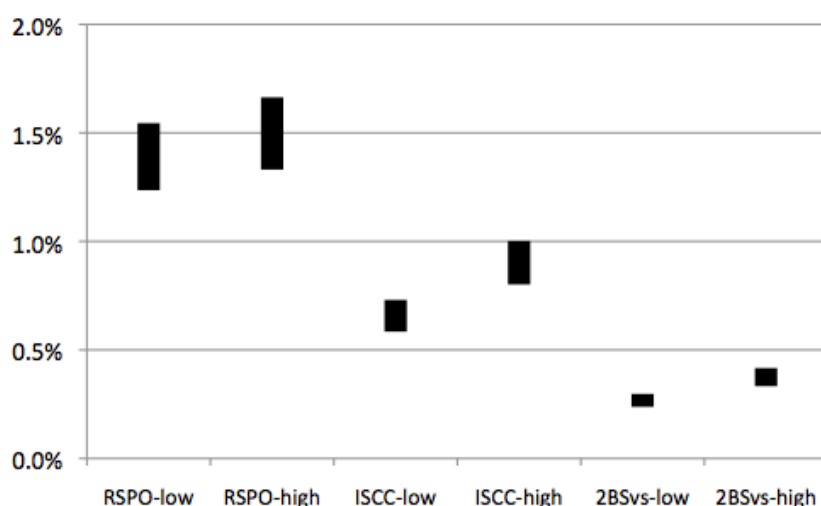
Figure 12: Relative contribution of certification costs for ISCC, RSPO and 2BSvs certification at the mill (for smallholders) – with upper ("high") and lower bound ("low") of cost range - compared to total production costs (320 to 400 €/tonne)

6.3.2   Jatropha from Tanzania (ISCC, NTA8080, RSB)

The setting of this case study is Jatropha production, harvested in Tanzania. Jatropha is produced with a yield level of 1100 kg /ha. There are two business models for Jatropha production in Tanzania; they can be representative for similar systems in other developing economies. These are:

• A large-scale plantation system of 350 ha; the farmer is responsible for transporting the harvested Jatropha seeds to the expeller;
• A smallholder system or contract-farming system where smallholder farmers are grouped in a legal cooperative, no contract is signed between the expeller and the farmers for cooperation in certification. Smallholders generally have a farm area of 1 ha (350 farmers for this example). When harvested, Jatropha is brought to one collection point, from where the expeller picks up the harvested seeds (transport is outsourced).
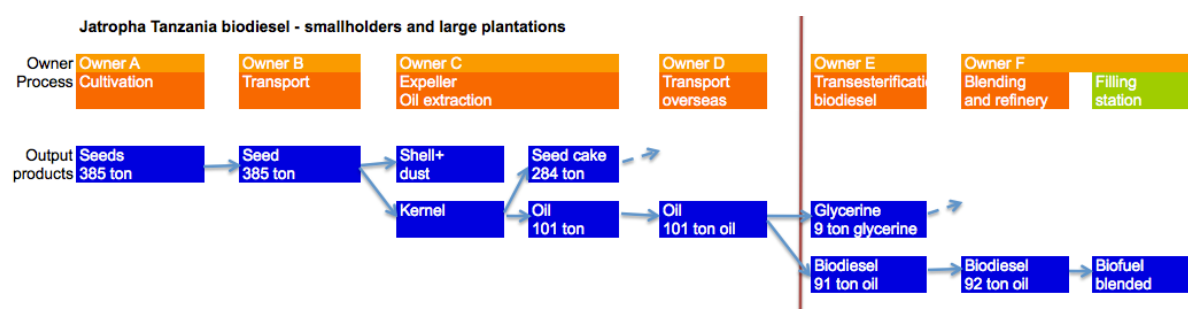
Figure 13: Supply chain case study Jatropha Tanzania – owners, processes and product flow

Transport is over a distance of 100 km. At the expeller, the hulls of the seeds are removed, the kernels are (mechanically) pressed, and the resulting oil is filtered. By-product of the oil is seed cake. The oil is transported to the port, from where it is transported overseas to the port of Rotterdam. Transesterification takes place in Rotterdam. The co-product of biodiesel is glycerine. The SME biodiesel is further blended with fossil fuels (Eijck, 2012), (Eijck et al, 2012).

In this case study, the following certification systems are compared: ISCC, NTA8080 and RSB. It is assumed that an initial certification audit takes place; all actors are considered to be of medium risk.

As the system cost structure is not available yet for RSB, this case study limits itself to a comparison of the required auditing days and a qualitative indication of expected indirect costs per system. Note, however, that experiences on required number of auditing days for RSB certification are still very limited and information is therefore based on relative comparisons with other systems.

Indication of indirect costs , based on different requirements systems (* = small, ** = medium, *** = high)

RSB	****		**	*	**	
NTA8080	****		**	*	*	
ISCC	***		*	*	*	
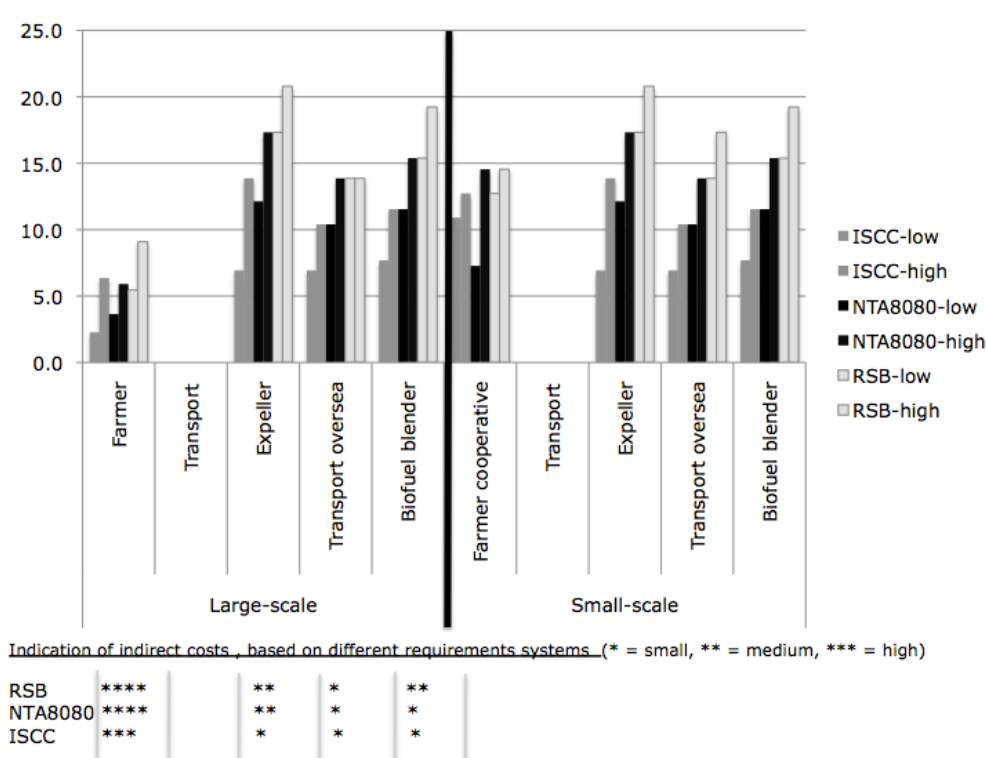
Figure 14: <u>General</u> indication of costs for auditing <u>only</u> in total for ISCC, NTA8080, and RSB– – with upper ("high") and lower bound ("low") of cost range -- in €/tonne/year, based on a general audit fee of 700 € / day, based on volumes of this specific case. Estimation of relative indirect costs between the systems and actors is marked with a *.

Ranges in auditing costs between systems are close to each other, although RSB is (expected to be) slightly more expensive than the other 2 systems (see figure 14). ISCC provides the opportunity to merge the auditing of the expeller and the farmers into one audit, which creates an option to reduce auditing costs.

Group sampling reduces the auditing costs for smallholders per farmer; costs still remain relatively high compared to large farms. Although total auditing days per year are highest on farm level, costs in €/tonne/year are higher at the end of the chain; this due to volume decreases in processing steps. Note that results are based on this specific example and that costs can substantially decrease when large volumes are handled or merged.

The costs for auditing days should be placed in perspective with the yield of the product and with the total costs (see also Annex 3). For a large-scale farmer, auditing costs would ask for 3% of the selling price of the seeds, compared to 6% for smallholders. This is close to 2% for the expeller.

Indirect costs are expected to be higher for RSB and NTA8080, compared to ISCC. This is due to the more stringent requirements of these 2 systems. Of course, this all relates to the preparedness of a company when starting the enrolment in a system. Indirect costs are expected to be higher for small-scale farmers than for a large-scale farmer. The establishment of a cooperative (though not required under ISCC) will be a cost. Hidden costs for group formation are mentioned for example by (Markelova, 2006) and (FAO, 2008) (and include e.g. initial high time investment in meetings or costs of organizing and operating collectively.

6.3.3   *Soy from Argentina (ISCC, RTRS, 2BSvs)*

This case starts with soybean production in Argentina, harvested in La Pampa province. Soy is produced on a large farm of 1000 ha with yields of 3.2 tdm / ha. The harvested soybeans are transported to the port, where crushing facilities are available. The soy seeds are pressed, and the resulting oil is filtered. By-product of the crushing is the soybean meal, used for the animal feed sector.

The crude soy oil needs some further purification and the product is refined soy oil. Transesterification takes place in Rosaria (Argentina). The co-product of biodiesel is glycerine. The SME biodiesel is transported overseas to Port of Rotterdam for further blending with fossil fuels.
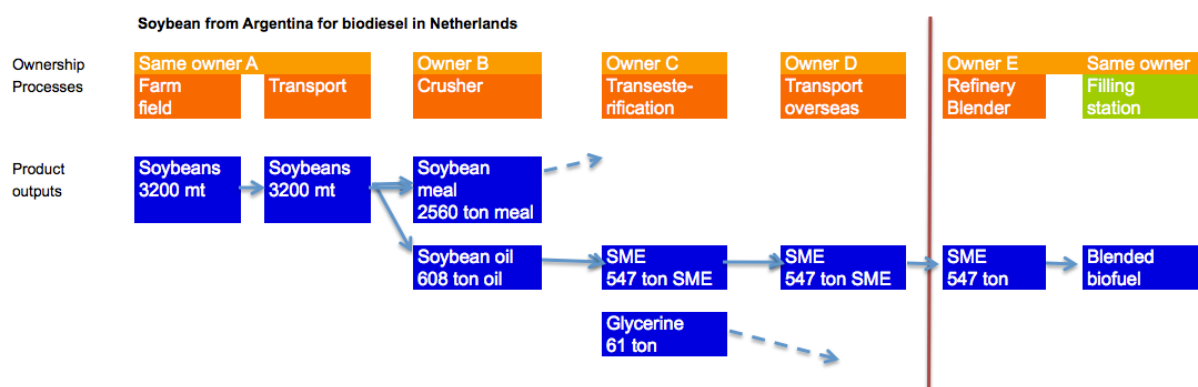
Figure 15: Supply chain case study Soybean Argentina – owners, processes and product flow

In this case, the costs for the following certification systems are compared: ISCC, RTRS and 2BSvs. It is assumed that actors in the supply chain are a member of the system.

Figure 16 provides an indication of direct costs for the three different certification systems in tonne per year (based on the volumes for this specific case), including auditing costs, quantity related fees and the fee for the certificate (excluding membership fees). Note that 2BSvs starts at the crushing unit, considered to be the first gathering point; ISCC and RTRS start the audit on farmer level. The auditing costs for ISCC and RTRS include for both stakeholder consultations on farm level.

Direct costs for certification at the crusher are in this example fully allocated to the soybean oil; note that RTRS certification also certifies the soybean meal, which means in practice a spread of the costs over larger volumes.
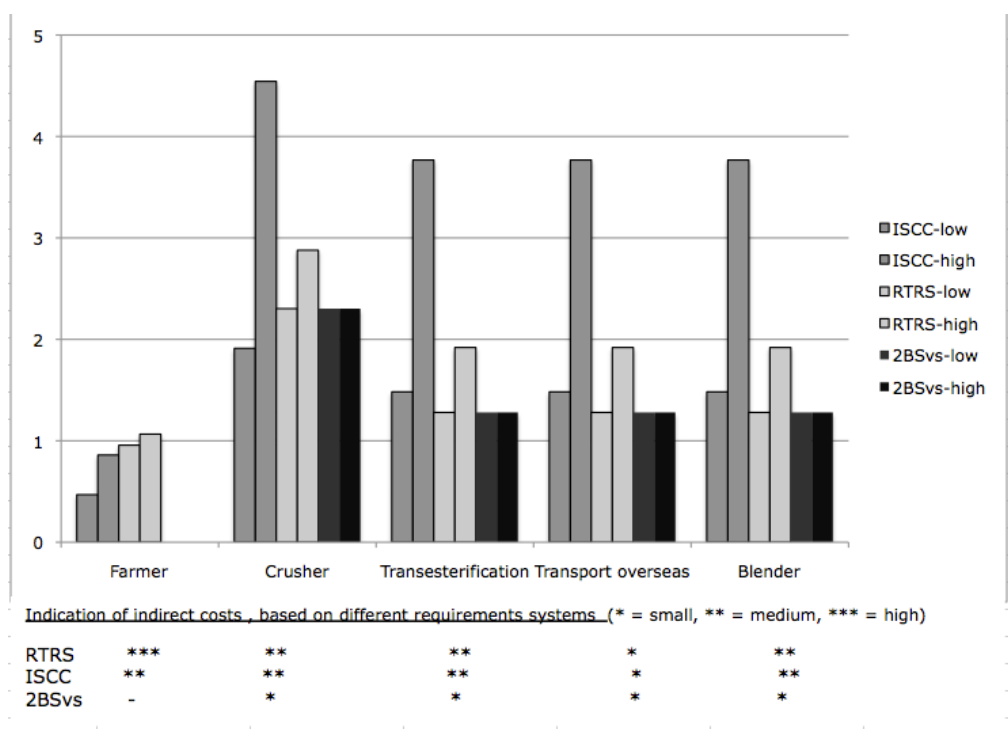
Figure 16: Indication of total direct costs (in €/tonne/year) for certification systems – with upper ("high") and lower bound ("low") of cost range - distinguished for different actors along the supply chain. Information is based on volumes of this specific case and on interviews. Estimation of relative indirect costs between the systems and actors is marked with *

Cost estimations are close to each other; the estimations indicate that auditing costs are lower for 2BSvs compared to the upper ranges of ISCC and RTRS. Indirect costs are also expected to be lowest for 2BSvs.

Figure 17 shows that the direct costs for auditing have to be placed in perspective with the quantity based fee and the certification fees of the systems. Quantity related fees on producer level are relatively high for RTRS compared to ISCC and is based on the certified quantity of the product. Quantity related fees are not asked from other actors in the supply chain. ISCC excludes the FGP from paying quantity related fees but they are asked for other actors in the chain – which is contrary to RTRS. Note that membership fees are not included in the comparison.

This example shows that the direct costs of a company not only relate to the auditing costs but also are strongly related to the cost structure of the system itself and the characteristics of the company (e.g. annual turnover and size of the product flow).
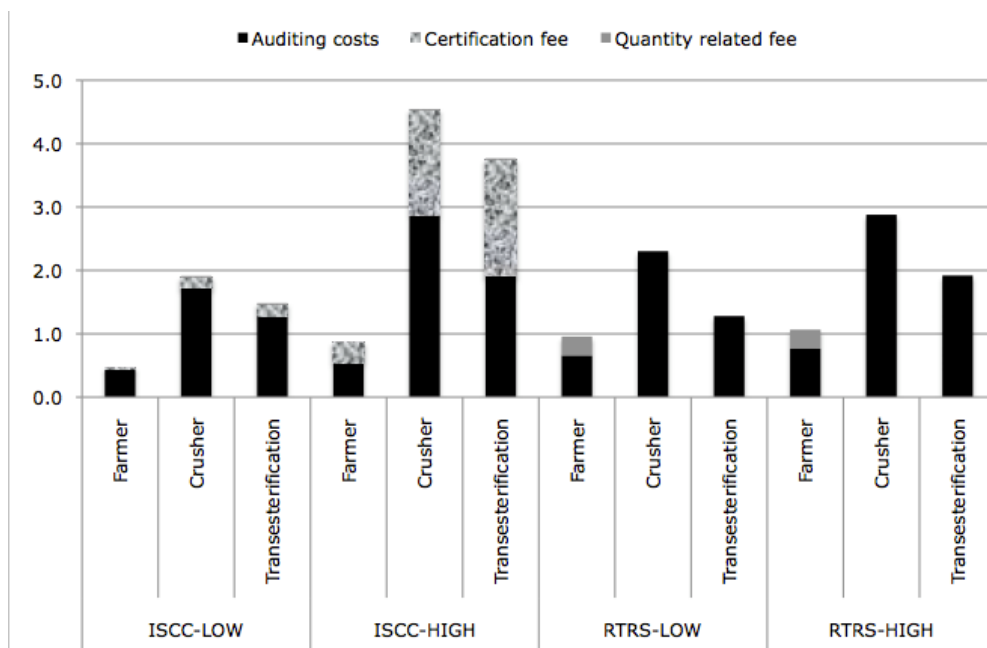
Figure 17: Differentiation of total direct costs for ISCC and RTRS – with upper ("high") and lower bound ("low") of cost range - to certification fees, quantity related fees and auditing costs in €/tonne/year for product flow as described in this case

Figure 18 gives an indication of the impact of RTRS certification costs over the overall production costs and prices in the beginning of the supply chain, at the soybean producer and the crusher. Basically, the "differential to non-certified farmer" and the "certification cost" indicate the additional costs compared to a non-certified farmer. An indication of the total costs and prices (excluding costs for certification) for this supply chain are included in Annex 3.

Certification costs in this example ("certified") are based on practical "real-life" experiences from a large soy producer in Argentina. Certification costs for the crusher are also based on this information. Price premiums are indicative and placed on the soy oil, as demand for certified oil is larger than for the meal. The costs for 'certified – major changes' implies an investment for the soy producer of 225.111 € (300.000 US$) and for the crusher of 75.037 € (100.000 US$), both over a period of 5 years.

Although certification costs are indicative, it does place the impact of certification costs into context with the overall production costs under different economic circumstances. Although impacts are small in € per ton, one of our respondents indicated that a price increase of 4 to 5% per ton can be a substantial yearly increase for purchasing resources when multiplied over large volumes.
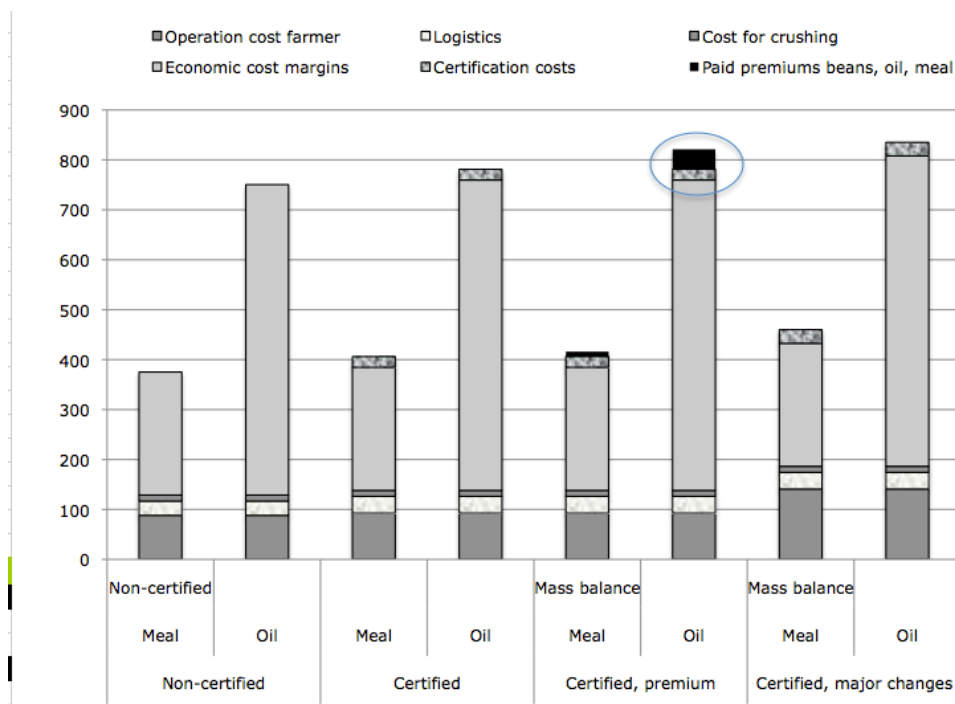
Figure 18: An indication of the impact of certification costs over the total costs in the beginning of the soy production supply chain (in €/tonne/year).

6.3.4   *Brazil (Bonsucro, ISCC, 2BSvs)*

A main production region for sugar cane is South-Central Brazil; where close to 90% of overall production is concentrated. This case assumes that sugar cane is produced on a farm area with a size of 200 ha with an average yield of 85 t cane/ha. The farmer transports the cane over a distance of 50 km to the closest mill / ethanol facility. This Brazilian ethanol plant, producing 77 litres per ton cane, has co-generation facilities for the bagasse, for which credits are received. The ethanol is transported by truck to the port over a distance of 250 km by a separate company. From here, it is transported overseas to Rotterdam, where the ethanol is further blended.
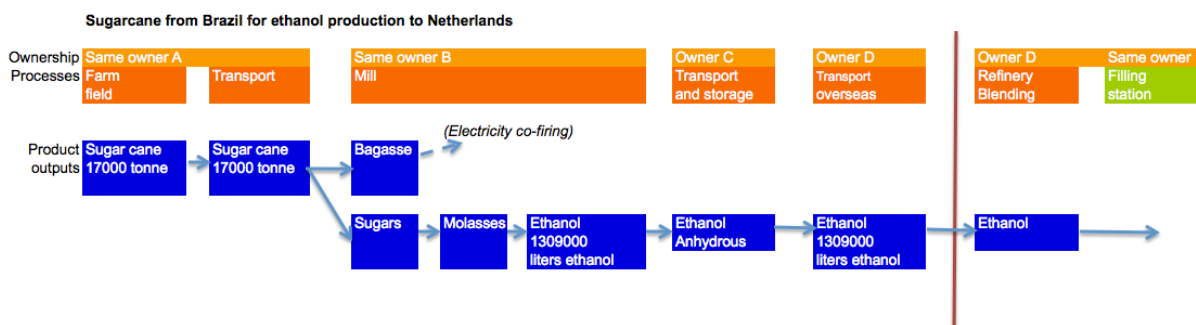
Figure 19: Supply chain case study Sugar cane Brazil – owners, processes and product flow

In this case, the costs for the following certification systems are compared: ISCC, Bonsucro and 2BSvs. Figure 20 shows the total direct costs for certification (excluding membership fee) for the three systems. Cost ranges largely coincide between the three systems. There are differences in the upper ranges because of the following underlying reasons:
• Auditing costs are comparable between ISCC and Bonsucro. 2BSvs has slightly lower auditing costs;

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- ISCC applies a certification fee based on annual turnover of the company, which explains the upper ranges (full range is taken into consideration)

Note that membership fees are not included in the comparison; Bonsucro does not have a certification fee but does have a higher membership fee than ISCC.

Based on a production cost of 0.46 US$/l (0.35 €/l) at the mill (see also Annex 3), direct certification costs will represent 0.3% to 0.6% of total production costs.

Indication of indirect costs , based on different requirements systems (* = small, ** = medium, *** = high)

Bonsucro	***	*	*	*
ISCC	***	*	*	*
2BSvs	**	*	*	*
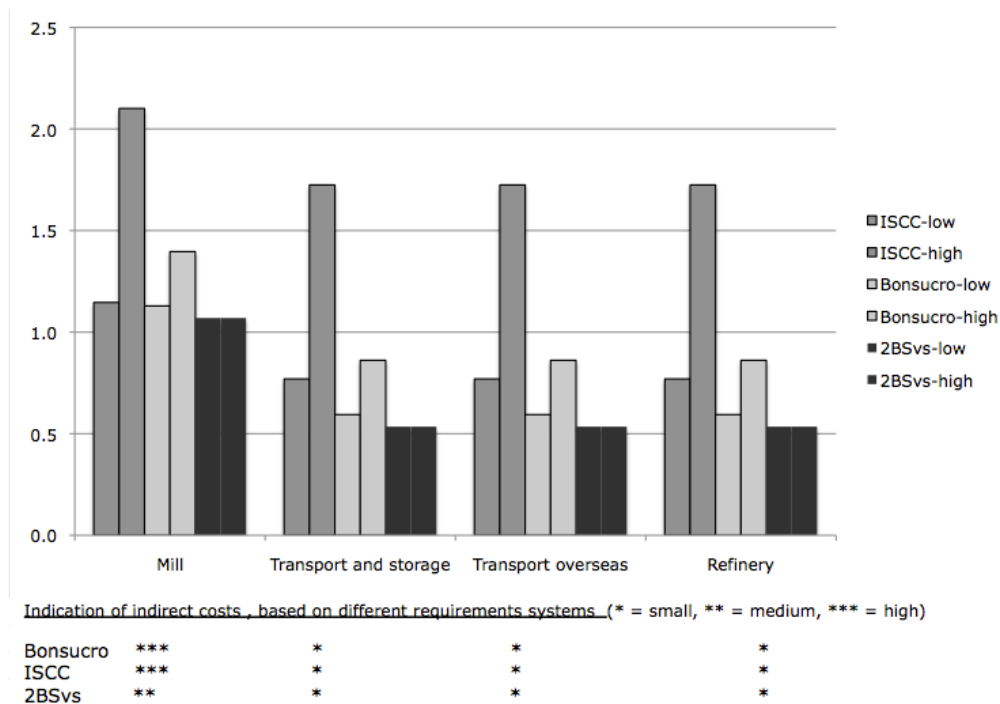
Figure 20: Indication of total direct costs (in €/1000 litre/ year) for ISCC, Bonsucro and 2BSvs – with upper ("high") and lower bound ("low") of cost range - distinguished for different actors along the supply chain. Information is based volumes of this specific case. Estimation of relative indirect costs between the systems and actors is marked with *

6.3.5   *Key conclusions from the case studies*

Cost estimations are based on the volumes of the case studies. Information on costs is largely based on interviews and experiences on costs for certification of biofuels are still limited. However, based on the case studies, it is possible to draw some general conclusions.

Costs for certification:
- The cost structure of a system has influence on the total direct certification costs and may be substantial. Costs for the system structure are unrelated to requirements on the level of assurance of a system although it is important that a system has enough financial capacity to cover e.g. secretarial expenses for handling procedures or grievances;
- Membership fees are not included in the comparison of the case studies. Being a member of a system is only a requirement for Bonsucro, RSPO and 2BSvs. This is not a requirement for the other systems;
- There are differences in auditing costs per system, although large differences have not been found;
- An indication of cost levels for different certification systems, based on the case studies, is given in table 19 below. The table indicates that in general 2BSvs has the lowest direct costs,

followed by NTA8080, Bonsucro, RTRS and ISCC. RSB and RSPO lead to relatively higher direct costs in comparison to the systems in this specific case.

- All systems result in a similar level of indirect costs, except 2BSvs for which the indirect costs are expected to be lower.
- Indirect costs depend on the sustainability requirements of a system (how many, level of strictness) and are also largely influenced by the preparedness of a company to meet compliance.

Table 19: General indication of cost level for different certification systems, based on the outcomes of the case studies ($ = low, $$ = medium, $$$ = high – all in relation to each other)

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Direct costs* • Soy • Palm Oil • Sugar cane • Jatropha	$$$	$$$	$$	$$	$ $ $	$$		$$ $$ $$ $$
Indirect costs (farmer level)	$$$	$$$	$$$	$$$	$$	$$$	n.a.	$$/$$$

* Excludes the membership fee of a system

Who bears the costs?
- Total required auditing days are highest at the farm or first gathering point, where most auditing days are needed to check compliance with the standard;
- More auditing days are needed for smallholders compared to single, larger farmer units. Thus, although the sampling of small farmers reduces the individual farmers auditing requirements, costs per year seem to remain higher compared to larger farming units.
- Total indirect costs are highest on farm level and can be substantial compared to direct costs for certification;
- Differences in indirect costs between smallholders and large farms depend on the preparedness of the company. Still, the establishment of a cooperative will be a cost for smallholders, as well as additional initial high time investment in meetings or costs of organizing and operating collectively.
- Which actors in the chain have the highest and lowest certification costs in €/tonne per year depends largely on product volumes; the higher the volume of a product flow, the lower the direct certification costs per tonne product;
- Mills have the highest certification costs €/tonne per year in the sugar cane and palm oil case studies; expellers have the highest certification costs in the Jatropha case; the crusher has the highest certification costs in the soybean case study;
- Certification costs can be reduced substantially when a producer decides to handle larger product volumes or to merge his product with other product flows.

Certification costs in relation to total costs and prices:
- The costs for certification should be placed in perspective with the yield of the product, the handled volumes and with the total production costs and prices;
- Direct certification costs in the palm oil case study are below 2% of total costs for smallholders at the mill; direct costs for the sugar cane case study are between 0.3% and 0.6% at the mill. Note that these comparisons are based on assumptions made for these specific case studies (e.g. volume flows and cost indications) and therefore highly variable;
- Impact of direct certification costs on total production costs is, however, relatively small – especially when large volumes are handled. This does not mean that yearly (investment) costs may not be substantial for producers, especially for those with limited financial capacity.
- The impact of direct certification costs on total production costs is in percentage highest for those actors which handle small volumes combined with low costs (e.g. transporters or traders);

- Certification costs have most impact on the price margin of the product for those actors where a) prices are relatively low and b) where margins are small.

6.4 Benefits

Apart from the costs, certification may also generate **possible benefits** received from certification. Roughly, two types of benefits can be distinguished: internal company benefits and external benefits.

Selecting the most suitable certification system could result into better cost or profit margins for a company; this depending on the type of benefit.

Internal company benefits refer to management or efficiency improvements within a company, which *may* lead to better cost-margins. Various systems have integrated this economic principle in their standard. Principle 2 of RSB requires for example "planning, monitoring and continuous improvement (transparent and consultative impact assessment, and economic viability) of a company while Bonsucro requires in its Principle 5 the "continuously improvement of key areas of the business" including promoting economic sustainability.

External benefits relate to meeting requirements or expectations on the market so a better market position can be achieved. Buyers and relevant stakeholders will define at the end the norm on sustainability and the willingness to pay for it. This may include the following benefits (based on outcomes of the interviews):
- Meeting demands of the market;
- Legal compliance (EU-RED and legal requirements producer country);
- Image and branding
- Price premium

Benefits are interrelated and will finally all influence the price that will be paid on the market for a product: A positive image and demand (or shortage) on the market for a product will increase price levels. Efficiency improvements will reduce costs. At the end, it is relevant to evaluate in how far benefits outweigh the costs for certification. Also, it is important to know which actors in the supply chain profit the most from these benefits. This information provides insight in the *final* burden (or benefit) of certification to the market[8].

6.4.1 Price premiums on the market

A premium is largely determined by certification costs, offer of certified volumes, demand, and end consumer willingness and commitment to sustainability. Various respondents have indicated that the market basically determines the premium for certified material: In case supply falls short, premiums increase. In case of oversupply, premiums decrease or they are not paid at all. A recent example for both situations can be given.

Supply falls short

Statistics from October 2011 indicate that premiums over MTBE for regular material remain at 75-112 €/tonne ($100-150/tonne) FOB ARA, while ISCC products continue to command premiums in the 150 €/tonne ($200s/tonne), (ICIS, 2011).

(ICIS, 2011) Explains that Germany continues to buck the trend and show good consumption, but only material holding the ISCC is traded there (October 2011). It is indicated that material with ISCC, which is required by Germany, was extremely tight in Northwest Europe in June 2011, although some supplies were available in the Mediterranean. Tightness on the market resulted that month in high premiums (187-225 €/tonne; 250-300 $/tonne), ICIS (2011).

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8 Note that both these costs and benefits do not consider the long-term economic benefits for a region received from environmental services (e.g. improvement water quality).

There has been a limited acceptance of approved certification systems in Germany until August 2011 - after then extended with all EU-recognised systems for biofuels and bioliquids. This, combined with ISCC preference from operators in the largest biofuel importer and consumer country in Europe, has strong influence on the demand and price premium for certified biofuels.

One respondent indicated that current price premiums are also related to double counting regulations (UCOME in some countries).

Demand falls short

Analysis of November 2010 showed that there was a supply of 450.000 metric tonnes CSPO compared to sales of around 180.0000 metric tonnes (News, 2012), although demand is increasing compared to previous years. (Leegwater, 2011) has indicated that the surplus price for palm oil depends on the possibility to receive a premium. At this moment, about 50% is sold with a premium; for the other 50%, the producer absorbs the costs. A similar oversupply of certified material currently exists for RTRS (Zeehandelaar, 2011); demand is expected to increase though.

Preferably, there is a more or less balanced economic market situation where producers are convinced (by demand and price) to choose for sustainable production, without creating extreme price fluctuations and distortions on the market. This situation can be further stimulated by:
• Broader acceptance of certification systems to avoid that supply is not artificially restricted;
• Commitment of buyers; this information is vital to convince producers that there is demand;
• Transparency in the market[9];
• Support to farmers to gain access on the market.

Price premium: Influence on the co-products

The demand and price fluctuations of certified biofuels or oils (and the premium to be paid for it) not only has an impact on the availability and price for the certified main product, but also on the availability and price of its certified co-product on the market, as stressed by various respondents during our interviews.

Basically, the certification system that is mostly used for the main product (e.g. oil) creates, possibly unintentionally, a large availability of a certified co-product (e.g. meal) on the market by this system. Price premiums, when paid for, are mostly placed on the oil resulting in sufficient supply of certified meal without additional cost for the end-user. An example of this dynamic is shown in figure 21.

At this moment, there is a higher demand of certified biofuel or oils, largely pushed by the requirements of the EU-RED. Consequently, companies that aim to buy certified meal or oils for the food or feed market have to deal with a) unexpectedly high demand in case of overlap of resources or b) an oversupply of certified resources.

It must also be noted that the stimulation of rapid growth of a certification system in the biofuels sector may thus also have its influence on the development of certification systems in other food or feed sectors.

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9 See also as example: WWF's first Palm Oil Buyers' Scorecard (WWF, 2011)
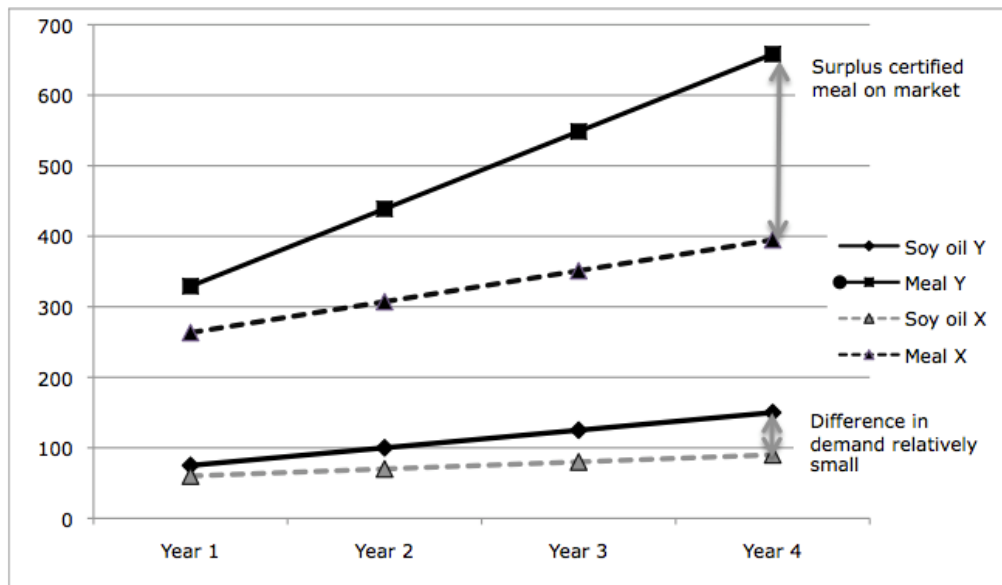
Figure 21: Impact of demand (in tonnes) for certified soy oil on availability of certified co-products

6.4.2   Do benefits outweigh the costs?

Clearly, an economic balance in costs and benefits is preferred to stimulate sustainable production. It is however difficult to say if and when certification benefits outweigh the costs for certification.

It is very important that companies select well the certification system that best suits their supply chain characteristics and their sustainability goals. When selecting a certification system, a company will need to make a thorough assessment based on expected costs and benefits, on its own strategy, company structure and its position in the market.

Internal benefits will be visible in a company on a medium term while certain investments to meet sustainability requirements need to be done on short notice. Consequently, costs and benefits will not occur at the same time and a company needs to be willing (and able) to invest now for creating benefits in the future.

The market - in terms of the demand, supply and product requirements - largely influences external benefits for a company. These types of benefits are also influenced by competing sectors and companies:

• There exists a transition period where not all the EU market is fully required to demonstrate compliance with sustainability. During this period, competition and market distortions within the sector may happen. This transition period will extend to 2013 at least when Member States finalise implementing their sustainability approval or verification procedures. After this transition period, when the full sector is required to demonstrate compliance with the EU sustainability criteria, this requisite will become standard for the whole sector. All companies working with the European Market will have then a level playing field. They all will have made investments to be able to stay in the market – irrespective of costs needed to meet these requirements;

• In case a company performs above the sustainability norm, it will be able to receive a price premium if there is demand for its product. This may incentivize a company to make some investments in the short term in order to position itself in a niche market.

6.4.3   *Who receives the benefits?*

None of the certification systems have defined rules to ensure that part of the paid premium returns to the farmer or plantation; this is considered as a dynamic economic process of the market, which should not be interfered (various respondents).

Table 20: Indication of recipients of benefits for certification along the supply chain

Type of benefit	Recipient
Efficiency and management improvements	Requirements on this aspect are laid down in the producer standard: Benefits mostly at <u>farm level</u>
Meeting demands of the market	Relevant for <u>all actors</u> in the supply chain
Legal compliance EU-RED	<u>Economic operators</u> delivering biofuels and bioliquids on the European market; mainly <u>traders and biofuel producers</u>
Legal compliance producer country	Requirements on legal compliance are laid down in the producer standard: Direct benefits at <u>farm level</u> though <u>other actors</u> also benefit from this assurance in terms of risk management
Image and branding	For those companies that want to distinguish their product from other market players; mostly relevant to <u>larger companies or end-users in the market.</u>
Price premium	At the point where there is a demand and / or shortage for a specific certified intermediate or end product – more likely to be at the end of the value chain (<u>traders, biofuel producers</u>)

Table 20 gives a general indication of the recipients that are expected to benefit most of the advantages of certification. It is expected that the actors in the end of the supply chain will receive most of the external benefits. Farmers will receive most of the internal benefits, largely enforced through the standard's requirements.

7　Conclusions and recommendations

The European market is heavily relying on EU-recognised voluntary systems for ensuring the sustainability of biofuels and bioliquids. In addition, market demand is increasing for biomass for heat and electricity generation for which the sustainability is to be guaranteed by means of certification systems. It is therefore very important to understand the extent to which these systems can ensure the sustainability of biofuels and bioliquids in the market - and at what cost.

The objective of this study is to provide a deeper understanding of the differences between voluntary certification systems for biofuels and biomass for other energy purposes; this in terms of their level of assurance, their scope, and their benefits and costs of certification. This study did not look at the differences in sustainability requirements between systems. This aspect is covered in the report "How to select a biomass certification scheme?" (NL Agency, 2011).

The outcomes of this study provide first of all background information for market parties to make their selection according to their specific sustainability goals and their supply chain characteristics.

In this Chapter we discuss the main findings for eight voluntary certification systems that have been analysed in this project, followed by some general considerations and conclusions. The systems evaluated are:
- Bonsucro;
- ISCC (EU version)
- NTA808/81;
- REDcert (German version, the EU version was not public during the realisation of this study)
- Roundtable on Sustainable Biofuels (RSB);
- Roundtable on Sustainable Palm Oil (RSPO);
- Roundtable on Responsible Soy (RTRS);
- 2BSvs

In all cases, with exception of REDcert, the EU versions of these systems were evaluated. The evaluated systems deal differently with how to include the RED requirements in their system. Basically, there are four approaches: the system itself is the EU-RED version (2BSvs), the EU-RED version is an "add-on" module and must be used in conjunction with the main system (RTRS, RSPO, Bonsucro), the system has 2 separate versions of which one version is the EU-RED version (REDCert, ISCC, RSB), or the system uses a step-in approach. For some systems the EU-RED version is stricter than their original version (e.g. ISCC) while this is the opposite for other systems (e.g. NTA8080)

Sustainability of biofuels is assured through the system specifications and by the *scope of the system* (i.e. its principles). The evaluated systems differ in their coverage of sustainability principles; some systems (such as 2BSvs) focus primarily on the EU-RED criteria while others (e.g. the roundtable initiatives) aim to cover social, environmental and economic principles as well. The sustainability scope of the system has not been included in the analysis of the level of assurance; information about this topic can be found in the report: How to select a biomass certification scheme? (NL Agency, 2011).

The systems also differ in the *coverage* of the supply chain; main differences can be found in both the end (e.g. re-blending included in Chain of Custody audit or not) and start of the supply chain. Although farmers are included in the audits of all certification systems, they are not in all cases the first certificate holder. The form of auditing (field or desk audits, sampling conditions) for farmers also shows large differences between the systems, which has its impact on the level of assurance.

7.1   Approach

The selected topics for assessing and benchmarking the level of assurance of voluntary systems are based on requirements and guidelines set by the draft ISEAL Assurance Code (ISEAL, 2011) and by the Dutch assessment protocol for voluntary sustainability systems for biofuels (NL Agency, 2012).

The coverage of the certification systems is analysed, with respect to the requirements on the level of assurance. This resulted in overview tables (included in the annex of the report), summarizing the results with the following symbols:
=   Topic is included in system, compatible with requirement as described in the benchmark
≈   Partially covered by the system / under development
X   Not included in the system, not compatible with requirement as described in the benchmark

Information for the benchmarking, costs and benefits is collected through literature, reviews of system documentation and interviews to market players, as acknowledged in this report. Feedback on the benchmark is received from all system owners and their comments are processed.

7.2   Level of assurance of systems and differences between them

The benchmarking between systems is done for six topics that are recognised by ISEAL as being of importance for analysing the level of assurance:
1. The management of the system itself
2. Quality requirements for auditors
3. Auditing procedures
4. Sampling, group and multi-site certification procedures
5. Chain of custody requirements and procedures;
6. Recognition or affiliation of system and acceptance other systems
Note that requirements in above topics are broader and stricter than required under the EU-RED.

The benchmark is developed to show the relative differences between the systems on level of assurance. The benchmark does not intend to give a judgement on the systems.

1. The benchmark on the *management of the system* itself includes transparency of information, stakeholder engagement and availability of a complaints system. 2BSvs has limited coverage of those, whereas RSB covers them well. Stakeholder consultation is well covered under RTRS, RSPO, RSB and Bonsucro and not at all covered under 2BSvs and REDcert. Making a public list of companies with a high risk of non-compliance is a weak point for most systems except for RSB and ISCC-EU.

2. All systems have auditing requirements, which include impartiality and independence of certification bodies; a specific written procedure to assure impartiality of certification bodies is required by some systems as well (RSB, RTRS, RSPO and Bonsucro). Personnel competency of auditors is required in all systems. Some of these requirements are also covered by ISO 19011 or ISO 65 accreditation requirements of the systems. Both ISO accreditation requirements are not explicit under 2BSvs; RSPO does not require ISO 19011 accreditation. Taken this into consideration, requirements on personnel competence of auditors are weakly covered under 2BSvs.

Specific details of auditor's expertise may still differ between systems. The lack of required knowledge on characteristics of a biofuel value chain (e.g. agricultural system, GHG calculation, processes) may hamper the objective judgement of an auditor on the correctness of the data. As example: A farmer may be declaring an impossible amount of fertilizers or a conversion unit

may have wrong technical assumptions as input for the GHG calculation. An auditor may not even realize when missing the experience to instantly judge values or assumptions.

All systems require that certification bodies are accredited or recognised by an organization. Most systems lean on the accreditation of certification bodies by an organization that is associated with IAF, a member of ISEAL and / or is ISO 17011 compliant. ISCC and REDcert provide the opportunity that a national authority recognises a certification body, which is the German Government body in their case. BLE is not the official German member of IAF.

3. Auditing procedures are all based on the validity of a certificate of 5 years or less. Most systems require annual assessments; REDcert and RSB use a slightly different approach, differentiating for smallholder operations (REDcert) or to risk classes (RSB). RSB, RTRS, NTA8080 and ISCC mention in their system documentation a procedure about the extent of auditing on individual farm level (not be confused with requirements on sampling for group auditing), based on a risk assessment.

Most of the evaluated systems make use of on-site field audits in the assessments with two exceptions: RSB and 2BSvs make use of *desk audits* as well. RSB provides the option for a desk audit only under restricted conditions, which does not seem to risk the level of assurance. The approach from 2BSvs is different and is based on the auditor's opinion if documentation provides sufficient proof to ensure compliance. This may result in a risk for lacking on-site verification – also in high-risk countries or areas.

Management of the audit is comparable between systems; small differences are found on e.g. the peer review of certification. This aspect has to be seen, however, in relation with the content of the standard and its strictness in verification requirements. The evaluated systems differ in their definition on verification procedures. RTRS checks in the field if farmers are on the payroll while ISCC assumes compliance when international agreements are recognized. Auditors are checking compliance with a standard based on the system documentation. Generic defined verification requirements in a standard may result in room for interpretation.

All systems have defined a definition or description on *non-compliance*, and the actions that lead to suspension or withdrawal of a certificate. Substantial differences can be found in the defined suspension / withdrawal period (Bonsucro: 1 month, RSB: 90 days, various: undefined) and the time period for notification (ISCC: immediate, NTA8080: 14 days, various: undefined). Experiences on non-compliance (or even fraud) are still very limited and clear procedures on how to communicate non-compliance of companies to other buyers in the supply chain are not clearly described (with the exemption of RSB and RTRS and RSPO to some extent).

4. Sampling requirements, possibilities and conditions differ strongly per system. These aspects should be seen in relation when looking at its impact on the level of assurance, see figure 21 below. 2BSvs and REDcert have the most lenient conditions in terms of requirements related to sampling, although due to different reasons. Conditions under RTRS and NTA8080 are the strictest.

All systems have in their documentation a procedure on claims and a description on the required contents of the certificate. Requirements in terms of *traceability* and administrative procedures and records are also mentioned in all systems. There are differences between systems about requirements on skilled personnel and management in the company. Only RTRS – and RSB to some extent- require explicitly identification of critical control points.
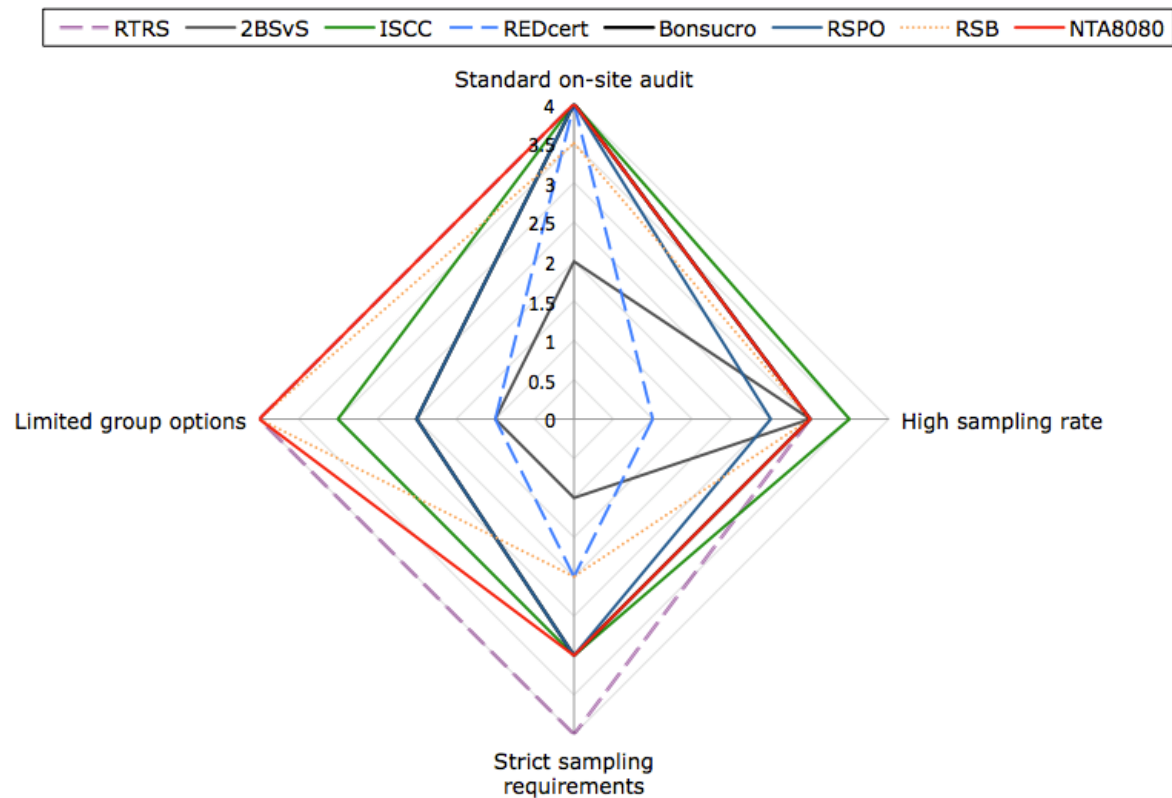
Figure 21: Sampling requirements, conditions and options for evaluated systems in perspective to strict (4=most strict) or lenient conditions (most lenient = 1)

5. The mass balance in a system, *the chain of custody method*, can be continuous in time (so-called continuous balancing method), in which case a 'deficit' is required not to occur at any point of time. Alternatively the balance could be achieved over an appropriate period of time and regularly verified (so-called fixed inventory method). The *continuous balancing method*, considered more accurate than the fixed inventory period, is required under the RSPO and RSB. This method is also possible under the RTRS, Bonsucro and ISCC. 2BSvs, NTA8080 and REDcert only require the *fixed inventory period* of their operators. RTRS, Bonsucro and ISCC provide for this option as well. The time frame is defined by all systems that apply the fixed inventory period, except by NTA8080.

A new *Chain of Custody audit* is generally required when there is a change of legal ownership and physical handling in the supply chain. Most of the evaluated systems (except Bonsucro) have an exception in case the product is sold on paper (and not physically traded); in this case, a CoC audit is not required. As experience is still limited, various systems are still discussing how to deal with this e.g. RSB and NTA8080): A CoC audit for paper traders is theoretically desirable in terms of level of assurance but practically complicated in implementation. RSB, RSPO and RTRS have defined procedures and guidance on how to handle outsourcing activities. This information is lacking in other system's documentation.

6. All systems are EU-recognised or are in the evaluation procedure. Currently, there are different approaches on *mutual recognition* of certificates from other systems:
- ISCC accept certificates from all other EU recognised systems;
- 2BSvs and REDcert accept other EU recognised systems as well, although implementation is so far very limited; 2BSvs requires officially a Multi Lateral Agreement and gap analysis to do so;
- NTA8080, RSB, RTRS, RSPO and Bonsucro only accept certificates from other systems in case there is a level playing field in requirements;

A clear risk for overall EU recognition of voluntary systems and mutual acceptance among these systems is that the claim of the end-user does not necessarily represent the sustainability requirements of the system itself; Systems may accept a certificate that has a lower level of assurance; for example, an ISCC certificate at the end-user may in fact be largely based on 2BSvs certificates at the beginning of the chain. The claim of the end-user may therefore be misleading to some extent for buyers who consciously opt for a certain standard because of its requirements.

Although this analysis does not presume to have covered completely all relevant aspects for analyzing the level of assurance of voluntary systems, the benchmark does give a good overview of the *relative performance between systems.*

Table 21 provides a summary of the outcomes. Note that the results should be interpreted with care and the results should be read in relation with the background information provided in Annex 1.

Table 21: Summarized outcome of benchmark between evaluated systems on level of assurance, [++] System covers all items; [+] 1 item is not covered, partially or under development; [0] 2 items are not covered, partially or under development; [-] 3 items are not covered, partially or under development; [--] 4 items are not covered, partially or under development, (or no items covered in case less than 4 items are benchmarked). Note that i) number of discussed item differs per issue, which creates some diffusion in the comparison.

	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
1. Management of system itself								
Transparency	++	+	+	-	-	0	0	+
Stakeholders	++	++	++	++	--	+	--	+
Complaints	++	++	++	++	+	++	+	++
2. Quality requirements for auditors								
Impartiality	++	++	++	++	+	+	++	++
Personnel competence [1]	++	+	++	++	--	+	0	0
Accreditation [2]	+	++	++	+	+	++	+	+
3. Auditing procedures								
Frequency certificate	++	0	+	0	0	+	-	+
Type of audits	0	+	++	++	--	+	++	++
Process requirements	+	++	+	++	++	+	+	++
Sanctions	++	+	+	+	0	+	0	+
Sampling, group and multi-site certification procedures								
Sampling options [3]	++	+	++	-	-	++	-	+
Requirements	--	0	++	0	0	+	-	0
Sample size	+	0	+	+	+	+	--	+
Chain of custody requirements and procedures								
Claims	++	++	++	++	+	+	+	++
Requirements tracing	+	+	++	-	0	0	+	+
Mass balance [4]	++	++	++	++	++	+	++	++
Procedures change ownership	+	+	+	+	0	0	--	0
Prevent uncontrolled mixing	+	+	+	+	+	+	+	--
Recognition or affiliation of system and acceptance other systems								
Level of recognition	+	-	+	+	0	0	-	0
Recognition other systems [6]	+	+	+	+	-	+	-	-

[1] Items that overlap with ISO 65 requirements are considered as covered by the system, [2] considered as partially covered, in case accreditation is possible by national government authority, [3] group sampling by FGP not considered to make this summary, (see table A.13), [5] considered as complied in case system applies continuous or fixed inventory, the use of an IT tracking system not considered for this overview table.

The following points to safeguard the level of assurance in the evaluated systems are limited covered by several of the evaluated systems:
- Weak sampling conditions, requirements and options on both farm / plantation and CoC level;
- Limited requirements in accreditation for certification bodies;
- Low proof of verification (e.g. allowing desk audits) at the farm or plantation;
- The recognition of other EU-recognised systems without clear conditions or transparency on the claims;
- Vague or undefined procedures (e.g. lack of claims procedure, no guidance on outsourcing activities, weakly defined verification requirements);
- No stakeholder consultation

A combination of lenient conditions and uncovered or unclear procedures may open the door for certification systems that can guarantee only a low level of assurance.

A level playing field in level of assurance on European level

In July 2011 the European Commission recognised seven certification systems for biofuels and bioliquids. Twenty more systems are currently in the evaluation process.

This study shows the variation in the level of assurance between the evaluated systems, despite their compliance with the EU-RED requirements (except for the evaluation of REDcert, which is based on the German version). The identified weak points (sampling requirements, accreditation, stakeholder consultation, complaints procedures, transparency, etc) are not mentioned as requirements in the EU-RED or are only generally defined.

This study shows that there is a variation in assurance requirements between systems for those points where the EU-RED lacks guidance or provides room for interpretation (e.g. sampling, outsourcing activities). More harmonization between systems on assurance requirements exists for those points where the EU-RED gives clear procedures and rules (e.g. 3rd party evaluation, mass balance).

To improve efforts in harmonization between systems, the following recommendations are made:
- Promote harmonization between systems, based on a minimum accepted level of assurance;
- Provide clearer guidance on assurance procedures for certification systems.
- Consider stricter interpretations for sampling requirements, accreditation and acceptance of other systems (see also identified weak points in 7.1)

7.3 Considerations for the market

Market parties are in general not familiar with the specific details and requirements of a voluntary system. They rely, in that respect, on the reputation and communication of the systems, assuring a good level of assurance. In addition, recognition of systems by national governments or by the European Commission is considered as trustworthy for their use.

Apart from *costs*, *market acceptance* of a certification system is of large importance for a company. Sustainability is seen as a dynamic process; if other systems appear to be more accepted by buyers of sellers, an operator may be willing to change system. Preferably, a system has to cover the EU and national regulations.

Practicality of the system is also important for market parties. Too many forms or non-availability of a standardized documentation system may lead to the need for developing additional administrative procedures or systems.

The *position of the farmer* in the certification process differs between systems, depending on the approach used. Under some systems, famers are individually audited, and thus controlled

for improvement; they are in principle free to select their own certification system (e.g. RSB, NTA8080, RTRS). Under other systems, farmers may not even be fully aware of the content of the system for which they are certified, as they form part of a non-audited farm sample that supplies to a first gathering point – having submitted a declaration on paper (e.g. 2BSvs).

7.4 Costs and benefits of certification

Costs for certification include direct and indirect costs. Complying with the sustainability requirements of a system causes the following *direct costs:* certification fees and auditing costs. Certification fees for a system can be split into two components, a membership fee and/or a quantity-dependent fee. Membership fees are generally based on property size, amount of feedstock processed or yearly financial turnovers.

Auditing costs include the costs that a company has to pay for an external audit to become or remain certified. Sampling requirements (and conditions) have influence on the number of auditing days – although this is also largely influenced by external factors. There are differences in the requirement of auditing days per system. Required auditing days are generally lower for 2BSvs and REDcert compared to the rest of the evaluated systems.

The cost structure of the system has influence on the *total certification costs* depending on the characteristics of the operator (size, annual turnover).

Indirect costs can be significant for a company, especially in the first year of certification. There are administrative indirect costs and indirect costs related to sustainability compliance. All systems result in a similar level of indirect costs, except 2BSvs for which the indirect costs are expected to be lower. Indirect costs are related to the sustainability requirements of a system (not in the scope of this study) and depend largely on the preparedness of a company and the need for improvements to meet compliance.

The case studies presented in this report provide some general indications in differences in direct costs *based on the assumed volumes, prices and costs for these specific examples.* In general, 2BSvs has the lowest direct costs (excluding membership fees), followed by NTA8080, Bonsucro, RTRS and ISCC. RSB and RSPO show in the case studies relatively higher direct costs in comparison to the other evaluated systems.

7.4.1 Who bears the cost?

Generally, required auditing days and indirect costs per year are highest at the start of the supply chain: at the farmer or the plantation. Indirect costs can be substantial compared to direct costs for certification but will depend on the preparedness of an operator. In case the audit starts at the first gathering point (FGP), these costs will be shared in some occasions between the FGP and the individual farmers (in case of a cooperative) or will be covered entirely by the farmer.

There is a difference in auditing costs between smallholders and larger farmer units, mainly because more auditing days are required for smallholders compared to a large owner. Smallholder cooperatives may have additional costs for example for the establishment of a cooperative or costs for operating collectively.

Which operators have the highest and lowest certification costs (in €/tonne per year) depends largely on product volumes; the higher the volume of a product flow, the lower the direct certification costs per tonne of product. The mills have the highest certification costs (in €/tonne per year) in the sugar cane and palm oil case studies. For the Jatropha case and the soybean case study, the highest certification costs are at the expeller and the crusher. Certification costs can be reduced substantially when a producer decides to handle larger product volumes or to merge his product with other product flows.

Certification costs in relation to total costs and prices

The costs for certification should be placed in perspective with the yield of the product, the handled volumes and with the total production costs and prices. Direct certification costs in the palm oil case study are below 2% of total costs for smallholders at the mill; direct costs for the sugar cane case study are between 0.3% and 0.6% at the mill. Note that these comparisons are based on the assumptions made for these specific case studies (e.g. volume flows and cost indications) and therefore highly variable.

Certification costs seem to be relatively small in comparison to the total production costs – especially when larger volumes are handled. This does not mean that yearly (investment) costs may not be substantial for producers, especially for those with limited financial capacity.

The impact of direct certification costs on total production costs is in percentage highest for those actors, which handle small volumes combined with low costs (e.g. transporters or traders). Certification costs have most impact on the price margin of the product for those actors where a) prices are relatively low and b) where margins are small.

At the end, the ability of an operator to make initial investments for reaching compliance of certification will depend on its capacity and the availability of capital.

7.4.3 *Benefits of certification*

Two types of benefits can be distinguished: Internal company benefits and external benefits. Internal benefits may be visible in a company on a medium term and after certain investments to meet sustainability are done. External benefits relate to meeting demands of the market, legal compliance or receiving a price premium. The market - in terms of the demand, supply and product requirements - largely influences external benefits.

At this moment, there exists a premium for certified biofuel due to shortages of demand or limited choices of certification systems available in the market. After this transition period, all companies working within the EU Market will have a level playing field. Investments then need to be made to stay in the market – irrespective of the costs needed to meet these requirements.

It is expected that the actors at the end of the supply chain will receive most of the external benefits. Farmers will receive most of the internal benefits, largely enforced through the standard's requirements.

7.5 **Relation cost – benefits and level of assurance between systems**

There is a relation between the costs, benefits and level of assurance between voluntary certification systems. At the same time, there are also many external factors that influence the costs and benefits of a system.

There is a relation between costs and internal company benefits (e.g. efficiency improvements) of a company, though this relation is not valid for all improvements and not linear. Investments related to economic improvements, one of the requirements in the standard of Bonsucro, may result into economic benefits. Other indirect costs such as legal compliance can, on the other hand, be high and will not create a direct economic benefit for the company (though it will generate social benefits to the company and to society).

Actors at the beginning of the supply chain (farmers / plantations) bear most of the annual certification costs. The actor bearing most of the costs varies, however, depending on the specific case and volumes handled. Costs are highest in the first years of certification while benefits are received on the mid-term. It is expected that actors at the end of the supply chain

will receive most of the external benefits. There is thus a discrepancy in balancing costs and benefits in terms of time and place in the chain. Certification systems have not defined rules to ensure that part of the external benefits return to the farmer or plantation. Some systems have provisions to support smallholders to become certified.

	Relation with level of assurance		External factors
Costs	Stakeholder consultation Coverage sustainability standard Strictness sustainability standard Sampling requirements Type of auditing required Traceability tools		System structure Annual turn over Size company Location company Complexity product
Benefits	Internal benefit: Efficiency improvements Management improvements		Market demand Shortage in market Policy driven Competition

Figure 18: Relation between cost – benefits and level of assurance and key influencing factors

It can be concluded that the systems that are most compatible with the requirements, as benchmarked in this study, are also the more expensive ones. 2BSvs is cheaper but is also the system that the least complies with the requirements as benchmarked in this study.

At the end, it is very important that companies select well the certification system that best suits their supply chain characteristics and their sustainability goals. As also stipulated in the study "How to select a biomass certification system?", a company will need to make a thorough assessment based on expected costs and benefits, on its own strategy, company structure and its position in the market when selecting a certification system.

Table A.1: Supply chain coverage of certification systems (■ = included in system and CoC audit required, X = included in system, no CoC audit needed, 0 = under discussion, # = first point of the formal certificate holder)

Processes	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
Farmer	■ [3] #	■ [4]	■ #	■ [10]	■ [9] [10]	■ #	■ [7]	■ # [15]
First gathering point [#]	■	■ #	■	■ #	■ # [14]	■	■ #	■ # [15]
Processing units [1]	■	■	■	■	■	■	■	■
Transportation	■	■	■	■	X	■	X	■
Trader (physical)	■	■	■	■	■ [9] [13]	■	■ [12]	■
Biofuel plant	■	■	■	■	■	■	■	■
Biofuel blender	■	■	■	■ [11]	X [12]	■	■ [8], [12]	■
Re-blending [2]	0 [4]	X	0 [4]	■ [11]	X [12]	X [6]	X [8], [12]	■ [12]

[#] First gathering point can be a storage unit, warehouse, central managing office of farmers, etc.
[1] Referring to intermediate processing units as crushing facilities or mills
[2] Example: re-blending biofuels from 7% to 2%
[3] The operators audited against the principles and criteria are farmers/feedstock producers, processing units/feedstock processors, biofuel plants/biofuel producers and biofuel blenders. It is important to note that not all the criteria apply equally to all these operators; for example, biofuel blenders are only bound to comply with Principle 3 (GHG).
[4] Farmer level and mill (first gathering point) are integrated in definition.
[5] The need for an audit for re-blending is still under discussion or not yet discussed (Zeehandelaar, 2011), (Rudolf, 2011)
[6] No supply chain certification needed as registered party for NEa will be one step in front of the supply chain
[7] Only through self-declaration, and part of the First gathering point certification
[8] German law doesn't require the supply chain to go beyond the "final interface" in which the final biofuel is produced. This biofuel (German version) is reported to the German government.
[9] Whenever justified, the verification audit maybe performed through a documentary verification audit rather than an on-site audit (see also next Chapter).
[10] Farmer audit is part of the first gathering point certification.
[11] Included, however no experience yet
[12] This is optional
[13] This can include any sub-contractors and/or storage sites within the same certificate.
[14] This can include trading activities within the same certificate
[15] Farmers can choose to be individually certified or as a group with a central office, which will be the official certificate holder, and will do internal audits and has a good management system in place and receives the self-declarations

Table A.2: Only for certification systems having 1st point of certification at the mill or the first gathering point (= covered, ≈ partially covered, x not included, o not applicable):

Processes	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	RED-cert	ISCC
System makes use of self-declaration farmers	O	X	O	≈ [5]	≈ [4]	O	= [2]	= [6]
On-site field audits farm are included	O	=	O	=	≈ [3]	O	=	=
Desk audits are allowed	O	X	O	X	= [3]	O	X	X
Individual farm field audits are possible	O	X [7]	O	X [7]	X	O	X	= [6]
Sampled on-site farm field audits are standard procedure [1]	O	X	O	=	≈ [3]	O	=	=

[1] This does not refer to sampling procedures relating to smallholder group certification or to multi-site certification (see next Chapter)

[2] Through self-declaration, and part of the First gathering point certification

[3] Site audits, unless the 1st gathering entity can demonstrate that all potential risk has been controlled through […]; in this case a desk audit is possible

[4] Self-declaration is used for demonstrating historic land use before 2008 and protected areas. Other data are to be monitored in internal management system of first gathering point (e.g. GHG data)

[5] Bonsucro requires the mills to show how the compliance of the producers is checked. There can be some declaration, but never just that; also technicians from the mill should go to the farms for internal monitoring control.

[6] ISCC group certification of farmers: farmers can choose to be individually certified or as a group. The main requirement for group certification is that there is a central office, this can be a first gathering point, a farmer, a cooperation, any other 3rd party, for practical reasons, most often the first gathering point is the Central Office.

[7] This is part of the supply base of the mill.

Table A.3: Coverage list of items that are publicly available at systems to promote transparency

Items	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
Rights and duties of companies [1]	green	green	green	green	X (red)	green [2]	green [7]	green
Availability of system documentation	green	green	green	≈ (yellow) [8]	green	≈ (yellow)	green	green
List of certified companies is published on website	green [3]	green	green	green	green	green	green	green
Summary reports of assessments for every company	green [3]	green	green	X (red)	X (red)	green	X (red) [5]	X (red)
List of non-compliance companies or companies with high risk is publicly available	green [4]	X (red)	X (red)	X (red)	X (red)	X (red)	X (red)	green [6]

[1] As example: How to handle claims, responsibilities of certified companies, and responsibilities of members system
[2] As being part of the documents NTA8080 and NTA8081
[3] Not applicable yet, but will be the case once certificates are provided.
[4] Participating Operators with a "very high" risk class (5) will be publicly listed by the RSB.
[5] However: REDcert checks each audit report
[6] ISCC specifically withdrawn certifications are listed online;
[7] Laid down in the system contract, to be available on demand (or after registration)
[8] Only the main document (of 4 documents) is publicly available online.

Table A.4: Processes for which stakeholders have the possibility to be involved in (summarized list from ISEAL, 2011):

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Commenting on company applications for becoming recognised / certified by system	green [8]	green [6]	green [1]	green	red X	red X	red X	yellow ≈ [13]
Audits: Stakeholder consultations on-site	green [4]	green	green	green	red X	green	red X	green
Review of policies and procedures system	green [5]	green [7]	green [3]	green [11]	red X [10]	green [2]	yellow ≈ [9]	green [12]

[1] Two weeks prior to the assessment, the CB shall publish their intention to carry out an assessment of the operation, including the scope of the assessment, on their website and inform the RTRS. There is invitation to submit comments

[2] Committee of experts notices points for improvement, to give guidance on interpretations, etc (Dakhorst, 2011). Everyone is invited to give feedback on the system; at the end the Scheme management Committee takes decisions.

[3] For example: the producer standard will be reviewed not less than once every five years and not more than once every three years. Standards are to be approved in the General Assembly and Executive Board.

[4] RSB requires that stakeholder consultations are part of the office and field audits and has set a number of requirements to these consultations

[5] The development and implementation of the RSB Global Sustainability Standard is based on a consensus-driven process among diverse interests in our governance structure. The RSB is supported by more than 130 member organizations.

[6] Audit starts when the mill requests certification by CB, who informs RSPO and the request is posted on RSPO website. The CB has to make a public announcement of the impending assessment at least one month before to inform the relevant stakeholders and invite their possible participation (RSPO, 2011a)

[7] RSPO is a multi-stakeholder initiative on sustainable oil palm products. As example: "This document will be reviewed within one year from the date of implementation and thereafter at intervals not greater than five years" (RSPO, 2011).

[8] Whenever an operator wants to enter the system, a public due diligence period of 2 weeks is open, during which any stakeholder can send comment or report issue about the applicant. On the basis of these comments and internal investigations, the RSB takes the decision to accept the operator into the system or not (Haye, 2011)

[9] For example: "the risk criteria above and the procedure to define the scope of the random inspection is subject to review by REDcert and adjusted if necessary". No stakeholder consultation included. REDcert has a supervisory board in which all parts of the biomass/biofuel chain are involved, but not yet NGO's

[10] No concrete indication found, there is a: "role Technical Advisor: Amendments of the Scheme documents and procedures"

[11] Proposals to develop or review a new standard may be submitted by any interested party to Bonsucro Secretariat, standards shall be reviewed on on-going basis, with the period of the next review to occur within a 3-5 year period and not exceeding 3 - 5 years from adoption of the previous version of the standard.

[12] ISCC 103 Quality Management states among others "…[…]…Every 5 years, the system as a whole is revised and the standards are adapted according to the latest findings from science and practice." Based on stakeholder consultation.

[13] Stakeholders do not comment on companies, which apply for certification, but they comment on companies, which want to become a member of the ISCC association.

Table A.5: Possibility to pose complaints on auditing procedures and / or the system itself (based on ISEAL, 2011):

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Complaint system about the system itself (from companies or the public)	[2]	[3]	[1]	[8]	X [6]	[4]	≈ [5]	
Certification bodies have complaints system in place								

[1] In order to be able to deal with possible complaints against RTRS members, the RTRS as an Association, […..] in a manner that is reflective of the nature, mission and goals of RTRS, the RTRS created a grievances procedure. In addition, there is a dispute resolution settlement procedure.

[2] The RSB STD 65-001 standard for dispute resolution provides the requirements to ensure timely, consistent, comprehensive and effective resolution of disputes. It provides the room to receive, register and address disputes raised about any aspect related to implementation of the RSB standards and/or RSB certification systems.

[3] The RSPO has a grievance procedure developed to address, process and decide formal complaints and grievances. The RSPO Certification Complaints Committee processes complaints and grievances

[4] Included in NEN Scheme ownership manual (Dakhorst, 2011)

[5] A formal REDcert complaint procedure is not yet defined, but a complaint procedure is operational. A complaint procedure is in place within ORGAINVENT's management system, which performs all business operations of REDcert and supplies the whole infrastructure, staff, etc.).

[6] Only: "Any interested stakeholder can raise a formal complaint to the Steering Committee regarding the performance of a certified entity or independent verification body." Is emailed the general email address. No specific grievance procedure available about complaints system.

[7] ISCC has a guidance document entitled ISCC 253 Complaints, Appeals and Arbitration

[8] There are strict, clear and transparent procedures about balanced representation, remuneration, selection of board members, complaints and grievance procedures and the decision making process.

Table A.6: Level of impartiality and independence that can be guaranteed by a system

Items	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
Third party evaluation required by CBs								
Written procedure CB required by system itself to guarantee independence [1]	[3]	[4]	[2]	[9]	X [7]	≈ [5]	[6]	[8]

[1] Referring here to explicit reference to this item in the standard. Note that this element is also covered by ISO Guide 65 (EN 45011)

[2] The CB shall maintain a written policy and procedures for avoidance of conflict of interest. A specific independent committee has to manage conflicts of interest if there. Records of committee should be kept 10 years..[…]. RTRS (2011a)

[3] The CB should have documented procedures for determining timely possible conflicts of interest. Records on these procedures (and actions taken) should be filed (RSB, 2011)

[4] Procedures for identifying and managing conflicts of interest must include provision for a specific independent committee, set up by the certification body (RSPO, 2011) [1]

[5] Not explicitly covered in documentation; ISO Guide 65 accreditation is requirement though

[6] Partially covered in the documentation, but assurance of impartiality is part of the official approval and monitoring process performed by the competent authority (BLE), so always covered indirectly.

[7] 2BSvs: only written agreement by CB "commitment to fulfil all requirements of the Scheme in particular concerning impartiality, integrity and competence, including staffing qualified auditors and personnel

[8] Part of the obligatory accreditation of CBs, therefore not mentioned specifically in the ISCC

[9] The CB is required to meet specific procedures for the management of safeguarding impartiality incl. liability and financing and non-discriminatory conditions, as specified in ISO IEC Guide 17065. As these requirements are inherent to ISO 14064 and […] these requirements will not be further detailed.

Table A.7: Requirements on personnel competence auditors and personnel certification bodies in systems:

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
CB has procedures on defining roles audit team [1]	✓	✓	✓	✓	✗	≈ [1]	✓	✗
Language skills	✓	✓	✓	✓	✗	✓	✗	✗
Demonstrable knowledge related to standard	✓	✓	✓	✓	✓	✓	✓	✓
Getting training on system is required	✓	✓	✓	✓	✓	✓ [2]	✓	✓
Educational requirements	✓	✓	✓	✓	✗	≈ [3]	≈ [3]	✓
Supervised period of practical auditing [1]	✓	✓	✓	✓	✗	✗ [4]	✗	✓
ISO 19011 accredited	✓	✗	✓	✓	≈ [7]	✓	✓	✓
ISO 65 accredited	✓	✓	✓	✓	≈ [6]	✓	✓ [5]	✓

[1] Also covered by ISO 65

[2] Auditors shall follow a training course designed for auditors (= part of agreement between CB and NEN), (Dakhorst, 2011)

[3] System is based on knowledge and skills, that can be acquired by inter alia education (see e.g. ISO 19011); no specific educational requirements in system

[4] CB shall maintain information on the relevant qualifications, training and experience of each member of the personnel involved in the certification process (see ISO Guide 65); no specific period required in system (Dakhorst, 2011)

[5] REDcert CB's must satisfy the requirements of EN 45011 or the ISO Guide 65:1996 (REDcert system principles inspection)

[6] Accredited against ISO guide 65, or against ISO 17021 (the European equivalent).

[7] Experienced in carrying out audits in conformity with ISO 19011, or accredited against ISO 14065, or experienced in carrying out audits in conformity with ISO 14064-3 or ISAE 3000

Table A.8: Accreditation and monitoring requirements certification bodies in systems: Certification bodies are accredited or recognised by:

Items	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
Continuous evaluation performance CBs [1]	red X	green =	green = [2]	yellow ≈ [10]	red X [14]	green = [7]	green = [9]	green = [13]
There is an accreditation requirement for CBs	green =	green =	green =	green =	green =	green =	green = [8]	green =
Certification bodies are accredited or recognised by:								
A national accreditation body that is associated with IAF	green = [4]	green = [5]	green =	green =	green =	green =	red X	green = [11]
A full or associate member of ISEAL	green = [4]	green =	green =	green =	red X	red X	red X	red X
A relevant national authority of one of the EU member states	yellow ≈ [6]	red X	red X	red X [12]	red X	red X	green =	green =
An accreditation body committed to comply with ISO 17011 or equivalent	green =	green =	green =	red X	green =	green = [3]	red X	green =

[1] To be specifically mentioned in documentation of system

[2] CBs are subject to annual surveillance visits by the AB including witnessing field assessments RTRS (2011a)

[3] All IAF members are ISO17011 accredited (Dakhorst, 2011)

[4] The CB shall hold and maintain accreditation to ISO/IEC Guide 62, [….] by an independent accreditation body, which is either a member of the ISEAL or the IAF (RSB, 2011)

[5] …[…]…This must be demonstrated either as a signatory to the IAF, Multilateral Recognition Arrangement (MLA) or through full membership of ISEAL (RSPO, 2011b)

[6] RSB is a recognised system by Germany; Germany requests CBs to be accredited by their national AB (Haye, 2011). This requirement is not explicitly mentioned in RSB's documentation.

[7] CBs need to be accredited and are under continuous evaluation of an IAF member (e.g. Dutch Accreditation Council RvA); in addition, annual harmonisation meetings with CBs are organized to evaluate the system and the way CBs apply the system (= part of agreement between CB and NEN)

[8] CBs have to be approved by the competent authority (REDcert system principles inspection) and by REDcert

[9] REDcert inspects each individual audit report, and keeps track of this report per individual auditor. Furthermore, an auditor loses REDcert approval if no audits were performed for more than a year

[10] Bonsucro standard has a provision on auditor evaluation, and will make this more concrete before the first round of re-audits start in June 2012

[11] Recognition is by a national public authority or an accreditation body. Such accreditation would be done by members of the IAF, by the bodies referred to in Article 4 of Regulation (EC) No 765/2008 or by bodies having a bilateral agreement with the European Co-operation for Accreditation

[12] Bonsucro recognised accreditation body members of the European cooperation for accreditation (EA)

[13] ISCC has implemented an Integrity Program, which aims to monitor the CBs verification activities. It consists of CB office and ISCC participant assessments, which are conducted by ISCC integrity auditors randomly or on a targeted basis after risk evaluations or complaints. It is already fully operational. On top, the national authority controls all ISCC CBs.

[13] This year there is a meeting for CBs in which they get feedback on 3 of their reports. Its still under discussion how this will be handled in the future, no existing procedure

Table A.9: Requirements frequency of auditing and validity of certificates by systems

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Validity of certificate is 5 years (or less)	green [4]	green	green	green	green [8]	green	green	green
There are at least annual assessments	green	green	green	green	green	green	yellow ≈ [7]	green
Frequency regular auditing based on risk assessment (procedure available) [1]	green [5]	red X	red X [6]	red X	red X	red X	red X	red X [10]
Extent of auditing is based on risk assessment (procedure available) [2]	green	red X	green	red X [10]	red X [9]	green [3]	red X	green

[1] This refers to regular audits (e.g. surveillance audits) and excludes procedures when major non-conformities are identified.

[2] This focuses on risk assessment of individual audits (excluding risk assessment for group or multi-site certification)

[3] Risk assessment forms part of the pre-audit. The auditor, based on his expertise, implements the risk analysis – which is not written in detail in the standard but explained as procedure.

[4] Based on risk class. Risk class 1 (24 months), class 2 (18 months), class 3 (12 months), class 4 (nine months), class 5 (6 months) and class 6 (three months). The CB may extend the specified period of validity of a certificate once for up to six or three months to enable evaluation under certain conditions (RSB, 2011).

[5] Based on risk class.

[6] For group and Multi-site certification, CB's and Group Manager Risk assessments must be considered for the sample size calculation (Not for auditing frequency, which is annual)

[7] Only full re-audits, which is normally annual, but every 3 years for small operations and every 5 years for very small operations

[8] "A temporary extension of up to 6 months can be granted during the recertification process at the end of the 5 years."

[9] "Perform a risk analysis of the activities and operations to be audited. The risk analysis shall at least include an identification of all the logistical sites and main activities covered by the certification unit."

[10] The Competent Authority may, however, induce the surveillance in shorter than annual intervals, especially due to the results of precedent surveillances

[11] Sampling is based on volumes provided by sugarcane suppliers to the mill, instead, auditors shall adapt the sampling method to take account of risk areas (although no guidance is specified).

Table A.10: Type of audits practiced in auditing for systems

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Main and re-assessments are on-site field audits	=	=	=	=	≈ [5]	=	= [3]	=
Other annual assessments are on-site field audits	≈ [2]	=	=	=	≈ [5]	=	=	=
Unannounced audits are included in procedure	X	X	= [1]	=	≈ [6]	X	= [4]	= [7]

[1] The CB may also make unannounced surveillance assessments (EC, 2011). For CoC: The CB shall inform the client of such surveillance assessments with at least 24 hours notice (RTRS, 2010)

[2] Desk audits are only possible in the two following situations: 1) Evaluation following an evaluation which did result in issuing a certificate for risk class 2, if concluded in 9 months of preceding field audit, 2) Evaluations following a field audit which resulted in issuing a valid certificate for risk class 1, if concluded within 12 months of preceding field audit. The other four risk classes only include field audits + office visits (RSB, 2011)

[3] In case of First gathering point, this included field audits of 3-5% of the supplying farms

[4] Only in exceptional cases

[5] Producers: Depending on risk analysis, a site audit or desk audit is to be implemented. "When the 1st gathering entity can demonstrate that all potential risk has been controlled as described above, the independent verification body can decide to reduce the sampling level accordingly. In any case the minimum required sampling level is 3% of collecting sites to be verified through site audits"

[6] 2BSvs obliges the verification bodies to have a template contract for operators containing "clear clauses to ensure that unannounced surveillance audit can be performed", however its meant for exceptional cases only, as of January 2012 it has never happened yet

[7] CBs can use unannounced surveillance audits as an instrument of risk management.

Table A.11: Management and process requirements for the audit, as defined by the system

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Companies are audited before allowing them to participate in the system	✓	✓	✓	✓	✓	✓	✓	✓
Audits are to be adequately planned, conducted and reported.	✓	✓	✓	✓	✓	✓	✓	✓
There is a clear procedure on how audits are conducted	✓	✓	✓	✓	✓	✓	✓	✓
The auditing plan includes a risk analysis of the scope and complexity of the activities undertaken by the company	✓ [3]	✓ [7]	✓	✓	✓	✓	✓ [10]	✓
The audit includes a peer review and/or independent decision on outcome report	✓ [5]	✓ [6]	✓ [9]	✓	✓	✓	✓ [11]	✓
The standard has entry-level certification	✗ [4]	✓	✗ [1]	✓	✓	≈ [2]	✗ [8]	✓

[1] The RTRS has established a progressive entry level and a stepwise approach to facilitate producers to step into the RTRS certification. After 3 years from the date of the initial certification assessment: the producer shall comply with 100% of the indicators (immediate + mid-term + short term compliance indicators), (RTRS, 2011a)

[2] For organizations that need to comply with RED a growth model has been developed; if an organization does not yet meet all NTA 8080 requirements, it may still qualify for RED certification. The RED version will be temporary; after 1 January 2013 it won't be possible to obtain a new RED certificate and with prolongation of the certificate the organization shall comply with the NTA 8080 requirements (Partners for Innovation, 2011).

[3] A key aspect, prior to acceptance in the system, is the completion of a 'Self risk assessment' by participating operators (as defined by RSB-STD-60-001). This is not part of the evaluation audits.

[4] RSB's minimum requirements are highlighted "Immediate full compliance required". Long-term requirement: if no explicit reference is made that the requirement must be met in less than 3 years.

[5] The CB shall submit the certification report together with the peer review report and its response to the peer review to the CB's decision-making entity.

[6] Audit reports are also scrutinised by independent 3rd party reviewers and an expert audit review panel

[7] Based on the supply chain certification system document, the auditing plan includes a risk analysis of the scope and complexity of the activities undertaken by the company (Jaacob et al, 2012).

[8] 75% compliance is enough, but improvement needs to be agreed on (through a commitment by operator to auditor), monitoring max 6 months after first inspection

[9] A peer review by CBs of, at least 70% of the audits reports is required. Furthermore, an internal peer review is mandatory under certain defined conditions (e.g. by major concerns of stakeholders).

[10] Every audit has to respect the results of earlier audits, the specific situation on-site, which may differentiate from the expected situation. This methodology includes a certain type of risk analysis.

[11] Every verifier report is analysed by REDcert

Table A.12: Requirements on procedures and sanctions for non-compliance as defined by systems

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Definition of non-compliances (major / minor) provided	▮ (green)	▮ (green)	▮ (green)	▮ (green)	▮ (green)	▮ (green)	▮ (green)	▮ (green)
Procedure for corrective actions is defined	▮ (green)	▮ (green)	▮ (green)	▮ (green) [18]	▮ (green)	▮ (green)	≈ (yellow) [10]	▮ (green)
Actions leading to suspension/withdrawal defined	▮ (green)	▮ (green)	▮ (green)	▮ (green) [18]	▮ (green) [14]	▮ (green)	▮ (green) [11]	▮ (green) [15]
Suspension period (max) [1]	90 days [4]	Unde-fined [8]	60 days	1 month	Full withdra-wal [14]	3 months	Full withdra-wal [11]	With-drawal [15]
Procedure defined on communicating withdrawal certificate to other companies	▮ (green) [5]	▮ (green) [6]	≈ (yellow) [7]	≈ (yellow) [17]	X (red) [19], [12]	≈ (yellow) [2]	X (red) [12]	≈ (yellow) [16]
Time period for notification suspension / withdrawal certificates (in days)	3 days [5]	X (red)	3 days [3]	1 day	X (red) [19]	14 days [9]	[13]	Immediately

[1] Maximum suspension period in which the major non-conformity shall be corrected before the certificate will be withdrawn and a new initial certification audit will be necessary.

[2] In case of suspension or withdrawal of certificate: information is adapted in the register of the NEN. The company is no longer allowed to provide transaction certificates under NTA 8080 system. The CB needs to check on this (Dakhorst, 2011).

[3] In the event certification expires, is revoked or somehow terminated, RTRS trademark users shall immediately cease any use of any kind whatsoever of the RTRS trademarks, including claims [...] within 3 days of expiration (RTRS, 2011b)

[4] Major non-compliances prevent certification and should be brought into compliance within 90 days in order to avoid that a full re-evaluation audit is necessary to obtain a RSB certificate (RSB, 2011).

[5] The participating operator is required, in case of suspension or withdrawal of the RSB certificate, to: Immediately cease use of any RSB trademarks, including on and/or in relation to any products and to identify all customers and suppliers affected, and notify them of the suspension [...] in writing within 3 business days ...[...] (RSB, 2011)

[6] Where objective evidence indicates that there has been a demonstrable breakdown in the supply chain caused by the certified client's actions or inactions [....] then immediate action needs to be taken by the CB, and the Supply Chain certification should be suspended until such time that it has been addressed (RSPO, 2011b). The IT-traceability system only allows selling palm oil when the product is certified at the date of shipment. For trademark usage, companies will need to sign a trademark licensing and refers to the RSPO Rules on Communication and Claims.

[7] Sanctions policy is under development (Frojan, 2011)

[8] No maximum suspension period for non-complying company. If grievance arises, certification will be suspended until the case is resolved (Jaacob et al, 2012)

[9] CB shall within 2 weeks after granting the certificate, recertification and/or certificate withdrawals send NEN a report for the information register (= part of agreement between CB and NEN), Dakhorst (2011)

[10] When an auditor encounters issues, a plan for improvement is agreed upon between the operator and auditor. In more serious cases, the REDcert sanctions committee passes judgement on the appropriate sanctions. The sanction committee is made up of a judge and an independent representative (not yet involved in daily operations) of each sector involved.

[11] REDcert has no suspension sanction, only certificate withdrawal. If REDcert accepts this, an operator can be certified again following the same procedure as initial certification

[12] No public communication of revoked certificates. When this happens, the operator is removed from the online database of certified companies

[13] No explicit time period. According to German law, all biomass/biofuel supplied before certification withdrawal is to be considered sustainable.

[14] 2BSvs: a requirement to become a verifier is to have a: "Contract template including clear clauses to ensure that unannounced surveillance audits can be performed, and the conditions under which a certificate can be suspended or terminated."

[15] Only membership can be suspended, no detailed procedure defined. Certificated can be withdrawn or denied in case major musts are not fulfilled. Re-certification after certification withdrawal is not possible for 1 year

[16] Withdrawal is communicated to other certification systems if applicable, and published on the website

[17] Suspension and withdrawal of certificates will be published online

[18] Possible sanctions for different incursions are described in section 5.12 of Certification protocol

[19] Under discussion

Table A.13: Sampling possibilities in different systems, specified to ownership models

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Grouped sampling (together with the first gathering point)	X	=	X	=	=	X	=	≈ [10]
Individual farm certification unless requirements are met for multi-group or smallholder certification	=	X [4]	=	X	X	=	X	≈ 10
Smallholder group audits is a specific possibility in the system [1]	= [2]	= [3]	=	≈ [7],[8]	≈ [5]	=	≈ [5]	=
Multi-site certification is a specific possibility for farmers or plantations [1]	=	=	=	≈ [8]	≈ [5]	=	≈ [5]	=
Multi-site certification is possible for the CoC audit	=	=	=	= [2]	=	=	= [9]	= [6]

[1] Referring here to specific conditions, requirements and sampling methods for smallholders or groups of plantations (owned by one farmer). Note that some systems apply sampling for all farmers supplying to a first gathering point, without making a distinction between these farmer ownership models.

[2] Group certification is possible through the concept of participating operator, which allows horizontal and vertical integrations (RSB, 2011)

[3] RSPO standard for certification of independent smallholders (group certification) is endorsed in 2010. Certification of independent smallholders under group certification is on-going (Jaacob et al, 2012)

[4] Individual farm certification is not possible as defined in the current RSPO certification system document i.e. certification unit is mill + supply base (Jaacob et al, 2012)

[5] No specific possibility, sampling of farmers is common practice in all cases

[6] Only for warehouses delivering to a first gathering point and warehouses after the first gathering point, not for first gathering points, conversion or other elements in the supply chain

[7] "When small scale farmers constitute the majority of the supply base of a mill, hence providing each less than 0.5 % of the volume, a minimum 20 farms should be sampled randomly to be verified for their compliance. The exact size of the sample should be determined by the auditor."

[8] Because the mill is the unit that is certified, including it's supplying farms, in practice all sites apply multi-site certification. However, the Certification Protocol states, "Multi-site certification is only permitted under the CoC Standard (and only if one company operates all sites). Group Certification is not allowed."

[9] Not multiple conversion plants, but if a plant has multiple storage sites, they can be grouped and sampled if they have a central office

[10] Optional

Table A.14: Requirements for group certification as defined by systems (requirements relate to <u>ALL</u> the options for group certifications in the systems)

Items	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
Requirements for multi-site or group certification are defined	≈ [4]	✓	✓	✓	✓ [6]	✓	✓	✓
Requirement that the audited group is a legal entity	✓	✓	✓	✓	✓	✓	✗	✗
A central management unit is required	≈ [4]	✓	✓	✓ [9]	✓ [6]	✓	✓	✓
Internal control system required and to be audited	≈ [4]	✓	✓	✓ [9]	✓	✓	✓	✓
Requirements on homogeneity land or production type	≈ [11]	≈ [12]	✓ [5]	✗	✗	✓ [13]	✗	✓ [8]
There is a procedure for risk based sampling	✓	≈ [2]	✓	✗	✓	✓	≈	✓
Requirement that at least all sites need to be visited during validity certificate	✗	✓ [3]	✓ [1]	✓ [10]	✗	✗	✗	✗ [7]
It is explicit that mass balance is on site level within the total administration of multiple sites	≈ [16]	✓ [15]	✓	✓	✓ [14]	✓	✓	✓

[1] The CB shall audit all sites participating in the multi-site system at least once during the 5-year validity of the CoC certificate (RTRS, 2010) [2] Mentioned in documentation, to be determined by auditors

[3] For CoC audits: All sites shall be audited within the 5-year certification period (RSPO, 2011)

[4] The concept of "participating operator" is defined; a group of stakeholders can indeed apply, provided that they constitute a legal entity. A more defined group certification policy is in development to clarify the related aspects (Haye, 2011).

[5] Multi-site certification: Group members/sites shall be located <u>near each other and in the same ecological region</u> (i.e. the farms shall have the same original vegetation type in broad ecological terms). Group members/sites shall use the same or very similar production systems.

[6] Producers: "The lead auditor shall ensure that as part of the audit the square root of the number of collecting sites covered by the scope of the certificate are verified through site audits, unless the 1st gathering entity can demonstrate that all potential risk has been controlled through: (1) All sites belong to and are directly managed by central office […], (2) The 1st gathering entity manages all collecting sites using same management system and procedures, (3) 1st gathering entity has centralised database system with up-to-date records to monitor a mass balance system covering all collecting sites".

[7] ISCC: Groups need an internal audit system, for which all group members need to be audited every year. However for external audit there is no maximum time period in which a group member needs to be visited, instead, farmers that were audited without any issues should not be part of the sample until all farms in the group have been audited

[8] The following factors bear specific relevance for group certification and must be considered by the auditors..[..].. Degree of similarity of the production systems and the crops within the group…

[9] "Overarching management system which controls, enforces, verifies and documents implementation of and compliance with Bonsucro. Responsibility must be clear as to who the Multisite Scheme owner and contacts are and the proposal shall detail all sites and activities and ensure the scope of service"

[10] The surveillance audits will always include the main site and a sample of the subsidiaries scheduled in such way that over the certification contract period of 3 years including 1 initial audit (or re-audit) and 2 surveillance audits all subsidiaries are covered at least one time in the sample.

[11] This is currently under discussion. Similar options are being contemplated, but nothing certain for the moment.

[12] RSPO requires sampling of the farms/plantation. The sampling should be based on the existing situation taking into consideration their variation in term of size, location, topography, issues etc.

[13] Requirements on group composition: a homogeneity is required relating to the region, production activities, land use and climatic conditions.

[14] The Central Office of the First gathering entity is generally the site that collects and centralizes all relevant information needed regarding the origin of the potentially sustainable biomass, the mass balance system (consolidated and at the level of each logistical site)

Table A.15: Sampling conditions for multiple sites or farmers (where Y is the number of sites)

Items	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
Producer:								
Initial certification audit	√y	0.8*√y [7]	-	[13]	√y [10], [17]	√y	3-5 % [9]	-
• Low risk [3]	5-7%	-	√y	-	-	-	-	√y
• Medium risk [4]	10-13%	-	√y*1.2	-	-	-	-	1.5 * √y
• Higher risk [5]	17-25%	-	√y*1.4	-	-	-	-	2 * √y
Surveillance audit	√y	0.8*√y [7]	-	[13]	√y [10] ,[17]	0,6 * √y	3- 5 % [9]	na [16]
• Low risk [3]	5-7%	-	0.8 * √y	-	-	-	-	-
• Medium risk [4]	10-13%	-	0.8 * √y*1.2	-	-	-	-	-
• Higher risk [5]	17-25%	-	0.8 * √y*1.5	-	-	-	-	-
Re-certification audit	√y	0.8*√y [7]	-	[13]	√y [10] ,[17]	0,8 * √y	3- 5 % [9]	-
• Low risk [3]	5-7%	-	√y	-	-	-	-	√y
• Medium risk [4]	10-13%	-	√y*1.2	-	-	-	-	1.5 * √y
• Higher risk [5]	17-25%	-	√y*1.4	-	-	-	-	2 * √y
Chain of Custody Audit								
Initial certification audit	√y	0.8*√y [8]	√y	33%[14]	[11]	√y	5% [9], [15]	√y [15]
• Low risk [3]	5-7%	-	-	-	-	-	-	-
• Medium risk [4]	10-13%	-	-	-	-	-	-	-
• Higher risk [5]	17-25%	-	-	-	-	-	-	-
Surveillance audit	√y	0.6*√y [8]	0,6 * √y	33%[14]	[11]	0,6 * √y	5% [9], [15]	na [16]
• Low risk [3]	5-7%	-	-	-	-	-	-	-
• Medium risk [4]	10-13%	-	-	-	-	-	-	-

• Higher risk [5]	17-25%	-	-	-	-	-	-	-
Re-certification audit	√y	0.8*√y [8]	√y	33%[14]	[11]	0,8 * √y	5% [9], [15]	√y [15]
• Low risk [3]	5-7%	-	-	-	-	-	-	-
• Medium risk [4]	10-13%	-	-	-	-	-	-	-
• Higher risk [5]	17-25%	-	-	-	-	-	-	-

[1] Where the combination of sites sampled at the main assessment and the subsequent annual surveillance assessments is fewer than necessary to ensure all sites are visited over the 5 year certificate validity period, the minimum number of sites shall increased each year to ensure at all sites are visited (RTRS, 2010)

[2] The representative sample of the operation(s) identified in the certification scope shall be calculated using one of the following two representative sample rate calculation methods (root square or percentages) for operational structures, whereas the calculation method shall apply which leads to the higher sample rate (RSB, 2011a).

[3] Based on risk class 1 and 2 for RSB (RSB, 2011a), [4] Based on risk class 3 and 4 for RSB (RSB, 2011a)

[5] Based on risk class 5 and 6 for RSB (RSB, 2011a)

[6] There are adjusted representative sample rate calculation methods and percentages for compliance claims. Minimum sample level of the RSB compliance claims made by the participating operator range from 10% (risk 1) to 100% (risk 5). Note: No compliance claims are possible for risk 6 (RSB, 2011a)

[7] Based on management sub-units, excludes main unit. The level of sampling to take place during a certification assessment shall include every mill (RSPO, 2007). The mill will need to go through a producer audit rather than a supply chain audit (Jaacob et al, 2012).

[8] Plus central office, specific examples are given in documentation (RSPO, 2011b). The audit sample may be increased or decreased based on the supply chain models employed and the complexity and risk associated with the operations. Risk assessment will be carried out by the auditor (Jaacob et al, 2012)

[9] Note that the REDcert EU version (not available at this point of report writing) will be based on √y. When certifying a first gathering point, a risk analysis of all the farms supplying this point (with biomass and self-declarations) is made by the auditor, which then visits a sample of 3% of the biomass suppliers (5% if not cross-compliant).

[10] "75% of group members are audited following risk analysis and 25% are selected at random"

[11] "A representative sample of processing sites and storage sites sharing the same management system and covered by the Central Office shall also be selected following an appropriate risk analysis and shall be verified during the audit.", no procedure for certifying in multiple Trader sites.

[12] Sampling requirements between the ISCC Germany and ISCC EU version differ substantially; ISCC Germany version requires a sampling of 3 to 5%. This is root square for EU version.

[13] Farm supplies: (% of mill turnover) is related to sample size (% of farms in group): > 25% turnover: 100% sampling, 10-25% turnover > 50%, 5-10% turnover: 25%, 1-5% turnover > 10%, 0.5-1% turnover > 5%

[14] The CB may decide which subsidiaries and the number of subsidiaries to sample depending on level of confidence that has been obtained from the main office quality management and the sampling. The surveillance audits will always include the main site and a sample of the subsidiaries scheduled in such way that over the certification contract period of 3 years including 1 initial audit (or re-audit) and 2 surveillance audits all subsidiaries are covered at least one time in the sample.

[15] Only multi-site option for logistics networks (warehouses), not for conversion units

[16] Annual re-certification, so no surveillance audit

[17] √y of the sites requires to be checked at least in a desk audit; or also called documentation audit. If the auditor judges the risks sufficiently limited by a good management system, the actual sample size for field audits can be reduced to a minimum of 3% of y

Table A.16: Availability of procedures on claims by system

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
System has a procedure on claims	≡	≡	≡	≡	X [2]	≈ [1]	≈ [4]	≡ [3]
System has defined the content of the certificate	≡	≡	≡	≡	≡	≡	≡	≡

[1] Certified companies may only use the claim (logo) in relation with the transaction certificate. No further policy on claim procedure in relation to communication, disputes, non-compliance or allowable on-product claims on products.

[2] Verification Process document section (1.7) on claims; rather generic and no mention about their logo, disputes etc. "Economic operator shall only make accurate..[…] sustainability claim(s) on sales documents, promotional documents.."

[3] ISCC document 208 entitled Requirements for the logo use

[4] All questions concerning REDcert claims and the protected REDcert brand are laid down in the system contract, in order to assure that only true REDcert participants take advantage from the brand and its usage.

Table A.17: CoC and tracing requirements for company, as defined by the system

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
A traceability system is available in company	=	=	=	=	=	=	=	=
Record keeping and documentation	=	=	= [1]	=	=	=	=	=
Records to be kept 5 years or longer	=	=	=	=	=	=	=	=
Skilled personnel and management in company	=	=	=	≈ [7]	X [6]	X	=	=
Company has procedure for identification of inputs and outputs	=	=	=	≈ [7]	=	= [2]	=	=
Critical control points to be identified by company	≈ [3]	X	=	X	X [5]	X [4]	X [8]	X [9]

[1] Land use data (status of land 2008) shall be kept in documentation
[2] There are administration requirements for the company outlining the management system that needs to be in place for information handling
[3] Basically, this forms part of the risk assessment to be done by the company (risk classes to be identified by critical points), (RSB, 2011)
[4] Organization shall have descriptions of internal processes and storage facilities (see interpretation document, 7.2.1 and 7.2.2), (Dakhorst, 2011)
[5] As example: the economic operator shall have access to relevant and detailed information [….]. The economic operator may perform a risk analysis and assessment.
[6] For example, only in few places: "This activity should only be performed by the most competent staff person(s), to maintain a high level of control and avoid wrong sustainability claims, at the level of each logistical site or centrally."
[7] Has been added in future version awaiting EC approval
[8] No formal need, but recommendation to set up a self-control system according to best management practise methodology (FMEA, HACCP)
[9] Critical control points are identified by the auditor, not the company itself

Table A.18: The system entails following requirements and / or facilities for the mass balance system

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Continuous balancing method specified	= [2]	=	=	= [10]	X	X	X [8]	=
Fixed inventory period method specified	X [7]	X [7]	=	=	=	= [1]	=	=
Maximum timeframe for fixed inventory period is defined and does not exceed 1 year	n.a. [7]	n.a. [7]	=	=	=	X	=	= [9]
Volume out is not allowed to exceed volume in	=	=	=	=	=	=	=	=
Separate IT-tracking system available to trace volumes	≈ [3]	= [5]	≈ [3]	=	X	X [6]	≈ [8]	X

[1] In totally, the amount of biomass that is obtained from the chain cannot exceed […] taking into account the possible conversion losses and the differences between initial and final stocks per period (NTA, 2011).

[2] RSB-STD-11-001-20-001: Thorough continuous tracking of RSB certified product is required (EC, 2011a).

[3] Under development

[4] There is not a fixed inventory period for volumes RSPO certified product received and shipped, but a continuous check ensuring that no more RSPO certified product is shipped than received (RSPO-RED, 2011)

[5] Supply chain actors who take legal ownership and physically handle RSPO Certified Sustainable oil palm products..[…]… Need to register their transaction in the RSPO IT System upon the moment of physical shipment. Exemptions exist for operators after the final refinery and traders that are part of a string (RSPO, 2011)

[6] Not specifically described; legally an annual (or even more frequently) reporting is required, and in addition, a CB checks the system yearly (surveillance audits) so needs to check whether the systems is balanced (Dakhorst, 2011)

[7] Only continuous balancing method applied; in these cases (to be) combined with an IT-tracking system. Consequently, no fixed timeframe to be defined.

[8] " Each quantity of sustainable biomass must be recorded in the internal mass balance system as soon as the interface, the operation or the operating site has obtained the legal and actual control over the sustainable biomass. The handling of the sustainable biomass within the interface, the operation or the operating site also has to be tracked and documented as an internal process in the internal mass balance system. Within the framework of the REDcert certification system, the web application Nabisy, provided by the BLE, replaces the internal mass balance system for suppliers after the final interface.

[9] 3 months as defined

[10] The Bonsucro system operates based on a so-called "metric system"; all possible indicators are quantified, and minimum values have to be reached. All data are logged in a software tool

Table A.19: Procedures systems for handling change of ownership under different circumstances

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Change of legal ownership: A new chain of custody audit is required	= [4]	= [6]	= [1]	=	=	=	≈ [9]	=
Chain of custody audit is required for 'paper traders'	≈ [5]	X [7]	X [2]	= [13]	X [11]	≈ [3]	X [10]	X [12]
Standard has specified rules on outsourcing activities	= [8]	=	=	≈ [13]	X	X	X [15]	X [14]

[1] The General Chain of Custody System Requirements of the RTRS Chain of Custody standard shall apply to any organization throughout the supply chain making RTRS claims about the output material they supply (RTRS, 2011c).

[2] The Chain of Custody is a control of physical flows not a Trading control, so it needs to follow all the physical steps where the product is involved (Zeehandelaar, 2011)

[3] Strictly speaking, all the traders need to be audited against the CoC because of change of legal ownership. Experience is limited on this issue. In practice, NTA8080 system will also most probably deal with this situation by focusing on the trader that physically offloads the material (Dakhorst, 2011)

[4] The electronic system will require that all changes in legal ownership of certified material will be recorded in the system. Any entity that takes possession must be registered with RSB, Chain of Custody auditing is required at a minimum, also if operator is a transport company (Rudolf, 2011)

[5] No experience yet on this issue. Most likely anyone who takes legal ownership of the product will need to be registered in the RSB system. Whether or not there would need to be some kind of Chain of Custody audit may depend on the individual circumstances (Rudolf, 2011).

[6] The General CoC System requirements of the RSPO Supply Chain Standard shall apply to any organization throughout the supply chain that take legal ownership and physically handle (including receipt into storage tanks) RSPO Certified Sustainable oil palm products (RSPO-RED, 2011).

[7] In this case, the relevant RSPO documents will go directly from the first party in the string [often the shipper] to the final buyer. Although the payment for product follows the full string…[…] (RSPO-RED, 2011)

[8] There are some requirements in the principles and criteria document, which refer specifically to third parties (e.g. on labour conditions, criterion 4g) (Haye,2011) The CB shall evaluate all subsidiaries, […] external third parties contracted or otherwise engaged, [….]

[9] German legislation doesn't require traders to be audited. A REDcert "proof of control" can be obtained for the company internal CoC and mass balance system of traders

[10] Paper traders only receive a confirmation of REDcert if they join the system and accept an independent audit, German legislation does not require this

[11] Trader: "Legal entity that buys and sales biomass and/or biofuels or related products. A trader that takes legal and physical possession of the product shall be certified. A trader that takes legal ownership of the product but does not take physical possession of the product does not necessarily need to be certified."

[12] No specific rules in the system documentation, but in personal communication: "ISCC certification always follows the flow of the physical product" so only operators that take ownership of the physical product.

[13] Has been revised for future version awaiting EC approval

[14] No specific rules in the system documentation, but in personal communication: "ISCC certification always follows the flow of the physical product as this guarantees traceability. So if the physical product is stored in a storage system this is subject to certification." Not specifically mentioned in system documentation.

[15] No specific rules in the system documentation, but in personal communication: "Outsourced storage facilities have to be registered with REDcert as a location (which will be inspected randomized – 5%), to be integrated into the mass balance system of the outsourcing company and to grant access to its facility for the purpose of inspection"

Table A.20: For preventing uncontrolled mixing of materials, the system entails the following requirements:

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Use of more tracking models by company considered	= [2]	≈ [1]	= [3]	0 n.a.	0 n.a.	X	0 n.a.	X
Use of more sustainability systems considered	X	X	X	X	X	= [4]	X	X

[1] The CB shall review the management documentation of the applicant to ensure that all elements of the respective RSPO Supply Chain Systems are addressed satisfactorily […] (RSPO, 2011b)

[2] The participating operator implementing simultaneously more than one tracking model in their operation(s) shall define clear product groups for each tracking model used. Product groups shall allow for unique identification of the product in each tracking model employed by the participating operator...[….], (RSB, 2010)

[3] Where the organization is simultaneously implementing more than one of the RTRS CoC system described in the RTRS Chain of Custody standard, it shall identify and record all critical control points where there is a risk of uncontrolled mixing or substitution between materials from different RTRS Chain of Custody systems.

[4] If the organization uses a number of sustainability systems, it shall unambiguously be proved that the corresponding sustainability claims are balanced. No temporary deficits of biomass according to NTA 8080 or equivalent [….] are allowed on the mass balance (NTA, 2011)

Table A.21: Level of recognition and affiliation of the system

Items	RSB	RSPO	RTRS	Bon-sucro	2BSvs	NTA8080	REDcert	ISCC
System is accepted by an accreditation body [1]	X	X	X	X	X	= [2]	X [8]	X [8]
Approved by EC	=	≈	=	=	=	≈	≈	=
Approved by individual member country	= [4]	= [5]	=	= [4]	= [4]	= [5]	= [5]	= [4]
System is a member (full or associate) of ISEAL	=	≈ [6]	=	=	X	≈ [7]	X	X

[1] Not to be confused with the accreditation of certification bodies, recognised by a system

[2] In December 2010 the system was accepted by the Dutch Accreditation Council (RvA - Raad voor Accreditatie)

[3] RSB is full member of ISEAL Alliance since June 2011 (Haye, 2011)

[4] Automatically for EU approved systems; RSB is separately recognised by Germany (Haye, 2011), Bonsucro has been recognised by the UK

[5] Temporarily approved by the Dutch government until July 2012 (REDcert also approved by Germany)

[6] RSPO has applied for ISEAL membership, currently under review (Jaacob et al, 2012)

[7] NEN is member of ISO and ISO and ISEAL have an alliance; see e.g. http://www.iso.org/iso/about/organizations_in_liaison/organizations_in_liaison_details.htm?id=542904

[8] However, accepted by the BLE (German Federal Agency for Agriculture and Food) for compliance with German Biomass Sustainability Ordinances

Table A.22: Recognition of other systems for certification

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
Systems accepts all other certificates when EU-approved	X	X	X	X	= [5]	X	= [7]	= [6]
Systems considers accepting other certificates only in case of system's level playing field requirements	= [3]	=	= [1]	=	X	= [2]	X [4]	X

[1] RTRS is flexible in terms of cooperation but absolutely strict in maintenance of standard (will not work under the consensus). RTRS is currently talking with various systems for possible cooperation (e.g. AAPRESID, Proterra),

[2] NTA808 will only accept other systems that are accredited as well. This is also a condition for the system to be accredited themselves (Dakhorst, 2011)

[3] RSB participates in an on-going benchmarking activity called the "Sustainability Standards Transparency Initiative", which is coordinated with ISEAL and GIZ. Ultimately, RSB is willing to accept certificates from other systems into the RSB CoC, provided that they are considered at par or superior in requirements (+ EU approved), (Haye, 2011)

[4] There is no need for official bilateral recognition of the REDcert system by other system owners.

[5] 2BSvs does require an MLA to be signed, but in principle accept other EC approved systems: "….the 2BSvs voluntary system may recognise other voluntary systems. Providing that: (1) in the case of a system fully approved by the EC, an agreement of mutual recognition is signed between the Steering Committee of the 2BSvs voluntary System and the owner of the other system, (2) in the case of a system partially recognised by the EC, a gap analysis is conducted by the Technical Advisor and a list of additional criteria to be audited is established. Requirements not covered by the partial recognition of the EC shall be audited by an auditor endorsed by the Technical Advisor. As of January, only ISCC has undergone gap analysis and can be used by 2BSvs

[6] ISCC accepts other EU-accepted certification systems as long as the delivery notes and content of the certificate for traceability is correct.

[7] Also certificates of other national systems, which have been accepted due a bilateral agreement by BLE

Table A.23: Characteristics of the cost structures for the eight voluntary systems

Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080	REDcert	ISCC
System has a membership fee	=	=	=	=	=	= [1]	=	=
Possibility for certification without being member	=	X	= [4]	X	=	=	X	=
System has a producer fee	≈ [6]	=	=	X	=	= [1]	= [6]	=
System provides guidance on auditing days required	≈ [2]	≈ [2]	≈ [3]	X	=	=	≈ [5]	X

* Table (complete) with all explanatory footnotes per system can be found in annex 1 (table 25).

[1] Annual fee per certificate [€50- €200] AND Fee per metric ton [€0.03] OR Annual membership fee [€50-€5,000], Partners for Innovation (2011)

[2] Limited guidance is provided.

[3] Limited guidance is provided. RTRS expects to define more specific guidance for CBs with regard to the number of person-days required in the field for adequate assessment of farms of different sizes (RTRS, 2011)

[4] Membership is not a certification requisite, it is only required for partial certification (Frojan, 2012)

[5] REDcert is, however, authorised to define a future minimum duration for audit steps particularly based on the inspection results for the purpose of quality assurance.

[6] This is under development

[6] This part of the membership fee is calculated according to the amount of sustainable biomass sold or processed in a year

9 Annex 2: Overview of product flow, production costs and prices for four case studies

Table: Man-days of audit (excluding travelling and based on single site auditing), NA = not applicable, * only for main audits. Experience on RSB is still limited. Specifications for smallholders are not relevant for all systems or information is limitedly available.

Operator	Items	RSB	RSPO	RTRS	Bonsucro	2BSvs	NTA8080 #	REDCert	ISCC
Location first certificate		Farm	First gathering point	Farm	First gathering point (mill) +farms	First gathering point + farms	Farm	First gathering point + farms	Farm
	Pre-audit					Na	1*	NA	
	On-site audit	4-5	20 (usually group auditing)	Min. 2,5	15 days (farms and mill together)	1.5 (to 4) [2]	2	0.5-1 +1-2h per farm	2-4
Biomass producer or first gathering point	Surveillance audit		10			1 (to 3) [2]	2	0.5-1 +1-2h per farm	
	Smallholder						0,5 extra		
	0 - 100 ha			2	1,5-2		0,5 - 1 extra		2
	100 - 1000 ha			3,5	2-2,5		1 - 2 extra		2 -3,5
	1000 - 1.000.000 ha						2 – 4,5 extra		
	> 1.000.000 ha						4 - 7 extra		
Supply chain: Chain of Custody									
Supply chain general		2 (indicative)	2-3 / 2	2		2			2
Processor	Pre-audit					NA	1*	NA	
	On-site audit		Min 2,5	Min 2,5	15 (team of 3)	1,5	1	1,5 - 5	1,5-2,5
	Surveillance audit		2-2,5	2-2,5		1,5	1	1 - 2	1,5-2,5
Trader	Pre-audit					NA	1*		
	On-site audit		2,5	2,5	Min. 2,5	1,5	1	NA	1,5-2,5

	Surveillance audit	2-2,5	2-2,5	1	1	1,5-2,5
End-user	Pre-audit				1*	
	On-site audit	No experience yet	1,5	1	NA	
	Surveillance audit			1		

[2] Number between brackets is maximum number of audit days, which rises with the number of collection sites. Annual audit can be reduced to man-days given before the brackets if a good management system is used. # Based on man-table auditing days, excluding time for report writing

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10   Annex 3: Overview of product flow, production costs and prices for four case studies

Table 1: Case study: General overview of production costs and prices along the palm oil chain for biofuels[10]

Processing steps	Products	Costs	Selling price
Palm oil production (small)	8000 ton FFB	Production costs: ≈ 35 US$/ton FFB Transportation costs: 112 US$/ton FFB Total: ≈ 137 US$/ton FFB	152 US$/ton FFB
Palm oil production (large)	8000 ton FFB	Production costs: ≈ 35 US$/ton FFB Transportation costs: 112 US$/ton FFB Total: ≈ 137 US$/ton FFB	152 US$/ton FFB
Mill	1840 ton CPO	350 US$ / ton CPO Transport (50 km): 3 US$ /ton oil Total: ≈ 353 US$/ton CPO	600 US$/ ton CPO, historic fluctuations from around 400 to 1100 US$/tonne CPO (2005-2009)
	6160 ton kernel	350 US$ / ton CPO Transport (50 km): 3 US$ /ton oil Total: ≈ 353 US$/ton CPO	450 US$/ton kernel
Transesterification	1656 t PME	0.83 US$/l PME (based on CPO price of 600 US$/ton CPO)	*Selling price* 0.55-1.20 US$/l (Malaysia, historical prices)
	184 t glycerine	See above: extra output is glycerine	100 US$ / tonne crude glycerine
Transportation overseas	1656 t PME	Around ≈ 70 US$/ton (for biodiesel)	Variable: 800 to 1600 US$/tonne (higher side for RME)
Refinery / blending	1656 t PME		

10 Information is largely based on Winrock (2009) and on Global Biopact (2011) plus additional information received from RSPO Secretariat (2012)

Table 2: Case study: General overview of production costs and prices along the Jatropha value chain for biofuels on a yearly basis:

Processing steps	Products	Costs	Selling price
Jatropha production (small)	385 ton seeds	Production cost: 0.15 $/kg seed Purchase price for farmer: 0.18 $/kg seed Transportation costs: 0.03 $/ kg seed	0.21 $ / kg seed
Jatropha production (large)	385 ton seeds	Production cost: 0.15 $/kg seed Transportation costs: 0.03 $/ kg seed	0.21 $ / kg seed
Expeller	101 ton oil	Input price: 210 US$ / ton oil 0.20 US$/litre oil expelling costs	900 US$/ton oil
	284 ton cake	Input price: 210 US$ / ton cake 0.20 US$/litre oil expelling costs	66 US$/ton cake
Transport to port	101 ton oil	Transportation costs: 0.01 US$/l	Indicative: 0.89-1.32 US$/l (also sold for higher prices)
Transportation overseas	101 ton oil	Around ≈ 70 US$/ton (for biodiesel)	
Transesterification Rotterdam	91 ton biodiesel	Input costs oil: Transesterification costs: 0.14 US$/l	Variable: 800 to 1600 US$/tonne biodiesel
	9 ton glycerine	Input costs oil: Transesterification costs: 0.14 US$/l	100 US$ / tonne crude glycerine

Table 3: Case study: General overview of production costs and prices along the soy value chain for biofuels[11]

Processing steps	Products	Costs	Selling price
Production costs farm		100 US$/ton soybeans	
Strategy costs		156 US$/ton soybeans	
Transportation farm to port		38 US$/ton soybeans	
Total costs farmer	3200 ton	294 US$/ton soybeans	450 to 538 US$ / ton soybeans
Crushing costs Oil	608 ton oil	Cost including buying inputs: 791 $/mt	1005 US$ / ton oil FOB (19%) – Fluctuating from ≈ 500 to 1400 US$/tonne from 2005 to 2009
Meal	2560 ton meal	Cost including buying inputs: 791 $/mt	405 US$ / ton meal FOB (80%)
Transesterification	547 ton SME	Cost including buying inputs: 1161 US$/mt	Biodiesel gate factory: *1073* US$/mt (fluctuating depending on price), (credits glycerine included)
	61 ton glycerine	See above, credits glycerine deducted from biodiesel costs	100 US$ / tonne crude glycerine (credit 0.01$/l biofuel)
Transportation overseas	547 ton SME	34.2 US$/mt (other source 70 US$/mt)	Selling price: 1200 US$/mt
Refinery or blender			FOB price Rotterdam: 1240 US$/mt Variable: 800 to 1600 US$/tonne biodiesel

11 Information is based on various resources: Dam et al (2010), Eijck (2012), Global Biopact (2011), Los Grobos (2012), World Bank, (2011) and information received from personal communication with Hilbert (2012)

Table 4: Case study: General overview of production costs and prices along the sugar cane chain for biofuels[12]

Processing steps	Products	Costs	Selling price
Sugar cane production	17000 tonne cane	18 US$/tonne estimation (0.26 US$/l)	US$ 24 / tonne cane delivered 0.31 US$/litre ethanol
Transportation	17000 tonne cane	Included in production	
Mill / Ethanol plant	1309000 l ethanol	0.31 US$/l feedstock cost Total: 0.46 US$/l	0.45 US$/l13
			Credit co-firing bagasse: 0.28 US$/l
Transport to port	1309000 l ethanol	0.035 US$/t·km 0.07 US$/l	0.6 US$/l FOB South Port
Transport overseas	1309000 l ethanol	Around ≈ 100 US$/ton (for ethanol)	Ethanol EU Rotterdam T2 0.9 US$/l (1248-1298 US$/tonne ETBE FOB ARA2, June – October 2011)
Refinery and blending	1309000 l ethanol		

12 Indicative information is derived from various sources: Crago (2010), WABCG FlashMarket (2011), Eijck (2012), APEC (2010) and UNICA (2011), ISIC Pricing over period June to October 2011
13 Based on 0.8 R$/l prices received by producers in Sao Paulo estate

11 References

This list of references is used in the report in combination with the factsheets for the individual systems (online annexes of this report). Specific references for the systems are included in the factsheets.

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