PURO.EARTH FACILITY AND OUTPUT AUDIT REPORT

Puro Standard General Rules Edition 2022 (Version V2)

Audit Start - End date: 19.4.2023 – 19.4.2023

Reported 30.4.2023

Project Number: PRJN-484924

DNV Team: Pasi Nissinen

CO_2 sink Sector (Puro Scheme): Biochar

Table of contents

INTRODUCTION **3**

DNV 3

PRODUCTION FACILITY STANDING DATA (PURO GENERAL RULES) **4**

GENERAL INFORMATION 4
BASE FOR CALCULATIONS IN OUTPUT REPORT 4
SHORT DESCRIPTION OF FACILITY AND ANY EXCLUSIONS FROM VERIFICATION SCOPE OBSERVED 5
STATEMENT OF CONFIDENTIALITY 5
DISCLAIMER 5

AUDIT RESULTS **6**

DETAILED OUTPUT REMOVAL VERIFIED 6
POSITIVE INDICATIONS 6
RECOMMENDATIONS FOR IMPROVEMENT 6

AUDIT FINDINGS **7**

DETAILED FINDINGS REQUIRING CORRECTIVE ACTIONS: 7

CONCLUSION **7**

Attachments:

ATTACHMENT 1 Bussme 2022 requirements and verification results

Introduction

This report summarises the results and conclusions from the performed facility and output audit. The audit is performed as a formal part of the Puro.earth certification process. The key objective is to determine the compliance of the operations with the Puro requirements.

DNV

DNV is one of the world's leading certification, assurance, and risk management providers.

Whether certifying a company's management system or products, providing training, or assessing supply chains, and digital assets, we enable customers and stakeholders to make critical decisions with confidence.

We are committed to support our customers to transition and realize their long-term strategic goals sustainably, collectively contributing to the UN Sustainable Development Goals.

Production facility standing data
(PURO General rules Biochar methodology)

General information

Facility unique identity	SE559276670201
CO2 Removal Supplier registering the Production Facility	GSRN number 643002406801000206 (Munka-Ljungby GSRN number 643002406801000190 (Svedala)
Name	Bussme Biochar AB
Locations	Lärlingsgatan 4, 266 35 Munka-Ljungby and Bäckgatan 4, 233 44 Svedala, Sweden
Date on which the Production Facility became eligible to receive CORCs	
Volume of Output during the full calendar year prior to registration	Shipped eligible production volume during 1.1.2022-31.12.2022 Munka-Ljungby 831 m3 Svedala 2794 m3
Removal Method(s) for which the plant is eligible to receive CORCs	Biochar
Production Facility has benefited from public support	No
Removal Method specific information as may be specified in the relevant Removal Method specific Methodology	Biochar, Pyrolysis process.

Base for calculations in Output report

4.6 Calculation parameters, MunkaLjungby				t
	E_{stored}	Document check.	Verified using the LCA and CORC calculation.	3,051
	$E_{biomass}$	Document check.	Verified using the LCA and CORC calculation.	0,176
	$E_{production}$	Document check.	Verified using the LCA and CORC calculation.	0,106
	E_{use}	Document check.	Verified using the LCA and CORC calculation.	0,12

4.6 Calculation parameters, Svedala				t
	E_{stored}	Document check.	Verified using the LCA and CORC calculation.	3,212
	$E_{biomass}$	Document check.	Verified using the LCA and CORC calculation.	0,210
	$E_{production}$	Document check.	Verified using the LCA and CORC calculation.	0,11
	E_{use}	Document check.	Verified using the LCA and CORC calculation.	0,151

Short description of facility and any exclusions from verification scope observed

Running pyrolysis process with process control in both facilities.

Statement of confidentiality

The contents of this report, including any notes and checklists completed during the audit will be treated in strictest confidence, and will not be disclosed to any third party without the written consent of the customer, except as required by the appropriate accreditation authorities.

Disclaimer

An audit is based on verification of a sample of available information. Consequently, there is an element of uncertainty reflected in the audit findings. An absence of nonconformities does not mean that they do not exist in audited and/or other areas. Prior to awarding or renewing certification this report is also subject to an independent DNV internal review which may affect the report content and conclusions.

Audit results

Detailed output removal verified

SUMMARY AND OUTPUT CALCULATION	MunkaLjungby	
Formula: CORCs= Estored-Ebiomass-Eproduction-Euse	1.1.-31.12.2022	
E_{stored}	3,051	mt CO2 eq / mt biochar (dry)
$E_{biomass}$	0,176	mt CO2 eq / mt biochar (dry)
$E_{production}$	0,106	mt CO2 eq / mt biochar (dry)
E_{use}	0,120	mt CO2 eq / mt biochar (dry)
CORC FACTOR (net carbon sequestration over 100 years)	2,649	mt CO2 eq / mt biochar (dry)
Total number of CORCs	**174,24**	**CORCs**

SUMMARY AND OUTPUT CALCULATION	Svedala	
Formula: CORCs= Estored-Ebiomass-Eproduction-Euse	1.1.-31.12.2022	
E_{stored}	3,212	mt CO2 eq / mt biochar (dry)
$E_{biomass}$	0,210	mt CO2 eq / mt biochar (dry)
$E_{production}$	0,110	mt CO2 eq / mt biochar (dry)
E_{use}	0,151	mt CO2 eq / mt biochar (dry)
CORC FACTOR (net carbon sequestration over 100 years)	2,741	mt CO2 eq / mt biochar (dry)
Total number of CORCs	**597,93**	**CORCs**

Positive indications

- Data collection and CORC calculations are systematic.
- File management is systematic.

Recommendations for improvement

- To calculate wood based raw material certification percentage if and when needed.

Audit findings

Detailed findings requiring corrective actions:

NA.

Conclusion

Conclusion	
The company is found compliant towards CORC requirement, and a certificate can be issued	Yes
The company is found NOT to be fully compliant towards CORC requirement and corrective actions are needed before a certificate can be issued	

ATTACHMENT 1

Biochar Methodology

Requirements and verification results

Company:	Bussme Biochar AB, sites MunkaLjungby and Svedala	
Facility address:	Lärlingsgatan 4, 266 35 Munka-Ljungby and Bäckgatan 4, 233 44 Svedala, Sweden	
Date:	19.4.2023	
Auditor:	Pasi Nissinen	DNV
Participants:	Carna Walle	Bussme
	Janne Kantero	Bussme
	Mari Tuomaala	DNV

1.1. Requirements for activities to be eligible under the methodology		Verification method	Verification remarks	Compliance
1.1.1	Biochar must be used in applications that preserve its carbon storage property (e.g. greenhouse substrates, surface water barrier, animal feed additive, wastewater treatment, insulation material, landfill/mine absorber, soil additive). Biochar must not be used in applications that destroy its carbon storage, e.g. fuel or reductant uses.	Document check.	According to the interviews 100 % of biochar products are used as soil additives.	Yes
1.1.2	Biochar must be produced from sustainable biomass: sustainably sourced biomass, or waste biomass such as agricultural waste, biodegradable waste, urban wood waste or food waste.	Document check.	Bussme is using branches and treetops which are classified as waste wood. Two wood suppliers of which one is PEFC certified.	Yes

1.1.3	The producer must demonstrate net-negativity with results from a life cycle assessment (LCA) or carbon footprint of the biomass production and supply, the biochar production process, and of the biochar use, including disaggregated information on the emissions arising at different stages and from different greenhouse gases.	Document check.	2050 Consulting Life cycle assessment of Bussme's biochar production and use for CORC calculation 28.2.2023.	Yes
1.1.4	In the biochar production process, the use of fossil fuels (coal, oil, natural gas) for ignition, pre-heating, or heating of the pyrolysis reactor is permitted. However, the co-firing of fossil fuels and biomass in the same reaction chamber is not permitted, as fossil carbon may be mixed with the biochar product. The greenhouse gas emissions associated with use of these fuels must be included in the LCA (i.e. supply of fuel, combustion of fuel, fugitive emissions), as for any other energy and material input used during the production process.	Document check.	Life cycle assessment of Bussme's biochar production and use for CORC calculation.	Yes
1.1.5	In the biochar production process, the pyrolysis gases must be combusted or recovered through an engineered process that either negates or makes negligible any methane emissions to the atmosphere. Bio-oil and pyrolysis gases can be stored for later use as renewable energy or materials.	Document check.	Process description. Pyrolysis gases and volatiles are combusted in pyrolysis process.	Yes

1.1.6	The molar H/Corg ratio must be less than 0.7. H/Corg ratio is an indicator of the degree of carbonisation and therefore of the biochar stability. Values exceeding 0.7 are an indication of non-pyrolytic chars or pyrolysis deficiencies (Schimmelpfennig and Glaser 2012).	Document check.	According to the CORC calculation the ratio is 0,10 in Munka and 0,04 in Svedala.	Yes
1.1.7	The biochar produced must meet any product quality requirements existing in the jurisdiction where biochar is used and for the specific applications considered. In other words, the biochar produced must be legal to use in the manner proposed.	Document check.	q.inspecta AG EBC certificate dated 6.2.2023.	Yes
1.1.8	Measures must be taken for ensuring safe working environment, cleaner production principles (see section 5.3.6), and safe handling and transport of biochar, e.g. to prevent fire, dust and health hazards. Such safety measures include, but are not limited to, providing a Material Safety Data Sheet, post-production quenching and cooling of biochar, and appropriate flue gas treatment systems.	Video plant tour in Svedala.	Verified during the plant tour: for example instructions to use PPEs. No chemicals are used in pyrolysis process.	Yes

1.2. Requirements for the Production Facility Audit		Verification method	Verification remarks	Compliance
1.2.1	The Production Facility Auditor checks the Production Facility against the Requirements for activities to be eligible under the general rules of Puro Standard and the specific requirement in this methodology (section 1.1.), and the Proofs and evidence needed from the CO2 Removal Supplier (section 5).	Video plant tour in Svedala.	Verified during the plant tour.	Yes
1.2.2	The CO2 Removal Supplier shall be able to demonstrate Environmental and Social Safeguards and that the Production Facility activities do no significant harm to the surrounding natural environment or local communities.	Document check.	Both sites have environmental permit. The level of air emissions of Munka site was checked during the audit and verified to be under ordered limits (particles, NOx and CO).	Yes
1.2.3	The CO2 Removal Supplier shall be able to demonstrate additionality, meaning that the project must convincingly demonstrate that the CO2 removals are a result of carbon finance. Even with substantial non-carbon finance support, projects can be additional if investment is required, risk is present, and/or human capital must be developed. To demonstrate additionality, CO2 removal Supplier must provide full project financials and counterfactual analysis based on Baselines that shall be project-specific, conservative and periodically updated. Suppliers must also show that the project is not required by existing laws, regulations, or other binding obligations.	Document check.	Additionality questions for suppliers (Puro document).	Yes

1.2.4	The Production Facility Auditor checks that the Production Facility is capable of metering and quantifying the biochar output in a reliable manner, for the Quantification of CO2 Removal (section 4). This check also prepares the CO2 Removal Supplier for producing the periodic Output Report.	Document check.	CORC calculation and production reports.	Yes
1.2.5	Collection of standing data of the Production Facility. The Production Facility Auditor collects and checks the standing data of the Production Facility and the CO2 Removal Supplier.	Document check.	All the information mentioned in the CORC calculation Excel file was verified during the audit. GSNR numbers checked.	Yes

5.2. Biomass production and supply		Verification method	Verification remarks	Compliance
5.2.1	Proof of origin and sustainability of the biomass feedstock used must be kept in records, be submitted to Puro, and made available for Output audits.	Document check.	CORC calculation and production reports.	Yes
5.2.2	Life cycle assessment data for the biomass production and supply must be provided and documented. In particular, climate change impact must be presented in a disaggregated way exhibiting the contribution of the different life cycle stages described in section 4.3, as well as the contribution of major greenhouse gases.	Document check.	Life cycle assessment of Bussme's biochar production and use for CORC calculation.	Yes

5.5. Proof of no double counting		Verification method	Verification remarks	Compliance
5.5.2	A statement is needed from the CO2 Removal Supplier that the underlying physical product (biochar) in which the CO2 is stored will not be sold or marketed as “climate positive” if the CO2 removal certificate associated with the underlying physical product (biochar) is removed from the underlying product and sold to another stakeholder not associated with the underlying physical product.	Document check.	Statement is sent with invoices confirming that the customer does not give any rigths to claim carbon sink.	Yes
5.5.2	Check of the packaging of the product (how the product is branded) is needed, if CO2 removal certificate associated with the underlying physical product (biochar) is removed from the underlying product.	Plant tour.	Packaging is containing only company name. All other information of the product is mentioned in the invoices.	Yes
5.5.3	No marketing and branding claims can be made by the end-user (user of biochar) that the underlying physical product (biochar) is a carbon sink, if the decoupled CO_2 certificate has been sold to and cancelled by another stakeholder not associated with the underlying physical product.	Document check.	Statement is sent with invoices confirming that the customer does not give any rigths to claim carbon sink.	Yes

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