PURO STANDARD OUTPUT AUDIT REPORT

Orca

Puro Standard General Rules Edition 2023 (Version 3.1 published in 1.6.2023)

Audit Start - End date: 11.6.2025 - 20.6.2025

DNV Project Number: PRJN-981786

DNV Team: Xiangkun Cao, Ali Daoud

Facility ID: 631817

Puro Standard: Geologically Stored Carbon Methodology Edition 2021, V1.1

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Attachments:

ATTACHMENT 1 GSC Compliance Checklist Edition 2023 – v1.1 – Monitoring Period March-April25 - Final

Introduction

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

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Production facility standing data
(PURO General rules 3.1)

General information

Facility unique identity	631817
CO2 Removal Supplier registering the Production Facility	Climeworks AG.
Name	Orca
Location	Nordurvellir 4, 816 Ölfus, Iceland
Date on which the Production Facility became eligible to receive CORCs	01/12/2023
Removal Method(s) for which the plant is eligible to receive CORCs	Geologically Stored Carbon Edition 2021, v1.1
Production Facility has benefited from public support	No
Removal Method specific information as may be specified in the relevant Removal Method specific Methodology	Direct Air Capture and Geologically Stored Carbon

Base for calculations in Output report

Contributions Level 1	**Total over period, tonne CO2-eq**
C captured*	142.85
C loss	0.00
C stored	142.85
E capture	-35.15
E injection**	-0.49
E equipment***	0.00
CORCs	107.21

* C captured is equal to C injected (gross) and therefore includes potential losses from venting or fugitive emissions prior to CO2 injection

** This figure includes energy use while injection system is on standby (not receiving CO2)

*** No emissions were amortized during this monitoring period.

Short description of facility and any exclusions from verification scope observed

The Climeworks Orca facility is a Direct Air Capture plant in Iceland, where CO_2 is captured from the atmosphere using a sorbent. Captured CO_2 is transported and stored through Climeworks' partner, Carbfix. Here, the CO_2 is dissolved in water and injected into the subsurface to achieve permanent storage of CO_2 through rapid in-situ mineralisation. Climeworks AG, as the project applicant, has the relevant contractual agreements in place with all parties involved to ensure ownership of produced CORCs.

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

Contributions		Total over period, tonne CO2-eq
Level 1	**Level 2**	
C stored	C captured*	-142.85
C stored	C loss	0.00
E capture	Energy capture	25.24
E capture	Sorbent	6.75
E capture	Water	3.15
E injection**	Energy storage	0.49
E equipment***	Storage	0.00
E equipment***	Capture	0.00
E equipment***	Transport	0.00
CORCs		107.210
ORC factor (net removed / gross stored)		0.75
Carbon stored (deducting losses)		-142.85
Grey emissions / loss to LCA		35.6

* C captured is equal to C injected (gross) and therefore includes potential losses from venting or fugitive emissions prior to CO2 injection

** This figure includes energy use while injection system is on standby (not receiving CO2)

*** No emissions were amortized during this monitoring period.

Positive indications

- Maintained detailed and organised approach to data management. The people involved in the audit have expertise and detailed understanding of the operations, coupled with strong systems in place throughout.
- Climeworks successfully addressed the minor non-compliance of lost energy meter data during the last audit.
  - Update INC0030221 (during last audit)
  - **Root cause**: These energy meters are located in remote areas. Due to changes made by the local provider to the mobile network, the meters have lost their mobile signal and the data has not been transmitted automatically. Manual reading was necessary.
  - **Corrective measure**: Issue addressed to service provider. Both meters are back online.
  - **Risk management**: Data transmission is regularly checked. The meters can be read manually at any time, no risk of data loss.

Recommendations for improvement

- Climeworks is recommended to conduct interim checks, verifications, or cross-comparisons performed on the meters (IDs 304, 307, 308) between their formal calibration dates to provide ongoing assurance of their accuracy.
    - The Kamstrup Multical 803 meters for cooling water (ID 304, last calibrated 23.10.2020) and heat (ID 307, last calibrated 28.08.2023) are listed with a 144-month (12-year) calibration interval, cited as "according to national regulations." The calibration intervals for the cooling water meter (ID 304, 144 months) and the heat meter (ID 307, 144 months) are notably long (12 years). While stated as being "according to national regulations," such extended intervals for critical measurement devices can increase the risk of undetected measurement drift.
    - Furthermore, the absence of a last calibration date for the electricity capture energy meter (ID 308) is a direct point of concern for compliance. ○ The L&G E650 energy meter designated for measuring electricity capture (ID 308) does not have a "Last calibration / Test" date recorded in the Monitoring Plan

- Climeworks is recommended to conduct internal controls or verification processes in place to ensure the ongoing accuracy and integrity of this ledger for embodied emissions.
    - The "Infrastructure Accounts.csv" 1 contains apparent data entry errors in its amortization table: "Amortization, March 2024" is dated "4/31/2024" (an invalid date), and "Amortization, April 2024" is dated "2024-03-30".1 Such errors raise concerns about the diligence in maintaining this critical accounting ledger.

Audit findings

Detailed findings requiring corrective actions:

No corrective actions were required.

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	