

溫室氣體查驗意見書

2024 年溫室氣體排放資訊

華夏海灣塑膠股份公司頭份總廠

苗栗縣頭份市田寮里 17 鄰民族路 571 號

經本公司依據 ISO 14064-3:2019 完成查驗，提出經修改之查驗意見，其符合下列標準要求

ISO 14064-1:2018

直接溫室氣體排放量

22,456.6067 公噸二氧化碳當量

間接溫室氣體排放量

375,251.3531 公噸二氧化碳當量

直接與間接溫室氣體總排放量

397,707.960 公噸二氧化碳當量

簽署人



鮑柏宇

管理與保證事業群副總裁

日期: 2025年07月08日

版次:1

TGP56B-15-1 2501

台灣檢驗科技股份有限公司

248016 新北市五股區(新北產業園區)五工路 136 之 1 號

t (02) 22993279 f (02)22999453 www.sgs.com



Validation and Verification

VB002

【全廠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		固定燃燒直接排放	21,434.2217
		移動燃燒直接排放	302.5101
		工業製程直接製程排放及移除	144.2692
		人為系統中溫室氣體釋放產生直接逸散排放	575.6057
		土地利用變更和森林直接排放和移除	0.0000
間 接 溫 室 氣 體 排 放	輸入能源溫室氣體排放	外購電力	68,172.6994
	運輸溫室氣體排放	原物料上游運輸，包含陸運與海運 原物料下游運輸，包含陸運與海運 員工通勤，包含小客車、機車、火車、接駁車與捷運 商務旅行，包含小客車、公車、火車、飛機、捷運與高鐵	12,377.3912
	組織使用產品溫室氣體排放	資本財與原燃物料採購，包含電力間接上游、自來水、瓦斯、汽柴油、天然氣、氯乙烯單體等 使用服務，包含廢棄物清理與運輸	277,880.3684
	使用來自於組織產品溫室氣體排放	下游壓注/注塑/射出、延押/押出/擠出、發泡射出、氯化鈣生產等製程	16,820.8941
	其他來源溫室氣體排放	非顯著	--
直接與間接溫室氣體總排放量			397,707.960

台灣檢驗科技股份有限公司(以下簡稱SGS)，針對華夏海灣塑膠股份公司頭份總廠(以下簡稱華夏海灣頭份總廠)，苗栗縣頭份市民族路 571 號，依據ISO 14064-3:2019之要求執行直接與間接溫室氣體排放量之查驗，查驗意見內容說明如下：

角色與責任

- 華夏海灣頭份總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。
- 簽約時間：SGS 秉持第三方查驗單位之準則，依據 2024 年 12 月 17 日簽訂雙邊協議
- 查驗準則：
 - 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
- 查驗期間：2025 年 02 月 04 日至 2025 年 02 月 20 日

查驗範圍

- 溫室氣體排放量資訊涵蓋週期：2024 年 01 月 01 日至 2024 年 12 月 31 日
- 包含廠區：

廠區	活動範圍地理位置
華夏海灣頭份總廠	苗栗縣頭份市田寮里 17 鄰民族路 571 號

- 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：環境部公告「溫室氣體排放係數」(113.02.05)
 - 間接溫室氣體排放：
 - 輸入能源之電力排放係數引用經濟部能源署 2025 年公布之 2024 年電力排碳係數: 0.474 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 9.5.0.0-Ecoinvent 3.0。
- 保證等級：依據查驗準則及雙邊協議執行查驗程序，針對華夏海灣頭份總廠於溫室氣體聲明所提查驗證據顯示
 - 類別一及類別二之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。
- 實質性差異門檻判斷準則：5%
- 盤查清冊版本：1140625，結案版
- 盤查報告書版本：2025 年 07 月 02 日，第六版
- 查驗意見之預期使用者：組織自行使用

查驗目標

SGS獨立客觀的取得支持溫室氣體聲明揭露資訊的佐證，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。

結論

SGS 採用以風險評估為基礎之方法，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，取得查驗意見需要之資訊、說明及相關佐證，確保溫室氣體聲明中的現場溫室氣體排放量無實質的錯誤聲明。

- 查驗數據結果：
 - 溫室氣體總排放量為 397,707.960 公噸二氧化碳當量
 - 生質燃燒之二氧化碳排放量為 0.0000 公噸二氧化碳當量。

【全廠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			固定燃燒直接排放	21,434.2217
			移動燃燒直接排放	302.5101
			工業製程直接製程排放及移除	144.2692
			人為系統中溫室氣體釋放產生直接逸散排放	575.6057
			土地利用變更和森林直接排放和移除	0.0000
間接溫室氣體排放	輸入能源溫室氣體排放	外購電力	68,172.6994	
	運輸溫室氣體排放	原物料上游運輸，包含陸運與海運 原物料下游運輸，包含陸運與海運 員工通勤，包含小客車、機車、火車、接駁車與捷運 商務旅行，包含小客車、公車、火車、飛機、捷運與高鐵	12,377.3912	
	組織使用產品溫室氣體排放	資本財與原燃物料採購，包含電力間接上游、自來水、瓦斯、汽柴油、天然氣、氯乙烯單體等 使用服務，包含廢棄物清理與運輸	277,880.3684	
	使用來自於組織產品溫室氣體排放	下游壓注/注塑/射出、延押/押出/擠出、發泡射出、氯化鈣生產等製程	16,820.8941	
	其他來源溫室氣體排放	非顯著	--	
	直接與間接溫室氣體總排放量		397,707.960	

- 查驗意見：SGS 根據下述狀況，提出經修改之查驗意見。
 - 查驗者有充分且適當的證據支持實質的排放量、移除量或儲存。
 - 查驗者針對實質的排放量、移除量或儲存採取適當的準則。
 - 當查驗者擬依賴相關管制時，管制之有效性已經過評估。
 - 查驗者採用 ISO 14064-1:2018 準則，經查驗有以下發現事項，然經調整修正後，無產生實質性錯誤。
 - 部分排放源之活動數據存在缺漏或期間不完整，包括宿舍用電、天然氣消耗及氯乙烯單體 (VCM)數據等，且個別設備之校正係數異動後未即時更新。
 - 部分燃料（柴油、天然氣、液化石油氣）之低位熱值及排放係數，尚未依據環境部 113 年最新版指引修正。
 - 部分上游間接排放及廢棄物處理缺少相關佐證。
 - 保留限制：無

保密性聲明

此報告及附件可能包含屬於華夏海灣頭份總廠之機密資訊，未經華夏海灣頭份總廠書面同意，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、誠實之原則進行查驗作業。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。

所有查驗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，並瞭解刑法上圖利罪、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。

Greenhouse Gas Verification Opinion

The inventory of Greenhouse Gas emissions in year 2024 of
**China General Plastics Corporation
Toufen Plant**

No. 571, Minzu Rd., Toufen City Miaoli County 351494, Taiwan (R.O.C.)

has been verified in accordance with ISO 14064-3:2019 as
meeting the requirements of

ISO 14064-1:2018

Opinion Type: Modified

Direct emissions

22,456.6067 tonnes of CO₂e

Indirect emissions

375,251.3531 tonnes of CO₂e

Direct emissions and indirect emissions

397,707.960 tonnes of CO₂e

Authorized by



Stephen Pao

Business Assurance Director

Date: 08 July 2025

Version 1

TGP56B-15-1 2501

SGS Taiwan Ltd.

No. 136-1, Wu Kung Road, New Taipei Industrial Park,

Wu Ku District, New Taipei City 248016, Taiwan

t (02) 22993279 f (02)22999453 www.sgs.com



Validation and Verification

VB002

The emission of each category is described as below:

Unit: tonnes of CO₂e

Reporting Boundaries			GHG Emissions
Inventory categories		Description	
Direct emissions		Direct emissions from stationary combustion	21,434.2217
		Direct emissions from mobile combustion	302.5101
		Direct process emissions and removals from industrial processes	144.2692
		Direct fugitive emissions arise from the release of GHGs in anthropogenic systems	575.6057
		Direct emissions and removals from land use, land use change and forestry	0.0000
Indirect emissions	Imported energy	Purchased electricity	68,172.6994
	Transportation	Upstream transportation of raw materials, including land and sea transport. Downstream transportation of raw materials, including land and sea transport. Employee commuting, including passenger cars, motorcycles, trains, shuttle buses, and metro systems. Business travel, including passenger cars, buses, trains, airplanes, metro systems, and high-speed rail.	12,377.3912
	Products used by an organization	Capital goods and procurement of fuels and raw materials, including upstream emissions of electricity, tap water, liquefied petroleum gas (LPG), gasoline, diesel, natural gas, and vinyl chloride monomer (VCM). Use of services, including waste disposal and transportation.	277,880.3684
	Associated with the use of products from the organization	Downstream processing, including injection molding, extrusion, foam injection molding, and calcium chloride production.	16,820.8941
	Other sources	Not significant.	--
Direct emissions and indirect emissions			397,707.960

SGS has been contracted for the verification of direct and indirect Greenhouse Gas emissions in accordance with

ISO 14064-3:2019

as provided by China General Plastics Corporation Toufen Plant (hereinafter referred to as "CGPC"), No. 571, Minzu Rd., Toufen City Miaoli County 351494, Taiwan (R.O.C.), in the GHG Statement in the form of GHG report.

Roles and responsibilities

- The management of CGPC 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.
- The verification was based on the verification scope, objectives and criteria as agreed on 17 December 2024.
- Verification Criteria: ISO 14064-1:2018
- Verification Period: 04 February 2025 to 20 February 2025.

Scope

- Location/boundary of the activities:
 - No. 571, Minzu Rd., Toufen City Miaoli County 351494, Taiwan (R.O.C.)
- Types of GHGs included: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, NF₃
- The IPCC 2021 AR6 GWP values are applied in this inventory.
- Emission factor:
 - Direct emissions: Greenhouse Gas Emission Factor, MOENV (2024.02.05).
 - Indirect emissions:
 - Electricity emission factor is 0.474 kgCO₂e/kwh (Announced by Energy Administration, Ministry of Economic Affairs in 2025).
 - The secondary database has Carbon Footprint Information Platform, SimaPro 9.5.0.0-Ecoinvent 3.0.

- 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.
- Materiality : 5%
- The version of inventory sheet: 1140625
- The version of GHG statement: 1140702, Ver 6
- Intended user of the verification opinion: 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 statement
- The data reported are accurate, complete, consistent, transparent and free of material error or omission.

Conclusion

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 the GHG emissions are free from material misstatement.

- The greenhouse gas emissions is 397,707.960 metric tonnes of CO₂ equivalent
- The emissions from the combustion of biomass is 0.0000 metric tonnes of CO₂ equivalent

The emission of each category is described as below:

Unit: tonnes of CO₂e

Reporting Boundaries			GHG Emissions
Inventory categories		Description	
Direct emissions		Direct emissions from stationary combustion	21,434.2217
		Direct emissions from mobile combustion	302.5101
		Direct process emissions and removals from industrial processes	144.2692
		Direct fugitive emissions arise from the release of GHGs in anthropogenic systems	575.6057
		Direct emissions and removals from land use, land use change and forestry	0.0000
Indirect emissions	Imported energy	Purchased electricity	68,172.6994
	Transportation	Upstream transportation of raw materials, including land and sea transport. Downstream transportation of raw materials, including land and sea transport. Employee commuting, including passenger cars, motorcycles, trains, shuttle buses, and metro systems. Business travel, including passenger cars, buses, trains, airplanes, metro systems, and high-speed rail.	12,377.3912
	Products used by an organization	Capital goods and procurement of fuels and raw materials, including upstream emissions of electricity, tap water, liquefied petroleum gas (LPG), gasoline, diesel, natural gas, and vinyl chloride monomer (VCM). Use of services, including waste disposal and transportation.	277,880.3684
	Associated with the use of products from the organization	Downstream processing, including injection molding, extrusion, foam injection molding, and calcium chloride production.	16,820.8941
	Other sources	Not significant.	--
Direct emissions and indirect emissions			397,707.960

- The opinion of SGS is modified in accordance with the following described circumstances.
 - The verifier has sufficient and appropriate evidence to support the material emissions, removals, or storage.
 - The verifier applies appropriate criteria for the material emissions, removals, or storage.
 - When the verifier intends to rely on relevant controls, the effectiveness of those controls has been assessed.
 - The verifier, applying the ISO 14064-1:2018 standard, presents the following findings. After adjustments and corrections, no material errors were identified.
 - Some emission sources have missing or incomplete activity data, including dormitory electricity consumption, natural gas usage, and vinyl chloride monomer (VCM) data. In addition, calibration coefficient adjustments for certain equipment were not updated promptly.
 - Certain fuels (diesel, natural gas, liquefied petroleum gas) have lower heating values (LHV) and emission factors that do not fully comply with the Ministry of Environment's 2024 GHG Inventory Guidelines.
 - Some upstream indirect emissions and waste treatment parameters also lack clear supporting evidence.
- Retention Limitation: NA

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 conducted 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 opinion shall be interpreted with the GHG statement of CGPC as a whole.

Verifier Group

Above opinions coincide with auditing process with fairness and impartiality and aim at the emission of year 2024 of clients.

Lead Verifier:

Long Lin

Verifier:

William Li

Chih Yuan Kuo

Note: This opinion 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 opinion, the findings and the supporting GHG Statement may be consulted at China General Plastics Corporation Toufen Plant, No. 571, Minzu Rd., Toufen City Miaoli County 351494, Taiwan (R.O.C.). This opinion 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.