

Certificate

Inventory Standard **ISO 14040:2006/AMD 1:2020,
ISO 14044:2006/AMD 2:2020**
Certificate Registr. No. **CO 50550458 0001**
Report No. **38545160 001**

Certificate Holder: **LENOVO (BEIJING) LIMITED**
201-H2-6, Floor 2, Building 2, No.6 Shangdi West Road, Haidian
District, Beijing, 100085, P. R. China

Verification Site: **TPV Electronics (Fujian) Co., Ltd.**
F3 plant, Optoelectronic Park, Rongqiao Economic and Technological
Development Zone, Fuqing City, Fujian Province, PRC

Verification Method: Verification Body: TÜV Rheinland Taiwan Ltd.
- Process: Document review, interview, remote audit and
recalculation
- Verification Standard: ISO 14064-3:2006

Verification Scope: Based on the information we have received and evaluated that:
- Programme: Voluntary scheme
- Product Category Rule: N/A
- Organizational Boundary: Operational Control
- Level of Assurance: Reasonable
- Materiality: 5%
- Analysis method: IMPACT World+ Midpoint V1.01 and ReCiPe
2016 Midpoint (E) V1.06
- LCA software or database: SimaPro Ver. 9.3.0.2 / Ecoinvent 3.8
- Product and Model no.: LCD Monitor / P27q-30
- Boundary: Cradle to Grave
- Data period: 2022.05.01~2022.05.31
- Functional unit: one set (include package)
- Result: according to annex
- Excluding the reporting requirements (Section 6 of ISO 14040 and
Section 5 of ISO14044)

Validity: This certificate is valid from 2022/07/27 until 2024/07/26
This certificate only verified the target product, this verification does not
include review of external communication.

2022-07-27


TÜV Rheinland Taiwan Ltd.
11F., No. 758, Sec. 4, Bade Rd.,
Taipei 105, Taiwan

This verification and validation is based on the information made available to TÜV Rheinland and the engagement conditions detailed above. Therefore, TÜV Rheinland cannot guarantee the accuracy or correctness of this information. TÜV Rheinland cannot be held liable by any party relying or acting upon this verification and validation.

Annex to certificate

Inventory Standard **ISO 14040:2006/AMD 1:2020,
ISO 14044:2006/AMD 2:2020**
Certificate Registr. No. **CO 50550458 0001**
Report No. **38545160 001**

Result:

Analysis method: IMPACT World+ Midpoint V1.01

Climate change, short term:	4.442E+02	kg CO ₂ eq
Climate change, long term:	4.171E+02	kg CO ₂ eq
Fossil and nuclear energy use:	5.991E+03	MJ deprived
Mineral resources use:	1.500E+01	kg deprived
Photochemical oxidant formation:	1.330E+00	kg NMVOC eq
Ozone layer depletion:	3.228E-05	kg CFC-11 eq
Freshwater ecotoxicity:	1.088E+07	CTUe
Human toxicity cancer:	5.226E-05	CTUh
Human toxicity non-cancer:	3.329E-04	CTUh
Freshwater acidification:	5.240E-06	kg SO ₂ eq
Terrestrial acidification:	4.394E-03	kg SO ₂ eq
Freshwater eutrophication:	7.705E-03	kg PO ₄ eq
Marine eutrophication:	4.787E-01	kg N eq
Particulate matter formation:	2.578E-01	kg PM _{2.5} eq
Ionizing radiation:	5.338E+03	Bq C-14 eq
Land transformation, biodiversity:	8.029E-02	m ² yr arable
Land occupation, biodiversity:	1.031E+01	m ² yr arable
Water scarcity:	1.005E+02	m ³ world eq

Annex to certificate

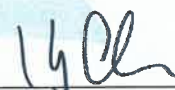
Inventory Standard **ISO 14040:2006/AMD 1:2020,
ISO 14044:2006/AMD 2:2020**
Certificate Registr. No. **CO 50550458 0001**
Report No. **38545160 001**

Result:

Analysis method: ReCiPe 2016 Midpoint (E) V1.06

Global warming:	4.031E+02	kg CO ₂ eq
Stratospheric ozone depletion:	3.408E-04	kg CFC-11 eq
Ionizing radiation:	6.864E+01	kBq Co-60 eq
Ozone formation, Human health:	1.122E+00	kg NO _x eq
Fine particulate matter formation:	1.021E+00	kg PM _{2.5} eq
Ozone formation, Terrestrial ecosystems:	1.130E+00	kg NO _x eq
Terrestrial acidification:	1.929E+00	kg SO ₂ eq
Freshwater eutrophication:	4.987E-01	kg P eq
Marine eutrophication:	1.889E-01	kg N eq
Terrestrial ecotoxicity:	3.645E+03	kg 1,4-DCB
Freshwater ecotoxicity:	8.110E+01	kg 1,4-DCB
Marine ecotoxicity:	8.181E+05	kg 1,4-DCB
Human carcinogenic toxicity:	2.704E+03	kg 1,4-DCB
Land use:	1.299E+01	m ² a crop eq
Mineral resource scarcity:	6.398E+00	kg Cu eq
Fossil resource scarcity:	1.113E+02	kg oil eq
Water consumption:	3.654E+00	m ³

2022-07-27



TUV Rheinland Taiwan Ltd.
11F, No. 758, Sec. 4, Bade Rd.,
Taipei 105, Taiwan



TÜVRheinland®
Precisely Right.

RN 報告號碼
38545160 001

Audit Report as per 稽核報告

ISO 14040:2006/AMD 1:2020,
ISO 14044:2006/AMD 2:2022

For

License holder : LENOVO (BEIJING) LIMITED

持證者

201-H2-6, Floor 2, Building 2, No.6
Shangdi West Road, Haidian District,
Beijing, 100085, P. R. China

License holder 持證者	Standard(s)/ 標準	Report Number(s)/報告號碼	Verification Type/查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

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License holder 持證者	Standard(s)/ 標準	Report Number(s)/報告號碼	Verification Type/查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

Document Review Date 文件審查日期 : 2022.06.13

Stage 1 Audit Date 第一階段稽核日期 : 2022.06.15

Stage 2 Audit Date 第二階段稽核日期 : 2022.07.04 ~ 2022.07.05

	Name 姓名	Document Review 文件審查	Remote audit 遠端稽核		Technical Review 技術審查
			Stage 1 階段 1	Stage 2 階段 2	
Team Leader 查驗組長	Vito Lin 林建志	1 day	1 day	2 days	- days
Verifier 查驗員	N/A	- days	- days	- days	- days
Observer 觀察員	N/A	- days	- days	- days	- days
Technical Reviewer 技術審查	Chi-hwan Lin 林琦桓	- days	- days	- days	1 day

Technical team information 技術團隊資訊

	Name 姓名	number of years experience in the field 相關的經驗	number of projects reviewed 審查的案件數	number of projects conducted 執行的案件數	Contact information 聯絡資訊
Team Leader 查驗組長	Vito C.C. Lin 林建志	2014 till now	Over 100 projects	Over 100 projects	vitocc.lin@tuv.com
Technical Reviewer 技術審查	Chi-hwan Lin 林琦桓	2011 till now	Over 100 projects	Over 100 projects	Chi-Hwan.Lin@tuv.com

1 Validation and verification result 查驗結論

Organization of self-declaration effectiveness was verified on site by means of random sampling by an appropriately selected verifier. This applies in particular to the compliance of validation and verification scope with validation and verification scheme and standard requirements. This was done by means of a sampling approach, by conducting interviews and reviewing the appropriate documentation.

組織自我宣告的有效性在現場由適合之查驗小組以隨機抽樣方式加以查驗，在這過程中，查驗了查驗範圍是否與查驗方案與標準要求一致。此係透過隨機查驗的方法實行，譬如藉由對相關文件之觀察及檢查。

<input type="checkbox"/>	The validation and verification revealed nonconformities which have been demonstrably corrected. The corrections and corrective actions taken in this respect have been verified. 查驗發現之不符合顯示已經消除，矯正與矯正措施已予以查驗。
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License holder 持證者	Standard(s)/ 標準	Report Number(s)/報告號碼	Verification Type/查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

<input checked="" type="checkbox"/>	The current validation and verification revealed the following nonconformities 在本次查驗中發現的不符合：		
	Standard(s) 標準	No. of major nonconformity 主要缺失數量	No. of minor nonconformity 次要缺失數量
	ISO 14040:2006/AMD 1:2020	0	0
	ISO 14044:2006/AMD 2:2020		
<input type="checkbox"/>	The nonconformities (No. x) with individual standard elements require a re-audit to verify the effectiveness of the corrections and corrective actions (probable date:..ddmmyyyy) 由於嚴重不符合(No.)-之矯正與矯正措施之執行需要覆查，稽核日期為.....		

The verifier therefore recommends (provided the effectiveness of corrections and/or corrective actions addressing the identified nonconformities has been verified) 查驗小組 (在查驗過不符合事項的矯正與矯正措施後)建議:

<input checked="" type="checkbox"/>	Award of the new certificate(s). 授予新查驗證書
<input type="checkbox"/>	Issue of the certificate only after successful completion of a re-audit. 唯有在覆查後獲得正面的結論始授予查驗證書

2 Scope 驗證範圍

2.1 Description of the organization 組織概述

Company 公司	LENOVO (BEIJING) LIMITED
Product / Service 產品/服務	筆記型電腦/桌上型電腦與平板電腦, 智慧手機, 智能裝置, 伺服器及儲存裝置, 及其他移動互聯、數位、電腦周邊等類產品等
Main Client / State 主要客戶/國家	全球
Other 其他	Lenovo is an internationally-renowned personal technology Company. The Lenovo product line includes Think-branded business PCs, Idea-branded consumer PCs, servers, workstations, and home mobile Internet terminals, including tablets and smartphones.

2.2 Scope 驗證範圍

The following sites and their scopes are included in the scope of validation and verification 驗證涵蓋了以下場所及其範圍:

Site No. 場所 編號	Sites included in verification 驗證涵蓋的場所 Name/address of site (Facilities code: Taiwan EPA only) 場所名稱 / 地址(管制編號: 限台灣環保署)	Scope and processes (product / service) 範圍和過程(商品/服務)	Standard(s) 標準	On-site Audit 現場查驗
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License holder 持證者	Standard(s)/ 標準	Report Number(s)/報告號碼	Verification Type/查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

01	TPV Electronics (Fujian) Co., Ltd. F3 plant, Optoelectronic Park, Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, PRC	Product: Monitor and TV PCBA, TV and LCD monitor assembly	ISO 14040:2006/A MD 1:2020, ISO 14044:2006/A MD 2:2020	<input checked="" type="checkbox"/>
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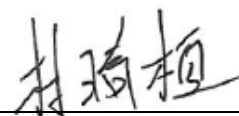
3 Dates 日期

2022.07.27



Date / Team Leader 日期 / 查驗組長

2022.07.27



Date / Technical Reviewer 日期 / 技術審查

License holder 持證者	Standard(s)/ 標準	Report Number(s)/報告號碼	Verification Type/查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

Annex ISO 14040:2006/ISO 14044:2006

(please delete if not an ISO 14040:2006/ISO 14044:2006 part)

L.1 Validation and verification Program 查驗方案

Inventory Criteria 盤查標準:	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020
Audit Criteria 稽核標準:	ISO 14064-3:2006
Product category rules (PCR) 產品類別規則	N/A
Scheme 方案:	Voluntary scheme
Intended user 預期使用者:	<input type="checkbox"/> Government 政府 <input checked="" type="checkbox"/> Customer 買家 <input type="checkbox"/> NGOs 非營利組織
	<input type="checkbox"/> Investor 投資方 <input checked="" type="checkbox"/> Private use 內部使用 <input type="checkbox"/> Consumer 消費者
Product / Service boundaries 商品/服務邊界:	Sources as presented in inventory spreadsheet provided by client. 來源的展現來自客戶提供的盤查清單。
Type of verification 查驗類型:	<input checked="" type="checkbox"/> First review 首次 <input type="checkbox"/> Renew 再驗證 <input type="checkbox"/> Re-audit/Additional 覆查/補查驗
	First review 首次: 2022
Consolidation methodology 彙總方法:	<input type="checkbox"/> Financial control 財務控制 <input checked="" type="checkbox"/> Operational control 營運控制
	<input type="checkbox"/> Equity share 股權持份 <input type="checkbox"/> Other 其他:
Level of assurance 保證等級:	<input checked="" type="checkbox"/> Reasonable assurance 合理 <input type="checkbox"/> Limited assurance 有限 <input type="checkbox"/> N/A 不適用
Materiality 實質性:	5 %
Cut-off criteria 截斷原則	N/A 未使用
LCA software 軟體	SimaPro Ver. 9.3.0.2
Assessment database 資料庫	Ecoinvent 3.8
Other 其他:	Excluding the reporting requirements (Section 6 of ISO 14040 and Section 5 of ISO14044)

L.2 Conclusion 結論

Based on the information we have received and evaluated, it was verified by TÜV Rheinland that:

基於取得的資訊進行評估，德國萊因之查驗結論：

L.2.1 Result 總結

Product / Service name 商品/服務名稱	: LCD Monitor
Model (series) no. 型號(系列)	: P27q-30
Functional (declared) unit 功能(宣告)單位	: one set (include package)
Site 場址	: TPV Electronics (Fujian) Co., Ltd. F3 plant, Optoelectronic Park, Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, PRC
Data period 數據區間:	: 2022.05.01~2022.05.31

License holder 持證者	Standard(s)/ 標準	Report Number(s)/報告號碼	Verification Type/查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

Stage	Raw materials	Production	Distribution / Retail	Consumer use	Disposal / Recycling	Total
Climate change, short term (kg CO ₂ eq)	2.394E+02	3.009E+00	1.050E+00	2.007E+02	7.575E-03	4.442E+02
Climate change, long term (kg CO ₂ eq)	2.250E+02	2.668E+00	1.036E+00	1.883E+02	6.440E-03	4.171E+02
Fossil and nuclear energy use (MJ deprived)	3.146E+03	2.759E+01	1.516E+01	2.802E+03	4.193E-01	5.991E+03
Mineral resources use (kg deprived)	1.403E+01	8.127E-03	1.429E-02	9.424E-01	1.294E-03	1.500E+01
Photochemical oxidant formation (kg NMVOC eq)	7.852E-01	9.118E-03	1.703E-02	5.186E-01	3.479E-05	1.330E+00
Ozone layer depletion (kg CFC-11 eq)	2.424E-05	2.849E-08	2.298E-07	7.783E-06	2.185E-09	3.228E-05
Freshwater ecotoxicity (CTUe)	8.015E+06	3.386E+04	2.675E+03	2.832E+06	1.919E+00	1.088E+07
Human toxicity cancer (CTUh)	3.960E-05	1.316E-07	9.649E-08	1.243E-05	-5.344E-12	5.226E-05
Human toxicity non-cancer (CTUh)	3.009E-04	4.042E-07	5.519E-08	3.154E-05	-1.048E-09	3.329E-04
Freshwater acidification (kg SO ₂ eq)	3.200E-06	2.998E-08	4.495E-08	1.965E-06	3.790E-10	5.240E-06
Terrestrial acidification (kg SO ₂ eq)	2.740E-03	2.434E-05	3.703E-05	1.592E-03	2.943E-07	4.394E-03
Freshwater eutrophication (kg PO ₄ eq)	6.886E-03	3.135E-07	3.648E-05	7.820E-04	3.228E-09	7.705E-03
Marine eutrophication (kg N eq)	4.673E-01	1.838E-04	3.503E-04	1.085E-02	-9.992E-08	4.787E-01
Particulate matter formation (kg PM _{2.5} eq)	1.490E-01	2.405E-03	8.934E-04	1.054E-01	1.065E-05	2.578E-01
Ionizing radiation (Bq C-14 eq)	2.381E+03	5.381E+00	6.670E+00	2.944E+03	3.264E-01	5.338E+03
Land transformation, biodiversity (m ² yr arable)	5.484E-02	2.482E-04	2.196E-04	2.498E-02	0.000E+00	8.029E-02
Land occupation, biodiversity (m ² yr arable)	6.800E+00	3.031E-02	2.147E-02	3.462E+00	0.000E+00	1.031E+01
Water scarcity (m ³ world eq)	6.577E+01	6.277E-01	3.568E-02	3.412E+01	-9.126E-03	1.005E+02
Geography boundary	China	China	USA and Netherlands	Worldwide	Worldwide	
Analysis method	IMPACT World+ Midpoint V1.01			System boundary of product	Cradle to Grave	

License holder 持證者	Standard(s)/ 標準	Report Number(s)/報告號碼	Verification Type/查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

Stage	Raw materials	Production	Distribution / Retail	Consumer use	Disposal / Recycling	Total
Global warming (kg CO ₂ eq)	2.171E+02	2.535E+00	1.023E+00	1.824E+02	5.865E-03	4.031E+02
Stratospheric ozone depletion (kg CFC-11 eq)	2.132E-04	9.982E-07	9.137E-07	1.257E-04	1.045E-08	3.408E-04
Ionizing radiation (kBq Co-60 eq)	3.061E+01	7.073E-02	8.600E-02	3.786E+01	8.523E-03	6.864E+01
Ozone formation, Human health (kg NO _x eq)	6.584E-01	8.300E-03	1.616E-02	4.387E-01	2.118E-05	1.122E+00
Fine particulate matter formation (kg PM _{2.5} eq)	5.704E-01	4.642E-03	5.110E-03	4.405E-01	4.206E-05	1.021E+00
Ozone formation, Terrestrial ecosystems (kg NO _x eq)	6.633E-01	8.303E-03	1.616E-02	4.423E-01	2.129E-05	1.130E+00
Terrestrial acidification (kg SO ₂ eq)	1.212E+00	1.038E-02	1.550E-02	6.902E-01	1.322E-04	1.929E+00
Freshwater eutrophication (kg P eq)	3.971E-01	5.982E-04	1.759E-04	1.008E-01	7.105E-09	4.987E-01
Marine eutrophication (kg N eq)	1.817E-01	3.799E-05	5.419E-06	7.162E-03	6.362E-09	1.889E-01
Terrestrial ecotoxicity (kg 1,4-DCB)	3.265E+03	3.471E+00	9.000E+00	3.674E+02	2.457E-02	3.645E+03
Freshwater ecotoxicity (kg 1,4-DCB)	6.946E+01	9.606E-02	1.443E-02	1.153E+01	5.449E-06	8.110E+01
Marine ecotoxicity (kg 1,4-DCB)	7.768E+05	3.810E+02	1.085E+02	4.080E+04	9.125E-02	8.181E+05
Human carcinogenic toxicity (kg 1,4-DCB)	2.031E+03	7.184E+00	5.265E+00	6.607E+02	5.090E-05	2.704E+03
Human non-carcinogenic toxicity (kg 1,4-DCB)	6.868E+05	3.210E+02	8.314E+01	3.382E+04	7.729E-02	7.210E+05
Land use (m ² a crop eq)	8.988E+00	3.700E-02	3.730E-02	3.926E+00	0.000E+00	1.299E+01
Mineral resource scarcity (kg Cu eq)	6.178E+00	1.664E-03	1.715E-03	2.164E-01	2.428E-04	6.398E+00
Fossil resource scarcity (kg oil eq)	5.968E+01	5.852E-01	3.272E-01	5.071E+01	6.213E-03	1.113E+02
Water consumption (m ³)	2.032E+00	1.520E-02	1.192E-03	1.606E+00	-2.122E-04	3.654E+00
Geography boundary	China	China	USA and Netherlands	Worldwide	Worldwide	
Analysis method	ReCiPe 2016 Midpoint (E) V1.06			System boundary of product	Cradle to Grave	

Reference of client documents 參照客戶文件:

- Report 報告 : Lenovo P27q-30_Product LCA Report_20220727(英文版 2022.07.27 AM 10:44
本).doc

License holder 持證者	Standard(s) 標準	Report Number(s) 報告號碼	Verification Type 查驗類型
LENOVO (BEIJING) LIMITED	ISO 14040:2006/AMD 1:2020, ISO 14044:2006/AMD 2:2020	38545160 001	First review

- Inventory sheet 盤查表: 冠捷科技-LCA(生命週期評估)及 PCF(產品碳足跡)評估資料收 2022.07.27 AM 08:55
 集總表-Lenovo P27q-30 _20220726 final.xls
 IMPACT World+ Midpoint V1.01_2022.07.27.xlsx 2022.07.27 AM 10:44
 ReCiPe 2016 Midpoint (E) V1.06_2022.07.27.xlsx 2022.07.27 AM 10:44

Life Cycle Assessment for Lenovo- P27q-30

Received Date: Jun, 08, 2022

Report Number: 2022-LCA0701

Date of Issue: Jul, 27, 2022

Commissioned Company :	Lenovo (Beijing) Limited (Entrusted by TUV Rheinland Taiwan)
Address :	N/A
Product Name/ Model Number :	LCD Monitor / P27q-30

Please Note :

1. This report contains 9 pages.
2. The content of this report is for reference only.
3. The inventoried data (Please refer to the **IV References**) are provided by the commissioning company, CYT is only responsible for the LCA software analysis.
4. If the LCA data has been modified, the report would be regarded as invalid.
5. This report shall not to be reprinted or photocopied.



I Product Overview

- 1. Unit Under Test (UUT) / Model Number : LCD Monitor / P27q-30**
- 2. Product Description : LCD Monitor**
- 3. Product weight :**
 - 3.1.1 Net weight : 6.8 kg/pcs**
 - 3.1.2 With packaging : 10.00 kg/pcs**

II Software information

- 1. Software : SimaPro 9.3.0.2**
- 2. Database : Ecoinvent 3.8**
- 3. Analyzing method(1) : IMPACT World+ Midpoint V1.01**

C:\Users\Public\Documents\SimaPro\Database\Professional1; CYTech - [檢視 方法 'IMPACT World+ Midpoint V1.01']

文件(F) 編輯(E) 計算(C) 工具(T) 窗口(W) 說明(H)

家 搜索 添加 删除 保存 打印 剪切 复制 粘贴 撤销 重做 A+B = D+A 42 帮助 工具 窗口 文件

概要 特性描述

名稱: IMPACT World+ Midpoint 版本: 1 01

結構

☐ 損壞情況估計 ☐ 標準化 ☐ 額外的 ☐ 新增

註解

IMPACT World+ Midpoint
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[This implementation (SimaPro version 1.00) corresponds to IMPACT World+ Midpoint version 1.29. It includes only recommended (not interim) midpoint level indicators and partial regionalization. For fully regionalized version of IMPACT World+ use SimaPro Flow or contact Support]

IMPACT World+, is the update of the IMPACT 2002+, LUCAS, and EDIP methods. According to the developers, most of the regional impact categories have been spatially resolved and all the long-term impact categories have been subdivided between shorter-term damages (over the 100 years after the emission) and long-term damages. Impact categories the Midpoint version are based on the following models:

- Global Warming Potential (GWP100) and Global Temperature Potentials (GTP100) are used for, respectively, climate change short- and long-term impacts. Those two indicators are needed because they express different impacts: GTP100 (climate change long-term) are impacts related to long-term cumulative warming (e.g. sea level rise), while GWP100 (climate change shorter-term) are impacts related to a rapid increase in temperature to which humans and species must adapt very quickly.
- Marine acidification impact is based on the same fate model as climate change, combined with the H⁺ concentration affecting 50% of the exposed species,
- For mineral resources depletion impact, the material competition scarcity index from de Bruille (2014) is applied as a midpoint indicator,
- Terrestrial and freshwater acidification impact assessment is based on Roy et al. (Roy et al. 2014; Roy et al. 2012a; Roy et al. 2012b) and combines, at a resolution of 2.5° (latitude x longitude), global atmospheric source-deposition relationships with soil and water ecosystems sensitivity,
- Freshwater eutrophication impact is spatially assessed at a resolution grid of 0.5°/0.5° based on a model from Helmes et al. (2012),
- Ecotoxicity and human toxicity impact is based on the parameterized version of USEtox for continents. The developers considered indoor emissions and differentiated the impacts of

關閉

4. Analyzing method(2) : ReCiPe 2016 Midpoint (E) V1.06

C:\Users\Public\Documents\SimaPro\Database\Professional1; CYTech - [檢視 方法 'ReCiPe 2016 Midpoint (E) V1.06']

文件(F) 編輯(E) 計算(C) 工具(T) 窗口(W) 說明(H)

概要 特性描述 標準化

名稱: ReCiPe 2016 Midpoint (E) 版本: 1 06

結構: ☐ 損壞情況估計 ☒ 標準化 ☐ 額外的 ☐ 新增

註解

ReCiPe 2016 v1.1 midpoint, Egalitarian perspective
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This is not the default ReCiPe midpoint method. The default ReCiPe midpoint method is the Hierarchist version.

The ReCiPe 2016 method is a new version of ReCiPe 2008, created by RIVM, Radboud University, Norwegian University of Science and Technology and PR?Sustainability. Due to significant methodological differences, the results of ReCiPe 2008 and ReCiPe 2016 cannot and should not be compared. In ReCiPe you can choose to use midpoint indicators or endpoint indicators. Each method has been created for three different perspectives. The method includes global normalisation factors for reference year 2010.

Subcompartments

In case the original method only reported a characterisation value for one specific subcompartment, this value is taken as the characterisation value for all subcompartments in this compartment. The characterisation values of the subcompartments "resh water" under water, "high population density" under air and "industrial soil" under soil were chosen as factor for the subcompartment "unspecified". Please mind that the factors in Global warming differ from the 100a time horizon in IPCC 2013 because climate-carbon feedback for non-CO2 GHGs is included. For further details see the method's documentation.

Regions for other impact categories

In the impact categories "Ozone formation, Human health", "Fine particulate matter formation", and "Ozone formation, Terrestrial ecosystems", the following geographies were mapped

關閉

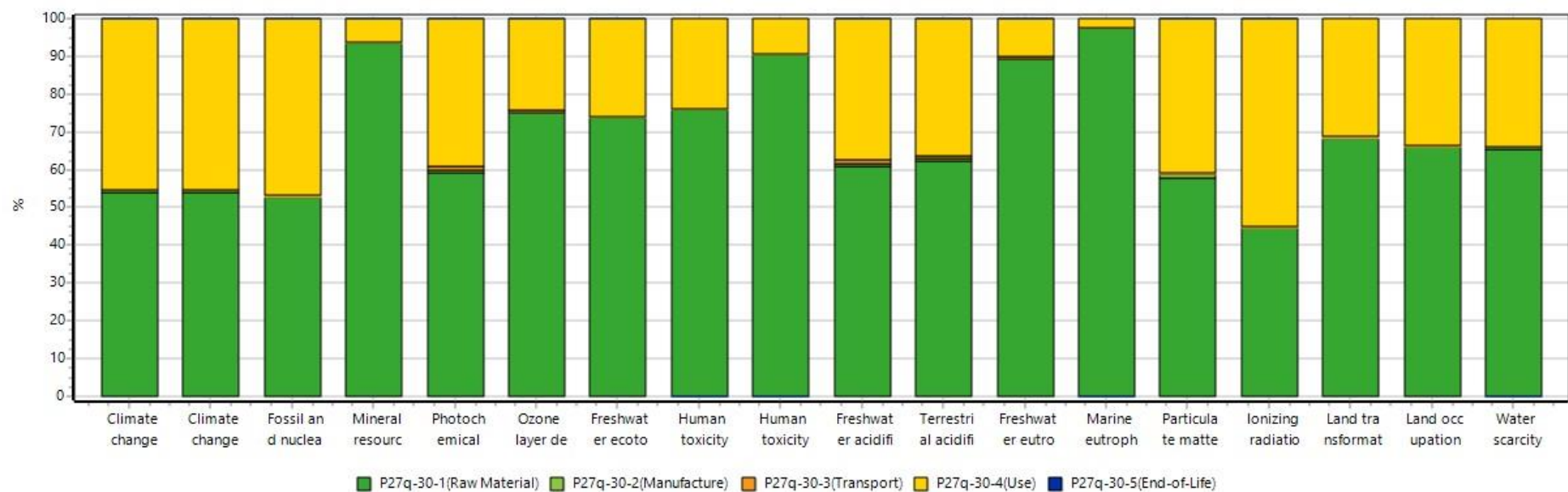
III Result

1. Evaluation summary of Product environmental impact- (IMPACT World+ Midpoint V1.01)

Table 1: Evaluation Summary of Product's Environmental Impact (IMPACT World+ Midpoint V1.01)

影響類別	單位	共計	P27q-30-1(Raw Material)	P27q-30-2(Manufacture)	P27q-30-3(Transport)	P27q-30-4(Use)	P27q-30-5(End-of-Life)
Climate change, short term	kg CO2 eq	4.44E+02	2.39E+02	3.01E+00	1.05E+00	2.01E+02	7.58E-03
Climate change, long term	kg CO2 eq	4.17E+02	2.25E+02	2.67E+00	1.04E+00	1.88E+02	6.44E-03
Fossil and nuclear energy use	MJ deprived	5.99E+03	3.15E+03	2.76E+01	1.52E+01	2.80E+03	4.19E-01
Mineral resources use	kg deprived	1.50E+01	1.40E+01	8.13E-03	1.43E-02	9.42E-01	1.29E-03
Photochemical oxidant formation	kg NMVOC eq	1.33E+00	7.85E-01	9.12E-03	1.70E-02	5.19E-01	3.48E-05
Ozone layer depletion	kg CFC-11 eq	3.23E-05	2.42E-05	2.85E-08	2.30E-07	7.78E-06	2.19E-09
Freshwater ecotoxicity	CTUe	1.09E+07	8.01E+06	3.39E+04	2.68E+03	2.83E+06	1.92E+00
Human toxicity cancer	CTUh	5.23E-05	3.96E-05	1.32E-07	9.65E-08	1.24E-05	-5.34E-12
Human toxicity non-cancer	CTUh	3.33E-04	3.01E-04	4.04E-07	5.52E-08	3.15E-05	-1.05E-09
Freshwater acidification	kg SO2 eq	5.24E-06	3.20E-06	3.00E-08	4.49E-08	1.97E-06	3.79E-10
Terrestrial acidification	kg SO2 eq	4.39E-03	2.74E-03	2.43E-05	3.70E-05	1.59E-03	2.94E-07
Freshwater	kg PO4 eq	7.70E-03	6.89E-03	3.13E-07	3.65E-05	7.82E-04	3.23E-09

eutrophication							
Marine eutrophication	kg N eq	4.79E-01	4.67E-01	1.84E-04	3.50E-04	1.09E-02	-9.99E-08
Particulate matter formation	kg PM2.5 eq	2.58E-01	1.49E-01	2.41E-03	8.93E-04	1.05E-01	1.07E-05
Ionizing radiation	Bq C-14 eq	5.34E+03	2.38E+03	5.38E+00	6.67E+00	2.94E+03	3.26E-01
Land transformation, biodiversity	m2yr arable	8.03E-02	5.48E-02	2.48E-04	2.20E-04	2.50E-02	0.00E+00
Land occupation, biodiversity	m2yr arable	1.03E+01	6.80E+00	3.03E-02	2.15E-02	3.46E+00	0.00E+00
Water scarcity	m3 world eq	1.01E+02	6.58E+01	6.28E-01	3.57E-02	3.41E+01	-9.13E-03



正在分析 1 p'P27q-30' ; 方法 : IMPACT World+ Midpoint V1.01/特性描述

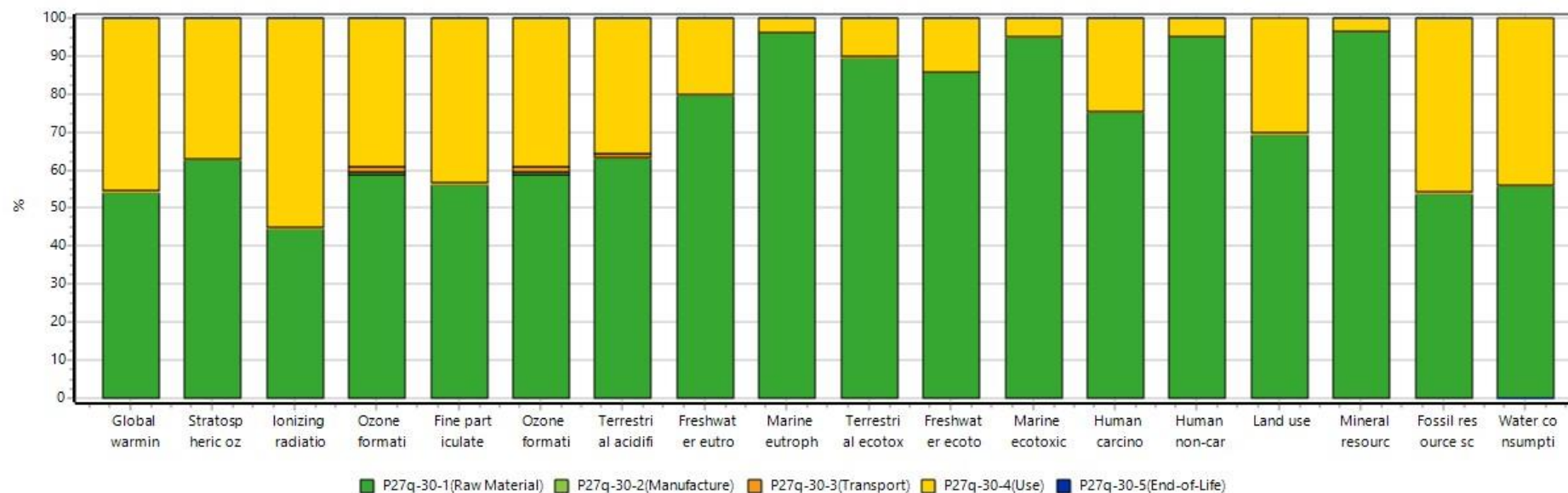
Figure 1: Evaluation Summary of Product's Environmental Impact - characterization(IMPACT World+ Midpoint V1.01)

2. Evaluation summary of Product environmental impact- (ReCiPe 2016 Midpoint (E) V1.06)

Table 2: Evaluation Summary of Product's Environmental Impact (ReCiPe 2016 Midpoint (E) V1.06)

影響類別	單位	共計	P27q-30-1(Raw Material)	P27q-30-2(Manufacture)	P27q-30-3(Transport)	P27q-30-4(Use)	P27q-30-5(End-of-Life)
Global warming	kg CO2 eq	4.03E+02	2.17E+02	2.54E+00	1.02E+00	1.82E+02	5.87E-03
Stratospheric ozone depletion	kg CFC11 eq	3.41E-04	2.13E-04	9.98E-07	9.14E-07	1.26E-04	1.04E-08
Ionizing radiation	kBq Co-60 eq	6.86E+01	3.06E+01	7.07E-02	8.60E-02	3.79E+01	8.52E-03
Ozone formation, Human health	kg NOx eq	1.12E+00	6.58E-01	8.30E-03	1.62E-02	4.39E-01	2.12E-05
Fine particulate matter formation	kg PM2.5 eq	1.02E+00	5.70E-01	4.64E-03	5.11E-03	4.40E-01	4.21E-05
Ozone formation, Terrestrial ecosystems	kg NOx eq	1.13E+00	6.63E-01	8.30E-03	1.62E-02	4.42E-01	2.13E-05
Terrestrial acidification	kg SO2 eq	1.93E+00	1.21E+00	1.04E-02	1.55E-02	6.90E-01	1.32E-04
Freshwater eutrophication	kg P eq	4.99E-01	3.97E-01	5.98E-04	1.76E-04	1.01E-01	7.11E-09
Marine eutrophication	kg N eq	1.89E-01	1.82E-01	3.80E-05	5.42E-06	7.16E-03	6.36E-09
Terrestrial ecotoxicity	kg 1,4-DCB	3.64E+03	3.26E+03	3.47E+00	9.00E+00	3.67E+02	2.46E-02
Freshwater ecotoxicity	kg 1,4-DCB	8.11E+01	6.95E+01	9.61E-02	1.44E-02	1.15E+01	5.45E-06
Marine ecotoxicity	kg	8.18E+05	7.77E+05	3.81E+02	1.09E+02	4.08E+04	9.13E-02

	1,4-DCB						
Human carcinogenic toxicity	kg 1,4-DCB	2.70E+03	2.03E+03	7.18E+00	5.27E+00	6.61E+02	5.09E-05
Human non-carcinogenic toxicity	kg 1,4-DCB	7.21E+05	6.87E+05	3.21E+02	8.31E+01	3.38E+04	7.73E-02
Land use	m2a crop eq	1.30E+01	8.99E+00	3.70E-02	3.73E-02	3.93E+00	0.00E+00
Mineral resource scarcity	kg Cu eq	6.40E+00	6.18E+00	1.66E-03	1.72E-03	2.16E-01	2.43E-04
Fossil resource scarcity	kg oil eq	1.11E+02	5.97E+01	5.85E-01	3.27E-01	5.07E+01	6.21E-03
Water consumption	m3	3.65E+00	2.03E+00	1.52E-02	1.19E-03	1.61E+00	-2.12E-04



正在分析 1 p 'P27q-30' ; 方法 : ReCiPe 2016 Midpoint (E) V1.06 / World (2010) E/特性描述

Figure 2: Evaluation Summary of Product's Environmental Impact – characterization (ReCiPe 2016 Midpoint (E) V1.06)

IV References

Reference of client documents:

冠捷科技-LCA(生命週期評估)及 PCF(產品碳足跡)評估資料收集總表-Lenovo P27q-30 _20220726 2022.07.27 AM 09:24

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