



#### Copyright, Language, and Version Notice

The official language of this “[Audit Guidance for Mass Balance Chain of Custody]” is English. The current version of the “[Audit Guidance for Mass Balance Chain of Custody]” is maintained on the Bonsucro website: [www.bonsucro.com](http://www.bonsucro.com).

Any discrepancy between copies, versions or translations shall be resolved by reference to the current English version. It is your responsibility to ensure you are using the current version of the Bonsucro “[Audit Guidance for Mass Balance Chain of Custody]”.

The Bonsucro “[Audit Guidance for Mass Balance Chain of Custody]” and its contents are copyright of “Bonsucro” - © “Bonsucro” 2011-2013. All rights reserved. Bonsucro prohibits any modification of part or all of the contents in any form.

2011

**BONSUCRO™**  
BETTER SUGAR CANE INITIATIVE



**BONSUCRO**  
AUDIT GUIDANCE FOR MASS BALANCE CHAIN OF CUSTODY STANDARD  
INCLUDING BONSUCRO EU AUDIT GUIDANCE FOR MASS BALANCE CHAIN  
OF CUSTODY STANDARD

**BONSUCRO**

**AUDIT GUIDANCE FOR MASS BALANCE**

**CHAIN OF CUSTODY STANDARD**

**INCLUDING BONSUCRO EU AUDIT GUIDANCE FOR**

**MASS BALANCE CHAIN OF CUSTODY STANDARD**

**VERSION 3.0 MARCH 2011**

## **HISTORY OF THE DOCUMENT**

The first version of this “Audit Guidance for Mass Balance Chain of Custody Standard” was set up in June 2010 and send around for socialization to the members of the Bonsucro EU Sub Committee.

The revised version was reviewed by the Bonsucro Management Committee on July 6, 2010 and adopted by the Management Committee on July 27, 2010.

In December 2010 and in February 2011, this version was revised based on feedback received from the EU on the level of compliance of the Bonsucro Certification System with EU RED requirements as well as feedback received from the first pilot audits and training.

Consultants on the project for Bonsucro in the development of this Audit Guidance have been: NewForesight™ and SGS.

Revision round	Date	Description of amendment
A	June 2010	Draft version send to Bonsucro EU Sub Committee
B	July 2010	Final version approved by Bonsucro Management Committee
C	December 2010	Revision made based on compliance with EU RED
D	February 2011	Revision made based on compliance with EU RED

This document is a work in progress. Especially during the first year of implementation, Bonsucro encourages feedback with suggestions for overcoming difficulties and improving the process.

This document is written in the English language. Bonsucro does not assume any liability for errors or misunderstandings introduced when this document is translated into other languages.

## TABLE OF CONTENTS

1 Introduction .....	4
1.1 Bonsucro .....	4
1.2 The Bonsucro Certification System.....	4
1.3 Intent of this document.....	6
1.4 How to read this document .....	6
2. Scope.....	7
2.1 Scope .....	7
2.2 Framework for auditing.....	7
2.3 References.....	8
2.4 Definitions and abbreviations .....	8
3 Audit Guidance .....	10
3.1 Traceability.....	10
3.2 Identification, traceability and verification of sustainability characteristics .	11
3.3 Control of mass balance system .....	12
3.4 Control of consignments.....	15
3.5 Control of mixes of consignments .....	16
3.6 Control of splitting of consignments from mixtures .....	17
Appendix 1: Terms and definitions.....	18

## 1 INTRODUCTION

### 1.1 BONSUCRO

Bonsucro is a global multi-stakeholder non-profit initiative dedicated to reducing the environmental and social impacts of sugarcane production. The mission of Bonsucro is to ensure that current and new sugarcane production and all sugarcane derived products are produced sustainably. Bonsucro aims to achieve this mission through designing and organization the process of multi-stakeholder definition for sustainable sugarcane production and all sugarcane derived products (i.e. ‘Standard Setting’) and ensuring the integrity of its implementation (i.e. ‘Certification’).

The document below is a guideline for auditors that are operating the “Bonsucro Chain of Custody Standard for the Mass Balance System”.

### 1.2 THE BONSUCRO CERTIFICATION SYSTEM

The Bonsucro Certification System consists of 3 main elements:

1- Standards: Bonsucro has developed 2 standards:

- The “*Bonsucro Production Standard*” contains principles and criteria for achieving sustainable production from sugarcane (all products) in respect of economic, social and environmental dimensions. In addition, the Production Standard contains a set of technical and administrative requirements for enabling the tracking of claims on this sustainable production of Bonsucro sugarcane and all sugarcane derived products in the cane supply area and in the milling operations including the transport from cane to the mill<sup>1</sup>.
- The “*Bonsucro Mass Balance Chain of Custody Standard*” contains a set of technical and administrative requirements for enabling the tracking of claims on the sustainable production of Bonsucro sugarcane (all products) along the entire supply chain after the mill and its cane supply; through production (e.g. conversion, processing, manufacturing, transformation), warehousing, transportation and trade to use of sugarcane and all sugarcane derived products.

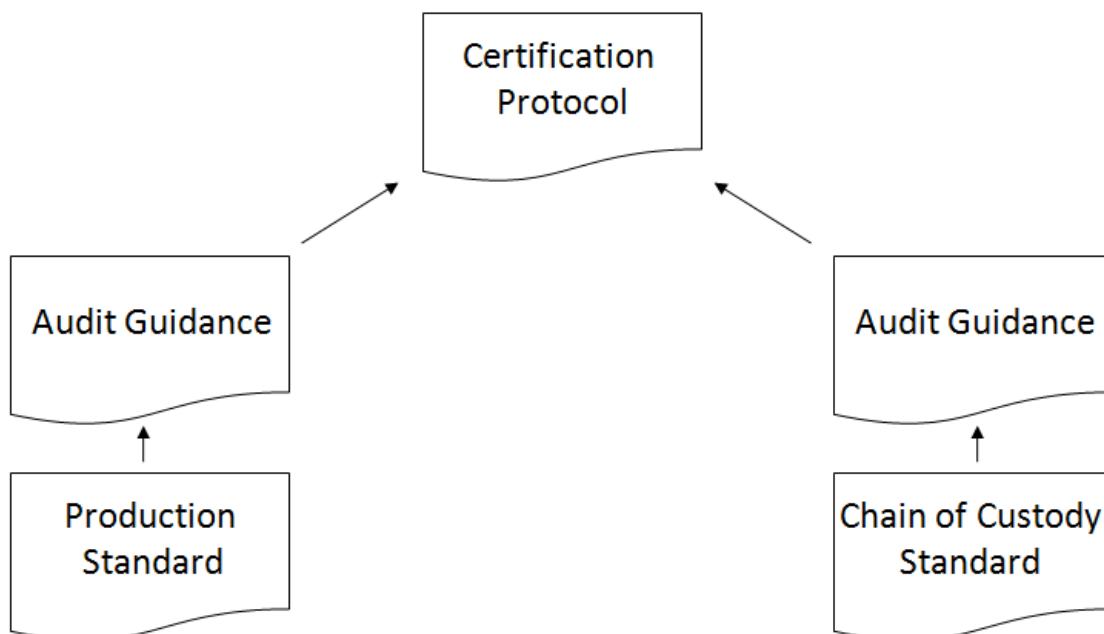
NOTE: Those Chain of Custody requirements that are applicable to the mill and its cane supply area are already included within the Production Standard and are identical to those of the Mass Balance Chain of Custody Standard.

- 2- Audit Guidance: Bonsucro has developed guidance documents for members and auditors on how to become compliant with the Bonsucro Production Standard and/or Chain of Custody Standard.
- 3- Certification Protocol: Bonsucro has developed a Certification Protocol for members and auditors that lists the process and procedures for certification against the Bonsucro standards. This includes: 1.) rules and requirements for Certification

<sup>1</sup> These requirements are identical to the requirements of the BSI Mass Balance Chain of Custody Standard.

Bodies to audit against the Bonsucro standards, 2.) certification requirements for economic operators to demonstrate compliance to the Bonsucro standards, and 3.) audit procedures for Certification Bodies to verify compliance with the Bonsucro standards.

Together these 3 elements form the Bonsucro Certification System. As such, these individual documents can never be used as stand-alone documents and must always be used in relation to each other.



The scope of the Bonsucro Certification System can be with or without compliance to EU Renewable Energy Directive (RED) and its similar provisions in the EU Fuel Quality Directive (FQD). As such, the Bonsucro Certification System makes a distinction between 2 main scopes:

1. “Bonsucro”: compliant with Bonsucro requirements
2. “Bonsucro EU”: compliant with Bonsucro requirements PLUS additional requirements that are needed for EU RED compliance

Within the Bonsucro Certification System documents (i.e. Standards, Audit Guidance, and Certification Protocol) the extra Bonsucro EU requirements are clearly marked. Both the Bonsucro scope and the Bonsucro EU scope form part of the overall ‘Bonsucro Certification System’ and will be referred to as such from here onwards.

For compliance with the Bonsucro EU scope ALL requirements need to be met (e.g. Bonsucro PLUS additional EU RED requirements). Bonsucro EU certification is equivalent to Bonsucro certification. Whereas the contrary does not apply; Bonsucro certification is not equivalent to Bonsucro EU certification. Members that do not wish to become Bonsucro EU compliant are excluded from this Bonsucro EU scope extension and do not have to comply with the additional EU RED requirements.

### ***1.3 INTENT OF THIS DOCUMENT***

The primary purpose of this document is to provide guidance and clarification on the Bonsucro Chain of Custody Mass Balance Standard for members, Certification Bodies and auditors. This Audit Guidance document provides this guidance through:

- 1- Description of how to interpret the principles and criteria from the Bonsucro standards
- 2- Audit instructions to verify compliance through indicators and verifiers
- 3- Information relating to exceptional situations
- 4- Objective criteria for critical limits
- 5- Tools and calculations for assessment

### ***1.4 HOW TO READ THIS DOCUMENT***

In chapter 3 of this document guidance is given per principle and criterion of the Bonsucro Chain of Custody Mass Balance Standard. With every criterion a brief explanation of the criterion is given together with the objective of the criterion, after which different indicators are described together with instructions on how to verify compliance.

## 2. SCOPE

### 2.1 *SCOPE*

The unit of certification will be all economic operators after the mill and its cane supply base who take legal ownership of the Bonsucro certified sugarcane products and/or all sugarcane products derived thereof. Those Chain of Custody requirements that are applicable to the mill and its cane supply area have been included within the Production Standard and are identical to those of this Mass Balance Chain of Custody Standard. Therefore mills and their cane supply area only need to comply with the Production Standard and the unit-of-certification for this Chain of Custody Standard starts *after* the mill.

This Chain of Custody Standard offers 2 scopes for certification:

1. “Bonsucro”: compliant with Bonsucro requirements
2. “Bonsucro EU”: compliant with Bonsucro requirements PLUS additional requirements that are needed for EU RED compliance

Within this Standard the additional Bonsucro EU requirements are clearly marked as such. For compliance with the Bonsucro EU scope ALL requirements need to be met (e.g. Bonsucro PLUS additional EU RED requirements). Bonsucro EU certification is equivalent to Bonsucro certification. Whereas the contrary does not apply; Bonsucro certification is not equivalent to Bonsucro EU certification. Members that do not wish to become Bonsucro EU compliant are excluded from this Bonsucro EU scope extension and do not have to comply with the additional EU RED requirements.

### 2.2 *FRAMEWORK FOR AUDITING*

No public claims relating to compliance of Bonsucro and/or Bonsucro EU certified sugarcane and all sugarcane derived products with the Bonsucro standard can be made without valid certification against the Bonsucro Certification System by an accredited Certification Body that is approved by Bonsucro to perform audits under the Bonsucro Certification System.

Verification of compliance with this Chain of Custody standard needs to follow the “Mass balance system”. This Chain of Custody standard contains specific requirements for the control of a mass balance system that is in conformance with the EU legislative requirements. The mass balance system is an accounting system to show the balance between input and output of sustainable sugarcane and all sugarcane derived products.

In order to achieve compliance with Bonsucro Chain of Custody Standard, 80% of the indicators contained in Elements 3.1 to 3.6 must be satisfied. In this, the specific Bonsucro EU requirements can be excluded from the scope (and thus compliance).

In order to achieve compliance with the Bonsucro EU Chain of Custody Standards, 80% of the indicators contained in Elements 3.1 to 3.6 must be satisfied. In addition, there are a

number of Major Elements (3.2.3, 3.2.4, 3.3.3, 3.3.4, 3.3.5, 3.4.1) which must be satisfied before compliance will be considered.

### **2.3 REFERENCES**

The Bonsucro Certification Protocol has been established based on the following references:

- a) ISO 9000: 2005 quality management terms and vocabulary
- b) ISO 9001:2008 quality management system
- c) ISO 19011: 2002 quality- and environmental management system's auditing
- d) ISO IEC Guide 65/EN 45011
- e) ISO Draft IEC Guide 17065
- f) ISO 14065:2007, IDT “Greenhouse gases- Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition”
- g) Draft ISO IEC Guide 17065
- h) ISO 14065:2007 IDT
- i) ISO 14064-3:2006
- j) ISEAL procedure P035 on Group Auditing
- k) EU RED 2009/28/EC and EU FQD 2009/30/EC directives, definitions and abbreviations
- l) 2010/335/: EU Commission Decision of 10 June 2010 on guidelines for the calculation of land carbon stocks for the purpose of Annex V to Directive 2009/28/EC OJ L 151, 17.06.2010
- m) Communication from the EU Commission on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme OJ C 160, 19.6.2010
- n) Communication from the EU Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels OJ C 160, 19.6.2010

### **2.4 DEFINITIONS AND ABBREVIATIONS**

**Chain of custody (choc):** the supply chain of a product including all stages from the feedstock production up until the release of the product for consumption (RE: communication from the commission on voluntary schemes)

**Client:** next legal owner of the product in the choc.

**Consignment:** quantity (e.g. batch, lot, load) of product mass with unique identification # and attached data specifying the product content in terms of kg (or tons of sugar or litres (or m<sup>3</sup>) of ethanol, the sustainability characteristics and greenhouse gas emission values assigned to that quantity in terms of EU RED annex V

**Economic operator:** Legal owner; Individual or organization which has ownership or physical control of sugarcane and/or all sugarcane derived products, from their origin to their market availability, for one or several steps in the chain of custody.

Note 1 - Organization is being used here as defined in ISO 14001

**EU legislative requirements:** referring to both EU RED and EU FQD requirements.

**Mass Balance System:** a system in which sustainability characteristics remain assigned to consignments ((RE: communication from the commission on voluntary schemes)

**Subcontractor:** not the legal owner of the product that is providing a service e.g. harvesting, transport, manufacturing, storage  
The subcontractor is operating under full responsibility of the legal owner.

**Supplier:** previous legal owner of the product in the choc.

**Traceability:** the ability of each economic operator in the chain of custody to trace back the product or raw material 1 step back to the supplier and one step forward to the client.

More definitions for the Bonsucro Certification System can be found in Appendix 1 of this document.

### 3 AUDIT GUIDANCE

*General instructions for the auditor:*

For compliance with Bonsucro Chain of Custody Standard, 80% of the indicators contained in Elements 3.1 to 3.6 must be satisfied. In this, the specific Bonsucro EU requirements can be excluded from the scope (and thus compliance).

For compliance with the Bonsucro EU Chain of Custody Standards, 80% of the indicators contained in Elements 3.1 to 3.6 must be satisfied. In addition, there are a number of Major Elements (3.2.3, 3.2.4, 3.3.3, 3.3.4, 3.3.5, 3.4.1) which must be satisfied before compliance will be considered.

In the Bonsucro EU scope where the standard indicates **MAJOR no** deficits can be accepted for certification.

Where the standard indicates: **>=90%** traceable the audit takes a sample of 10 verifications ( e.g. 10 consignments) and when this sample shows 0 or 1 defects this will be qualified compliant and reported **>= 90 % a..** When more than 1 defect is found the criteria score will be reported < 90% and the criteria will be checked for non – compliant.

NOTE 1 samples for auditing the different elements may be combined for audit efficiency

NOTE 2: in order to prevent from double counting it is not possible to use the same non conformity in other criteria.

#### 3.1 TRACEABILITY

Criteria	Indicator
3.1.1	<b>Final certified product can be traced from the dispatch area of the processor until next owner</b>
<b>&gt;=90%</b>	The contract between processor in the role of supplier and next owner in the role of client details which party is responsible for the product, both parties and the transporters keep a signed copy of the legal transport documents
3.1.2	<b>Each following link in the chain keeps track of the products</b>
<b>&gt;=90%</b>	Each point of transfer from one owner to the next owner must be traceable who is the supplier and who is the client and who is responsible for transport and storage

The principle of traceability is that each economic operator in the chain of custody is responsible for the data supplied in the product declarations submitted to the next economic operator.

### **3.2 IDENTIFICATION, TRACEABILITY AND VERIFICATION OF SUSTAINABILITY CHARACTERISTICS**

<b>Criteria</b>	<b>Indicator</b>
<b>3.2.1</b>	<b>Each consignment has a unique identification #</b>
<b>&gt;=90%</b>	What method and which system either administrative, physical or both is used for unique identification of the consignment.  Follow at least 10 samples of consignments in different stages of the process and trace back and forward asking the documents, records and or data entry of the consignments.  Due to continuous processing and tanks or warehouses continuously receiving inputs and being dispatched it is difficult to identify a consignment. In this specific situation it is required that the economic operator is keeping data about the day and time of the inputs and outputs. It is acceptable that the consignment # is the day + time for identification and traceability.
<b>3.2.2</b>	<b>Each consignment contains a specification with at a minimum the data specified in appendix 4</b>
<b>&gt;=90%</b>	Verify samples (as indicated above) of consignments and trace back and forward these specifications through the Choc together with the consignments.
<b>3.2.3</b>	<b>Consignments clearly specify the scope of compliance:</b>  <b>Non compliant</b>  <b>Bonsucro compliant</b>  <b>Bonsucro EU compliant</b>
<b>Bonsucro EU Major</b>	Cross check on the above samples if the scopes are specified on the documents, record, data and when applicable also physical;  In case of physical the scope storage tank might be indicated on the tank and on transports
<b>3.2.3</b>	<b>Data for Bonsucro EU compliance</b> <b>additional as requirement for Bonsucro EU in appendix 5</b> <b>E-Values for greenhouse gas</b> <b>el Values for carbon stock change</b>
<b>Bonsucro EU Major</b>	Addition data for greenhouse gas emissions and carbon stock changes <b>RE appendixes 1, 2, 3</b> Sample 10 combined with the above and cross check for verification

### 3.3 CONTROL OF MASS BALANCE SYSTEM

Criteria	Indicator
3.3.1	<b>The accounting system for the control of the mass balance is documented and mass balance records and data are maintained on a daily base and verifiable</b>
>= 90 % validated within 1 week	Verify together with the consignments as indicated in the above articles if data older than 1 week have been entered in the system and match with each other. Data within one week should be available, traceable and can be identified with consignment #
3.3.2	<b>Validation of data before official entering in the accounting system</b> <b>The management representative (as indicated in the management system requirements (RE: Bonsucro certification protocol)is responsible for validation</b>
>= 90 % validated within 1 week	Verify a set of data corresponding with the above consignment and see if the validated data match. Verify the validation procedure which includes an interview with the validator. Special attention on the prevention of fraud of the accounting system. The 4 eyes principle is applicable on validation which means that the validator and the person responsible for composing the data can not be the same person.
Bonsucro	
3.3.3	<b>Mass Balance “in time periods” shows over the time period the evidence that the balance of sustainable material is positive.</b> <b>The management representative is responsible for validation.</b>
Bonsucro EU Major	The accounting system requires data entries of all inputs, conversions, outputs of product. These data are collected on a daily base and there should not be any longer delay for entering these data than 1 week. Although data are entering continuously this doesn't mean that the mass balance can be produced on a continual base. There need to be planned intervals (balance intervals) where usually at the beginning and at the end of each period inventories are taken and all data in that period are entered, checked for completeness and validated. Before a period can be closed also all laboratory and validation results need to be delivered. This means that normally some time will be required to fully close a period. Given the fact that in the standard the maximum period for mass balance is one month, another month is allowed for producing the report. This is leading to the major requirement below:

	<p><b>Major</b> in case of absence of data or longer than 1 period (max month) no report of balance</p> <p><b>Major</b> in case of negative balance and no actions taken to correct within next period</p> <p>The auditor will check one period (e.g. 1 month) but also the month to date which is including the cummulation until the actual period of all periods of that harvest year (in case of mill) or accounting year (in case of economic operators after the mill). In case of negative balance of sustainable material in 1 period the economic operator is required to correct this in the next period and to identify this corection in the next and cumulative mass balance reports.</p>
3.3.4	<p><b>The mass balance is based on sugar or alcohol weight or volume calculation based on sampling and analysis by a qualified laboratory; using normative methods and results of measuring are validated by a qualified laboratory preferably (but not mandatory) holding a ISO IEC 17025 accreditation.</b></p> <p>(RE: to reference list ISO IEC 17025 for the accreditation of testing laboratory).</p> <p>Metering and weighing equipment in the operations or used by subcontractors for volume or weight input and output of the mass balance is required calibration with a minimum frequency of 1 x year preferably (but not mandatory) by a calibration and testing organization that is accredited for ISO IEC 17025. At least the equipment used for calibration may not be used for regular production and needs to be stored in a safe place. Methods and proof of verification and validation of results need to be recorded and need to be demonstrated to the auditor.</p>

### Note

It is acceptable to use other units of calculation of sugar content e.g.:

- Sucrose Content
- TSAI (Total Solids As invert)
- ART (Total Sugar Content expressed as Reduced Sugars)

For ethanol content it is also possible to make conversions e.g. in hydrous or anhydrous ethanol.

Units and methods of calculation used in the practice of production and trade need to be approved by the certification body. In general calculations and units can be accepted when traceable to raw material on the condition that the way of calculation and the ratio's used are made transparent and are documented and the applied method is are used in a consistent matter for the harvest year.

For calculation examples see appendix 1 of the Bonsucro Audit Guidelines for Production Standard.

<b>Bonsucro EU Major</b>	<p>Calculation of the amount of sugar in the balance:      Volume in liters x density (d20) x % of sugar = kg of sugar</p> <p>For the sugar producers that produce only sugar the figure is expressed in total sugar in direct relation with raw material sugar content and multiplied by the factory performance index expressed in % (RE: Bonsucro P&amp;C chapter 3)</p> <p>The ton of sugars can be related to MJ and calculated into GHG by using the values (or default values) for the amount of CO2 expressed in gCO2 eq/MJ (Choc appendixes 1.2.,.3)</p> <p><b>Major</b> In case of total failure to calibrate or unreliable, not verified and not validated testing methods .Evidence to be provided is the verification and validation of data by qualified staff or qualified subcontractors preferably (but not mandatory) holding an ISO 17025 accreditation.</p> <p><b>Minor:</b> Otherwise: too late &gt; 1 year or not complete</p>
<b>3.3.5</b>	<p><b>The total mass balance in the period is reliable within a tolerance of +/- 5% calculated over the total sugar and/or alcohol content input - output</b></p> <p>In case of losses or spillage this is counted for</p> <p>By products are also counted for as these may contain sugar and/or alcohol rests that require to be reported</p>
<b>&gt;= 90 % of mass balance within tolerance</b>	<p>Check the total balance and see if the management representative takes action in case of exceeding the +/- 5 % limit; before validating the mass balance; it may occur that bigger differences indicate some entries did not take place and can easily be corrected or indicate that losses of product where not notified.</p>

### 3.4 CONTROL OF CONSIGNMENTS

3.4.1	<p>Consignments have a unique # for identification; the # identifies the accounting year for the harvest, the unit of operation (farm, site etc.) and the # is generated by the accounting system in sequence of time when the consignment was first entered in the system.</p> <p>The # and the consignment can not be split or mixed with other consignments (see below mixing and splitting of consignments how to address these).</p> <p>From the consignment #, date and time the physical location of the consignment can be retrieved</p>
<b>Bonsucro EU Major</b>	<p>Verify if consignments entering or leaving the site are accounted for in the system and have received unique registration #.</p> <p>This also counts for consignments that are mixing or splitting.</p> <p>For special audit guidance see the chapters below.</p> <p><b>Major System</b> is not operational  <b>Minor &gt; =90% compliance</b></p>

### **3.5 CONTROL OF MIXES OF CONSIGNMENTS**

<b>3.5.1</b>	A new consignment # is generated for a mix; procedure is equal to the individual consignment
<b>&gt;=90%</b>	Look for examples of mixes and take samples and trace back to the individual consignments in the mix correctly
<b>3.5.2</b>	<b>The separate sizes and sustainability characteristics of each individual consignment remain assigned to the mixture</b>
<b>&gt;=90%</b>	Verify if the rules for counting the sustainability characteristic are forwarded to the mixture in proportions of the mixture and are applied correctly
<b>3.5.3</b>	Provides the sum of all consignments withdrawn from the mixture to be described having the same sustainability characteristics in the same quantities , as the sum of all consignments added to the mixture
<b>&gt;=90%</b>	Verify if the rules for counting the sustainability characteristic are forwarded to the mixture in proportions of the mixture and are applied correctly
<b>3.5.4</b>	<b>To avoid double counting: at the moment the individual assignments are assigned to the mixture they will automatically booked off from the previous # as “sold” to the new # of the mix</b>
<b>&gt;=90%</b>	Ask for the way this is organized in the accounting system and take samples for verification

### 3.6 CONTROL OF SPLITTING OF CONSIGNMENTS FROM MIXTURES

<b>3.6.1</b>	Any consignment split off from a mixture requires a new #; use procedure above for generating a new consignment.
<b>&gt;=90%</b>	Look for examples of splits and take samples and trace back to the previous mixture
<b>3.6.2</b>	The sustainability characteristics of the mixture consignment remain assigned to the consignments# that have been split off in proportion of the volume that has been split off.
<b>&gt;=90%</b>	Verify if the rules for counting the sustainability characteristic are forwarded from the mixture to the split of consignment in proportions of the volume have been applied correctly. <b>NO AVERAGING</b>
<b>3.6.3</b>	To avoid double counting: at the moment a new unique nr. Has been assigned to the to the split this will automatically be booked off from the previous # from the mix as “sold” to the new # of the split consignment.
<b>&gt;=90%</b>	Ask for the way this is organized in the accounting system and take samples for verification.

## APPENDIX 1: TERMS AND DEFINITIONS

Normative references for definitions referring to:

ISO 9000:2005; ISO 14001:2004; ISO IEC Guide 17000:2004; EU RED (2009/28/EC); EU FQD (2009/30/EC); CEN/TC383

**Accreditation:** Third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks  
(Source: Adapted from ISO/IEC 17000:2004)

**Accreditation body:** Authoritative body that performs accreditation

Note: The authority of an accreditation body is generally derived from government  
(Source: Adapted from ISO/IEC 17000:2004)

**Audit:** i.e. Conformity assessment, verification; demonstration that specified requirements relating to a product, process, system, person or body are fulfilled

Note 1 - the subject field of conformity assessment includes activities defined elsewhere in this standard, such as testing, inspection and certification, as well as the accreditation of conformity assessment bodies.

Note 2 - The expression “object of conformity assessment” or “object” is used in this standard to encompass any particular material, product, installation, process, system, person or body to which conformity assessment is applied.

(Source: Adapted from ISO/IEC 17000:2004)

**Auditor:** i.e. Assessor, Verifier; person that performs the audit (i.e. assessment, verification)

**Actual value:** The greenhouse gas emission saving for some or all of the steps of a specific biofuel production process; (Source: EU RED 2009/28/EC)

**Agricultural Worker Categories:** Summary of broad categories of agricultural workers. There is a lack of clear-cut distinctions between different categories of workers. Consequently, there are numerous types of labour relations and different forms of labour force participation. The different categories of workers also vary within each country and, in certain cases, a single farmer may be grouped in more than one category. Many smallholders supplement their income with wages earned by working in large commercial farms during harvesting periods. (Source: ILO)

**Aerothermal energy:** Energy stored in the form of heat in the ambient air (Source: EU RED 2009/28/EC)

**Biofuels:** Means liquid or gaseous fuel for transport produced from biomass (Source: EU RED 2009/28/EC)

**Biofuel production:** Transformation of biomass or of an intermediate product derived from biomass into a biofuel. (Source: CEN/TC383)

**Bioliquids:** Means liquid fuel for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass. (Source: EU RED 2009/28/EC)

**Biomass:** Means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste. (Source: EU RED 2009/28/EC)

**Biomass processing:** Transformation of biomass into an intermediate product (Source: CEN/TC383)

**Bonsucro certified members:** Bonsucro members who have been certified by Bonsucro approved Certification Bodies to be in compliance with the Bonsucro Certification System

**Cane supply area:** area which a mill defines as the farms/estates supplying cane for the purposes of certification.

**Certificate period:** 1-year period as part of the 3-year certification validity. Certificate period 1 runs from the issue date of certificate till the start date of the annual surveillance audit. Certificate period 2 runs from the start of the first annual surveillance audit till the start date of the second surveillance audit. Certificate period 3 runs from the start date of the second certificate period till the end date of the certification.

**Certification Body:** i.e. Conformity Assessment Body; Body that performs the audit  
Note 1 - An accreditation body is not a conformity assessment body (ISO/IEC 17000:2004) (Source: Adapted from ISO/IEC 17011:2005)

**Chain of custody (choc):** The supply chain of a product including all stages from the feedstock production up until the release of the product for consumption (RE: communication from the commission on voluntary schemes). (Source: EU RED 2009/28/EC)

**Chain of custody stage:** Changes of ownership or physical control of biomass, intermediate products, semi-finished products. (Source: CEN/TC383)

**Child:** Any person less than 15 years of age, unless local minimum age law stipulates a higher age for work or mandatory schooling, in which case the higher age would apply. If however, local minimum age law is set at 14 years of age in accordance with developing country exceptions under ILO convention 138, the lower age will apply. (Source: ILO)

The ILO Minimum Age Convention, No. 138 (1973) states that the minimum age of employment should not be less than the age of completion of compulsory schooling and, in any case, shall not be less than 15 years. However a Member country whose economy and educational facilities are insufficiently developed, may under certain conditions initially specify a minimum age of 14 years. (Source: ILO)

**Child labour:** Any work by a child younger than the age (s) specified in the above definition of a child, except as provided by ILO recommendation 146. (Source: ILO)

**Client:** Next legal owner of the product in the choc.

**Company:** The entirety of any organization or business entity responsible for implementing the standard. (Source: SA 8000)

**Conducting business with integrity:** Businesses should work against corruption in all its forms, including extortion and bribery. (Source: Principle 10 UN Global Compact)

**Consignment:** quantity (e.g. batch, lot, load) of product mass with unique identification # and attached data specifying the product content in terms of kg (or tons of sugar or litres (or m<sup>3</sup>) of ethanol, the sustainability characteristics and greenhouse gas emission values assigned to that quantity in terms of EU RED annex V

**Default value:** Means a value derived from a typical value by the application of pre-determined factors and that may, in circumstances specified in this Directive, be used in place of an actual value. (Source: EU RED 2009/28/EC)

#### **Discrimination**

1. The term **discrimination** includes—(Art 1 C111)

(a) any distinction, exclusion or preference made on the basis of race, colour, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation;

(b) such other distinction, exclusion or preference which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation as may be determined by the Member concerned after consultation with representative employers' and workers' organisations, where such exist, and with other appropriate bodies.

2. Any distinction, exclusion or preference in respect of a particular job based on the inherent requirements thereof shall not be deemed to be discrimination.

3. For the purpose of this Convention the terms **employment** and **occupation** include access to vocational training, access to employment and to particular occupations, and terms and conditions of employment. (Source: ILO Convention C111)

**District heating or district cooling:** Means the distribution of thermal energy in the form of steam, hot water or chilled liquids, from a central source of production through a network to multiple buildings or sites, for the use of space or process heating or cooling. (Source: EU RED 2009/28/EC)

#### **Document:** Information and its supporting medium

Note 1 - The medium can be paper, magnetic, electronic or optical computer disk, photograph or master sample, or a combination thereof;

Note 2 - Adapted from ISO 9001:2000; ISO 14001:2004

**Economic operator:** Legal owner; Individual or organisation which has ownership or physical control of sugarcane and/or all sugarcane derived products, from their origin to their market availability, for one or several steps in the chain of custody.

Note 1 - Organization is being used here as defined in ISO 14001

**Energy from renewable sources:** Means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases. (Source: EU RED 2009/28/EC)

**EU legislative requirements:** referring to both EU RED and EU FQD requirements.

**Forced or compulsory labour:** This shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily. (Source: ILO Convention C29)

**Most common forms of forced or compulsory labour:**

Forced labour can take many forms - some imposed by the State, but the majority in the private economy.....Forced labour can be an outcome of trafficking in persons and irregular migration... Mechanisms of force applied include debt bondage, slavery, misuse of customary practices and deceptive recruitment systems. Some of the most common forms of forced labour include (for a full list see ILO Handbook)

Combating forced labour: A handbook for employers and business, booklet 2

**Debt-induced forced labour:**

Commonly referred to as “bonded labour” in south Asia, where the practice is most common, but also known as “debt bondage”. ... Debt bondage arises when a person mortgages his or her services or those of his family members to someone providing credit in order to repay the loan or advance.

**Forced labour as an outcome of human trafficking:**

Trafficking in persons, or human trafficking, is often linked to forced labour. It is fuelled by organised criminal networks or individuals and can involve deceptive recruitment, racketeering and blackmailing for the purpose of labour exploitation.

**Forced labour linked to exploitation in labour contract systems:**

This can be found almost everywhere in the world today. For example, migrant workers can find themselves “bonded” to a labour contractor because excessive fees have been charged and with limited if any possibility to change the employer once they arrive in the destination country.

**Geothermal energy:** Energy stored in the form of heat beneath the surface of solid earth. (Source: EU RED 2009/28/EC)

**Greenhouse gas / GHG:** Gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. (Source: CEN/TC383)

Note - GHGs include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydro-fluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>).

**Greenhouse gas emission** Mass of a GHG released to the atmosphere over a specified period of time. (Source: Adapted from ISO 14064-1:2006)

**Gross final consumption of energy:** Means the energy commodities delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry and fisheries, including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat indistribution and transmission. (Source: EU RED 2009/28/EC)

**Guarantee of origin:** Means an electronic document which has the sole function of providing proof to a final customer that a given share or quantity of energy was produced from renewable sources as required by Article 3(6) of Directive 2003/54/EC. (Source: EU RED 2009/28/EC)

**Hazardous child labour:** Hazardous child labour is defined by Article 3 (d) of the ILO Convention concerning the Prohibition and Immediate Action for the elimination of the worst forms of child labour, 1999 (182) 3D work which, by its nature or its circumstances in which it is carried out is likely to harm the health, safety or morals of children. (Source: ILO)

**High Conservation Value (HCV):** High Conservation Value (HCV) areas are defined as natural habitats where conservation/ biodiversity values are considered to be of outstanding significance or critical importance based on factors such as the presence of rare or endemic species, sacred sites, or resources harvested by local residents (see [www.hcvnetwork.org](http://www.hcvnetwork.org)). For implementation of the Bonsucro standard each country is required to provide a country specific and official interpretation of High Conservation Value which will be used for audits in that country. A cut off date of 1 January 2008 will apply.

The six High Conservation Values (HCVs):

HCV 1 Areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia).

HCV 2 Areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

HCV 3 Areas that are in or contain rare, threatened or endangered ecosystems.

HCV 4 Areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).

HCV 5 Areas fundamental to meeting basic needs of local communities (e.g. subsistence, health).

HCV 6 Areas critical to local communities' traditional cultural identity (e.g. areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

**Hydrothermal energy:** Means energy stored in the form of heat in surface water. (Source: EU RED 2009/28/EC)

**Intermediate product:** Output from a unit process that is an input to other unit processes involving further transformation within the system. (Source: CEN/TC383)

**Mass balance system:** System which (where each economic operator within an EU member state or country) keeps track of the amount of sustainable biomass, biofuel or bioliquid it sources and the amount of sustainable biomass, biofuel or bioliquid it delivers and in which sustainability characteristics remain assigned to consignments. (Source: CEN/TC383)

**Organization:** Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.

**Phosphate equivalent as a measure of eutrophication:** Since phosphorus and nitrogen differ in their eutrophication effects, a phosphate equivalent conversion is used based on potency factors of 3.06 for phosphorus and 0.42 for nitrogen. Using 120 kg N /ha/y and 20 kg P /ha/y, the figure would be  $(120 \times 0.42) + (20 \times 3.06) = 112$  kg phosphate/ha/y. (Source: IChemE (2002). Sustainable development progress metrics. Inst. Chem. Engrs. London.)

**Product declaration** Document passed on to the next economic operator in the chain of custody specifying properties, sustainability characteristics and GHG emission data of a defined consignment. (Source: CEN/TC383)

**Occupational accident:** an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death. Included in occupational accidents are travels, transport or road traffic accidents in which workers are injured and which arise out of or in the course of work, i.e. while engaged in an economic activity, or at work, or carrying on the business of the employer.

**Occupational injury:** any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity. ILO Resolution/Convention 155 on statistics of occupational injuries (resulting from occupational accidents), adopted by the Sixteenth International Conference of Labour Statisticians, (Oct.1998)

**Occupational disease:** A disease contracted as a result of an exposure to risk factors arising from work activity. (Source: ILO)

**Renewable energy obligation:** Means a national support scheme requiring energy producers to include a given proportion of energy from renewable sources in their production, requiring energy suppliers to include a given proportion of energy from renewable sources in their supply, or requiring energy consumers to include a given proportion of energy from renewable sources in their consumption. This includes schemes under which such requirements may be fulfilled by using green certificates. (Source: EU RED 2009/28/EC)

**Record:** Document stating results achieved or providing evidence of activities performed

**Reporting period:** This will be one year unless otherwise agreed. The period should include a single complete milling season.

**Support scheme:** Means any instrument, scheme or mechanism applied by a Member State or a group of Member States, that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased. This includes, but is not restricted to, investment aid, tax exemptions or reductions, tax refunds, renewable energy obligation support schemes including those using green certificates, and direct price support schemes including feed-in tariffs and premium payments. (Source: EU RED 2009/28/EC)

**Typical value:** Means an estimate of the representative greenhouse gas emission saving for a particular biofuel production pathway. (Source: EU RED 2009/28/EC)

**Theoretical recovery of sugar:** The theoretical OR (Overall Recovery) normalized for juice purity and cane fibre content is calculated as:

$$OR=E*BHR=0,98*(100-((20*WFC)/(100-WFC)))*(1,5-(50/PJ))$$

where *wFC* is the fibre content of the cane in g/100 g and *PJ* the purity of the raw juice. In addition, refining all white sugar in a white end refinery is expected to

increase the undetermined loss by 0.4 % of the sugar in raw juice. Then the factor 0.98 becomes 0.976.

**Traceability:** The ability of each economic operator in the chain of custody to trace back the product or raw material 1 step back to the supplier and one step forward to the client.

**Third-party conformity assessment activity:** Conformity assessment activity that is performed by a person or body that is independent of the person or organization that provides the object, and or user interests in that object. Adapted from ISO/IEC 17000:2004

**Raw material:** Primary or secondary material that is used to produce a product. (Source: Adapted from ISO 14040:2006)

Note - Secondary material includes recycled material.

**Significantly affected:** A significant impact would be apparent if the operations of sugarcane farms or mills resulted in changes to the environment that resulted in (1) the quality and / or quantity of habitat supporting an endangered or threatened species being affected to the extent that the numbers and viability of the species (the classification from the IUCN red list) was adversely affected; (2) conversion, diminution or degradation of the integrity of an endangered habitat such that there was a measurable adverse impact on its ecological status in the opinion of a competent ecologist (3) ecosystem service (such as water supply) being sufficiently changed as to cause material adverse impacts to local communities or ecosystems (for example, flows contain additional nutrients that change downstream ecology or affect the availability of drinking water for downstream communities)

**Sugarcane yield:** Irrigated - 85; Supplementary 65; Rainfed 45 (total yield per year/total ha cut/weighted average age at harvest) for each category of water regime. Value for reporting period or 5 year rolling average can be used. Seedcane production (yields and area) should be excluded and non cane areas and roads and contours should be excluded from area harvested. (Supplementary = areas where irrigation is necessary to guarantee continuous sugarcane production).

**Supplier/contractor** A business entity which provides the company with goods and/or services integral to, and utilized in/for, the production of the company's goods and/or services. (Source: SA 8000)

**Supplier:** Previous legal owner of the product in the choc

**Subcontractor/sub-supplier:** A business entity in the supply chain which, directly or indirectly, provides the suppliers with goods and/or services integral to, and utilized in/for, the production of the supplier's and/or company's goods and/or services. (Source: SA 8000)

**Subcontractor:** Not the legal owner of the product that is providing a service e.g. harvesting, transport, manufacturing, storage. The subcontractor is operating under full responsibility of the legal owner.

**Sustainability criteria:** States or properties as a means of judging whether or not a sustainability principle has been fulfilled. (Source: CEN/TC383)

**Young worker:** Any worker over the age of a child as defined above and under the age of 18. (Source: ILO)

**Worst forms of child labour:** Whilst child labour takes many different forms, a priority is to eliminate without delay the worst forms of child labour as defined by Article 3 of ILO Convention 182. (Source: ILO)

<b>Symbols and Abbreviations</b>	BOD biological oxygen demand ChoC Chain of Custody COD chemical oxygen demand EMP environmental management plan ESIA environmental and social impact assessment g grams GHG greenhouse gas ha hectares HCV high conservation value kg kilograms kJ kilojoules kWh kilowatt hours L litres MJ megajoules RS reducing (invert) sugars t metric tonnes tc tonnes cane TSAI total sugars expressed as invert y year
----------------------------------	---

**The information below has been taken from EU RED annex V C: Methodology**  
Greenhouse gas emissions from the production and use of transport fuels, biofuels and bioliquids shall be calculated as:

E = eec + el + ep + etd + eu - esca - eccs - eccr - eee,  
where

E = total emissions from the use of the fuel;

eec = emissions from the extraction or cultivation of raw materials;

el = annualised emissions from carbon stock changes caused by land-use change;

ep = emissions from processing;

etd = emissions from transport and distribution;

eu = emissions from the fuel in use;

esca = emission saving from soil carbon accumulation via improved agricultural management;

eccs = emission saving from carbon capture and geological storage;

eccr = emission saving from carbon capture and replacement; and

eee = emission saving from excess electricity from cogeneration.

Emissions from the manufacture of machinery and equipment shall not be taken into account.

SAVING = (EF - EB)/EF where EB = total emissions from the biofuel or bioliquid; and EF = total emission from the fossil fuel comparator

$$el = (CSR - CSA) \times 3,664 \times 1/20 \times 1/P \quad (1)$$

(1) the quotient obtained by dividing the molecular weight of CO<sub>2</sub> (44,010 g/mol) by the molecular weight of carbon (12,011 g/mol) is equal to 3,664

CSR = carbon stock associated with the reference land use (measured as mass of carbon per unit area, including both soil and vegetation). The reference land use shall be the land in use in January 2008 or 20 years before the raw material was obtained, whichever was later.

CSA = the carbon stock per unit area associated with the actual land use (measured as mass of carbon per unit area, including both soil and vegetation). In cases where the carbon stock accumulates over more than one year, the value attributed to CSA shall be estimated stock per unit area after 20 years or when the crop reaches maturity, whichever the earlier.

P = the productivity of crop (measured as biofuel or bioliquid energy per unit area per year).