

Independent Assurance Opinion

Verification Opinion No.:
C593693-2022-AG-TWN-DNV

Issued date:
20 June, 2023

Page 1 of 2

This is to verify initiate reporting of Greenhouse Gas Inventory Management Report (2022) of

GlobalWafers Co., Ltd. Hsinchu Plant

Scope of Verification

DNV Business Assurance (DNV) has been commissioned by GlobalWafers Co., Ltd. Hsinchu Plant ('the Organization') to perform a verification of the greenhouse gas statements of Greenhouse Gas Inventory Management Report (2022) (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 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 (2022), which was published on 29 March, 2023(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 (2022) 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.

GHG Verifier
Lin Carlos



Place and date:

Taipei, 20 June, 2023

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, 2022 to 31st December, 2022, it is DNV's opinion that 100% 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 and removals 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**	205.0014
2	Indirect GHG emissions from imported energy	6,242.9868
<i>Total greenhouse gas emissions and removals in Category 1 & 2</i>		6,447.9882
3	Indirect GHG emissions from transportation	435.7864
4	Indirect GHG emissions from products used by the Organization	10,813.0474
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>		11,248.8338

*: Unless other indicated, the Indirect Emissions was calculated based on 2021 electricity emission factor of 0.509 kg CO₂-e/kwh, which was announced by Bureau of Energy, Ministry of Economic Affairs. The Global Warming Potential (GWP) defined in IPCC AR5 (2013) 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. C593693-2022-AG-TWN-DNV

APPENDIX A

The greenhouse gas statements of GlobalWafers Co., Ltd. Hsinchu Plant Greenhouse Gas Inventory Management Report (2022) with respect to the following sites:

Site	Address
GlobalWafers Co., Ltd. Hsinchu Plant	No. 8, Gongye E. 2nd Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)

APPENDIX B

The Reporting Boundary of GlobalWafers Co., Ltd. Hsinchu Plant Greenhouse Gas Inventory Management Report (2022)

Category	Reporting Boundary	Report
Direct GHG emissions and removals	Stationary Combustion	Emergency generator sets
	Mobile Combustion	Official car
	Process Activities	Non-applicable
	Direct Fugitive Emissions	Septic tank, fire extinguisher, air conditioner, ice water host, refrigerator and water dispenser
	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 .	Electricity Use
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.	Raw material, consumables, logistic
	-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	Non-applicable
	-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 Air Travel Transportation

Indirect GHG emissions from products used by the Organization	-Emissions from purchased goods	Upstream Emissions of Raw Material
	-Emissions from capital goods	Not significant
	-Emissions from the production of purchased energy (electricity and oil), but not included in Categories 1 and 2.	Upstream emissions from 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. Hsinchu 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	5.6914	31.5723	0.1473	167.5904	-	-	-	205.0014
%	2.776%	15.401%	0.072%	81.751%	0.000%	0.000%	0.000%	100.000%

Indirect emission-Imported energy emission :

Consumption(kWh)	Emission Factor	Unit	Emission (ton CO ₂ e)
12,265,200	0.5090000000	kg CO ₂ e/ kWh	6,242.9868

Greenhouse Gas Verification Statement

The inventory of Greenhouse Gas emissions in year 2021 of

GlobalWafers Co., Ltd.
Hsinchu HQ

No. 8. Industrial E. Rd. II, Hsinchu Science Park
Hsinchu 30075, 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

197.1317 tonnes of CO₂e

Indirect emissions

29,247.9922 tonnes of CO₂e

Direct emissions and indirect emissions

29,445.124 tonnes of CO₂e

Authorized by

David Huang

Senior Director

Date: 18 April 2022

Version 1

TGP56A-15-6 2103

SGS Taiwan Ltd.

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Statement TW22/00082GG, continued

The emission of each category is described as below:

Unit: tonnes of CO₂e

Reporting Boundaries		GHG Emissions	
Inventory categories	Description		
Direct emissions		197.1317	
Indirect emissions	Imported energy	Imported Electricity 8,518.5384	
	Transportation	Upstream transportation and distribution for raw material (at least 80% of the total spend)	212.8888
		Business travel (overseas business travel flights only)	194.4468
		Employee commuting	162.5138
		Downstream transportation and distribution for sold products	0.0000
	Products used by an organization	Purchased goods (at least 80% of the total spend)	18384.5846
		Fuel- and energy- related activities (not included in category 1 or category 2)	1,567.4797
		Transportation and treatment for waste generated in operations.	207.5401
	Associated with the use of products from the organization	NA	--
	Other sources	NA	--
Direct emissions and indirect emissions		29,445.124	

SGS has been contracted by GlobalWafers Co., Ltd. (hereinafter referred to as “GlobalWafers”), No. 8. Industrial E. Rd. II, Hsinchu Science Park Hsinchu 30075, Taiwan, R.O.C. for the verification of direct and indirect Greenhouse Gas emissions in accordance with

ISO 14064-3:2006

as provided by GlobalWafers Co., Ltd. Hsinchu HQ (hereinafter referred to as “GlobalWafers Hsinchu”) · No. 8. Industrial E. Rd. II, Hsinchu Science Park Hsinchu 30075, Taiwan, R.O.C., in the GHG Assertion in the form of GHG report covering GHG emissions of the period 01 January 2021 to 31 December 2021.

Roles and responsibilities

The management of GlobalWafers Hsinchu 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 2021 to 31 December 2021.

SGS conducted a third party verification of the provided GHG assertion against the principles of ISO 14064-1:2018, ISO 14064-3:2006 in the period 07 March 2022 to 22 March 2022. The verification was based on the verification scope, objectives and criteria as agreed between GlobalWafers and SGS on 15 November 2021.

Level of Assurance

The level of assurance for category 1 and category 2 agreed is that of reasonable assurance.

Scope

GlobalWafers has commissioned an independent verification by SGS Taiwan of reported GHG emissions of GlobalWafers Hsinchu arising from the manufacture of silicon ingots, silicon wafer, silicon diffused wafer, polished wafers 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 TW22/00082GG, continued

- Title or description activities: GHG verification for GlobalWafers Hsinchu in year 2021
- Location/boundary of the activities:
 - No. 8. Industrial E. Rd. II, Hsinchu Science Park Hsinchu 30075, Taiwan, R.O.C.
- Physical infrastructure, activities, technologies and processes of the organization: The manufacture of silicon ingots, silicon wafer, silicon diffused wafer, polished wafers
- GHG sources, sinks and/or reservoirs included: Sources as presented in the inventory spreadsheet provided by GlobalWafers Hsinchu
- Types of GHGs included: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, NF₃
- The IPCC 2013 AR5 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 0.502 kgCO₂e/kwh (Announced by Bureau of Energy, Ministry of Economic Affairs in 2021).
 - The secondary database has Carbon Footprint Calculation Platform, SimaPro 9.0.0.41 Ecoinvent 3, DoITPro(2017).
- Directed actions: NA
- GHG information for the following period was verified: 01 January 2021 to 31 December 2021
- The version of inventory sheet: V1(1110321)
- The version of GHG assertion: V1, 2022/03/21
- 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.

Conclusion

GlobalWafers Hsinchu provided the GHG assertion based on the requirements of ISO 14064-1: 2018. The GHG information for the period 01 January 2021 to 31 December 2021 disclosing emissions of 29,445.124 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.	197.1317	
Indirect emissions	Imported energy	Imported Electricity	8,518.5384
	Transportation	Upstream transportation and distribution for raw material (at least 80% of the total spend)	212.8888
		Business travel (overseas business travel flights only)	194.4468
		Employee commuting	162.5138
		Downstream transportation and distribution for sold products	0.0000
		Purchased goods (at least 80% of the total spend)	18384.5846
	Products used by an organization	Fuel- and energy- related activities (not included in category 1 or category 2)	1,567.4797
		Transportation and treatment for waste generated in operations.	207.5401
		Associated with the use of products from the organization	NA
	Other sources	NA	--
Direct emissions and indirect emissions		29,445.124	

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 for the period 01 January 2021 to 31 December 2021 are fairly stated.

We conducted our verification with regard to the GHG assertion of GlobalWafers Hsinchu 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 ISO14064-1:2018 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 GlobalWafers Hsinchu as a whole.

Statement TW22/00082GG, continued

Verifier Group

Above statements coincide with auditing process with fairness and impartiality, and aim at the emission of year 2021 of clients.

Lead Verifier:

Emma Kao

Verifier:

Steve Hsieh

Hans Lin

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 GlobalWafers Co., Ltd. Hsinchu HQ, No. 8. Industrial E. Rd. II, Hsinchu Science Park Hsinchu 30075, 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.