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Audit Report 2024

In accordance with the following requirements:

Puro.earth - Biochar Methodology

Nuntorp Gård
46464 Brålanda
Operator's No.: PE-71203

Contact details operator

Name and address

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Contact person(s)

Ms Åsa Sievert

Audit visit details

Date
04.09.2024

Duration
2 h 15 m

Persons present including their function
JOHANSSON Richard, Owner
SIEVERT Åsa, Consultant
Philipp Seitz, bio.inspecta AG, Auditor

	very good						not satisfactory
Clarity of documentation	☐	☐	☐	☒	☐	☐	☐
Audit visit preparation:	☐	☐	☐	☒	☐	☐	☐

O.K | Corrective action required | Not verified | Not relevant

Puro.earth - Biochar Methodology

				1	**Audit Description**
☒	☐	☐	☐	1.01	Audited Standard: *Puro.earth CO2 Removal Marketplace General Rules 3.1 – Biochar Methodology (Annex A)*
☒	☐	☐	☐	1.02	Type of Audit: *Production Facility Audit and Output Audit* *Output Audit*
☒	☐	☐	☐	1.03	Auditing Body: *bio.inspecta AG, Ackerstrasse 117, CH-5070 Frick* *www.bio-inspecta.ch*
☒	☐	☐	☐	1.04	Audit order assigned to an impartial auditor, free from any conflicts of interest, capable and qualified to complete this audit according to Pur Standard. *Auditor (name/surname): PHILIPP SEITZ*
☒	☐	☐	☐	1.05	Audit ID: *752025*
☒	☐	☐	☐	1.06	Audit Date: *04.09.2024*
☒	☐	☐	☐	1.07	Production Facility Location: *Nuntorp 328, 46464 Bralanda, Vestra Göalands Län*
☒	☐	☐	☐	1.08	Production period: *The start of the production period is not clearly ascertainable because a clear cut-off in terms of EBC certification and batch registration is missing for the beginning of the claim period.* *July 2023 - August 2024*
☒	☐	☐	☐	1.09	Audit could be finished within the scheduled time frame
				2	**Standing Data Confirmation**

O.K | Corrective action required | Not verified | Not relevant

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				2	**Standing Data Confirmation**
☒	☐	☐	☐	2.01	The standing data has been collected from Puro and checked for consistency against other evidence. (GL Ref.1.2.5.) *Trade registry available; location evidenced; removal method eligible; only 57% Govt. support. LCA calculation covers the period Jul 2022 to Aug 2023. The start of the production period is not clearly ascertainable because a clear cut-off in terms of EBC certification and batch registration is missing for the beginning of the claim period (75% of claimed volumes belong to ba-se-224-1-2, 25% to the period prior to EBC certification). Neither are production protocols available in the early stage.*
				3	**Evidence Confirmation**
☒	☐	☐	☐	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.) *The LCA is categorised as cradle-to-grave as it considers the impacts from forestry through to transport to end use. The feedstock proceeds from own forests, invoices do therefore not indicate volume or weight but transport hours of the freight forwarder. Biomass volumes can only be retrieved from chipping invoices (hours of operation); notwithstanding, the exact volume is unknown because volumes used in another boiler are neither consolidated nor available. The lab analysis performed by Eurofins in January 2023 (which is the representative sample for batch ba-se-224-1-2 that is largely accounting for the validation period) demonstrates an organic carbon content of 92.3% in the dry state. The produced biochar has an average H/Corg molar ratio of 0.12. The hydrogen content is also part of the analysis and used for calculation of the permanence factor.*
				4	**Eligibility Checklist**
☐	☒	☐	☐	4.01	Biochar is used in applications other than energy. (GL Ref. 1.1.1.) *Except for the distance travelled, no information is given on the sink locations. Raw data is not made available.*

O.K | Corrective action required | Not verified | Not relevant

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				4	**Eligibility Checklist**
☐	☒	☐	☐	4.02	Biochar is produced from sustainable forest or waste biomass raw materials (consult positive list of biomasses). (GL Ref. 1.1.2) *Nuntorp uses approximately 75% forest biomass in their production of biochar. The other 25% of the biomass comes from waste streams (here: damaged trees infested by the pest spruce bark beetle removed to protect the rest of the productive forest). Proof of sustainable management for the 75% of forest biomass has not been submitted. An objective explanation of how the relation between forest and waste biomass has been established is missing.*
☒	☐	☐	☐	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 processess (eg. Biodigesters, cement production) is permitted. (GL Ref. 1.1.4.) *The pyrolysis unit doesn't directly consume fossil fuels, only electricity for its periphery. The carbonisation itself is ignited like a camp fire with the same forest and/or waste wood used for carbonisation.*
☒	☐	☐	☐	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.) *Pyrolysis gases are captured and combusted within the reactor.*
☒	☐	☐	☐	4.06	The molar H/Corg ratio is less than 0.7. *The produced biochar has a H/Corg molar ratio of 0.12 according to Eurofins, Jan 23 analysis, which is representative for batch ba-se-224-1-2 that largely accounts for the validation period. The H/Corg ratio is well below the 0.7 threshold.*
☒	☐	☐	☐	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). *The facility holds an EBC certificate of the highest EBC status which is AgroOrganic. It is therefore most suitable for soil improvement products for which it is used for.*

O.K | Corrective action required | Not verified | Not relevant

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				4	**Eligibility Checklist**
☐	☒	☐	☐	4.08	Evidence of safe handling and transport is provided and adequate for the production facility. (GL Ref. 1.1.8.) *Nuntorp has implemented appropriate measures to ensure the safe storage and transport of the biochar. Contrary to the moisture content of 2.7% featured in the analysis, the moisture content is significantly higher. Because of constraints of quenching at the outlet screw, quenching happens at the big bag station. The reason why the analytical moisture content is low is attributable to sampling before quenching. Yet, the actual moisture content is unknown due to the lac of moisture measurements.*
				5	**LCA Checklist**
☐	☒	☐	☐	5.01	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) *Compliance with comparable conditions is outlined in the LCA report. Most process emissions have been calculated in the LCA using the cradle-to-grave approach. The following emissions have been accounted for: Harvesting of the wood, transport and production of pellets, transport to the production site, the manufacturing of the biochar on site, transportation of the biochar. The following emissions have not been accounted for: use of the biochar.*
☐	☒	☐	☐	5.02	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-grav 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) *Most process emissions have been calculated in the LCA using the cradle-to-grave approach. The following emissions have been accounted for: Harvesting of the wood, transport and production of pellets, transport to the production site, the manufacturing of the biochar on site, transportation of the biochar. The following emissions have not been accounted for: use of the biochar.*

O.K | Corrective action required | Not verified | Not relevant

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O.K	Corrective action required	Not verified	Not relevant		
				5	**LCA Checklist**
☒	☐	☐	☐	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 *The default baseline emission scenario for feedstock is zero as no methane emissions from decay of biomass occurs. Wood which proceeds from own forest is chipped on a frequent basis as per input requirements of boiler and Biomacon.*
☐	☒	☐	☐	5.03	Life cycle assessment (LCA) follows ISO standard, WRI GHG protocol or similar method. (GL Ref. 3.2) *Whether the calculation of the carbon footprint of the biochar follows ISO 14040, 14044 and 14067 is not declared in the LCA report.*
				6	**Production Facility Checklist (Desktop and Verbal Confirmation).**
☒	☐	☐	☐	6.01	Evidence of Production Facility eligibility under the general rules of Puro Standard. (GL Ref. 1.2.1) *Trade registry available; location evidenced; removal method eligible; only 57% Govt. support.*
☐	☒	☐	☐	6.02	The Production Facility demonstrate Environmental and Social Safeguards. (GL Ref. 1.2.2.) *Environmental evaluation report signed.* *Comment: To be verified during next validation.*

O.K | Corrective action required | Not verified | Not relevant

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				6	**Production Facility Checklist (Desktop and Verbal Confirmation).**
☒	☐	☐	☐	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 i 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) *Revenue from the sales of CORCs is an important part of Nuntorp's business case. A biochar boiler is 3-4 times more expensive than a wood chip boiler which would have been bought otherwise. Operationa care is much higher and so are operational costs.*
☐	☒	☐	☐	6.04	The Production Facility's documentation system is accurate and reliab (GL Ref. 1.2.4) *Calculation of flow of goods is compromised because of poor biomass and production records.*
☐	☒	☐	☐	6.05	The quantity of the biochar produced and sold is quantified and documented in a reliable manner (GL Ref. 1.2.4) *Disclosure of the consolidated overview of production volume is difficu because production data is not systemized in one reference document and not disclosed batch-wise (mention of the batch ID is inconsistent).* *Comment: To be verified during next validation.*
☐	☒	☐	☐	6.06	Relevant meters are in place and they are calibrated (GL Ref. 1.2.4) *Instead of relying on objective data (weighing, moisture measurement), conversion from volume to weight relies on volatile means of measurement (bulk density, single analysis instead of averaged value of more than one analysis).* *Comment: To be verified during next validation.*

O.K | Corrective action required | Not verified | Not relevant

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				6	**Production Facility Checklist (Desktop and Verbal Confirmation).**
☐	☒	☐	☐	6.07	The emissions from the cultivating, harvesting and transporting of the biomass are estimated and calculated in a reliable manner (GL Ref 1.2.4) *Although conversion from volume to ton assumes a water content of 50% which is conservative, biomass quantities are tentative because no weighing is practised, neither is the volume measurable by means of truckloads but instead by hours of chipping. Compared to objective means like weighing and moisture measurements, biomass quantities must rather be considered tentative. Raw data to assess the correctness of the 'Corresponding amount of biochar transported' is no available. An objective explanation of how the relation between forest and waste biomass has been established is missing. External and internal transport emission calculations for ton km are incorrect. Diese consumption is given for volume but not for tonnage. Empty return journeys both for solid and chipped wood are not taken into account.* *Comment: Emission calculations from biomass transport are unchanged i.e. empty return journeys have not been factored. A safety margin of 10% is therefore recommended and has been applied to the output statement.*
☐	☒	☐	☐	6.08	The energy use of the Production Facility can be quantified and the emissions from the process calculated (GL Ref. 1.2.4) *The use of electricity is not measurable through objective means. The alternative calculation based on nominal output is (1) not representative as it stems from a different setup, and (2) incorrect because the bulk density is not corresponding with the reference analysis AR-23-FR-005124-02.* *Comment: Although the electricity output calculation has not been revamped, this criteria was temporary lifted because of use of renewable energy sources.*
☐	☐	☐	☒	6.09	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 *Backstopping with LCA provider only.*
				7	**Calculation Checklist**

O.K | Corrective action required | Not verified | Not relevant

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				7	Calculation Checklist
☐	☒	☐	☐	7.01	Qbiochar = Quantity of biochar produced and sold to end user. (dry char) (GL Ref. 4.2.) *Instead of relying on objective data (weighing, moisture measurement), conversion from volume to weight relies on volatile means of measurement (bulk density, single analysis instead of average value of multiple analyses). For future validations, the quantity of the biochar produced must be quantified in a reliable manner.*
☒	☐	☐	☐	7.02	FpTHTs = c + m x H/Corg (GL Ref. 4.2.) *See 'Permanence factor calculation' attached.*
☒	☐	☐	☐	7.03	C Biochar = carbon content of biochar (GL Ref. 4.2.) *According to EUROFINS AR-23-FR-005124-02 corresponding to ba-se-224-1-2.*
☒	☐	☐	☐	7.04	Estored = biochar carbon storage = Qbiochar x Cbiocharorg x FpTHTs x 44/12 (GL Ref. 4.2.) *See 'Permanence factor calculation' attached.*
☐	☒	☐	☐	7.05	Ebiomass = LCA emissions of production and supply of biomass (GL Ref. 4.3.) *Ebiomass is not fully verifiable because calculatory paths are not indicated (diesel to CO2eq for harvesting and chipping). Raw data to assess the correctness of the 'Corresponding amount of biochar transported' is not available. Please submit a revamped LCA calculation including raw data and calculatory paths.*
☐	☒	☐	☐	7.06	Eproduction = LCA emissions from biochar manufacturing (GL Ref. 4.4 *Eproduction is not fully verifiable because calculatory paths are not indicated. Please submit a revamped LCA calculation including calculatory paths.*
☐	☒	☐	☐	7.07	Euse = LCA emissions of the use of biochar, including distribution up to the point of final use (GL Ref 4.5) *Euse emissions for application have not been accounted for. Please submit an updated version of the LCA by taking emissions of biochar use into account.*

O.K | Corrective action required | Not verified | Not relevant

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				7	**Calculation Checklist**
☐	☒	☐	☐	7.08	CORCs = Estored - Ebiomass - Eproduction - Euse *CORCs: 509,32 (pre-deduction); CORCs: 458,39 (final verified amount after deduction of 10% safety margin)*
☐	☒	☐	☐	7.09	Quantity of CORCs (in evidence). *CORCs: 509,32 (pre-deduction); CORCs: 458,39 (final verified amount after deduction of 10% safety margin)*
☐	☒	☐	☐	7.10	Confirm consistency. *Certificates are claimed based on sales, rather than production as they are asynchronous. For the period Jul 2022 to Sep 2023, Nuntorp has sold 162,86 t of biochar. A safety margin of 10% shall be applied to cater for omissions of due diligence regarding LCA revamp and CORC factor ton CO2e/dry ton biochar adjustment.*
				8	**Site Visit Checklist**
☐	☒	☐	☐	8.01	The raw material is of eligible type and sustainably sourced (GL Ref. 1.1) *Proof of sustainable management for the 75% of forest biomass has not been submitted.*
☐	☒	☐	☐	8.02	The LCA specifics and emissions boundary are consistent with observations on site (GL Ref. 1.1) *Most process emissions have been calculated in the LCA using the cradle-to-grave approach. The following emissions have been accounted for: Harvesting of the wood, transport and production of pellets, transport to the production site, the manufacturing of the biochar on site, transportation of the biochar. The following emissions have not been accounted for: use of the biochar.*
☒	☐	☐	☐	8.03	There are no fossil fuels used to heat the pyrolysis reactor (GL Ref. 1.1) *The pyrolysis unit doesn't directly consume fossil fuels, only electricity for its periphery. The carbonisation itself is ignited like a camp fire with the same forest and/or waste wood used for carbonisation.*

O.K Corrective action required Not verified Not relevant

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O.K	Corrective action required	Not verified	Not relevant	8	Site Visit Checklist
☒	☐	☐	☐	8.04	Pyrolysis gases are recovered in the biochar production process (GL Ref. 1.1) *Pyrolysis gases are captured and combusted within the reactor.*
☐	☒	☐	☐	8.05	Evidence of safe handling and transport of the biochar (GL Ref. 1.1) *Nuntorp has implemented appropriate measures to ensure the safe storage and transport of the biochar. Contrary to the moisture content of 2.7% featured in the analysis, the moisture content is significantly higher. Because of constraints of quenching at the outlet screw, quenching happens at the big bag station. The reason why the analytical moisture content is low is attributable to sampling before quenching. Yet, the actual moisture content is unknown due to the lac of moisture measurements.*
☐	☒	☐	☐	8.06	Biochar is used in applications other than energy (GL Ref. 1.1) *Except for the distance travelled, no information is given on the sink locations. Raw data is not made available.*
☒	☐	☐	☐	8.07	The molar H/Corg ratio is less than 0.7 *The produced biochar has a H/Corg molar ratio of 0.12 according to Eurofins, Jan 23 analysis, which is representative for batch ba-se-224-1-2 that largely accounts for the validation period. The H/Corg ratio is well below the 0.7 threshold.*
☐	☒	☐	☐	8.08	Confirm how the Production Facility documents the quantity of biocha produced and sold *Disclosure of the consolidated overview of production volume is difficu because production data is not systemized in one reference document and not disclosed batch-wise (mention of the batch ID is inconsistent)*

O.K | Corrective action required | Not verified | Not relevant

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				8	**Site Visit Checklist**
☐	☒	☐	☐	8.09	Confirm that the Production Facility's documentation system is accurate and reliable *Biomass quantities are tentative because no weighing is practised, neither is the volume measurable by means of truckloads but instead by hours of chipping which is tentative compared to objective means like weighing and moisture measurements. Raw data to assess the correctness of the 'Corresponding amount of biochar transported' is nc available.* *Comment: To be verified during next validation.*
☐	☒	☐	☐	8.10	Confirm that appropriate metering infrastructure is present and calibrated correctly to determine production output *Instead of relying on objective data (weighing, moisture measurement), conversion from volume to weight relies on volatile means of measurement (bulk density, single analysis instead of averaged value of more than one analysis). Disclosure of the consolidated overview of production volume is difficult because production data is not systemized in one reference document and not disclosed batch-wise (mention of the batch ID is inconsistent).* *Comment: To be verified during next validation.*
☐	☒	☐	☐	8.11	Confirm that appropriate metering infrastructure is present to quantify the energy use of the Production Facility *The use of electricity is not measurable through objective means. The alternative calculation based on nominal output is (1) not representative as it stems from a different setup, and (2) incorrect because the bulk density is not corresponding with the reference analysis AR-23-FR-005124-02.* *Comment: Although the electricity output calculation has not been revamped, this criteria was temporary lifted because of use of renewable energy sources.*

O.K | Corrective action required | Not verified | Not relevant

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				8	Site Visit Checklist
☐	☒	☐	☐	8.12	Confirm the calculations that are used to quantify emissions from the process. These account for: - the energy (e.g. waste heat) created by the biochar - the energy source used in the production process *Potential emissions from electricity only. Most if not all electricity sourced from own solar power. The use of electricity is not measurable through objective means. The alternative calculation based on nominal output is (1) not representative as it stems from a different setup, and (2) incorrect because the bulk density is not corresponding with the reference analysis AR-23-FR-005124-02.* *Comment: Although the electricity output calculation has not been revamped, this criteria was temporary lifted because of use of renewable energy sources.*
☐	☒	☐	☐	8.13	Confirm the process that is in place to quantify emissions from the harvest of raw materials. These account for: - forest biomass vs biomass from other waste *Ebiomass is not fully verifiable because calculatory paths are not indicated (diesel to CO2eq for harvesting and chipping). Raw data to assess the correctness of the 'Corresponding amount of biochar transported' is not available. An objective explanation of how the relation between forest and waste biomass has been established is missing.* *Comment: A revamped LCA calculation including raw data and calculators paths has not been submitted. A safety margin of 10% is therefore recommended and has been applied to the output statement.*
☐	☒	☐	☐	8.14	Confirm the process that is in place to quantify emissions from the transport of raw materials to the Production Facility. *External and internal transport emission calculations for ton km are incorrect. Diesel consumption is given for volume but not for tonnage. Empty return journeys are not accounted for.* *Comment: A revamped LCA calculation has not been submitted. A safety margin of 10% is therefore recommended and has been applied to the output statement.*

O.K | Corrective action required | Not verified | Not relevant

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				8	**Site Visit Checklist**
☐	☒	☐	☐	8.15	The Production Facility demonstrate Environmental and Social Safeguards *Environmental evaluation report signed. Air emissions of flue gas are measured elsewhere (by Biomacon on a reference plant). It is unknown on which prototype the measurement was done. For EBC, a certificate of emissions measured elsewhere is not valid if a type certification of the relevant technology is lacking, even if the measurement was conducted on the same prototype (non compliance highlighted in the EBC Finfdings report of 04.09.24). Air emission measurement shall be conducted until next inspection unless type certified and availability of 3 measurements on the same prototype.* *Comment: To be verified during next validation.*
☒	☐	☐	☐	8.16	Confirm the CO2 removals are a result of carbon finance *Revenue from the sales of CORCs is an important part of Nuntorp's business case. A biochar boiler is 3-4 times more expensive than a wood chip boiler which would have been bought otherwise. Operational care is much higher and so are operational costs.*
☒	☐	☐	☐	8.17	The requirements for Quantification of CO2 Removal have been explained to the Supplier by the Auditor for the purpose of compiling the Output Report

O.K | Corrective action required | Not verified | Not relevant

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				8	**Site Visit Checklist**
☐	☐	☐	☒	8.18	Confirm the process that is in place to collect and maintain proofs as per Section 5 of the Biochar Guidelines. - Proof of sustainability of raw material for forest biomass (FSC, SFI, PEFC, other certifications) - Proof of sustainability of raw material for waste biomass - LCA data for biomass and biochar production, supply and use, including climate change impact and the contribution of each life cycle stages - Proof of product quality: laboratory analysis of total organic carbon content, hydrogen content and H/Corg - Proof of production volume: documentation for the whole period and methodology applied to calculate the dry mass of biochar produced. - For mobile units or carbonizer operator: proof of load cell measurement of the biochar for the whole period, and water input measurement. - Proof of end use of biochar: offtake agreement, shipment, and other records indicating the intended use of biochar. - Justification on the soil temperature selected for the calculation of the biochar sequestration. - Proof of sales - Proof of no double counting/C positive marketing. *Previously answered.*
				9	**Overall conclusion**
☒	☐	☐	☐	9.01	Overall conclusion: *To provide 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, corrections have to be crafted into the LCA which has not happened. To provide the credibility notwithstanding, a 10% safety margin shall be applied.*

Auditor’s evaluation and recommendation

Non-compliance	Corrective action	Deadline
Puro.earth - Biochar Methodology		
4.01 Except for the distance travelled, no information is given on the sink locations. Raw data is not made available.	Customer details and respective uses must be made available for potential random checks, and/or declarations by end users that biochar will not be combusted.	completed
4.02 Proof of sustainable management for the 75% of forest biomass has not been submitted. Neither is it clear how the relation between forest and waste biomass is being established.	Please submit proof of sustainable management for forest biomass, for example, by PEFC or FSC certificates or by comparable regional standards or laws. Please provide a clear explanation how the relation between forest and waste biomass has been established.	completed
4.08 The actual moisture content is unknown due to the lack of moisture measurements.	Proof of frequent moisture measurements must be made available by next audit.	completed
5.01 The following emissions have not been accounted for: use of the biochar.	Please submit an updated version of the LCA by taking emissions of biochar use into account. Include details on biochar end-use and associated emissions up-to-the-point of biochar mixing into a mineral matrix. Comment 16.04.25: Emissions from biochar use have been included as a descriptive element into the LCA report but not in quantitative terms. The total emissions for life cycle phase 3 have remained the same. A safety margin of 10% is therefore recommended and has been applied to the output statement.	31.10.2024

5.02 The following emissions have not been accounted for: use of the biochar.	Please submit an updated version of the LCA by taking emissions of biochar use into account. Include details on biochar end-use and associated emissions up-to-the-poin of biochar mixing into a mineral matrix. Comment 16.04.25: Emissions from biochar use have been included as a descriptive element into the LCA report but not in quantitative terms. The total emissions for life cycle phase 3 have remained the same. A safety margin of 10% is therefore recommended and has been applied to the output statement.	31.10.2024
5.03 Whether the calculation of the carbon footprint of the biochar follows ISO 14040, 14044 and 14067 is not declared in the LCA report.	Please clarify whether applicable ISO standards are being met. Comment 16.04.25: No clarification has been given as to ISO conformity. A safety margin of 10% is therefore recommended and has been applied to the output statement.	31.10.2024
6.02 Air emissions of flue gas are measured elsewhere (by Biomacon on a reference plant). It is unknown on which prototype the measurement was done. For EBC, a certificate of emissions measured elsewhere is not valid if a type certification of the relevant technology is lacking, even if the measurement was conducted on the same prototype (non compliance highlighted in the EBC Finfdings report of 04.09.24).	Air emission measurement shall be conducted until next inspection unless type certified and availability of 3 measurements on the same prototype. Comment 16.04.25: To be verified during next validation.	completed
6.04 Calculation of flow of goods is compromised because of poor biomass and production records.	Take measures to improve documentation and provide written evidence (addressed during EBC certification).	completed

6.05 Disclosure of the consolidated overview of production volume is difficult because production data is not systemized in one reference document and not disclosed batch-wise (mention of the batch ID is inconsistent).	For future validations, the quantity of the biochar produced must be quantified and documented in a reliable manner. Calibrated meters shall be in place. According to 5.3.2 of the Puro Earth biochar methodology, dry mass of the amount of produced biochar shall be calculated using the measured weight of biochar and through deduction of the weight of water that was used as input. Additional measurement equipment for greater accuracy can be proposed by the operator. Comment 16.04.25: To be verified during next validation.	completed
6.06 Instead of relying on objective data (weighing, moisture measurement), conversion from volume to weight relies on volatile means of measurement (bulk density, single analysis instead of average value of multiple analyses).	For future validations, the quantity of the biochar produced must be quantified in a reliable manner. Comment 16.04.25: To be verified during next validation.	completed
6.07 Biomass quantities are tentative because no weighing is practised, neither is the volume measurable by means of truckloads but instead by hours of chipping which is tentative compared to objective means like weighing and moisture measurements. Raw data to assess the correctness of the 'Corresponding amount of biochar transported' is not available. External and internal transport emission calculations are incorrect. Empty return journeys both for solid and chipped wood are not taken into account.	The objectiveness of quantified biomass must be improved, and biomass transport calculation corrected.	31.10.2024
6.08 The use of electricity is not measurable through objective means. The alternative calculation based on nominal output is (1) not representative as it stems from a different setup, and (2) incorrect because the bulk density is not corresponding with the reference analysis AR-23-FR-005124-02.	Please submit a revamped nominal output calculation. Comment 16.04.25: Although the electricity output calculation has not been revamped, this criteria was temporary lifted because of use of renewable energy sources.	completed

8.01 Proof of sustainable management for the 75% of forest biomass has not been submitted.	Please submit proof of sustainable management of forest biomass, for example, by PEFC or FSC certificates or by comparable regional standards or laws. Please provide a clear explanation how the relation between forest and waste biomass has been established.	completed
8.02 The following emissions have not been accounted for: use of the biochar.	Please submit an updated version of the LCA by taking emissions of biochar use into account. Include details on biochar end-use and associated emissions up-to-the-poin of biochar mixing into a mineral matrix. Comment 16.04.25: Emissions from biochar use have been included as a descriptive element into the LCA report but not in quantitative terms. The total emissions for life cycle phase 3 have remained the same. A safety margin of 10% is therefore recommended and has been applied to the output statement.	31.10.2024
8.05 The actual moisture content is unknown due to the lack of moisture measurements.	Proof of frequent moisture measurements must be made available by next audit.	completed
8.06 Except for the distance travelled, no information is given on the sink locations. Raw data is not made available.	Customer details and respective use must be made available for potential random checks, and/or declarations by end users that biochar will not be combusted.	completed
8.08 Disclosure of the consolidated overview of production volume is difficult because production data is not systemized in one reference document and not disclosed batch-wise (mention of the batch ID is inconsistent).	The quantity of the biochar produced must be quantified and documented in a reliable manner. Please submit production data for ba-se-224-1-2 which is clearly allocable to the batch and documented accordingly.	completed

8.09 Biomass quantities are tentative because no weighing is practised, neither is the volume measurable by means of truckloads but instead by hours of chipping which is tentative compared to objective means like weighing and moisture measurements. Raw data to assess the correctness of the 'Corresponding amount of biochar transported' is not available.	The quantity of the biochar produced must be quantified and documented in a reliable manner. Calibrated meters shall be in place. The objectiveness of quantified biomass must be improved. Comment 16.04.25: To be verified during next validation.	completed
8.10 Instead of relying on objective data (weighing, moisture measurement), conversion from volume to weight relies on volatile means of measurement (bulk density, single analysis instead of averaged value of more than one analysis).	For future validations, the quantity of the biochar produced must be quantified in a reliable manner. Comment 16.04.25: To be verified during next validation.	completed
8.11 The use of electricity is not measurable through objective means. The alternative calculation based on nominal output is (1) not representative as it stems from a different setup, and (2) incorrect because the bulk density is not corresponding with the reference analysis AR-23-FR-005124-02.	Please submit a revamped nominal output calculation. Comment 16.04.25: Although the electricity output calculation has not been revamped, this criteria was temporary lifted because of use of renewable energy sources.	completed
8.12 The use of electricity is not measurable through objective means. The alternative calculation based on nominal output is (1) not representative as it stems from a different setup, and (2) incorrect because the bulk density is not corresponding with the reference analysis AR-23-FR-005124-02.	Please submit a revamped nominal output calculation. Comment 16.04.25: Although the electricity output calculation has not been revamped, this criteria was temporary lifted because of use of renewable energy sources.	completed
8.13 Ebiomass is not fully verifiable because calculatory paths are not indicated (diesel to CO2eq for harvesting and chipping). Raw data to assess the correctness of the 'Corresponding amount of biochar transported' is not available. An objective explanation of how the relation between forest and waste biomass has been established is missing.	Please submit a revamped LCA calculation including raw data and calculatory paths.	31.10.2024

8.14 External and internal transport emission calculations for ton km are incorrect. Diesel consumption is given for volume but not for tonnage. Empty return journeys are not accounted for.	Please submit an updated version of the LCA regarding transport emissions.	31.10.2024
8.15 Air emissions of flue gas are measured elsewhere (by Biomacon on a reference plant). It is unknown on which prototype the measurement was done. For EBC, a certificate of emissions measured elsewhere is not valid if a type certification of the relevant technology is lacking, even if the measurement was conducted on the same prototype (non compliance highlighted in the EBC Finfdings report of 04.09.24).	Air emission measurement shall be conducted until next inspection unless type certified and availability of 3 measurements on the same prototype. Comment 16.04.25: To be verified during next validation.	completed

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, 14.05.2025	Brålanda, ...
bio.inspecta AG / q.inspecta GmbH International Department	Nuntorp Gård
	.....
Philipp Seitz	name, first name.....
Auditor	function.....