

Product Carbon Footprint Verification Report

Report Number: 61.027.23.029.01



Taiwan

Name of the client	EDAC POWER ELECTRONICS CO., LTD.
Name of responsible party	EDAC POWER ELECTRONICS CO., LTD. (Factory)
Address of client	11 F.-2, No. 150, Jian 1st Rd., Zhonghe Dist., New Taipei City 235603, Taiwan, R.O.C.
Name of the verified product	Power Adapter
Verified product model	EA/ EM1068 Series
Time period	2022-01-01 – 2022-12-31
System boundary	Cradle-to-Gate
Declared unit	per piece of the EA/ EM1068 Series Power Adapter (including package)
Verification criteria	<ul style="list-style-type: none">• ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
Product carbon footprint claim	6.5 kgCO _{2e} per piece of the EA/ EM1068 Series Power Adapter (including package)
Materiality	5%
Level of assurance	<input checked="" type="checkbox"/> Reasonable assurance level <input type="checkbox"/> Limited assurance level
Time period of document review	2023-12-21
Date of on-site verification	Stage 1: 2023-12-26, 2023-12-27 Stage 2: 2024-01-23, 2024-01-24
Lead verifier	Jo Fang <i>Jo Fang</i>
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1 Verification overview

1.1 Verification purpose

TÜV SÜD Asia Ltd. Taiwan Branch (hereinafter referred to as TÜV SÜD) was commissioned by EDAC POWER ELECTRONICS CO., LTD. (hereinafter referred to as EDAC) to conduct a product life cycle carbon footprint verification of its Power Adapter.

The purpose of this verification includes:

- 1) to verify whether the product carbon emission information and data provided by EDAC and its evidential documents and sources are complete and credible;
- 2) to verify whether the product carbon emission data, calculation methods and report provided by EDAC comply with the requirements of ISO 14067:2018 standard;
- 3) to issue an opinion based on the intended area of application, goals, scope and criteria as agreed upon with EDAC on 2023-05-05.

1.2 Verification criteria

The verification is mainly based on ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification. Other relevant standards and literature that were also referred to are listed in the “References” section of this verification report. According to the requirements of ISO 14067:2018, the Product Category Rule (PCR), if present, should be used by reference.

1.3 Verification evidence-gathering activities

TÜV SÜD conducted document review and on-site verification of the responsible party on 2023-12-26, 2023-12-27, and 2024-01-23, 2024-01-24 respectively. The objects and contents including: the provided PCF report, the underlying LCA model, basic information about the enterprise, bill of materials (BOM) of inputs & outputs, measuring records of emission sources, information related to the life cycle of the assessed product, invoices, reporting files, SAP extraction, technical specifications, etc. Through the strategic analysis the nature and extent of the verification activities were determined. A risk assessment was used to identify the risk of a material misstatement or non-compliance with the criteria and to determine the nature and extent of evidence-gathering activities. Though this, a reasonable evidence-gathering plan was developed for:

- 1) Boundaries, emission facilities, and identification of emission sources, etc.
- 2) Information management for the acquisition, recording, transmission and aggregation of data and parameters related to emissions within the system boundary of the product carbon footprint assessment.
- 3) Accounting methods and emission data calculation process.
- 4) Calibration and maintenance of measuring instruments and monitoring equipment.
- 5) Verification of quality assurance and documentation archiving.
- 6) Evaluating the impact of the various streams of data on the materiality of the product carbon footprint.
- 7) Collecting sufficient and appropriate evidence upon which to base the conclusion of the verification.

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The responsible party provides relevant supporting materials and evidentiary materials according to the evidence-gathering plan formulated by the verification team depending on the risk assessment's results, the verification process covers a minimum percentage of the data sources to be collected and to be cross-checked as shown in Table 1-1.

Table 1-1 Risk-based approach

Result of the risk assessment (Arithmetic mean to the assessed risks when low risk=1, medium risk=2, high risk=3)	1
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Actions resulting from the risk assessment in regard to the nature and extent of evidence-gathering activities			
Result of The Risk Assessment	Low Risk	Medium Risk	High Risk
Minimum percentage of data sources to be collected and checked for plausibility	>50% of the total GHG value	>75% of the total GHG value	As close to 100% as possible
Minimum percentage of data sources to be cross-checked (with data provided by client & secondary data e.g., from LCA databases), starting with the hotspots	>25% of the total GHG value	>50% of the total GHG value	As close to 100% as possible

1.4 Overview of the responsible party

Since 1998, EDAC POWER ELECTRONICS CO., LTD. has continued to produce high-quality Power Adapter.

The verified product is Power Adapter. The appearance of the product is shown in Figure 1-1.

Product	Product Part	Product Model	Weight (kg/unit)	Annual Production Output (units)
Power Adapter	Full Product	EA/ EM1068 Series	0.36	691,572



Figure 1-1 Product photo

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2 Verification scope

2.1 Greenhouse gas types

The scope of greenhouse gases verified in this product carbon footprint is consistent with the scope of the latest IPCC Assessment Report, including GWP100 values for carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and nitrogen trifluoride (NF₃), including carbon feedbacks.

2.2 Time and place of verified data

The carbon footprint data of the verified products cover the period from 2022-01-01 to 2022-12-31; the manufacturing site address is No. 59, Chang Sheng Road, Sheng Pu, Suzhou Industrial Park, Suzhou, Jiangsu, China.

2.3 Declared units

The declared unit of product carbon footprint for this verification is per piece of the EA/ EM1068 Series Power Adapter (including package).

2.4 System boundary

The system boundary for this verification is "cradle-to-gate". The process flow of the product life cycle is shown in Figure 2-1.

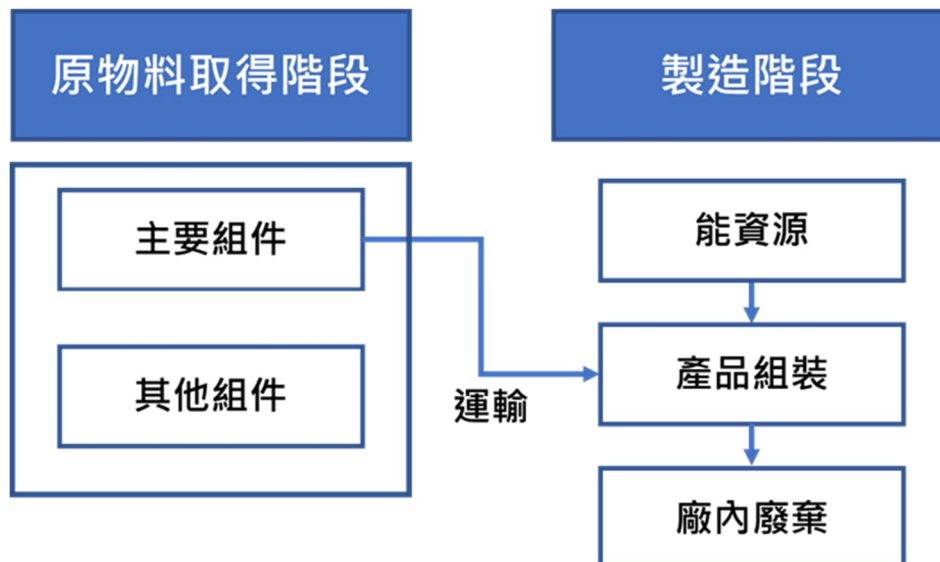


Figure 2-1 Process flow of the product life cycle

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2.5 Cut-off criteria

The following cut-off criteria were implemented and their applicability and impact on the GHG result were discussed in the PCF report. An overview of the most important and impactful cut-off criteria is given in Table 2-1.

Table 2-1 Cut-off criteria

Cut-off criteria	Applicability was discussed is reasonable	Approximated impact of the cut-off on the result
除主要組件之其他組件運輸排放	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Low impact
公用設備如緊急發電機、化糞池及冷媒設備	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Low impact

2.6 Allocation procedures

The allocation procedure is chosen at process level and can therefore differ from process to process. The most important and impactful allocation decisions are listed in Table 2-2.

Table 2-2 Allocation procedures

Allocation procedures	Multi-output process in question	Resulting product & allocation share in %	By-products & allocation share in %	Short justification for the decision
生產工時	N/A	19.43%	N/A	BOM表分配到每台

2.7 Software and database

The life cycle analysis software used in this study was calculated by Excel modeling, using Simapro – v9.3.0.3, CHINA POPULATION RESOURCES AND ENVIRONMENT, and Taiwan EPA Carbon Footprint Information Platform.

3 Verification of product carbon footprint data inventory

All data listed in the tables of this chapter was verified. Just because data is not explicitly listed in this chapter does not mean that it has not been verified.

3.1 Acquisition stage - purchased goods

3.1.1 List of raw & ancillary/auxiliary materials and their packaging and transport

NOTE 1: raw material = primary or secondary material that is used to produce a product (ISO 14040).

NOTE 2: ancillary input = material input that is used by the unit process producing the product, but which does not constitute part of the product (ISO 14040).

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The raw & ancillary/auxiliary materials, their packaging materials (if applicable) with their respective amounts per functional or declared unit are listed in Table 3-1 and Table 3-2, as well as a list of transportation data of these materials.

Only the most important and impactful raw & ancillary/auxiliary materials are listed here. The complete list of materials & their respective transportation distances and suppliers can be accessed through the BOM, and other documents provided by the client as requested via the application form in the pre-engagement phase as well as collected through the evidence-gathering plan.

Table 3-1 List of raw material data

Raw & ancillary/auxiliary material	Amount of material per declared unit (Kg)	Supplier name	Supplier location	Transport distance (Km)	Transport vehicle
PCB	0.0110	N/A	N/A	N/A	N/A
內部線材	0.0003	N/A	N/A	N/A	N/A
外部線材-狀山川	0.0225	壯山川製品有限公司	江蘇省昆山市	29	Transport, freight, lorry 7.5-16 metric ton
外部線材-億隆	0.0474	億隆電器有限公司	江蘇省昆山市	46.8	Transport, freight, lorry 7.5-16 metric ton
金屬薄膜式電阻	0.0007	N/A	N/A	N/A	N/A
貼片式電阻	0.0002	N/A	N/A	N/A	N/A
輔助電阻	0.0000	N/A	N/A	N/A	N/A
電解電容 >2cm	0.0122	N/A	N/A	N/A	N/A
電解電容 <2cm	0.0050	N/A	N/A	N/A	N/A
插件式電容	0.0041	N/A	N/A	N/A	N/A
貼片式電容	0.0001	N/A	N/A	N/A	N/A
IC	0.0003	N/A	N/A	N/A	N/A
二極體	0.0035	N/A	N/A	N/A	N/A
三極體	0.0021	N/A	N/A	N/A	N/A
電感器	0.0127	N/A	N/A	N/A	N/A
磁環	0.0009	N/A	N/A	N/A	N/A
變壓器	0.0453	N/A	N/A	N/A	N/A

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Raw & ancillary/auxiliary material	Amount of material per declared unit (Kg)	Supplier name	Supplier location	Transport distance (Km)	Transport vehicle
保險絲	0.0006	無錫華派電子有限公司	江蘇省昆山市	70	Transport, freight, lorry 7.5-16 metric ton
插座	0.0077	浙江樂磁電子股份有限公司	浙江省樂清市	408.8	Transport, freight, lorry 7.5-16 metric ton
橡膠絕緣片	0.0009	N/A	N/A	N/A	N/A
mylar片	0.0071	N/A	N/A	N/A	N/A
矽膠絕緣片	0.0000	N/A	N/A	N/A	N/A
塑膠機殼-忠瑞	0.0270	慈溪忠瑞塑膠製品有限公司	浙江省慈溪市	146.9	Transport, freight, lorry 7.5-16 metric ton
塑膠機殼-潤鎂	0.0274	潤鎂信新材料科技有限公司	江蘇省蘇州市	27.5	Transport, freight, lorry 7.5-16 metric ton
鋁製散熱片	0.0314	N/A	N/A	N/A	N/A
螺絲螺帽	0.0025	N/A	N/A	N/A	N/A
錫條/錫絲	0.0029	N/A	N/A	N/A	N/A
助焊劑/稀釋劑/清洗劑	0.0029	N/A	N/A	N/A	N/A
白膠/導熱膠	0.0210	N/A	N/A	N/A	N/A
紅膠	0.0001	N/A	N/A	N/A	N/A

Table 3-2 List of packaging materials of the raw material data

Raw & ancillary/auxiliary material	Amount of material per declared unit (Kg)	Supplier name	Supplier location	Transport distance (Km)	Transport vehicle
禮盒(白板紙)	0.0067	N/A	N/A	N/A	N/A
標籤	0.0056	N/A	N/A	N/A	N/A
包材(瓦楞紙)	0.0382	N/A	N/A	N/A	N/A
PE袋/氣泡袋/膠帶	0.0030	N/A	N/A	N/A	N/A

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3.2 Product manufacturing stage

3.2.1 List of emission source

The data of the manufacturing stage of the verified product(s) can be mainly contributed to the emission sources involved in the unit processes shown in Table 3-3. The emission source is given per functional or declared unit of product. The most important and impactful emission sources and unit processes are listed here.

Table 3-3 Emission list of product manufacturing stage

Energy source	For unit process	Amount of activity data in this unit process per declared unit	Activity data Unit
電力	整廠使用量	0.590	度(kwh)

3.2.2 List of waste disposal

Table 3-4 lists waste disposal in the manufacturing stage. This also includes the transportation processes of waste (if any). The waste disposal data is given per functional unit of product. According to Table 2-1, emissions related to recycling processes had been cut-off in the PCF report.

Table 3-4 List of waste disposal data of manufacturing stage

Waste material	Amount of waste material per declared unit	Activity data Unit	What happens with the waste?	Transport distance(Km) (If any)	Transport vehicle (If any)
危害廢棄物	0.0021	公斤/年	焚化處理	39.6	Transport, freight, lorry 7.5-16 metric ton

3.3 Product distribution and sales stage

3.3.1 List of product distribution and sales stages

Table 3-5 lists the distribution of the client's product(s) to the customer. Focus was put on the verification of transport method and distance, starting from the client's factory gate. If no primary data on the downstream supply-chain exists, average values and assumptions are checked for plausibility and conservativeness.

Table 3-5 List of product transportation data

Transported product	Transported to	Transport distance (If any)	Transport vehicle (If any)
N/A	N/A	N/A	N/A

3.4 Product use stage

3.4.1 List of product use stages

The use stage is most likely not to be verified, as it can include claims about the future and is therefore part of a validation. The data gathered about average use or respective assumptions made, shall be plausible and shall be discussed in the GHG report. Table 3-6 gives a short summary about the product use parameters, focusing on the most important and influential parameters.

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Table 3-6 List of product use parameter

Product use parameter	For which specific product	How was this data gathered? Assumption?	Is the data or the assumption plausible?
N/A	N/A	N/A	N/A

3.5 Product disposal or recycling stage

3.5.1 List of product disposal or recycling stage at the end-of-life

The end-of-life stage is most likely not to be verified, as it can include claims about the future and is therefore part of a validation. The data gathered about disposal or recycling, or respective assumptions made, shall be plausible and shall be discussed in the GHG report. Table 3-7 gives a short summary about the product end-of-life parameters, focusing on the most important and influential parameters.

Table 3-7 List of product end-of-life parameter

End-of-life process	For which specific product	How was this data gathered? Assumption?	Is the data or the assumption plausible?
N/A	N/A	N/A	N/A

3.6 Data sources and quality assessment

The product carbon footprint data for this verification was sourced from Bill of Material(BOM), Indirect raw materials list_2022, Equipment consumables list_2022, Sewage treatment records and General affairs invoice documents. The data quality is in accordance with the requirements of section 6.3.5 of ISO 14067:2018.

The data quality result of the declared unit is 2.99 points, belonging to basic-level data quality.

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Table 3-8 Pedigree Matrix to refer to in order to assess the data quality of the most important processes

	1 (excellent)	2 (very good)	3 (good)	4 (fair)	5 (poor)
Reliability	Verified data based on measurements	Verified data partly based on assumptions or non-verified data based on measurements	Non-verified data partly based on qualified estimates	Qualified estimate (e.g., by industrial expert)	Non-qualified estimate
Completeness	Representative data from all sites relevant for the market considered, over an adequate period to even out normal fluctuations	Representative data from >50% of the sites relevant for the market considered, over an adequate period to even out normal fluctuations	Representative data from only some sites (<<50%) relevant for the market considered or >50% of sites but from shorter periods	Representative data from only one site relevant for the market considered or some sites but from shorter periods	Representativeness unknown or data from a small number of sites and from shorter periods
Temporal correlation	Less than 3 years of difference to the time period of dataset	Less than 6 years of difference to the time period of the dataset	Less than 10 years of difference to the time period of the dataset	Less than 15 years of difference to the time period of the dataset	Age of data unknown or more than 15 years of difference to the time period of the dataset
Geographical correlation	Data from area under study	Average data from larger area in which the area under study is included	Data from area with similar production conditions	Data from area with slightly similar production conditions	Data from unknown Or distinctly different area (e.g., different continent)
Further technological correlation	Data from enterprises, processes and materials under study	Data from processes and materials under study (i.e., identical technology) but from different enterprises	Data from processes and materials under study but from different technology	Data on related processes or materials	Data on related processes on laboratory scale or from different technology

Pedigree Matrix was taken from: Weidema, Bo & Bauer, Christian & Hirschier, Roland. (2013). Data quality guideline for the ecoinvent database version 3.

[R]. Overview and Methodology Ecoinvent. Report 1 St. Gallen: The Ecoinvent Centre. 76-84.

3.7 Assumptions

In the following the most important and impactful assumptions of the life cycle assessment are listed in Table 3-9. Focus was laid to check on the transparent communication and clear argumentation why this assumption was made and why it couldn't be done in a better way. Be aware that each of the assumptions listed here shall be analyzed through a sensitivity analysis and listed in chapter 4.4.2 of this document.

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Table 3-9 Product carbon footprint data sources and quality assessment table

Assumption	Impacted unit process(es)	Reason for making this assumption	Argumentation is comprehensible and transparent
All series of products are included in the calculation	All	If only select standard products, it will not be representative of other products. Therefore, components used in the series of products will be included in the calculation and amortized.	Yes
Also Semi-finished products are included in the calculation	All	In addition to packaging materials, other components of semi-finished products are used, so they are also included in the calculation of amortized carbon footprint.	Yes

4 Product carbon footprint verification results and analysis

4.1 Product carbon footprint verification results

Based on the verified product carbon footprint data inventory, the total GHG emission per functional or declared unit of product was calculated by the client and is stated in Table 4-1.

Table 4-1 Product carbon footprint result

Product	Total CO ₂ e per functional or declared unit
per Piece of the EA/ EM1068 Series Power Adapter (including package)	6.5 kgCO ₂ e

4.2 Contribution of each life cycle stage

The carbon emissions at each stage of the product life cycle and the proportion of them was calculated as is shown in Table 4-2.

Table 4-2 Values and proportions of carbon footprint of each product in different life cycle stages

Product	Life cycle stage	Total CO ₂ e per functional or declared unit	Percentage share of total impact
per Piece of the EA/ EM1068 Series Power Adapter (including package)	Acquisition of raw material	6.085 kgCO ₂ e	93.66 %
	Production	0.412 kgCO ₂ e	6.34 %

4.3 Contributing of the different emissions to the GHG footprint

The most important GHGs and their percentage influence are summarized in Table 4-3.

The specific GHG emissions and removals which should be reported according to ISO 14067 6.4.9.8 are stated in Table 4-4. These values will be put on the verification statement.

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Table 4-3 Product carbon footprint result

GHG	Total CO ₂ e per functional or declared unit	Percentage share of total impact
CO ₂	6.5 kgCO ₂ e	100 %
CH ₄	N/A	N/A
N ₂ O	N/A	N/A
Others	N/A	N/A

Table 4-4 Impact of specific GHG emissions and removals

GHG	Total GHG value in CO ₂ e	Percentage share of total impact
net fossil GHG emissions (includes emissions and removals)	6.5 kgCO ₂ e	100 %
net biogenic GHG emissions (includes emissions and removals)	N/A	N/A
net GHG emissions resulting from dLUC (includes emissions and removals)	N/A	N/A
Aircraft GHG emissions	N/A	N/A

4.4 Completeness and consistency verification

The carbon footprint verification process relies on data, arguments, and evidence. A check for completeness of data was done by following the data trails and a check for consistency was done by cross-checking a percentage of data. The depth of both checks is given through the result of the risk assessment. Still, assumptions and argumentation about allocation procedure or cut-off criteria can heavily impact the PCF result. Therefore, extensive checks on the impact of said assumptions are necessary. This is done through sensitivity analysis and uncertainty analysis.

4.4.1 Sensitivity analysis

The PCF report gives insight on the impacts of the assumptions made and their significance. For this, sensitivity analysis is used. This analysis gives insight on the change of the result by just changing one parameter, which wasn't based on primary data but instead was built one or more assumptions. This analysis should be performed by the client for all the assumptions, which impact are assessed by the verifier with the largest emission of each stage of the total carbon footprint. The results of the assessments are summarized in Table 4-5. Highly impactful assumptions should be pointed out to the client with the aim of improving the data quality and thereby reducing uncertainty. If this is not possible, the client shall clearly state this as limitation of the study. If the assumption could lead to a material misstatement, this must also be included in the verification statement. Please confer with the senior verifier to clarify the details of this decision.

Whenever several alternative allocation procedures are applicable, a sensitivity analysis shall be conducted to illustrate the consequences of the departure from the selected approach.

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Table 4-5 Sensitivity analysis results of assumptions potentially impacting the product carbon footprint with largest emissions at each stage

Assumption checked via sensitivity analysis	Parameter changed	Amount of emission after change	Impact on the total GHG value of the study
二極體	- 10%	0.8107	-1.39%
	+10%	0.9908	1.39%
	- 20%	0.7206	-2.77%
	+20%	1.0809	2.77%
電解電容 >2cm	- 10%	0.5551	-0.95%
	+10%	0.6784	0.95%
	- 20%	0.4934	-1.90%
	+20%	0.7401	1.90%
IC	- 10%	0.4719	-0.81%
	+10%	0.5767	0.81%
	- 20%	0.4194	-1.61%
	+20%	0.6291	1.61%
電感器	- 10%	0.5222	-0.89%
	+10%	0.6383	0.89%
	- 20%	0.4642	-1.79%
	+20%	0.6963	1.79%

4.4.2 Uncertainty analysis

The data of the client's verified product carbon footprint and its evidential materials and sources have been analyzed and the data quality was already analyzed in Chapter 3.6 in a semi-quantitative way. Now, uncertainty of the total product carbon footprint result can generally also be quantified by the client using Monte Carlo analysis. This is only mandatory when comparing similar products from different companies. Otherwise, this uncertainty analysis can be performed by the client to get more insight on the data. But a quantification of uncertainty is hard to achieve and has always been seen with a grain of salt by researchers as well as practitioners. Therefore, the client can refrain from quantifying uncertainty as quantifying uncertainty has to be done for every process and input data point in order to give insight on the total uncertainty of the footprint. If this is not the case, a quantified uncertainty might be misleading and could be interpreted as greenwashing.

What always has to be done is the qualitative discussion of uncertainty of the most impactful processes, assumptions and the total PCF result. This is also called a qualitative uncertainty analysis. The largest uncertainties of the assessed product and gives insight on the potential impact of said uncertainties on the end result as well as why the uncertainty cannot be reduced in order to increase the general quality of the assessment.

Verified the product carbon footprint study report had conducted qualitative uncertainty analysis.

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5 Recommendation for product carbon footprint work

NA

6 Verifier's opinion

Based on the evidence gathered the verifier concludes to issue one of the following verification statements (also called opinion in ISO 14064-3 & 14065), or to disclaim the issuance of an opinion. The verifier shall use Table 6-1 for the decision and prepare the respective verification statement template.

- Unmodified opinion
- Modified opinion
- Adverse opinion
- Disclaim the issuance of an opinion

Table 6-1 Misstatement and opinion types (ISO 14065:2020)

Type of misstatement	Extent of misstatement	Opinion type
There is no misstatement	None	Unmodified
The misstatement is not material	Not pervasive	Unmodified/Modified
The misstatement is material	Not pervasive	Modified
	Pervasive	Adverse
There is a misstatement, but the type is unknown	Not pervasive	Modified
	Pervasive	Disclaimed

NOTE 1: Pervasive misstatements, individually or in aggregate, are those that are:

- not confined to specific elements, classifications or line items of the environmental information statement;
- even if confined, represent a substantial portion of the environmental information statement;
- fundamental to the intended user's understanding of the environmental information statement.

NOTE 2: An adverse opinion is issued when the environmental information is misrepresented or misstated in a pervasive way. To disclaim the issuance of an opinion is done when there was a lack of evidence, so it is unclear if the environmental information is correct or not.

7 References

- 1) ISO 14067:2018 Carbon footprint of products — Requirements and guidelines for quantification and communication
- 2) ISO 14040:2006 Environmental management — Life cycle assessment — Principles and Framework
- 3) ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines
- 4) ISO 14064-3:2019 Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements
- 5) ISO 14065:2020 General principles and requirements for bodies validating and verifying environmental information

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Annexes

Annex 1 – Verification Plan

Annex 2 – Clarification/Corrective Action Request, Response and Conclusions

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Annex 1- Verification Plan

Site/Date	Time	Key/Required Process/Activity	Process Owner/ Company's Representative	Related (Supporting) Processes/Doc./Data	Verifiers
2023-12-26 (Stage 1)	09:30- 09:45	Opening meeting	翌勝電子股份有限 公司(新北市中和區 建一路150號)	<ul style="list-style-type: none"> 查證流程說明 確定查證計畫內容 	Jo Chun
	09:45- 10:15	Site tour		<ul style="list-style-type: none"> 了解現場環境與製程型態等 	
	10:15- 11:00	文審階段待釐清事項說明與 研究報告確認		<ul style="list-style-type: none"> 簡介宣告單位盤查數據及報告情況 產品碳足跡研究報告 產品盤查清冊 材料清單(BOM) 生產流程圖 相關佐證資料 截斷原則應用佐證 確認文審階段待釐清事項與矯正計畫說明 	
	11:00- 12:00	碳足跡計算分配程序確認			
	12:00- 13:00	Lunch break			
	13:00- 17:15	原物料階段排放查證 <ul style="list-style-type: none"> 直接原料 間接原料 設備耗材 包材及廠務投入 	<ul style="list-style-type: none"> 材料清單(BOM) 活動數據清冊 係數佐證來源 	Jo Chun	
	17:15- 17:30	Closing meeting	<ul style="list-style-type: none"> 總結第一天查證結果 		

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Site/Date	Time	Key/Required Process/Activity	Process Owner/ Company's Representative	Related (Supporting) Processes/Doc./Data	Verifiers
2023-12-27 (Stage 1)	09:30- 09:45	Opening meeting	翌勝電子股份有限 公司(新北市中和區 建一路150號)	<ul style="list-style-type: none"> 查證流程說明 確定查證計畫內容 	Jo Chun
	09:45- 12:00	原物料階段排放查證 <ul style="list-style-type: none"> 直接原料 間接原料 設備耗材 包材及廠務投入 		<ul style="list-style-type: none"> 材料清單(BOM) 活動數據清冊 係數佐證來源 	
	12:00- 13:00	Lunch break			
	13:00- 17:00	製造階段排放查證 <ul style="list-style-type: none"> 製程投入之能資源 製程廢棄物及用量 廢棄物產出與運輸 	翌勝電子股份有限 公司(新北市中和區 建一路150號)	<ul style="list-style-type: none"> 材料清單(BOM) 活動數據清冊 係數資料佐證來源 	Jo Chun
	17:00- 17:15	Briefing Findings		<ul style="list-style-type: none"> 查證小組內部討論及彙 整觀察結果與發現事項 	
	17:15- 17:30	Closing meeting (Stage 1)		<ul style="list-style-type: none"> 總結 Stage 1 查證結果 	

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Site/Date	Time	Key/Required Process/Activity	Process Owner/ Company's Representative	Related (Supporting) Processes/Doc./Data	Verifiers
2024-01-23 (Stage 2)	09:30-09:45	Opening meeting	翌勝電子股份有限公司(新北市中和區建一路150號)	<ul style="list-style-type: none"> Stage 2 流程說明 確定查證計畫內容 	Jo Chun
	09:45-12:00	Stage 1待釐清及缺失事項確認與討論		<ul style="list-style-type: none"> 說明 S1 發現事項修訂結果 確認待釐清事項與矯正計畫說明 	
	12:00-13:00	Lunch break			
	13:00-16:30	數據品質查證	翌勝電子股份有限公司(新北市中和區建一路150號)	<ul style="list-style-type: none"> 數據收集資訊 數據品質評估 	Jo Chun
	17:00-17:30	Closing meeting		<ul style="list-style-type: none"> 總結第一天查證結果 	

Site/Date	Time	Key/Required Process/Activity	Process Owner/ Company's Representative	Related (Supporting) Processes/Doc./Data	Verifiers
2024-01-24 (Stag 2)	09:30-09:45	Opening meeting	翌勝電子股份有限公司(新北市中和區建一路150號)	<ul style="list-style-type: none"> Stage 2 流程說明 確定查證計畫內容 	Jo Chun
	09:45-12:00	敏感度查證		<ul style="list-style-type: none"> 敏感度分析 不確定性評估 	
	12:00-13:00	Lunch break			
	13:00-16:30	衝擊評估結果確認	翌勝電子股份有限公司(新北市中和區建一路150號)	<ul style="list-style-type: none"> 材料清單(BOM) 活動數據清冊 係數資料佐證來源 	Jo Chun
	16:30-17:00	Briefing Findings		<ul style="list-style-type: none"> 查證小組內部討論及彙整觀察結果與缺失情形 	
17:00-17:30	Closing meeting	<ul style="list-style-type: none"> 總結查證結果 待釐清事項說明 			

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Annex 2 -Clarification/Corrective Action Request, Response and Conclusions

Clause	Clarification/Corrective Action Request	Verifier	Response	Item Closed (Yes/No/Comments)
Document Review				
6.3.5	(CR) 尚有部分事項待釐清如下: (1) 清冊有些許欄位單位未標明。 (2) 外購電力數據與 ISO 14064-1 查證結果不一致。	Jo Chun	(1) 已於清冊補充未標明單位之欄位 (2) 外購電力數據採用 2022 年蘇州廠全廠用電扣除宿舍用電	S1階段已確認修訂
6.3.4	(CR) 根據宣告單位所引用之產品類別規則“非固定式電源插座-含電源延長線、智慧型節電器、轉接頭”，其系統邊界屬於(B2C)，生命週期階段應包含下游配送，使用階段之電力及產品廢棄處理，與本產品碳足跡研究之系統邊界(4.1節)不一致，請釐清。	Jo	本次盤查之標的產品為B2B產品，為其形式與非固定式電源插座-含電源延長線、智慧型節電器、轉接頭相似，故參考該產品類別規則。已於報告書P.1修正為參考該產品類別規則	S1階段已確認修訂
7.3	(CR) 碳足跡研究報告內容勘誤如下:6.2.1節及6.2.2節數據描述部分有不一致狀況，請再協助釐清	Jo	已於報告書P.12-P.13將6.2.1節及6.2.2節之數據描述修正一致	S1階段已確認修訂
6.4.6	(CR) 除了BOM可一對一之零組件外，其餘輔料及包材之原料階段投入，是否涉及分配原則之使用，請協助釐清	Jo	輔料及包材之原料階段投入，採用2022年系列內產品總投料量除以系列內產品總產量進行分配	S1階段已確認修訂
6.3.3	(CR) 本次碳足跡產品宣告單位“ EX1101與EX1068”屬於系列產品，請於碳足跡研究報告內補充其涵蓋產品範圍。	Jo	已於P.4補充說明本次碳足跡標的產品為EX1101與EX1068兩支系列產品，並補充說明其涵蓋產品範圍	S1階段已確認修訂

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Clause	Clarification/Corrective Action Request	Verifier	Response	Item Closed (Yes/No/Comments)
On-Site Findings-Stage 1				
6.3.5	(CAR) 運輸計算目前僅計算主要供應商，但不同型號使用的供應商比例不同，請調整。	Jo	1. 部分主要元件（外部線材及塑膠機殼）依照供應商供貨比例重新計算，部分主要元件（保險絲及插座）以最大宗供應商為代表。	S2 階段已確認修訂
6.3.5	(CAR) 以下與係數及量化有關調整： 1. 保險絲調整為主體之材料係數(PA66) 2. 電解電容係數有分高度>2 cm 跟< 2cm, 原都只用>2 cm, 請分開量化。 3. 絕緣片調整為三種(silicon、rubber、mylar sheet), 分開使用係數並量化。 4. 鋁製散熱片調整為鋁原料+metal working 5. 白膠、導熱膠、紅膠調整為導熱膠主材料(氧化鋁)之係數。	Jo	1. 已將保險絲係數修正為尼龍 66 與塑膠製品之係數。 2. 已將電解電容分為高度>2 cm 跟< 2cm, 並分別量化。 3. 已將絕緣片修正為三種(silicon、rubber、mylar sheet), 並分別量化。 4. 已將鋁製散熱片細數調整為鋁原料+metal working。 5. 已將白膠、導熱膠、紅膠調整為導熱膠主材料(氧化鋁)之係數。	S2階段已確認修訂
7.3	(CAR) 碳足跡研究報告資訊部分項目尚待釐清： 1. 請確認與 PCR 之參考內容說明調整，因目前援引之系統邊界設定有所差異，並產品樣態亦有差異。 2. EX1101 系列產品之分配資訊引用上，請配合現場佐證，將 M45(後加工)之工時加上前段處理(M36)，並於兩項產品之全場工時及分配佔比上一併調整。	Chun	1. 雖標的產品與報告書所述之 PCR 樣態有所差異，惟標的產品與報告書所述之 PCR 其部分性質相似，故本次盤查不引用該 PCR 內容執行，僅參考該 PCR 部分內容進行碳足跡評估。 2. EX1101 系列產品之分配資訊引用 SI 現場佐證，將 M45(後加工)之工時加上前段處理(M36)，並於兩項產品之全場工時及分配佔比上一併調整。	S2階段已確認修訂

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Clause	Clarification/Corrective Action Request	Verifier	Response	Item Closed (Yes/No/Comments)
On-Site Findings-Stage 1				
6.3.5	<p>(CR) 碳足跡清冊計算，部分活動數據之資訊待釐清，包含以下：</p> <ol style="list-style-type: none"> 產品單重之引用數值，請根據現場紀錄進行調整。 1068 及 1101 系列，其原始計算清單之 PCB 版數量皆可能有低估，請確認每件產品之引用單重。 1101 系列 IC 零組件抽查，發現料號 (1421916100+ 1421916200) 一組產品，秤重結果為 0.32g，與清冊數據 0.187g 有落差，請釐清。 1068 系列 IC 零組件抽查，料號 (141100R151) 零件，單重為 2.1g，現場提出組成大多為三極體，請釐清是否需拆解計算。 	Chun	<ol style="list-style-type: none"> 已依據現場磅重數據，重新調整產品單重。 1068 及 1101 系列之 PCB 板單重已重新修正，採用現場實際磅重之數據。 料號(1421916100+ 1421916200)一組產品已修正為現場實際磅重數據 0.32g 經確認料號(141100R151)零件屬於三極體，故將料號(141100R151)零件納入三極體計算。 	S2階段已確認修訂

Clause	Clarification/Corrective Action Request	Verifier	Response	Item Closed (Yes/No/Comments)
On-Site Findings-Stage 2				
-	None	-	-	-

-- END OF REPORT --