

**bio.inspecta AG**  
**q.inspecta AG**

Ackerstrasse 117  
CH - 5070 Frick  
Tel. +41 (0)62 865 63 00  
Fax +41 (0)62 865 63 01  
[international@bio-inspecta.ch](mailto:international@bio-inspecta.ch)  
[www.bio-inspecta.ch](http://www.bio-inspecta.ch)



**bio.inspecta**



**q.inspecta**

---

---

## *Audit Report 2023*

*In accordance with the following requirements:*

*Puro.earth - Biochar Methodology*

---

---

**Carbon Cycle GmbH & Co KG**  
**92286 Rieden**  
**Operator's No.: PE-70829**

## Contact details operator

### Name and address

Carbon Cycle GmbH & Co KG  
Schwandorfer Strasse 30  
DE-92286 Rieden

### Phone/Fax

Fixnet: +49 9474 909900  
Mobile: -  
Fax: -  
Email: info@carbon-cycle.de

### Contact person(s)

Herr Michael Wiederer

## Audit visit details

### Date

13.10.2023

### Duration

0 h 0 m

### Persons present including their function

FERGUSON, Paul, LCA provider  
Philipp Seitz, bio.inspecta AG, Auditor

**very good**

**not satisfactory**

**Clarity of documentation**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------	--------------------------	--------------------------	--------------------------

**Audit visit preparation:**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------	--------------------------	--------------------------	--------------------------

O.K.   
 Corrective action required   
 Not verified   
 Not relevant

Puro.earth - Biochar Methodology

				<b>1</b>	<b>Audit Description</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.01	Audited Standard:  <i>Puro.earth CO2 Removal Marketplace General Rules 3.0 – Biochar Methodology (Annex A)</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.02	Type of Audit:  <i>Output Audit</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.03	Auditing Body:  <i>bio.inspecta AG, Ackerstrasse 117, CH-5070 Frick www.bio-inspecta.ch</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.04	Audit order assigned to an impartial auditor, free from any conflicts of interest, capable and qualified to complete this audit according to Puro Standard.  <i>Auditor (name/surname): Philipp SEITZ</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.05	Audit ID:  <i>PE-70829</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.06	Audit Date:  <i>13.10.23</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.07	Production Facility Location:  <i>Schwandorfer Strasse 30, 92286 Rieden</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.08	Production period:  <i>01.10.22 - 30.09.23</i>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.09	Audit could be finished within the scheduled time frame
				<b>2</b>	<b>Standing Data Confirmation</b>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>2 Standing Data Confirmation</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>2.01 The standing data has been collected from Puro and checked for consistency against other evidence. (GL Ref.1.2.5.)</p> <p><i>Trade registry available; location evidenced; removal method eligible; no public support! Evidence of output volume: The period of this LCA revision is 01.10.22 – 30.09.23. Production figures are consolidated in an excel overview and displayed in aggregate form with pivot tables; validation period comprises EBC batch period ba-de-29-1-2 (=12 months from 01.10.22 to 30.09.23); corroboration of consolidated production records with daily production protocols on a limited sample basis (Nov 2022 proofed fully correct). Consolidated production records include only ready-for-sale volumes after blending and conditioning. First-in-first-out principle followed. Maximum stock that may be kept is one truck load for each product line: Öko-Terr &amp; Öko-Feed.</i></p>
				<b>3 Evidence Confirmation</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>3.01 All necessary evidence has been provided to the auditor by the Production facility and has been used to complete the compliance checklist. (GL Ref. 5.)</p> <p><i>Proof of product quality: EUROFINS laboratory analysis AR-22-FR-046815-01 for biochar sampled from 19.-21.10.21 according to EBC standard annex 4A and 4C. EBC certificate renewed in Dec2022. Production figures are consolidated in an excel overview and displayed in aggregate form with pivot tables; validation period comprises EBC batch period ba-de-29-1-2 (=12 months from 01.10.22 to 30.09.23); corroboration of consolidated production records with daily production protocols on a limited sample basis (Nov 2022 proofed fully correct). Consolidated production records include only ready-for-sale volumes after blending and conditioning. Proof of sales/proof of no double counting: Available and verified in sales folder. No further research on end use as client base is similar to last year. No further investigation into whether clients are benefitting from other crediting scheme for the purchased volumes.</i></p>
				<b>4 Eligibility Checklist</b>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				4 Eligibility Checklist
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>4.01 Biochar is used in applications other than energy. (GL Ref. 1.1.1.)</p> <p><i>The produced biochar is not used for energy purposes. There are two product groups: "Pflanzkohle ÖKO FEED" for animal feed and animal litter, and "Pflanzkohle ÖKO TERR" for soil improvement purposes. Both kinds are sold in multiple grading and packaging variants. Verification of bulk sales has not triggered any suspicion about the use of biochar for energy purposes. No further research on end use as client base is similar to last year. Retail sales to individual / private customers who use it predominantly for animal husbandry, composting, biogas etc.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>4.02 Biochar is produced from sustainable forest or waste biomass raw materials (consult positive list of biomasses). (GL Ref. 1.1.2)</p> <p><i>Coniferous wood extracted through sustainable forest management (PEFC certificates uploaded for a significant supplier sample size); No confirmed peatlands in areas where raw material (wood chips) is being sourced (supported by PEFC certificates for all suppliers of raw material). Coniferous wood commonly not used in construction. Timber qualities that could be used for construction are assumed to have been precluded from the production of wood chips. Included in EBC list of permissible inputs.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>4.04 Pyrolysis reactor input fuel for heating is not a fossil fuel. Unless only used for ignition/pre heating or in a mobile unit and the emissions are fully included in the LCA. The use of waste heat from other industrial processes (eg. Biodigesters, cement production) is permitted. (GL Ref. 1.1.4.)</p> <p><i>Propane for ignition only to heat the efflux up to 850 degree Celsius before pyrolysis gas enters (Puro.earth allows fossil fuels as starter). Heating support of kilns during biomass intake through electrodes and electricity supplied from the grid. Emission factor used as per Econvert 3.9.1: electricity production, hydro, reservoir, non-alpine region - DE - electricity, high voltage -Reference product: electricity, low") = hydropower (certificate of energy supplier uploaded).</i></p>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>4 Eligibility Checklist</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>4.05 Pyrolysis gases are combusted or recovered. Bio-oil and pyrolysis gases can be stored for later use as renewable energy or materials. (GL Ref. 1.1.5.)</p> <p><i>Major part is combusted in the Eflux burner, minor part (portion of condensable gases) is condensed to oil.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>4.06 The molar H/Corg ratio is less than 0.7.</p> <p><i>The molar H/Corg ratio significantly below 0.7 across various EUROFINS analyses. According to EUROFINS analytical report AR-22-FR-046815-01 (analytical reference for EBC batch ba-de-29-1-2 and underlying validation period), H/Corg ratio is 0.16.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>4.07 The biochar produced meets any product quality requirements existing in the jurisdiction where biochar is used and for the specific applications considered (GL Ref 1.1.7).</p> <p><i>EBC certified according to EBC FeedPlus and EBC AgroOrganic qualities.                      GMP+ certified for use as feed as per national jurisdiction.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>4.08 Evidence of safe handling and transport is provided and adequate for the production facility. (GL Ref. 1.1.8.)</p> <p><i>Carbon Cycle has implemented appropriate measures to ensure safe storage and transport of biochar. They provide a material safety data sheet; biochar is moistened to average 20% (minimum 12%); and the output is covered during transport.</i></p>
				<b>5 LCA Checklist</b>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				5	LCA Checklist
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.01	<p>LCA complete and shows: carbon footprint of the biomass production and supply , emissions from the biochar production process , carbon footprint of the biochar end use - cradle to grave. (GL Ref. 1.1.3)</p> <p><i>The LCA study considers the full product life cycle (system boundary A1-A4, B1 &amp; Infrastructure), referred to as "cradle to grave", as per new Puro earth requirements, for the entire validation period (01.10.22 - 30.09.23). Respective emissions revised according to system boundaries. Emissions from infrastructure are calculated based on 25 year lifetime and production capacity of 20.000 t. However, if an annual production of 250 t is laid down (approximate, averaged and rounded of last 2 years), the total production capacity during the lifetime can not exceed 6.250 t.</i></p>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5.02	<p>The CO2 Removal Supplier provides a life cycle assessment (LCA) for biochar activity including disaggregated information on the emissions arising at different stages. The system boundary is set cradle-to-grave and includes emissions from production and supply of the biomass, from biomass conversion to biochar, and from biochar distribution and use. (GL Ref. 3.1)</p> <p><i>The LCA study provided by the CO2 Removal Supplier considers the full product life cycle (system boundary A1-A4, B1 &amp; Infrastructure), referred to as "cradle to grave", as per new Puro earth requirements, for the entire validation period (01.10.22 - 30.09.23). The entire production process of wood harvesting, chipping, transport and handling of feedstock, drying, biochar manufacturing, transport of biochar to the application site and biochar application have been included in the system boundary. Regarding the infrastructure, the reactors manufacturing, installation and disposal are considered as part of the operation, and included in the assessment. The system boundary of this study accords to the Puro earth requirements. Respective emissions revised according to system boundaries. Weighted Average Distance (km) for calculation of A4 emissions of biochar transport is only partly verifiable as distances for a significant number of customers are not traceable because of incomplete addresses; for some clients the shortest distance was taken instead of being averaged.</i></p>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>5 LCA Checklist</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>5.04 The default baseline emission scenario for the project activity feedstock is zero, which is a conservative assumption since it is not taking into account methane emissions derived from decay of manure or combustion of waste biomass. If a non-zero baseline presented, needs to be accepted by Puro.earth</p> <p><i>No non-zero baseline emission claims for feedstock submitted. The feedstock stays on site for less than a month, which means that no pile emissions occur.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>5.03 Life cycle assessment (LCA) follows ISO standard, WRI GHG protocol or similar method. (GL Ref. 3.2)</p> <p><i>The carbon footprint calculation for the biochar produced during the validation period uses a life cycle assessment approach per ISO 14040 and 14044, ISO 14067 and the Puro Earth methodology for biochar edition 2022 version 2, where applicable. Ecoinvent 3.9.1 database cut-off version was used as secondary data, while whenever data was not available from the plant logs, other external sources and the Ecoinvent database were used (secondary data). For Ecoinvent data sets, the method "IPCC 2021 &lt; global warming potential (GWP100)" is used.</i></p>
				<b>6 Production Facility Checklist (Desktop and Verbal Confirmation).</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>6.01 Evidence of Production Facility eligibility under the general rules of Puro Standard. (GL Ref. 1.2.1)</p> <p><i>Production figures are consolidated in an excel overview and displayed in aggregate form with pivot tables; validation period comprises EBC batch period ba-de-29-1-2 (=12 months from 01.10.22 to 30.09.23); corroboration of consolidated production records with daily production protocols on a limited sample basis (Nov 2022 proofed fully correct). Consolidated production records include only ready-for-sale volumes after blending and conditioning.</i></p>



O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>6 Production Facility Checklist (Desktop and Verbal Confirmation).</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>6.02 The Production Facility demonstrate Environmental and Social Safeguards. (GL Ref. 1.2.2.)</p> <p><i>Production figures are consolidated in an excel overview and displayed in aggregate form with pivot tables; validation period comprises EBC batch period ba-de-29-1-2 (=12 months from 01.10.22 to 30.09.23); corroboration of consolidated production records with daily production protocols on a limited sample basis (Nov 2022 proofed fully correct). Consolidated production records include only ready-for-sale volumes after blending and conditioning. First-in-first-out principle followed. Maximum stock that may be kept is one truck load for each product line: Oeko-Terr &amp; Oeko-Feed.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>6.03 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. (GL Ref. 1.2.3)</p> <p><i>Production output: Final weight (wet) and moisture content of production output measured at factory gate prior to sales. Dry weight obtained by factoring in moisture content (systematized and consolidated for validation period 01.10.2022 - 30.09.23). Energy use: Electricity metered: monthly electricity consumption available through invoices of electricity provider; energy consumption disclosed on invoices a monthly basis. Priming gas not metered: invoices of gas purchases available (all invoices of gas purchases of validation period taken into account since last invoice accounted for in previous validation period). Diesel consumption for telescopic handler and forklift based on invoices purchased during validation period.</i></p>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>6 Production Facility Checklist (Desktop and Verbal Confirmation).</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>6.04 The Production Facility's documentation system is accurate and reliable (GL Ref. 1.2.4)</p> <p><i>Waste heat: Nominal heat output of heat exchanger that dries the wood chips and heats the installations is 650 KWh (Total output 800 KWh). The quantity of waste heat used exceeds 70%. Energy source: Electricity:                      Electricity metered: monthly electricity consumption available through invoices of electricity provider; energy consumption disclosed on invoices on a monthly basis (Oct 2022 to Sep 2023). Use of renewable energy for heating the kilns based on regular German energy mix (emissions calculated based on "electricity production, hydro, reservoir, non-alpine region - DE - electricity, high voltage". Propane (priming gas): Used to heat the eflox up to 850 degree Celsius before pyrolysis gas enters, at 950 degree Celsius the priming gas turns off; not metered, however, invoices of gas purchases available (invoices of gas purchases of validation period taken into account).</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>6.05 The quantity of the biochar produced and sold is quantified and documented in a reliable manner (GL Ref. 1.2.4)</p> <p><i>List of biomass purchases can be extracted from accounting in form of an excel document; pivot tables display biomass purchases on a monthly basis both for wet and dry matter (after factoring in moisture content); for validation period 4, values for dry wood chips are obtained from moisture measurements for each delivery; biomass delivery disclosed on a monthly basis from Jun 2021 to Sep 2022 &gt; refer to wood purchases in LCA). Sample of delivery notes cross-checked with list (sample of delivery notes attached). Supply distance up to source (chipping sites) checked for all suppliers (verified under google maps) multiplied by the respective biomass quantities. Correct application of actual moisture levels for calculation of TON KMI. Emission factor for harvesting drawn from Ecoinvent: Softwood forestry, pine, sustainable forest management (Reference product: wood chips, wet, measured as dry mass); INCLUDES CHIPPING.</i></p>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>6</b>	<b>Production Facility Checklist (Desktop and Verbal Confirmation).</b>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.06	<p>Relevant meters are in place and they are calibrated (GL Ref. 1.2.4)</p> <p><i>For calculation of tonkm wet material correctly taken into account. Factored distances however differ from actual ones for (1) Bay. Staatsforsten Schnaittenbach (distance to Forstrevier Etzerich 38-52 km; to Forstrevier Freudenberg 28-35 km and to Forstrevier Mantel 58-71 km instead of 20 km); (2) LU Steinbauer (11-13 km instead of 7 km). For REINDL, Georg the distance = 2 km ist not realistic as 26 Hrs. are required for 1.169 cbm</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.07	<p>The emissions from the cultivating, harvesting and transporting of the biomass are estimated and calculated in a reliable manner (GL Ref 1.2.4)</p> <p><i>Potential uncertainties and losses have sufficiently been addressed during the validation exercise.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.08	<p>The energy use of the Production Facility can be quantified and the emissions from the process calculated (GL Ref. 1.2.4)</p> <p><i>Pyrolysis gases recovered for heat generation in the eflox. &gt; 70% of waste heat (650 of 800 KWh) used for chip drying (since May 2020 ) and heating of installations (since beginning of operations).</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.09	<p>The auditor goes through the Quantification of CO2 Removal requirements with the CO2 Removal Supplier, so that the Supplier is able to calculate the CO2 Removal independently in its Output Report</p> <p><i>Proof of product quality: EUROFINS laboratory analysis AR-21-FR-044620-01 for biochar sampled according to EBC standard annex 4A and 4C. EBC certificate renewed in Dec 2022. Proof of production volume: The period of this LCA revision is 01.10.22 - 30.09.23. Production figures are consolidated in an excel overview and displayed in aggregate form with pivot tables; validation period comprises EBC batch period ba-de-29-1-2 (=12 months from 01.10.22 to 30.09.23). Proof of sales: 74,7% of production allocated to sales under the Puro Earth banner; sales figures do therefore correspond to production figures (also, stockkeeping usually does not happen). proof of double counting:</i></p>
				<b>7</b>	<b>Calculation Checklist</b>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>7</b>	<b>Calculation Checklist</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.01	<p><math>Q_{\text{biochar}}</math> = Quantity of biochar produced and sold to end user. (dry char) (GL Ref. 4.2.)</p> <p><i>Systemised in excel overview, consolidated and displayed in aggregated form with pivot tables. Final weight (wet) and moisture content of production output measured at factory gate prior to sales. Dry weight obtained by factoring in moisture content.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.02	<p><math>F_{\text{pTHTs}} = c + m \times H / C_{\text{org}}</math> (GL Ref. 4.2.)</p> <p><i>Provided in the Gross embodied CO2 calculator at given soil temperature and selected time horizon (CORC calculator for biochar attached).</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.03	<p><math>C_{\text{Biochar}}</math> = carbon content of biochar (GL Ref. 4.2.)</p> <p><i>Carbon content constantly over 90% across various EUROFINS analyses. According to reference analytical report AR-22-FR-046815-01 =92%.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.04	<p><math>E_{\text{stored}} = Q_{\text{biochar}} \times C_{\text{biocharorg}} \times F_{\text{pTHTs}} \times 44/12</math> (GL Ref. 4.2.)</p> <p><i>Provided in the LCA calculator as Gross embodied CO2, at given soil temperature and selected time horizon. Value: 3.01.</i></p>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

7 Calculation Checklist				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>7.05 Ebiomass = LCA emissions of production and supply of biomass (GL Ref. 4.3.)</p> <p><i>3 sources identified: electricity, priming gas, and diesel for forklift and telescopic handler! Electricity: Electricity metered: monthly electricity consumption available through invoices of electricity provider; energy consumption disclosed on invoices a monthly basis (Jun 2021 to Sep 2022); for Sep 2022 consumption estimated based on average consumption per production over last 15 months due to unavailability of invoice. Total consumption: 411.778 KWh. Use of renewable energy for heating the kilns based on regular German energy mix (emissions calculated based on "German market for electricity, low voltage -Reference product: electricity, low") = hydropower (certificate of energy supplier uploaded). Propane (priming gas): Used to heat the eflox up to 850 degree Celsius before pyrolysis gas enters, at 950 degree Celsius the priming gas turns off; not metered, however, invoices of gas purchases available (invoices of gas purchases of validation period 4 taken into account); total usage: 3.126 L. Diesel consumption for telescopic handler and forklift based on invoices since last validation period 3.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>7.06 Eproduction = LCA emissions from biochar manufacturing (GL Ref. 4.4)</p> <p><i>Nominal heat output of heat exchanger that dries the wood chips and heats the installations is 650 KWh (since May 2020 /total output 800 KWh). Since May 2020, waste heat usage 81% &gt; leakage below the permissible 30%.</i></p>

O.K  
 Corrective action required  
 Not verified  
 Not relevant

Puro.earth - Biochar Methodology

				<b>7</b>	<b>Calculation Checklist</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.07	<p>Euse = LCA emissions of the use of biochar, including distribution up to the point of final use (GL Ref 4.5)</p> <p><i>Emission factor for harvesting drawn from Ecoinvent 3.6: Softwood forestry, pine, sustainable forest management (Reference product: wood chips, wet, measured as dry mass); INCLUDES CHIPPING. Emissions per unit output correctly measured on the basis on wet chips (see LCA calculations). Loss of sinks were assumed to be zero against the backdrop of sustainable forest management; all suppliers have valid PEFC certificates). Loss of sinks due to pile emissions during forest depot storage assumed to be zero as pile storage is less than a month.</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.08	<p>CORCs = Estored - Ebiomass - Eproduction - Euse</p> <p><i>618 CORCs for 210 t dry matter shipped and accounted for within ba-de-29-1-2 (01.10.22 - 30.09.23).</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.09	<p>Quantity of CORCs (in evidence).</p> <p><i>618 CORCs for 210 t dry matter shipped and accounted for within ba-de-29-1-2 (01.10.22 - 30.09.23).</i></p>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.10	<p>Confirm consistency.</p>
				<b>9</b>	<b>Overall conclusion</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.01	<p>Overall conclusion:</p> <p><i>The validator confirms that the LCA calculation 01.04.22 - 31.03.23 provides a credible and faithful account of output volumes and emissions, and thus of declared carbon dioxide removals from sales which have occurred in the same period, as stated in the Output statement. The validator is confident that the conservativeness has been applied to a sufficient degree to say that declared CO2 removals are fully justified.</i></p>

## Auditor’s evaluation and recommendation

Non-compliance	Corrective action	Deadline
Puro.earth - Biochar Methodology		
<p>5.01 Emissions from infrastructure are calculated based on 25 year lifetime and production capacity of 20.000 t. However, if an annual production of 250 t is laid down (approximate, averaged and rounded of last 2 years), the total production capacity during the lifetime can not exceed 6.250 t.</p>	<p>Emissions from infrastructure may have been under reported because of wrong assumption of the production capacity over the lifetime.</p>	<p>31.12.2023</p>
<p>5.02 Weighted Average Distance (km) for calculation of A4 emissions of biochar transport is only partly verifiable as distances for a significant number of customers are not traceable on google.maps because of incomplete addresses; for some clients the shortest distance was taken instead of being averaged; for retail customers no distances are indicated.</p>	<p>Complete addresses of customers must be provided to allow for verification of distances. Distances must be provided for all customers and carefully measured.</p>	<p>31.12.2023</p>
<p>6.06 Weighted Average Distance (km) for calculation of A2 emissions of feedstock transport may be underreported. Factored distances differ from actual ones for (1) Bay. Staatsforsten Schnaittenbach (distance to Forstrevier Etzerich 38-52 km; to Forstrevier Freudenberg 28-35 km and to Forstrevier Mantel 58-71 km instead of 20 km); (2) LU Steinbauer (11-13 km instead of 7 km). For REINDL, Georg the distance = 2 km ist not realistic as 26 Hrs. are required or 1.169 cbm</p>	<p>Please revise distances for said suppliers before submitting an updated LCA calculation based on revised distances and weighed average distance.</p>	<p>31.12.2023</p>

## The Right to be Heard

The undersigned has reviewed the outcome of the audit documented in this report and confirms the completeness and accuracy of the information provided in the audit and the content of this report.

He/ she has taken note of the non-conformities, measures, deadlines and sanctions described in this report.

The undersigned has the option of submitting a counter-notification in writing to bio.inspecta AG within three working days of receipt of this report. If no reply is received within this period, the contents of this report shall be deemed to be acknowledged.

Frick, 11.01.2024

Rieden, .....

bio.inspecta AG / q.inspecta GmbH  
International Department

Carbon Cycle GmbH & Co KG



.....

Philipp Seitz

name, first name.....

Auditor

function.....