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CHANGE, E-WASTE, ENERGY EFFICIENCY;  
CONSTRUCTION, INSTALLATION AND PROTECTION  
OF CABLES AND OTHER ELEMENTS OF OUTSIDE  
PLANT

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**Circular economy: Guide for operators and  
suppliers on approaches to migrate towards  
circular ICT goods and networks**

Recommendation ITU-T L.1020



ITU-T L-SERIES RECOMMENDATIONS

**ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION,  
INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT**

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## Recommendation ITU-T L.1020

### Circular economy: Guide for operators and suppliers on approaches to migrate towards circular ICT goods and networks

#### Summary

Recommendation ITU-T L.1020 suggests approaches of circular economy (CE) for information and communication technology (ICT) goods and networks. It focuses particularly on the next steps in improving circularity in the operators' supply chain.

The Recommendation provides a guide on how operators could work with their supply chain to improve CE aspects for ICT goods and networks but it does not provide metrics. The objective of the guide is to provide options to improve circularity and to enable operators and their suppliers to create business models for the promotion of circular networks for an optimum solution that uses all the loops of circularity – from sharing to recycling.

#### History

Edition	Recommendation	Approval	Study Group	Unique ID*
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#### Keywords

Circular economy, end-user goods, guideline, ICT, infrastructure, ICT goods, ICT networks.

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## Recommendation ITU-T L.1020

### Circular economy: Guide for operators and suppliers on approaches to migrate towards circular ICT goods and networks

#### 1 Scope

This Recommendation suggests approaches of circular economy (CE) for the information and communication technology (ICT) goods. It focuses particularly on the next steps in improving circularity in the operators' supply chain.

The Recommendation provides a guide on how operators could work with their supply chain to improve CE aspects for ICT goods and networks through a *manifesto* intended to improve the circularity of products through supply chain actions. The objective of the guide is to provide options to improve circularity and to enable operators and their suppliers to create business-models for the promotion of circular networks for an optimum solution using all the loops from sharing to recycling. Thus the proposed manifesto can be used by operators and their suppliers to improve the circularity of all ICT goods and networks, both for infrastructure and end-user goods.

This Recommendation does not outline metrics, but is intended to be used as a guide for operators to work jointly with suppliers to improve circularity.

This Recommendation builds upon Supplement 28 to the ITU-T L-series of Recommendations [b-ITU-T L-Sup.28] and the corresponding ETSI report [b-ETSI EE TR 103 476] which cover CE as used in the ICT industry and existing CE metrics, as well as examples of their use.

#### 2 References

None.

#### 3 Definitions

##### 3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

**3.1.1 e-waste** [b-UNEP-12/5]: Electrical or electronic equipment that is waste, including all components, sub-assemblies and consumables that are part of the equipment at the time the equipment becomes waste.

##### 3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

**3.2.1 circular economy:** A circular economy is restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times while reducing waste streams.

A concept that distinguishes between technical and biological cycles, the circular economy is a continuous, positive development cycle. It preserves and enhances natural capital, optimises resource yields, and minimises system risks by managing finite stocks and renewable flows, while reducing waste streams.

(NOTE – The definition is based on [b-EMF], and amended.)

## **4 Abbreviations and acronyms**

This Recommendation uses the following abbreviations and acronyms:

CE	Circular Economy
ICT	Information and Communication Technology
KPI	Key Performance Indicators
UNEP	United Nations Environment Programme

## **5 Conventions**

None.

## **6 Circular economy: Guideline on how to migrate to circular ICT goods and networks**

### **6.1 Background**

ICT services will be key to enable energy reduction and dematerialization in society, for instance by reducing fuel consumption due to reduced travelling, and by decreasing the use of materials through cloud services. For example, services such as video-on-demand reduce the use of CDs and DVDs.

At the same time, ICT goods and networks use energy and materials, therefore in order to reduce the use of resources and to reduce e-waste as much as possible, it is necessary to consider their full life cycle.

To achieve circularity, focus is not only on reuse and recycling, but also on the design of the products. Designs based on circular principles will be improved and promoted when this is seen as a vital step in the whole supply chain, not only by operators and end-users but also by producers and their sub-contractors.

The following mechanisms lead to increased resource efficiency and reduce e-waste production to contribute to the CE:

- a) increased usage rate by sharing or virtualization;
- b) extended operating life time of equipment by simplified maintenance and reuse;
- c) reuse/redistribution for equipment or components on other type of function or in other countries;
- d) refurbishment and remanufacturing; and
- e) recycling of all materials without using landfill or incineration at the final stage.

### **6.2 Way forward**

To promote a circular economy, it is necessary to define a framework and scenarios to reduce the use of new materials or to migrate to reused raw materials. This will avoid using new raw materials extracted from mines. In other words, efforts should be made not to take more from the earth than what could be recovered. In an ideal world, ICT infrastructure equipment would not use virgin materials and during production only renewable energy would be used. At the end of the life cycle all materials would be recovered through reuse or recycling.

Operators should be able to choose equipment not only based on the quality of the services but also based on the contribution to circularity. To realize circularity, focus should not be on the reuse and recycling only, but it starts with the design of the products. Designs based on circular principles will be improved if this is seen as a vital step forward in the whole supply chain. This refers not only to operators, but also their suppliers including sub-contractors and even end-users in order to promote the use of reused materials.



Also, a first step to move towards circular ICT goods can be paved by an agreement amongst operators and suppliers in the form of a *manifesto* intended to improve the circularity of products through supply chain actions. The first version of such a manifesto is described in Annex A. This manifesto can be used by operators and their suppliers to improve the circularity of all ICT goods and networks, both for infrastructure and end-user goods.

## **Annex A**

### **Manifesto**

(This annex forms an integral part of this Recommendation.)

#### **A.1 Goals and ambitions**

- 1) It is desirable that business operations minimize their material impact on the planet and its natural resources, in an endeavour not to deplete them further and to remain within the limits of what the planet can generate or restore by itself.
- 2) Operators should aim to reduce the material impact of products and services. This implies that all new equipment installed in networks and data centres, and all end-user goods should become almost fully circular. This implies that almost all the materials should be reused or recycled. To achieve circularity, it is necessary to use fewer materials in equipment, increase the operating lifetime of goods and, wherever possible, switch to more sustainable materials. Minimizing the impact on the planet calls for a balance between a longer operating lifetime and the renewing of ICT goods and networks with more energy efficient products, possibly based on new and more sophisticated materials.
- 3) This manifesto is drawn up between operators and suppliers to achieve the circularity of goods, networks and services. The manifesto expresses the commitments to actions that are needed to develop value chain collaborations to transfer the industry into a circular business model by using less virgin raw materials, extend operating lifetime, reuse and recycle all products and improve energy efficiency as much as possible.
- 4) With this manifesto, operators and suppliers take the joint responsibility of reaching these circular goals and ambitions.

#### **A.2 How to change towards a circular business model**

To realize the objective of achieving close to 100% circularity, parties jointly agree to, when economically viable, develop circular projects considering the following four focus points:

- 1) Reduce: Reduce the use of virgin raw materials through:
  - 1.1) Virtualization; further virtualization and automation of networks to reduce the environmental footprint;
  - 1.2) Migration to software- and service-based business models rather than hardware-models;
  - 1.3) Dematerialization; i.e., dematerialization of DVDs, CDs and newspapers by replacing them with connectivity-enabled digital media; and
  - 1.4) Using recycled and bio-based materials; extend the use of recycled and bio based materials where possible.
- 2) Extend: Extend the use of products for a longer operating lifetime and use them more efficiently:
  - 2.1) Extend the lifetime of goods and networks by designing them for a longer operating life time;
  - 2.2) Increase or optimize rates of utilization; and
  - 2.3) Minimize the impact on the planet by finding a balance between the longer operating lifetime and the introduction of more energy efficient ICT goods, possibly based on new and more sophisticated materials.
- 3) Reuse and Recycle: Improve second life of products and materials
  - 3.1) Use of goods and or materials that have been designed to be recycled (i.e., designed with a life cycle perspective in mind);

- 3.2) Increase the reuse of products as reuse by customers or suppliers is the best choice for returned goods to expand the total lifetime;
  - 3.3) Reuse could take place in the country where the product was originally purchased or in another country. In case the product is reused in another country, the company that sends the product to the other country should properly track that the end-of-life treatment of the product is taken care of as it would have been at the original place of usage. If the other country does not have proper end-of-life treatment facilities, the product should be shipped elsewhere for proper treatment;
  - 3.4) Repair and refurbishment of returned goods and goods intended for reuse should be arranged in a way that supports the circularity;
  - 3.5) Choose reuse over recycling when possible; and
  - 3.6) Landfill should be avoided as much as possible.
- 4) Energy Efficiency
    - 4.1) Parties should investigate ways to further enhance the energy efficiency of network infrastructure and end-user equipment.

### **A.3 Implementation**

The parties will jointly develop initiatives for a circular business model, including implementation, planning and performance, such as:

- 1) Undertake joint studies with operators and suppliers to investigate new business models to contribute to a more circular economy;
- 2) Draw up a list of initiatives to achieve circular goals and setting joint goals on current initiatives;
- 3) Plan quarterly meetings to monitor progress on circular initiatives; and
- 4) Set up, select and monitor key performance indicators (KPIs) on circular goals.

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