

Independent Assurance Opinion

Verification Opinion No.:
C670835-2023-AG-TWN-DNV

Issued date:
07 March, 2024

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This is to verify initiate reporting of Greenhouse Gas Inventory Management Report (2023) of

GlobalWafers Co., Ltd. Zhunan Plant

Scope of Verification

DNV Business Assurance (DNV) has been commissioned by GlobalWafers Co., Ltd. Zhunan Plant ('the Organization') to perform a verification of the greenhouse gas statements of Greenhouse Gas Inventory Management Report (2023) (hereafter the "Inventory Report") in Taiwan, ROC with respect to the sites listed in Appendix A.

The Reporting Boundary for the verification including direct GHG emissions and removals, indirect GHG emissions from imported energy, indirect GHG emissions from transportation, indirect GHG emissions from products used by the Organization and indirect GHG emissions associated with the use of products from the Organization. The further descriptions for the Reporting Boundary is listed in Appendix B.

Verification Criteria and GHG Programme

The verification was performed on the basis of ISO 14064-1:2018 as well as criteria given to provide for consistent GHG emission identification, calculation, monitoring and reporting.

The verification was conducted in accordance with ISO 14066:2011, ISO 14065:2020, ISO14064-3:2019.

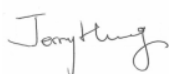
Verification Opinion

It is DNV's opinion that the Inventory Report (2023), which was published on 10 January, 2024(ver. 1), is free from material discrepancies in accordance with the verification criteria identified as stated above. The opinion is decided based on the following approaches,

- For the Direct (Category 1) and Indirect GHG emissions from imported energy (Category 2), the reliability of the information within the Inventory Report (2023) were verified with reasonable level of assurance.
- For the other indirect GHG emissions, the involved information was tested using agreed-upon procedures, AUP, defined in Inventory Report.

Also, the GHG information as stated in Appendix B and C has been verified during the process.

Chien Yi Jerry Huang
GHG Verifier



Place and date:
Taipei, 07 March, 2024

For the issuing office:
DNV Business Assurance Co., Ltd.
29Fl., No. 293, Sec. 2, Wenhua Rd.,
Banqiao District, New Taipei City 220,
Taiwan



Management Representative

Supplement to Verification Opinion

Process and Methodology

The reviews of the Inventory Report and relevant documents, and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

Quantification of Greenhouse Gas Emission

The Inventory Report covering the period 1st January, 2023 to 31st December, 2023, it is DNV's opinion that GHG emissions and removals identified within the Reporting Boundary has been included in the Inventory Report as claimed in accordance with the verification criteria identified as stated above, and results in quantification of GHG emissions that are real, transparent and measurable.

Organizational Boundary of Verification

☐ Financial Management Control ☒ Operational Management Control ☐ Equity Share

GHGs Verified

☒ CO₂ ☒ CH₄ ☒ N₂O ☒ HFCs ☒ PFCs ☒ SF₆ ☒ NF₃

The Quantification of GHG emissions in Direct and Indirect Emission Source:

Category	Direct and indirect GHG emissions categorization*	Emissions and removals verified, tonnes CO ₂ -e
1	Direct emissions and removals**	257.0693
2	Indirect GHG emissions from imported energy	21,026.4397
<i>Total greenhouse gas emissions and removals in Category 1 & 2</i>		21,283.5090
3	Indirect GHG emissions from transportation	507.1208
4	Indirect GHG emissions from products used by the Organization	23,166.9209
5	Indirect GHG emissions associated with the use of products from the Organization	-
<i>Total greenhouse gas emissions and removals in Category 3,4 & 5</i>		23,674.0417

*: Unless other indicated, the Indirect Emissions was calculated based on 2022 electricity emission factor of 0.495 kg CO₂-e/kwh, which was announced by Bureau of Energy, Ministry of Economic Affairs. The Global Warming Potential (GWP) defined in IPCC AR6 (2021) has been choose and correctly referred by the Organization.

** :the details subcategory of each category could be refer later in the Report.

Verification Opinion

☒ unmodified
☐ modified
☐ adverse

Appendix A to Verification Opinion No. C670835-2023-AG-TWN-DNV

APPENDIX A

The greenhouse gas statements of GlobalWafers Co., Ltd. Zhunan Plant Greenhouse Gas Inventory Management Report (2023) with respect to the following sites:

Site	Address
GlobalWafers Co., Ltd. Zhunan Plant	No. 21, Kezhong Rd., Zhunan Township, Miaoli County, Taiwan (R.O.C.)

APPENDIX B

The Reporting Boundary of GlobalWafers Co., Ltd. Zhunan Plant Greenhouse Gas Inventory Management Report (2023)

Category	Reporting Boundary	Report
Direct GHG emissions and removals	Stationary Combustion	Emergency generator sets
	Mobile Combustion	Vehicles owned by the organization
	Process Activities	NA
	Direct Fugitive Emissions	wastewater, fire extinguisher, coolant emission from air conditioners and refrigerators
	Land use, Land use change	Non-applicable
Indirect GHG emissions from imported energy	The amount of greenhouse gas emissions produced by the input of electricity .	Imported Electricity
Indirect GHG emissions from transportation	-Upstream transportation and distribution-the greenhouse gas emissions emitted during the transportation of the spare parts and consumables on-board supplies purchased.	80% purchased goods transportation
	-Downstream transportation and distribution-the greenhouse gas emissions emitted during the transportation of the spare parts and consumables on-board supplies purchased.	Products (Wafer)
	-Emissions from employee commuting include emissions -Employee commuting includes vehicles and motorcycles or public transportation.	High speed rail, Taiwan Railway, highway bus carrier, city bus carrier, automobile, scooter
	-Emissions from customer and visitor transport	NA
	-Emissions from business travel -Employee travel includes land, sea, and air transportation, such as domestic travel by high-speed rail travel transportation, highway bus travel transportation, Taiwan railway travel transportation, automobile travel.	International business travel by Air
Indirect GHG emissions from products used by the Organization	-Emissions from purchased goods	Upstream Emissions of 80% Raw Material
	-Emissions from capital goods	Not significant
	-Emissions from the production of purchased	Upstream emissions from

	energy (electricity and oil), but not included in Categories 1 and 2.	purchased electricity (including transportation) Upstream emissions of boiler natural gas (including transportation) Forklift diesel upstream emissions (including transport) Upstream emissions of motor gasoline (including transport)
	-Emissions from disposal of solid and liquid waste	Waste disposal (excluding transportation) Waste - Clearance Transport Recycling Transportation
	-Emissions from asset usage-the annual greenhouse gas emissions of category 1 and 2 generated by leasing assets of other businesses.	Not significant
Indirect GHG emissions associated with the use of products from the Organization	-Emissions or removals from the use stage of the product include the total expected lifetime emissions from all relevant products sold.	Not significant

The scope of other indirect emissions (other than Imported Energy with specified/limited list of sources) was defined by *GlobalWafers Co., Ltd. Zhunan Plant's* own pre-determined criteria for significance of indirect emissions, considering the intended use of the GHG inventory.

APPENDIX C

For direct emissions and removals, quantified separately for each GHG as below, in tonnes of CO₂-e :

GHG type	GHG Emission (ton CO ₂ -e)							
	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Total
Total	53.1317	24.2504	0.3496	179.3376	-	-	-	257.0693
%	20.67%	9.43%	0.14%	69.76%	0.000%	0.000%	0.000%	100.000%

Indirect emission-Imported energy emission :

Consumption(kWh)	Emission Factor	Unit	Emission (ton CO ₂ e)
42477656	0.4950000000	kg CO ₂ e/ kWh	21,026.4397

報告編號：(TH24-317 / 第 1 版)

溫室氣體查證報告意見書
THGHG24317-00

查證範圍： 環球晶圓股份有限公司-竹南二廠
苗栗縣竹南鎮頂埔里科北五路 8 號 1 樓、3 樓

查證準則： ISO 14064-1：2018

查證目標： 法標國際 (AFNOR ASIA) 根據 ISO14064-3：2019 標準，確認上述組織之溫室氣體聲明(溫室氣體盤查報告書)依據雙方協議之查證準則進行盤查並提出報告，AFNOR 以客觀公正的立場及原則(相關性、完整性、一致性、準確性、透明度)執行查證。

數據期間： 2024 年 1 月 1 日至 2024 年 12 月 31 日 (檢視的數據為歷史性質)

查證數據： 直接溫室氣體排放量(類別 1)： 426.9452 公噸 CO₂e
能源間接溫室氣體排放量(類別 2)： 2,518.6706 公噸 CO₂e
間接溫室氣體排放量(類別 3~6)： 563.4519 公噸 CO₂e

全球暖化潛勢值(GWP)：引用 IPCC 2021 年第 6 次評估報告。

聲明依據：本聲明必須與下列文件作為一個整體以進行解釋說明。

溫室氣體盤查報告 (版次： 3 ; 日期： 2025 年 2 月 26 日)

溫室氣體盤查清冊 (版次： 3 ; 日期： 2025 年 2 月 26 日)

實質性： 5% (類別 1 及類別 2)

意見類型： ☒ 不含保留意見 ☐ 含保留意見(請見附頁) ☐ 放棄簽發

查證結論： 確認組織依據雙方協議查證準則之要求提出溫室氣體聲明，並公正地呈現溫室氣體數據及相關資訊，與雙方協議的查證範圍、目標和準則一致。
聲明盤查數據之合理保證等級為類別 1 及類別 2。

本文件核發日期： 2025 年 03 月 20 日

APPROVED BY



Steven Huang
Director for Certification
ON BEHALF OF
AFNOR ASIA

113-2024/00

報告編號：(TH24-317 / 第 1 版)

各類別排放量數據：

類別	內容說明	溫室氣體排放量 (公噸 CO ₂ e)	備註
(類別 1) 直接溫室氣體排放	製程排放源、逸散性排放源	426.9452	
(類別 2) 輸入能源之間接溫室氣體排放	電力	2,518.6706	所在地基準
(類別 3) 運輸之間接溫室氣體排放	原物料上游運輸、員工通勤	22.3111	
(類別 4) 組織使用的產品之間接溫室氣體排放	購買產品、廢棄物處理	541.1408	
(類別 5) 使用組織的產品之間接溫室氣體排放	NS	NS	
(類別 6) 其他來源之間接溫室氣體排放	NS	NS	

生質燃燒排放： 0.0000 公噸 CO₂e

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其他查證相關資訊

組織邊界：	營運控制權
溫室氣體類型：	二氧化碳(CO ₂)、甲烷(CH ₄)、氧化亞氮(N ₂ O)、氫氟碳化物(HFCs)、全氟碳化物(PFCs)、六氟化硫(SF ₆)、三氟化氮(NF ₃)
預期使用目的：	自願理解溫室氣體排放狀況做為減量策略依據。 (本聲明責任僅適用於上述預期使用目的，不適用其他任何目的。)
間接排放重大性準則：	- 已鑑別利害相關者要求： <input checked="" type="checkbox"/> 是 <input type="checkbox"/> 否 - 已鑑別法規要求： <input type="checkbox"/> 是 <input checked="" type="checkbox"/> 否 - 已鑑別排放量大小： <input type="checkbox"/> 是 <input checked="" type="checkbox"/> 否 - 其他說明：
電力係數：	引用 2024 年 04 月 26 日能源署公告之 2023 年度電力係數
數據來源：	<input checked="" type="checkbox"/> 初級數據來源於現場營運活動的數據蒐集。 <input checked="" type="checkbox"/> 類別 3~6 排放量計算為使用估算數據。 次級數據來源為：環境部產品碳足跡資訊網 <input type="checkbox"/> 其他說明：
查證方法	<input checked="" type="checkbox"/> 現場查證
保留意見：	無
其他：	無
查證作業實施日期：	ST1 2025 年 01 月 16 日 ST2 2025 年 01 月 23 日
報告日期：	2025 年 01 月 23 日



Certificate

Certificat

報告編號：(TH24-317 / 第 1 版)

查證團隊與技術審查

主導查證員： 湯鈞堯

簽名：湯鈞堯

查證員： 王登源

簽名：王登源

查證員： 蕭名財

簽名：蕭名財

獨立審查者： 陳怡靜

簽名：陳怡靜

查證程序

AFNOR 以風險評估方法及管制為基礎，證據蒐集程序包括：行前評估、現場訪視、與場址的人員訪談、確認所提供的文件證據、對排放數據進行抽樣、評估數據管理系統、確認排放數據的蒐集與彙總、生產與能源消耗之間的分析，並確認所參考的協議條款是否被適當應用。

角色與職責

受查組織責任方依據查證準則規定，負責準備並提出溫室氣體聲明。此項責任包括規劃、實施及維護與溫室氣體聲明有關的數據管理系統，溫室氣體盤查清冊和盤查報告確認。

AFNOR 對所報告的溫室氣體排放量提供獨立的第三方查證，出具本次查證組織型溫室氣體排放量之查證意見。查證團隊具獨立及公正性，不存在任何利益衝突。