

Product-Category Rules (PCR)  
for Preparing an Environmental Product  
Declaration (EPD) for  
LTE Indoor/Outdoor Networking Equipment  
PCR 2015:1.0

MitraStar Technology Corporation

Version 1.0  
2015-05-22

This document complies with the relevant requirements of the International EPD®SYSTEM,  
as well as the management requirements of the Environment and Development Foundation  
([www.edf.org.tw](http://www.edf.org.tw))

## Table of Contents

1. General Information .....	3
2. Company and product description .....	3
2.1 Product group function .....	3
2.2 Product group components.....	4
2.3 Product technical description.....	5
3. List of materials and chemical substances .....	5
4. Declared unit .....	6
5. System boundaries .....	6
5.1 Specification of different boundary settings .....	8
6. Cut-off rules .....	9
7. Allocation rules .....	9
8. Units .....	10
9. Calculation rules and data quality requirements .....	10
10. Parameters to be declared in the EPD .....	12
11. Recycling information.....	13
12. Other environmental information (Optional) .....	14
13. Information about the certification.....	15
14. References .....	16
Appendix II – Reporting Format for the EPD .....	18
Appendix III Abbreviations .....	20

## 1. General Information

This document is to be used as the product category rules (PCR) for the manufacturing of LTE (Long Term Evolution) Indoor/Outdoor Networking Equipment (“product”) globally. This PCR covers products with the Harmonized System (HS) Codes/CCC Codes of 85176900927. The requirements specified in this PCR are intended to be used for EPDs certified in accordance with the ISO 14025 standard. This document shall be valid until XX, 2017.

This PCR was first drafted by the MitraStar Technology Corporation. Representatives from major Taiwanese manufacturers of similar products and stakeholders were invited by the Environment and Development Foundation (EDF) to the open consultation meeting held on February 17, 2015, to participate in the discussion and review of this PCR. EDF subsequently reviewed and approved this PCR.

For further information and comments concerning this PCR, please contact: MitraStar Technology Corp – Quality management Department Jeremy Yang (tel:+886-3-5777998, ext.53109 , fax : +886-3-5790152 ; Email : jeremy.yang@mitrastar.com.tw) 或 MitraStar Technology Corp - Quality management Department Daniel Lee Manager (tel : +886-3-577-7998 ext. 53101 , fax : +886-3-5777998 ; Email : daniel.lee@mitrastar.com.tw . )

## 2. Company and product description

The EPD shall include information about the manufacturing company/organization. The information may include manufacturing process related information, and environmental related information, such as the environmental management system information. The information may also include special issues which the company/organization would like to emphasize, such as the products meeting certain environmental criteria, or environmental safety and health related information.

This PCR is applicable to both Business-to-Business (B2B) and Business-to-Consumer / Customer, (B2C) communications. During the inventory of product related environmental impacts, the scope of inventory shall cover both the product and its packaging.

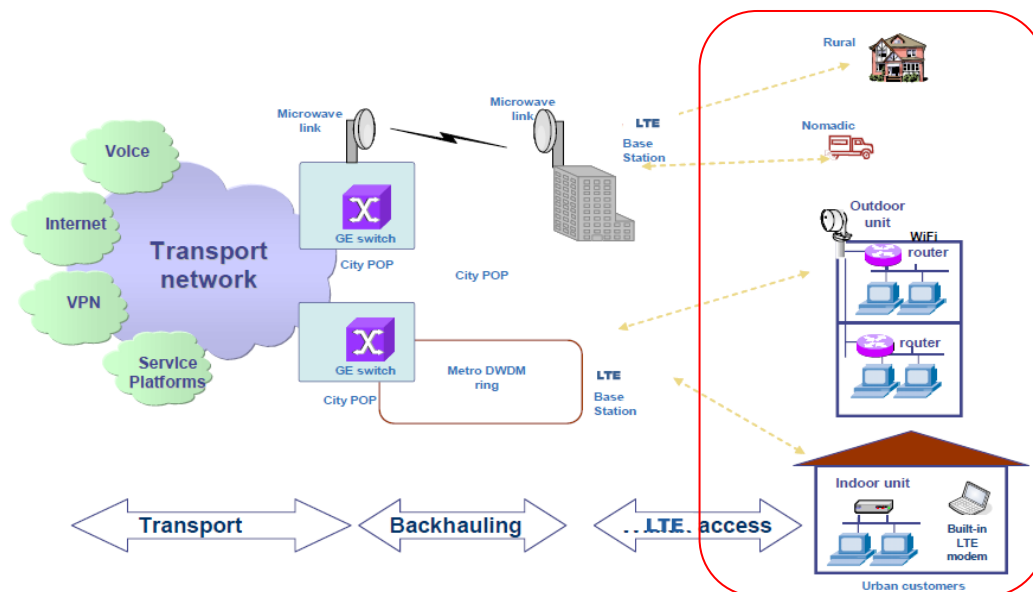
### 2.1 Product group function

The scope of LTE Indoor/Outdoor Networking Equipment covered in this PCR is defined in the box with red border to the right of Figure 1 below.

LTE is the standard for a new generation of wireless broadband technology defined by the 3GPP (3rd Generation Partnership Project). Products based on the LTE standard adopt the OFDM (orthogonal frequency division multiple) modulation technology and are able to provide 150 Mbps downlink and 50 Mbps uplink connection speed. With the upgrading of wireless broadband speeds, in addition to basic Internet services, other services such as voice, video, Internet and television, are also expected to be greatly enhanced. It is widely envisioned by the IT industry that through this new generation of wireless broadband technology, convenient and high-bandwidth network can be present everywhere, enabling all kinds of services to be made readily available.

Through the deployment of LTE technology, other value-added services (e.g., voice, Internet TV, or other paid services) in addition to basic Internet services, have increasingly been rolled out to the consumers. In order to meet the demand of the market, LTE products need to fully conform to the new 3GPP standards, IT equipment manufacturers also need to cooperate in integrating and creating the appropriate environment for LTE network architecture and services.

The LTE frequency bands can be roughly divided into TDD (Time-Division Duplex) bands (e.g., band numbers 38/40/41/42/43), and FDD (Frequency-Division Duplexing) bands (e.g., band numbers 3/7/8/20, 4/13). Based on the LTE standard, communication equipment manufacturers then manufacture LTE mobile hotspots, LTE outdoor network equipment, and LTE indoor network device capable of running on different or multiple frequency bands.



**Figure 1 LTE Indoor/Outdoor Networking Equipment**

In most cases, LTE indoor/outdoor networking equipment can be integrated into a residential/home network gateway, which allows residential gateway to be directly connected to the home network.

## 2.2 Product group components

The product's main components shall at least include the following:

- External casing
- Input/output interface
- PCB
- Electronic components: e.g., network core processor (IC), built-in Wi-Fi antenna, capacitors, connectors, resistors.
- Power supply: external power supply or internal power supply

The product may also include the following secondary/auxiliary components:

- External Wi-Fi antenna
- Cables: e.g., network cable, phone cable
- Packaging material

- Secondary battery
- Others: e.g., literature discs (CD/DVD), user manual

The actual composition of the products shall be based on the BOM (bill of materials).

### **2.3 Product technical description**

The product technical description part of the EPD may include but not limited to the following information:

- Size and weight
- Connected source equipment and terminal equipment
- Type and number of interfaces, and data transfer speed, The types of interfaces can be defined as follows (definition of interfaces not defined below shall be provided elsewhere):
  - Ethernet wireline interface: This interface shall at least comply with the IEEE 802.3 standard, and equip with the RJ45 connector.
  - Wi-Fi Ethernet interface: This interface shall at least comply with the IEEE 802.11 standard, and transmit data through an external Wi-Fi antenna.
  - Home Plug powerline interface: This interface shall at least comply with the HomePlug standard, with the regional power plug as the connector interface.
  - HomePNA phoneline interface: This interface shall at least comply with the HomePNA3.1 standard (equivalent to ITU-T G.9954 standard), with any twisted pair or coaxial cable (coax) as the connector interface.
  - MoCA coax interface: This interface shall at least comply with the MoCA 1.0 standard.
  - Unified high-speed wireline interface: This interface shall at least comply with the ITU-T G.9960 standard.
  - USB interface
  - Passive optical network (PON) interface
  - Bluetooth
  - Memory Card reader
- Product configuration
- Firmware upgrade possibilities
- Other support functions and their definitions, e.g., Quality of Service (QoS), network diagnostics, performance monitoring and power management.

### **3. List of materials and chemical substances**

The contents of the following materials and substances in the product shall be declared:

- List of materials with accumulated weight at least 95% of product weight (shall include materials for major components);
- All substances/materials in the product restricted/regulated by legal and customer requirements;
- The following materials in the main components: flame retardants, lead content in solder, lead and flame retardant content in solder masking agent, and substances regulated by EU's RoHS Directive (the latest version).

The declaration of halogen-free flame retardants, lead-free solders and no RoHS-regulated substances may only be made when appropriate evidences are available (for example, test reports from accredited laboratories/testing facilities). The following organizations may provide accreditation for testing facilities: Taiwan Accreditation Foundation (TAF), (Asia Pacific Laboratory Accreditation Cooperation (APLAC), International Laboratory Accreditation Cooperation (ILAC) or ILAC Mutual Recognition Arrangement (ILAC MRA). For definitions of testing methodology and confirmations of regulated hazardous substances based on the accredited laboratories' product testing methods, please refer to IEC 62321 Standard.

#### 4. Declared unit

The declared unit is one (1) unit of LTE indoor/outdoor networking equipment. The reason for adopting this unit is that the product is sold and marketed in this unit.

#### 5. System boundaries

The main system boundaries for the declared product system are presented as follows:

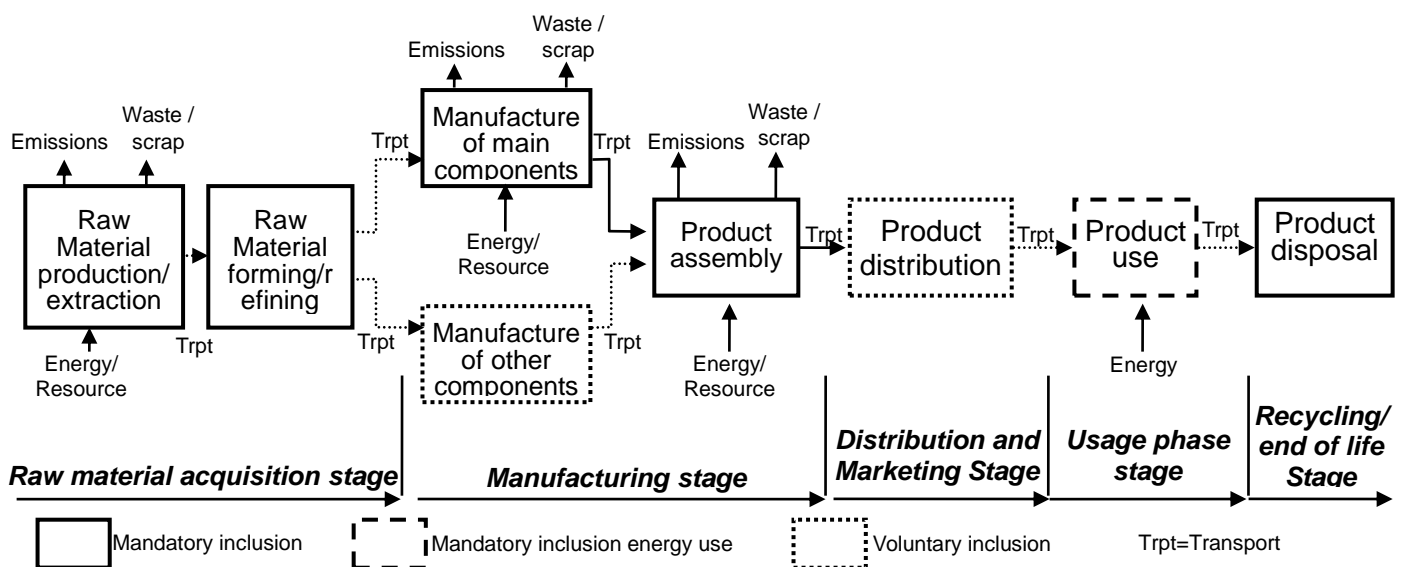


Figure 2 System boundary of the product system

As noted in Figure 2 above, the life cycle of an LTE indoor/outdoor networking equipment covers five life cycle stages: raw material acquisition, product manufacturing, distribution and marketing, product use and recycling/end-of-life. The system boundary for each life cycle stage is described as follows.

##### Raw Materials Acquisition Stage

The LCA shall include information for the following unit processes:

- Raw material extraction/production and manufacturing of main components and other components.

Inventory and reporting of transportation of raw materials is optional (voluntary).

### **Manufacturing Stage**

The LCA shall include information for the following unit processes:

- Manufacturing of main components/assemblies;
- Assembly of product;
- Treatment of waste;
- Transportation of process waste from the product assembly plant and main component manufacturers to the waste treatment facilities;
- Transportation of main components to the product assembly plant.

Inventory and reporting of manufacturing of secondary/other components and their transportation to the product assembly plant is optional (voluntary).

The data quality requirements for the main components are described in Section 9 on calculation rules and data quality requirements. The EPD/CFP shall also include the other minor/smaller components of the product, but their data quality requirements may be different from those of the main components.

### **Distribution and Marketing Stage**

The LCA shall include information for the following unit processes:

- Transportation of products to the first stage distribution sites.

Inventory and reporting of transportation within distribution sites and from sales/distribution sites to users is optional (voluntary).

### **Use Stage**

The EPD shall declare the product's power consumption during Idle State and On State when used by the users. The power consumption data shall be verified in accordance with corresponding test methods adopted by the region the product is being marketed, e.g., EN 62301. For the definition of each power consumption state, please refer to "Code of Conduct on Energy Consumption of Broadband Equipment Version 5.0" promulgated by the European Commission. The definitions of the product's Idle State and On State are described in Table 1 below.

Table 1 Definitions of Idle State and On State for LTE Indoor/outdoor Networking Equipment

<b>Interface/Component</b>	<b>Idle State</b>	<b>On State</b>
LTE	Equipment and individual components are in the idle state, there is no data transmission, and the device can be activated any time	Data Transmission:download 1 Mbit/s, upload 200 kbit/s

In order to provide basis for the calculation of energy consumption for residential network infrastructure equipment, the requirements in EU ErP Directive (Regulation 801/2013 (Lot 26: Networked standby losses of energy using products) and Japanese JEMAI PBX System PCR were adopted in developing the following calculation equation for annual power consumption of the LTE Indoor/outdoor Networking Equipment as follows.

## **Usage scenario:**

Based on consumers' working behavior, divide their time into working days (workdays) and holidays.

Workdays: 5 workday/week × 4 week/month × 12 month/year = 240 workday/year

Holidays: 365 day/year - 240 day/year = 125 day/year.

Assume the LTE indoor/outdoor networking equipment is connected to the power main all year round. During the working days, the product is at On State 3.25 hour/day, and Idle State 20.75 hour/day; during the holidays, the product is at On State 3.4 hour/day, and Idle State 20.6 hour/day.

## **Calculation formula:**

Total energy consumption during the use stage (W hr/yr) =

[On State energy consumption (w) \* 3.25 hr/day + Idle State energy consumption (w) \* 20.75 hr/day] \* 240 day/yr + [On State energy consumption (w) \* 3.4 hr/day + Idle State energy consumption (w) \* 20.6 hr/day] \* 125 day/yr

The declaration of maintenance information during the use stage, and transportation of end-of-life products to the waste disposal system is voluntary.

## **Recycling/end-of-life Stage**

Reporting of recycling information (such as recycling and dis-assembly report or information on recycling channels) is mandatory in the EPD for B2C products.

If the product recycler's recycling technology or recycling scenario exhibits potential recycling benefits, such information shall be described in the EPD.

## **5.1 Specification of different boundary settings**

### **Boundary in time**

The validity period for the LCA results presented in the LCA report shall be defined.

### **Boundary towards nature**

If the manufacturing processes are located within Taiwan, the solid waste categories as defined in Taiwan's Waste Disposal Act shall be adopted. If the processes are located in other countries, equivalent legal requirements shall be considered.

The natural boundary of the system shall describe the boundary where the materials and energy resources flow from nature into the system, and where the water and air emissions and waste are released out of the system.

Only the quantity of the disposed waste needs to be considered; landfilling process does not



need to be considered. If the waste is generated through wastewater treatment or incineration process, such waste should be included into the wastewater treatment or incineration process.

### **Boundaries in the life cycle**

The boundaries in the product life cycle are described in Figure 2. The construction of the site and infrastructure, as well as the production of manufacturing equipment do not need to be included.

### **Boundaries towards other technical systems**

Boundaries towards other technical systems describe the inputs of material and other components towards other systems, as well as outputs of materials towards other systems. For the inputs of recycled materials and energy towards the product manufacturing stage, the transportation between the recycling process and use of recycled materials shall be included in the data set. For the production of recyclable products during the manufacturing stage, the transportation towards the recycling process shall be included.

*(Note: Further explanations are provided in Section 7 on open-loop recycling.)*

### **Boundaries regarding geographical coverage**

The manufacturing stage may cover manufacturing processes located on any sites around the world. For processes located in a specific region, the data used should be representative of the region. The data for the main constituents shall be the specific regional data for the region where the process takes place (see Section 9). For ease of comparison, no matter where the emissions are generated, the same environmental impact parameters should be used for life cycle impact assessment (see Section 10).

## **6. Cut-off rules**

For any impact category, if the sum of various impacts from a specific process/activity is less than 1% of the impact equivalent in that category, such a process/activity may be neglected during the inventory analysis. Nonetheless, the accumulated impact of neglected process/activity may not exceed 5%. That is, at least 95% of the potential life cycle emissions shall be evaluated. Components and materials omitted from the LCA shall be documented.

*(Note: This judgment for this “1% Rule” is based on the environment relevance assessment of material input to the system, and does not consider special and exceptional environmental impacts.)*

## **7. Allocation rules**

The main allocation rules shall be valid for the entire product system. For other secondary processes, other allocation rules may be defined; however, the use of these rules should be justified. Product-specific information should be preferentially collected in order to avoid the need for allocation. While selecting allocation rules, the following principles are recommended.

- **Multi-output:** The allocations are based on the changes in the resource consumption and pollutant emissions (for example, adopted quantity allocation for some main component, or surface allocation for some components), following the changes in the studied system's output product or function or economical relationship.
- **Multi-input:** The allocation is based on actual relationship. For example, the manufacturing process's emissions may be affected by the change in waste flow input.
- **Open loop recycling:** For the input of recycled materials or energy during the manufacturing stage of the product system, the transportation between the recycling process and the recycling to material use shall be included in the dataset. For the product which shall be recycled during the manufacturing stage, the transportation towards the recycling process shall be included.

*(Notes: Allocation may be avoided through avoidance of dividing processes, for example as described in Section 6.3 of ISO/TR 14049; or through expansion of system boundary (for example as described in Section 6.4), so that the amended system shares the same product exchanges as the original system.)*

## 8. Units

The base units and derived units of the International System of Units (SI, *Système International d'unités*) shall be used preferentially.

### **Power & energy units:**

- power unit: W
- energy unit: J

### **Specification units:**

- length unit: m
- capacity unit: m<sup>3</sup>
- area unit: m<sup>2</sup>
- weight unit: kg

### **If necessary, prefixes may be used before the SI units:**

- 10<sup>9</sup> = giga, symbol "G"
- 10<sup>6</sup> = mega, symbol "M"
- 10<sup>3</sup> = kilo, symbol "k"
- 10<sup>-2</sup> = centi, symbol "c"
- 10<sup>-3</sup> = milli, symbol "m"
- 10<sup>-6</sup> = micro, symbol "μ"
- 10<sup>-9</sup> = nano, symbol "n"

## 9. Calculation rules and data quality requirements

### **Data quality requirements for the raw material acquisition stage**

- Generic data may be used for the acquisition, production, forming and refining of raw materials used for components of the products. Please refer to Appendix I for the

common sources of generic data. The year of the data cannot be older than 1990.

### **Data quality requirements for the manufacturing stage**

- Site specific data (for example, specific data for manufacturing plant or transportation) shall be used for the manufacturing and assembly of major components. If other types of information are used, description of the information and rationale for using the information shall be provided. For site specific data of main component manufacturing plants, specific data from a plant representative of such a site may be used.
- Generic data may be used for the manufacturing of other components for the products. Please refer to Appendix I for the common sources of generic data.
- When generic data are used, the equivalence between the chemical and/or physical process of referred systems shall be considered.
- Generic data may also be used when suppliers refuse to provide specific data, or when even if generic data are used in place of specific data, there is only minor impact to the results. The general rule is that if generic data are used in place of specific data, their combined contribution for all life cycle stages shall not be greater than 50% of total impacts for each impact category.
- The data shall be representative for the average of a specific year. If the average data for a specific time period of less than one year is used, the reason for using such data shall be provided.
- The electricity mix for the manufacturing stage should be site specific data. If site specific data cannot be obtained, the official electricity mix for the country where the site is located may be used as approximate value. The electricity mix should be documented.
- For the definition of hazardous waste, the definition as defined in Taiwan's Waste Disposal Act shall be used for sites located in Taiwan. For sites located outside Taiwan, legal requirements for the host country shall be observed.
- For the transportation of main components to the manufacturing plant, the actual transportation modes used and distance traveled shall be considered.

### **Date quality requirements for the use stage**

- The energy consumption of the product shall be determined based on testing methodology stipulated in applicable international, national or industrial standards of the countries/regions the product is marketed.
- For the electricity mix for the use stage, the official electricity mix for the country where the product is exported may be used as approximate value or generic data. Please refer to Appendix I for the common sources of generic data. The year of the data cannot be older than 1990.

### **Date quality requirements for the recycling/end-of-life stage**

- Generic data may be used during the recycling/end-of-life stage, if for specific reason the site specific data for the recycling/waste disposal system cannot be obtained. Then generic data and recycling rate may be used to calculate environmental impact. Please refer to Appendix I for the common sources of generic data. The year of the data cannot be older than 1990.

## 10. Parameters to be declared in the EPD

The following parameters shall be declared in the EPD:

### Resource use

- non-renewable resources
  - materials resources
  - energy resources (used for energy conversion purposes)
- renewable resources
  - material resources
  - energy resources (used for energy conversion purposes)
- secondary resources
  - material resources (pre-consumer or post-consumer recycling and reuse)
  - energy resources (used for energy conversion purposes)
- recovered energy flows (such as thermal energy) expressed in MJ
- water use divided into:
  - total amount of water (consider make-up water for in-plant recycling and reuse)
  - direct amount of water used by the core process

### The following requirements on the resource declaration also apply:

- all parameters for resource consumption shall be expressed in mass, with the exception of renewable energy; resources used for the generation of hydroelectric, wind electricity and solar energy, which shall be expressed in MJ;
- all parameters shall not be aggregated but reported separately. Resources which contribute for less than 5% in each category shall be included in the resources list as “other”;
- nuclear power shall be reported among the non-renewable energy resources as kg of uranium calculated by converting the thermal energy (MJ) considering a reactor of III generation with an efficiency of 33%;
- the PCR can define other resources (for example rare materials originating from the LCI data) which may be listed and detailed in the EPD for each specific product category;
- the energy content into some products (such as paper or plastic based products) is useful information for the end of life management. For this reason, the “energy content of product” shall be declared in MJ: its estimation shall be made considering the gross calorific value of the product. Only the energy that is suitable for an eventual energy recovery at the end of life shall be considered (energy content of steel due to its carbon content for example shall not be considered since it is not practically recoverable);
- energy content of biomass used for feed or food purposes shall not be considered.

## Impact equivalents expressed as potential environmental impacts

The potential environmental impacts associated with the various types of use of resources and pollutant emissions shall be reported into the following impact categories:

- Emission of greenhouse gases (expressed as the sum of global warming potential, GWP, 100 years, in CO<sub>2</sub> equivalents).
- Emission of acidifying gases (expressed as the sum of acidifying potential in sulphur dioxide (SO<sub>2</sub>) equivalents).
- Emission of gases that contribute to the creation of ground-level ozone (expressed as the sum of ozone-creating potential, ethene-equivalents).
- Emission of substances to water contributing to oxygen depletion (expressed as phosphate (PO<sub>4</sub>) equivalents).

## Impact categories for optional declaration

- Emission of ozone-depleting gases (expressed as the sum of ozone-depleting potential in mass of CFC 11-equivalents, 20 years).

## Waste

- hazardous waste (as defined in Taiwan's Waste Disposal Act, or follow host countries' laws for sites outside Taiwan).
- non-hazardous waste

*(Note: For characterization factors of each impact category, please refer to General Programme Instructions For The International EPD System, Version 2.01 (2013-09-18))*

## 11. Recycling information

The inclusion of recycling information for B2C products shall be mandatory and shall include information such as dis-assembly instructions, which parts/components are suitable for recycling (such as metal cases) or not suitable for recycling. The information which the EU WEEE Directive requires the end product manufacturer to provide may also be included in the declaration information for products.

If practical, information for the parts which cannot be recycled and therefore should be disposed of properly during the end-of-life stage may also be included.

Recycling marking for product's plastic components and plastic packaging material (optional information):

- Plastic parts marking: Where technologically possible, plastic parts of the product weighing  $\geq 25$  g shall be marked in accordance with the ISO 11469 and ISO 1043 Part 1/2/3/4, SPI or other international standard label to facilitate their identification and recovery at the end of life.
- Plastic packaging material marking: The Plastic packaging materials shall be labeled on the parts with SPI or other international standards for ease of sorting.

## **12. Other environmental information (Optional)**

The EPD may cover information including technology adopted, site of product manufacturing and assembly, as well as information on other working environment, health and risk-related aspects.

If this PCR is to be used for product carbon footprint declaration purpose, in the declaration, information regarding commitment on GHG reduction should be included and shall ensure that the commitment is measurable, reportable and verifiable. The organization may also list environmental and energy management related information, such as awards, commendations and system certifications.

### 13. Information about the certification

The information on PCR review, EPD verification and verification organization shall be included.

EPD Certification is valid until 20XX-\_\_-\_\_

According to the Requirements for the international EPD system, *General Programme Instructions, Version 2.01 (2013)* – [www.environdec.com](http://www.environdec.com).

The PCR review for \_\_\_\_\_ (PCR 2015: ) was administered by the Environment and Development Foundation and carried out by an LCA expert panel chaired by Dr. Wen-Ching Chen ([wencc@edf.org.tw](mailto:wencc@edf.org.tw)).

Independent verification of the declaration, according to ISO 14025:2006

Internal     External

Third party verifier: Environment and Development Foundation in Taiwan.

Accredited by :

Name:

Title:

Organization:

Signature:\_\_\_\_\_

Name:

Title:

Organization:

Signature:\_\_\_\_\_

Name:

Title:

Organization:

Signature:\_\_\_\_\_

Environmental declarations from different programmes may not be comparable.

## 14. References

The EPD shall refer to the following documents:

- GENERAL PROGRAMME INSTRUCTIONS FOR THE INTERNATIONAL EPD® SYSTEM, Version 2.01 (2013-09-18), downloadable from:  
[http://www.environdec.com/Documents/GPI/General\\_programme\\_instructions\\_2\\_01\\_20130918.pdf](http://www.environdec.com/Documents/GPI/General_programme_instructions_2_01_20130918.pdf)
- Relevant PCR documents
- The underlying LCA report

When available, the following documents shall also be referenced:

- Other documents and recycling instructions that verify and complement the EPD.

References for developing this PCR:

- EUROPEAN COMMISSION, Code of Conduct on Energy Consumption of Broadband Equipment Version 5, 2013.12
- LTE-Technology Introduction Application Note, C. Gessner, A. Roessler, M. Kottkamp July 2012
- International EPD System, PCR Basic Module-CPC Division 47-Radio, Television and Communication Equipment and Apparatus Version. 0.5, 2009.08
- EuP Preparatory Studies Lot 26: Networked Standby Losses Draft Report Task 3-Consumer Behaviour and Local Infrastructure, Fraunhofer Institute for Reliability and Microintegration, IZM
- Japan's JEMAI PBX System PCR



## Appendix I – Generic Data Sources to Refer to

For processes located within Taiwan, Taiwan generic data or the data published by the commercial, industrial and energy competent authorities of the Republic of China (ROC) government, may be used. However, for other regions (such as EU), if there are more relevant generic data available, these data should be used instead. Data from the following generic databases are recommended for use.

Material/Process	Database	Published
Industrial processes	Ecoinvent 2nd edition	2007
Packaging materials, transport, waste treatments	BUwAL 250, 2nd edition	2004
Steel, Primary copper, Copper products, Electricity, Fuels, Aluminum, Chemicals, Transports, Waste management,	LCA Database for Taiwan : DoITPro	2008~2010
	PE-GaBi	2006
	ELCD version 2.0	2009
	Ecoinvent 2 <sup>nd</sup> edition	2007
	The Boustead Model 5.0	2007
	EIME (Environmental Information and Management Explorer) EcoBilan	1998-2000
	ETH ESU 96	2004
	Boustead model 5.0	2007
Plastics	PE Plastic Europe (Association of Plastics Manufacturers in Europe)	1993-1998
	PE-GaBi	2006
	ELCD	2009
	Ecoinvent 2 <sup>nd</sup> edition	2007
	The Boustead Model 5.0	2007
	EIME (Environmental Information and Management Explorer) EcoBilan	1998-2000
Electronic components	LCA Database for Taiwan : DoITPro	2008~2010
	PE-GaBi	2006
	ELCD	2009
	Ecoinvent 2 <sup>nd</sup> edition	2007
	The Boustead Model 5.0	2007
	EIME (Environmental Information and Management Explorer) EcoBilan	1998-2000

## **Appendix II – Reporting Format for the EPD**

This appendix provides guidance information for the titles of sections, types of data and required information to be reported in the mandatory reporting part of the EPD. As a generic reporting template, the following titles and sub-titles are recommended:

*(Refer to the PCR manual for the section numbering, the information in Italics are the recommended data/information for inclusion)*

### **Introductory part**

Each EPD should have an introduction part on the top part of the EPD which includes the following information:

- *Company/organization name*
- *Product name*
- *EPD registration number*

### **Description of the company/organization and product/service**

#### ***Company/Organization***

- *Description of company/organization*
- *Description of overall working environment, existing quality system and environmental management system*

#### ***Product and services (see Section 2)***

- *Product's main applications*
- *Description of product specification, manufacturing process, manufacturing sites (if there are several sites)*
- *For product's environmental performance aspects, characteristics which may improve the usefulness of product*
- *Other types of relevant information, for example, special manufacturing processes with special advantages to the environment*

### **List of materials and chemical substances**

- *Content declaration (see Section 3)*

### **Presentation of the environmental performance**

- *Outline of the LCA methodology, for example, period of LCA, declared units, system boundaries (graphical presentation), cut-off and allocation rules, and data sources.*

#### ***Raw material acquisition and manufacturing stage (see Section 10)***

#### ***Distribution, use and end-of-life stage (see Section 10)***

- *Geographical region for product delivery*
- *Transportation data*
- *Product design life*
- *Description of each stage and associated energy consumption*
- *Use stage power consumption and annual global warming potential*
- *End-of-life information*

## **Information about Company and Certification Organization**

**Recycling information** (see Section 11)

**Other environmental information** (see Section 12)

**Information regarding certification** (see Section 13)

- *Names of certification and verification organizations*
- *Validity of certification certificates*
- *Compliance with legal and relevant requirements*

**References** (see Section 14)

- *relevant PCR documents*
- *General Programme Instructions for the International EPD® System, Version 2.01 (2013-09-18)*
- *underlying LCA study*
- *other supporting documents for LCA information*
- *other relevant documents regarding company/organization's environmental activities*

### Appendix III Abbreviations

Acronym	Common Name
APLAC	Asia Laboratory Accreditation Cooperation
CFP	Carbon Footprint of Product
EPD	Environment Product Declaration
HG	Home Gateway
LTE	Long Term Evolution
LTE CPE	LTE Indoor/Outdoor Networking CPE
3GPP	3rd Generation Partnership Project
OFDM	Orthogonal frequency-division multiplexing
TDD	Time-division duplex
FDD	Frequency-division duplex
HPNA	Home Phoneline Networking Alliance
ILAC	International Laboratory Accreditation Cooperation
MRA ILAC	International Laboratory Accreditation Cooperation Mutual Recognition Arrangement
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
MAC	Media Access Control
MoCA	Multimedia over Coax
PCR	Product Category Rule
PHY	Physical
QoS	Quality of Service
RMS	Remote Management Server
RoHS	The Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment Directive
TAF	Taiwan Accreditation Foundation
Trpt	Transportation
WEEE	The Waste Electrical and Electronic Equipment Directive
WiFi	Wireless Fidelity