

Endorsement of System provider under Global Artisan C-Sink

The Global Artisan C-Sink Standard does not exclude any specific low- nor mid-tech methods (chapter 4.3.); however, it mandates that pyrolysis gases must pass through a fire front or combustion chamber before being released into the atmosphere. Biochar produced from traditional charcoal piles and retorts, where pyrolysis gases are emitted without passing through a combustion zone, cannot be certified under the current method. For large TLUDs and retorts equipped with gas combustion, as well as other unlisted types of pyrolysis equipment, an application must be submitted to Carbon Standards for consideration.

This document aims to provide a clear understanding of the steps involved and the requirements needed to obtain the endorsement as System provider for the Global Artisan C-Sink standard by Carbon Standards International.

The endorsement is valid for Global Artisan C-Sink standard and for up to 3 years. As long as there are no major updates or changes to the standard, the System Provider endorsement will be renewed with a re-endorsement audit every year. With every standard update, CSI will define as well, if a more complex re-endorsement is required. However, it is important to note that if there is a major update or revision to the standard, the System provider endorsement may need to be reviewed with a full re-endorsement audit and the System provider itself potentially updated to align with the new version of the standard. This ensures that the endorsement reflects the most current best practices and requirements in the field of pyrolysis technologies under Global Artisan C-Sink.

1. Endorsement process

Step	Description	Responsible party
1	System provider reaches out to Carbon Standards International (CSI) for a first introduction call right here .	System provider
2	The System provider registers for the endorsement process. Registration can be done through this link . With this step the registration fee will be invoiced.	CSI/ System provider
3	An offer for the service is sent out by CSI, signed by the System provider. In addition, an NDA can be signed if wished.	CSI
4	The System provider hands in the requested and required documents for the first phase (detailed flow chart, construction plans, mass balance, sampling plan and methane test plan). Additional videos or pictures can be requested. The information is provided in a report structure.	System provider
5	CSI checks for completeness of the documentation. First evaluation of the general eligibility is done.	CSI
6	Online meeting to understand the system (external experts can be involved) and discussion of the sampling and methane test plan.	CSI/ System provider
7	System provider conducts the methane tests and biochar quality test after the final approval of the test protocols by CSI. The full analysis reports are handed in. The initial report is extended with the new results.	System provider
8	Upon successful completion, the System provider will receive a certificate designating them as an "Endorsed System provider". The System provider will be listed	CSI

Step	Description	Responsible party
	on the website of CSI. After the audit the costs for the endorsement process will be invoiced. If the endorsement is not successful, the System provider has the chance to improve their product and start the endorsement process again. The costs for the endorsement will be invoiced in any case.	

2. General requirements

In the following table, general requirements of Carbon Standards International for System provider are listed. Those aspects are additional to the specific requirements of the Global Artisan C-Sink standard.

Requirement	Description
Detailed flow chart	- A schematic process flow chart of the system - Showing the flow of biochar, additional biomass, exhaust-/flue-/syn- gases, residues
Construction plan	2D or 3D plan of the construction plans
Mass balances	Amount of input (biomass) to amount of output (biochar, heat, biogas)
User/operating manual	A description of how the pyrolysis unit is to be operated ("user manual" incl. precautions relevant to occupational health and safety, e.g. avoidance of flue gas exposure, burns, etc.).
Biochar quality analysis	- A sample plan has to be handed in and approved by CSI before samples are taken. - Complete analysis of biochar from three different biomasses/feedstocks by an CSI EBC/WBC endorsed lab: - C, H, N, O, S + Ash, H/C ratio - pH - Water Holding Capacity - Density @ < 3mm particle size - Electrical Conductivity of the solid biochar 18 EPA PAHs, 8 EFSA PAHs - If there are moving metallic parts in the reactor, these additional elements need to be analyzed: - As, Pb, Cd, Cu, Ni, Hg, Zn, Cr, B, Mn, Ag - The biochar has to fulfil the WBC-Agro criteria
Methane emission measurements	- The methane tests must be done by the Ithaka Institute. Please contact the Ithaka Institute directly for questions and offers. - The methane tests must include at least the following: - Recording values for CO and CxHx (optional: NOx and PM10) - Utilizing the same three different biomasses/feedstocks as used in the biochar quality analysis - Assessing the starting, production, and stopping phases of a load - Methane emissions must be below 30 kg CH₄ per ton of biochar produced.