



PURO.EARTH FACILITY AND OUTPUT AUDIT REPORT

Hjelmsäters Egendom

Puro Standard General Rules (Version 3.1 published in 1.6.2023)

Audit Start - End date: 6.9.2023 - 6.9.2023

Project Number: PRJN-484924

DNV Team: Mari Tuomaala, Sari Siitonen

CO₂ sink Sector (Puro Scheme): Biochar Methodology



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verification results 060923**



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 Version 3.1)

General information

Facility unique identity	SE8008165931
CO2 Removal Supplier registering the Production Facility	GSRN 643002406801000145
Name	Hjelmsäters Egendom
Location	53394, Hällekis, Sweden
Date on which the Production Facility became eligible to receive CORCs	13.9.2023
Volume of Output during the full calendar year prior to registration	Information not available
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

Formula: $CORCs = E_{stored} - E_{biomass} - E_{production} - E_{use}$

4.6 Calculation parameters			t
E_{stored}	Document check	Verified using the LCA and CORC calculation.	3,253 / 3,425
$E_{biomass}$	Document check	Verified using the LCA and CORC calculation.	0,103
$E_{production}$	Document check	Verified using the LCA and CORC calculation.	0,078
E_{use}	Document check	Verified using the LCA and CORC calculation.	0,031

Short description of facility and any exclusions from verification scope observed

<p>Hjelmsäters Egendom biochar production site was audited on 6.9.23.</p> <p>No exclusions from the verification scope were observed.</p>



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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		
Formula: CORCs= Estored-Ebiomass-Eproduction-Euse	period 1.10.21-31.5.22 / period 1.7.22-31.5.23	
E _{stored}	3,252 / 3,425	mt CO2 eq / mt biochar (dry)
E _{biomass}	0,103	mt CO2 eq / mt biochar (dry)
E _{production}	0,078	mt CO2 eq / mt biochar (dry)
E _{use}	0,031	mt CO2 eq / mt biochar (dry)
CORC FACTOR (net carbon sequestration over 100 years)	3,040 / 3,213	mt CO2 eq / mt biochar (dry)
Total number of CORCs	91,86 / 190,21 = 282,07	CORCs

Positive indications

- good documentation and certificate availability.

Recommendations for improvement

- LCA report to indicate the biochar use phase.



Audit findings

Detailed findings requiring corrective actions:

N/A

Conclusion

Conclusion	
The company is found compliant towards CORC requirement, and a certificate can be issues	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:	Hjelsätters Egendom	
Facility address:	Hjelsätters Egendom, 53394, Hällekis, Sweden	
Date:	06.09.2023	
Auditor:	Mari Tuomaala	3E Energy Ltd / DNV
Participants:	Edvard Hamilton	Hjelsätters Egendom
	Åsa Sievert	Biosievert

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 review	An invoice template and an example invoice was reviewed, and it was verified that those contained a statement about which is a proper use of the material	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.	Certificate review	The plant is using treetops and damaged trees, and those originate from certified forests	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.	LCA document review	An LCA is produced by a respected body and the LCA was reviewed during the visit	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.	Factory visit and discussions, and the LCA document review	During the site visit it was observed that only wood chips were fed into pyrolysis chamber, and that no ignition energy is used. LCA provided similar evidence.	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.	Factory visit and discussions	The gases are burned in the chamber, and the energy is used for the process. No pyrolysis oil is produced. Emissions are monitored.	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 (Schimmelöfennig and	Lab tests from both of the production periods were reviewed.	The ratios were 0,21 and 0,15	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.	Lab tests from both of the production periods were reviewed.	The biochar is certified through EBC. The values are taken from lab test provided beforehand.	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.	A certificate review	The factory is EBC certified and the mentioned factors are taken into account in that.	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).	Factory visit and discussions. Documentation mentioned in other items of Attachment 1.	Some of the required items were reviewed as part of other items of the Attachment 1. Some of the items were discussed during the visit in general. The visual inspection (factory visit) was inline with discussions.	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.	A sign attached to the machine	The pyrolysis machine is CE certified	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.	Investment calculation review	The project economics was reviewed and that showed that income from the carbon finance is necessary.	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.	Inspection of the packages. EPC certification review.	Only full packings with a known volume are delivered. It is known how much biochar that contains. Also, EBC requires documentation about produced biochar.	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.	A review of a sample document.	The producer is maintaining records in clouds.	Yes

5.2. Biomass production and supply

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.	A review of the certificate.	Processes related to this documentation were discussed.	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.	LCA document review	The document is well aligned with the requirements	Yes

5.5. Proof of no double counting

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.	Review of packaging. Review of the invoice template.	Packaging was reviewed and no signs of false statements were observed. Also, there are instructions in the invoicing about the product use.	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.	see the previous	see the previous	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	Discussions at the site. Review of an example invoice.	The product is used in e.g., soils. No violation in the product's use has been shown in the communication between the producer and the final client.	Yes

4.6 Calculation parameters

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