

Reduction of fossil GHG emissions of biochar production

Name of biochar producer: **Musternia**
EBC/WBC producer ID: **xxx**
Year of first report: **2024**
Version number: **Version 1.0**
Methodology: **Global Biochar C-Sink 3.0**

EXAMPLE

Table of content

1.	Purpose.....	3
1.1.	Overview of current status	3
2.	Progress report	4
3.	Annexes	4
3.1	C-Sink Potential certificates	4

EXAMPLE

1. Purpose

Given that global GHG emissions are successfully reduced by 2050 to less than 10% of the emissions recorded for the year 1990, negative emissions of at least 800 Gt CO₂e are still needed until the end of the century to limit global temperature rise to about 2 °C. The remaining 10% of GHG emissions will mainly comprise emissions from agriculture and waste decomposition but must not originate from fossil carbon sources. Consequently, C-sink producers must reduce their fossil carbon emissions, too. It is neither convincing nor acceptable in the long term if C-sink producers consume fossil carbon for the provision of machine fuel and electricity. Therefore, as a certified biochar producer, we present a plan outlining how to reduce fossil GHG emissions of biochar production as specified below to less than 100 kg CO₂e per ton of biochar-carbon in 2030 and to less than 20 kg CO₂e per ton of biochar-carbon in 2035.

Based on chapter 4.4 in the Global Biochar C-Sink standard (page26&27), the Biochar GHG balance was calculated according to equation 6 and is best on ton biochar carbon (BC):

$$[\text{Biochar_GHG}_{\text{balance}}(\text{tCO}_2\text{e per ton BC})] = \frac{[[\text{Total GHG emissions at factory - gate (t CO}_2\text{e)}] - [\text{Total non fossil CH}_4\text{ emissions (t CO}_2\text{e)}]]}{\text{mass of biochar per batch (t DM)} * C_{\text{content of biochar}}}$$

1.1. Overview of current status

Category:	Unit	Baseline: 2023	Current year: 2024	2030	2035
Biomass production	t CO ₂ e/t BC	0	0		
Biomass harvest	t CO ₂ e/t BC	0	0		
Biomass transportation	t CO ₂ e/t BC	0.014	0.014		
Biomass preparation	t CO ₂ e/t BC	0.029	0.029		
Biomass drying	t CO ₂ e/t BC	0	0		
Pyrolysis: Electricity	t CO ₂ e/t BC	0.146	0.016		
Pyrolysis: Pre-heating	t CO ₂ e/t BC	0.015	0		
Packaging	t CO ₂ e/t BC	0.01	0.01		
Total GHG emission until factory-gate	t CO ₂ e	155.26	68.14		
Non fossil CH ₄ emissions	t CO ₂ e	32.64	32.64		
Biochar GHG balance	t CO ₂ e/t BC	0.204	0.059	0.1	0.02
Mass of biochar carbon per batch	t DM	600	600		
Carbon content of biochar	%	92	92		

2. Progress report

In comparison to the baseline in year 2023 and a Biochar GHG balance of 0.204 t CO₂e/t biochar carbon, the balance could be reduced significantly (minus 71%) to a value of 0.059 t CO₂e/t biochar carbon in the for the year 2024. Two main measures were taken:

1. Source of electricity, we changed from a normal electricity product of the local provider (country mix, emission factor of 243g CO₂e/kWh) to a fully renewable product with a carbon footprint of 26 g CO₂e/kWh.
2. For the pre-heating a change from fossil fuel (LPG) to wood was taken.

3. Annexes

3.1 C-Sink Potential certificates

EXAMPLE