

## 溫室氣體查驗意見

2023 年溫室氣體排放資訊

## 久裕興業科技股份有限公司

台灣台中市大雅區昌平路四段 462 巷 9 號

經本公司依據 ISO 14064-3:2019 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

175.9656 公噸二氧化碳當量

間接溫室氣體排放量

31,069.1435 公噸二氧化碳當量

直接與間接溫室氣體總排放量

31,245.109 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

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TGP56B-15-1 2404

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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查驗意見編號 TW24/00623GG,接續

【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		所在地基準	市場基準
直接溫室氣體排放	固定燃燒直接排放		5.0729	
	移動燃燒直接排放		50.3238	
	工業製程直接製程排放及移除		75.2264	
	人為系統中溫室氣體釋放產生直接逸散排放		45.3426	
	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	3678.1197	905.5167
	運輸溫室氣體排放	<ul style="list-style-type: none"> <li>上游運輸產生的排放(主要原料運輸、組立原料運輸、製程委外加工運輸)</li> <li>下游產品運輸配送產生的排放(成品運輸)</li> <li>商務旅行產生的排放(高鐵、飛機)</li> <li>廢棄物運輸產生的排放</li> </ul>	9,739.9659	
	組織使用產品溫室氣體排放	<ul style="list-style-type: none"> <li>外購能源其上游資源開採階段的排放(電力、汽油、柴油)</li> <li>採購商品產生的排放(主原料、加工原料、自來水)</li> <li>廢棄物處置產生的排放</li> <li>上游資產租賃使用產生的排放(租賃販賣機冷媒)</li> </ul>	17,020.5070	
	使用來自於組織產品溫室氣體排放	下游資產租賃產生的排放(出租廠房用電)	630.5509	
	其他來源溫室氣體排放	無顯著排放源	-	
直接與間接溫室氣體總排放量			31,245.109	28,472.506
再生能源憑證認購資訊				
廠區/地域	憑證來源	再生能源類別/地域(國家)	輸入能源溫室氣體排放量	
			所在地基準	市場基準
深圳廠/中國	I-REC	風力/中國	2,772.6030	0.0000



查驗意見編號 TW24/00623GG,接續

【各公司/廠區各類別溫室氣體排放量】

單位：公噸二氧化碳當量

公司/廠區	直接溫室氣體排放量	間接溫室氣體排放量		溫室氣體 排放量總和
	類別一	類別二	類別三~六	
台灣廠	106.7756	658.1468	786.8778	1,551.800
深圳廠	61.5607	2,772.6030	23,975.7245	26,809.888
泰州廠	7.6293	247.3699	2,628.4215	2,883.421



## 查驗意見編號 TW24/00623GG,接續

台灣檢驗科技股份有限公司(以下簡稱SGS)，經與久裕興業科技股份有限公司(以下簡稱久裕興)，台灣台中市大雅區昌平路四段462巷9號，達成雙邊協議，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

- 久裕興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 2023 年 9 月 18 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：2024 年 8 月 1 日至 2024 年 8 月 20 日

## 查驗範圍

- 溫室氣體排放量資訊涵蓋週期：2023 年 1 月 1 日至 2023 年 12 月 31 日
- 包含廠區：

廠區	活動範圍地理位置
總公司-臺灣廠	工廠-臺灣台中市大雅區西寶里昌平路四段 462 巷 9 號 行銷暨研發中心-臺灣台中市大雅區西寶里昌平路四段 508 號
深圳廠(久裕交通器材(深圳)有限公司)	中國深圳市寶安區石岩街道水田第三工業區創業路 12 號
泰州廠(久裕精密工業(泰州)有限公司)	中國江苏省泰州市高港区高新技术产业园区创新大道南侧 38 号

- 排放溫室氣體種類：二氧化碳(CO<sub>2</sub>)、甲烷(CH<sub>4</sub>)、氧化亞氮(N<sub>2</sub>O)、氫氟碳化物(HFCs)、全氟碳化物(PFCs)、六氟化硫(SF<sub>6</sub>)、三氟化氮(NF<sub>3</sub>)
- 全球暖化潛勢(GWP)引用 IPCC 2021 第 6 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：溫室氣體排放係數管理表 6.0.4 版
  - 間接溫室氣體排放：
    - 輸入能源之台灣電力排放係數引用經濟部能源局 2024 年公布之 2023 年電力排碳係數：0.494 公斤二氧化碳當量/度計算
    - 輸入能源之中國電力排放係數引用中国生态环境部公布之 2022 年全国电网平均排放因子：0.5703 公噸二氧化碳當量/千度計算
    - 二級資料庫引用產品碳足跡資訊網、高鐵官網、SimaPro 9.5.0.0、SimaPro 9.4.0.3、中国产品全生命周期温室气体排放系数库(2022)(CPCD 2.0)。



- 保證等級：依據查驗準則及雙邊協議執行查驗程序，針對久裕興於溫室氣體聲明所提查驗證據顯示  
總公司-臺灣廠
  - 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。深圳廠/泰州廠
  - 依據查驗準則及雙邊協議執行查驗程序，針對深圳廠/泰州廠之溫室氣體聲明，給予有限保證等級。
- 實質性差異門檻判斷準則：5%
- 盤查清冊版本次：240801V1
- 盤查報告書版本次：台灣廠-2024/8/20 V2；深圳廠/泰州廠-2024/8/20 V1
- 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 31,245.109 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



查驗意見編號 TW24/00623GG,接續

【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		固定燃燒直接排放	5.0729
		移動燃燒直接排放	50.3238
		工業製程直接製程排放及移除	75.2264
		人為系統中溫室氣體釋放產生直接逸散排放	45.3426
		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	3,678.1197
	運輸溫室氣體排放	<ul style="list-style-type: none"><li>上游運輸產生的排放(主要原料運輸、組立原料運輸、製程委外加工運輸)</li><li>下游產品運輸配送產生的排放(成品運輸)</li><li>商務旅行產生的排放(高鐵、飛機)</li><li>廢棄物運輸產生的排放</li></ul>	9,739.9659
	組織使用產品溫室氣體排放	<ul style="list-style-type: none"><li>外購能源其上游資源開採階段的排放(電力、汽油、柴油)</li><li>採購商品產生的排放(主原料、加工原料、自來水)</li><li>廢棄物處置產生的排放</li><li>上游資產租賃使用產生的排放(租賃販賣機冷媒)</li></ul>	17,020.5070
	使用來自於組織產品溫室氣體排放	下游資產租賃產生的排放(出租廠房用電)	630.5509
	其他來源溫室氣體排放	無顯著排放源	-
	直接與間接溫室氣體總排放量		31,245.109



查驗意見編號 TW24/00623GG, 接續

## 【各公司/廠區各類別溫室氣體排放量】

單位：公噸二氧化碳當量

公司/廠區	直接溫室氣體排放量	間接溫室氣體排放量		溫室氣體 排放量總和
	類別一	類別二	類別三~六	
台灣廠	106.7756	658.1468	786.8778	1,551.800
深圳廠	61.5607	2,772.6030	23,975.7245	26,809.888
泰州廠	7.6293	247.3699	2,628.4215	2,883.421

- 於 2023 年共認購 5,800 張再生能源憑證，其輸入能源溫室氣體排放之地域基準排放量及市場基準排放量，分別如下表所示：

單位：公噸二氧化碳當量

再生能源憑證認購資訊				
廠區/地域	憑證來源	再生能源類別/地域(國家)	輸入能源溫室氣體排放量	
			所在地基準	市場基準
深圳廠/中國	I-REC	風力/中國	2,772.6030	0.0000

- 查驗意見：SGS 根據下述狀況，提出修正後無保留意見之查驗意見。
  - 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。
    - 已提供適當證據支持經修正意見。
    - 活動數據已依據支持證據進行修訂。
- 保留限制：無



**保密性聲明**

此報告及附件可能包含屬於久裕興之機密資訊，未經久裕興書面同意，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。

**查驗團隊**

上述意見係查驗團隊依據公正之查驗過程所提出之意見。

主導查驗員：

曾偉編

查驗員：

湯程凱

備註：本查驗意見遵照 SGS 溫室氣體查驗服務條款要求 [http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm)，意見內容由台灣檢驗科技股份有限公司依據溫室氣體聲明之查驗結果進行編製，業經客戶同意後發行。本查驗意見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 Opinion

The inventory of Greenhouse Gas emissions in year 2023 of

**Joy Industrial Co., LTD**

No. 9, Ln. 462, Sec. 4, Changping Rd., Daya Dist., Taichung City, Taiwan (R.O.C.)

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

**ISO 14064-1:2018**

Direct emissions

**175.9656** tonnes of CO<sub>2</sub>e

Indirect emissions

**31,069.1435** tonnes of CO<sub>2</sub>e

Direct emissions and indirect emissions

**31,245.109** tonnes of CO<sub>2</sub>e



Authorized by



Stephen Pao

Business Assurance Director

Date: 05 October 2024

Version 1

TGP56B-15-1 2404

SGS Taiwan Ltd.

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

New Taipei City 24803, Taiwan

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# Opinion TW24/00623GG, continued

The emission of each category is described as below:

Unit: tonnes of CO<sub>2</sub>e

Reporting Boundaries			GHG Emissions	
Inventory categories	Description		Location-based	Market-based
Direct emissions	Direct emissions from stationary combustion		5.0729	
	Direct emissions from mobile combustion		50.3238	
	Direct process emissions and removals from industrial processes		75.2264	
	Direct fugitive emissions arise from the release of GHGs in anthropogenic systems		45.3426	
	Direct emissions and removals from land use, land use change and forestry		0.0000	
Indirect emissions	Imported energy	Indirect GHG emissions from electricity purchased by an organization	3,678.1197	905.5167
	Transportation	<ul style="list-style-type: none"> <li>Emissions generated from upstream transportation (transportation of main raw materials, transportation of assembly materials, outsourced processing transportation)</li> <li>Emissions generated from downstream product transportation and distribution (finished product transportation)</li> <li>Emissions generated from business travel (high-speed rail, airplanes)</li> <li>Emissions generated from waste transportation</li> </ul>	9,739.9659	
	Products used by an organization	<ul style="list-style-type: none"> <li>Emissions from the resource extraction stage of purchased energy (electricity, gasoline, diesel)</li> <li>Emissions generated from the procurement of goods (primary raw materials, processed raw materials, tap water)</li> <li>Emissions generated from waste disposal</li> <li>Emissions generated from the use of upstream leased assets (refrigerants in leased vending machines)</li> </ul>	17,020.5070	



# Opinion TW24/00623GG, continued

Reporting Boundaries			GHG Emissions	
Inventory categories		Description	Location-based	Market-based
	Associated with the use of products from the organization	Emissions generated from the leasing of downstream assets (electricity usage in rented factories)	630.5509	
	Other sources	No significant emission sources	-	
Direct emissions and indirect emissions			31,245.109	28,472.506
Purchased Renewable Energy Certificate(s) Information				
Site/Location	Type	Renewable Energy Source/Location	Imported energy emissions	
			Location-based	Market-based
Shenzhen Plant /China	I-REC	Wind / China	2,772.6030	0.0000

The emission of each site is described as below:

Unit: tonnes of CO<sub>2</sub>e

Site	Direct emissions	Indirect emissions		Total GHG emissions
	Category 1	Category 2	Category 3~6	
Taiwan Plant	106.7756	658.1468	786.8778	1,551.800
Shenzhen Plant	61.5607	2,772.6030	23,975.7245	26,809.888
Taizhou Plant	7.6293	247.3699	2,628.4215	2,883.421



## Opinion TW24/00623GG, continued

SGS has been contracted by Joy Industrial Co., LTD (hereinafter referred to as "JOY-TECH"), No. 9, Ln. 462, Sec. 4, Changping Rd., Daya Dist., Taichung City, Taiwan (R.O.C.) for the verification of direct and indirect Greenhouse Gas emissions in accordance with

**ISO 14064-3:2019**

as provided by Joy Industrial Co., LTD (hereinafter referred to as "JOY-TECH"), No. 9, Ln. 462, Sec. 4, Changping Rd., Daya Dist., Taichung City, Taiwan (R.O.C.), in the GHG Statement in the form of GHG report.

**Roles and responsibilities**

- The management of JOY-TECH 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 between JOY-TECH and SGS on 18 September 2023.
- Verification Criteria: ISO 14064-1:2018
- Verification Period: 1 August 2024 to 20 August 2024.

**Scope**

- GHG information for the following period was verified: 01 January 2023 to 31 December 2023
- Location/boundary of the activities:
  - No. 9, Ln. 462, Sec. 4, Changping Rd., Daya Dist., Taichung City, Taiwan (R.O.C.)
  - No. 508, Sec. 4, Changping Rd., Daya Dist., Taichung City, Taiwan (R.O.C.)
  - No. 12, Chuangye Road, Shuitian Third Industrial Zone, Shiyan Street, Baoan District, Shenzhen City, Guangdong Province, China
  - No. 38, South Side of Innovation Avenue, High-tech Industrial Park, Gaogang District, Taizhou City, Jiangsu Province, China
- Types of GHGs included: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>, NF<sub>3</sub>
- The IPCC 2021 AR6 GWP values are applied in this inventory.



## Opinion TW24/00623GG, continued

- Emission factor:
  - Direct emissions: Greenhouse Gas Emission Factor Table (6.0.4).
  - Indirect emissions:
    - Electricity emission factor of Taiwan is 0.494 kgCO<sub>2</sub>e/kwh (Announced by Energy Administration, Ministry of Economic Affairs in 2023).
    - Electricity emission factor of China is 0.5703 tonCO<sub>2</sub>e/mwh (Announced by Ministry of Ecology and Environment of China in 2022).
    - The secondary database has Carbon Footprint Information Platform, high-speed rail website, SimaPro 9.5.0.0, SimaPro 9.4.0.3, China's Product Life Cycle Greenhouse Gas Emission Factor Database (2022) (CPCD 2.0).
- Taiwan Plant: 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.
- Shenzhen Plant / Taizhou Plant: The level of assurance agreed is limited assurance.
- Materiality : 5%
- The version of inventory sheet: 240801V1
- The version of GHG statement: Taiwan Plant-2024/8/20 V2 ; Shenzhen Plant / Taizhou Plant-2024/8/20 V1
- 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 31,245.109 metric tonnes of CO<sub>2</sub> equivalent
- The emissions from the combustion of biomass is 0.0000 metric tonnes of CO<sub>2</sub> equivalent



# Opinion TW24/00623GG, continued

The emission of each category is described as below:

Unit: tonnes of CO<sub>2</sub>e

Reporting Boundaries		GHG Emissions
Inventory categories	Description	
Direct emissions	Direct emissions from stationary combustion	5.0729
	Direct emissions from mobile combustion	50.3238
	Direct process emissions and removals from industrial processes	75.2264
	Direct fugitive emissions arise from the release of GHGs in anthropogenic systems	45.3426
	Direct emissions and removals from land use, land use change and forestry	0.0000
Indirect emissions	Imported energy	3,678.1197
	Transportation	9,739.9659
	Products used by an organization	17,020.5070



# Opinion TW24/00623GG, continued

Reporting Boundaries			GHG Emissions
Inventory categories		Description	
	Associated with the use of products from the organization	Emissions generated from the leasing of downstream assets (electricity usage in rented factories)	630.5509
	Other sources	No significant emission sources	-
Direct emissions and indirect emissions			31,245.109

The emission of each site is described as below:

Unit: tonnes of CO<sub>2</sub>e

Site	Direct emissions	Indirect emissions		Total GHG emissions
	Category 1	Category 2	Category 3~6	
Taiwan Plant	106.7756	658.1468	786.8778	1,551.800
Shenzhen Plant	61.5607	2,772.6030	23,975.7245	26,809.888
Taizhou Plant	7.6293	247.3699	2,628.4215	2,883.421

JOY-TECH purchased 5,800 Renewable Energy Certificate(s) in 2023. The imported energy emissions by location-based and market-based approach shown as the following table :

Unit: tonnes of CO<sub>2</sub>e

Purchased Renewable Energy Certificate(s) Information				
Site/Location	Type	Renewable Energy Source/Location	Imported energy emissions	
			Location-based	Market-based
Shenzhen Plant / China	I-REC	Wind / China	2,772.6030	0.0000



## Opinion TW24/00623GG, continued

- 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.
    - Adequate evidence has been provided to support the amended opinions.
    - The activity data has been revised based on 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 JOY-TECH as a whole.



# Opinion TW24/00623GG, continued

## Verifier Group

Above opinions coincide with auditing process with fairness and impartiality and aim at the emission of year 2023 of clients.

Lead Verifier:

Victor Tseng

Verifier:

kyle Tang.

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](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 Assertion may be consulted at Joy Industrial Co., LTD, No. 9, Ln. 462, Sec. 4, Changping Rd., Daya Dist., Taichung City, 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.