

LCA Report

Category : gram

Model : 14Z90T, 14ZD90T, 14ZG90T



1 Notebook Feature

Display	14'' LCD
Reference life time	4 years
Total Power consumption	44.76kWh
Total mass (package and additional elements included)	1.9276kg
Total mass excluding package in manufacturing stage (only product)	1.1417kg
Total mass of package	0.7859kg

2 LCA Calculation Information

Period of validity	5 years
Time boundary of data	2023.11. ~ 2024.10. (1 year)
Boundary	Entire Life Cycle (from cradle to grave)
Manufacturing Name/Adress	Tech-front Computer Co., Ltd. 18#, Zongbao Road, Shapingba District, Chongqing, China
Standard	ISO14040, ISO14044 and ISO14067
LCA Software info	Simapro 9.6.0.1
PCR reference	This report was prepared with reference to the PCR of PEP-ecopassport related to the EPD of French electrical and electronic products, in addition to the Korean laptop use scenario ‘EPD 019:2021(00):202103’.
Method for impact assessment	EN 15804 + A2 methodology

3 System boundary



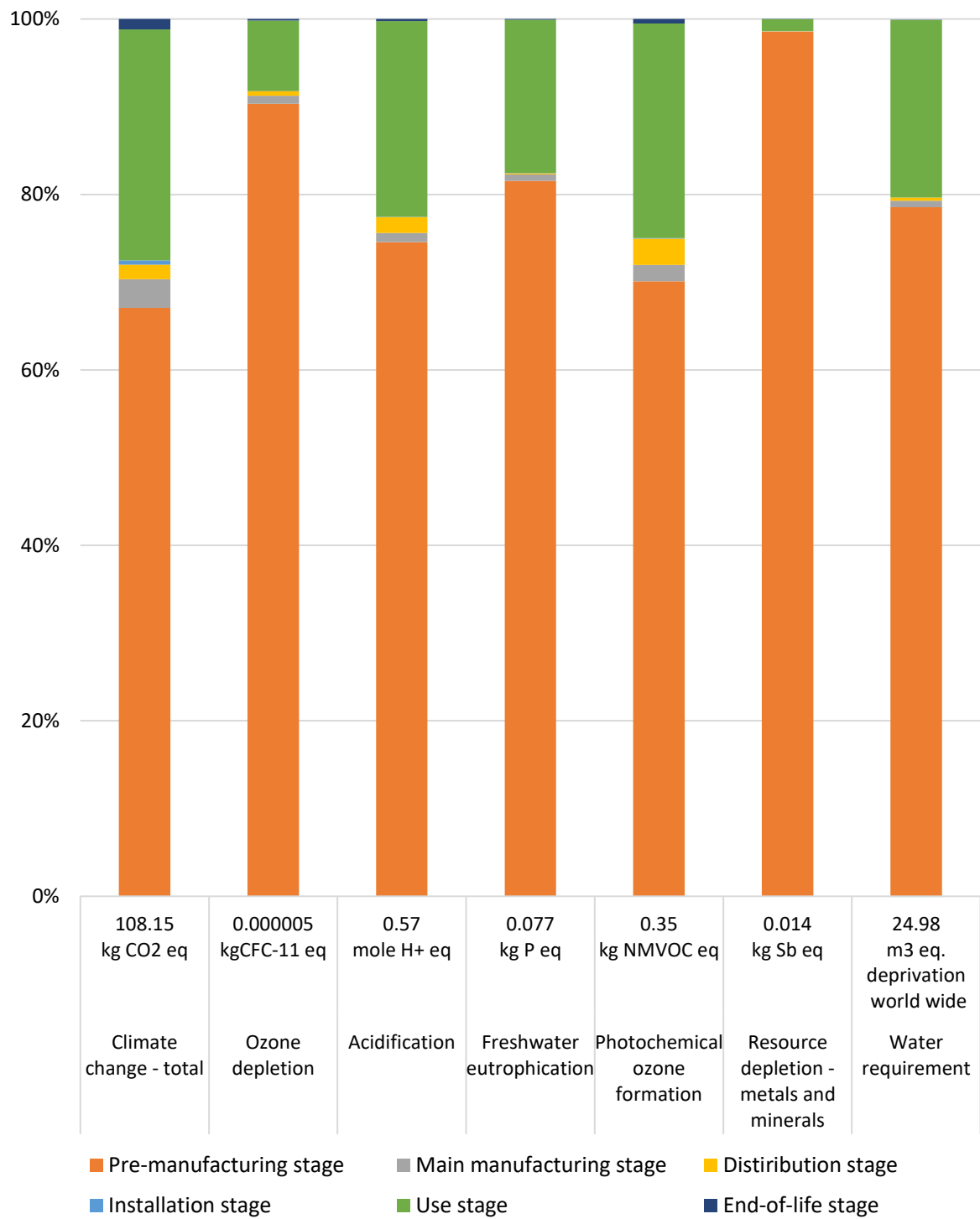
The manufacturing stage consists of **two phases**: **pre-manufacturing**, which involves the production of components, and **main manufacturing**, which includes notebook assembly, transportation, and waste disposal.

Category	Sub-category	Data quality	Data source
Pre-manufacturing (Extraction of raw materials)	Steel, Aluminum, PET, Glass, PC, PMMA etc.	Secondary	Ecoinvent v3.10, Korea national LCI DB
Main manufacturing	Product	Primary	LG Electronics, Korea
Distribution	Transportation	Primary	LG Electronics, Korea
Installation	Installation elements	-	WEEE Directive, EU
Use	Total energy consumption	Primary	LG Electronics, Korea
	Reference lifetime	Primary	LG Electronics, Korea
	Coefficient of use stage	Primary	LG Electronics, Korea
End-of-Life	Product disposal	-	WEEE Directive, EU

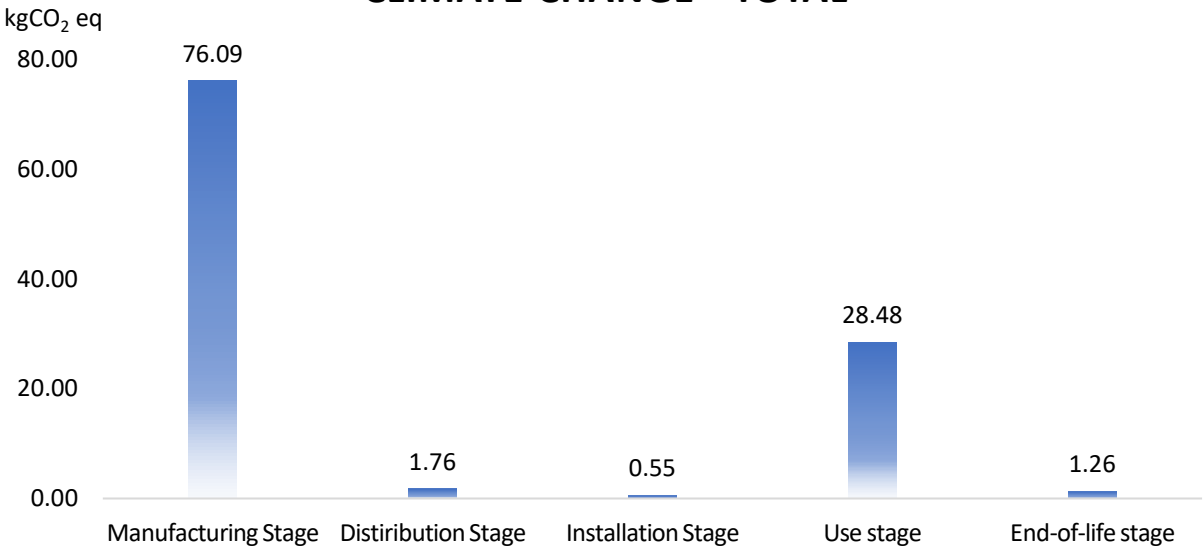
A verification report(critical review) for LCA study has been finished by verifiers from TÜV Rheinland China.

4 LCA Result

Environmental impact by each category

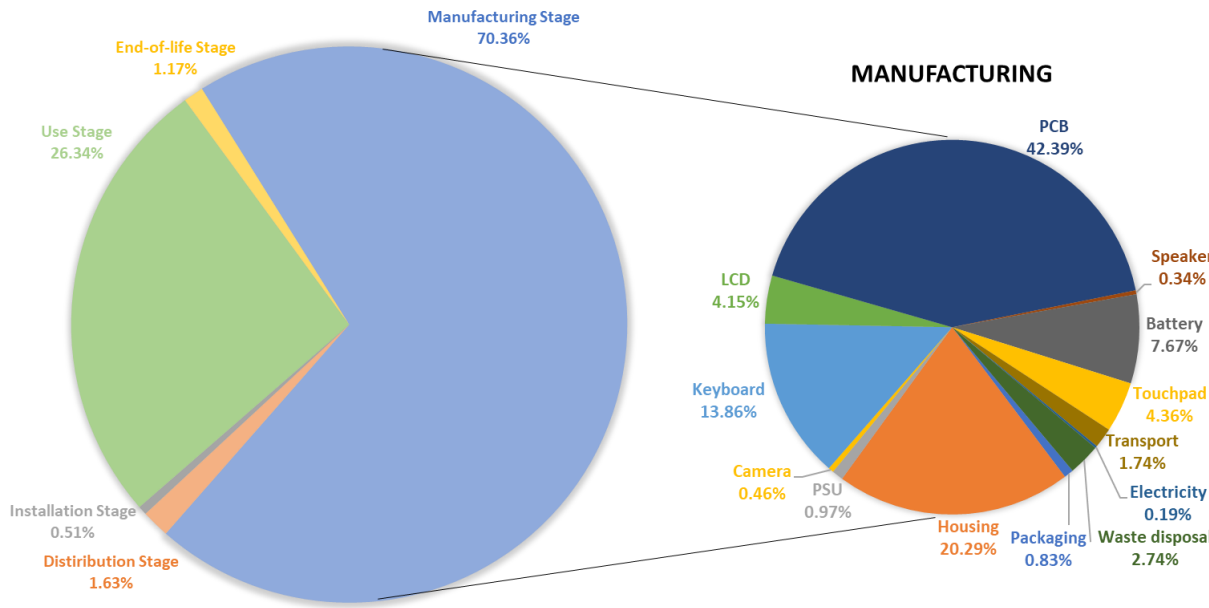


CLIMATE CHANGE - TOTAL



The climate change impact associated with each process of the manufacturing stage is shown, including packaging, the product itself, transportation, electricity consumption, and waste disposal. The impact of the product itself is further broken down by component parts. The power consumption at the manufacturing stage includes only the electricity used in the product assembly process, and the impact on transportation is conservatively calculated.

LIFE CYCLE ASSESMENT



The climate change impact in the manufacturing stage was significant in the following order: PCB, Housing, Keyboard, Battery, Touchpad, LCD, Waste disposal, Transport, PSU, Packaging, Camera, Speaker, Electricity

Results of environmental impact per product

Category	Unit (/product)	Stage					
		Total	Manufacturing	Distribution	Installation	Use	End-of-life
Climate change - total	kg CO2 eq	1.08E+02	7.61E+01	1.76E+00	5.55E-01	2.85E+01	1.26E+00
Climate change - fossil fuels	kg CO2 eq	1.07E+02	7.61E+01	1.76E+00	1.82E-01	2.84E+01	9.46E-01
Climate change - biogenics	kg CO2 eq	6.52E-01	-9.01E-02	9.64E-05	3.73E-01	5.22E-02	3.17E-01
Climate change - land use and land use transformation	kg CO2 eq	1.02E-01	7.79E-02	6.13E-04	2.92E-05	2.36E-02	2.23E-04
Ozone depletion	kgCFC-11 eq	4.63E-06	4.22E-06	2.56E-08	2.19E-10	3.72E-07	7.30E-09
Acidification	mole H+ eq	5.75E-01	4.35E-01	1.04E-02	1.28E-04	1.28E-01	1.29E-03
Freshwater eutrophication	kg P eq	7.66E-02	6.30E-02	1.04E-04	2.80E-05	1.34E-02	6.48E-05
Marine aquatic eutrophication	kg N eq	1.16E-01	8.46E-02	2.75E-03	3.20E-04	2.73E-02	7.20E-04
Terrestrial eutrophication	mole N eq	1.16E+00	8.49E-01	3.03E-02	5.41E-04	2.76E-01	3.60E-03
Photochemical ozone formation	kg NMVOC eq	3.47E-01	2.50E-01	1.04E-02	1.77E-04	8.49E-02	1.76E-03
Resource depletion - metals and minerals	kg Sb eq	1.39E-02	1.37E-02	4.09E-06	3.01E-08	1.89E-04	1.56E-06
Resource depletion - fossils	MJ	7.22E+02	4.66E+02	1.81E+00	3.60E-02	2.53E+02	7.21E-01
Water requirement	m3 eq. deprivation world wide	2.50E+01	1.98E+01	8.82E-02	-1.79E-02	5.07E+00	6.92E-03
Emission of fine particles	disease inc.	1.37E-05	1.28E-05	9.65E-08	1.36E-09	6.84E-07	3.31E-08
Ionizing radiation, human health	kBq U-235 eq	1.29E+01	6.21E+00	1.60E-02	3.01E-04	6.72E+00	6.06E-03
Ecotoxicity (fresh water)	CTUe	1.37E+03	1.19E+03	6.52E+00	3.52E+00	1.57E+02	7.82E+00
Human toxicity, carcinogenic effects	CTUh	8.21E-07	7.66E-07	7.35E-09	2.04E-10	4.49E-08	2.47E-09
Human toxicity, non-carcinogenic effects	CTUh	2.72E-06	2.38E-06	1.77E-08	1.63E-08	2.73E-07	3.46E-08
Impacts related to land use/soil quality	Pt	4.36E+02	3.41E+02	1.04E+01	1.80E-01	8.02E+01	3.76E+00