Closing the loop: Circular economy for telecom operators

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ITU-T Study Group 5: EMF, environment, climate action, sustainable digitalization and circular economy, develops standards on:

- Electromagnetic compatibility, resistibility and lightning protection
- Soft error caused by particle radiations
- Human exposure to electromagnetic fields
- Circular economy and e-waste management
- ICTs related to the environment, energy efficiency, clean energy and sustainable digitalization for climate actions

Question 7 in study group 5:

“E-waste, circular economy, and sustainable supply chain management”

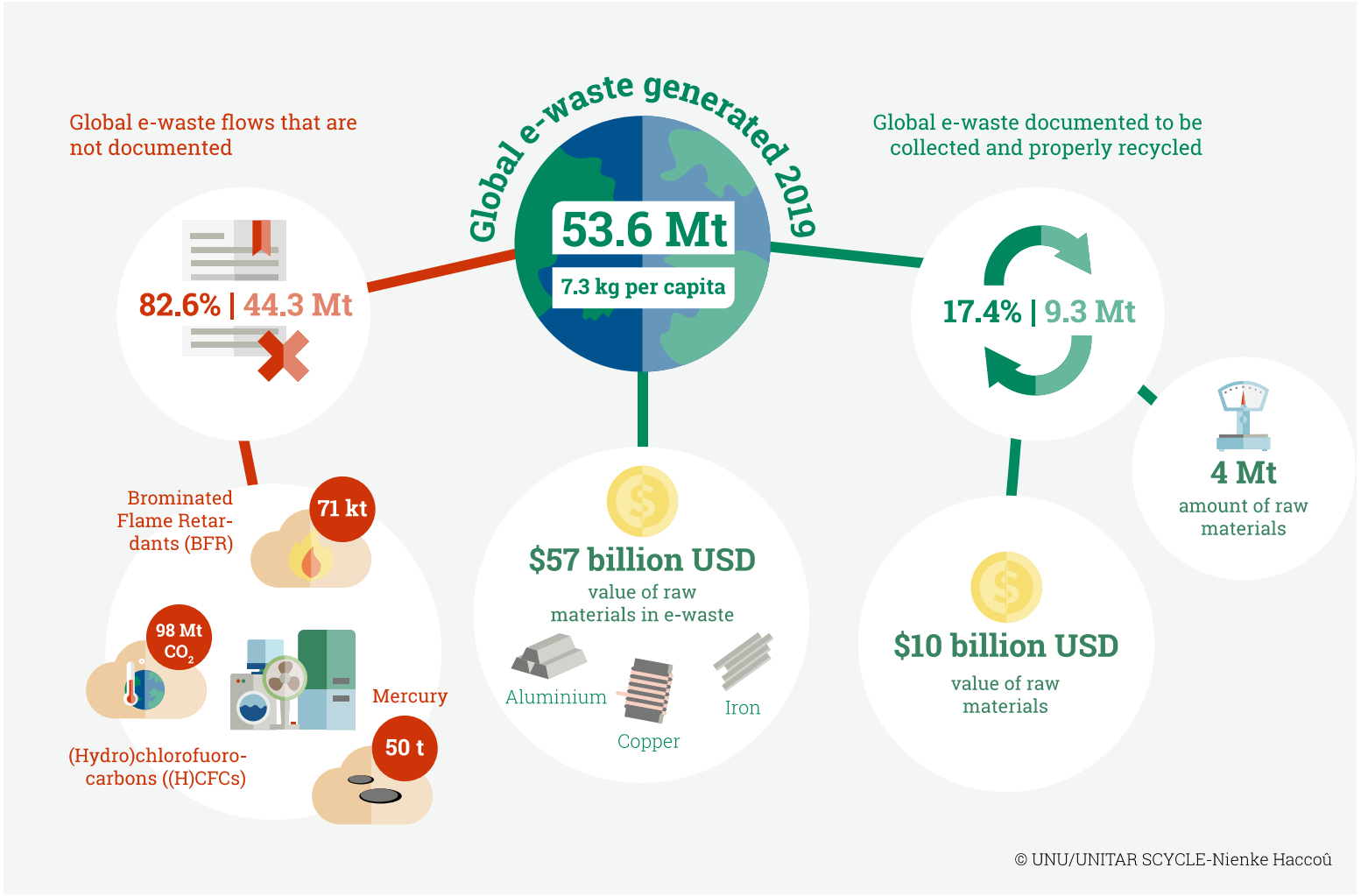
Technical alignment of standards with European ETSI Environmental Engineering

Focus on circularity and transparency about environmental and climate change aspects

ITU-T Q7/SG5: “E-waste, circular economy, and sustainable supply chain management”

- 2012 **Rare metals**: L.1100 recycling,
  2014 L.1101 measurement, 2016 L.1102 digital labels
- 2018 L.1020, 2020 L.1021,
  2021 L.1022 **circular economy principles** in the ICT sector
- 2020 L.1023: Assessment method for circular scoring (**ecodesign**), rev. 2023
- 2020 L.1024 Impact of servitisation (**circular business models**)
- 2021 L.1033: Guidance for **institutions of higher learning** to contribute in the effective life cycle management of e-equipment and e-waste
- 2021 **Digital product passport**: L.GDSPP, L.D4PI 2022 (w ETSI)
- 2022 L.1035 Sustainable management of **batteries**,
  2023-4 L.DLB durability of Lithium-ion batteries
- 2023 L.1061 **Circular public procurement**
- 2023 L.ME_DD, L.GPSIM **secure deletion**, L.ME_AF **firmware updates**
- 2023-4 L.suppl.GSP **Green supply chain** management,
  L.SCCA **carbon accounting**
- 2023 L.1070 “Global digital sustainable product passport opportunities to achieve a circular economy”
- 2024 L.D4PI “An information model for digital product information on sustainability and circularity”

We produce every year as many e-devices as people alive!



Importance of circular economy

- **Improvements**
  - in electricity supply
  - in material and energy efficiency of ICT devices and networks
- **In addition to / replacement**
- In the circular economy …
  - Durability, long lifespan
  - Multiple cycles
  - Business models: Servitisation
- **More information, verifiable claims**
- **Better accountability**
  - Product information, impacts

Digitisation → Digitalisation → Digital transformation

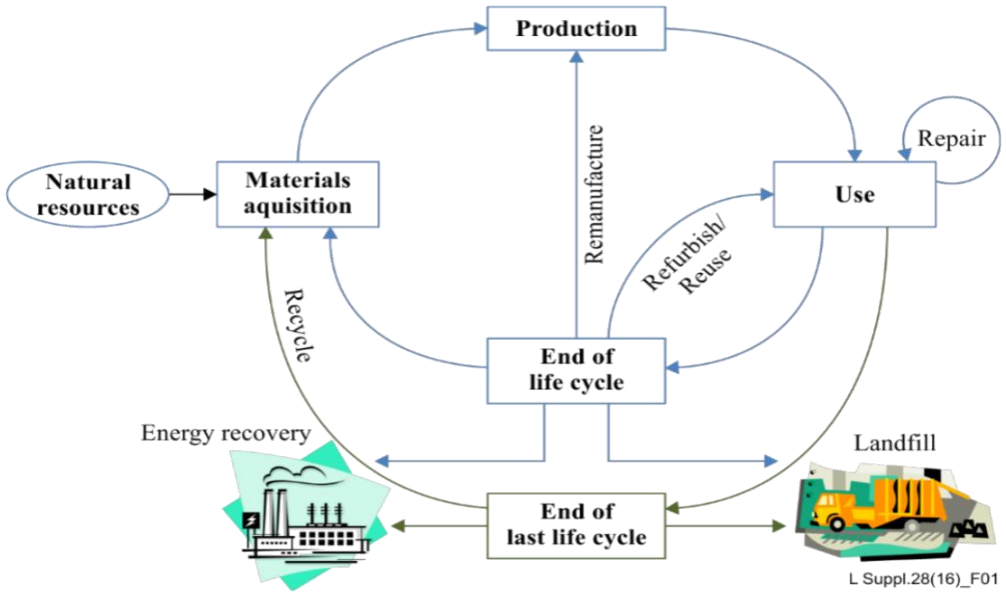
Digitalization and Products

- Related Standards: material datasheets, databases, data carriers, storage, technical data interop protocols, etc.
- Digital transformation concerns most if not all product categories: EEE, ICT, but also plastics, textile, vehicles, buildings, etc.

Improve the environmental sustainability of products, EC Sustainable Product Initiative 2020+

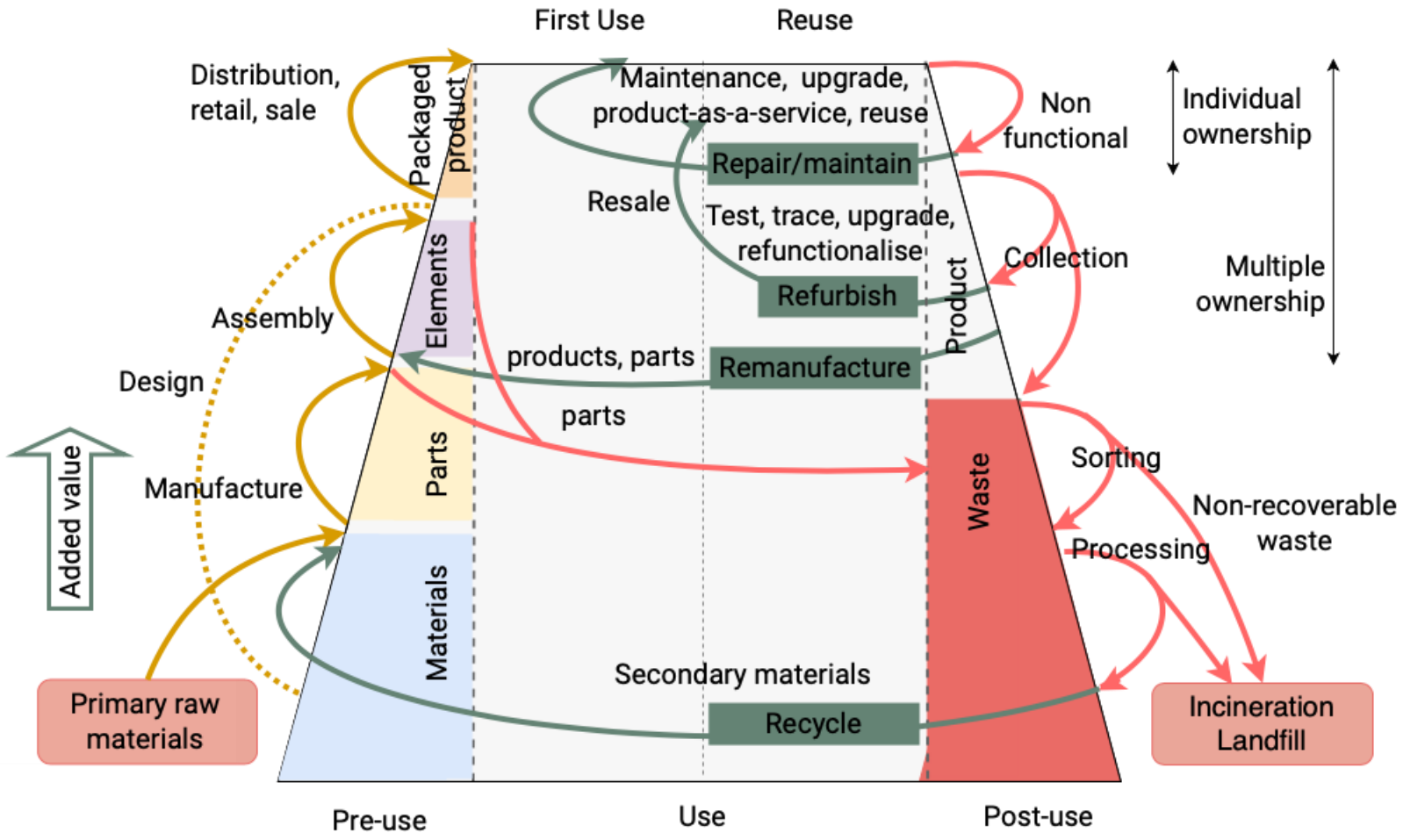
- Requirements related to product durability, reusability, upgradability and reparability, the presence of substances of concern in products, product energy and resource efficiency, recycled content in products, product remanufacturing and high-quality recycling, and for reducing products' carbon and environmental footprints.
- Improve products environmental sustainability and access to sustainability information along the supply chain.
- Incentivise more sustainable products and business models to improve value retention.
- Improve application of sustainable product legislative framework.

Circular economy for telecom operators



Eco-design of products and services	Reuse	Optimising life cycle and end-of-life
Selling repairable products	e-waste	*Knowing helps digital information about products*

Circular Economy


First Use
Reuse
Distribution, retail, sale
Packaged product
Maintenance, upgrade, product-as-a-service, reuse
Non functional
Individual ownership
Repair/maintain
Resale
Test, trace, upgrade, refunctionalise
Collection
Multiple ownership
Refurbish
Assembly
Elements
Product
products, parts
Remanufacture
Design
parts
Added value
Manufacture
Parts
Waste
Sorting
Non-recoverable waste
Processing
Materials
Secondary materials
Recycle
Primary raw materials
Incineration Landfill
Pre-use
Use
Post-use

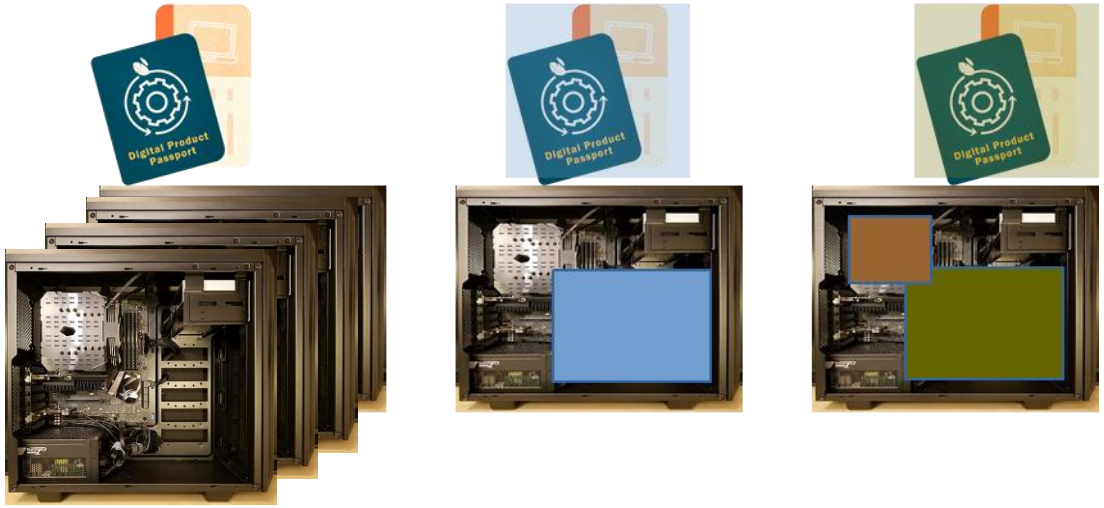

Circular Economy

- Requirements of reporting key aspects related to circularity and transparency of an ICT or digital technology product in digital format.
- Facilitate and automate analysis of different ICT products based on circularity aspects.
- Facilitate preparation and reuse in the second-hand market and the reverse supply chain.
- Help manufacturers, governments, users to implement voluntary reporting and monitoring mechanisms to assess these qualities

Global digital sustainable product passport to achieve a circular economy

- Elements (examples)
  - A *unique product identifier:* product, batch, item, part
  - *Data carrier:* scan code in the product
  - *Details:*
    - Codes, compliance, economic operators
    - Env. performance: materials (critical, hazardous), energy, weight, durability
    - Info for buyers and end-users (maintenance, repair, parts), treatment (end-of-life), operators (handling), market surveillance, customs
    - Specific details for each product category (verticals)
- Uses: need to know basis; evolutionary: already needed, used
  - More sustainable, circular products: design, reuse, ...
  - Traceability, transparency, verifiability: accountability
  - Informed choice: procurement
  - Incentives: EPR, reuse, return, recycling
  - Automation, smart decisions!

- Devices can be upgraded, reconfigured, repaired replacing parts:
  - Serialised, one chassis for life
  - Different hardware parts
  - What a recycler sees in an end-of-life product may be very different from the first product



ICT Product Pathway

This is the info for Digital Passport:
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Hardware

- Device
  - Chassis: Tower
  - Manufacturer: Dell Inc.
  - Model: Optiplex 790
  - SerialNumber: 13SSB5J
  - Sku:
  - Type: Desktop
  - Version: 01
- Components
  - {'type': 'GraphicCard', 'model': '2nd Generation Core Processor Family Integrated Graphics Controller', 'manufacturer': 'Intel Corporation'}
  - {'type': 'Motherboard', 'model': '0j3c2f', 'manufacturer': 'Dell Inc.', 'serialNumber': '/13SSB5J/CN7360422H02JU/', 'version': 'A21', 'slots': 4, 'usb': 2, 'firewire': 0, 'serial': 1, 'pcmcia': 0, 'biosDate': '2018-02-11T23:00:00.000Z', 'ramSlots': 4, 'ramMaxSize': 32}
  - {'type': 'NetworkAdapter', 'model': '82579lm Gigabit Network Connection', 'manufacturer': 'Intel Corporation', 'serialNumber': 'D4:BE:D9:A2:12:86', 'variant': '04', 'speed': 1000, 'wireless': False}
  - {'type': 'Processor', 'model': 'Intel Celeron Cpu G530 @ 2.40ghz', 'manufacturer': 'Intel Corp.', 'brand': 'Celeron', 'speed': 1.677685, 'cores': 2, 'threads': 2, 'address': 64}
  - {'type': 'RamModule', 'model': 'Hmt351u6cfr8c-H9', 'manufacturer': 'Hynix/hyundai', 'serialNumber': '157AAB3C', 'size': 4096, 'speed': 1067, 'interface': 'DDR3', 'format': 'DIMM'}
  - {'type': 'RamModule', 'model': 'Ct51264bd160bj.c8f', 'manufacturer': '859b', 'serialNumber': 'E2555565', 'size': 4096, 'speed': 1067, 'interface': 'DDR3', 'format': 'DIMM'}
  - {'type': 'SolidStateDrive', 'model': 'Ct240bx500ssd1', 'serialNumber': '1927E18B23E1', 'variant': 'R013', 'size': 240057.409536, 'interface': 'ATA'}
  - {'type': 'SoundCard', 'model': '6 Series/c200 Series Chipset Family High Definition Audio Controller', 'manufacturer': 'Intel Corporation'}

A working digital product passport for:
Chassis: a305d06175
Detailed hardware ID: ab0f5fab03

Proof-of-Concept DPP Prototype

Thank you!

Questions?
Let us know!

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