Carbon Footprint Product Category Rule (CFP-PCR)

(Approved CFP-PCR number: PA-DH-01)

Applicable Product(s): Portable electronic communication devices

Approved November 13, 2012

The CFP Communication Program

*The term of validity of the approved CFP-PCR shall be 5 years from the authorization date.

*The details recorded in this CFP-PCR may be modified or amended as appropriate as a result of discussions between related businesses on the CFP Communication Program by undergoing the process of CFP-PCR amendment.

*This document is a translation draft of the original CFP-PCR, edited by Samsung Electronics Co., Ltd. and TCO2 Co. Ltd.

Carbon Footprint of Products- Product Category Rule of
"Portable electronic communication devices"

This document prescribes the rules on CFP quantification and declaration for "Portable electronic communication devices" under the "CFP Communication Program" (hereinafter called "the CFP Program") operated and managed by JEMAI (Japan Environmental Management Association for Industry).
The businesses shall conduct CFP quantification and declaration based on this document and "Requirements for CFP quantification and declaration".

No.	Items	Contents
1	Scope	This CFP-PCR prescribes rules, requirements, and instructions for CFP quantification and declaration applicable to "Portable electronic communication devices" (hereinafter called "PECD") under the CFP Program. The scope of this CFP-PCR overlaps with another approved CFP-PCR (IT equipment, certified CFP-PCR PA-CI-01). However this CFP-PCR targets mobile electronic devices which have displays, internal power supply and communication functions, and specializes to organize and streamline functions, scenarios and data collection for these devices. For the contents which possibly violate laws/regulations related to a target product, compliance of the laws/regulations shall take precedence.
2	Definitions of product category	
2-1	Product category	The target products of this CFP-PCR are products that are listed below classified in the Japan design classification (enforcement version 1st April 2007). (1) H7-43 Mobile Phones (2) H7-6243 Small display devices (3) H7-724 Computers with display(Laptop Type) (4) H7-725 Computers with display(Portable Type) (5) Any other devices in H7-7 series which are portable At this point this CFP-PCR will only refer to PECD that are classified as one of the following. 1. Smartphones 2. Tablets 3. Digital Media Players(*) (*) Digital Media Players that are not portable, or players that are determined to only have display areas that can only show information such as title, playback and recording status, or players that only have playback capabilities which can be classified to H6-542 of the Japan design classification, players that do not have communication means (such as Wi-Fi) are excluded.
2-2	Functions	PECD classified by types defined in 2-1 each shall have the following

<table>
<tr><td></td><td></td><td>functions implemented shown in the table below.
“M” stands for Mandatory; “O” stands for Optional
.
<table>
<tr><th></th><th colspan="3">PECD</th></tr>
<tr><th>Function</th><th>Smartphone</th><th>Tablet</th><th>Digital Media Player</th></tr>
<tr><td>Idle</td><td>M</td><td>M</td><td>M</td></tr>
<tr><td>Phone call (Includes phone calls via Internet)</td><td>M</td><td>O</td><td>O</td></tr>
<tr><td>SMS</td><td>M</td><td>O</td><td>O</td></tr>
<tr><td>Email</td><td>M</td><td>M</td><td>O</td></tr>
<tr><td>Web browse</td><td>M</td><td>M</td><td>O</td></tr>
<tr><td>Audio playback</td><td>M</td><td>M</td><td>M</td></tr>
<tr><td>Video playback</td><td>M</td><td>M</td><td>M</td></tr>
<tr><td>Camera</td><td>O</td><td>O</td><td>O</td></tr>
</table></td></tr>
<tr><td>2-3</td><td>Calculation unit (functional unit)</td><td>1 Product , provision of functionality for assumed lifetime of product</td></tr>
<tr><td>2-4</td><td>Components of product</td><td>The following components shall be included.
- Product (product itself and packaging, accessories)
Accessories (charger, user manual, CD-ROM, etc.) which are always supplied together with the product itself
- Transport materials used in each life cycle stage, and indirect materials</td></tr>
<tr><td>3</td><td>Referenced standards and CFP-PCR</td><td>The following CFP-PCR shall be referenced.
- PA-BB: Paper Containers, Packaging and Wrapping (Intermediate goods)
- PA-BC: Plastic Containers/packaging
- PA-BD: Metallic Containers/packaging (Intermediate goods)
- PA-BE: Glass Container (Intermediate goods)
These four CFP-PCR related to containers/packaging are hereinafter collectively called “the CFP-PCR of containers/packaging”.
- Product-Category Rules (PCR) for Preparing an Environmental Product Declaration (EPD) for Smartphone PCR 2011:1.0
- JIS C 8711 Secondary lithium cells and batteries for portable applications
- IEC 61960:2011 Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium cells and batteries for portable applications</td></tr>
<tr><td>4</td><td>Terms and definitions</td><td>(1) Smartphone
Mobile phones that can use various functions by adding applications. In addition to voice calls, it can browse web sites with a web browser, send and receive e-mails, browse and create document files, show and play photos, music and video, ability to shoot photos and videos for models which have built-in cameras.
[Terminological dictionary: Ministry of Internal Affairs and Communications, Security information Site for the public(21st September 2012)]

(2) Tablet Terminal</td></tr>
</table>

		General-purpose portable terminal device for the purpose of utilization of network services. Generally less than 1kg in weight, screen size larger than 5 inches (in case the device has multiple screens the sum of the multiple screens) should be one guideline. Excludes the following (1)-(3). 1. Servers, workstations, e-book readers, electronic dictionaries, calculators, mobile phones for telecommunications operators (smart phones, mobile phones, PHS), TV Internet-enabled game consoles, digital audio players, digital photo frames, car navigation systems, handheld terminals, order terminals for tables. 2. A personal computer Small general-purpose computer that is intended to be used by one person at a time. 3. Those sold under the brand of mobile phone operators [“Definition of Tablet Terminals” : Japan Electronics and Information Technology Industries Association “Domestic Shipments of tablet devices”(24th May 2012)] (3)Digital Media Player A portable Media Player which has the capability to record, play back compressed digital media such as music or video, obtained from internet services or personal computers. (4) Printed-wiring board A board printed with wiring. [JIS C 5603 printed circuit terms] (5) Bracket Metal parts for mounting other parts, such as displays or printed circuit boards. (6)SMS Stands for Short Message Service. A service that can send and receive short text messages or other information between mobile phones. [Glossary: H.24 White Paper on Information and Communications Ministry of Internal Affairs and Communications (November 2nd 2012)] (7)GSM Digital mobile communication system of the second generation has been standardized as an industry standard for Europe. Had been widely adopted in Europe and America, and Asia. [Glossary: H.24 White Paper on Information and Communications Ministry of Internal Affairs and Communications (November 2nd 2012)] (8)3G Digital mobile communication system that conforms to the standard "IMT-2000" (third generation mobile communication system). "FOMA" series of NTT DoCoMo, the au "CDMA 1x WIN" series, "SoftBank 3G" series of SoftBank corresponds to this system. [Glossary: H.24 White Paper on Information and Communications Ministry

		of Internal Affairs and Communications (November 2nd 2012)] (9)3.9G Third generation mobile communication systems (standards IMT-2000) sophisticated systems (3.9G). 3.9-generation mobile phones. High-speed transmission comparable to optical fiber becomes possible. [Glossary: H.24 White Paper on Information and Communications Ministry of Internal Affairs and Communications (November 2nd 2012)] (10)4G 4G is the next generation mobile communication system of 3G and 3.9 systems. A system that realizes up to 1Gbps when moving at low speed and 100Mbps when moving at high speed. Recommendation concerning the wireless standard has been approved at the annual general meeting of wireless communication of ITU (International Telecommunication Union) held in January 2012. [Glossary: H.24 White Paper on Information and Communications Ministry of Internal Affairs and Communications (November 2nd 2012)] (11)Wi-Fi A brand name which the industry group WECA (the current Wi-Fi Alliance) has given to the wireless LAN "IEEE 802.11a/b/g/n standard aimed to deepen the awareness of consumers. [Glossary: H.24 White Paper on Information and Communications Ministry of Internal Affairs and Communications (November 2nd 2012)] (12)Application Software such as word processing, spreadsheet, image editing, etc. used for the purpose of achieving tasks. [Glossary: H.24 White Paper on Information and Communications Ministry of Internal Affairs and Communications (November 2nd 2012)] (13) Assumed use term “Assumed use term” refers to a time period to quantify the impact of the “use and maintenance stage”, when quantifying the GHG emissions for the entire life cycle of a product.
5	Product system (data collection range)	
5-1	Product system (data collection range)	The following life cycle stages shall be covered. - The raw material acquisition stage - The production stage - The distribution stage - The use and maintenance stage - The disposal and recycling stage Process data that is difficult to collect separately for the “raw material acquisition stage” and the “production stage”, may be recorded in either stage.
5-2	Cut-off criteria and	[Stage, process, and flow, to be covered as cut-off target]

	cut-off target	- Impact other than when using capital goods such as facility for product production - Impact of construction (e.g., construction of production plant, etc.) - Impact of durable goods used for multiple years - Impact of containers/packaging and transport materials which are used for procuring inputs from outside - Of indirect materials, impact of versatile items (e.g., masks, work gloves). - Impact of indirect departments (e.g., clerical division, research division, etc.) - Impact of land use change The processes listed below are known to have a small impact to the entire Life Cycle and may be cut-off. ・ Transport process of all procurement, software development process, Water supply process and waste water treatment process, waste transport and waste treatment process related to production of important raw materials in “raw material acquisition stage” ・ All loss at “production stage” ・ Transport and production process of indirect materials, transport process between sites, waste water treatment process, waste transport and treatment process in “production stage” ・ Production, transport and waste treatment processes related to any transport materials that are used, storage processes, sales process of telecommunications operator and all distributors in “distribution stage” ・ Production, transport and waste treatment processes related to any maintenance parts, data transfer processes to and from the PECD in “use and maintenance stage”
5-3	Life cycle flow chart	General life cycle flow chart is shown in Annex A (normative). When quantifying a CFP, a specific life cycle flow chart detailed for each target product shall be created, which does not deviate from the general life cycle flow chart.
6	CFP quantification method applied to all stages	
6-1	Range of primary data collection	Data collection range of primary data shall be described in No.7-2, No.8-2, No.9-2, No.10-2, and No.11-2. For data collection items outside of the range of primary data collection, primary data may be collected as appropriate.
6-2	Quality of primary data	Not stipulated.
6-3	Primary data collection method	Not stipulated.
6-4	Quality of secondary data	Not stipulated.
6-5	Secondary data collection method	Not stipulated.
6-6	Allocation	[Rules on criteria of allocation] Not stipulated. [Rules on avoidance of allocation] Not stipulated.

<table>
<tr><td></td><td></td><td>[Rules on target of allocation]
Not stipulated.</td></tr>
<tr><td>6-7</td><td>Scenario</td><td>[Collection of data on transport]
When it is difficult to collect primary data of transport volume (or on fuel consumption amount), and when no scenario is set for each stage, the scenario in Annex B (normative) shall be used.

[Wastes]
For treatment method, when it is difficult to collect primary data or when a scenario for each stage is not set, the following assumptions shall be used for quantification: the materials which can be incinerated (e.g., paper, plastics) are assumed to be treated by incineration; the materials which cannot be incinerated (e.g., metals) are assumed to be treated by landfill. For the items covered by “the CFP-PCR of containers/packaging,” the scenario of wastes treatment prescribed in “the CFP-PCR of containers/packaging” shall be applied.</td></tr>
<tr><td>6-8</td><td>Other</td><td>Not stipulated.</td></tr>
<tr><td>7</td><td colspan="2">Requirements for the raw material acquisition stage</td></tr>
<tr><td>7-1</td><td>Range of the processes</td><td>(1) Process related to production and transport of “important raw materials”
(2) Process related to production and transport of “other raw materials”
(3) Process related to production and transport of “accessories”
(4) Process related to production and transport of “packaging”</td></tr>
<tr><td>7-2</td><td>Data collection items</td><td>The data items listed in the following table shall be collected.

(1) Process related to production of “important raw materials”
<table>
<tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied by activity</th></tr>
<tr><td>“Components of display / touch panel”
Amount of each component amount needed for production of display / touch panel input to product production site</td><td>*1</td><td>“Each component”
Emission factor of production</td></tr>
<tr><td>“Components of printed wiring board”
Amount of each component amount needed for production of printed wiring board input to product production site</td><td>*1</td><td>“Each component”
Emission factor of production</td></tr>
<tr><td>“Components of parts set on printed wiring board”
Amount of each component amount needed for production of parts set on printed wiring board input to product production site</td><td>*1</td><td>“Each component”
Emission factor of production</td></tr>
<tr><td>“Components of rechargeable battery”</td><td>*1</td><td>“Each component”</td></tr>
</table></td></tr>
</table>

Amount of each component amount needed for production of rechargeable battery input to product production site		Emission factor of production
“Components of bracket” Amount of each component amount needed for production of bracket input to product production site	*1	“Each component” Emission factor of production
“Components of cover” Amount of each component amount needed for production of cover input to product production site	*1	“Each component” Emission factor of production
“Fuels” “Electricity” Input amounts of raw materials to production process	*1	“Fuels” “Electricity” Emission factor of production, supply, and use
“Green House Gas” Direct emission amounts of Green House Gasses in raw material production process	*1	Global Warming Potential(GWP) of “Green House Gas”

(2) Process related to production of “other raw materials”

Activity	Category of activity	Emission factor to be multiplied by activity
“key pad” Input amount to product production site	Primary	“key pad” Emission factor of production
“vibration motor” Input amount to product production site	Primary	“vibration motor” Emission factor of production
“speaker” Input amount to product production site	Primary	“speaker” Emission factor of production
“microphone” Input amount to product production site	Primary	“microphone” Emission factor of production
“camera module” Input amount to product production site	Primary	“camera module” Emission factor of production
“antenna” Input amount to product production site	Primary	“antenna” Emission factor of production
“other parts” Input amount to product production site	Primary	“other parts” Emission factor of production

(3) Processes related to production of “accessories”

		<table><tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied by activity</th></tr><tr><td>“charger” Input amount to product production site</td><td>Primary</td><td>“charger” Emission factor of production</td></tr><tr><td>“user manual” Input amount to product production site</td><td>Primary</td><td>“user manual” Emission factor of production</td></tr><tr><td>“other accessories” Input amount to product production site</td><td>Primary</td><td>“other accessories” Emission factor of production</td></tr></table> (3) Processes related to production of packaging” <table><tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied by activity</th></tr><tr><td>“packaging” Input amount to product production site</td><td>Primary</td><td>“packaging” Emission factor of production</td></tr></table> *1 For processes related to production of “important parts”, inputs such as raw materials, electricity, fuels, electricity, and direct GHG emissions which have a significant effect to produce those parts shall be collected. However it is also common that most of these parts used for assembly are procured from companies outside, and a complete set of all inputs and outputs of primary data is difficult to obtain. Therefore in situations where the coverage of the primary data is not complete and for items that do not have a significant impact, secondary data can be used to supplement that shortage. However the validity of the supplemented secondary data shall be verified at CFP verification. If primary data for the production of these parts are difficult to obtain, the following two methods may be used. However if any appropriate secondary data exists, method (A) shall take precedence over method (B). (A) Acquire the input amount (e.g. weight) for the specific part and also the emission factors to manufacture that part(cradle to gate) and multiply them (B) Acquire all the input amounts for all the raw materials that constitute the part and multiply it each with the sum of production and processing emission factors (both cradle to gate) for that raw material.
7-3	Primary data collection method and requirements	Not stipulated.
7-4	Scenario	Not stipulated.
7-5	Other	Not stipulated.

<table>
<tr><td>8</td><td colspan="2">Requirements for the production stage</td></tr>
<tr><td>8-1</td><td>Range of the processes</td><td>(1) Production process of product (processing, assembly, inspection, storage, and packing, etc.)</td></tr>
<tr><td>8-2</td><td>Data collection items</td><td>The data items listed in the following table shall be collected.

(1) Production process of product (processing, assembly, inspection, storage, and packing, etc.)
<table>
<tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied by activity</th></tr>
<tr><td>“Water”
“Fuels”
“Electricity”
Input amounts to product production process</td><td>Primary</td><td>“Water”
“Fuels”
“Electricity”
Emission factors of production, supply, and use</td></tr>
</table>
[Primary data collection items to be collected for allocation]
- Production amount of “industrial product itself”
- Production amount of “co-product”</td></tr>
<tr><td>8-3</td><td>Primary data collection method and requirements</td><td>Not stipulated.</td></tr>
<tr><td>8-4</td><td>Scenario</td><td>Not stipulated.</td></tr>
<tr><td>8-5</td><td>Other</td><td>Not stipulated.</td></tr>
<tr><td>9</td><td colspan="2">Requirements for the distribution stage</td></tr>
<tr><td>9-1</td><td>Range of the processes</td><td>(1) Transport process of “shipped items”
All processes from the production site to the final agent (The agent that sells the product to the consumer) shall be included. In the life cycle flow chart of Annex A, only processes until the tertiary Agency is shown. However if in reality there are more agents existing, they shall be included.</td></tr>
<tr><td>9-2</td><td>Data collection items</td><td>The data items listed in the following table shall be collected.

(1) Transport/storage process of “shipped items”
<table>
<tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied by activity</th></tr>
<tr><td>“Shipped items(product itself and packaging, accessories)”
Transport volume (or fuel consumption amount)</td><td>Primary(*1) or scenario</td><td>“Transport mean”
Emission factor of transport</td></tr>
</table>
*1 The following items shall be collected as primary data.
[The fuel consumption method]
- “Fuel consumption” for each transport mean
[The fuel cost method]</td></tr>
</table>

<table>
<tr><td></td><td></td><td>- “Fuel cost” for each transport mean
- “Transport distance” for each transport mean
[The ton-kilometer method]
- “Transport load” for each transport mean</td></tr>
<tr><td>9-3</td><td>Primary data collection method and requirements</td><td>Not stipulated.</td></tr>
<tr><td>9-4</td><td>Scenario</td><td>(Provisions on product transport)
The following scenario may be used.

(1) Case where production site is domestic
Route : Production Site -> Final Agent
Mean : Road (Truck)
Distance : 1,000 km

(2) Case where production site is in foreign country (*)
Route : Production Site -> Production Country Airport
Mean : Road (Truck)
Distance : 500 km

Route : Production Country Airport -> Domestic Airport
Mean : Air transport international cargo
Distance : Distance between countries or airports may be used

Route : Domestic Airport -> Final Agent
Mean : Road (Truck)
Distance : 1,000 km

(3) In cases where primary data for transport distances is collected from the production site to the primary delivery destination
Route : Primary Delivery Destination -> Final Agent
Mean : Road (Truck)
Distance : 500 km

(*)
In general the product cycle of PECD is very short, and product delivery is urgent. Therefore if scenarios are to be adopted for any inter-country transport, transport by air shall be used.</td></tr>
<tr><td>9-5</td><td>Other</td><td>Not stipulated.</td></tr>
<tr><td>10</td><td colspan="2">Requirements for the use and maintenance stage</td></tr>
<tr><td>10-1</td><td>Range of the processes</td><td>(1) Process related to “Electricity consumption of PECD in use”
(2) Process related to “Electricity consumption of PECD charger in standby mode”
.</td></tr>
<tr><td>10-2</td><td>Data collection items</td><td>The data items listed in the following table shall be collected.

(1) Processes related to “Electricity consumption of PECD in use”
<table><tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied by activity</th></tr></table></td></tr>
</table>

“Electricity” Electricity consumption of PECD in use	Primary or scenario	Emission factor of production, supply, and use

“Electricity consumption of PECD in use” shall be calculated using the following formula.

“Electricity consumption of PECD in use” [kWh] =
<Assumed use term> [Years]
x 365[day/Year]
x <Electricity use of PECD per day >[mWh/day]
/ <Battery Capacity>[mWh]
x <Electricity use per charge>[kWh]

Variables which make up the above formula shall be collected with the following “Category of activity”.
<Assumed use term>[Years] : Scenario
<Battery Capacity>[mWh] : Primary
<Electricity use of PECD per day> [mWh/day] : Primary or Scenario
<Electricity use per charge>[mWh] : Primary

(2) Process related to “Electricity consumption of PECD charger in standby mode” Activity	Category of activity	Emission factor to be multiplied by activity
“Electricity” Electricity Consumption when PECD charger is in standby mode	Primary or scenario	” Electricity” Emission factor of production, supply, and use

“Electricity consumption of PECD charger in standby mode” shall be calculated using the following formula.

“Electricity consumption of PECD charger in standby mode” [kWh]=
<Assumed use term> [Years]
x 365[day/Year]
x(24 - < Time for one full charge> [h]
x <Electricity use of PECD per day> [mWh/day]
/ <Battery Capacity> [mWh])
x <Standby Power> [W] / 1000

Variables which make up the above formula shall be collected with the following “Category of activity”.
<Assumed use term>[Years] : Scenario
<Time for one full charge>[h] : Primary
<Battery Capacity>[mWh] : Primary
<Electricity use of PECD per day> [mWh/day] : Primary or Scenario
<Standby Power>[W] : Primary

10-3	Primary data collection method	Each item in the following bracket shall be calculated using the following methods listed below.

	and requirements	<Electricity use of PECD per day> 1. Collect the accumulative use time per function in a day for the PECD. The total usage time of all the functions must add up to be 24 hours. 2. Inquiries and electronic log data for a limited number of sample users may be used for data collection. However the validity of the sampling method is subject to CFP verification. 3. The usage time for each mandatory function defined in the table of section 2-2 shall be collected. Unimplemented optional functions do need not be collected but may be collected. 4. Define the operation steps and conditions that must be taken to measure the electricity use of each function set in (1). 5. Calculate the <Electricity use of PECD per day> using the following formula. <Electricity use of PECD per day> [mWh] = Σ<electricity usage time>$_i$ [h] * <electricity use>$_i$[mW] <Electricity use per charge> and <Time for one full charge> 1. Leave PECD on until battery set to device is discharged and PECD is turned off. 2. Wait for 1 hour at that state with PECD turned off. 3. Connect turned off PECD to charger to recharge battery. 4. Wait until the battery is fully recharged and measure <Total electricity usage>[kWh] and <Time for one full charge> [h]. Reference “JIS 8711 Secondary lithium cells and batteries for portable applications (IEC 61960)” for other testing environment and conditions. <Standby Power> Power used by the charger alone (status where PECD is not connected to charger) in W.
10-4	Scenario	The following scenario may be used. <Assumed use term of PECD> Assumed use term 2 years Adopted the longer period of 24 months of the two installment periods 12 and 24 months (“Advice on installment payments” “Troubles with mobile phone contract and Advice to consumers” 18th March, 2010 Ministry of Internal Affairs and Communications, Consumer Agency) <Electricity use of PECD per day : scenario 1> The following scenario may be used for Smartphones. The following table is an extraction and translation of the referenced document (*3). For details view the original document. Usage Scenario and Usage time under each Mode:

Usage Mode	Usage Time (h)	Operating conditions and procedures
Idle mode	18.97	During idle mode, the mobile phone is awake but not running any applications and the backlight is off.
Talk	2.00	From dialing to speaking for 77 seconds, with the backlight on.
Music	1.00	Playback 12.3MiB, 537 second stereo 44.1kHz MP3 music with the backlight off, GSM (*4) on and repeat 10 times.
Video	0.42	Playback 5 minutes, 12.3 MB H.263 encoded video clip (silent) with the backlight on, and repeat 10 times.
SMS	0.60	Input 55 words in 62 seconds with the backlight on, repeat 10 times.
Email (WiFi)	0.315	Open, download and read five email (60 KiB image), reply two emails with backlight on, repeat 10 times.
Email (3G)(*5)	0.315	ibid
Web browsing (WiFi)	0.19	View the web 490 seconds, including open web application, select page, and download the content to browse Yahoo! Japan website (*6), open state, repeat 10 times.
Web browsing (3G) (*5)	0.19	ibid

In cases where it is difficult to prepare the exact measurement environment or the scenario is considered to deviate from the reality of the device or other reasons, users may modify the operating conditions of the usage scenario but shall not change “usage time”.
However if there are functions that are well used and are not in the table above, they may be added by reducing the same amount of time from the idle time, and the “usage time” is subject to CFP verification. If any changes to the basic scenario are made, they must be documented in the registration information.

*3
Product-Category Rules (PCR) for Preparing an Environmental Product Declaration (EPD) for Smartphone PCR 2011:1.0 Compal Communications, Inc. & GIGA-BYTE Technology Corporation Version 1.0 2011-12-31

*4
Wireless communication standard is not limited to GSM. A communication standard which the product uses in Japan can be adopted.

*5
In cases where it is difficult to limit the communication standard to 3G for measurement, other communication standards such as 4G (e.g. 3.9G) may

<table>
<tr><td></td><td></td><td>be used. However if communication standards other than 3G was used for the measurement, it shall be documented in the registration information.

*6
In the referenced document the website to be viewed under the usage mode “Web browsing” is set to “BBC News”. In order to reflect Japanese conditions, the website to view has been changed to “Yahoo! Japan”.

<Electricity use of PECD per day : scenario 2>
The following scenario may be used for all devices.

A usage scenario where a full charge once per day would occur.
This would be the same as setting the following equation.
<Electricity use of PECD per day> [mWh]
= <Battery Capacity>[mWh]</td></tr>
<tr><td>10-5</td><td>Other</td><td>Not stipulated.</td></tr>
<tr><td>11</td><td colspan="2">Requirements for the disposal and recycling stage</td></tr>
<tr><td>11-1</td><td>Range of the processes</td><td>(1) Disposal and recycling process of “used product itself”
(2) Disposal and recycling process of “used charger, accessories”
(3) Disposal and recycling process of “packaging waste”
(4) Disposal and recycling process of “used user manuals”</td></tr>
<tr><td>11-2</td><td>Data collection items</td><td>The data items listed in the following table shall be collected.

(1) Disposal and recycling process of “used product itself”
<table>
<tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied by activity</th></tr>
<tr><td>“Used product itself”
Emissions for each treatment method</td><td>Primary or scenario</td><td>“Each treatment method”
Emission factor</td></tr>
<tr><td>“Used product itself”
Transport volume (or fuel consumption amount) to each treatment facility</td><td>*1</td><td>“Each transport mean”
Emission factor</td></tr>
<tr><td>“Of used product itself, component derived from fossil resource”
Incineration volume of the component</td><td>Primary or scenario</td><td>“Incineration of each component derived from fossil resource”
Emission factor</td></tr>
<tr><td>“Of used product itself, biodegradable organic component”
Landfill volume of the component</td><td>Primary or scenario</td><td>“Each organic component”
Emission factor of anaerobic decomposition</td></tr>
</table>
(2) Disposal and recycling process of “used charger, accessories”
<table>
<tr><th>Activity</th><th>Category of activity</th><th>Emission factor to be multiplied</th></tr>
</table></td></tr>
</table>

		by activity
“used charger, accessories” Emissions for each treatment method	Primary or scenario	“Each treatment method” Emission factor of treatment
“used charger, accessories” Transport volume (or fuel consumption amount) to each treatment facility	*1	“Each transport mean” Emission factor
“Of used charger, accessories, component derived from fossil resource” Incineration volume of the component	Primary or scenario	“Incineration of each component derived from fossil resource” Emission factor
“Of waste used charger, accessories, biodegradable organic resource” Landfill volume of the resource	Primary or scenario	“Each organic resource” Emission factor of anaerobic decomposition

(3) Disposal and recycling process of “packaging waste”

Activity	Category of activity	Emission factor to be multiplied by activity
“packaging waste” Emissions for each treatment method	Primary or scenario	“Each treatment method” Emission factor of treatment
“packaging waste” Transport volume (or fuel consumption amount) to each treatment facility	*1	“Each transport mean” Emission factor
“Of packaging waste, component derived from fossil resource” Incineration volume of the component	Primary or scenario	“Incineration of each component derived from fossil resource” Emission factor
“Of packaging waste, biodegradable organic resource” Landfill volume of the resource	Primary or scenario	“Each organic resource” Emission factor of anaerobic decomposition

(4) Disposal and recycling process of “used user manuals”

Activity	Category of activity	Emission factor to be multiplied by activity
“used user manuals” Emissions for each treatment	Primary or	“Each treatment method”

<table>
<tr><td></td><td></td><td>
<table>
<tr><td>method</td><td>scenario</td><td>Emission factor of treatment</td></tr>
<tr><td>“used user manuals”
Transport volume (or fuel consumption amount) to each treatment facility</td><td>*1</td><td>“Each transport mean”
Emission factor</td></tr>
<tr><td>“Of used user manuals, component derived from fossil resource”
Incineration volume of the component</td><td>Primary or scenario</td><td>“Incineration of each component derived from fossil resource”
Emission factor</td></tr>
<tr><td>“Of used user manuals, biodegradable organic resource”
Landfill volume of the resource</td><td>Primary or scenario</td><td>“Each organic resource”
Emission factor of anaerobic decomposition</td></tr>
</table>
*1. Requirements for transport volume (or fuel consumption amount) shall conform to No.7-2.
</td></tr>
<tr><td>11-3</td><td>Primary data collection method and requirements</td><td>Not stipulated.</td></tr>
<tr><td>11-4</td><td>Scenario</td><td>(Provisions on the waste treatment regarding the main part of the product)
The following waste and recycle scenario shall be used for the PECD body

(1)SmartPhone
Landfill 73.7 [%]（*1）
Recycle 26.3 [%] （*3）

(2)Tablets
Landfill 97.6 [%]（*2）
Recycle 2.4 [%] （*3）

(3)Portable Media Player
Landfill 100 [%]

*1
The recycled portion of 26.3% was taken from the following source.
“The situation of recycling PHS and mobile Phones FY 2011”
Telecommunications Carriers Association webpage referenced Oct. 2012
The remaining portion of 73.7% that is not recovered is assumed to be collected as municipal waste and landfilled.

*2
<Personal computer recovered FY 2011 (Note book Type PC)>
/ <Personal Computer Domestic distribution results FY 2011(Note Book Type)>
= 189,000 / 7,968,000 * 100 = 2.4[%]</td></tr>
</table>

		<Personal computer recovered FY 2011> Actual collection and recycling numbers of used PCs in FY 2011, Personal Computer 3R Association for the Advancement of Personal Computer 3R http://www.pc3r.jp/topics/120717.html Personal Computer Domestic distribution results FY 2011 JEITA http://www.jeita.or.jp/japanese/stat/pc/2011/ *3 The recycle process for the PECD body shall apply the crushing process as the recycle preparation process. (Waste treatment of accessories and other parts) Landfill 100 [%] (Among the accessories, the provisions pertaining to the disposal scenario of paper manuals, etc.) Incineration 22.2 [%] Recycle77.8 [%]（*4） *4 Trends in waste paper recovery rate 2011 Public Interest Incorporated Foundation Paper Recycling Promotion Center
11-5	Other	Not stipulated.
12	CFP declaration method	
12-1	Additional information	[Additional information which shall be displayed] The following usage condition must be displayed. - Assumed use term of product [Years] [Additional information which may be displayed] - GHG reduction effects (quantified in the process [10-2(2)]) that may take place if users were to connect the charger to a power point only when the device is charging. - GHG reduction effects of the device when it is set to energy saving mode rather than the normal mode(Can be displayed if measurements were done under the same conditions and only the mode of the PECD was changed) Both reduction effect values are subject to CFP verification.
12-2	Registration information	[Additional information which shall be displayed] - The assumed usage conditions and its source of how “Electricity use of PECD per day” [10-2(1)] was derived. - The breakdown list of each function and its usage time, if the “use time per function” method was adopted to calculate the “Electricity use of PECD per day” - The contents of the changes made, if any changes were made to the scenario <Electricity use of PECD per day: scenario 1> and used.

Display Example 1:
Assumed Usage Condition：Total Discharge Once a day
Source：PCR 10-4(Electricity use of PECD per day : scenario 2)

Display Example 2:
Assumed Usage Condition:

Usage Mode	Assumed Usage Time (h)	Changes in scenario
Idle mode	18.97	
Talk	2.00	
Music	1.00	Average of 3 measurements
Video	0.42	Average of 3 measurements
SMS	0.60	
Email (WiFi)	0.315	Average of 3 measurements
Email (3G)	0.315	Average of 3 measurements, 4G communication environment
Web browsing (WiFi)	0.19	Average of 3 measurements
Web browsing (3G)	0.19	Average of 3 measurements, 4G communication environment

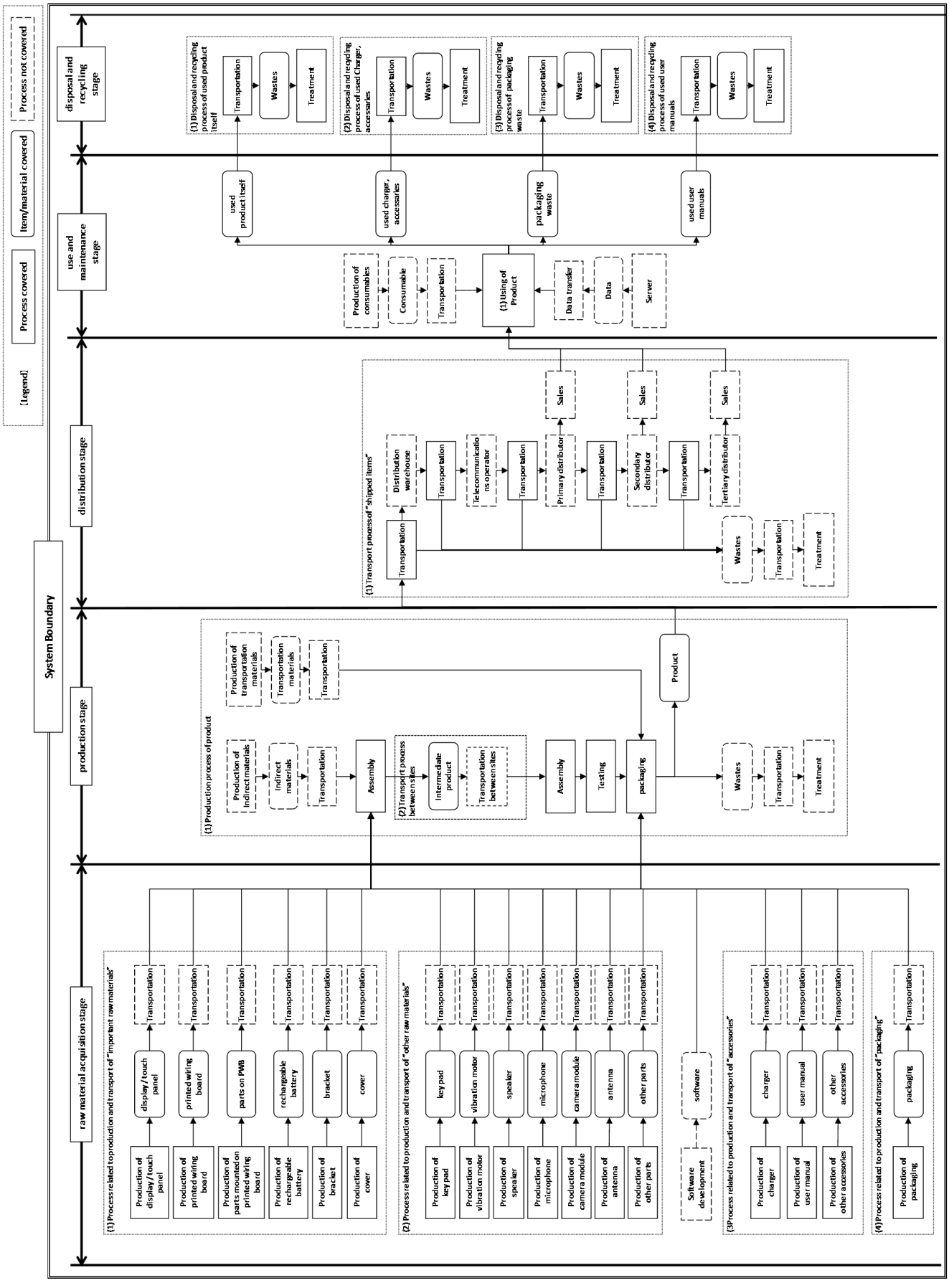
Source：PCR 10-4(Electricity use of PECD per day : scenario 1)

Display Example 3:
Assumed Usage Condition:

Usage Mode	Assumed Usage Time (h)	Operating conditions and procedures
Idle	21.75	Status in Stand mode.
Game(Wi-Fi)	1.0	Move to free game site and select game download and play. Total procedure in 5 minutes. Repeat 5 times with different selection of games.
Web browsing(Wi-Fi)	0.5	Move to Yahoo Japan webpage and click through 10 pages. Total procedure in 5 minutes. Repeat 5 times.
SNS(Wi-Fi)	0.25	Access Facebook and post 1 item to newsfeed, 1 message and view newsfeed. Total procedure in 5 minutes. Repeat 5 times.
Email(Wi-Fi)	0.25	Download 5 emails that have 20 letters as the subject and 100 letters as the body (1 email should have a 100KB image

<table>
<tr><td></td><td></td><td><table>
<tr><td></td><td></td><td>attached). Open all emails.
Reply 1 email that has 50 letters added.
Total procedure in 5 minutes.
Repeat 5 times.</td></tr>
<tr><td>Video(Wi-Fi)</td><td>0.25</td><td>Access Youtube and view videos in full screen mode.
Total procedure in 5 minutes.
Repeat 5 times with different selection of videos.</td></tr>
</table></td></tr>
<tr><td>12-3</td><td>Other</td><td>Not stipulated.</td></tr>
</table>

Annex A (normative): Life cycle flow chart



※All processes related to supply and use of energy and water are omitted from this flow chart.
※This flow chart shows an overview of a representative life cycle flow chart. For CFP quantification of a specified product, it shall be quantified according to processes actually used, such as by omitting unneeded process from this chart.

Annex B (normative): Transport scenario

The following shows transport scenarios when no primary data can be collected.

B1. Transport distance

- Transport within a city or not across adjacent cities: 50km
- Transport within a prefecture: 100km
- Transport possibly across prefectural border to another side of the border: 500km
- Transport which is not limited within a specific area: 1,000km
- Road transport distance within overseas country: 500km
- Sea transport distance between ports (port => port)

- Distance between airports (airport=>airport)
- Airport to destination country (airport => international airport closest to destination country capital)
- Departure country to airport (international airport closest to departure country capital => airport)
- Transport of wastes: 50 km
- Transport of procurement (raw materials, indirect materials) by road only: 500 km

B2. Transport means and loading ratio

Life cycle flow chart	Scenario	
The raw material acquisition stage - Transport for raw material procurement	Road transport only	<Transport mean> 10-ton truck <Loading ratio> 62%
	Transport including air transport (Domestic transport in a country from which products will be imported; Production site => Airport)	<Transport mean> 10-ton truck <Loading ratio> 62%
	Transport including air transport (International transport; Airport => Airport)	<Transport mean> Air transport international cargo
	Transport including air transport (Domestic transport; Airport => Client)	<Transport mean> 10-ton truck <Loading ratio> 62%
	Transport of wastes (Production site => Treatment facility)	<Transport mean> 2-ton truck <Loading ratio> 58%
The production stage - Transport between sites - Transport for indirect material procurement - Transport of wastes	Transport between sites	<Transport mean> 2-ton truck <Loading ratio> 58%
	Transport for indirect material procurement	Same as the raw material acquisition stage
	Transport of wastes (Production site => Treatment facility)	<Transport mean> 2-ton truck <Loading ratio> 58%
The distribution stage - Transport of products	In case of overseas production and via air transport (Production site => Airport in production country)	<Transport mean> 10-ton truck <Loading ratio> 62%
	In case of overseas production and via air transport (Airport in production country => Domestic Airport)	<Transport mean> Air transport international cargo
	In case of overseas production and via air transport (Domestic Airport => Store)	<Transport mean> 10-ton truck <Loading ratio> 62%

	In case of domestic production site (Production site => Store)	<Transport mean> 10-ton truck <Loading ratio> 62%
	Transport of wastes (Store => Treatment facility)	<Transport mean> 2-ton truck <Loading ratio> 58%
The disposal and recycling stage	Transport of wastes (Garbage collection site => Treatment facility)	<Transport mean> 2-ton truck <Loading ratio> 58%