Verification Report
(ISO 14064)

Company: Rhenus Air & Ocean Management GmbH & Co. KG
Client No.: -
Order No.: -

PSB Singapore

Verification Date (on-site):	2023-09-18 - 2023-09-19
Client:	Rhenus Air & Ocean Management GmbH & Co. KG
Street / P.O. box:	Rhenus-Platz 1
Zip Code / State / City:	59439 Holzwickede, Germany
Contact Person Name: Title: Email: Telephone No:	 Juthaporn Srinang Head of Decarbonization Management Juthaporn.Srinang@ap.rhenus.com +66-81-750-7366
Reporting Period:	2022-01-01 to 2022-12-31
GHG Reporting Criteria:	ISO 14064-1:2018 Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals (“ISO 14064-1”)
Verification Standard:	ISO 14064-3:2019 Greenhouse gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements (“ISO 14064-3”)
Report Number: Version No.: Date of Issue:	Rhenus Air & Ocean - 2022 Emissions - Received 2023-08-04 (rev. 2023-12-15)
Scope of verification: Geographical: No. of facilities:	GHG Inventory Cat 1, Cat 2, Cat 3 (purchased logistics) 191/14, CTI Tower, 28th Floor, Ratchadapisek Road, Klongtoey, Bangkok 10110, Thailand 1
No. of sites verified:	1
Technical sector as per IAF MD 14:2014:	-
Verified total emissions (tCO_2e):	885,685.19
Verification opinion:	In TÜV SÜD PSB’s opinion, there is no evidence that the GHG statement: - is not materially correct and is not a fair representation of the GHG data and information; and - has not been prepared in accordance with the related international standard on GHG quantification, monitoring, and reporting.
Verification team:	Timothy Pereira (LV) Anekpong Apithambundit (trainee) Wirada Chairungrueang (trainee) Kenny Lo (trainee) Yin Hui Lai (trainee, off-site)
Independent verifier:	Zhi Xiang Wong

1 INTRODUCTION

TÜV SÜD PSB was engaged by Rhenus Air & Ocean Management GmbH & Co. KG ("Rhenus A&O") to conduct an independent third-party verification of their GHG statement.

1.1 INTENDED USER

This report has been prepared for the organization for the expressed purpose of facilitating the creation of a verified GHG statement.

1.2 GHG INVENTORY CATEGORIES

The following GHG emissions have been verified by TÜV SÜD PSB:

GHG inventory category	Emissions	
Category 1: Direct GHG emissions and removals	6,511.07	tCO_2e
Category 2: Indirect GHG emissions from imported energy	4,313.19	tCO_2e
Category 3: Indirect GHG emissions from transportation	874,860.93	tCO_2e*
Category 4: Indirect GHG emissions from products used by organization	NA	tCO_2e
Category 5: Indirect GHG emissions associated with the use of products from the organization	NA	tCO_2e
Category 6: Indirect GHG emissions from other sources	NA	tCO_2e
Total	885,685.19	tCO_2e

*Emissions derived from purchased logistics only.

2 VERIFICATION METHODOLOGY

2.1 VERIFICATION OBJECTIVES

The overall objective of the verification process was to provide an independent assessment of the GHG emissions report against defined criteria. In particular, the assessment involved the evaluation whether the organization's GHG statement, including monitoring and reporting has been carried out in accordance with the principles and requirements defined by ISO 14064-1 and the specifications presented in the organization's GHG program.

The specific objectives were to:

a) Determine the extent of conformity of the organization's GHG statement with the applicable verification criteria in accordance with ISO 14064-3 meeting the requirements of ISO 14064-1;

b) Assess completeness of the organization's GHG inventory of GHG emissions and removals;

c) Evaluate the organization's GHG information system and its controls/management in preparing its GHG emission report; and

d) Confirm whether the GHG statement is without material discrepancy (and in conformance with regulations), and whether the verification activities provide the level of assurance agreed upon, at the beginning of the verification process.

2.2 LEVEL OF ASSURANCE

The GHG emissions report was verified to a limited level of assurance as agreed upon with the client at the beginning of the verification process.

2.3 GHG REPORTING CRITERIA

The GHG reporting was based on ISO 14064-1.

2.4 VERIFICATION STANDARD

The verification was performed in accordance with ISO 14064-3.

2.5 VERIFICATION SCOPE

Organizational boundaries:

- GHG emission-generating activities from operations across 47 regions globally
- Consolidation approach: Operational control
- Locations:

No.	Region	Total verifiable emissions (tCO_2e)	Sampled
1	Argentina	8.23	
2	Australia	136.07	✓
3	Austria	14,127.14	
4	Belgium	20,693.55	
5	Brazil	10.17	
6	Cambodia	180.95	
7	Canada	2,309.52	
8	Chile	30.78	✓
9	China	18,755.84	✓
10	Croatia	51,681.13	✓
11	Cyprus	1.22	
12	Czech Republic	821.41	
13	France	55.47	
14	Germany	532.09	✓

15	Hong Kong	610.56	
16	India	9,588.01	
17	Indonesia	57.52	
18	Ireland	107.82	
19	Italy	3,832.03	
20	Japan	37.88	
21	Kazakhstan	34,436.41	
22	Malaysia	936.50	
23	Mexico	3.06	
24	Myanmar	1,300.25	
25	Namibia	4.02	
26	Netherlands	2,295.90	
27	New Zealand	62.40	
28	Philippines	211.96	
29	Poland	24,671.04	
30	Portugal	503.68	
31	Romania	25,398.93	
32	Serbia	747.45	
33	Singapore	207.17	
34	Slovenia	39,780.71	
35	South Africa	3,398.03	✓
36	South Korea	3,071.22	
37	Spain	80,683.48	✓
38	Switzerland	5,620.15	
39	Taiwan	74.68	
40	Thailand	4,848.16	✓
41	Turkey	31,882.40	✓
42	United Arab Emirates	21.56	
43	Ukraine	207.20	
44	United Kingdom	2,249.35	
45	United States	445.68	
46	Usbekistan	6,979.00	
47	Vietnam	16.39	
G1	A&O Global (global-level)	481,330.00	✓
G2	Project Logistics (global-level)	10,721.00	✓

Reporting boundaries:

- Type of GHG: CO_2, CH_4, N_2O, and HFCs.
- Reporting period: 2022-01-01 to 2022-12-31
- The emission streams / sources in the operational boundaries included:

Category 1: Direct GHG emissions and removals – (i) Company vehicles, (ii) equipment gas leakage, and (iii) heating & facility fuel use.

Category 2: Indirect GHG emissions from imported energy – (i) Company vehicles (electric), (ii) purchased electricity, and (iii) purchased heat, steam & cooling.

Category 3: Indirect GHG emissions from transportation – (i) Purchased logistics.

2.6 MATERIALITY

The materiality threshold as agreed at the beginning of the verification process is 10% of the aggregated GHG inventory.

2.7 VERIFICATION PROCESS

Verification Activity and Timeline

Main Stages	Activities	Deliverables by TÜV SÜD PSB	Timeline
Pre-engagement assessment	Agreed on engagement terms including type of engagement, level of assurance, scope, criteria, materiality threshold.	Appointment / engagement letter	2023-07-21
Verification planning	Conducted strategic analysis & risk assessment of the facility's operations & GHG document & data. Developed evidence-gathering activities and site visit plan.	Site Visit Plan	2023-08-31
Conducting verification activities	Performed preliminary detailed verification based on emission report.	Action List (Preliminary)	2023-09-17
	Conducted on-site visit check compliance and assess the GHG statements. Raised misstatements.	Action List (Site)	2023-09-18 to 2023-09-19
	Submission of corrective action by clients for issues raised; Followed up on actions taken by client to address misstatements and non-conformities.	Action List (Final)	2024-01-03
Verification Reporting	Reached conclusion & formed opinion, and prepared verification report/statement.	Verification Report & Verification Statement	2024-01-25

3 VERIFICATION TEAM: QUALIFICATIONS, ROLES AND RESPONSIBILITES

The verification team is identified as below:

Name	Role	Responsibilities
Timothy Pereira	Lead Verifier	Conducted verification and prepared verification report
Zhi Xiang Wong	Independent Reviewer	Conducted independent review

Technical Expert (TE):	NIL
Interpreter:	NIL
Observer/Trainee:	Anekpong Apithambundit Wirada Chairungrueang Kenny Lo Yin Hui Lai

4 VERIFICATION STRATEGY, RISK ANALYSIS & SAMPLING PLAN

The verification strategy applied to this verification was combined controls testing and substantive approach (data quality and materiality check). The verification team designed and executed verification procedures using a risk-based approach that focused on both the testing of the client's controls and substantive testing of emission data.

The GHG information has been assessed in terms of completeness, consistency, transparency, relevance, and conservativeness, including origin of the source data and reference documentation. The verification methodology included verifying documentation, confirmation with process owners, observation and interview with GHG representatives' processes and procedures.

The assessment has been carried out focusing on the following aspects:

Aspects	Verification approaches & risk level
Identification of GHG emission sources	Verified GHG emission stream and sources based through on-site visit, check on the layout plants, and interviewing the staff, and confirming of any changes in emission sources from previous year and base year if applicable. Risk Level: Low
Selection and collection of GHG activity data (source data) & other parameters	Assessed the appropriateness and accuracy of the activity data selected and collection and extraction procedure and assessed uncertainty risk. Risk Level: Medium
Selection of GHG emissions estimation and quantification methodologies.	Assessed the GHG estimation and quantification methodologies to confirm its appropriateness. Confirmed if any changes in quantification methodologies from previous

	year and base year if applicable. Risk Level: Low
Selection or development of GHG emission factors	Assessed the GHG conversion / emission factors are based on recognized origins, are appropriate, currently valid, take into account of quantification uncertainty and yield accurate and reproducible results and are consistent with the intended use of the GHG inventory. Confirmed if any changes in source of conversion /emission factors from previous year and base year if applicable. Risk Level: Low
Calculation of GHG emissions	Performed substantive approach (data quality and materiality check) by tracing inventory data to primary source and confirming that collection & extraction process for the activity data from the internal system and calculation and processing of activity data & conversion data for emission report have been performed correctly. Sample sizes have been worked out for each emission streams/sources for data flow & materiality test. Risk Level: Low

4.1 INFORMATION REFERENCE LIST

The information will be updated as necessary as information is evaluated during the review, risk verification and planning stages. The information upon which this review is based has been derived from submitted documentation as following:

Document No.	Title/Description	Issued by	Issued on	Relevance to verification
1	Rhenus Air & Ocean - 2022 Emissions	Rhenus A&O	2023-08-04 (rev. 2023-12-15)	GHG statement
2	Cozero methodology, category and subcategory list, and user manual	Rhenus A&O	2023-08-04	GHG accounting and reporting platform
3	Rhenus Air & Ocean - Business Unit Main Activity	Rhenus A&O	2023-08-04	Facilities and primary operations
4	Rhenus Air & Ocean - Emissions factors - *<region>*	Rhenus A&O	2023	Region-specific GHG emissions and factors
5	Various supporting documents	Rhenus A&O	2023	Facility-level, city-level, and region-

				level supporting evidence
6	Emission factors, conversion factors, and GWP	Cozero	-	GHG emissions calculations

4.2 SITE VERIFICATION PLAN

TÜV SÜD PSB conducted physical site visit of Rhenus A&O's Thailand HQ using the verification plan attached in Annex 1.

4.3 FACTS DISCOVERED AFTER THE VERIFICATION

As part of TÜV SÜD PSB's accredited GHG verification system, TÜV SÜD PSB reserves the right to re-assess the conclusions in this report and potentially reissue the report if any facts about the GHG statement are brought to our attention after the verification.

5 VERIFICATION RESULTS

5.1 REMAINING ISSUES, INCLUDING MATERIAL DISCREPANY, FROM PREVIOUS VERIFICATION

This was the first ISO 14064-1 conducted for Rhenus A&O.

5.2 GHG EMISSION SOURCES

The following GHG emission streams / sources have been identified through checking the layout plans, and interviewing the staff, and confirming of boundaries and changes in emission sources from previous year, if any. The list of emission sources reported has been confirmed to be complete.

Emission stream	Facility	Emission Source	GHG	Included in Emission Report?
Company vehicles	Rhenus A&O	Fuel combustion	CO_2, N_2O, CH_4	☒ Yes ☐ No
Equipment gas leakage	Rhenus A&O	Diesel and gasoline combustion	HFCs	☒ Yes ☐ No
Heating & facility fuel use	Rhenus A&O	Fuel combustion	CO_2, N_2O, CH_4	☒ Yes ☐ No

Purchased electricity	Rhenus A&O	Electricity consumption (indirect)	CO_2, N_2O, CH_4	☒ Yes ☐ No
Purchased heat, steam & cooling	Rhenus A&O	Utilities consumption (indirect)	CO_2, N_2O, CH_4	☒ Yes ☐ No
Purchased logistics	Rhenus A&O	Fuel combustion (indirect)	CO_2, N_2O, CH_4	☒ Yes ☐ No

5.3 GHG INFORMATION AND CONTROLS

There is a dedicated team from Rhenus A&O at the group level to manage GHG documentation, quantification, and reporting processes, and to perform peer review and quality check.

The GHG emissions report developed by Rhenus A&O was verified during the assessment. Refer to below quantification method adopted for the GHG emissions report.

Emission stream/source	Quantification Method	Remarks
Company vehicles	GHG Emission (tCO_2e) = Activity data x EF	Fuel consumption, distance traversed, and spending
Equipment gas leakage	GHG Emission (tCO2e) = Activity data x GWP	Top-up quantity
Heating & facility fuel use	GHG Emission (tCO_2e) = Activity data x EF	Fuel consumption
Purchased electricity	GHG Emission (tCO_2e) = Activity data x EF	Electricity consumption
Purchased heat, steam & cooling	GHG Emission (tCO_2e) = Activity data x EF	District heating and cooling consumption
Purchased logistics	GHG Emission (tCO_2e) = Activity data x EF	Fuel consumption, distance traversed, mass-distance traversed, spending, and storage volume

Rhenus A&O has established GHG inventory operation specification procedures to describe the responsibilities, workflow for collection and checking of activity data, and quantification methodology used.

In addition, GHG emissions inventory was prepared to show the emission data, processing and calculation done. During the site visit, the verifier traced the emissions report and inventory to the primary source. Refer to section 5.4 for the data quality and materiality check.

Representatives for each emissions stream were interviewed and able to demonstrate well data flow collection and checking process. The operational procedures for data measurement,

collection and compilation, quality checks and reviews are available at Rhenus A&O. All the monitored data are archived in electronic or paper form.

In summary, GHG emissions report has been prepared in accordance with Rhenus A&O GHG inventory operation specification and GHG accounting principles and standards. No significant reporting risks have been identified for the data reported.

5.4 DATA QUALITY AND MATERIALITY

The data quality and accuracy of the activity data was verified by reconciling it to source documents. The accuracy of data was verified by tracing inventory data to primary source and confirming that collection & extraction process for the activity data from the internal system and calculation and processing of activity data and conversion data for emission report have been performed correctly. These checks were performed using a risk-based approach in accordance with the sampling plan. Verification activities applied in a limited level of assurance verification are less extensive in nature, timing, and extent than in a reasonable level of assurance verification.

The uncorrected discrepancies, in aggregate, does not exceed the 10% materiality threshold defined in section 2.6.

6 FINDINGS AND CONCLUSION

6.1 SUMMARY OF FINDINGS

A detailed list of findings raised is appended in Annex 2 – Action List. All the corrective actions have been responded by the organization's representative and misstatements have been resolved satisfactorily.

Stage	No. of Misstatements	No. of Clarifications	No. of Recommended Improvements
Preliminary findings	0	0	0
On-site findings	3	0	8

6.2 CONCLUSION

Verification Opinion: There is no evidence that the GHG statement within the period from 2022-01-01 to 2022-12-31, is not materially correct and is not a fair representation of the GHG data and information and has not been prepared in accordance with the related international standard on GHG quantification, monitoring, and reporting.

I, the lead verifier of this abovementioned verification engagement affirm that I conducted the verification in line with TÜV SÜD PSB's ISO 14064-1 GHG Program, which provided us with sufficient evidence to return the above verification opinion.

Lead Verifier Timothy Pereira

Date: 2024-01-23

I, the independent reviewer of this abovementioned verification engagement affirm that I have conducted the independent review in line with TÜV SÜD PSB's ISO 14064-1 GHG Program.

Independent Reviewer: Wong Zhi Xiang

Date: 2024-01-24

Annexes	
Annex 1	Site Visit Plan
Annex 2	Action List
Annex 3	Verification Statement

Copies of the Verification Report go to:

- Client
- Verification team
- Verification Body (iCert)