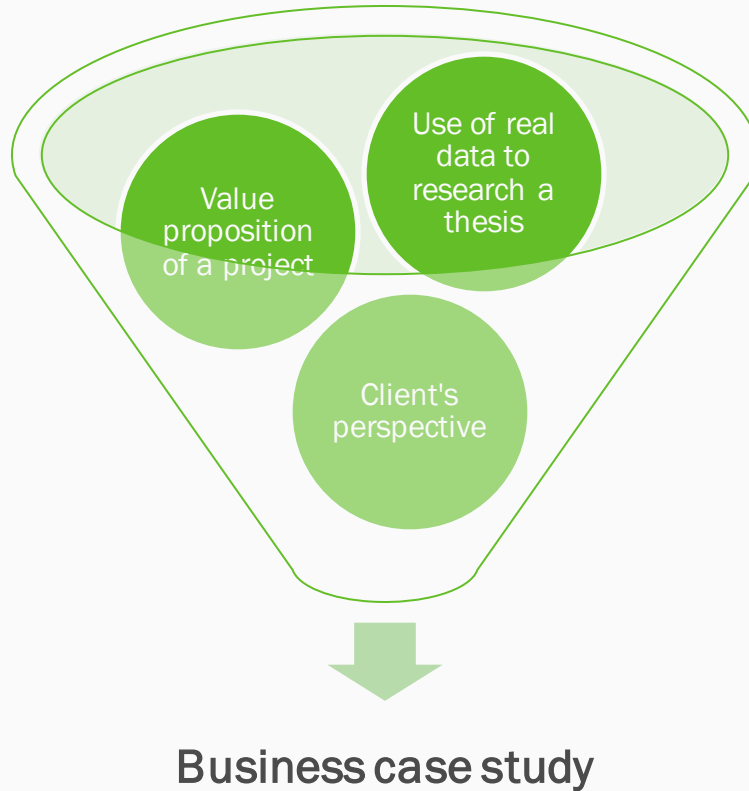




BUSINESS CASE BONSUCCRO - BRAZIL
November, 2020

What is a business case study?



Context & Objectives

Context

- Partner: Agroícone
- Similar study in 2014
- Need for update

Objectives

1. Quantify **costs** and **benefits** of Bonsucro certification in Brazil for production side
2. Obtain **cost-benefit ratio** of Bonsucro certification, including possible scenario of integration with RenovaBio

Methodology

1. Data collection

- Interviews
- Bonsucro database
- Survey with producers and certification bodies

2. Data analysis

Discounted cash flow

- Initial and maintenance allowances
- 7-year baseline period
- Calculation of the cost-benefit ratio
 1. **NPV** (Net Present Value)
 2. **IRR** (Internal Rate of Return)
 3. **Payback**
 4. **ROI** (Return on Investment)

Methodology

T = 0

Year before
certification

Costs

T = 1

First year of
certification

Costs

Benefits

T = 2, 4, 5, 7

Maintenance of
certification

Costs

Benefits

T = 3, 6

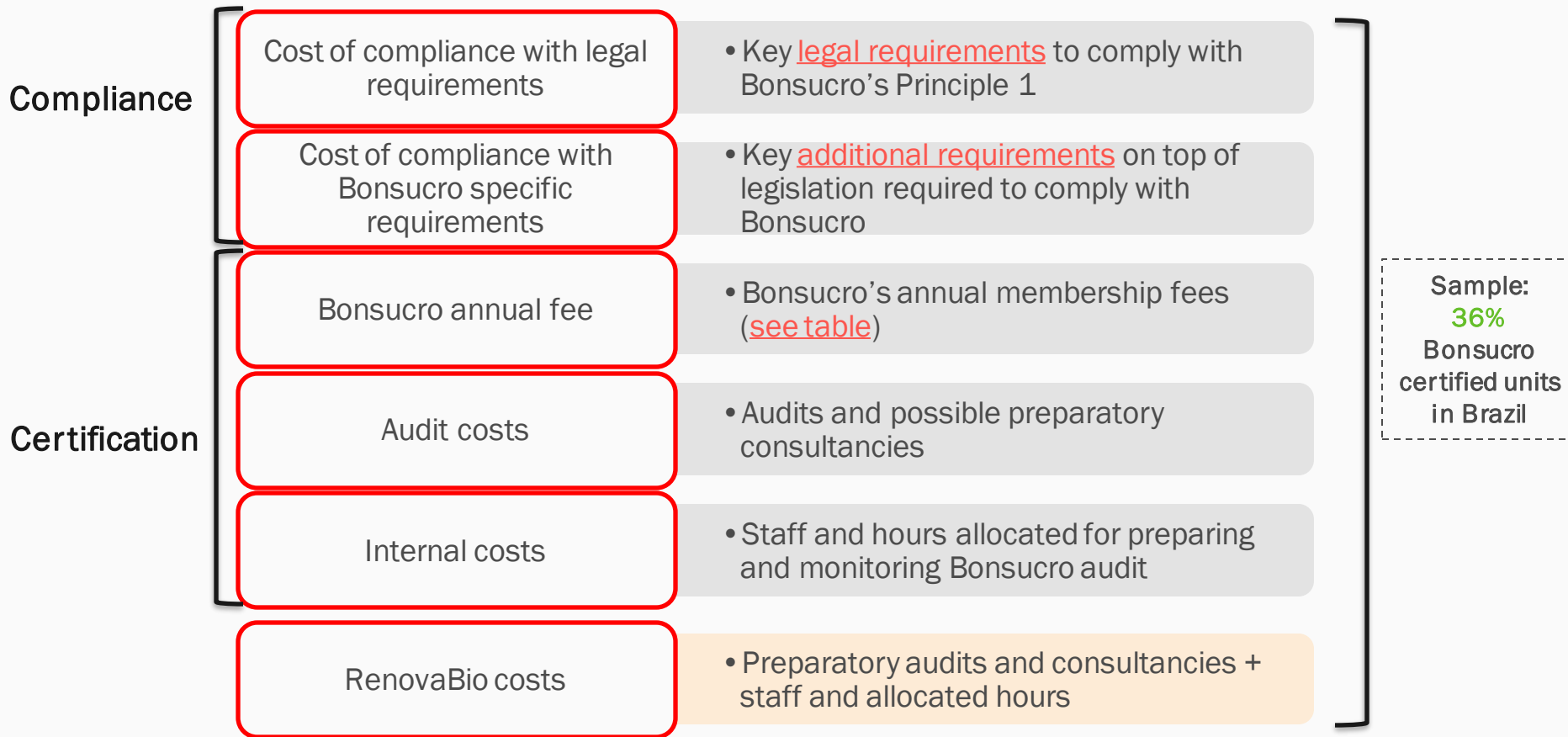
Recertification

Costs

Benefits

Comparison of year prior to certification with averages for subsequent years, by variable

Methodology – mapped costs



Methodology – mapped benefits

Tangible

[Exclusive attribution to certification]

Commercial benefits

- Sales of certified volumes
- Inventory carrying cost avoided

Premium

- Additional premium received for the sale of Bonsucro certified volume

Reduction of fines

- Avoided expenses with fines due to improvements brought by certification

Operational benefits

- Reduction in: **1)** Fertilizer use, **2)** Absenteeism rate, **3)** Accident rate, **4)** Diesel use

Environmental benefits

- **1)** Reduction in CO₂ (baseline CBIO price)
• **2)** Reduction **water** consumption

RenovaBio benefits

- New revenue from sales of CBIOs

Sample:
36%
Bonsucro certified units in Brazil

Sample:
100%
Bonsucro certified units in Brazil

Methodology – disclaimer

**Benefits that
were not
included in
this study**

Improvements in business risk
management

Improvements in image and
reputation

Improvements in stakeholder
management



**More
representativeness
of Center-South
region**

Results

1) How much does Bonsucro certification cost?

Costs of Bonsucro certification

		Costs	USD/ton cane	%
Bonsucro Compliance Costs	67%	Bonsucro additional requirements	0.5	67%
Bonsucro Certification Costs	33%	Bonsucro annual fee	0.06	8%
		Audits/consultancies	0.04	5%
		Internal costs	0.15	20%
		Total USD/ton cane	0.75	
		Total BRL/ton cane	3.98	

- Costs with legal compliance: 0.89 USD/ton (aprox. BRL 4,71/ton) → **not attributed to certification**
- Average cost of production of 1 ton sugarcane in Brazil ([CNA, 2020](#)): BRL 88,77/ton = aprox. USD 16.74/ton
- Cost of USD 0.75/ton is the total cost from Year 0 to Year 7 (period of 7 years of certification)

Results

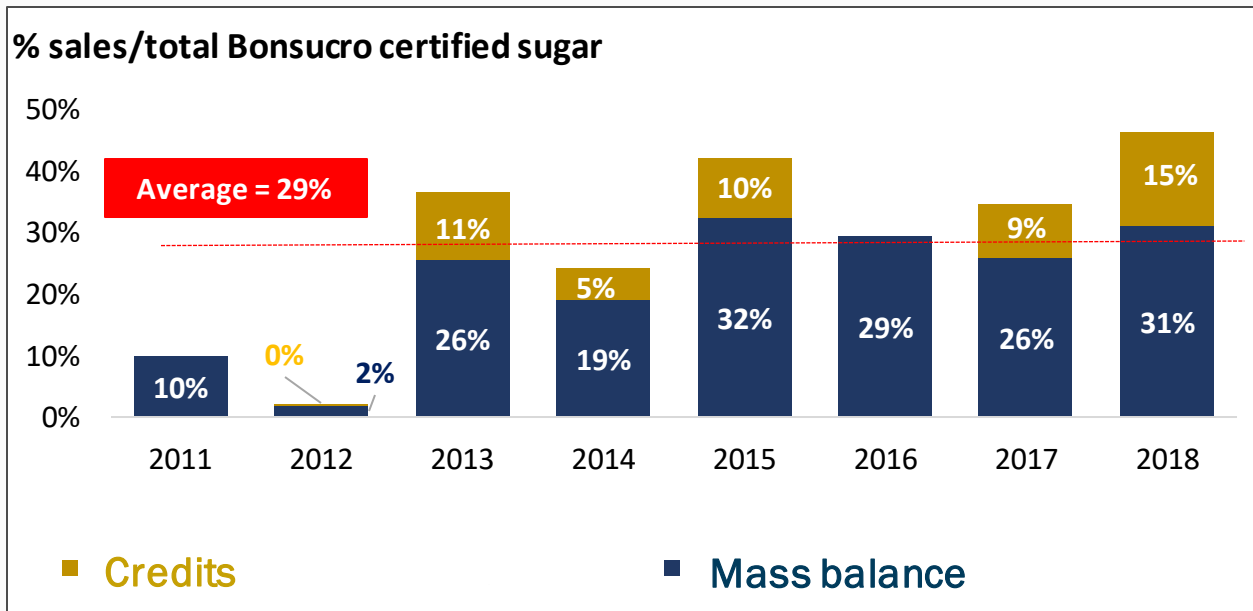
2) What are the benefits of Bonsucro certification?

Benefits of Bonsucro certification

		Benefits	USD/ton cane	%
Bonsucro Tangible Benefits	31%	Commercial benefits	0.38	31%
		Premium	0	0%
Bonsucro Intangible Benefits	69%	Reduction of fines	0.16	13%
		Operational benefits	0.59	48%
		Environmental benefits	0.092	8%
		Total USD/ton cane	1.22	
		Total BRL/ton cane	6.48	

Understanding the benefits

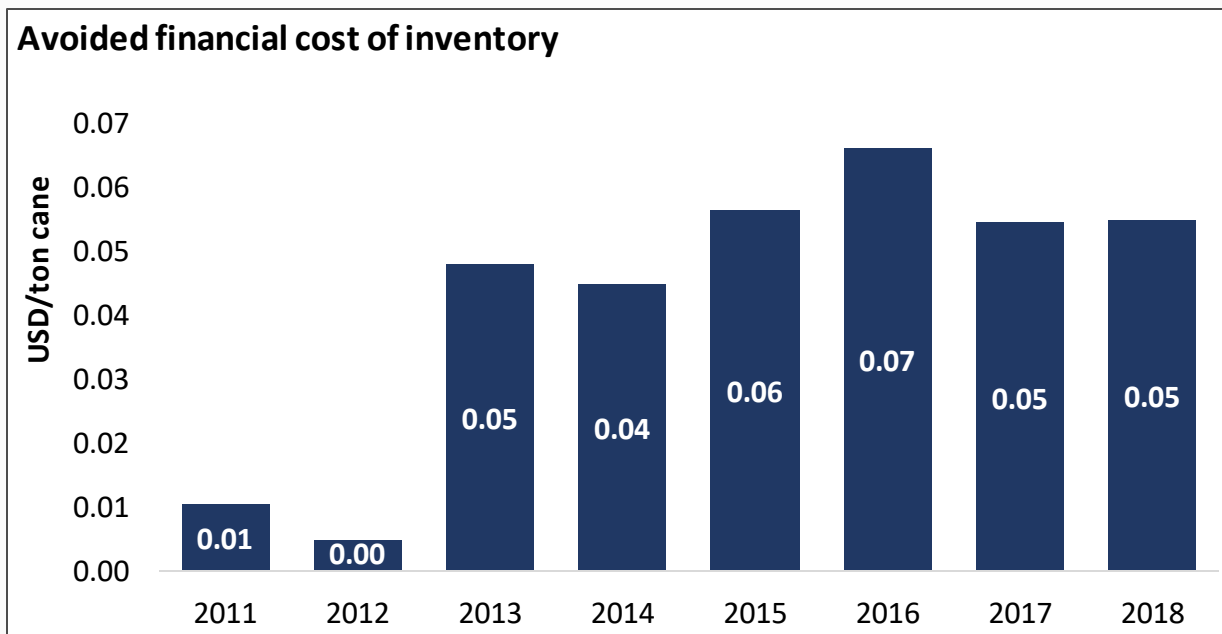
Commercial



Revenue of sales +
 avoided inventory costs =
 commercial benefits f
 certification

Understanding the benefits

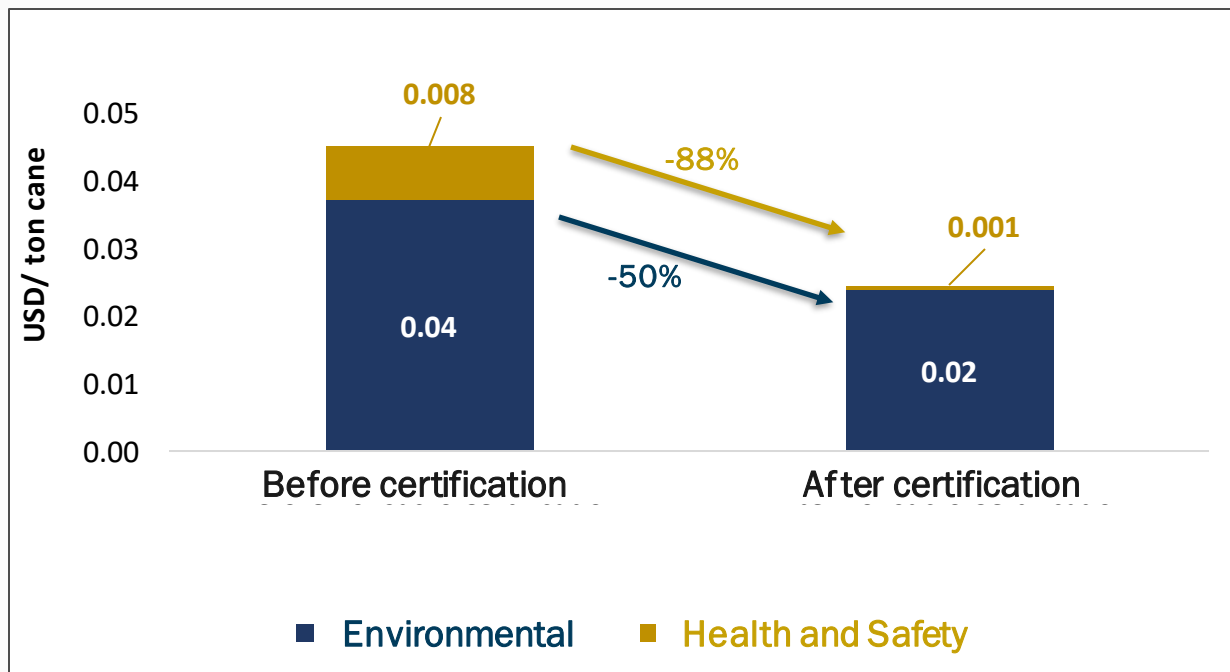
Commercial



Revenue of sales +
avoided inventory costs =
commercial benefits f
certification

Understanding the benefits

Reduction of fines



This difference was included as an intangible benefit of certification

Bonsucro requirements that contribute to it:

- Environmental Management Plan
- HS* trainings
- HS* risk assessment
- Grievance mechanism
- Stakeholder engagement

*HS = Health and Safety

Understanding the benefits

Operational

- 1) Fertilizer use
- 2) Absenteeism rate
- 3) Accident rate
- 4) Diesel use

Fertilizer application



Reduction in cost with fertilizers (-7%) was included as intangible benefit of certification

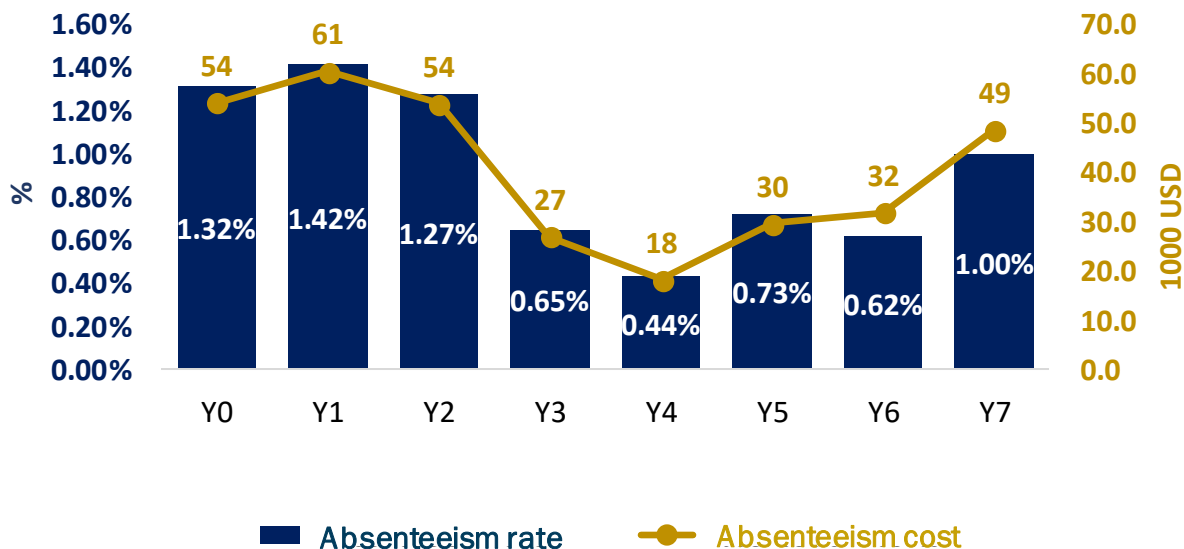
Fertilizer cost =
 Application rate (kg/ton) x price (USD/kg)

Understanding the benefits

Operational

- 1) Fertilizer use
- 2) Absenteeism rate
- 3) Accident rate
- 4) Diesel use

Absenteeism rate



Reduction in cost of absenteeism (-9%) was included as intangible benefit of certification

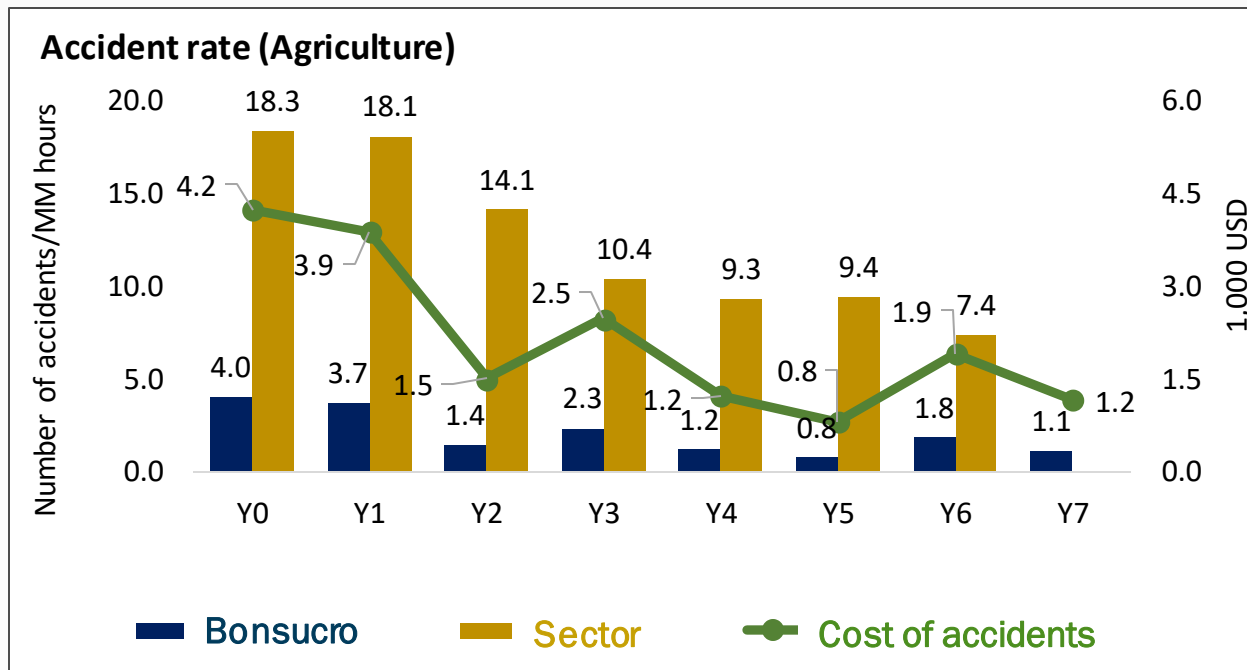
More significant reduction in the **first 4 years** of certification

Absenteeism cost =
number of hours lost
x hourly wage

Understanding the benefits

Operational

- 1) Fertilizer use
- 2) Absenteeism rate
- 3) Accident rate
- 4) Diesel use



Reduction in cost of accidents (-70%) was included as intangible benefit of certification

Accident rate is 80% lower than sector

Understanding the benefits

Operational

- 1) Fertilizer use
- 2) Absenteeism rate
- 3) Accident rate
- 4) Diesel use

Diesel use (Agriculture)



Reduction in cost of diesel (-14%) was included as intangible benefit of certification

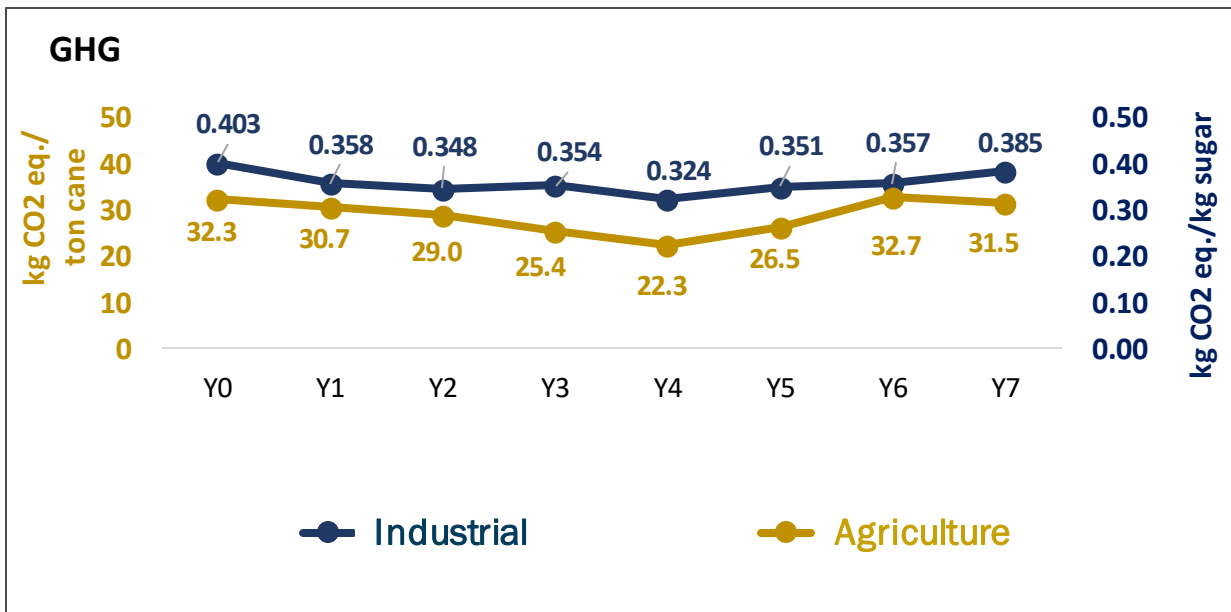
$$\text{Diesel cost (USD)} = \text{Diesel use (L/ton)} \times \text{Diesel price (USD/L)}$$

Understanding the benefits

1) Reduction in GHG emissions

2) Reduction in water use

Environmental



GHG Value =

(Bonsucro emission factor – RenovaBio emission factor) * Liters ethanol * Price CBIO

After 4y of certification, reduction of **-31%** GHG in agriculture and **-20%** industrial phases.

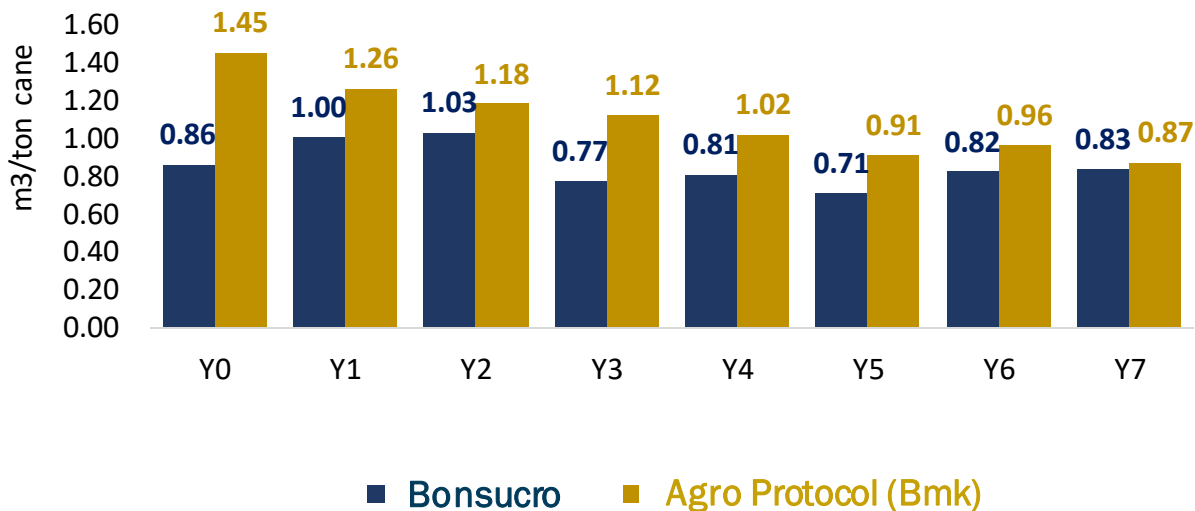
Potential increase in CBIOs of 0.092 USD/ton cane provided by the reduction of GHG emissions from areas certified by Bonsucro

Understanding the benefits

- 1) Reduction in GHG emissions
- 2) Reduction in water use

Environmental

Water use



Reduction in cost of water use (-20%) was included as intangible benefit of certification

Results

3) What happens when RenovaBio is included in the calculation?

Including RenovaBio in the calculation

Costs		USD/ton cane	%	
Bonsucro Compliance Costs	64%	Bonsucro additional requirements	0.5	64%
Bonsucro Certification Costs	32%	Bonsucro annual fee	0.06	8%
		Audits/consultancies	0.04	5%
		Internal costs	0.15	19%
RenovaBio	4%	Audits + internal	0.03	4%
		Total USD/ton cane	0.78	
		Total BRL/ton cane	4.13	

Benefits		USD/ton cane	%	
Bonsucro Tangible Benefits	16%	Commercial benefits	0.38	16%
		Premium	0	0%
Bonsucro Intangible Benefits	34%	Reduction of fines	0.16	7%
		Operational benefits	0.59	24%
		Environmental benefits	0.092	4%
RenovaBio	50%	Sales CBIO (CBIO=BRL 17.7/USD 3.3)	1.22	50%
		Total USD/ton cane	2.44	
		Total BRL/ton cane	12.94	

- Cost is marginal for a Bonsucro certified mill to achieve RenovaBio certification
- Mapped causes:
 - Reduction of staff time (-50%)
 - Logistic optimization of audits (-30%)
 - Cost reduction with satellite images
 - Optimization of data collection
- **Higher return margin** for Bonsucro certified mills, because they have **lower cost** to achieve RenovaBio certification

Results

4) What is Bonsucro cost-benefit ratio?

Cost-benefit ratio of Bonsucro certification

Bonsucro

Costs: **USD 0.75/ton**
Benefits: **USD 1.22/ton**

Relation:
NPV: **+ 0,42 USD/ton**
IRR: **156%**
Payback: **1 year**
ROI: **+ 61%**

Bonsucro + RenovaBio

Costs: **USD 0.78/ton**
Benefits: **USD 2.44/ton**

Relation:
NPV: **+ 1,51 USD/ton**
IRR: **500%**
Payback: **1 year**
ROI: **+ 100%**

Conclusions

1. Bonsucro certification in Brazil has a **positive cost-benefit ratio**
 - Growing trend in sales of certified volumes should improve it further
2. Ratio **is even more advantageous** when Bonsucro certified mill obtains RenovaBio certification (**lower cost → higher return margin**)
 - Having the same are of scope for both can bring even more benefits
3. Bonsucro looking for **continuous improvements** in its certification cost-benefit ratio.
Ex: integration with other certifications, recognition by financial institutions, influence over market demand
4. Existence of **other benefits** of Bonsucro certification that were not included in this study
→ cost-benefit ratio can be even better

Appendix



Main legal requirements to comply with Bonsucro Principle 1 (mapped costs)

Environmental legislation
Operating license
Water permits
Management/adequation of water and oil separator boxes
Management/adequation of containment basins
Solid waste management/disposal
Management/disposal of liquid effluents
Management/application of vinasse
Agrochemicals management
Packaging management/disposal and washing

Health, Safety and Labor legislation
Indemnities in labor lawsuits
Construction / maintenance of living area
Purchase of security items (PPE, etc.)
Housing construction / maintenance
Normative training (Ex: NR's)
Fire fighting installations
Electrical installations
Boilers and pressure vessels (elimination of SIRs - Serious and Imminent Risks)
Adjustments / replacements and maintenance of machines and equipment
Signaling
Lifeline installation / maintenance
Anti-discrimination practices

Main additional Bonsucro requirements (mapped costs)

Additional Bonsucro requirements
Research and Development
Vocational training
Engagement actions with stakeholders
Satellite image
Monitoring of greenhouse gas (GHG) emissions
Improvements in the management and use of agrochemicals
Improvement in the management of water consumption
Improved management of energy consumption
Training on Bonsucro and/or Calculator standards

Commercial benefits

Commercial benefits = Sales + Carrying inventory cost avoided

Carrying inventory Avoided = ((Sugar amount) * (Sugar price)) * (1 + interest rate)^6 - ((Sugar amount) * (Sugar price))

Where monthly interest rate = 0,29% (Selic – BR interest rate)

Operational benefits – Accident rate

Cost of accidents = number of accidents X (direct + indirect costs)

Where:

- **Direct costs** = 3% of payroll for high-risk companies
- **Indirect costs** = 4x direct costs = refers to other costs not covered by insurance, such as expenses with hiring and training another worker, material damage resulting from the accident, cost with risk of image of the factory, production interruption and others

References:

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Environmental benefits – Water use

Water use = Use/ton cane (Y_n) - Use/ton of cane (Y_{n-1}) * price water capture, in which
average price = BRL 0.03/m³

Thank you!



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