

溫室氣體查驗聲明書

2022 年溫室氣體排放資訊

台灣氯乙烯工業股份有限公司林園廠

高雄市林園區工業一路 1 號

經本公司依據 ISO 14064-3:2006 完成查驗並符合下列標準要求



ISO 14064-1:2018

直接溫室氣體排放量

126,905.1050 公噸二氧化碳當量

間接溫室氣體排放量

575,139.2957 公噸二氧化碳當量

直接與間接溫室氣體排放量

702,044.401 公噸二氧化碳當量

簽署人

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台灣檢驗科技股份有限公司

新北市五股區(新北產業園區)五工路 136 之 1 號

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【全廠/集團各類別溫室氣體排放量】

單位：公噸二氧化碳當量

報告邊界		溫室氣體排放量
類別	內容說明	
直接溫室氣體排放	彙整組織邊界內由組織擁有或控制的溫室氣體。	126,905.1050
間接溫室氣體排放	輸入能源溫室氣體排放	51,940.8360
	運輸溫室氣體排放	51,499.6121
	組織使用產品溫室氣體排放	471,698.8476
	使用來自於組織產品溫室氣體排放	-----
	其他來源溫室氣體排放	-----
直接與間接溫室氣體總排放量		702,044.401

台灣檢驗科技股份有限公司(以下簡稱SGS), 經與台灣氯乙烯工業股份有限公司林園廠(以下簡稱台氯林園廠), 高雄市林園區工業一路1號, 達成雙邊協議, 依據ISO 14064-3:2006 之要求執行直接與間接溫室氣體排放量之查驗, 溫室氣體排放量涵蓋期間自2022年01月01日至2022年12月31日, 查驗聲明內容說明如下:

角色與責任

台氯林園廠管理階層確保組織溫室氣體資訊系統之發展、紀錄維護及文件化程序已符合標準要求, 負責評估、決定及報告溫室氣體排放量資訊, 並提供支持溫室氣體主張所需之其他資訊給SGS。

SGS 秉持第三方查驗單位之準則, 依據2023年03月27日及2023年10月20日簽訂之雙邊協議、ISO 14064-1:2006、ISO 14064-3:2006 要求, 於2023年05月19日至2023年06月20日期間及2023年10月17日執行溫室氣體排放量查驗活動, 並根據台氯林園廠適用範圍、目標、準則及溫室氣體排放量涵蓋期間自2022年01月01日至2022年12月31日之查驗結果, 提出溫室氣體查驗聲明。

保證等級

GS依據查驗準則及雙邊協議執行查驗程序, 針對台氯林園廠於溫室氣體主張所提類別一及類別二之查驗證據顯示, 未違反實質性差異門檻, 符合主管機關認可之合理保證等級。類別三至六為有限保證等級。

查驗範圍

SGS依據與台氯林園廠之雙邊協議, 確認台氯林園廠組織邊界及營運範圍內之人為活動溫室氣體排放量與相關標準要求之符合性, 根據ISO 14064-3:2006準則提出上述保證聲明涵蓋內容如下:

- 查驗台氯林園廠之 2022 年溫室氣體排放量
- 包含廠區:

廠區	活動範圍地理位置
林園廠	高雄市林園區工業一路 1 號

- 溫室氣體排放源資訊來源為台氯林園廠之盤查資訊
- 排放溫室氣體種類: 二氧化碳(CO₂)、甲烷(CH₄)、氧化亞氮(N₂O)、氫氟碳化物(HFCs)、全氟碳化物(PFCs)、六氟化硫(SF₆)、三氟化氮(NF₃)
- 全球暖化潛勢(GWP)引用 IPCC 2021 第六次評估報告之全球暖化潛勢值
- 排放係數資料庫來源:
 - 直接溫室氣體排放: 行政院環保署溫室氣體排放係數管理表 6.0.4
 - 間接溫室氣體排放:
 - 輸入能源之電力引用經濟部能源局 2023 年公布之 2022 年電力排放係數: 0.495 公斤二氧化碳當量/度計算
 - 二級資料庫引用產品碳足跡資訊網、SimaPro 9.4.0.2 Ecoinvent 3.

- 溫室氣體排放量資訊涵蓋週期：2022 年 01 月 01 日至 2022 年 12 月 31 日
- 盤查清冊版本次：112/10/17
- 盤查報告書版本次：112/10/17
- 查驗聲明之預期使用者：組織自行使用

查驗目標

SGS獨立客觀的取得支持溫室氣體主張揭露資訊的佐證，確保報告資訊符合準確性、完整性、一致性及透明度之準則，其內容包含錯誤或遺漏之項目。

查驗準則

遵守下列相關標準要求執行溫室氣體主張之查驗：

- ISO 14064-1:2018 溫室氣體－第 1 部：組織層級溫室氣體排放與移除之量化及報告附指引之規範

實質性

台氯林園廠定義溫室氣體主張符合性之實質性差異門檻判斷準則為5%，SGS依據此準則確認溫室氣體揭露資訊之遺漏或錯誤程度。

結論

台氯林園廠依據查驗準則要求提出溫室氣體主張，揭露資訊涵蓋期間自2022年01月01日至2022年12月31日，期間溫室氣體排放量為 **702,044.401** 公噸二氧化碳當量及生質燃燒之二氧化碳排放量為 0.0000 公噸二氧化碳當量。SGS採用風險評估方法為基礎，確保並控管溫室氣體排放資訊揭露風險；規劃及執行查驗流程，包含行前評估、取樣計畫、證據之蒐集，取得查驗聲明需要之資訊、說明及相關佐證，確保揭露之溫室氣體排放量準確性。

【全廠/集團各類別溫室氣體排放量】

單位：公噸二氧化碳當量

報告邊界		溫室氣體排放量
類別	內容說明	
直接溫室氣體排放	彙整組織邊界內由組織擁有或控制的溫室氣體。	126,905.1050
間接溫室氣體排放	輸入能源溫室氣體排放	51,940.8360
	運輸溫室氣體排放	51,499.6121
	組織使用產品溫室氣體排放	471,698.8476
	使用來自於組織產品溫室氣體排放	無揭露

其他來源溫室氣體排放	無揭露	-----
直接與間接溫室氣體總排放量		702,044.401

SGS以客觀公正之立場，評估台氯林園廠溫室氣體資訊系統、監督方法及報告程序，溫室氣體排放量涵蓋期間自2022年01月01日至2022年12月31日，依據查驗結果保證其適用範圍、目標及準則之一致性及適切性，針對類別一及類別二提出合理保證而類別三至六為有限保證之查驗聲明，無保留意見之列舉。

SGS根據自身角色及責任，在此聲明溫室氣體主張具實質性、正確性，以及公平性地陳述溫室氣體數據及資訊，並依據ISO 14064-1:2018製備執行溫室氣體量化、監督及報告溫室氣體資訊，本查驗聲明將視為說明台氯林園廠溫室氣體主張之查驗結果。

保密性聲明

此報告及附件可能包含屬於台氯林園廠之機密資訊，未經台氯林園廠書面同意，其他個人、團體或公司禁止自行複製或發行。

利益衝突迴避聲明

此報告及附件內容完全依照主管機關之標準方法與程序等相關規定，秉持公正、誠實進行查驗作業。絕無虛偽不實，如有違反，就政府機構所受損失願負連帶賠償責任之外，並接受主管機關依法令所為之行政處分及刑事處罰。

所有查證人員瞭解如自身受政府機關委任從事公務，亦屬於刑法上之公務員，並瞭解刑法上圖利罰、公務員登載不實偽造公文書及貪污治罪條例之相關規定，如有違反，亦為刑法及貪污治罪條例之適用對象，願受最嚴厲之法律制裁。

本公司與受查驗單位並無財務投資之關係，且符合主管機關對利益衝突迴避之要求。如有違反前述事實情事，經主管機關查證屬實時，此報告及附件內容願接受主管機關判定為無效之處分。

查證團隊

上述聲明係查證團隊依據公正之查驗過程，針對台氯林園廠之 2022 年溫室氣體排放量所提出之聲明。

主導查驗員：

莊典謨

黃文鋒

備註：本查驗聲明遵照 SGS 溫室氣體查驗服務條款要求 http://www.sgs.com/terms_and_conditions.htm，聲明書內容由台灣檢驗科技股份有限公司依據溫室氣體主張之查驗結果進行編製，業經客戶同意後發行。本聲明書非用以解除客戶遵守組織章程、全國或者地方法令，以及任何被發佈國際指南章程之責任；客戶與 SGS 彼此為獨立之個體，客戶非受 SGS 約束，在此 SGS 除客戶之外毋須代表其面對其他組織團體。

Greenhouse Gas Verification Statement

The inventory of Greenhouse Gas emissions in year 2022 of

TAIWAN VCM CORPORATION Lin-Yuan Plant

No.1, Industrial 1st Rd., Lin-Yuan Dist.,
Kaohsiung City, Taiwan, R.O.C.



has been verified in accordance with ISO 14064-3:2006 as
meeting the requirements of

ISO 14064-1:2018

Direct emissions

126,905.1050 tonnes of CO₂e

Indirect emissions

575,139.2957 tonnes of CO₂e

Direct emissions and indirect emissions

702,044.401 tonnes of CO₂e

Authorized by



Stephen Pao

Knowledge Deputy General Manager

Date: 03 November 2023

Version 2

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SGS Taiwan Ltd.

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Statement TW23/00294GG, continued

The emission of each category is described as below:

Unit: tonnes of CO₂e

Reporting Boundaries			GHG Emissions
Inventory categories		Description	
Direct emissions		This direct GHG emissions are the sum of owned or controlled by the organization within the organization.	126,905.1050
Indirect emissions	Imported energy	Imported Electricity and Steam.	51,940.8360
	Transportation	The transportation GHG emissions of raw materials, products , employee commuting and business travel.	51,499.6121
	Products used by an organization	Emmissions from the capital goods purchased and disposal of solid waste.	471,698.8476
	Associated with the use of products from the organization	Unquantified	----
	Other sources	Unquantified	----
Direct emissions and indirect emissions			702,044.401

Statement TW23/00294GG, continued

SGS has been contracted by TAIWAN VCM CORPORATION Lin-Yuan Plant (hereinafter referred to as "TVCM"), No.1, Industrial 1st Rd., Lin-Yuan Dist., Kaohsiung City, Taiwan, R.O.C. for the verification of direct and indirect Greenhouse Gas emissions in accordance with

ISO 14064-3:2006

as provided by TAIWAN VCM CORPORATION Lin-Yuan Plant (hereinafter referred to as "TVCM"), No.1, Industrial 1st Rd., Lin-Yuan Dist., Kaohsiung City, Taiwan, R.O.C., in the GHG Assertion in the form of GHG report covering GHG emissions of the period 01 January 2022 to 31 December 2022.

Roles and responsibilities

The management of TVCM is responsible for the organization's GHG information system, the development and maintenance of records and reporting procedures in accordance with that system, including the calculation and determination of GHG emissions information and the reported GHG emissions.

It is SGS's responsibility to express an independent GHG verification opinion on the GHG emissions as provided in the GHG Assertion for the period 01 January 2022 to 31 December 2022.

SGS conducted a third-party verification of the provided GHG assertion against the principles of ISO 14064-1:2018 and ISO 14064-3:2006 in the period 19 May 2023 to 20 June 2023 and 17 October 2023. The verification was based on the verification scope, objectives and criteria as agreed between TVCM and SGS on 27 March 2023 and 20 October 2023.

Level of Assurance

The level of assurance for category 1 and category 2 agreed is that of reasonable assurance. Category 3 till category 6 agreed is that of limited assurance.

Scope

TVCM has commissioned an independent verification by SGS Taiwan of reported GHG emissions of TVCM arising from manufacture and sell of vinyl chloride monomer (VCM) activities, to establish conformance with ISO 14064:2018 principles within the scope of the verification as outlined below.

This engagement covers verification of emission from anthropogenic sources of greenhouse gases included within the organization's boundary and is based on ISO 14064-3:2006.

Statement TW23/00294GG, continued

- Title or description activities: GHG verification for TVCM in year 2022
- Location/boundary of the activities:
 - No.1, Industrial 1st Rd., Lin-Yuan Dist., Kaohsiung City, Taiwan, R.O.C.
- Physical infrastructure, activities, technologies and processes of the organization: Manufacture and sell of vinyl chloride monomer (VCM)
- GHG sources, sinks and/or reservoirs included: Sources as presented in the inventory spreadsheet provided by TVCM
- Types of GHGs included: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, NF₃, CFCs, HCFCs
- The IPCC 2021 AR6 GWP values are applied in this inventory.
- Emission factor:
 - Direct emissions: Greenhouse Gas Emission Factor Table (6.0.4), EPA.
 - Indirect emissions:
 - Electricity emission factor is 0.495 kgCO₂e/kwh (Announced by Bureau of Energy, Ministry of Economic Affairs in 2023).
 - The secondary database has Carbon Footprint Information Platform, SimaPro 9.4.0.2 Ecoinvent 3 database.
- Directed actions: NA
- GHG information for the following period was verified: 01 January 2022 to 31 December 2022
- The version of inventory sheet: 112/10/17
- The version of GHG assertion: 112/10/17
- Intended user of the verification statement: Private

Objective

The purposes of this verification exercise are, by review of objective evidence, to independently review:

- Whether the GHG emissions are as declared by the organization's GHG assertion
- The data reported are accurate, complete, consistent, transparent and free of material error or omission.

Criteria

Criteria against which the verification assessment is undertaken are the principles of ISO 14064-1:2018.

Materiality

The materiality required of the verification was considered by SGS to 5%, based on the needs of the intended user of the GHG Assertion.

Statement TW23/00294GG, continued

Conclusion

TVCM provided the GHG assertion based on the requirements of ISO 14064-1: 2018. The GHG information for the period 01 January 2022 to 31 December 2022 disclosing emissions of **702,044.401** metric tonnes of CO₂ equivalent and 0.0000 metric tonnes of direct CO₂ emissions from the combustion of biomass are verified by SGS to a reasonable level of assurance, consistent with the agreed verification scope, objectives and criteria.

The emission of each category is described as below:

Unit: tonnes of CO₂e

Reporting Boundaries			GHG Emissions
Inventory categories		Description	
Direct emissions		This direct GHG emissions are the sum of owned or controlled by the organization within the organization.	126,905.1050
Indirect emissions	Imported energy	Imported Electricity and Steam.	51,940.8360
	Transportation	The transportation GHG emissions of raw materials, products , employee commuting and business travel.	51,499.6121
	Products used by an organization	Emmissions from the capital goods purchased and disposal of solid waste.	471,698.8476
	Associated with the use of products from the organization	Unquantified	-----
	Other sources	Unquantified	-----
Direct emissions and indirect emissions			702,044.401

SGS's approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions information and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the organization's reported GHG emissions.

We planned and performed our work to obtain the information, explanations, and evidence that we considered necessary to provide a reasonable level of assurance that the GHG emissions of category 1 and category 2, and limited level of assurance of category 3 till category 6 for the period 01 January 2022 to 31 December 2022 are fairly stated.

Statement TW23/00294GG, continued

We conducted our verification with regard to the GHG assertion of TVCM which included assessment of GHG information system, monitoring and reporting plan/protocol. This assessment included the collection of evidence supporting the reported data, and checking whether the provisions of the protocol reference, were consistently and appropriately applied.

In SGS's opinion the presented GHG assertion

- is materially correct and is a fair representation of the GHG data and information, and
- is prepared in accordance with ISO 14064-1:2018 on GHG quantification, monitoring and reporting.

Confidentiality

The reports and attachments may contain relevantly confidential information of the clients. In addition to being submitted as governmental application or certification documents, the reports and attachments are not allowed to be edited, duplicated, or published without the clients' agreement in written form.

Avoidance of Conflict of Interest

The reports and attachments are completely complied with the standards and procedures that related authorities established. The reports and attachments of auditing process are conduct with fairness and honesty. If not, the auditing institution not only has to bear the relevant compensation duties, but also to receive legal charge and punishment.

This statement shall be interpreted with the GHG assertion of TVCM as a whole.

Verifier Group

Above statements coincide with auditing process with fairness and impartiality and aim at the emission of year 2022 of clients.

Lead Verifier:

Tim Chuang

Wayne Huang

Note: This Statement is issued, on behalf of Client, by SGS Taiwan Ltd. ("SGS") under its General Conditions for Greenhouse Gas Verification Services available at http://www.sgs.com/terms_and_conditions.htm. The findings recorded hereon are based upon an audit performed by SGS. A full copy of this statement, the findings and the supporting GHG Assertion may be consulted at TAIWAN VCM CORPORATION Lin-Yuan Plant, No.1, Industrial 1st Rd., Lin-Yuan Dist., Kaohsiung City, Taiwan, R.O.C., This Statement does not relieve Client from compliance with any bylaws, federal, national or regional acts and regulations or with any guidelines issued pursuant to such regulations. Stipulations to the contrary are not binding on SGS and SGS shall have no responsibility vis-à-vis parties other than its Client.