

# Review of Bonsucro Production Standard GHG Emission Indicators

## Final review report

September 2020

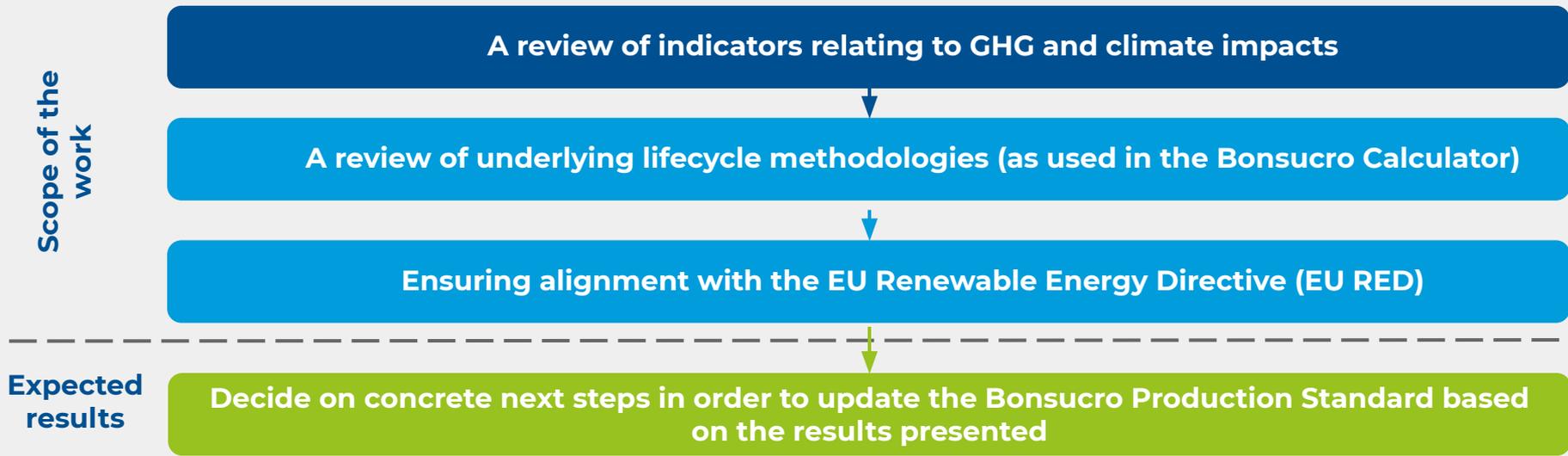
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# Scope and objectives of the project

Bonsucro is a not-for-profit organisation setting the standards for sustainable sugarcane production. The Bonsucro Production Standard, used to certify sustainable sugar and sustainable bioethanol from sugarcane, is currently undergoing revision. As part of this process, Bonsucro is looking for technical support for the revision of the indicators relating to GHG emissions and the underlying life cycle assessment (LCA) methodology.



# Benchmark analysis on GHG accounting requirements and criteria

# Benchmark analysis on GHG accounting

## Key Findings 1/2

Standard	Version	GHG inventory requirements	GHG indicators & thresholds	GHG reduction plan	GHG sequestration / removals	d&i LUC emissions	GHG tool
	2018	High	Medium	Medium	Medium	Medium	
	2016	High	High	Low - Medium	Low	Medium - High	
	2017	Low	Low	Medium	Medium	Low	
	2017	Low	Low	Low	Medium	Low	
	2018	Medium	Low	Low - Medium	Low	Low	
	2015	Low - Medium	Low	Low	Low	Low	
	2015	Low	Low	Low	Low	Low	

**Note:** ProTerra, RTRS, and Rainforest Alliance are currently developing their GHG accounting & reporting requirements and their rating will improve in the coming year

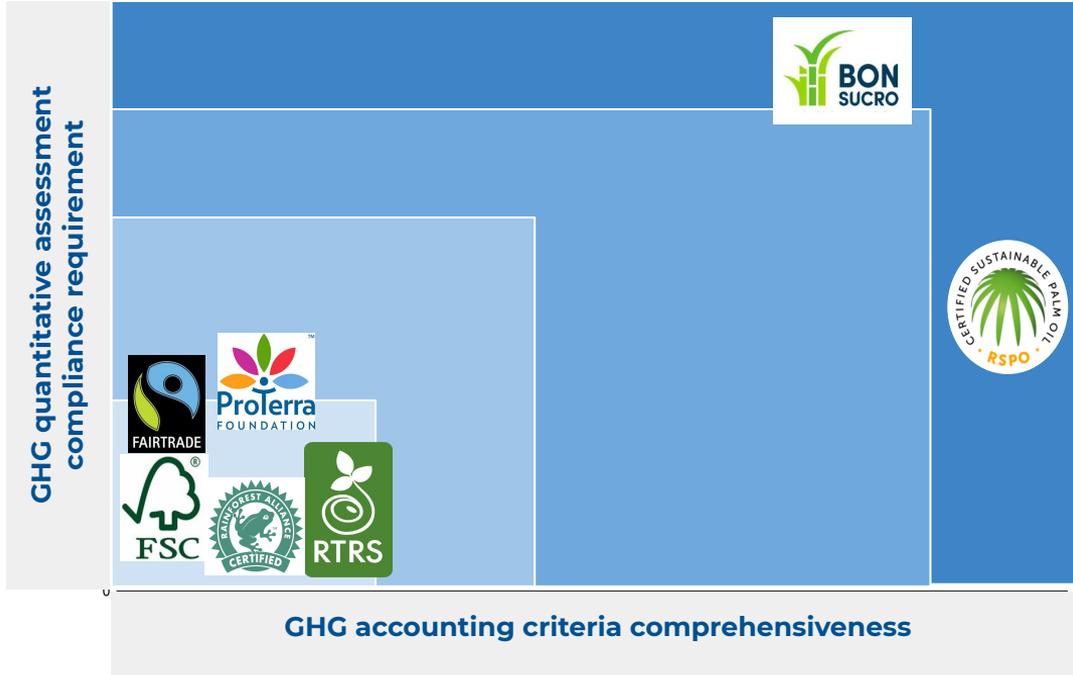
 **Established**  
 **In-progress**

**GHG inventory requirements:** inclusion of specific criteria that require the operators to develop a GHG emissions inventory at production and processing levels  
**GHG indicators & thresholds:** definition of specific GHG indicators per production unit and efficiency standard used as a certification threshold  
**GHG reduction plan:** inclusion of criteria for the definition of a reduction plan related to energy use, production interventions and carbon sequestration opportunities  
**Carbon sequestration/removals:** inclusion of requirements to promote the implementation and monitoring of carbon sequestration interventions on-farm  
**d&i LUC emissions:** inclusion of criteria and requirements for the calculation of d&i LUC emissions

**Note:** the rating given is an "average" rating of the standard based on a high level analysis with the aim to provide an indicative measure of performance rather than a "scientific rating". **High:** full coverage of the topic within the P&C of the standard, with specific ad hoc criteria. **Medium:** coverage of the topic within the P&C, but not specific criteria and details provided. **Low:** topic not covered, or covered very loosely.

# Benchmark analysis on GHG accounting

## Key findings 2/2



### X axis: GHG accounting criteria comprehensiveness

- GHGs inventory
- GHGs indicators/thresholds
- GHGs commitment and reduction plans
- Intervention accounting
- GHGs emissions calculation tool

### Y axis: GHG quantitative assessment compliance requirement

- **High:** Criterion must be met in order for the certification to be awarded
- **Medium:** Criterion must be met under particular conditions; implemented in a specified time frame beyond the year of the audit
- **Low:** Criterion is not existing, or is optional/voluntary, or is recommended but with no evidence required for action nor time implementation deadline

# Benchmark analysis on GHG accounting

## GHG emission reduction plans



The key environmental issues are covered by an appropriate and implemented environmental impact and management plan (EIMP), including GHG emissions and energy consumption.

The EIMP addresses key environmental issues: biodiversity, ecosystem services, soil, water, air, climate change, use of crop protection chemicals, use of artificial fertilisers, cane burning and noise.



RSPO requires the producers to **implement and monitor plans to reduce or minimise GHGs through the Palm GHG calculator** and report them publicly. The plans cover both production and development of new areas.



Adopt practices to minimise the use of energy from non-renewable sources and to derive an increasing proportion of their energy from renewable sources and **develop a programme to reduce or compensate emissions.**

Farm management sets a **GHG reduction strategy and compensates for its GHG emissions.**



Action plan to **reduce emissions and increase sequestration of GHGs on the farm.**

Opportunities for increasing carbon sequestration through the restoration of native vegetation, forest plantation and other means are identified and implemented.

### Recommendation

- **Integrate specific requirements and indicators for GHG reduction strategy and implementation plan into the Bonsucro Production Standard.** The calculations to define the targets and commitments based on the efficiency standard can be aligned with national and international initiatives such as SBTi. The monitoring of the targets shall be integrated in the Bonsucro's GHG tool. This will help producers have a better understanding of the development of GHG emissions, and be more accurate in defining management and mitigation plans.

# Benchmark analysis on GHG accounting

## Intervention accounting (Removals)



The standard requires the members to estimate the emissions from agriculture activities. The result is also used in the calculation of the total emissions field-to-gate.

Examples: % ground cover of tops or leaves after harvest to ensure the continuous improvement of soil organic carbon; soil surface mechanically tilled per year (% of area under cane)



RSPO defines the plantation's GHG accounting boundaries as follows:

Plantation: emissions from land use, fertilisers and organic matter, use of fuels, cultivation in peat as well as **sequestration and carbon capture by plantation and areas dedicated to conservation.**



The standard requires that soil organic matter is monitored to quantify change in soil carbon and steps are taken to improve it or to mitigate negative trends.

Producers are required to implement and promote conservation activities in, out or around the farm. Opportunities for **increasing carbon sequestration through the restoration of native vegetation, forest plantation and other means are identified and implemented.**

### Recommendation

- **Include both in the Standard and in the GHG tool ad hoc criteria to account for carbon removals activities both on the productive land and conservation areas within and surrounding the farm.** In the Bonsucro Production Standard, there is no direct requirement that encourages producers to implement and keep track of interventions that aim to increase carbon removal and soil carbon sequestration neither on farm land or on conservation areas within the farming unit.

# Benchmark analysis on GHG accounting

## GHGs emissions tool - Tool's features and outputs



Bonsucro is one of the few standards that has developed its own tool to measure GHGs from production, processing, and transportation.

The tool is also compliant with the more stringent requirement from the EU RED.

Main output of the tool:

- GHG emission calculation
- Carbon stock estimation



The PalmGHG Calculator allows palm oil growers to estimate and monitor their net greenhouse gas emissions. The calculator also enables the identification of crucial areas in the production chain and therefore guide emission reduction opportunities.

The GHG assessment procedure is a useful tool to assist growers in achieving low carbon new palm oil development. The procedure includes land cover analysis and mapping, soil mapping, carbon stock estimation, **carbon stock maps, integrated maps, scenario setting, GHG emission calculation, selection of optimum scenarios, and management and mitigation plans.**



RTRS allows producers to use the BioGrace tool to comply with the RTRS EU RED requirements. However, RTRS will develop a calculator that will include key GHG outputs, such as GHG emission calculation, carbon stock estimation, carbon stock maps, and integrated maps.

### Recommendation

- **Upgrade Bonsucro's GHG tool with forward-looking features will empower the producers even more to create accurate GHG emission evaluations and reduction strategies.**
- **Add scenario analysis to the calculator.** Operators can understand what type of interventions could be beneficial to reduce the GHG footprint and achieve a lower efficiency standard or to prevent the increase of GHG emissions due to mismanagement of some areas both on-farm and outside the farm borders.

# Scope and boundaries

## Scope of certification



The certification unit is the mill and its cane supplying area and includes all relevant activities on the farms.

However, producers have the choice to select the plot of land to be certified, which can be used to not declare the full extent of the deforestation happening at a farm level.



The RSPO P&C apply to existing plantings, as well as planning, siting, development, expansion and new plantings.  
Farm (**production and conservation areas**) and mill (including kernel crushing plant).



Farm (**production area, fallow land and natural ecosystem**) and farm infrastructure (roads, administrative infrastructures, collection points, processing and packing units, storage facilities and worker housings).



Farm and its limits (**including on-farm conservation areas, i.e native vegetation and wildlife**).

### Recommendation

- **Align with the other standards and include in the scope of the certification not only the productive area, but also the farming system's fallow land, natural ecosystem, and conservation areas.** (more details in the report)

# Land management requirements

## Different approaches across the standards



Bonsucro stipulates conservation value (HCV) assessments and ban conversion of HCV areas. However, HCV areas for Bonsucro allow for limited legal exploitation if the conservation value is maintained.

The HCS Approach is required of the producers only if they aim to be EU RED compliant.



Zero net deforestation guaranteed through the HCV approach. The 2018 RSPO P&C includes new requirements to ensure the effective contribution of RSPO to halting deforestation. This will be achieved by incorporating the **High Carbon Stock Approach (HCSA) Toolkit in the revised standard.**



Under both RTRS and Proterra, legal and illegal deforestation is not allowed. For certification under these standards, high above-ground carbon stock cannot have been cleared.

### Recommendation

- **Align Bonsucro Production Standard with best practices by incorporating the HCS Approach as a core element of the standard and not only as an additional element of the voluntary modules to comply with EU RED.**

# Carbon footprint method review



# Key findings

South Pole's review showed that Bonsucro Production Standard's GHG indicator and accounting approach is one of the most advanced in comparison to other standards, together with RSPO. The standard gives a fairly good picture of the performance of certified members at farm and mill level by addressing the important elements in its scope definition.

However, the review identified some gaps and areas of improvement across the methodology as well as the possibility to better integrate the GHG accounting results (i.e. threshold values) into the standard as a driver of performance and reduction of environmental impact.

## Key areas of improvement

- **Scope of the certification:** the current scope of the certification is at plot level which does not prevent LUC somewhere else on the same farm. **We recommend changing the scope of accounting to the entire farm system, at least for LUC.**
- **GHG emission scope:** a rough estimate of emissions generated by aerial spraying and transport of workers show a potential significant impact to be included in the scope of the certification. **We recommend including aerial spraying (direct operations) and transportation of workers (potentially).**
- **Emissions factors:** the EFs are not based on LCA principles. They come from different sources and only account for direct emissions. **We recommend switching to the use of ecoinvent for all EFs.**
- **dLUC:** the emissions factors for forest conversion included in the tool are outdated. **We recommend using FAO data, which provide the best up to date estimates data sources to estimate the emissions of land use change.**
- **GHG emissions threshold:** the current threshold is relatively high (compared to average impact of Bonsucro members and ecoinvent emission factors for sugarcane) and only partially excludes deforestation. **We recommend lowering the threshold accordingly to boost Bonsucro's members performance**
- **Ethanol vs. sugar allocation:** The current allocation is based on energy content, but does not reflect the market reality well. **We recommend applying a dynamic allocation based on co-products economic value.**
- **EU-RED alignment:** we recommend updating the standard guidance with the latest EU RED guidance

# Full list of topics covered in the review process

**20 individual comments and recommendations were made across the different topics.** Note that the full extended list is available in the Excel file attached to this document.



**Emissions factors** (*electricity, energy, inputs*)



**Direct fields emissions** (*N2O and SOC*)



**Electricity generation system expansion** (*electricity mix*)



**GHG emission scope** (*transport of employees and aerial spraying*)



**Scope of certification** (*production area/conservation areas*)



**GHG thresholds values**



**Allocations** (*co-products*)



**LUC** (*default emissions factors and iLUC*)



**Biogenic carbon**



**Interventions benefits** (*reduction/sequestration of GHG emissions*)



**EU RED** (*alignment with the new Directive 2018/2001*)

# Output prioritisation

## Methodology

We reviewed our comments and recommendations in term of:

- overall criticality/impact on the footprint (**red**=high impact on the footprint)
- Difficulty of implementation for Bonsucro (**red**=difficult, e.g data collection, recalculation, etc.)
- Members acceptance (some elements will require more effort from the members and/or will lead to stricter requirements)
- Difficulty of implementation for the members (e.g. complex data collection)
- Stakeholders acceptance (mostly linked to the acceptance of the approach in the LCA/Carbon footprint field)

Topic	Category	Criticality of update/impact on the footprint	Difficulty of implementation (Bonsucro)	Members potential acceptance	Difficulty of implementation by the members	Stakeholders acceptance
LUC	Direct deforestation	🔴	🔴	🟢	🟢	🟢
Rules	Scope	🔴	🟢	🟡	🔴	🟢
Emissions factors	Electricity	🔴	🟢	🟢	🟢	🟢
Emissions factors	Input	🔴	🟢	🟢	🟢	🟢
Scope	Transport of workers	🔴	🟡	🟡	🟡	🟢
EU RED	EU RED	🔴	🟢	🟢	🟢	🟢
Thresholds values	Thresholds values	🔴	🟢	🔴	🟡	🟢
Land use management	HCS consideration	🔴	🟢	🟡	🔴	🟢
Direct emissions	N fertiliser	🔴	🔴	🟡	🔴	🟡
SOC	Soils carbon emissions	🟡	🔴	🔴	🟡	🟡
Scenarios	Dynamic modeling / SBTi	🟡	🔴	🟢	🟡	🟢
iLUC	Indirect deforestation	🟡	🔴	🔴	🟢	🟡
Allocation factors	Co-products (su+eth)	🟡	🟢	🟡	🟢	🟢
Interventions - Benefits	Agroforestry, SOC, riparian corridors	🟡	🔴	🟢	🔴	🟢
Emissions factors	Energy use	🟡	🟢	🟢	🟢	🟢
Scope	Aerial application of pesticides	🟡	🟡	🟡	🟡	🟢
Biogenic carbon	Biogenic carbon	🟢	🟢	🟢	🟢	🟢
System extension	Energy production	🟢	🟡	🟢	🟢	🟢

**Red**= critical, difficult or acceptance low (qualitative scale)

**Green**= not critical, not difficult or acceptance high (qualitative scale)

# High-priority modification to be implemented

## Topic

## Recommendation\*



**Scope of certification** (*production area/conservation areas*)



Consider the entire farm for the scope of certification, specifically for LUC and fertilisers use.



**GHG emission scope**  
(*transport of employees and aerial spraying*)



Include aerial spraying (direct operations) and transportation of workers (potentially)



**Emissions factors** (*electricity, energy, inputs*)



Update EFS withecoinvent database 3.6



**GHG thresholds values**



Adjust the threshold according to methodology changes and potentially to new performance targets



**LUC**  
(*default emissions factors*)



Update direct LUC factors by either the EU commission factors (available later in 2020) or FAO custom factors



**Allocations**  
(*co-products*)



Replace energy allocation by an economic allocation more in line with the financial drivers of production of sugar/ethanol



**EU RED** (*alignment with the new Directive 2018/2001*)



Update the standard guidance with the latest EU RED guidance

\* more details for each of the recommendation can be found in the report below

# Scope of certification

## Plot vs. farm vs. supply chain

It is currently possible for the standard members to "pick and choose" the plots of farm they want to certify. This approach doesn't lead to full accountability of land use and changes emissions that could be occurring on the same farm, but in a different plot. **The current approach is not in line with best practices and it might lead to potential reputational risk for Bonsucro Production Standard.**

**South Pole recommends evaluating the land use change emissions at the farm level, not the plot level.** If possible, South Pole recommends that **the entire farm be under certification** (ownership and suppliers) to avoid loopholes.

If Bonsucro would like to adjust the standard to take these aspects into consideration, South Pole suggests the following prioritisation:

1. With the current set of criteria, clearly communicate and acknowledge the fact that the certification is currently only at the plot (and not farm) level, and that it only covers direct operations (and not suppliers).
2. Start collecting information from suppliers (not as detailed as for operations).
3. Embed LUC information in the GHG calculation tool.
4. Embed LUC information in the certification criteria. Include a strict criteria to cover average conditions at farm level, including all plots (e.g. deforestation from another plant non certified needs to be allocated partly to the certified plot) and a softer criteria to start with on suppliers (mostly around deforestation, yield and fertilisers).

# GHG emissions scope

## Transport employees and aerial spraying

### Workers transportation

- A rough estimate of the emissions for the transportation of workers over 40km (including the return, i.e. 20km one way), using regular buses and assuming the labour requirement of 70 labour-day/ha showed that **the emissions per tonne of cane could be significant: almost 4 kgCO<sub>2</sub>/t cane (assuming 40t/ha yield).**
- The transport of workers is addressed through the Scope 3 GHG indicators. **It is common practice for this to be embedded into corporate GHG accounting of companies based on GHG Protocol categories.** Given that it can represent an important contribution to GHG emissions and provides a potential impact reduction opportunity, we recommend to include it. **It would require either the volume of fuels used for the transportation or the number of employees, mode of transportation, and distance.** The latter set of information is generally easy to obtain from contractors.
- The implication is however tricky for developing countries that still rely heavily on labour to harvest sugarcane, as their impact will most likely be higher.
- **We therefore recommend embedding the transport of field workers and other employees in the scope of the standard, given its significance.**

### Aerial spraying

- A rough estimate of the emissions per tonne of cane of aerial spraying shows that the **potential impact is 1kgCO<sub>2</sub>-eq/t cane**, which is significant enough to be explored further.
- **We therefore recommend to collect data from the members to identify the relevance of this activity to integrate it into the carbon footprint calculation.**

# Emissions factors review summary

- **Emissions factors are overall underestimated**, which might come from the fact that:

1. the source of the data is not based on LCA principles (only direct emissions are considered);
2. they are outdated; or
3. for electricity mixes, they are considering production mix instead of distribution or market mixes.

- **We recommend using the latest version of ecoinvent 3.6 or equivalent LCI database to update emissions factors for the electricity mixes** (low voltage distribution and/or market should be used in ecoinvent).

- The added-value of ecoinvent is that it provides a lot more granularity, geographical coverage and processes details than other databases. It is also fully transparent and documented.

Process	EF difference with ecoinvent
Gasoline	3%
Diesel	-27%
Fuel Oil	4%
Natural Gas	1%
Coal	-30%

Process	EF difference with ecoinvent
Nitrogen (elemental)	-66%
Potash (K2O)	-6%
Phosphate (P2O5)	-67%
Lime (CaCO3)	59%
Herbicide	145%
Insecticide	185%

Process	EF difference with ecoinvent
Argentina	-39.8%
Australia	-12.4%
Brazil	-49.5%
Brazil - NE grid	-80.0%
Brazil - N grid	-56.9%
Brazil - SE grid	-65.4%
Brazil - S grid	-43.8%
Canada	-6.5%
China	-25.8%
Finland	26.6%
France	-1.9%
Germany	-19.8%
India	-46.1%
India - NE grid	-4.2%
India - N grid	-31.9%
India - SE grid	-32.7%
India - W grid	-41.1%
Indonesia	-29.9%
Ireland	13.2%
Malaysia	-42.4%
Mozambique	-99.4%
Netherlands	-23.3%
Pakistan	-30.9%
Philippines	-40.2%
Poland	-33.4%
Portugal	6.8%
South Africa	-22.5%
Spain	17.8%
Sweden	-0.2%
Russia	-55.8%
Ukraine	-46.5%
United Kingdom	22.8%
United States	-1.4%

# Role of thresholds and impact performance of Bonsucro certified members

**47% of certified organisations indicated land use change**, which lead to  $\frac{2}{3}$  of the Bonsucro certification GHG emissions. (Bonsucro Outcome Report 2019)

Share of GHG emissions (farm level) with land use change (2013-2018)

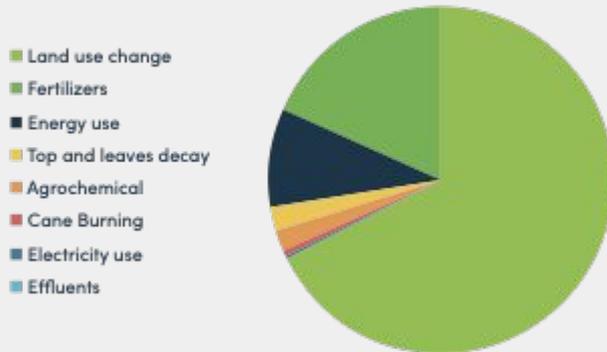


Figure 19. Composition of GHG emissions (farm level) (n: 378)

- **Given the possibility to select the plot of land to be certified**, which can be used to not declare the full extent of the deforestation happening at a farm level, **the current standard does not manage to prevent full deforestation and land use change.**
- Additionally, Bonsucro certified farms are 15% more likely to reduce their impact once they obtain their certification than otherwise (*Outcome Report 2019, Bonsucro*). The driver for this reduced impact is not clearly stated by Bonsucro and it is probably not solely driven by the certification/GHG requirements.
- **The definition of an effective threshold can guarantee the standard to drive continuous improvement and impact reduction.** (*See next slide on the role of thresholds*)

# Thresholds value choice

- The current threshold is very high\* (compared to the average impact of Bonsucro members and ecoinvent emission factors for sugarcane) and it does not represent a compliance high barrier for any farm that does not have too much deforestation. This threshold does not fully guarantee the implementation of achievable best practices by any farm, certified or not.
- **We recommend Bonsucro redefine the threshold to an overall lower value**, that could be differentiated between smallholders and bigger plantations to:
  1. exclude deforestation from the practices entirely (and adjust the threshold accordingly);
  2. drive continuous improvements from members and to adopt best practices. This can be done by annually reviewing the carbon footprint of the members of Bonsucro and adjusting the baseline to the a 50th or 75th percentile of the average value.

**Depending on the choice of Bonsucro to update the standard with our or other recommendations, we suggest to estimate the potential impact of methodology changes on the thresholds values and adjust them in consequence.**

\* Based on Bonsucro's 2018 and 2019 impact report, which states an average impact of sugarcane in the **range of 24 kgCO<sub>2</sub>/t** if we discard land use change. Additionally, the value was compared to the average emission factors from ecoinvent for sugarcane which are much lower than the threshold of Bonsucro.

# Land use management and requirements in Bonsucro standard

To actively manage deforestation issues, the Bonsucro Standard currently requires the operators to use a conservation value (HCV) assessment and ban the conversion of HCV areas. Based on the best practices identified across other standards and international frameworks, we think that there are additional principles and criteria that are required to ensure Bonsucro's operators implement best practices in land management and in particular, reduce deforestation/LUC.

We would recommend the following 4 criterias:

- 1 Legal compliance and certification cut-off date:** compliance with national and local laws. The standard can go beyond the national laws and in such cases the standard shall prevail
- 2 No conversion of HCV areas:** prevent the use of legally protected areas or of critical biodiversity (including HCV categories 1-6) for the cultivation of sugarcane
- 3 No conversion of HCS areas:** in addition to HCV, HCS forests are required to be conserved by the standard
- 4 iLUC:** no deforestation, even legal and outside HCV/HCS areas, carried out if iLUC driven by sugarcane in the region is above a specific threshold, which could be the one of EU RED.

	Bonsucro	Bonsucro EU-RED
1		
2		
3		
4		

It is recommended to integrate into the Bonsucro Production Standard the same additional requirement around no conversion of HCS and iLUC approach that is required by the EU-RED adds-on modules to enhance land management by all operators and ensure zero gross deforestation. Integrating ad-hoc thresholds for iLUC emissions will of course ensure the compliance with EU RED first, and will avoid the LUC/deforestation in all critical areas.

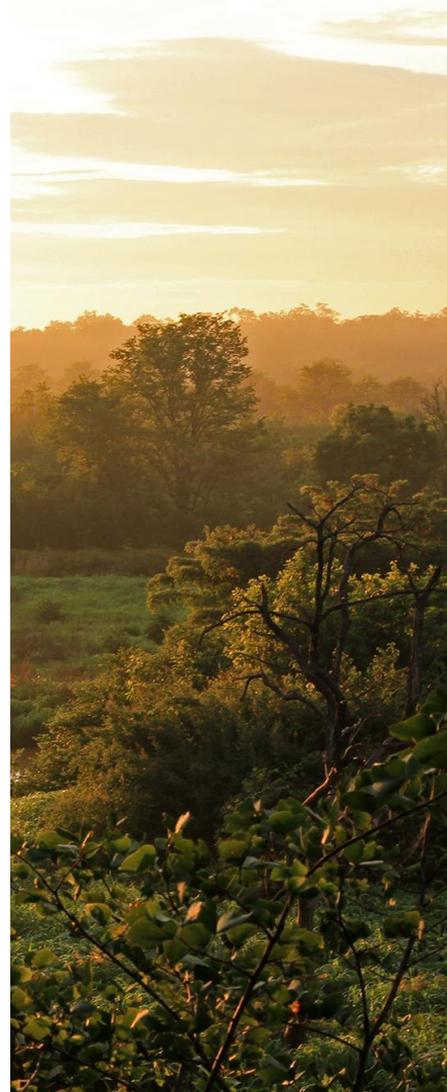
# dLUC and iLUC

## Direct Land Use Change emissions (dLUC)

- The emissions factors for forest conversion from PAS 2050 are outdated, while tools like Blonk 2014 provide more up to date readily available estimates.
- The recommended option would be to leverage FAO data, which provide the best up to date estimates that most of the organisation use for land use change accounting
- We noticed that the difference of carbon stock change from PAS2050 and Blonk 2014 vary by at +- 20-30% already. We expect the same level of changes if compared to the FAO data.
- **We recommend re-calculating the carbon stock using FAO data per country.**

## Indirect Land Use Change emissions (iLUC)

- Currently, only direct land conversion is accounted for in Bonsucro tool based on the declared information from members. However, it does not reflect the potential indirect land use change that sugarcane drives at region level, through a change of demand on land (indirect land use change).
- This method is already used by the EU RED. Integrating it directly within the threshold might not be well received from the operators; however, it could be a very important element to consolidate Bonsucro's strategy on deforestation criteria and for additional requirements in the standard (e.g. acceptance of new members in region with high iLUC)
- **We recommend using the iLUC as an additional criteria of land use management, next to HCV and HCS. However, we do not recommend embedding iLUC in the GHG accounting.**



# Allocation ethanol vs. sugar

For a mill that diverts sucrose equally towards sugar and ethanol, the following allocation factors can be derived:

- 1) **Energy based**, which is the allocation per default in the standard, and
- 2) **Economic allocation**

We analysed the history of prices for both sugar and ethanol and derived different scenarios of allocation factors.

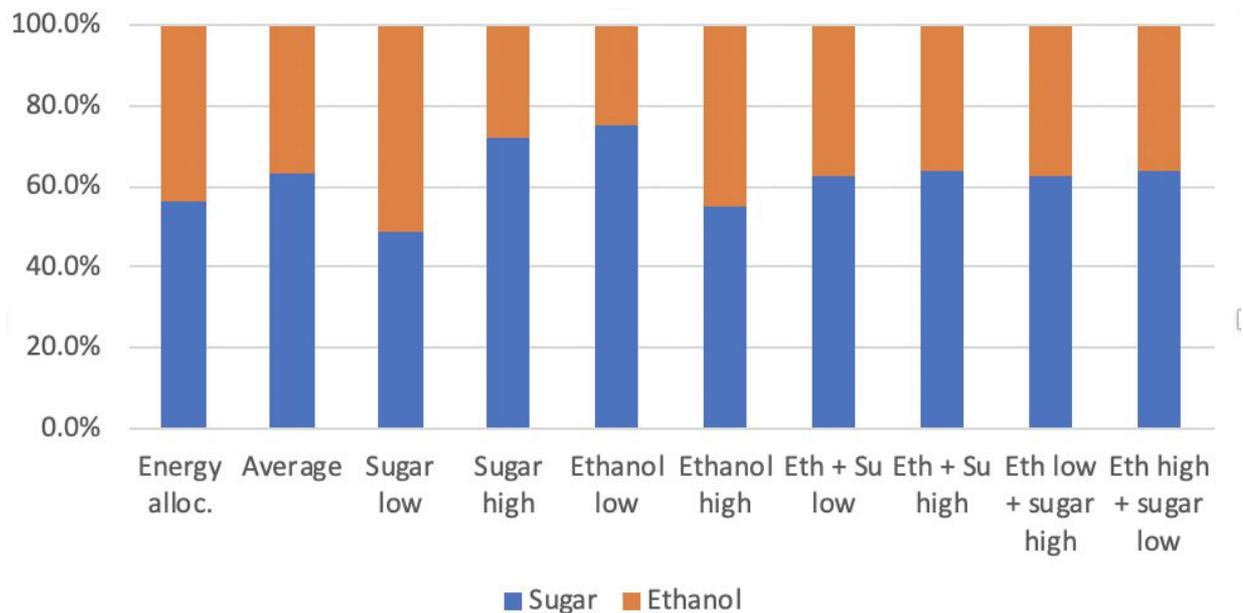
Energy allocation	
Sugar	56.5%
Ethanol	43.5%

Despite the variability of the economic valuation factors, it is the main driver to adjust the production towards sugar or ethanol. **Therefore, it is recommended to use the economic allocation instead of the energy allocation, which does drive the production decisions.**

Economic allocation	Average	Eth low + Eth high							
		Sugar low	Sugar high	Ethanol low	Ethanol high	Eth + Su low	Eth + Su high	sugar high	+ sugar low
Sugar	64%	49%	72%	75%	55%	62%	64%	62%	64%
Ethanol	36%	51%	28%	25%	45%	38%	36%	38%	36%

# Allocation co-products ethanol vs. sugar

Illustration of the variability of allocation factors for ethanol vs. sugar. 50/50 sucrose used for sugar and ethanol.



# Alignment with the New EU RED 2018/2001

## Emission savings

Topic	Bonsucro Production Standard 2016	New elements
<b>Emission savings from the use of biofuel</b>	<p><b>Minimum greenhouse gas savings:</b></p> <p>For installations starting operations after 5 October 2015:</p> <p>The greenhouse gas emission saving from the use of biofuels and bioliquids shall be at least 60 % less than the threshold established by the European Union legislation based on a Fossil Fuel Comparator (FFC) of 83.8 g CO<sub>2</sub>eq/MJ**. Therefore, the global warming burden of compliant biofuel and bioliquids shall be less than 33.5 g CO<sub>2</sub>eq/MJ.</p> <p>For installations having started operations on or before 5 October 2015:</p> <p>Until 31 December 2017, the greenhouse gas emission saving from the use of biofuels and bioliquids shall be at least 35 % less than the threshold established by the European Union legislation based on a Fossil Fuel Comparator (FFC) of 83.8 g CO<sub>2</sub>eq/MJ**. Therefore, the global warming burden of compliant biofuel and bioliquids shall be less than 54.4 g CO<sub>2</sub>eq/MJ until 31 December 2017. With effect from 1 January 2018, the greenhouse gas emission saving from the use of biofuels and bioliquids shall be at least 50 % (therefore less than 41.9 g CO<sub>2</sub>eq/MJ).</p>	<p>10. The greenhouse gas emission savings from the use of biofuels, bioliquids and biomass fuels taken into account for the purposes referred to in paragraph 1 shall be:</p> <ul style="list-style-type: none"><li>(a) at least 50 % for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations in operation on or before 5 October 2015;</li><li>(b) at least 60 % for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 6 October 2015 until 31 December 2020;</li><li>(c) at least 65 % for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 1 January 2021;</li><li>(d) at least 70 % for electricity, heating and cooling production from biomass fuels used in installations starting operation from 1 January 2021 until 31 December 2025, and 80 % for installations starting operation from 1 January 2026.</li></ul>

**Recommendation: update the Bonsucro Production Standard to lower the threshold of GHG emission savings from the use of biofuel and bioliquids produced in installation in operation on or before 5 October 2015 from 35% to 50%.**

# Alignment with the New EU RED 2018/2001

## Disaggregated values for biofuel

Topic	Bonsucro Production Standard 2016	New elements
<b>Disaggregated values for biofuel</b>	<p>The default value is the sum of the default value for cultivation: 14 g CO<sub>2</sub>eq/MJ + the default value for processing (including excess electricity): 1 g CO<sub>2</sub>eq/MJ + the default value for transport and distribution: 9 g CO<sub>2</sub>eq/MJ. Emissions from the manufacture of machinery and equipment shall not be taken into account.</p>	$E = e_{ec} + e_l + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{cct}$ <p><b>E cultivation = 17.1 gCO<sub>2</sub>eq/MJ</b></p> <p><b>E processing = 1.3 gCO<sub>2</sub>eq/MJ</b></p> <p><b>E transport &amp; distribution = 9.7 gCO<sub>2</sub>eq/MJ</b></p>

**Recommendation:** as for the Directive 2008, total emissions are 24g CO<sub>2</sub>eq/MJ, whilst for the new Directive 2018, total emissions are 28,1g CO<sub>2</sub>eq/MJ. Update the Bonsucro Production Standard default values for cultivation, processing and transport and distribution as it is stated in the new Directive 2018/2001.

# Alignment with the New EU RED 2018/2001

## High iLUC risk feedstocks

Commission delegated the regulation EU 2019/807 supplementing the Directive 2018/2001 regarding

- the determination of high indirect land-use change-risk feedstock for which a significant expansion of the production area into land with high carbon stock is observed and
- the certification of low indirect land-use change-risk biofuels, bioliquids and biomass fuels

### Article 3 on iLUC

For the purpose of determining the high indirect land-use change-risk feedstock, the following cumulative criteria shall apply:

(a) the average annual expansion of the global production area of the feedstock since 2008 is higher than 1 % and affects more than 100,000 hectares.

(b) the share of such expansion into land with high-carbon stock is higher than 10 %, in accordance with the following formula:

$$x_{\text{hcs}} = \frac{x_f + 2,6x_p}{PF}$$

where

$x_{\text{hcs}}$  = share of expansion into land with high-carbon stock;

$x_f$  = share of expansion into land referred to in Article 29(4)(b) and (c) of Directive (EU) 2018/2001;

$x_p$  = share of expansion into land referred to in Article 29(4)(a) of Directive (EU) 2018/2001 including peatland;

PF = productivity factor.

PF shall be 1,7 for maize, 2,5 for palm oil, 3,2 for sugar beet, 2,2 for sugar cane and 1 for all other crops.

# Alignment with the New EU RED 2018/2001

## Low iLUC risk fuels

**Biofuels, bioliquids and biomass fuels may only be certified as low indirect land-use change-risk fuels if all the following criteria are met:**

- (a) the biofuels, bioliquids and biomass fuels comply with the sustainability and greenhouse gas emissions saving criteria set out in Article 29 of Directive (EU) 2018/2001;
- (b) the biofuels, bioliquids and biomass fuels have been produced from additional feedstock obtained through additionality measures that meet the specific criteria set out in Article 5;
- (c) the evidence needed to identify the additional feedstock and substantiate claims regarding the production of additional feedstock is duly collected and thoroughly documented by the relevant economic operators.

Biofuels, bioliquids and biomass fuels may only be certified as low indirect land-use change-risk fuels if:

- (a) the additionality measures to produce the additional feedstock meet at least one of the following conditions:
  - (i) they become financially attractive or face no barrier preventing their implementation only because the biofuels, bioliquids and biomass fuels produced from the additional feedstock can be counted towards the targets for renewable energy under Directive 2009/28/EC or Directive (EU) 2018/2001;
  - (ii) they allow for cultivation of food and feed crops on abandoned land or severely degraded land;
  - (iii) they are applied by small holders;
- (b) the additionality measures are taken no more than 10 years before the certification of the biofuels, bioliquids and biomass fuels as low indirect land-use change-risk fuel.

# Additional areas of improvement

## Interventions benefits (carbon reduction/sequestration accounting)

### Context

- There is a current trend from the private sector to start leveraging the GHG accounting benefits of different intervention like planting trees, agroforestry, SOC, etc.
- The GHG protocol working group is also developing methods to account for those benefits.
- More and more companies have a net zero GHG strategy and commit to a Science Based Target (SBTi).

Land-Intensive  
Sectors

70+  
Joined SBTi



- Activities that drive carbon sequestration on the plantation/farm could be accounted for and reflected in the results from Bonsucro, and potentially used by members to account for SBTs and/or converted in carbon credits/offsets.
- **We would recommend Bonsucro to have a module in the GHG tool that can allow members to input carbon reduction/sequestration activities in order to measure these positive impacts and track progress.** Initially, the results could be reported separately to the overall footprint.
- In the future, these carbon reductions/sequestrations could become a claim of footprint reduction (against corporate SBTs) or even a source of finance (e.g. climate finance).
- **In implementing such recommendation, Bonsucro would increase the value of its standard system by adding new impact and financing value for its members.**

See reference literature for more info.

# Additional areas of improvement

## Direct fields emissions (N and SOC)

### N emissions

- The factor used of 1.325% of N applied for direct field emissions could be reconsidered based on some literature that indicate a possible lower level of emissions.
- For instance, a publication (reference provided together with the review documents) indicates levels of emissions of 0.46% +/-0.33 for N.
- **We would recommend to conduct a in-depth literature review to provide different choices of direct emissions from N (or a model).**

### Soil organic carbon

- Currently, soil organic carbon net change is not accounted in Bonsucro's carbon footprint. By using average properties of soils and IPCC emission factors for soil, **we could estimate an increase of emissions of about 2.75 kgCO<sub>2</sub>-eq/t cane**, which is not negligible, although the variability of SOC accounting is quite important depending on each location, practice, climate, soil, etc. In general, SOC is lost from agriculture land use. This trend can be reversed in specific conditions though.
- **We recommend accounting for this factor in the future, and based on a review of methods used in LCA, developing specific emissions factors for Bonsucro according to different contexts.**
- **We also recommend further encouraging the use of regenerative agriculture practices which would lead to creating a positive net impact over a 10-20 year timeline.**

*See reference literature for more info.*

# Contacts

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