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Analysis of quantification methodologies for greenhouse gas emissions for electrical and electronic products and systems

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ANALYSIS OF QUANTIFICATION METHODOLOGIES FOR GREENHOUSE GAS EMISSIONS FOR ELECTRICAL AND ELECTRONIC PRODUCTS AND SYSTEMS

FOREWORD

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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC/TR 62725, which is a technical report, has been prepared by IEC technical committee 111: Environmental standardization for electrical and electronic products and systems.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
111/266/DTR	111/291/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Electrical and electronic products and systems (hereinafter referred to as “EE products”) are widely used in our society, hence raising awareness of their environmental impacts. Consequently customers in the market and other stakeholders are requiring or requesting that the electronics sector take actions to address the quantification and reduction of environmental impacts through environmental conscious design during the product development phase.

Among those environmental impacts, climate change is an important issue. A number of initiatives at local, national, regional, and international levels are being developed and implemented, aiming to curb the concentration of greenhouse gas (GHG) emissions which is understood to be a major contributing factor.

A basic and generic methodology to quantify Carbon Footprint of Products (hereinafter referenced as “CFP”) is under development in ISO 14067. It specifies principles and requirements for studies to quantify CFP, based on the methodology of life cycle assessment (LCA) specified in ISO 14040 and ISO 14044. In addition, major standardisation activities, and private, government and industry driven initiatives have started work on establishing methodologies for CFP, quantifying GHG emissions and related issues.

This plurality of initiatives highlights the necessity of developing guidance, which facilitates the understanding of existing methodologies and suggests workable and implementable options that address the specific characteristics of EE products, for example;

- Supply chains can be dynamic, long, complicated and global. Some product categories are associated with significant impacts from raw material acquisition, production stage, or end-of-life. Reasonable and consistent methodologies are needed to be shared with all the relevant actors along the global supply chain.
- Many products have relatively long lives, extending over many years, with associated energy consumption, which underlines the significance of the use stage. For such product categories, specific attention is paid to energy efficiency. It should be noted that the assumptions behind use scenarios are critical to achieve consistency.
- In addition to associated CO_2 emissions, some products use substances that have the potential for additional GHG emissions (e.g. SF_6 used in switchgear).

These characteristics support the market relevance for providing generic guidance in the form of this Technical Report (hereinafter referred to as TR) for the quantification, documentation and communication of GHG along the life cycle of EE products.

The contents and features of this TR are as follows:

- A study and review of relevant standards, regional initiatives and practices are provided to clarify and compare the differences and similarities in multiple existing methodologies for CFP studies.
- This Technical Report, based on relevant International Standards, Draft International Standards, especially ISO/DIS 14067, and other standards, gives a comprehensive additional guidance which enable readers to carry out CFP study for EE products.

It should be also emphasized that CFP addresses the single impact category of climate change and does not assess other potential social, economic or environmental impacts. Therefore CFPs do not provide an indicator of the overall environmental impact of products.

The information in this TR is entirely informative in nature and does not establish nor is it intended to imply any normative requirements.

NOTE 1 This TR may be used as quantification guidance for GHG emissions as a part of the environmental impact categories in a multi-criteria environmental assessment.

NOTE 2 This TR is not directly intended for electrical and electronic equipment (EEE) as defined by EU regulation therefore this TR uses the term "electrical & electronic products (EE products)."

ANALYSIS OF QUANTIFICATION METHODOLOGIES FOR GREENHOUSE GAS EMISSIONS FOR ELECTRICAL AND ELECTRONIC PRODUCTS AND SYSTEMS

1 Scope

This Technical Report is intended to provide users with guidance to understand methodologies and to evaluate carbon footprint of products (hereinafter referred to as CFP), by quantifying the greenhouse gases (GHG) emissions (hereinafter referred to as CFP study) for Electrical and Electronic products (hereinafter referred to as EE products) based on life-cycle thinking.

This TR is applicable to any type of EE products, which are new or modified (e.g. reconditioned, upgraded, etc.).

This TR is based on the result of a comparative study on existing methodologies published or under discussion in representative international organizations.

This TR is intended to be used by those involved in design and development of EE products, and their supply chains regardless of industry sectors, regions, types, activities and sizes of organizations. This TR may also be used as guidance to prepare a PCR of each product category in EE sector.

NOTE 1 In this TR, ISO/DIS 14067, ITU-T L.1400 and L.1410, GHG Protocol Product Life Cycle Accounting and Reporting Standard (hereinafter referred to as (GHG Protocol Product Standard), BSI PAS 2050, and other international, regional and national initiatives are studied and compared since these documents and initiatives are regarded as the most influential ones worldwide at the moment.

NOTE 2 This TR refers to requirements relevant to EE products in the existing documents and quotes them with boxes. The boxes are followed by guidance applicable to EE products. The documents which this TR refers to (e.g. ISO/DIS 14067) may be revised in the future. These boxes do not capture the full text of the standards referred to and readers are encouraged to read these standards for thorough understanding of their requirements.

NOTE 3 This TR is programme-neutral. If a programme (e.g. a specific Carbon Footprint of Products (CFP) Initiative) is applicable, some requirements of that programme may be additional to the guidance provided in this TR.

2 Normative reference

There are no normative references. Informative references are noted in the bibliography.

NOTE This clause is included so as to respect IEC clause numbering.