

# Independent Assurance Opinion

Verification Opinion No.:  
C662674-2023-AG-TWN-DNV

Issued date:  
05 March, 2024

Page 1 of 2

This is to verify initiate reporting of Greenhouse Gas Inventory Management Report (2023) 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 (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 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 February 6, 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.

Po-Chien Tai  
GHG Verifier



Place and date:  
Taipei, 05 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 1<sup>st</sup> January, 2023 to 31<sup>st</sup> 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

☒ CO<sub>2</sub> ☒ CH<sub>4</sub> ☒ N<sub>2</sub>O ☒ HFCs ☒ PFCs ☒ SF<sub>6</sub> ☒ NF<sub>3</sub>

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 <sub>2</sub> -e
1	Direct emissions and removals**	233.3744
2	Indirect GHG emissions from imported energy	4,384.6942
Total greenhouse gas emissions and removals in Category 1 & 2		4,618.0686
3	Indirect GHG emissions from transportation	539.7099
4	Indirect GHG emissions from products used by the Organization	8,997.2268
5	Indirect GHG emissions associated with the use of products from the Organization	-
Total greenhouse gas emissions and removals in Category 3,4 & 5		9,536.9367

\*: Unless other indicated, the Indirect Emissions was calculated based on 2022 electricity emission factor of 0.495 kg CO<sub>2</sub>-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 to Verification Opinion No. C662674-2023-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 (2023)

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 CO<sub>2</sub>-e :

GHG type	GHG Emission (tonnes CO <sub>2</sub> -e)							
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Total
Total	3.0365	21.9116	0.0681	208.3582	-	-	-	233.3744

# 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, ISO 14064-3:2019.

### 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 1<sup>st</sup> January, 2022 to 31<sup>st</sup> 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

☒ CO<sub>2</sub> ☒ CH<sub>4</sub> ☒ N<sub>2</sub>O ☒ HFCs ☒ PFCs ☒ SF<sub>6</sub> ☒ NF<sub>3</sub>

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 <sub>2</sub> -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 &amp; 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 &amp; 5</i>		11,248.8338

\*: Unless other indicated, the Indirect Emissions was calculated based on 2021 electricity emission factor of 0.509 kg CO<sub>2</sub>-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 CO<sub>2</sub>-e :*

GHG type	GHG Emission (ton CO <sub>2</sub> -e)							
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	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 <sub>2</sub> e)
12,265,200	0.5090000000	kg CO <sub>2</sub> e/ kWh	6,242.9868