

# Independent Verification Opinion

**Verification Opinion No.:**  
C683518-2023-AG-TWN-DNV

**Issued Place:**  
Taipei

**Issued Date:**  
12 August, 2024

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

## PEGATRON CORPORATION

### Scope of Verification

DNV Business Assurance (DNV) has been commissioned by PEGATRON CORPORATION ('PEGATRON' or 'the Company') to perform a verification of the greenhouse gas statements of Greenhouse Gas Inventory Management Report (2023) (hereafter the "Inventory Report") with respect to the twenty-one sites listed in Appendix A

The Reporting Boundary for the verification including direct GHG emissions and removals, indirect GHG emissions from imported energy and other indirect GHG emissions. The scope of indirect emissions, other than Imported Energy with specified/limited list of sources, was defined by PEGATRON's own pre-determined criteria for significance of indirect emissions, considering the intended use of the GHG inventory. 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 Inventory Report, refer to Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate Accounting and Reporting Standard developed by WRI and WBCSD, categorizes scope 3 emissions into 15 distinct categories.

The verification was conducted in accordance with ISO 14066:2011, ISO 14065:2020 and ISO 14064-3:2019.

### Verification Statement

It is DNV's opinion that the Inventory Report (2023), which was published in July 2024, is free from material discrepancies in accordance with the verification criteria identified as stated above. The reliability of the information within the Inventory Report (2023) were verified with a specific level of assurance as listed below.

- 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 verified and tested using agreed-upon procedures, AUP, defined in Inventory Report.

Hsiantin Tim Kuo  
GHG Verifier



Place and date:  
Taipei, 12 August, 2024

For the issuing office:  
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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. The Inventory Report correctly complies with the requirement of ISO 14064-1:2018.

### 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 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 Control  Operational Control  Equity Share

### GHGs Verified

CO<sub>2</sub>  CH<sub>4</sub>  N<sub>2</sub>O  HFC<sub>s</sub>  PFC<sub>s</sub>  SF<sub>6</sub>  NF<sub>3</sub>

The Quantification of GHG emissions and removals in Direct and Indirect Emission from Imported Energy Source:

Category	tonnes CO <sub>2</sub> -e*
1. Direct GHG emissions and removals	33,097.7028
2. Indirect GHG emissions from imported energy	364,454.0744
<i>Summation</i>	397,551.7772

\*: Unless other indicated, the Indirect Emissions related to Taiwan sites were calculated based on 2023 electricity emission factor of 0.494 kg CO<sub>2</sub>-e/kwh, which was announced by Energy Administration, Ministry of Economic Affairs. The Global Warming Potential (GWP) defined in IPCC AR6 (2021) has been choose and correctly referred by the Organization.

The greenhouse gas statements of PEGATRON CORPORATION Greenhouse Gas Inventory Management Report (2023) with respect to each site were verified as listed in Appendix A.

The Quantification of other indirect emissions:

Other Indirect Emissions Category**	tonnes CO <sub>2</sub> -e
1a. Purchased goods and services, Production-related procurement	4,298,740
1b. Purchased goods and services, Non-production-related procurement	71,165
2. Capital goods	96,230
3. Fuel- and energy-related emissions	148,164
4. Upstream transportation and distribution	1,109,912
5. Waste generated in operations	30
6. Business travel	3,675
7. Employee commuting	22,940
8. Upstream leased assets	Not Quantified
9. Downstream transportation and distribution	2,051,689
10. Processing of sold products	1,199
11. Use of sold products	2,323,039
12. End-of-life treatment of sold products	99
13. Downstream leased assets	11,899
14. Franchises	Not Quantified
15. Investments	2,644
<i>Summation</i>	10,141,424

\*\* :the details subcategory and quantification methodology of each category could be refer later in the APPENDIX B.

### Verification Opinion

unmodified  modified  adverse

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## APPENDIX A

The greenhouse gas assertion for direct GHG emissions and removals and indirect GHG emissions from imported energy of PEGATRON CORPORATION Greenhouse Gas Inventory Management Report (2023) with respect to the following sites:

No.	Site	Location	Direct GHG emissions and removals verified, tonnes CO2e	Indirect GHG emissions from imported energy verified, tonnes CO2e <sup>2</sup>	Total Electricity consumed in each site		Renewable Electricity self-generated or purchased <sup>1</sup>				Indirect GHG emissions from imported energy calculated, tonnes CO2e <sup>4</sup>
					in kWh	Percentage, %	Self-generated or purchased, kWh	i-REC or GEC certificate purchased, kWh	Ratio to total electricity consumption, %	GHG avoidance, tonnes CO2e <sup>3</sup>	
1	HQ	TWN	220.1370	8,886.8467	18,011,578	2.5%	22,010	-	0.003%	-	8,886.8467
2	PTY	TWN	165.6946	15,687.9753	31,757,035	4.4%	-	-	-	-	15,687.9753
3	PXD	TWN	1.8898	1,637.9064	3,315,600	0.5%	-	-	-	-	1,637.9064
4	PSH	CHN	15,371.8859	37,356.1678	179,051,656	24.7%	147,041,055 <sup>5</sup>	-	20.299%	-	37,356.1678
5	PKS	CHN	10,189.3306	100,154.0282	171,382,204	23.7%	4,085,440	105,832,000	15.174%	58,927.2576	41,226.7706
6	PSZ	CHN	3,251.0959	88,336.4275	144,381,728	19.9%	457,334	30,542,000	4.279%	17,005.7856	71,330.6419
7	Cotek	CHN	1.3628	9,546.4497	15,148,144	2.1%	-	-	-	-	9,546.4497
8	Casetek	CHN	583.3952	13,562.9114	24,358,677	3.4%	-	8,046,000	1.111%	4,480.0128	9,082.8986
9	PCQ	CHN	1,020.7871	12,708.6849	22,824,506	3.2%	-	6,160,000	0.850%	3,429.8880	9,278.7969
10	Kaichuan	CHN	49.3034	2,226.6905	3,999,085	0.6%	-	-	-	-	2,226.6905
11	PMX	MEX	448.0482	8,203.5083	18,729,471	2.6%	-	-	-	-	8,203.5083
12	PCZ	CZK	61.8069	621.6052	2,103,910	0.3%	-	-	-	-	621.6052
13	PTB	IDN	944.0232	16,604.0553	21,410,774	3.0%	-	-	-	-	16,604.0553
14	PHP	VNM	87.1782	2,530.8464	4,007,674	0.6%	-	-	-	-	2,530.8464
15	PVN	VNM	328.1774	17,134.8229	27,133,528	3.7%	-	3,933,000	0.543%	2,483.6895	14,651.1334
16	PTI	IND	276.2659	27,751.4612	33,719,880	4.7%	-	32,400,000	4.473%	26,665.2000	1,086.2612
17	PJ	JPN	-	334.6387	732,251	0.1%	-	-	-	-	334.6387
18	PKR	KOR	9.5963	119.2773	249,482	0.0%	-	-	-	-	119.2773
19	PSG	SGP	0.9046	120.8647	296,237	0.0%	-	-	-	-	120.8647
20	PAU	AUS	-	335.6584	459,806	0.1%	-	-	-	-	335.6584
21	PTSI	USA	86.8197	593.2474	1,300,404	0.2%	-	-	-	-	593.2474
			33,097.7028	364,454.0744	724,373,631	100.0%	151,605,839	329,695,640	46.7%	112,991.83	251,462.2409

Note:

- The Company avoids carbon emissions from electricity consumptions of related site in 2023 by,
  - self-generating renewable electricity 8,823,199 kWh in HQ, PSH, PKS and PSZ, and purchasing 142,782,640 kWh renewable energy electricity in PSH, which equal 151,605,839 kWh renewable electricity consumed and reduced 64,880.37 tonnes CO2e emission in 2023,
  - purchasing 186,913,000 kWh renewable energy with its I-RECs or GEC certificate, which equal in total to avoiding 112,991.83 tonnes CO2e emission in 2023.
- Indirect GHG emissions from imported energy, indicated as the result from location-based approach in the Report.
- GHG avoidance was calculated by using the number of i-REC or GEC certificate purchased multiplied by emission factors announced by relevant authority in each site, following announced criteria in the Report.
- Indirect GHG emissions from imported energy calculated, indicated as the result from market-based approach in the Report, by deducted the GHG avoidance from the indirect GHG emissions from imported energy as mentioned in Note 2, following announced criteria in the Report.
- The total renewable electricity consumed in PSH, 147,041,055 kWh, as the summation due to solar self-generated electricity, 4,258,415 kWh and the renewable electricity, with pre-determined emission factor indicated in the certificate provided, purchased from specific contracted local power plant provider, 142,782,640 kWh.

## APPENDIX B

*The Reporting Boundary of scope 3 emissions refer to Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate Accounting and Reporting Standard for PEGATRON CORPORATION Greenhouse Gas Inventory Management Report (2023):*

Due to the limitation of data accessibility and different production type of each site, not all the data from each site was included in the Reporting Boundary. The involvement of the data from each site within this verification shown as below,

No.	Category	HQ	PTY	PXD	PSH	PKS	PSZ	Cotek	Casetek	PCQ	taichuan	PTB	PHP	PVN	PTI	PMX	PCZ	PJ	PKR	PSG	PAU	PTSI	
1a.	Purchased goods and services, Production-related	√			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
1b.	Purchased goods and services, Non-Production-related	√			√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
2.	Capital goods	√			√	√	√	√	√	√	√	√	√	√	√	√	√					√	√
3.	Fuel- and energy-related emissions	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
4.	Upstream transportation and distribution	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√							√
5.	Waste generated in operations				√	√	√	√	√	√	√												
6.	Business travel	√	√	√	√	√	√	√	√	√	√	√			√								
7.	Employee commuting	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√			
9.	Downstream transportation and distribution	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√							√
10.	Processing of sold products		√		√	√	√	√	√	√	√	√	√	√	√		√						
11a.	Use of sold products	√					√	√					√	√									
12.	End-of-life treatment of sold products	√																					
13.	Downstream leased assets				√	√	√																
15.	Investments	√																					

The Reporting Boundary and methodology used for the quantification and the results of each category of scope 3 emissions for PEGATRON CORPORATION shown as below,

No.	Category	Reporting Boundary and Methodology applied	GHG emissions, tonnes CO2e
1	Purchased goods and services	1a.: Production-related procurement <ul style="list-style-type: none"> <li>Report all upstream (i.e. cradle to gate) emissions from production-related materials/products purchased by the company during the reporting year.</li> <li>Calculated based on the quantity/weight of each type of purchased (production-related) goods and the full life cycle emission coefficient (Ecoinvent).</li> <li>The goods purchased by Pegatron during the reporting year mainly include 36 major categories, including institutions, equipment, production consumables, fixtures/tools, chemical materials (FOR PCBA), System Component, DISPLAY (MONITOR, LCD), and packaging materials, CONNECTOR, RESISTOR. For details, please refer to the Report.</li> </ul>	4,298,740
		1b.: Non-production-related procurement <ul style="list-style-type: none"> <li>All upstream (i.e., cradle-to-gate) emissions from non-production-related products and services purchased by PEGATRON that are not included in other categories of Scope 3 upstream emissions (i.e., Categories 2-8) during the reporting period.</li> <li>Based on relevant financial expenditure data. According to the category to which the expenditure commodity belongs, the corresponding EEIO emission factor (kgCO2e/\$) is identified. The emission amount is the product of the expenditure amount and the corresponding emission factor.</li> <li>The goods and services purchased by Pegatron during the reporting period include research and development expenses, management expenses, manufacturing expenses, sales expenses. For details, please refer to the Report.</li> </ul>	71,165
2.	Capital goods	<ul style="list-style-type: none"> <li>The accounting subjects in this category including Building, Deferred charges- renovation engineering, Electrical engineering, Land cost, Machinery equipment. For details, please refer to the Report.</li> <li>The calculation is based on the amount of purchasing various fixed assets and the emission coefficient analyzed by EEIO Environmental Extended Input Output (EEIO) open-source data.</li> </ul>	96,230
3.	Fuel- and energy-related emissions	<ul style="list-style-type: none"> <li>Emissions from the extraction, production and transportation of fuels and energy purchased and consumed by the Company in the reporting year (the portion not included in Scope 1 and 2).</li> <li>Pegatron's emissions from fuel and energy-related activities during the reporting period include:               <ul style="list-style-type: none"> <li>Upstream emissions from purchased fuels (the extraction, production and transportation of fuels consumed by companies).</li> <li>Upstream emissions from purchased electricity (extraction, production and transportation of fuels used for electricity and heat consumed by businesses).</li> <li>Transmission and distribution losses (loss of electricity and heat during transmission and distribution).</li> </ul> </li> </ul>	148,164
4.	Upstream transportation and distribution	<ul style="list-style-type: none"> <li>Products purchased by Pegatron during the reporting year were transported and distributed between first-tier suppliers and the Company using vehicles not owned or operated by Pegatron.</li> <li>Considering the completeness of the data, only the carbon emissions of the "air transport" category are quantified this year.</li> <li>Based on the transport weight [kg], transport distance and mode of transport for inbound and outbound logistics. The corresponding transportation emission factor (kgCO2e/(tonne transportation weight*km)) is matched according to the transportation mode of the material, and the transportation distance is determined according to the transportation route. The emission amount of each transportation is the product of mass, transportation distance and emission factor.</li> </ul>	1,109,912
5.	Waste generated in operations	<ul style="list-style-type: none"> <li>Waste generated from operating activities owned or controlled by Pegatron in the reporting year is contracted to third parties to process and dispose of emissions. Waste treatment and disposal activities may include: landfill, recycling, incineration, composting, etc.</li> <li>Calculation based on physical waste quantity, treatment methods and BEIS emission factors.</li> </ul>	30
6.	Business travel	<ul style="list-style-type: none"> <li>GHG emissions generated by Pegatron employees engaged in business-related activities using transportation vehicles owned or operated by third parties.</li> <li>Considering the completeness of the data, only the carbon emissions of the "air transport" category are quantified this year.</li> <li>For emissions from flying, the corresponding travel distance [km] is calculated based on the flight and route information provided by Pegatron. Match the corresponding emission factor [kgCO2e/(passenger*km)] according to the transportation mode, and the emission amount is the product of travel distance and emission factor.</li> </ul>	3,675
7.	Employee commuting	<ul style="list-style-type: none"> <li>Pegatron employees report their transportation emissions between where they live and where they work, which may include cars, buses, railways, subways, motorcycles, bicycles, and walking.</li> <li>Calculation based on annual commuting days, commuting methods and average commuting distance of employees in each region.</li> </ul>	22,940
9.	Downstream transportation and distribution	<ul style="list-style-type: none"> <li>Reports the transportation and distribution of products sold by Pegatron during the reporting year between the Company's operations and downstream users (when not paid for by Pegatron and using vehicles and facilities not owned or controlled by Pegatron).</li> <li>Considering the completeness of the data, only the carbon emissions of the "air transport" category are quantified this year.</li> </ul>	2,051,689

Lack of fulfillment of conditions as set out in the Certification Agreement may render this Certificate invalid. This Verification Opinion is based on the information made available to us and the engagement conditions detailed above. Hence, DNV cannot guarantee the accuracy or correctness of the information. DNV cannot be held liable by any party relying on or acting upon this Verification Opinion.

		<ul style="list-style-type: none"> <li>The calculation methodology is basically similar to Category 4, based on product sales weight [tonne], transportation distance and transportation method. The corresponding transportation emission factor (kgCO<sub>2</sub>e/(tonne transportation weight*km)) is matched according to the transportation mode, and the transportation distance is determined according to the transportation route. The emission amount of each transportation item is the product of mass, transportation distance and emission factor.</li> </ul>	
10.	Processing of sold products	<ul style="list-style-type: none"> <li>Emissions generated during downstream processing of intermediate products sold during the reporting year.</li> <li>The final product group corresponding to each intermediate product is divided into final product groups. Make assumptions about the weight of a specific final product for each final product group and the power consumption of the processing process of a single final product. Based on the weight proportion of each intermediate product in the corresponding final product, calculate the power consumption required for processing, and multiply The emissions are obtained based on the quantity and the full life cycle electricity emission factor of the corresponding region.</li> </ul>	1,199
11a.	Use of sold products	<ul style="list-style-type: none"> <li>Emissions generated during the use of goods and services sold by Pegatron to downstream users (consumers who use these final products) during the reporting year.</li> <li>Considering that Pegatron only has the ability to design energy consumption for ODM products designed by itself, this year only ODM (product line code is BA) router products were inventoried.</li> <li>Based on each product's energy consumption pattern, set power, quantity, service lifetime, and the electricity life cycle emission factor of the country where it is sold, and combined with grid decarbonization factors, the emissions of each product during its use phase are calculated.</li> </ul>	2,323,039
12.	End-of-life treatment of sold products	<ul style="list-style-type: none"> <li>Emissions resulting from the disposal and treatment of products sold during the reporting year as waste when their use ends.</li> <li>Considering that Pegatron only has the ability to design energy consumption for ODM products designed by itself, this year only ODM (product line code is BA) router products were inventoried.</li> <li>The calculation is based on the weight of sold product and packaging at final disposal, treatment methods and BEIS emission factors.</li> </ul>	99
13.	Downstream leased assets	<ul style="list-style-type: none"> <li>Emissions from assets operated and controlled by Pegatron (as lessor) and leased to other entities that are not included in Scope 1 and 2.</li> <li>Various types of leased assets held by Pegatron during the reporting period include catering vendors, medical offices, shops and other places at sites PKS, PSZ and PSH.</li> <li>The emissions from these leased assets include the full life cycle emissions of all purchased fuel and purchased energy.</li> <li>It is calculated by multiplying the fuel and energy consumption by the corresponding life cycle emission factors. Among them, the full life cycle emission factors of fuel and energy are calculated using the sum of WTT, T&amp;D and Scope 1&amp;2 emission factors.</li> </ul>	11,899
15.	Investments	<ul style="list-style-type: none"> <li>Reports emissions from Pegatron's investments in the reporting year that are not included in Scope 1 and 2.</li> <li>Calculated based on the industry and main business of the invested company, as well as the current year's revenue and equity investment proportion, the revenue unit is US dollars.</li> </ul>	2,644

The scope of indirect emissions, other than Imported Energy with specified/limited list of sources, was defined by PEGATRON's own pre-determined criteria for significance of indirect emissions, considering the intended use of the GHG inventory.

## APPENDIX C

*The Greenhouse Gas direct emissions and removals, Category 1, for PEGATRON CORPORATION Greenhouse Gas Inventory Management Report (2023), quantified separately for each GHG as below, in tonnes of 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
12,648.8887	19,766.6220	56.9339	625.2582	0.0000	0.0000	0.0000	33,097.7028
38.2%	59.7%	0.2%	1.9%	0.0%	0.0%	0.0%	100.0%