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SERIES L: ENVIRONMENT AND ICTS, CLIMATE
CHANGE, E-WASTE, ENERGY EFFICIENCY;
CONSTRUCTION, INSTALLATION AND PROTECTION
OF CABLES AND OTHER ELEMENTS OF OUTSIDE
PLANT

**Supplement for eco-specifications and rating
criteria for mobile phones eco-rating
programmes**

ITU-T L-series Recommendations – Supplement 32

ITU-T

ITU-T L-SERIES RECOMMENDATIONS

**ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION,
INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT**

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Supplement 32 to ITU-T L-series Recommendations

Supplement for eco-specifications and rating criteria for mobile phones eco-rating programmes

Summary

Supplement 32 to ITU-T L-series Recommendations on eco-rating outlines a baseline assessment framework and defines a minimum set of criteria to be considered when assessing the environmental performance of mobile phones.

This Supplement is designed to enable manufacturers to assess mobile phones in order to demonstrate a minimum level of environmental performance and also to achieve enhanced environmental performance.

- clause 7 lists the criteria to consider when seeking compliance to the minimum level of environmental performance described in this Supplement;
- clause 8 addresses how products can achieve higher levels of environmental performance.

This Supplement does not promote any form of labelling and the methods by which ratings are displayed to consumers remain at the discretion of manufacturer or the sales entity.

History

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Introduction

It has recently been estimated that the sales of smartphones and mobile phones is around 2.3 billion units per year [b-Andrae, Edler, 2015]. To promote a more sustainable society, the information and communication technology (ICT) industry has recognized the need to provide relevant mobile phone information, especially with regard to environmental performance aimed at enabling consumers to make more informed purchasing decisions.

For several years, manufacturers and network operators have been reporting the sustainability credentials of mobile phones. However, inconsistencies among approaches cause confusion and have made comparisons difficult, and waste time and resources for both operators and manufacturers when collecting and providing very similar data.

This Supplement aims to help reduce detrimental effects, intends to deliver useful information to end users on the environmental performance of mobile phones and aligns with existing eco-rating programmes. This Supplement is written in a way so as to compliment the work represented in [UL 110].

This Supplement establishes a standalone, minimum set of requirements for mobile phones related to their environmental performance.

It should be noted that other documents e.g., [ITU-T L.1410] and [UL 110], can be used to complement these environmental performance baseline requirements for mobile phones.

It is acknowledged, however, that other aspects are important beyond environmental performance and beyond the environmental factors contained in this Supplement.

It is expected that the standardized approach in this Supplement can also make information available to original equipment manufacturers (OEMs) regarding best practices in the industry.

The following guiding principles have been utilized when preparing this Supplement:

- prioritization: focus on a primary group of attributes;
- alignment: complement or utilize other standards that are accepted by network operators and manufacturers;
- simplicity: provision of easy-to-understand information to consumers;
- differentiation: set a baseline to identify mobile phones that do not meet a minimum set of requirements and reference criteria from [UL 110] for demonstrating ambition levels above the baseline;
- transparency: provide stakeholders with information on the methodology;
- credibility: demonstrated collaboration of the mobile industry, with representatives from carriers or network operators and mobile phone manufacturers;
- consistency: Consider regional requirements.

Supplement 32 to ITU-T L-series Recommendations

Supplement for eco-specifications and rating criteria for mobile phones eco-rating programmes

1 Scope

This Supplement outlines an assessment framework and defines the baseline criteria to be considered by an eco-rating programme when assessing the environmental performance of mobile phones.

This framework establishes the basis for an eco-rating programme based on criteria that are relevant and transparent:

- relevance is important to ensure that the mobile phone is scored, against criteria having an environmental impact;
- transparency is the guarantee that all included criteria (and only these criteria) have been taken into account fairly.

In this context, the Supplement is intended to:

- identify attributes having an impact on the environmental footprint of a mobile phone;
- define the scoring method to quantify these impacts, reflecting the performance of the mobile phone from an environmental point of view.

This Supplement starts from the principles that an appropriate eco-rating programme should:

- apply to all mobile phones, irrespective of where the mobile phones are sold;
- address the market globally (e.g., national or regional aspects should not be taken into account by the eco-rating programme);
- work in concert with [UL 110] to identify advanced mobile phones implementing innovative solutions or functionalities.

This Supplement does not:

- mandate the consideration of any social or ethical aspects that might be associated with the design, manufacturing or marketing of mobile phones;
- include any aspects related to eco-labels (definition of the labels, criteria to obtain these labels, etc.).

Consideration was given to using life cycle assessments (LCAs) to compare products. The fact remains that the existence of several eco-rating programmes maintains some confusion within the user community. Initiatives exist to correct this situation, particularly under the leadership of operators seeking to align their own programmes (see Appendix III). However, this LCA approach is not included (see Appendices I and II).

This Supplement is intended to be used to facilitate global cooperation and is expected to be used in conjunction with other complementary international standards.

Figure 1 illustrates the aspects that are or are not in the scope of this Supplement.

2 References

- [ITU-T L.1000] Recommendation ITU-T L.1000 (2011), *Universal power adapter and charger solution for mobile terminals and other hand-held ICT mobile phones*.
- [ITU-T L.1410] Recommendation ITU-T L.1410 (2014), *Methodology for environmental life cycle assessments of information and communication technology goods, networks and services*.
- [IEC 61249-2-21] IEC 61249-2-21:2003, *Materials for printed boards and other interconnecting structures – Part 2-21: Reinforced base materials, clad and unclad – Non-halogenated epoxide woven E-glass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad*.
- [IEEE 1680.1] IEEE 1680.1 (2009), *IEEE standard for environmental assessment of personal computer products, including notebook personal computers, desktop personal computers, and personal computer displays*.
- [ISO 1043-1] ISO 1043-1:2011, *Plastics – Symbols and abbreviated terms Part 1: Basic polymers and their special characteristics*.
- [ISO 11469] ISO 11469:2016, *Plastics – Generic identification and marking of plastics products*.
- [UL 110] UL 110 (2012), *Standard for sustainability for mobile phones*.

3 Definitions

3.1 Terms defined elsewhere

This Supplement uses the following term defined elsewhere:

3.1.1 mobile phone [b-ITU-T K.49]: Portable terminal equipment used for communication and connecting to a fixed telecommunication network via a radio interface.

3.1.2 primary energy [ITU-T L.1410]: The energy content of natural resources which can be used for energy production.

3.2 Terms defined in this Supplement

This Supplement defines the following terms:

3.2.1 homogeneous material: A material of uniform composition throughout or a material, consisting of a combination of materials, that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes.

3.2.2 maintenance release: Software or firmware update to enable a mobile phone to continue to operate as it was intended at the point of sale.

3.2.3 reference package: List of physical items (mobile phone, accessories, documentation, etc.) that is always used in its entirety by the manufacturer when claiming compliance with the criteria described in the Supplement. A reference package is defined by the manufacturer.

4 Abbreviations and acronyms

This Supplement uses the following abbreviations and acronyms:

5R	Rethink, Reduce, Recycle, Refurbish, Resale
ADP	Abiotic (resource) Depletion Potential
AMOLED	Active-Matrix Organic Light-Emitting Diode
CS	Corporate Sustainability
CSTN	Colour Super-Twist Nematic
DDR	Double Data Rate
e-MMC	electronic Multimedia Card
ENIG	Electroless Nickel Immersion Gold
GHG	Greenhouse Gas
GSM	Global System for Mobile Communications
GWP100	Global Warming Potential at 100 years
HVAC	Heating, Ventilation, and Air Conditioning
IC	Integrated Circuit
ICT	Information and Communication Technology
ILCD	International (reference) Life Cycle Data (system)
ITO	Indium–Tin Oxide
LCA	Life Cycle Assessment
LCD	Liquid Crystal Display
LCIA	Life Cycle Impact Assessment
MLCC	Multilayer Ceramic Capacitor
NAND	Not And (electronic logic gate)
OEM	Original Equipment Manufacturer
PCB	Printed Circuit Board
PCR	Product Category Rule
PGM	Platinum Group Metals
RAM	Random Access Memory
RF	Radio Frequency
SDRAM	Synchronous Dynamic Random Access Memory
TFT–LCD	Thin-Film Transistor–Liquid Crystal Display

5 Conventions

None.

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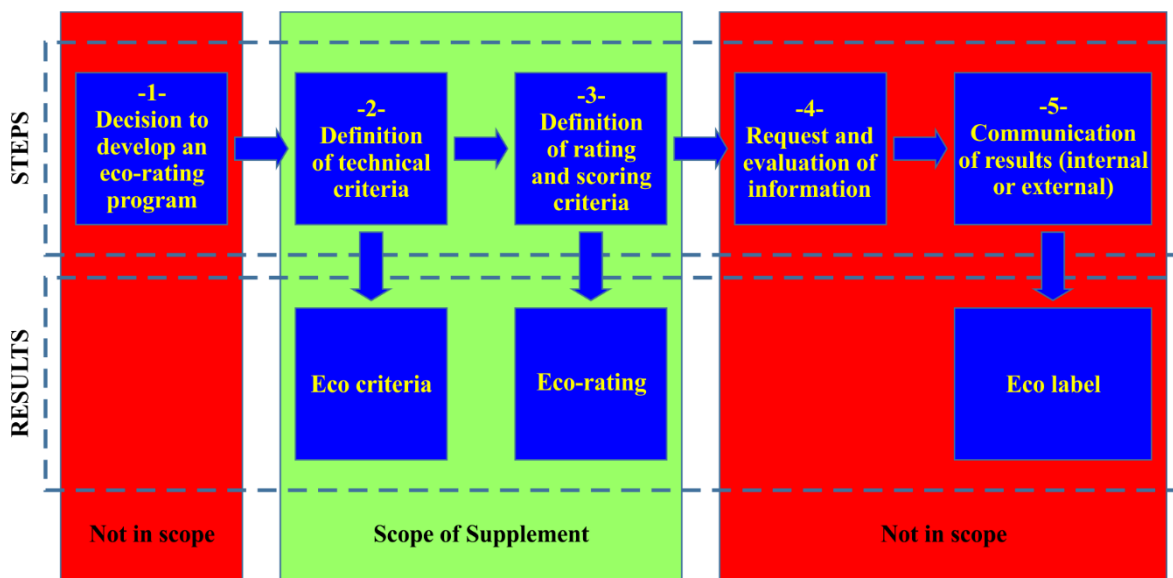
6 Introduction to eco-rating programmes

Historically, the main objective of an eco-rating programme for mobile phones was to evaluate their environmental and sustainability attributes.

Eco-rating programmes were based on two main principles:

- 1) collection of information and estimation of the environmental impact of mobile phones; and
- 2) assessment of the different types of mobile phones through scoring methods unique to each rating scheme.

Typically, eco-rating programmes followed a common five-step process that results in three outcomes, as illustrated in Figure 1.



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Figure 1 – Eco-rating programme common process steps and outcomes

Organizations or companies may decide to develop eco-rating programmes for mobile phones, as indicated in step 1 of Figure 1, based on specific needs, such as consumer demand, corporate sustainability (CS) initiatives or environmental footprint assessment.

Step 2 reflects the activity of defining the technical criteria required to assess the environmental and sustainability performance of mobile phones. These criteria are mostly based on life cycle assessment (LCA) principles and responsible mobile phone design features. This process requires technical expertise and a detailed description of the various attributes to be evaluated.

Step 2 results in the identification of eco criteria. Each criterion is the compiled result of the detailed evaluation of the technical and comparison specifications defined in step 2 of the eco-rating programme.

In step 3, a scoring methodology is described, taking into account the different eco-specification criteria identified and selected for the evaluation of the mobile phone. Step 3 leads to the creation of an eco-rating used to rate mobile phones.

After the definition of the eco-specifications and rating criteria, step 4 initiates the process of assessment, based on information and technical details provided by mobile phone manufacturers.

Last, step 5 communicates the results of the mobile phone evaluation. This communication results in a public disclosure process of eco-rating information through websites, in-store merchandizing, etc., and made available online or at points of sale. The results of the eco-rating process are presented under a particular scheme, e.g., logo or figure.

The compilation of data needed to evaluate primary energy consumption, use of raw materials and potential greenhouse gas (GHG) emissions remains an indispensable process for assessing the environmental impact associated with a product. This process is complicated and can seem expensive for mobile phones whose lifetimes are relatively short, and for which technology is changing very quickly. In this context, this Supplement aims to define a limited set of criteria to be verified by a product claiming to limit its environmental impact. Attributes listed in Appendices IV and V will also be considered for inclusion in any future edition of this Supplement.

7 Eco criteria

7.1 Mobile phone sustainability and responsible design

7.1.1 Product durability, reparability and serviceability

Prolonging the useful life of a mobile phone is one of the most effective ways of reducing overall product environmental impact, as it delays the need for a replacement, and hence use of additional natural resources and emissions of carbon. Therefore it is important to consider the elements listed in clauses 7.1.1.1 to 7.1.1.3.

7.1.1.1 Mobile phone compliance with [ITU-T L.1000]

Incompatibility of chargers for mobile phones is an environmental challenge potentially creating quantities of waste. To promote harmonization, conformance with [ITU-T L.1000] should be recognized.

7.1.1.2 Mobile phone firmware/software updates and maintenance releases

Prolonging product useful life is one of the effective ways of reducing overall product environmental impact, as it delays the need for a replacement and hence use of additional natural resources and carbon emissions.

Providing firmware/software updates can prolong the life of a mobile phone by providing maintenance releases for the period of the manufacturer's warranty when technically possible.

7.1.1.3 Mobile phone personal data transfers to a new phone

Simplifying the transfer of data from an old to a new mobile phone should allow the old phone to be more readily reused or recycled, hence reducing overall resource demands.

Tools for simplifying personal data transfers could take the form of an application (app), a cloud based service or instructions detailing a manual process. Personal data transfers should include at a minimum camera-generated images and videos, and contacts. Instructions of tools should be publicly posted or made available on the mobile phone itself.

7.1.2 Use phase power consumption

Power consumption is a key area where manufacturers are improving their mobile phones.

7.1.2.1 Manufacturer-provided information on reduced energy phone usage

Mobile phone manufacturers are often in a position to provide detailed information about mobile phone energy usages under various operating conditions.