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General principles for the environmental labelling of consumer products

Methodological standard for the environmental assessment of Datacenter IT hosting services and cloud services

FAITS & CHIFFRES

January 2023

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1. Scope of the standard

1.1. Purpose of the document

The Product Category Rules (PCR) provide the method for calculating the environmental labelling indicators of a product category. The environmental labelling objectives are as follows:

- Inform consumers about the environmental impacts of the products and services they buy
- Direct consumer demand towards more environmentally friendly products
- Thereby encourage producers to ensure a more environmentally friendly design of their products so as to limit their impact on the environment.

The category rules are an adaptation of the repository of best practices BP X 30-323-0 "General principles for an environmental communication on mass market products".
The category rules adapt the items set out in Article A.1 paragraph 1 of the repository of best practices BP X 30-323-0. The repository of best practices BP X 30-323-0 states as a guiding principle that the assessment of the environmental impacts of products should be developed in accordance with the life cycle approach and the multi-criteria approach.

This document supplements and clarifies the sectoral rules of the "parent" PCR: "Methodological standard for the environmental assessment of digital services" for the case of Datacenter IT hosting services and cloud services.

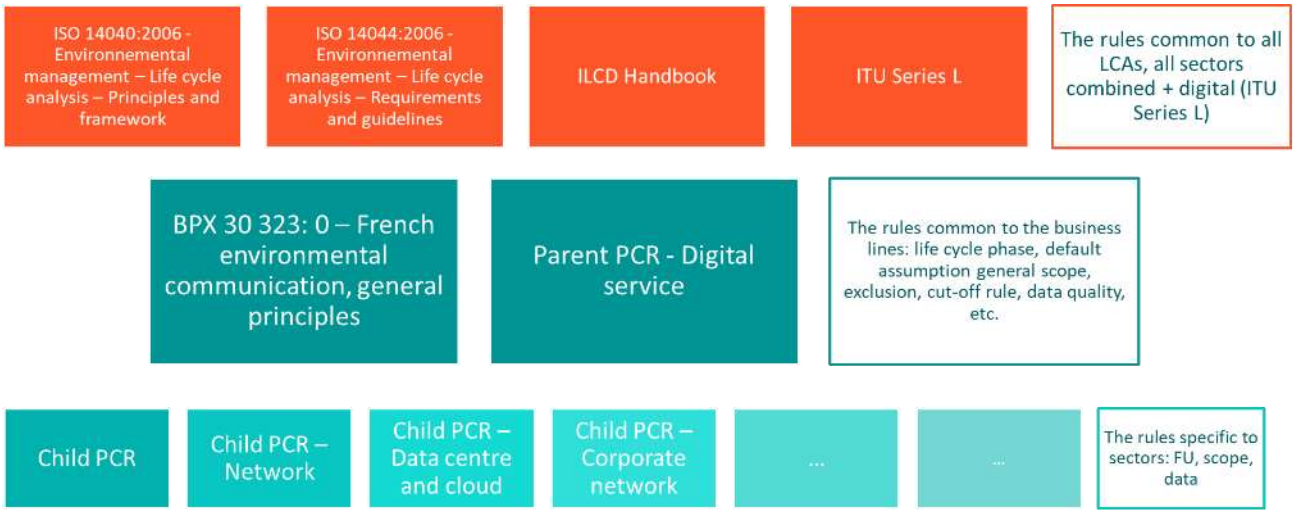

Figure 1: Positioning of the standard in the global standard context. This PCR is produced based on the same methods as the recognised standards in the digital sector, namely:

These PCR are built on the same methodological bases as the standards recognised in the digital sector, namely:

- IT equipment PEF
- ITU Series L, and specifically L.1410

The ITU L.1410 standard indicates the different stages in a digital service LCA, and those covered by the standard. The figure below summarises these stages and indicates those covered by this PCR and its "parent" PCR.

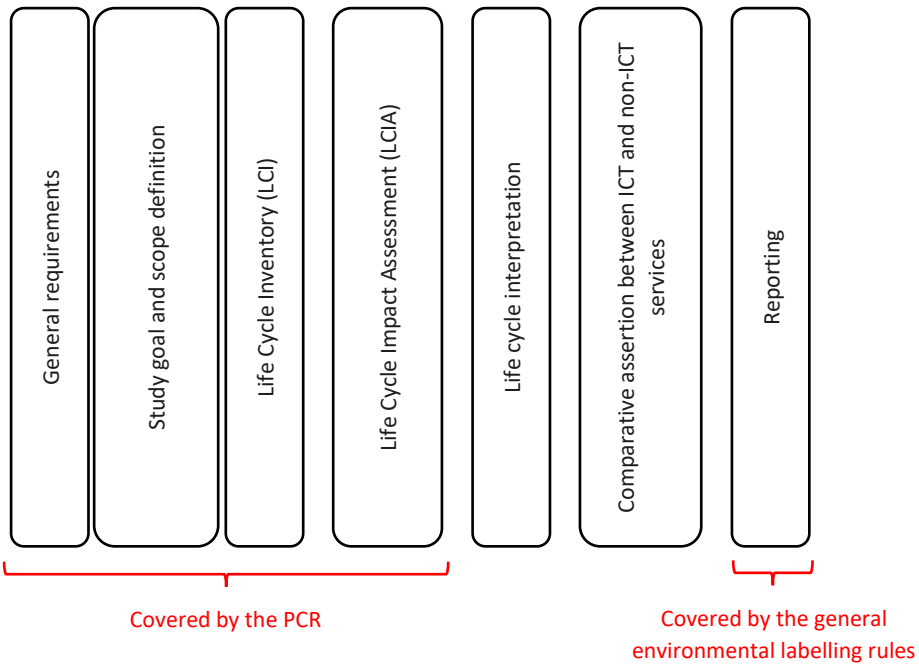

Figure 2: Stages covered by the PCR, taken from standard ITU L.1410

1.2. Area of application

This standard is specifically dedicated to the environmental assessment of IT hosting in Datacenters and in the cloud.

Its aim is to:

- Govern the methodology for assessing the environmental impacts of IT hosting in Datacenters and in the cloud.
- Simplify the calculation method to make environmental labelling easier for companies that market them.

A digital service is an activity characterised by the performance of a service or the provision of information using a set of digital equipment, digital infrastructures and other digital services to capture, circulate, process, analyse, restore and store data. This equipment and infrastructure are characterised in three tiers: terminals, telecommunication networks and IT centres; a set of software being used at different levels to "orchestrate" the physical equipment and deliver the expected service.

Although this activity is linked to one or more physical products (terminals, networks, servers), it is transient and often intangible.

Digital services can be delivered and used by companies, individuals, administrations, authorities and other entities without restriction.

As a reminder, the rules for environmental labelling of digital services are defined by the "digital services" parent PCR. As such, to assess the environmental impacts of an end-to-end digital service based on cloud services (e.g. "Make a user account available in an SaaS solution" or "Execute a business act in an SaaS solution"), the rules of the parent PCR should be followed, as should the rules presented in the following standards:

- For assessing the environmental impact of user terminals and connected objects: existing sectoral rules and the ITU L.1410 standard;
- For assessing the environmental impact of fixed and mobile networks: Internet Access Provision PCR;
- For assessing the environmental impact of a corporate LAN: Corporate local network and telephony services PCR, FU1: "Provide a local network";
- For assessing the impact of the cloud: this standard "Datacenter IT hosting services and cloud services", choosing the FU corresponding to the implementation of the service.

1.2.1. Datacenters

Datacenters are defined by the standard EN 50600-1 as structures or a group of structures dedicated to the centralised hosting, interconnection and operation of telecommunications equipment, information technologies and networks providing data storage, processing and transport services, as well as energy distribution and environmental control facilities and infrastructure, and the necessary levels of resilience and security required to ensure the desired service availability.[1]

Datacenters must meet three complementary requirement levels:

- **Electrical resilience** and **technical resilience** to enable 24/7 uninterrupted operation. Several standards detail the sizing requirements per availability level (Uptime Institute, EN 50600, TIA 942);
  Physical and logical security to guarantee the integrity of the equipment and data hosted;
  Energy and environmental performance, since Datacenters, like other players in the digital sector, are increasingly being questioned on their environmental impact.

Datacenters are characterised by:

- **Their size**, which can range from a few dozen square metres (e.g. computer rooms associated with tertiary areas) to thousands of square metres (e.g. so-called hyperscale Datacenters);
- **Their architecture**: the architecture of a Datacenter is important, as there are several possible scenarios:
  - Construction of a new building;
  - Renovation of an existing Datacenter;
  - Refurbishment of an existing building to host computer rooms;
  - Optimisation of the surface area of an existing building to host computer rooms.

  In the first three scenarios, the construction, renovation or refurbishment may involve a building that will either be entirely dedicated to hosting computer rooms, or dedicated partly to offices for tertiary use.
- **Their density**, given in installed electrical power (kW or kVA) per unit of surface area of the computer room (per rack or per square metre). The density corresponds to the maximum electrical power that can be used by the IT equipment on a unit of surface area.
- **The type of cooling system**, as different cooling technologies are used in Datacenters (free cooling, free chilling, immersion system, etc.)
- **The Datacenter's capacity factor (ratio of available installed IT power to the IT power used):**
  - The available installed IT power is defined as the maximum electrical capacity of the Datacenter that can power the IT equipment;
  - The commercialised IT power (DCCommPow) is defined as the sum of the Datacenter's IT power reserved by customers;
  - The average IT power (DCConsPow) is defined as the proportion of IT power of the IT equipment installed in the Datacenter actually used (measured at the scale of the Datacenter).

[1] EN 50600-1: Information technology - Datacenter facilities and infrastructures - Part 1: General concepts

1.2.2. Cloud services

Cloud computing is a widely used term that encompasses several business models and services. It is characterised in practice by "access via a telecommunications network to shared and configurable resources"[2]; it is defined by:

- IT resources that can be used in self-service mode and on demand;
- Universal access from any type of terminal;
- The sharing and optimisation of resources within Datacenters;
- Elasticity, as a user can immediately use storage capacity for computing power;
- The continuous measurement of usage and pay-per-use.

Cloud computing services include several types of services:

- **Infrastructure as a Service (IaaS),**

The service rendered to the consumer corresponds to the provision of processing, storage, network and other fundamental computing resources on which the consumer can deploy and run arbitrary software, which may include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure, but does have control over the operating systems, storage and applications deployed. They can also exercise limited control over certain network components. [3]

- **Platform as a Service (PaaS),**

The service rendered to the consumer corresponds to the provision of an execution environment that makes it possible to deploy applications created by the consumer or acquired by them, created using programming languages, libraries, services and tools managed by the supplier. The consumer does not manage or control the underlying cloud infrastructure, in particular the network, servers, operating systems or storage, but does have control over the applications deployed and if necessary the configuration settings of the application hosting environment. [4]

- **Software as a Service (SaaS).**

The service rendered to the consumer corresponds to the provision of an application running on a cloud infrastructure. Applications are accessible from various client devices through a thin client interface, such as a web browser or a program interface. The consumer does not manage or control the underlying cloud infrastructure, including the network, servers, operating systems, storage or even the capacities of the individual applications, with the possible exception of the limited configuration settings of applications specific to the user. [5]

1.3. Positioning in relation to standard ITU L.1410 / ETSI 203 199[6]

The ITU L.1410 standard "Methodology for environmental life cycle assessments of information and communication technology goods, networks and services" developed jointly by the ITU and ETSI (ETSI numbering: 203 199) complements standards ISO 14040 and ISO 14044 for the IT products, networks and services sector.
It is currently the only international standard on the LCA of digital services.
Although not prescriptive, it indicates an ideal towards which LCA practitioners should strive, without it necessarily being possible to meet all the recommendations.

The position of this PCR in relation to this standard is:

- To respect the principles of the standard as soon as possible;
- To complement the standard based on the specific needs of French environmental labelling;
- To provide rules, assumptions and secondary data to simplify the conduct of LCAs of digital services for a less expert audience than that of the standard.

Overall, the PCR falls within the context of the standard and, although it provides certain specifications, it does not contradict the standard.

[2] SP 800-145- The NIST Definition of Cloud Computing
[3] ICT Sector Guidance built on the GHG Protocol Product Life Cycle Accounting and Reporting Standard (chapter 4)
[4] ICT Sector Guidance built on the GHG Protocol Product Life Cycle Accounting and Reporting Standard (chapter 4)
[5] ICT Sector Guidance built on the GHG Protocol Product Life Cycle Accounting and Reporting Standard (chapter 4)
[6] https://www.itu.int/rec/T-REC-L.1410-201412-I/en

1.4. Positioning relative to the method described in the Green Gas Protocol[7]

This standard was constructed independently of the rules identified in the international greenhouse gas protocol, known as the "GHG Protocol". Nevertheless, a verification of this protocol's alignment was carried out and is presented in **Annex E-GHG Protocol and alignment verification**.

2. Display units

2.1. Functional unit

In order to cover all Datacenter IT hosting services and cloud services, several functional units have been selected:

- **FU1:** Provide IT hosting services for operation of the IT equipment
- **FU2:** Provide a physical server hosted in a Datacenter with a given computing power **FU3**: Provide storage equipment hosted in a Datacenter with a given storage capacity
- **FU4**: Provide network equipment hosted in a Datacenter with given characteristics
- **FU5:** Run 1 hr of processor core computing
- **FU6:** Provide a virtual server with a given capacity
- **FU7:** Provide a database with a given capacity
- **FU8:** Provide a storage space with a given capacity
- **FU9:** Provide a PaaS deployment and execution environment
- **FU10:** Provide an FaaS environment
- **FU11:** Provide an SaaS solution

Note that the environmental labelling of the functional units in this document will only take into account a single usage scenario, namely the actual approach based on operating data. The theoretical approach based on design data has not been chosen for this standard.

Actual/operating data approach
Labelling using an actual/operating data approach should take into account:

- For IT and network equipment: the actual lifespans and actual consumption of the equipment.

The functional unit can be broken down into several scopes:

- Controlled scope: covers only those elements that are under the control of the digital service operator (e.g. only the Datacenter for a cloud operator);
- Global scope: covers all of the elements used to deliver the digital service, whether or not they are controlled by the digital service operator (terminals, networks, Datacenter).

The functional units and the scope are detailed in chapter 12 of this standard.

2.2. Block diagram and data flow diagram

In order to understand the digital service, identify the structural data and establish the scope and the boundaries of the system to be considered, a block diagram and a data flow diagram of the digital service concerned must be produced.

- **The block diagram** indicates the main sets of equipment or sites used to perform the digital service.
- **The data flow diagram** shows the connection and the use of each of these sets through the use of the digital service.

As the block diagram proposed in this standard is a macro diagram, it should be complemented by the mapping and characterisation of the set of equipment used by the digital service provider.

The flow chart is not relevant for these sector rules, as they address the Datacenter part (level 2) rather than a digital service as a whole (level 1).

[7] GHG Protocol Product Life Cycle Accounting and Reporting Standard ICT Sector Guidance – WBSC&WRI
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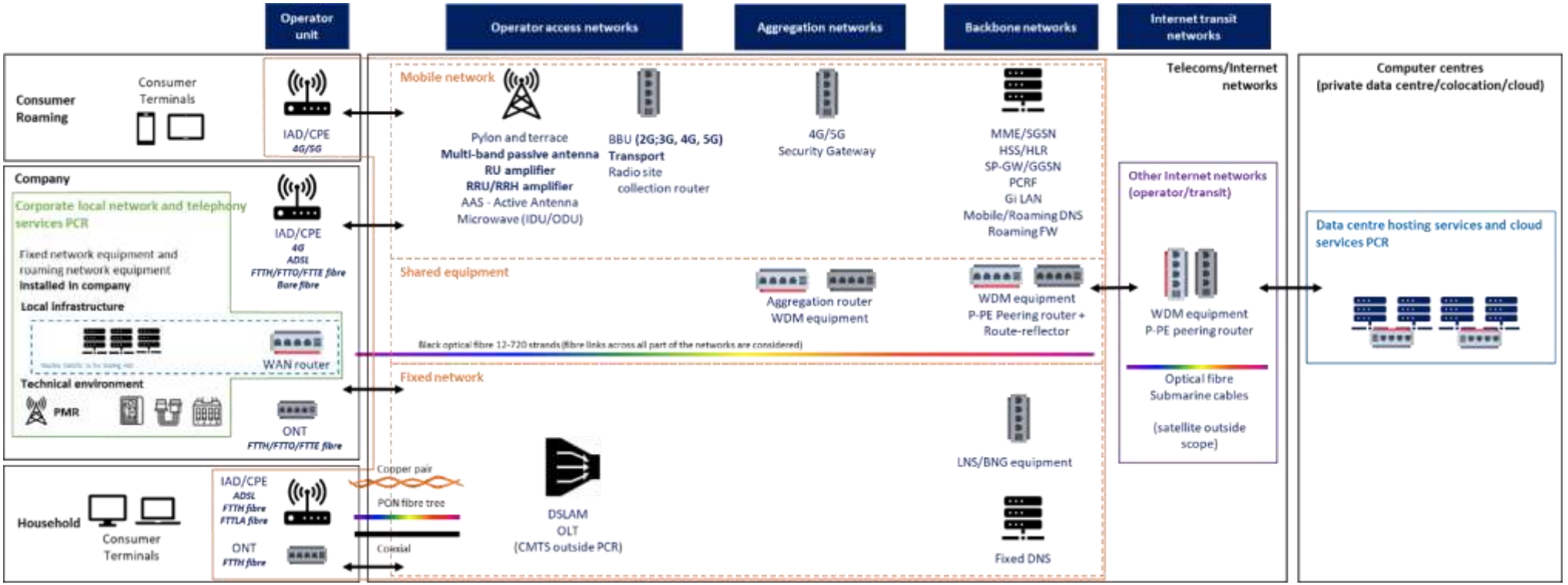

Figure 3: Block diagram of the connection between the different PCRs of a digital service

Keys:

Light blue: Datacenter – tier covered by this standard

Blue: Distribution of equipment between the different parts of the networks (Access, Aggregation and Backbone)

↔ Data exchange

The minimal approach adopted is the screening approach. This standard makes it possible to go as far as a comprehensive approach.

The following table summarises the different approaches and their characteristics:

Approach	Life cycle phases	Indicators	Collection data	Modelling data
Single criterion or single stage approach	Incomplete	Incomplete	Impact data not covering all indicators	N/A
Screening approach	Complete	Complete	Non-homogeneous impact data and/or sources (manufacturers' environmental statements, studies, etc.)	Broad level of granularity (tier, or broad system)
Simplified approach	Complete	Complete	Secondary homogeneous LCI data	Intermediate level of granularity (more detailed systems, equipment)
Comprehensive approach	Complete	Complete	Primary homogeneous LCI data	Detailed level of granularity (specific equipment)

Table 1: details of approaches

Note 1: the approach for a part of the LCA depends on its weakest parameter.

Note 2: the overall LCA approach is equal to the weakest approach of its parts.

Note 3: external communication of environmental data or data for comparisons between several digital services should be based on comprehensive LCA approaches

3. System boundaries

3.1. Stages and flows included

The tier of digital services considered for each of the functional units listed above will be Level 2 - Datacenter/Cloud services

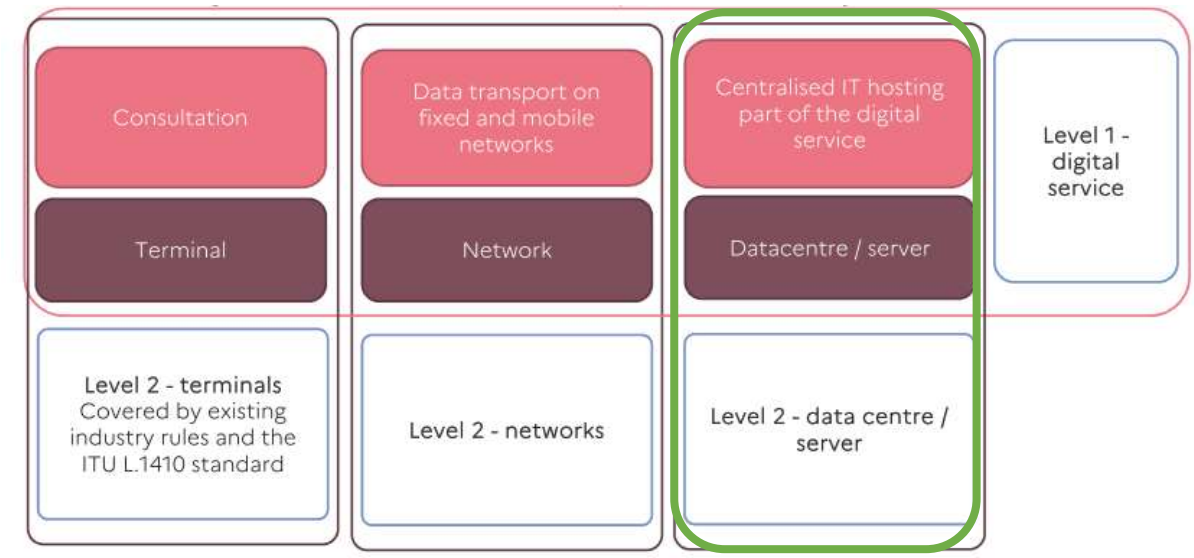

Figure 4: Analysis levels of the "child" PCR

These "child" sector rules cover the following level: Level 2 - Datacenter/Cloud services.

For each equipment item in the Datacenters/Cloud services tier, the life cycle stages taken into account are detailed for each functional unit in chapter 12.

3.2. Exclusion

In accordance with the "Digital Services" PCR, the following stages are excluded from the environmental assessment:

- Flows related to R&D;
- Flows related to employees' transport from home to work and business trips;
- Flows related to services associated with a product or system such as advertising, canvassing and marketing.

With regard specifically to these category rules, the following stages are excluded from the environmental assessment:

- Flows related to sales services (shops, after-sales service, etc.);
- Flows related to administrative services.

4. Rules for allocation between products and co-products

The elements used for the assessment of the Datacenter/Cloud services tier are considered using an equipment-based approach: all equipment used by the digital service constitutes primary or secondary data. The digital service is considered as a sum of the use of each equipment item, each use being defined through an allocation rule in relation to the total impact of the equipment.

Specific case of the reuse of heat

If some of the heat produced by the Datacenter is used as a product, the allocation of greenhouse gas emissions associated with the use of electricity will be shared between the two products.

This allocation will be based on the environmental labelling of the heat product already established, with the aim of allocating all of the emissions. If this data is not available, then it will be based on the economic value of the two products.

In all cases, all emissions related to the use of electricity are accounted for, and there is no double counting.

The allocation rules for each functional unit are detailed in chapter 12.

End of life

For **the end-of-life phase**, reference should be made to the rules for environmental labelling in "GENERAL PRINCIPLES FOR AN ENVIRONMENTAL COMMUNICATION ON MASS MARKET PRODUCTS - PART 0: GENERAL PRINCIPLES AND METHODOLOGICAL FRAMEWORK", March 2016, chapter B.2.3.
http://www.base-impacts.ademe.fr/gestdoclist

IT equipment lifespan

The lifespan of the physical IT equipment should be specified.

If the physical equipment comes from the standard market: the environmental declaration of the equipment and the standard lifespan must be retrieved. Beyond the estimated lifespan, the actual total lifespan of the equipment should be considered.

5. Connection between data

This section provides information on the different types of data to be collected and modelled, as well as the collection and quality criteria to follow. Lastly, it lists the primary, secondary and semi-specific data needed to model the digital service, based on the control of the declarers on each data item to be collected.
Each declarer must indicate the choice of each data item, as well as the associated quality level in the report.

Primary activity data (or specific data) is a quantified value derived from a direct measurement or a calculation from direct measurements of an activity or process in the product life cycle. After multiplication by an emission or characterisation factor, this value can be used to calculate an impact category indicator.

Secondary data (or generic data) is a quantified value of a product life cycle activity or process obtained from sources other than direct measurement or calculation from direct measurements.

Semi-specific data: data provided by default but which can be specified by the operator to improve the environmental assessment.

These semi-specific values, which are deliberately conservative, are intended to encourage stakeholders in the sector to substitute their own values in order to improve the results of the environmental assessment. The conservative values proposed are not average values and must be used strictly within the context of this methodological standard.

Data collection is carried out by the organisation wishing to use environmental labelling in accordance with this standard (including for data from the overall scope not under the control of this organisation).

The nature of the data expected for each functional unit is detailed in chapter 12.

5.1. Primary data collection method

The actual approach based on operating data has been chosen. The PUE and the actual capacity factor should therefore be taken into account. In addition, the primary data measured or calculated should be collected over a period of one year to avoid seasonal variations only for data of a seasonal nature.

5.2. Completeness and connection between primary, secondary and semi-specific data

It is difficult to apply the principle of mass, energy or impact cut-off rules in the case of digital services. The preferred approach here is therefore that of the representativeness (completeness) of the equipment or systems, depending on the approach chosen.

The minimum data requirements for the Life Cycle Inventory have been identified for each functional unit in chapter 12.

5.3. Data quality

See the "Methodological standard for the environmental assessment of digital services" PCR: no changes.

5.4. IT equipment maintenance

The impacts from mobilising the IT equipment maintenance teams can be significant. Consequently, except for FU1, elements related to the IT equipment and platform maintenance should be included in the environmental impact assessment of the functional unit considered.

The elements to be taken into account are as follows:

- Offices for tertiary use;
- IT equipment;
- Travel of the maintenance teams.

6. Environmental indicators

6.1. Data leading to environmental impacts

See the "Methodological standard for the environmental assessment of digital services" PCR: no changes.

6.2. Environmental indicators selected

See the "Methodological standard for the environmental assessment of digital services" PCR: no changes.

6.3. Other relevant environmental indicators

In addition to impact indicators, flow or performance indicators specific to the Datacenter may be integrated (see application standards ISO 30134 etc.).

- Power Usage Effectiveness (PUE) to calculate the overall energy efficiency of a Datacenter
  - Standardised: EN 50600-4-2 based on ISO/IEC 30134-2
- Water Usage Effectiveness (WUE) to calculate the direct water consumption of the Datacenter
  - Standardised: ISO/IEC 30134-9
- Energy Reuse Factor (ERF) to measure the amount of energy reused at the output of a Datacenter, which can take several forms, such as the reuse of waste heat for example.
  - Standardised: work in progress
- Renewable Energy Factor (REF) to calculate the share of renewable energy use
  - Standardised: ISO/IEC 30134-3

These indicators are recommended.

7. Temporary data validation and update frequency

See the "Methodological standard for the environmental assessment of digital services" PCR: no changes.

8. Validation method for data and results

See the "Methodological standard for the environmental assessment of digital services" PCR: no changes.

9. Method for taking into account the time lag in GHG (greenhouse gas) emissions

See the "Methodological standard for the environmental assessment of digital services" PCR: no changes.

10. Limits

See the "Methodological standard for the environmental assessment of digital services" PCR: no changes.

11. Description of methodology for each functional unit

11.1. FU1: Provide IT hosting services for operation of the IT equipment

11.1.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide IT hosting services for operation of the IT equipment and of a specific Datacenter"

The definition of this functional unit is based on the answer to the following questions:

The function performed/service rendered: "What? "	Provide IT hosting services for operation of the IT equipment
The scope of the function or service: "How much/many? "	IT equipment with a rated electrical power of 1kW
The required level of quality: "How? "	In a Datacenter itself defined by a type and PUE, a level of resilience, physical and logical security, a type of cooling
The lifespan of the product: "How long? "	for one month[8]

Table 2: Description of functional unit 1

This functional unit covers only the scope that is under the control of the IT centres and therefore includes:

- The building architecture (controlled scope)
- The technical environment (controlled scope)
- Design of the Datacenter (controlled scope)
- Datacenter maintenance (controlled scope)

Standard unit

No standard unit in view of the specific nature of the functional unit

[8] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.1.2.System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (Datacenter design)*
Distribution					*Mandatory*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		**Excluded from this functional unit (see FU2 to FU4)**
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Mandatory (maintenance and installation of new equipment in the Datacenter)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 3: Life cycle scope of functional unit 1

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR
Note 3: the items in bold are the items for which there is a divergence compared to the "Digital services" parent PCR
The following are excluded from the scope:

- Hosted IT equipment;
- Network equipment installed in the Meet Me Room (MMR)[9];
- The WAN (covered by the "Internet Access Providers" child PCR).

11.1.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of IT hosting services for operation of the IT equipment.
For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
dU	Study duration
DDV_DC	Datacenter lifespan
DDV_eqt	Equipment lifespan. This includes the estimated duration of use + the first life duration for refurbished equipment.
$PuissCommDC$	Proportion of the Datacenter's installed power reserved by customers

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $\frac{dU}{DDV\_DC * PuissCommDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** $\frac{dU}{DDV_{DC} * PuissCommDC}$ **x FE**	**Impacts_UF =** $\frac{1}{PuissCommDC}$ **x FE**
IT equipment	**Impacts_UF =** 0	**Impacts_UF =** 0	**Impacts_UF =** 0
Network equipment	**Impacts_UF =** 0	**Impacts_UF =** 0	**Impacts_UF =** 0

Table 4: Allocation rules for calculating functional unit 1

Focus on the lifespan of the building:

- **Building lifespan assumption (dedicated to hosting computer rooms):** 25 years.
- **Renovation or rehabilitation of an existing building:** The impacts allocated to the building are divided according to its estimated total lifespan after renovation, taking into account the first life duration and the estimated duration of the second life. The building's impact is considered throughout the life cycle, including the impact of renovation operations.
- **Optimisation of space in an existing building**: base the building's lifespan and the ratio of existing floorspace optimised for hosting/total floorspace of the existing building.

Focus on the lifespan of the equipment

Annex D specifies the standard lifespans per equipment item that should be taken into account for the allocation rules and to identify the equipment for which the end of life should be taken into account in the analysis (equipment with a lifespan of less than 10 years, such as batteries for example).

[9] Included in the operator room/WAN equipment in functional units 2, 3 and 4

11.1.4.Connection between data

The minimum elements to take into account for the **manufacturing, distribution and end of life** phase are

- The architectural batches, distributed as follows[10]:
    - Roads and other networks;
    - Structure, masonry, structural work, frames;
    - Facades;
    - Roofing and waterproofing;
    - Interior and exterior woodwork, closures;
    - Insulation;
    - Partitioning, suspended ceilings;
    - Floor and wall coverings, painting;
    - Preparation and implementation products;
    - Designed floor assembly[11].
- The technical batches, distributed as follows:
    - Air conditioning;
    - High current;
    - Backup power;
    - Fire;
    - Security;
    - Low current;
    - Local energy production;
    - Safety: video surveillance, access control;
    - Immersion system.

This data and its nature is shown in the table in Annex B – Connection between data.

For FU1, the impact of mobilising the Datacenter design, production and maintenance teams can be significant (living quarters, site organisation, design team, etc.). However, due to a lack of available data to assess this life phase of the Datacenter, these impacts are excluded from the current modelling.

[10] Decree of 23/12/2013 on the environmental declaration of construction products intended for use in building works

[11] In addition to the order of 23/12/2013, specific to Datacenters

11.2. FU2: Provide a physical server hosted in a Datacenter with a given computing capacity

11.2.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide a physical server hosted in a Datacenter with a given computing capacity"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Host a physical server
The scope of the function or service: "How much/many? "	Defined by a given computing capacity expressed as CPU, RAM (GB), Storage (GB)
The required level of quality: "How? "	**No redundancy and no backup** In a Datacenter itself defined by a type and PUE, a level of resilience, physical and logical security, a type of cooling
The lifespan of the product: "How long? "	for one month[12]

Table 5: Description of functional unit 2

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Additional elements:
  - The IT equipment, in this case the physical server (controlled scope);
  - The Datacenter network equipment (non-controlled scope);
  - Physical server maintenance (controlled scope).

Standard unit

No standard unit in view of the specific nature of the functional unit

[12] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.2.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (maintenance and installation of IT equipment)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 6: Life cycle scope of functional unit 2

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.2.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of a physical server in a Datacenter with a given power.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
dU	Duration of use of the equipment considered in the study
DDV_DC	Datacenter lifespan
DDV_eqt	Equipment lifespan. This includes the estimated duration of use + the first life duration for refurbished equipment.
$PuissEqt$	The rated power of the equipment
$PuissCommDC$	Proportion of the Datacenter's installed power reserved by customers
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU2, this factor is equal to $\frac{PuissEqt}{PuissDisponibleDC}$.

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $\frac{dU}{DDV\_DC} \times \frac{PuissEqt}{PuissCommDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** $\frac{dU}{DDV\_DC} \times \frac{PuissEqt}{PuissCommDC}$ **x FE**	**Impacts_UF =** $\frac{PuissEqt}{PuissCommDC}$ **x FE**
IT equipment **FE = FE_eqt (DDV_eqt)**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** **EF**
Network equipment pool **EF = sharing% × Pool_shr_EF(eqt_LS)**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** **FE**

Table 7: Allocation rule for calculating functional unit 2

11.2.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The following additional data:
  - Actual consumption of the consumables necessary for the use of the IT equipment[13]
  - IT equipment concerned by the functional unit according to the characteristics described in Annex A – Characteristics of the IT equipment mentioned in the functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter
  - Network equipment from the server to the output of the Datacenter according to the characteristics below described in Annex A – Characteristics of the IT equipment mentioned in the functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter

This data and its nature is shown in the table in Annex B – Connection between data.

[13] To be defined based on the rolling 12 month measurement or default value assessed as follows: server rated power×1×365dys×24hours taking into account **100% of the maximum power**.

11.3. FU3: Provide storage equipment hosted in a Datacenter with a given storage capacity

11.3.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide storage equipment hosted in a Datacenter with a given storage capacity"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Host storage equipment
The scope of the function or service: "How much/many? "	Defined by a storage capacity in GB, storage architecture (Direct Attached Storage (DAS) vs. Network Attached Storage (NAS) vs. Storage Area Network (SAN)), a storage type (SDD, HDD, Controllers) and the size (number of inches)
The required level of quality: "How? "	**No redundancy and no backup** In a Datacenter itself defined by a type and PUE, a level of resilience, physical and logical security, a type of cooling
The lifespan of the product: "How long? "	for one month[14]

Table 8: Description of functional unit 3

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Additional elements:
  - The IT equipment, in this case the storage equipment (controlled scope);
  - The Datacenter network equipment (non-controlled scope);
  - Storage equipment maintenance (controlled scope).

Standard unit

- Provision of a 10 TB SSD storage bay without redundancy hosted in a Datacenter
- Provision of a 10 TB HHD storage bay without redundancy hosted in a Datacenter

[14] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.3.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (maintenance and installation of IT equipment)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 9: Life cycle scope of functional unit 3

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.3.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of storage equipment hosted in a Datacenter with a given power.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
dU	Duration of use of the equipment considered in the study
DDV_DC	Datacenter lifespan
DDV_eqt	Equipment lifespan. This includes the estimated duration of use + the first life duration for refurbished equipment.
$PuissEqt$	The rated power of the equipment
$PuissCommDC$	Proportion of the Datacenter's installed power reserved by customers
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU3, this factor is equal to $\frac{PuissEqt}{PuissDisponibleDC}$.

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $\frac{dU}{DDV} \times \frac{PuissEqt}{PuissCommDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** $\frac{dU}{DDV} \times \frac{PuissEqt}{PuissCommDC}$ **x FE**	**Impacts_UF =** $\frac{PuissEqt}{PuissCommDC}$ **x FE**
IT equipment	**Impacts_UF =** **0**	**Impacts_UF =** **0**	**Impacts_UF =** **0**
Network equipment pool **FE = [FE_eqt (DDV_eqt)+ sharing% × Pool_shr_EF(eqt_LS)]**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** **EF**

Table 10: Allocation rule for calculating functional unit 3

11.3.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The following additional data:
  - Actual consumption of the consumables necessary for the use of the IT equipment[15]
  - IT equipment concerned by the functional unit according to the characteristics described in Annex A – Characteristics of the IT equipment mentioned in the functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter
  - Network equipment from the server to the output of the Datacenter according to the characteristics below described in Annex A – Characteristics of the IT equipment mentioned in the functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter

This data and its nature is shown in the table in Annex B – Connection between data.

[15] To be defined based on the rolling 12 month measurement or default value assessed as follows: server rated power×1×365dys×24hours taking into account **100% of the maximum power**.

11.4. FU4: Provide network equipment hosted in a Datacenter with given characteristics

11.4.1. Description of the functional unit

The functional unit chosen is as follows:
"Provide network equipment hosted in a Datacenter with given characteristics"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Host network equipment
The scope of the function or service: "How much/many? "	Defined by a bandwidth and a number of copper ports or optical fibre ports
The required level of quality: "How? "	**No redundancy and no backup** In a Datacenter itself defined by a type and PUE, a level of resilience, physical and logical security, a type of cooling
The lifespan of the product: "How long? "	for one month[16]

Table 11: Description of functional unit 4

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Additional elements:
  - The IT equipment, in this case the network equipment (controlled scope);
  - The Datacenter network equipment (non-controlled scope);
  - Maintenance of the network equipment (controlled scope).

Standard unit

- Provision of network equipment with a bandwidth of 10 Gb/s and 48 optical fibre ports hosted in a Datacenter

[16] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.4.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (maintenance and installation of IT equipment)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 12: Life cycle scope of functional unit 4

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.4.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of network equipment hosted in a Datacenter with a given power.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
dU	Duration of use of the equipment considered in the study
DDV_DC	Datacenter lifespan
DDV_eqt	Equipment lifespan. This includes the estimated duration of use + the first life duration for refurbished equipment.
$PuissEqt$	The rated power of the equipment
$PuissCommDC$	Share of the Datacenter's electrical production reserved by a customer
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU4, this factor is equal to $\frac{PuissEqt}{PuissDisponibleDC}$.

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $\frac{dU}{DDV} \times \frac{PuissEqt}{PuissCommDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** $\frac{dU}{DDV} \times \frac{PuissEqt}{PuissCommDC}$ **x FE**	**Impacts_UF =** $\frac{PuissEqt}{PuissCommDC}$ **x FE**
IT equipment	**Impacts_UF =** **0**	**Impacts_UF =** **0**	**Impacts_UF =** **0**
Network equipment pool **FE = [FE_eqt (DDV_eqt)+ sharing% × Pool_shr_EF(eqt_LS)]**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** $\frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** **EF**

Table 13: Allocation rule for calculating functional unit 4

11.4.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The following additional data:
  - Actual consumption of the consumables necessary for the use of the IT equipment[17]
  - IT equipment concerned by the functional unit according to the characteristics described in Annex A – Characteristics of the IT equipment mentioned in the functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter
  - Network equipment from the server to the output of the Datacenter according to the characteristics below described in Annex A – Characteristics of the IT equipment mentioned in the functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter

This data and its nature is shown in the table in Annex B – Connection between data.

[17] To be defined based on the rolling 12 month measurement or default value assessed as follows: server rated power×1×365dys×24hours taking into account **100% of the maximum power**.

11.5. FU5: Run 1 hr of processor core computing

11.5.1. Description of the functional unit

The functional unit chosen is as follows:
"Run computation corresponding to 1 hour of processor core computing"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Perform computation
The scope of the function or service: "How much/many? "	Defined by the set of IT equipment used for the computing
The required level of quality: "How? "	In a Datacenter itself defined by a type and PUE, a level of resilience, physical and logical security, a type of cooling
The lifespan of the product: "How long? "	for one hour[18]

Table 14: Description of functional unit 5

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Elements of functional units 2, 3 and 4:
  - The IT equipment: physical communications servers, storage equipment and network equipment (non-controlled scope);
  - Maintenance of the IT equipment: physical IT servers, storage equipment and network equipment (non-controlled scope);
  - The Datacenter network equipment (non-controlled scope).
- Additional elements:
  - Maintenance of the computing platform (controlled scope).

Standard unit

No standard unit in view of the specific nature of the functional unit

[18] The duration of 1 hour corresponds to the duration defined in the technical committees. However, the calculations are made based on the platform's actual annual consumption, subsequently reduced down to 1 hour.

11.5.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory (see FU2, FU3 and FU4)
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (maintenance of the computing platform)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 15: Life cycle scope of functional unit 5

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.5.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the execution of one hour of core processor computing.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
$NbCoeur.H.CPU$	Number of core.hours used during the year
dU	Study duration
DDV_DC	Datacenter lifespan
DDV_eqt	Equipment lifespan. This includes the estimated duration of use + the first life duration for refurbished equipment.
$PuissPoolEqt$	The rated power of the equipment pool
$PuissCommDC$	Proportion of the Datacenter's installed power reserved by customers
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU5, this factor is equal to $\frac{PuissPoolEqt}{PuissDisponibleDC}$.

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $\frac{1}{NbCoeur.H.CPU} \times \frac{dU}{DDV\_DC} \times \frac{PuissPoolEqt}{PuissCommDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU} \times \frac{dU}{DDV\_DC} \times \frac{PuissPoolEqt}{PuissCommDC}$ **x FE**	**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU} \times \frac{PuissPoolEqt}{PuissCommDC}$ **x FE**
IT equipment pool (take the management servers into account) **EF = [FE_Poolclient (DDV_eqt) + sharing% × Poolmgt_EF(eqt_LS)]**	**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU} \times \frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU} \times \frac{dU}{DDV\_eqt}$ **x EF**	**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU}$ **x EF**
Network equipment pool **FE = [FE_Pool_client (DDV_eqt)+ %mutualisation * FE_Pool_mut(DDV_eqt)]**	**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU} \times \frac{dU}{DDV_{eqt}}$ **x FE**	**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU} \times \frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** $\frac{1}{NbCoeur.H.CPU}$ **x FE**

Table 16: Allocation rule for calculating functional unit 5

11.5.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The data of functional unit 2 and/or of functional unit 3 and/or of functional unit 4
- The additional data and its nature is shown in the table in Annex B – Connection between data.

11.6. FU6: Provide a virtual server with a given capacity

11.6.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide a virtual server with a given capacity"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Provide a virtual server
The scope of the function or service: "How much/many? "	Defined by the number of CPUs, RAM and storage capacity given in GB
The required level of quality: "How? "	**No redundancy and no backup** In a Datacenter itself defined by a type and PUE, a level of resilience, physical and logical security, a type of cooling
The lifespan of the product: "How long? "	for one month[19]

Table 17: Description of functional unit 6

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Elements of functional units 2, 3 and 4:
  - The IT equipment: physical communications servers, storage equipment and network equipment (non-controlled scope);
  - Maintenance of the IT equipment: physical IT servers, storage equipment and network equipment (non-controlled scope);
  - The Datacenter network equipment (non-controlled scope).
- Additional elements:
  - Virtual server design (controlled scope);
  - Virtual server maintenance (controlled scope).

Standard unit

- Provide a virtual server with the following dimensions (1 vCPU, 4 GB RAM, 100 GB of storage)
- Provide a virtual server with the following dimensions (2 vCPU, 4 GB RAM, 200 GB of storage)
- Provide a virtual server with the following dimensions (2 vCPU, 8 GB RAM, 200 GB of storage)
- Provide a virtual server with the following dimensions (8 vCPU, 32 GB RAM, 400 GB of storage)
- Provide a virtual server with the following dimensions (32 vCPU, 128 GB RAM, 400 GB of storage)

[19] [19] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.6.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory (see FU2, FU3 and FU4)
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (virtual server maintenance)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 18: Life cycle scope of functional unit 6

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.6.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of a virtual server with a given capacity.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
$vCPUVM$	Reserved vCPU capacity of the VM
$NbvCPUPool$	Sum of the number of reserved vCPU of all VMs hosted by the pool (containing the VM)
dU	Lifespan of the virtual machine / duration of the study
$PuissConsoPool$	The consumed power of the equipment pool hosting the virtual machine (in kW)
$PuissConsoDC$	The average IT power consumed over one year of the Datacenter (in kW)
DDV_DC	Lifespan of the Datacenter containing the VM
DDV_eqt	Lifespan of the equipment whose impacts are allocated to the VM
$RatioFabCPU$	Ratio of origin of impacts in the manufacturing phase between RAM, CPU and Storage $\frac{\%Impacts\_CPU}{\%Impacts\_RAM + \%Impacts\_CPU + \%Impacts\_Sto}$
$RatioFabRAM$	Ratio of origin of impacts in the manufacturing phase between RAM, CPU and Storage $\frac{\%Impacts\_RAM}{\%Impacts\_RAM + \%Impacts\_CPU + \%Impacts\_Sto}$
$RatioFabSto$	Ratio of origin of impacts in the manufacturing phase between RAM, CPU and Storage $\frac{\%Impacts\_Sto}{\%Impacts\_RAM + \%Impacts\_CPU + \%Impacts\_Sto}$
$qtéRAMVM$	Reserved RAM capacity of the VM
$NbRAMPool$	Sum of the reserved RAM capacities of all VMs hosted by the pool containing the VM
$volStoVM$	Storage space capacity in GB
$NbGOPool$	Sum of the reserved storage capacities of all VMs hosted by the storage equipment pool
$MaxCPURAMSto$	$Max\left(\frac{vCPUVM}{NbvCPUPool}; \frac{qtéRAMVM}{NbRAMPool}; \frac{volStoVM}{NbGOPool}\right)$
$RatioUseCPU$	Ratio of origin of electricity consumption in the use phase between RAM, CPU and Storage $\frac{\%Conso\_CPU}{\%Conso\_RAM + \%Conso\_CPU + \%Conso\_Sto}$
$RatioUseRAM$	Ratio of origin of electricity consumption in the use phase between RAM, CPU and Storage $\frac{\%Conso\_RAM}{\%Conso\_RAM + \%Conso\_CPU + \%Conso\_Sto}$
$RatioUseSto$	Ratio of origin of electricity consumption in the use phase between RAM, CPU and Storage $\frac{\%Conso\_Sto}{\%Conso\_RAM + \%Conso\_CPU + \%Conso\_Sto}$
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU6, this factor is equal to $\frac{PuissConsoPool}{PuissConsoDC}$.

The following distributions will be considered by default[20]:

- $\%Impacts\_RAM$ = 30%
- $\%Impacts\_CPU$ = 2%
- $\%Impacts\_Sto$ = 68%

[20] These values were defined based on a server configuration with the following technical characteristics: 2 processors of 48 cores, 8 SSD of 2 TB and 24 RAM (12 of 32 GB and 12 of 16 GB).

Scope	Allocation rules		
	DC and IT design (optional) **Manufacture (mandatory)** **End of life (mandatory)**	**Transport (mandatory)**	**Use (mandatory)** **DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $(RatioFabCPU \times \frac{vCPUVM}{NbvCPUPool} + RatioFabRAM \times \frac{qtéRAMVM}{NbRAMPool} + RatioFabSto \times \frac{volStoVM}{NbGOPool}) \times \frac{PuissConsoPool}{PuissConsoDC} \times \frac{dU}{DDV\_DC}$ x **EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** MaxCPURAMSto $\times \frac{PuissConsoPool}{PuissConsoDC} \times \frac{dU}{DDV\_DC}$ x **FE**	**Impacts_UF =** $(RatioUseCPU \times \frac{vCPUVM}{NbvCPUPool} + RatioUseRAM \times \frac{qtéRAMVM}{NbRAMPool} + RatioUseSto \times \frac{volStoVM}{NbGOPool}) \times \frac{PuissConsoPool}{PuissConsoDC}$ **x FE**
IT equipment pool (take the management servers into account) **FE = [FE_Poolclient (DDV_eqt) + sharing% × Poolmgt_EF(eqt_LS)]**	**FU_impacts =** $(RatioFabCPU \times \frac{vCPUVM}{NbvCPUPool} + RatioFabRAM \times \frac{qtéRAMVM}{NbRAMPool} + RatioFabSto \times \frac{volStoVM}{NbGOPool}) \times \frac{dU}{DDV\_eqt}$ **x FE**	**FU_impacts =** MaxCPURAMSto $\times \frac{dU}{DDV\_eqt}$ **x FE**	**FU_impacts =** $(RatioUseCPU \times \frac{vCPUVM}{NbvCPUPool} + RatioUseRAM \times \frac{qtéRAMVM}{NbRAMPool} + RatioUseSto \times \frac{volStoVM}{NbGOPool})$ **x FE**
Network equipment pool **FE = [FE_Pool_client (DDV_eqt) + sharing% × Pool_shr_EF(eqt_LS)]**	**FU impacts =** $\frac{vCPUVM}{NbvCPUPool} \times \frac{dU}{DDV\_eqt}$ **x FE**	**FU impacts =** $\frac{vCPUVM}{NbvCPUPool} \times \frac{dU}{DDV\_eqt}$ **x FE**	**Impacts UF =** $\frac{vCPUVM}{NbvCPUPool}$ **x FE**

Table 19: Allocation rule for calculating functional unit 6

11.6.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The data of functional unit 2 and/or of functional unit 3 and/or of functional unit 4
- The additional data and its nature is shown in the table in Annex B – Connection between data.

11.7. FU7: Provide a database with a given capacity

11.7.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide a database with a given capacity"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Provide a database
The scope of the function or service: "How much/many? "	Defined by its storage capacity
The required level of quality: "How? "	**No redundancy and no backup** Defined by the type of database (MySQL, No SQL, number of relations, number of requests), data temperature, amount of data, number of connections, client CPU time or time spent by the request, security level, redundancy level and backup level
The lifespan of the product: "How long? "	for one month[21]

Table 20: Description of functional unit 7

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Elements of functional units 2, 3 and 4:
  - The IT equipment: physical communications servers, storage equipment and network equipment (non-controlled scope);
  - Maintenance of the IT equipment: physical IT servers, storage equipment and network equipment (non-controlled scope);
  - The Datacenter network equipment (non-controlled scope).
- Additional elements:
  - Database design (controlled scope);
  - Database maintenance (controlled scope);

Standard unit

- Provide a database with 10GB of storage

[21] [21] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.7.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory (see FU2, FU3 and FU4)
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (database maintenance)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 21: Life cycle scope of functional unit 7

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.7.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of a database with a given capacity.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
$volSto$	Storage space capacity in GB
$NbGo$	Total sum of the storage capacities reserved by all users of the storage infrastructure
dU	Lifespan of the database / duration of the study
$PuissConsoPool$	The consumed power of the pool of equipment hosting the storage space (in kW)
$PuissConsoDC$	The average IT power consumed over one year of the Datacenter (in kW)
DDV_DC	Lifespan of the Datacenter containing the equipment pool
DDV_eqt	Equipment lifespan
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU7, this factor is equal to $\frac{PuissConsoPool}{PuissConsoDC}$.

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $\frac{volSto}{NbGO} \times \frac{dU}{DDV\_DC} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** $\frac{volSto}{NbGO} \times \frac{dU}{DDV\_DC} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x FE**	**Impacts_UF =** $\frac{volSto}{NbGO} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x FE**
IT equipment pool (take the management servers into account) **FE = [FE_Poolclient (DDV_eqt) + sharing% × Poolmgt_EF(eqt_LS)]**	**Impacts_UF =** $\frac{volSto}{NbGO} \times \frac{dU}{DDV\_eqt}$ **x FE**	**Impacts_UF =** $\frac{volSto}{NbGO} \times \frac{dU}{DDV_{eqt}}$ **x EF**	**Impacts_UF =** $\frac{volSto}{NbGO}$ **x EF**
Network equipment pool **FE = [FE_Pool_client (DDV_eqt) + sharing% × Pool_shr_EF(eqt_LS)]**	**Impacts_UF =** $\frac{volSto}{NbGO} \times \frac{dU}{DDV\_eqt}$ **x EF**	**Impacts_UF =** $\frac{volSto}{NbGO} \times \frac{dU}{DDV_{eqt}}$ **x EF**	**Impacts_UF =** $\frac{volSto}{NbGO}$ **x EF**

Table 22: Allocation rule for calculating functional unit 7

11.7.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The data of functional unit 2 and/or of functional unit 3 and/or of functional unit 4
- The additional data and its nature is shown in the table in Annex B – Connection between data.

11.8. FU8: Provide a storage space with a given capacity

11.8.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide a storage space with a given capacity"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Provide a storage space
The scope of the function or service: "How much/many? "	Defined by its storage capacity[22]
The required level of quality: "How? "	**No backup** Amount of reserved storage (input and output volume) Ingress and egress network flows Functionalities (block, object store, file system) Sustainability criterion [23] Level of redundancy (DC, zonal, regional, multi-regional level) Storage system: SSD, HDD, etc. Capacity to retrieve data and level of performance Class of service (IOPS and bandwidth, data temperature)[24]
The lifespan of the product: "How long? "	for one month[25]

Table 23: Description of functional unit 8

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Elements of functional units 2, 3 and 4:
  - The IT equipment: physical communications servers, storage equipment and network equipment (non-controlled scope);
  - Maintenance of the IT equipment: physical IT servers, storage equipment and network equipment (non-controlled scope);
  - The Datacenter network equipment (non-controlled scope).
- Additional elements:
  - Storage space design (controlled scope);
  - Storage space maintenance (controlled scope).

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Standard unit

- Provide a storage space of XGB×h based on the characteristics mentioned in the "how".

[22] Disk space

[23] Capacity to not lose data

[24] Hot data: Immediately available data; Cold data: Archived data that requires time to access

[25] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.8.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory (see FU2, FU3 and FU4)
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (storage space maintenance)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 24: Life cycle scope of functional unit 8

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.8.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of the storage space with a given capacity.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
$vCPUVM$	Number of vCPU allocated to the storage space
$NbCPUPool$	Number of CPU of the server equipment pool
dU	Lifespan of the database
$PuissConsoPool$	The consumed power of the equipment pool (in kW)
$PuissConsoDC$	The average IT power consumed over one year of the Datacenter (in kW)
DDV_DC	Lifespan of the Datacenter containing the equipment pool
DDV_eqt	Equipment lifespan
$RatioFabSSD$	Ratio of origin of impacts in the manufacturing phase between the SSD and CPU to the distribution of impacts in the manufacturing phase $\frac{\%Impacts\_SSD}{\%Impacts\_SSD + \%Impacts\_CPU}$
$MaxCPUSto$	$Max\left(\frac{vCPUVM}{NbCPUPool}; \frac{volSto}{NbGO}\right)$
$RatioUseCPU$	Ratio of origin of electricity consumption in the use phase between RAM and CPU $\frac{\%Conso\_CPU}{\%Conso\_SSD + \%Conso\_CPU}$
$volSto$	Storage volume used in GB, taking redundancy into account
$NbGo$	Sum of storage volumes used by all users of the storage equipment pool
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU8, this factor is equal to $\frac{PuissConsoPool}{PuissConsoDC}$.

Scope	Allocation rules		
	DC and IT design (optional) **Manufacture (mandatory)** **End of life (mandatory)**	**Transport (mandatory)**	**Use (mandatory)** **DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $[RatioFabSSD \times \frac{volSto}{NbGO} + \frac{vCPUVM}{NbCPUPool} \times (1 - RatioFabSSD)] \times \frac{dU}{DDV\_DC} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**Impacts_UF =** $\text{Max}CPUSto \times \frac{PuissConsoPool}{PuissConsoDC} \times \frac{dU}{DDV\_DC}$ **x EF**	**FU_impacts =** $[RatioUseCPU \times \frac{vCPUVM}{NbCPUPool} + (1 - RatioUseCPU) \times \frac{volSto}{NbGO}] \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**
IT equipment pool (take the management servers into account) **FE = [FE_Poolclient (DDV_ec + sharing% × Poolmgt_EF(eqt_LS)]**	**FU_impacts =** $[RatioFabSSD \times \frac{volSto}{NbGO} + \frac{vCPUVM}{NbCPUPool} \times (1 - RatioFabSSD)] \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $\text{Max}CPUSto \times \frac{dU}{DDV_{eqt}}$ **x EF**	**FU_impacts =** $[RatioUseCPU \times \frac{vCPUVM}{NbCPUPool} + (1 - RatioUseCPU) \times \frac{volSto}{NbGO}]$ **x EF**
Network equipment pool **FE = [FE_Pool_client (DDV_e + sharing% × Pool_shr_EF(eqt_LS)]**	**FU_impacts =** $\frac{vCPUVM}{NbCPUPool} \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $\frac{vCPUVM}{NbCPUPool} \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $\frac{vCPUVM}{NbCPUPool}$ **x EF**

Table 25: Allocation rule for calculating functional unit 8

11.8.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The data of functional unit 2 and/or of functional unit 3 and/or of functional unit 4
- The following additional data:

This data and its nature is shown in the table in Annex B – Connection between data.

11.9. FU9: Provide a PaaS deployment and execution environment

11.9.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide a PaaS deployment and execution environment"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Provide a deployment and execution environment
The scope of the function or service: "How much/many? "	Defined by CPU resources and CPU time reserved and GB of memory
The required level of quality: "How? "	**No redundancy and no backup** Depending on the type of application (CPU resource and CPU time and GB of memory) Managed mode[26] and serverless mode[27]
The lifespan of the product: "How long? "	for one month[28]

Table 26: Description of functional unit 9

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Elements of functional units 2, 3 and 4:
  - The IT equipment: physical communications servers, storage equipment and network equipment (non-controlled scope);
  - Maintenance of the IT equipment: physical IT servers, storage equipment and network equipment (non-controlled scope);
  - The Datacenter network equipment (non-controlled scope).
- Additional elements:
  - Design of the PaaS deployment and execution environment (controlled scope);
  - Maintenance of the PaaS deployment and execution environment (controlled scope).

Standard unit

- Provide an environment for the deployment and execution of XCPU×sec
- Provide an environment for the deployment and execution of XRAM×sec

[26] Provisioning or deprovisioning of virtual servers based on the load, but billing is for the mobilisation of the virtual server

[27] Billing is for CPU time and RAM/Container time

[28] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.9.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	**Tag**	**Life cycle stage**			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory (see FU2, FU3 and FU4)
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (maintenance of the PaaS deployment and execution environment)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 27: Life cycle scope of functional unit 9

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.9.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of a PaaS deployment and execution environment.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
$NbCoeur.H.CPU$	Number of core.hours reserved during the year
$NbCoeur.H.Pool$	Number of reserved core.hours of the server equipment pool
dU	Lifespan of the CPU and RAM resources
$PuissConsoPool$	The consumed power of the equipment pool (in kW)
$PuissConsoDC$	The average IT power consumed over one year of the Datacenter (in kW)
DDV_DC	Lifespan of the Datacenter containing the equipment pool
DDV_eqt	Equipment lifespan
$RatioFabCPU$	Ratio of origin of impacts in the manufacturing phase between the RAM and CPU to the distribution of impacts in the manufacturing phase $\frac{\%Impacts\_CPU}{\%Impacts\_RAM + \%Impacts\_CPU}$
$QtéRAM.H.CPU$	Amount of RAM.hours reserved during the year
$NbRAM.H.Pool$	Amount of reserved RAM.hours of the server pool
$RatioUseCPU$	Ratio of origin of electricity consumption in the use phase between RAM and CPU $\frac{\%Conso\_CPU}{\%Conso\_RAM + \%Conso\_CPU}$
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU9 and 10, this factor is equal to $\frac{PuissConsoPool}{PuissConsoDC}$.

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $[RatioFabCPU \times \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioFabCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}] \times \frac{dU}{DDV\_DC} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**FU_impacts =** $Max(\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool}; \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}) \times \frac{dU}{DDV\_DC} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**	**FU_impacts =** $[RatioUseCPU * \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioUseCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}] \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**
IT equipment pool (take the management servers into account) **FE = [FE_Poolclient (DDV_ec + sharing% × Poolmgt_EF(eqt_LS)]**	**FU_impacts =** $[RatioFabCPU \times \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioFabCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}] \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $Max(\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool}; \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}) \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $[RatioUseCPU \times \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioUseCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}]$ **x EF**
Network equipment pool **FE = [FE_Pool_client (DDV_(+ sharing% × Pool_shr_EF(eqt_LS)]**	**FU_impacts =** $\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool}$ **x EF**

Table 28: Allocation rule for calculating functional unit 9

11.9.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The data of functional unit 2 and/or of functional unit 3 and/or of functional unit 4
- The additional data and its nature is shown in the table in Annex B – Connection between data.

11.10. FU10: Provide an FaaS environment

11.10.1. Description of the functional unit

The functional unit chosen is as follows:

"Provide an FaaS environment"

The definition of this functional unit is based on the following questions:

The function performed/service rendered: "What? "	Provide an FaaS environment
The scope of the function or service: "How much/many? "	Defined by consumed CPU resources and CPU time and GB of memory
The required level of quality: "How? "	**No redundancy and no backup** Amount of memory Amount of CPU Invocation (number of system calls)
The lifespan of the product: "How long? "	for one month[29]

Table 29: Description of functional unit 10

This functional unit covers the overall scope, which includes all of the elements used to enable the function to be performed, namely:

- Elements of functional unit 1:
  - The building architecture (non-controlled scope);
  - The technical environment (non-controlled scope);
  - Datacenter design (non-controlled scope);
  - Datacenter maintenance (non-controlled scope).
- Elements of functional units 2, 3 and 4:
  - The IT equipment: physical communications servers, storage equipment and network equipment (non-controlled scope);
  - Maintenance of the IT equipment: physical IT servers, storage equipment and network equipment (non-controlled scope);
  - The Datacenter network equipment (non-controlled scope).
- Additional elements:
  - FaaS environment design (controlled scope);
  - FaaS environment maintenance (controlled scope).

Standard unit

No standard unit in view of the specific nature of the functional unit

[29] [29] The duration of 1 month corresponds to the duration defined in the technical committees. However, the calculations are made over a period of 1 year to avoid seasonal variations (subsequently reduced to monthly)

11.10.2. System boundaries

For all equipment of each tier (terminal, network, Datacenter/server), the following life cycle stages must be taken into account:

Environmental labelling	ITU L.1410				Coverage by the "parent" PCR
Life cycle stage	Tag	Life cycle stage			
Manufacturing	A	Raw material acquisition			
	A1		Raw material extraction		Mandatory
	A2		Raw material processing		Mandatory
	B	Production			
	B1		ICT good production		
	B1.1			Parts production	Mandatory
	B1.2			Assembly	Mandatory
	B1.3			ICT manufacturer support activities	*Excluded*
	B2		Support goods manufacturing		
	B2.1			Support goods manufacturing	*Excluded*
	B3		Construction of ICT-specific site		
	B3.1			Construction of ICT-specific site	*Mandatory (see FU1)*
Distribution					*Included*
Installation					*Excluded*
Use	C	Use			
	C1		ICT goods use		Mandatory (see FU2, FU3 and FU4)
	C2		Support goods use		Mandatory
	C3		Operator support activities		*Included (FaaS environment maintenance)*
	C4		Service provider support activities		*Excluded*
End of life	D	Goods end-of-life treatment			
	D1		Preparation of ICT goods for reuse		Mandatory
	D2		ICT-specific EoLT End of life of support equipment		
	D2.1			Storage / Disassembly / Dismantling / Shredding	Mandatory

Table 30: Life cycle scope of functional unit 10

Note: the tags are not taken from standard EN 15804 despite their similarity, but from ITU L.1410.
Note 2: the items in italics are the elements stated in this standard in accordance with the "Digital services" parent PCR

11.10.3. Allocation rules

For all equipment considered in the scope, allocation rules will need to be defined for each stage of the equipment's life cycle in order to quantify the share allocated to the provision of an FaaS environment.

For the manufacturing, distribution, use and end-of-life phases, the following allocations will be used:

Parameter	Definition
$NbCoeur.H.CPU$	Number of cores.hours used during the year
$NbCoeur.H.Pool$	Number of cores.hours used of the server equipment pool (number of cores.hours used = number of cores in the pool × capacity factor × 24 × 365)
dU	Lifespan of the CPU and RAM resources
$PuissConsoPool$	The consumed power of the equipment pool (in kW)
$PuissConsoDC$	The average IT power consumed over one year of the Datacenter (in kW)
DDV_DC	Lifespan of the Datacenter containing the equipment pool
DDV_eqt	Equipment lifespan
$RatioFabCPU$	Ratio of origin of impacts in the manufacturing phase between the RAM and CPU to the distribution of impacts in the manufacturing phase $\frac{\%Impacts\_CPU}{\%Impacts\_RAM + \%Impacts\ \_CPU}$
$QtéRAM.H.CPU$	Amount of RAM.hours used during the year
$NbRAM.H.Pool$	Amount of RAM.hours used of the server equipment pool (amount of RAM.hours used = amount of RAM in the pool × capacity factor × 24 × 365)
$RatioUseCPU$	Ratio of origin of electricity consumption in the use phase between RAM and CPU $\frac{\%Conso\_CPU}{\%Conso\_RAM + \%Conso\ \_CPU}$
$\%mutualisation$	For shared equipment (management servers and network equipment of the Datacenter), this factor is applied. As part of FU9 and 10, this factor is equal to $\frac{PuissConsoPool}{PuissConsoDC}$.

Scope	Allocation rules		
	DC and IT design (optional) Manufacture (mandatory) End of life (mandatory)	**Transport (mandatory)**	**Use (mandatory) DC and IT maintenance (optional)**
Building architecture **EF = Archi_EF(DC_LS)**	**FU_impacts =** $[RatioFabCPU \times \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioFabCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}] \times \frac{dU}{DDV\_DC} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**		
Technical environment **EF = TechEnv_EF(DC_LS)**		**FU_impacts =** $Max(\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool}; \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}) \times \frac{dU}{DDV\_DC} \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**	**FU_impacts =** $[RatioUseCPU * \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioUseCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}] \times \frac{PuissConsoPool}{PuissConsoDC}$ **x EF**
IT equipment pool (take the management servers into account) **FE = [FE_Poolclient (DDV_ec + sharing% × Poolmgt_EF(eqt_LS)]**	**FU_impacts =** $[RatioFabCPU \times \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioFabCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}] \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $Max(\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool}; \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}) \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $[RatioUseCPU \times \frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} + (1 - RatioUseCPU) \times \frac{QtéRAM.H.CPU}{NbRAM.H.Pool}]$ **x EF**
Network equipment pool **FE = [FE_Pool_client (DDV_(+ sharing% × Pool_shr_EF(eqt_LS)]**	**FU_impacts =** $\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool} \times \frac{dU}{DDV\_eqt}$ **x EF**	**FU_impacts =** $\frac{NbCoeur.H.CPU}{NbCoeur.H.Pool}$ **x EF**

Table 31: Allocation rule for calculating functional unit 10

11.10.4. Connection between data

The data to take into account are:

- The data of functional unit 1
- The data of functional unit 2 and/or of functional unit 3 and/or of functional unit 4
- The following additional data:

Life cycle stage	Type of data	Type of data
FaaS environment design and maintenance		
Use	FaaS deployment and execution environment maintenance man-days	Primary data
	FaaS deployment and execution environment maintenance man-days	Primary data

Table 32: Connection of the data for functional unit 10

11.11. FU11: Provide an SaaS solution

In order to model and assess the impact of an SaaS solution, the following functional units should be used and the defined criteria identified:

- **FU6: "Provide a virtual server" or FU9 "Provide a PaaS deployment and execution environment" or FU10 "Provide an FaaS environment"**
  - **Apply the methodology for X CPU resources and Y RAM resources**
- **FU7: "Provide a database"**
  - **Apply the methodology for XGB of stored data**
- **FU8: "Provide a storage space"**
  - **Apply the methodology for XGB×h of stored data**

ABBREVIATIONS AND ACRONYMS

ADEME	French Environment and Energy Management Agency
PCR	Product Category Rules
Archi_EF (dt)	Emission factors of the Datacenter's architecture over the period dt.
TechEnv_EF(dt)	Emission factors of the Datacenter's technical environment over the period dt.
eqt_EF(dt)	Emission factors of the equipment considered in the functional unit over the period dt.
FE_Poolclient(dt)	Sum of the emission factors of each equipment item included in the main pool considered in the study, over the period dt.
Poolmgt_EF(dt)	Sum of the emission factors of each server of the management pools included in the scope of the study, over the period dt.
Pool_shr_EF(dt)	Sum of the emission factors of each equipment item included in the shared network pools at the scale of the Datacenter, over the period dt.

12. Annexes

12.1. Annex A – Characteristics of the IT equipment mentioned in functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter

Characteristics Physical server, storage equipment and network equipment	
Processor and cores	Amount in units
HDD disc	Amount in units and by type[30]
SSD disc	Amount in units and by type[12]
RAM	Amount in units and by type[12]
GPU	Amount in units
Fan units	Amount in units
Power supply	Weight in kg
Characteristics Network equipment from the server to the Datacenter exit	
Switch	Amount in units and by type[31]
Firewall	Amount in units and by type[32]
Router	Amount in units and by type[14]

Table 33: Characteristics of the IT equipment mentioned in functional units FU2, FU3 and FU4 and network equipment from the server to the output of the Datacenter

[30] According to the individual storage capacity in GB

[31] According to the number of ports per U, number of processors, the number of RAM and the individual capacity per RAM

[32] PCB surface area, SSD storage, type of processor (semiconductor surface area, number of masks/lithography processes (e.g. 7nm etc.) and loss/yield percentage)

12.2. Annex B – Connection between data

Functional unit concerned	Life cycle stage	Data	Nature of the data
Building architecture (Datacenter)			
FU1	Manufacture	Concrete (volume in m3)	**Semi-specific data**[33]
		Steel (quantity in kg)	**Semi-specific data**[34]
		Designed floor assembly (surface in m²)	**Semi-specific data**[35]
		Lifts and freight lifts (amount in units)	Primary data
		Partitions (surface in m²)	**Semi-specific data**[36]
Technical environment (Datacenter)			
FU1	Manufacture	Air processing unit (amount in units and power in kW)	Primary data
		Cooling unit (amount in units and power in kW)	Primary data
		Chilled water pump (amount in units and power in kVA)	Primary data
		Air conditioning cabinet (amount in units and power in kW)	Primary data
		High-voltage cell (amount in units and power in kW)	Primary data
		Transformer (amount in units and power in kVA)	Primary data
		Batteries (amount in units and technology)	Primary data
		Inverters (amount in units and power in kVA)	Primary data
		Power generators (amount in units and power in kVA)	Primary data
		High current cabling (amount in linear metres)	Primary data
		Busbar (amount in linear metres)	Primary data
		Extinguishing gas (total weight in kg)	Primary data
		Local energy production equipment (amount in units and according to the technical characteristics)	Primary data
Datacenter design and construction			
FU1	Manufacture	Datacenter design and construction man-hours	Primary data
IT equipment			
FY2, FU3 and FU4	Manufacture	Physical server	**Semi-specific data**[37]
		Storage equipment	Primary data
		Network equipment	Primary data
		Switch	Primary data
		Firewall	Primary data
		Router	Primary data
Distance covered			
All FUs	Distribution	Distance covered - IT equipment	**Semi-specific data**[38]
		Distance covered - other	**Semi-specific data**[39]
Consumables used in the running of the Datacenter			
All FUs	Use	Consumables - Outsourced energy	Primary data
		Consumables - Water	Primary data
		Consumables - Fugitive emissions	Primary data
		Consumables - Immersion system	Primary data
Maintenance of the Datacenter and the IT equipment and platforms			
FU1	Use	Datacenter maintenance man-hours	Primary data
FU2 to FU4		IT equipment maintenance man-hours	Primary data
FU5		Computing platform maintenance man-hours	Primary data
FU6		Virtual server maintenance man-hours	Primary data
FU7		Database maintenance man-hours	Primary data
FU8		Storage space maintenance man-hours	Primary data
FU9		PaaS deployment and execution environment maintenance man-hours	Primary data
FU10		FaaS environment maintenance man-hours	Primary data

Table 34: Connection between the data of functional unit 1

[33] 1m2 surface area = 4 m3 concrete

[34] 1m2 surface area = 600 kg steel

[35] 1m2 surface area = 1.3m² designed floor assembly

[36] 1m2 surface area = 0.7m² partitions

[37] Average server (five-year lifespan) available in the Base Impact® – Data concerning the NegaOctet project

[38] 19,000 km maritime transport + 1,000 km land transport

[39] 1,000 km land transport

12.3. Annex C – List of CPA codes concerned

CPA code	Description
J	INFORMATION AND COMMUNICATION SERVICES
58	Publishing services
58.1	Publishing services of books, periodicals and other publishing services
58.11	Book publishing services
58.11.3	On-line books
58.11.30	On-line books
58.11.4	Advertising space in books
58.11.42	Advertising space in books, electronic
58.12	Publishing services of directories and mailing lists
58.12.2	On-line directories and mailing lists
58.12.20	On-line directories and mailing lists
58.13	Publishing services of newspapers
58.13.2	On-line newspapers
58.13.20	On-line newspapers
58.13.3	Advertising space in newspapers
58.13.32	Advertising space in newspapers, electronic
58.14	Publishing services of journals and periodicals
58.14.2	On-line journals and periodicals
58.14.20	On-line journals and periodicals
58.14.3	Advertising space in journals and periodicals
58.14.32	Advertising space in journals and periodicals, electronic
58.19	Other publishing services
58.19.2	Other on-line content
58.19.21	On-line adult content
58.19.29	Other on-line content n.e.c.
58.2	Software publishing services
58.21	Publishing services of computer games
58.21.2	Computer games downloads
58.21.20	Computer games downloads
58.21.3	On-line games
58.21.30	On-line games
58.29	Other software publishing services
58.29.3	Software downloads
58.29.31	System software downloads
58.29.32	Application software downloads
58.29.4	On-line software
58.29.40	On-line software
59	Motion picture, video and television programme production services, sound recording and music publishing
59.1	Motion picture, video and television programme services
59.11	Motion picture, video and television programme production services

59.11.2	Motion picture, video and television programme products
59.11.24	Films and other video downloads
59.11.25	Streamed video content
59.2	Sound recording and music publishing services
59.20	Sound recording and music publishing services
59.20.3	Music publishing services
59.20.32	Electronic scores
59.20.35	Music downloads
59.20.36	Streamed audio content
60	Programming and broadcasting services
60.1	Radio broadcasting services
60.10	Radio broadcasting services
60.10.1	Radio broadcasting services; broadcast originals
60.10.11	Radio programming and broadcasting services
60.2	Television programming and broadcasting services; broadcasting originals
60.20	Television programming and broadcasting services; broadcasting originals
60.20.1	Television programming and broadcasting services
60.20.11	Linear television programming and broadcasting services
60.20.12	On-line video-on-demand services
60.20.13	Other video-on-demand services
61	Telecommunications services
61.1	Wired telecommunications services
61.10	Wired telecommunications services
61.10.1	Data and message transmitting services
61.10.11	Fixed telephony services - access and use
61.10.12	Fixed telephony services - calling features
61.10.13	Private network services for wired telecommunications systems
61.10.2	Carrier services for wired telecommunications
61.10.20	Carrier services for wired telecommunications
61.10.3	Data transmission services over wired telecommunications networks
61.10.30	Data transmission services over wired telecommunications networks
61.10.4	Wired Internet telecommunications services
61.10.41	Internet backbone services
61.10.42	Narrow-band Internet access services over wired networks
61.10.43	Broad-band Internet access services over wired networks
61.10.49	Other wired Internet telecommunications services
61.10.5	Home programme distribution services over wired infrastructure
61.10.51	Home programme distribution services over wired infrastructure, basic programming package
61.10.52	Home programme distribution services over wired infrastructure, discretionary programming package
61.10.53	Home programme distribution services over wired infrastructure, pay-per-view
61.2	Wireless telecommunications services
61.20	Wireless telecommunications services
61.20.1	Mobile telecommunications services and private network services for wireless telecommunications systems
61.20.11	Private network services for wireless telecommunications systems

61.20.12	Mobile voice services
61.20.13	Mobile text services
61.20.14	Mobile data services, except text services
61.20.2	Carrier services for wireless telecommunications
61.20.20	Carrier services for wireless telecommunications
61.20.3	Data transmission services over wireless telecommunications networks
61.20.30	Data transmission services over wireless telecommunications networks
61.20.4	Wireless Internet telecommunications services
61.20.41	Narrow-band Internet access services over wireless networks
61.20.42	Broad-band Internet access services over wireless networks
61.20.49	Other wireless Internet telecommunications services
61.20.5	Home programme distribution services over wireless networks
61.20.50	Home programme distribution services over wireless networks
61.3	Satellite telecommunications services
61.30	Satellite telecommunications services
61.30.1	Satellite telecommunications services, except home programme distribution services via satellite
61.30.10	Satellite telecommunications services, except home programme distribution services via satellite
61.30.2	Home programme distribution services via satellite
61.30.20	Home programme distribution services via satellite
61.9	Other telecommunications services
61.90	Other telecommunications services
61.90.1	Other telecommunications services
61.90.10	Other telecommunications services
62	Computer programming, consultancy and related services
62.0	Computer programming, consultancy and related services
62.01	Computer programming services
62.01.1	IT design and development services
62.01.11	IT design and development services for applications
62.01.12	IT design and development services for networks and systems
62.03	Computer facilities management services
62.03.1	Computer facilities management services
62.03.11	Network management services
62.03.12	Computer systems management services
63	Information services
63.1	Data processing, hosting and related services; web portals
63.11	Data processing, hosting and related services
63.11.1	Data processing, hosting, application services and other IT infrastructure provisioning services
63.11.11	Data processing services
63.11.12	Web hosting services
63.11.13	Application service provisioning
63.11.19	Other hosting and IT infrastructure provisioning services
63.11.2	Advertising space or time in Internet
63.11.20	Advertising space or time in Internet
63.12	Web portal services

63.12.1	Web portal content
63.12.10	Web portal content
63.12.2	Internet advertising space in web portals
63.12.20	Internet advertising space in web portals

Table 12: CPA codes

12.4. Annex D – Standard equipment lifespan

Type of equipments	Lifetime reference for Datacenter infrastructure and technical environment
Datacenter structure	25 years
Buried tanks	40 years
Generating set	40 years
Transformer	30 years
Copper cabling	30 years
Electronic	25 years
Air conditioning	15 years
Heat pump	15 years
UPS	10 years
Air cooler	10 years
Batteries	10 years
Optical fibre	10 years

12.5. Annex E – GHG Protocol and alignment verification

Notion	PCR	GHG Protocol	Alignment
Definition of Functional Units	2.1	4.3	Aligned: the GHG Protocol remains generic, the DC & Cloud PCR proposes several scenarios.
System boundaries	3	4.4	Aligned (one of the three tiers) The digital spectrum is subdivided into three tiers (Terminals, Network, Datacenters and Cloud) in the two standards. The Datacenter & Cloud PCR is limited to the scope of the Datacenter & Cloud Tier, as its name indicates. The case of the other tiers is addressed via the other "child" PCRs. The GHG Protocol concerns the three tiers.
Exclusions	3.2	4.4.3	Aligned
Reuse of waste heat	4		Difference: Addition in the PCR
Completeness and connection between primary, secondary and semi-specific data	5.2	5.3.6	Aligned
Recommended environmental indicators	6	All	Different: GWP + additions of further indicators in the DC & Cloud PCR
Other relevant environmental indicators	6.3	4	Aligned PUE indicator integrated, addition of other performance indicators in the DC & Cloud PCR: WUE, ERF, REF
Data quality	11	4.5	Aligned The GHG Protocol gives the user the ability to use secondary data. The DC & Cloud PCR details the quality of the data expected for each type of data collected per functional unit.
Method for allocating IT equipment impacts: Amortisation over the lifespan	11	4.4.4	Aligned
Allocations of the services rendered by a shared equipment item. The equipment's impacts are fully distributed among the users.	11	4.2.2	Aligned
Separation of fixed emissions and variable emissions	11	4.2.4	Aligned In the case of the DC Cloud PCR: - fixed emissions correspond to emissions during the manufacturing, distribution and end of life phase. - variable emissions correspond to emissions during the use phase
Allocation of the infrastructure: GHG Protocol: capacity provisioned for fixed emissions & energy consumption for variable emissions	11	4.2.4	Difference: In the PCR - either allocation of all emissions based on the use of capacities provided relative to total capacities used by all users. - or allocation of all emissions based on the use of reserved capacity of capacities provided relative to total capacities reserved by all users. This depends on whether the service is marketed based on reservation or use.
Allocation of IT equipment item to a virtual machine: GHG Protocol: capacity provisioned for fixed emissions & capacity used for variable emissions	11.6	4.2.4	Difference: In the PCR - either allocation of all emissions based on the use of capacities provided relative to total capacities used - or allocation of all emissions based on the use of reserved capacity of capacities provided relative to total capacities reserved by all users. This depends on whether the service is marketed based on reservation or use.

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THE ADEME IN BRIEF

At the ADEME - the French agency for ecological transition - we are firmly committed to the fight against global warming and resource degradation.

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ADEME
AGENCE DE LA TRANSITION ÉCOLOGIQUE

FAITS & CHIFFRES

GENERAL PRINCIPLES FOR THE ENVIRONMENTAL LABELLING OF CONSUMER PRODUCTS

This methodological standard for the environmental assessment of Datacenter IT hosting and cloud services provides the method for calculating the environmental labelling indicators of this product category.

This document supplements and clarifies the sectoral rules of the "parent" PCR: "Methodological standard for the environmental assessment of digital services" for the case of Datacenter IT hosting and cloud services, and should be read in parallel.