ECO RATING 2021

METHODOLOGY OVERVIEW

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ACRONYMS

IC Integrated circuit

LCA Life cycle assessment

PCB Printed circuit board

1. Introduction

During recent years, several environmental evaluation methods aimed at mobile devices have been developed by different entities, with a modest level of market uptake, and a lack of harmonisation across the industry. The Eco Rating initiative has sought to change this and to develop a common evaluation methodology, with a high involvement of the mobile phone sector, particularly manufacturers for smartphones and feature phones, and integrating the most recent advances in the standardization of life cycle assessment and circular economy.

Eco Rating is an initiative aimed at empowering mobile phone users and help them make more informed purchasing decisions. Market research indicates that there is a growing desire to base purchasing decisions on sustainability criteria but so far there has been a lack of transparency to enable this. To be able to make responsible purchasing decisions when buying mobile handsets, customers must have access to relevant and trustworthy information about the environmental performance of the devices from a life cycle perspective. This is what Eco Rating is all about.

The Eco Rating takes into account international Life Cycle Assessment standards (including ISO 14040, ISO 14044, ITU L.1015, ETSI TR 103 679), technical standards developed by CENELEC under the Mandate 543 of the European Commission (EN 45550 to EN 45559) and other criteria defined in different guidelines (ETSI, ITU, UL). In addition, the proposed methods by the European Commission for the development of Product Environmental Footprint (PEF) have been analysed and used as guidelines.

DOCUMENTATION	URL
EU Product and Organisation Environmental Footprint	https://ec.europa.eu/environment/eussd/smgp/ef_pilots.htm
Product Environmental Footprint Category Rules Guidance v6.3	https://ec.europa.eu/environment/eussd/smgp/pdf/PEFCR_guidance_v6.3.pdf
JRC Guidance for Assessment of Material Efficiency: Application to Smartphones	https://ec.europa.eu/jrc/en/publication/guidance-assessment-material-efficiency-application-smartphones
Mandate M543.- Material Efficiency Standards by CEN/CENELEC/ETSI	https://ec.europa.eu/growth/tools-databases/mandates/index.cfm?fuseaction=search.detailandid=564
TCO-Certification for smartphones	https://tcocertified.com/new-generation-tco-certified/#documents
Precision of a Streamlined Life Cycle Assessment Approach Used in Eco-Rating of Mobile Phones	https://www.mdpi.com/2078-1547/8/2/21
ETSI TR 103 679. Product Environmental Footprint Category Rules (PEFCRs) for smartphones	https://www.etsi.org/deliver/etsi_tr/103600_103699/103679/01.01.01_60/tr_103679v010101p.pdf
ITU L.1015: Criteria for evaluation of the environmental impact of mobile phones	https://www.itu.int/rec/T-REC-L.1015/
ISO 14040:2006: Environmental management — Life cycle assessment — Principles and framework	https://www.iso.org/standard/37456.html
ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines	https://www.iso.org/standard/38498.html

CLC/TR 45550.- Definitions related to material efficiency	https://www.en-standard.eu/search/?q=45550
EN 45552:2020.- General method for the assessment of the durability of energy-related products	https://www.en-standard.eu/search/?q=45552
EN 45553:2020.- General method for the assessment of the ability to remanufacture energy-related products	https://www.en-standard.eu/search/?q=45553
EN 45554:2020.- General methods for the assessment of the ability to repair, reuse and upgrade energy-related products	https://www.en-standard.eu/search/?q=45554
EN 45555.- General methods for assessing the recyclability and recoverability of energy-related products	https://www.en-standard.eu/search/?q=45555
EN 45557.- General method for assessing the proportion of recycled material content in energy-related products	https://www.en-standard.eu/search/?q=45557
EN 45559.- Methods for providing information relating to material efficiency aspects of energy-related products	https://www.en-standard.eu/search/?q=45559

Eco Rating considers 13 environmental impact categories, and six circular economy and material efficiency criteria.

ENVIRONMENTAL IMPACT CATEGORIES				
Climate change	Ozone depletion	Ionising radiation	Land use	Water scarcity
Photochemical ozone formation	Respiratory inorganics	Eutrophication freshwater	Eutrophication marine	Eutrophication terrestrial
Resource use, energy carriers		Resource use, minerals and metals	Acidification terrestrial and freshwater	

CIRCULAR ECONOMY / MATERIAL EFFICIENCY CATEGORIES		
Durability	Repairability / Reusability / Upgradeability	Recyclability and recoverability
Use of hazardous and restricted substances	Recycled materials content	Waste packaging and accessories

Eco Rating is a consciously broad approach to cover the whole environmental performance of mobile phones from a life cycle perspective: from raw material extraction over production, transport, usage and to end of life.

The raw material extraction phase and the production phase of mobile phones have a significantly large environmental impact (ca. 80% of the whole life cycle). Therefore, it is important to include this into the assessment of the environmental performance of mobile phones.

From a circular economy perspective, prolonging the utilization of a product is central to limiting its environmental impact. Durability, repairability, and upgradability are relevant to enable this. A circular economy requires products to be both a sink and source of secondary raw materials. Hence, the Eco Rating also assess the recyclability and the use of recycled materials.

From an environmental perspective, another key aspect is to avoid the use of harmful substances along the supply chain and during recycling. This works best when such substances are restricted which reduces the need to process harmful substances in the supply chain and during recycling.

Lastly, the Eco Rating considers the use of sustainable packaging as an important aspect for promoting sustainability and therefore this has also been included in the Eco Rating methodology.

The Eco Rating initiative has been founded by the mobile network operators Deutsche Telekom, Orange, Telefonica, Telia Company and Vodafone. The initiative is also open to the participation of other operators as per November 2021. The Eco Rating initiative is presented at www.ecoratingdevices.com.

2. Methodology

2.1 Overview

The Eco Rating method evaluates mobile phone devices from a life cycle perspective. The method allows the obtention of a final characteristic Eco Rating score, showing the environmental performance of the assessed device considering its whole life cycle.

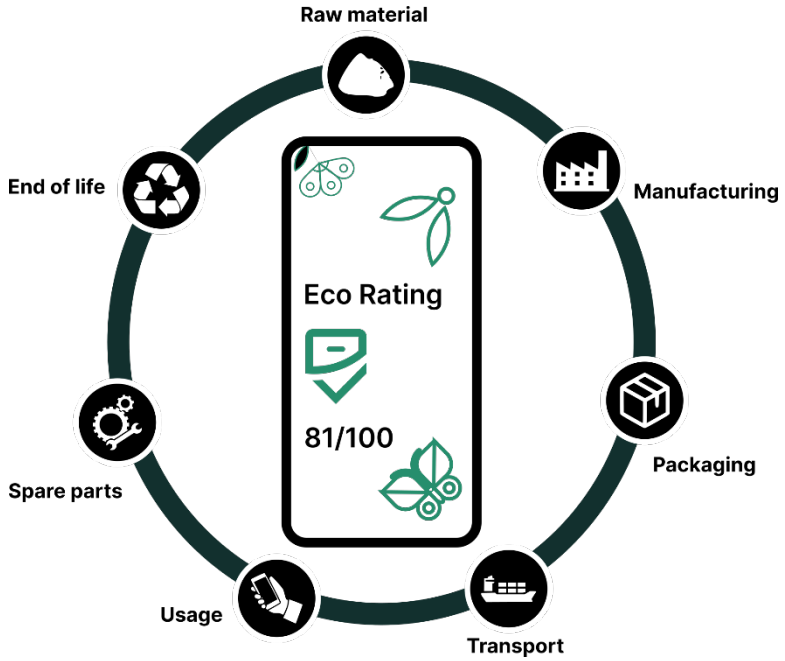


Figure 01.- Mobile phone life cycle

The Eco Rating uses input information provided by device vendors about the smartphones and feature phones they manufacture to evaluate the life cycle performance of a specific device. The evaluation is made combining the 13 environmental impact areas and six material efficiency criteria (see section 1) to obtain one single score, the Eco Rating score, for each device being analysed.

The Eco Rating score is based on an assessment of the environmental impact (based on a Life Cycle Assessment) and the material efficiency features of the device. The score ranges from 0 to 100 (0 = very poor performance; 100 = very good performance).

The result is calculated considering the following functional unit (i.e. reference time period and functions provided by the device): "Enable one hour daily calling, one hour web browsing and one hour video watching daily for four years". For feature phones, the functional unit is "Enable one hour daily calling for four years".

In addition to the overall Eco Rating score, the Eco Rating also calculates six material efficiency sub scores from the data input, showing the performance of the product in each of the analysed material efficiency categories. The final score includes assessments that are not reflected in the sub scores. Devices that achieve higher sub scores will usually achieve a higher overall Eco Rating, but the overall score is not directly dependent on the sub scores and is not calculated as an

average of the sub scores. However, all the sub scores have a relative impact on the overall result, depending on their relevance towards the life cycle of the specific device being assessed.

Two different score ranges have been established, one for feature phones and another one for smartphones, meaning that the result obtained by a feature phone can only be compared with the result obtained by other feature phones. The same holds for smartphones, which are evaluated using a different score threshold.

2.2 The rating process

The device manufacturer provides input data to Eco Rating by answering >150 device-specific questions by self-declaration. Please refer to section 2.4 for a detailed list of questions asked to the manufacturer.

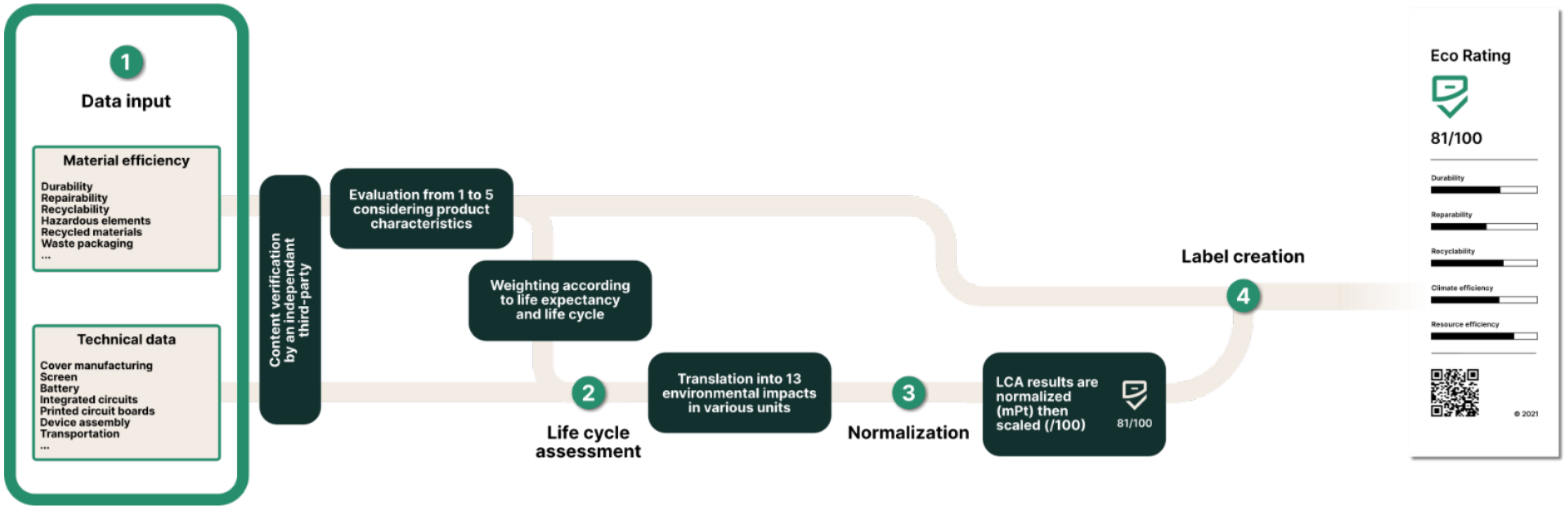
The aim of the Eco Rating is to translate the raw data provided by the device manufacturers (size of screen, transportation mode, etc.) into environmental impacts – for which each impact has a specific unit. The input data needed to obtain a rating are specific to hardware design details.

To translate the raw data into environmental impacts, the Eco Rating uses a database able to dispatch the raw data into environmental impact figures based on a Life Cycle Assessment, expressed in millipoints (mPts) and based on characterization, normalization and weighting factors.

The values are thereafter translated back from the millipoints to a /100 scale used in the label guidance, here again with scaling factors determined from representative products for each type of mobile (feature phone or smartphone).

The weighting uses factors recommended by the European Commission in the EF Method, which is publicly available and already used by the Product Environmental Footprint Initiative.

Figure 02.- The rating process



2.3 Input data

The input data needed to obtain a rating are specific to hardware design details. The device manufacturer is therefore responsible for providing input data to Eco Rating by answering >150 device-specific questions by self-declaration (see section 2.4).

Operators verify the coherence of the input through the technical support of an independent and neutral entity specializing in Life Cycle Assessment. The entity searches for incoherencies in the input data and operators can clarify such inconsistencies with the manufacturers if needed. This approach is facilitated by the fact that mobile device design across the industry is based on a handful of chipsets and few approaches to integrate essential components into the device, such as display or battery. This narrows the expectancy range of data inputs down and inconsistencies are thus expected to become noticeable quite readily.

Operators also, as part of their individual sourcing processes, implement additional data quality measures.

2.4 Assessment of material efficiency

The material efficiency assessment of the Eco Rating methodology covers six main aspects.

MATERIAL EFFICIENCY CATEGORIES	
1	DURABILITY
2	REPAIRABILITY, REUSABILITY AND UPGRADABILITY
3	RECYCLABILITY AND RECOVERABILITY
4	USE OF HAZARDOUS AND RESTRICTED SUBSTANCES
5	RECYCLED MATERIAL CONTENT
6	PACKAGING AND ACCESSORIES

2.4.1 DURABILITY

This aspect includes six questions that relates to mobile phone design and supporting activities, which are important to increase the useful life of the product.

	INPUT REQUESTED	FURTHER DETAILS
DUR-01	Guarantee period for the terminal and its components	Including battery. Not considering other accessories such as Headsets, External Power Suppliers, etc.
DUR-02	Dust protection	IEC 60529.- Degrees of protection provided by enclosures (IP Code) (or equivalent such as EN 60529).
DUR-03	Water protection	IEC 60529.- Degrees of protection provided by enclosures (IP Code) (or equivalent such as EN 60529).
DUR-04	Drop resistance	IEC 60068-2-31: Environmental testing (or equivalent such as EN 60068-2-31), Test Free fall.

DUR-05	Battery life (full charge cycles)	IEC 61960-3:2017.- Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium cells and batteries for portable applications - (or equivalent, e.g. EN-61960-3:2017).
DUR-06	Charge Connector lifetime (number of times without damage)	EN 62684:2018.- Interoperability specifications of common external power supply (EPS) for use with data-enabled mobile telephones, (Test procedure EIA 364-09.- Durability Test Procedure for Electrical Connectors and Contacts.

2.4.2 REPAIRABILITY, REUSABILITY AND UPGRADABILITY

This aspect includes eight questions, which try to identify different topics related to mobile phone design and supporting activities that could increase the useful life of the product by improving its repairability, reusability and upgradability potential.

Some of the questions (i.e. REP-05, REP-06 and REP-07) include specific questions for three relevant parts of the mobile phone (i.e. Battery, Screen and Back Covers). In these cases, the score is calculated as the average of the score obtained for these three parts.

	INPUT REQUESTED	FURTHER DETAILS
REP-01	Period of time of regular updated support of operating systems and firmware	Period after the placement of the last unit of the model on the market. "Regular" means at least once per quarter.
REP-02	Period of time of available spare parts and components (available online, at reasonable price and delivered in a maximum of 15 days)	Period after the placement of the last unit of the model on the market.
REP-03	Information to the user on how to proceed and the tools to use to a secure data deletion of all user data without compromising the functionality of the device	
REP-04	Information to the user on how to proceed and the tools to use for simplified and secure transfer of data from old to a new product	
REP-05	Disassembly depth/sequence of priority parts	For priority parts (i.e. screen, battery and back cover).
REP-06	Type of fasteners and their accessibility of priority parts	For priority parts (i.e. screen, battery and back cover).
REP-07	Type of tools needed for disassembly of priority parts	For priority parts (i.e. screen, battery and back cover).
REP-08	Information availability on repairability, reusability and upgradability of the terminal (repair manual, instructions on how to disassembly some parts, etc.)	

2.4.3 RECYCLABILITY AND RECOVERABILITY

This aspect includes nine questions, which try to identify relevant topics to increase the potential recycling and/or recovery of the product's materials and components, when it arrives to its end-of-life scenario.

	INPUT REQUESTED	FURTHER DETAILS
REC-01	Take-back programs (free of charge for end-user) implemented for the collection of used terminals.	Percentage of countries where take-back programs exist for the product, over the total of countries where the product is sold (x%). Calculation contains number of countries where the product is sold and the number of countries with voluntary and/or regulated take back programs (values used for the calculation of the score).
REC-02	Provision of information to the user about the existence and conditions of use of the take-back program	Consideration on how the final user of the mobile phone could reach this information published by the manufacturer. Manufacturer should indicate the URL of the web page where this information is available. If it is provided using other communication channels, these should be reported.
REC-03	Disassembly of parts that require selective treatment. Number of disassembly steps/operations to reach the target parts (sum of all operations).	Number of total steps needed to extract all the components required in the depollution process fixed by WEEE Directive.
REC-04	Disassembly of parts containing precious/critical raw materials (e.g. microphones, speakers and vibration units). Number of disassembly steps/operations to reach the target parts (sum of all operations).	Total number of disassembly steps needed to extract the components that contains "critical raw materials" or "precious metals" in order to carry out a selective recycling of them.
REC-05	Provision of additional information to recyclers on precious/critical raw materials, recyclable materials, etc. (components, locations, quantities, and disassembly sequences).	This section considers how recyclers, whom could be interested in the recovering of the materials or components of the mobile phone, could reach information about this. If the handset manufacturers rating is 3-5, the manufacturer shares the relevant URL.
REC-06	Marking of plastic parts. Minimum weight of the marked parts (considering the terminal, packaging, and accessories).	For optimum recycling of plastic, the recycler must be able to recognize the type of plastic (base polymer) in the waste. The marking of plastic parts of the devices according to ISO 11469:2016 and ISO 1043 serves this purpose. It is optimal if even small plastic parts are marked. Hence, the highest number of points is awarded if the marking is applied for plastic parts with a mass as small as 5 grams.
REC-07	Polymer (or plastic formulations) compatibility in plastic parts	There are cases where plastic parts are composites of different polymers or polymer formulations, which is unfavorable for recycling. This criterion assesses whether this is the case in the first place and if so, how difficult the handling of such parts for recycling is.

REC-08	Polymers' purity (absence of additives) in plastic formulation	In most cases plastic needs to be formulated with additives to adjust them to the specific application. During mechanical recycling these additives remain in the plastic and deteriorate the quality for the secondary application where the additives then are not the best fit to the new application. This category rewards efforts to control additive content to the absolute minimum required.
REC-09	Recyclability rate of the product	Calculated according to IEC TR 62635:2012.

2.4.4 USE OF HAZARDOUS AND RESTRICTED SUBSTANCES

This aspect includes six questions, which try to identify the use of hazardous and restricted substances inside the mobile phone and in its manufacturing process.

	INPUT REQUESTED	FURTHER DETAILS
HAZ-01	Halogen free	Eco Rating considers the content of total halogens and the specific content of chlorine and bromine (in ppm) in the different parts and components.
HAZ-02	RoHS Directive	Eco Rating considers the accordance of the product (and accessories) with the latest provisions of European Union RoHS Directive (Directive 2011/65/EU and its amendments) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
HAZ-03	Hazardous substances in the product	This is related to Annex XIV REACH and candidate list (SVHC). As a minimum, Eco Rating considers whether the associated legal obligations are fulfilled if and when 0.1% of a SVHC are exceeded in a component. For the maximum number of points, legal requirements need to be exceeded and the use of SVHC and other harmful substances exceeding 0.1% is relinquished.
HAZ-04	Hazardous substances used in the product	This is related to Annex XVII REACH and the adherence to the associated legal regulations (limitations and prohibition to sell) is assessed. For the maximum number of points, legal requirements need to be exceeded and the use of SVHC and other harmful substances exceeding 0.1% is relinquished.
HAZ-05	Hazardous substances in the battery	The Battery Directive regulates Pb, Hg and Cd in batteries. Depending on the element, its concentration, and the type of battery either an obligation to mark or a prohibition to sell is invoked. Minimum again is legal compliance. For the maximum number of points, exceeding legal requirements and restricting Hg and Cd even further or avoid their use altogether is required.
HAZ-06	Hazardous Substances Management System	Eco Rating considers the Voluntary Management Systems implemented by the applicant to monitor the hazardous substances included or used in the mobile phone.

2.4.5 RECYCLED MATERIAL CONTENT

This aspect includes four questions, which try to identify the use of recycled/renewable materials in the mobile phone.

	REQUESTED INPUT	FURTHER DETAILS
REN-01	Plastic Covers and other structural parts. Percentage of recycled plastic (pre- or post-consumer) intentionally used.	Eco Rating considers the % of recycled plastic (pre- or post-consumer) intentionally used in the mobile phone's cover and/or other structural parts. The use of the standard EN 45557:2020.- General method for assessing the proportion of recycled material content in energy-related products as basis for definitions and calculation methods is stated.
REN-02	Plastic Covers and other structural parts. Percentage of bio-based plastic / bio-degradable intentionally used.	Eco Rating considers the percentage of bio-based plastic / bio-degradable plastic intentionally used in the mobile phone's cover and/or other structural parts. The definition of Plastics Europe for bio-based plastic / bio-degradable plastic will apply (https://www.plasticseurope.org/).
REN-03	Metallic Covers and other structural parts. Percentage of recycled metal (pre- or post-consumer) intentionally used.	Eco Rating considers the percentage of recycled metals (pre- or post-consumer) intentionally used in the mobile phone. EN 45557:2020 is stated for calculation.
REN-04	Packaging elements (cardboard/paper). Percentage of recycled material (pre- or post-consumer) intentionally used	Eco Rating considers the percentage of recycled material (pre- or post-consumer) intentionally used in the packaging of the mobile phone, including plastic film, paper or cardboard. EN 45557:2020 is stated for calculation.

2.4.6 PACKAGING AND ACCESSORIES

This aspect includes seven questions, which try to identify the type and quantity of materials used in the packaging and the characteristics of the accessories included with the mobile phone.

	INPUT REQUESTED	FURTHER DETAILS
PAC-01	Quantity of plastic used in packaging	Target is to avoid plastic as a packaging material for which the highest number of points is awarded.
PAC-02	Volume of packaging material per volume of product. Percentage of void space	Eco Rating considers the percentage of void space in the packaging using the following formula: Vpackaging-Vproduct)/Vpackaging x100
PAC-03	Packaging elements (cardboard).- % of packaging materials certified by FSC/PEFC systems or equivalent (chain of custody and source management)	Eco Rating considers the type of cardboard used in the packaging regarding the origin of the raw materials.
PAC-04	User manual and other documentation in paper (in-box)	Eco Rating considers where paper is used and the origin of the paper used.
PAC-05	Accessories (charger) included with the product (in-box)	Eco Rating considers the potential end-of-life scenario for the charger (if it is included in the mobile phone in-box).

PAC-06	Accessories (cable) included with the product (in-box)	Eco Rating considers the potential end-of-life scenario for the cable (if it is included in the mobile phone in-box).
PAC-07	Accessories (headset) included with the product (in-box)	Eco Rating considers the potential end-of-life scenario for the headset (if it is included in the mobile phone in-box).

2.5 Life cycle assessment

The life cycle assessment made by the Eco Rating tool is based on information about the technical device features regarding the following 11 different areas.

LIFE CYCLE EVALUATION AREA	
1	BASIC DEVICE PARAMETERS
2	COVER MANUFACTURING
3	SCREEN MANUFACTURING
4	BATTERY MANUFACTURING
5	INTEGRATED CIRCUITS MANUFACTURING
6	PRINTED CIRCUIT BOARDS MANUFACTURING
7	CAMERA MANUFACTURING
8	DEVICE ASSEMBLY
9	SCARCE MATERIALS CONTENT
10	TRANSPORTATION PHASE
11	USE PHASE

2.5.1 BASIC DEVICE PARAMETERS

INPUT REQUESTED		UNIT	REQUIRED INFORMATION
1	VENDOR NAME	Free text	Name of the vendor putting the assessed device in the market.
2	DEVICE MODEL	Free text	Commercial name of the device.
3	DEVICE ID CODE	Free text	Univocal identification code used internally for the vendor to identify this device.
4	RELEASE DATE	Date	Date on which the device was launched to the market.

5	DEVICE TYPE	Select	"Feature phone" or "Smartphone" (A feature phone is a handheld electronic device designed for mobile communication, allowing phone calls and text messaging and incorporating features such as the ability to access the Internet and store and play music. However, feature phones lack the advanced functionality of a smartphone, capable of performing multiple different functions via the installation of a wide range of different APPs.) Note that the final score range for feature phones is different than the one for smartphones, causing that your score will be different depending on this answer.
6	DEVICE HEIGHT	mm	Total height of the assembled device, measured in mm.
7	DEVICE WIDTH	mm	Total width of the assembled device, measured in mm.
8	DEVICE THICKNESS	mm	Total thickness of the assembled device, measured in mm.
9	INTERNAL STORAGE CAPACITY	GB	Capacity of the device to store information on its own, without using any external storage card, peripheral or independent device, measured in GB.
10	RAM MEMORY	GB	Internal RAM memory of the device, measured in GB. If some integrated circuits of the smartphone contain embedded RAM required for their own operations (e.g. Qualcomm Snapdragon X55 and X50 5G modem with 256 MB of embedded RAM) do not count this embedded RAM here.
11	TOTAL WEIGHT OF THE DEVICE	gr	Total weight of the handset, including battery, measured in grams.
12	WEIGHT OF THE CHARGER, INCLUDING CABLE	gr	Total weight of the charger, including cables if any, measured in grams.
13	WEIGHT OF OTHER ACCESSORIES CONTAINED IN THE PACKAGING	gr	Total weight of any accessories contained in the packaging, apart from the charger (e.g. headset), measured in grams.

2.5.2 COVER MANUFACTURING

INPUT REQUESTED		UNIT	REQUIRED INFORMATION
13	WEIGHT OF ALUMINUM IN THE CASING	gr	Weight of the different materials that compose the device cover, measured in grams.
14	WEIGHT OF STEEL IN THE CASING		
15	WEIGHT OF PC IN THE CASING		
16	WEIGHT OF ABS IN THE CASING		
17	WEIGHT OF GLASS IN THE CASING		

2.5.3 SCREEN MANUFACTURING

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
18	SCREEN AREA	cm2	Total active area of the TFT LCD or AMOLED display panel.
19	SCREEN TECHNOLOGY	Select	"TFT LCD" or "AMOLED"

2.5.4 BATTERY MANUFACTURING

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
20	WEIGHT OF THE BATTERY PACK	gr	Total weight of the battery pack, measured in grams.
21	CAPACITY OF THE BATTERY	mAh	Total energy capacity of the battery of the device, expressed in mAh.
22	BATTERY VOLTAGE	V	Nominal voltage of the battery, measured in volts.

2.5.5 INTEGRATED CIRCUITS MANUFACTURING

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
23	AREA OF SILICON DIE SIZE IN ALL THE INTEGRATED CIRCUITS WITH MORE THAN 12 PINS/BALLS	cm2	Sum of the areas of silicon die contained within all the integrated circuits having more than 12 pins or balls in the device.
24	AREA OF SILICON DIE SIZE IN RAM MEMORY INTEGRATED CIRCUITS	cm2	Sum of the areas of silicon die contained within all the RAM integrated circuits having more than 12 pins or balls in the device.
25	AREA OF SILICON DIE SIZE IN INTERNAL STORAGE MEMORY INTEGRATED CIRCUITS	cm2	Sum of the areas of silicon die contained within all the internal storage memory integrated circuits having more than 12 pins or balls in the device.
26	TOTAL NUMBER OF INTEGRATED CIRCUITS IN THE DEVICE	#	Count the total number of integrated circuits having more than 12 pins or balls in the device.

2.5.6 PRINTED CIRCUIT BOARDS MANUFACTURING

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
27	AREA OF MAIN PCB	cm^2	Total area of the main printed circuit board of the device, measured in cm^2.
28	TYPE OF PCB (MAIN PCB)	Select	"Rigid" or "Flexible" using.
29	NUMBER OF COPPER LAYERS OF MAIN PCB	Select	Number of copper layers composing the main printed circuit board using the roll down.

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
30	AREA OF PCB 2	cm^2	Total area, type and number of copper layers of the second larger printed circuit board of the device, if any.
31	TYPE OF PCB (PCB 2)	Select	
32	NUMBER OF COPPER LAYERS OF PCB 2	Select	
33	AREA OF PCB 3	cm^2	Total area, type and number of copper layers of the third larger printed circuit board of the device, if any.
34	TYPE OF PCB (PCB 3)	Select	
35	NUMBER OF COPPER LAYERS OF PCB 3	Select	
36	AREA OF PCB 4	cm^2	Total area, type and number of copper layers of the fourth larger printed circuit board of the device, if any.
37	TYPE OF PCB (PCB 4)	Select	
38	NUMBER OF COPPER LAYERS OF PCB 4	Select	
39	TOTAL AREA OF OTHER RIGID (AND FLEX/RIGID COMBINED) PCBS	cm^2	Total area of all the other rigid (and flex/rigid combined) printed circuit boards that were not already declared using the previous fields, if any.
40	NUMBER OF COPPER LAYERS OF THE OTHER RIGID (AND FLEX/RIGID COMBINED) PCBS	Select	The highest number of copper layers composing the other rigid (and flex/rigid combined) printed circuit boards using the roll down, if any.
41	TOTAL AREA OF OTHER FPC (FLEXIBLE)	cm^2	Total area of all the other flexible printed circuit boards that were not already declared using the previous fields, if any.

2.5.7 CAMERA MANUFACTURING

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
42	NUMBER OF MAIN CAMERAS	#	Number of cameras composing the main camera set.
43	MAIN CAMERA MAX RESOLUTION	MP	Maximum resolution of the main camera set, measured in megapixels.
44	MAIN CAMERA 1 SENSOR SIZE	1/x''	Main camera set sensor sizes, expressed as fraction of inch (1/x").
45	MAIN CAMERA 2 SENSOR SIZE	1/x''	
46	MAIN CAMERA 3 SENSOR SIZE	1/x''	
47	MAIN CAMERA 4 SENSOR SIZE	1/x''	

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
48	MAIN CAMERA 5 SENSOR SIZE	1/x''	
49	NUMBER OF SELFIE CAMERAS	#	Number of cameras composing the front (selfie) camera set.
50	FRONT CAMERA MAX RESOLUTION	MP	Maximum resolution of the front (selfie) camera set, measured in megapixels.
51	FRONT CAMERA 1 SENSOR SIZE	1/x''	Front (selfie) camera set sensor sizes from the roll down list, expressed as 1/x".
52	FRONT CAMERA 2 SENSOR SIZE	1/x''	
53	FRONT CAMERA 3 SENSOR SIZE	1/x''	

2.5.8 DEVICE ASSEMBLY

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
54	ELECTRICITY CONSUMPTION DURING FINAL ASSEMBLY	kWh/ device	Electricity consumption during the final assembly of the device, measured in kWh per device.
55	WEIGHT OF CARDBOARD IN THE PACKAGING	gr	Weight of cardboard in the packaging of the device, if any, measured in grams.
56	WEIGHT OF PAPER IN THE PACKAGING, INCLUDING DOCUMENTATION	gr	Weight of paper in the packaging of the device, including all the documents included within the packaging, if any, measured in grams.
57	WEIGHT OF PLASTIC FILM IN THE PACKAGING	gr	Weight of plastic film used for the packaging of the device, if any, including the ones attached to the handset, measured in grams.

2.5.9 SCARCE MATERIALS CONTENT

	INPUT REQUESTED	UNIT	REQUIRED INFORMATION
58	TOTAL GOLD CONTENT IN THE DEVICE	mg	Total quantity of gold contained in the handset, measured in milligrams. Equivalent formats of Full Material Disclosures, such as EN IEC-62474 or similar ones, are also accepted.
59	PERCENTAGE OF GOLD COMING FROM A RECYCLED SOURCE	Select	Percentage of this metal coming from a recycled source from the roll down list.
60	TOTAL SILVER CONTENT IN THE DEVICE	mg	Total quantity of silver contained in the handset, measured in milligrams.
61	PERCENTAGE OF SILVER COMING FROM A RECYCLED SOURCE	Select	Choose the percentage of this metal coming from a recycled source from the roll down list.
62	TOTAL TIN CONTENT IN THE DEVICE	mg	Total quantity of tin contained in the handset, measured in milligrams.

INPUT REQUESTED		UNIT	REQUIRED INFORMATION
63	PERCENTAGE OF TIN COMING FROM A RECYCLED SOURCE	Select	Choose the percentage of this metal coming from a recycled source from the roll down list.
64	TOTAL TANTALUM CONTENT IN THE DEVICE	mg	Total quantity of tantalum contained in the handset, measured in milligrams.
65	PERCENTAGE OF TANTALUM COMING FROM A RECYCLED SOURCE	Select	Percentage of this metal coming from a recycled source.
66	TOTAL INDIUM CONTENT IN THE DEVICE	mg	Total quantity of indium contained in the handset, measured in milligrams.
67	PERCENTAGE OF INDIUM COMING FROM A RECYCLED SOURCE	Select	Percentage of this metal coming from a recycled source.
68	TOTAL COBALT CONTENT IN THE DEVICE	mg	Total quantity of cobalt contained in the handset, measured in milligrams. Note that the battery is part of the handset.
69	PERCENTAGE OF COBALT COMING FROM A RECYCLED SOURCE	Select	Percentage of this metal coming from a recycled source.

2.5.10 TRANSPORTATION PHASE

INPUT REQUESTED		UNIT	REQUIRED INFORMATION
70	LOCATION OF MAIN MANUFACTURING SITE (SITE WITH HIGHER YEARLY PRODUCTION)	Select	Location of the main manufacturing site for the device being analysed.
71	LOCATION OF MAIN DISTRIBUTION MARKET	Select	Location of the main market to which the device being analysed is aimed.
72	MAIN MODE OF TRANSPORT (BY DISTANCE) FROM MANUFACTURING SITE TO FINAL MARKET	Select	Main mode of transport used to transport the device.

2.5.11 USE PHASE

QUESTION		UNIT	REQUIRED INFORMATION
73	BATTERY ENDURANCE - ONLY TALKING	Minutes	Time that the fully charged device battery would be able to last, in talking mode, measured in minutes.
74	BATTERY ENDURANCE - ONLY WEB BROWSING	Minutes	Smartphone assessment only. Time that the fully charged device battery would be able to last, in web browsing mode, measured in minutes.

QUESTION		UNIT	REQUIRED INFORMATION
75	BATTERY ENDURANCE - ONLY VIDEO PLAYING	Minutes	Smartphone assessment only. Time that the fully charged device battery would be able to last, in video playing mode, measured in minutes.
76	BATTERY ENDURANCE - ONLY STAND-BY	Minutes	Time that the fully charged device battery would be able to last, in stand-by mode, measured in minutes.

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