

Recommendation

ITU-T L.1061 (03/2023)

SERIES L: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant

E-waste and circular economy

Circular public procurement of information and communication technologies

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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.1061

Circular public procurement of information and communication technologies

Summary

Green procurement policies, which focus on purchasing durable information and communication technology (ICT) equipment and recycling e-waste, can help reduce emissions and resource extractions and influence the market by increasing demand and stimulating research and product development.

Recommendation ITU-T L.1061 provides technical guidance to public sector organizations on improving their procurement practices to purchase more circular ICT goods and services. The Recommendation covers the purchase of ICT equipment such as personal computers, terminals, network equipment and servers, and imaging equipment, and recommends specific requirements in procurement to (1) minimize the generation of e-waste and its adverse effects; (2) maximize the use of energy-efficient equipment; (3) maximize the useful life of equipment; and (4) maximize recyclability. It also covers design for e-waste prevention and procurement recommendations which are relevant for the management choices of the e-waste hierarchy, as well as specific requirements and guidance on procurement to enhance the energy efficiency, reduce greenhouse gas (GHG) emissions to mitigate climate change and reduce the emissions of hazardous substances in e-waste.

History

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Introduction

Communities worldwide face the consequences of climate change, depletion of natural resources, loss of biodiversity, environmental degradation and increasing poverty [b-UNDP]. To address these issues, all levels of society (public and private) realize that change is required to develop a more sustainable society and planet. Sustainable development [b-UN-1] has three pillars: economic, social and environmental.

Over their lifespan, ICT products follow pre-use, use and post-use processes. Raw material and part production, design and ICT goods manufacturing are pre-use processes that result in an ICT product. Procurement is the first process in an expected long use phase of that product, followed by post-use end-of-life treatment that starts with collecting ICT products declared as e-waste. Each decision in a given process affects the following decision. Pre-use decisions determine the durability of a product in the use phase. In the end, the amount of resulting e-waste, its effects and recyclability are also affected by pre-use decisions, but procurement is the first and key use decision.

Purchasing durable ICT equipment and recycling e-waste helps reduce emissions and resource extraction. Furthermore, green procurement policies can influence the market by increasing demand and stimulating research and product development, thus leading to increased availability and better prices for these ICT products.

This Recommendation focuses on the environmental pillar of sustainability in the public procurement of ICT products. Therefore, it aims to provide a set of circular procurement principles to contribute to achieving environmental goals for organizations in [ITU-T L.1420], the Connect 2030 in [ITU-T L.1031] for the ICT sector, and the planetary goals of the UNFCCC starting with the Paris Agreement.

Sustainable public procurement aims at achieving the best value for money on a whole-life basis in terms of generating benefits not only to the organization but also to society and the economy while minimizing environmental damage [b-DEFRA]. Cost, environmental and social aspects are the main components.

This Recommendation is structured as follows:

- The framework of environmental and circularity considerations in the public procurement of ICT products and services is in clause 6.
- The e-waste hierarchy ranks environmentally sound e-waste management strategies in clause 7.
- How procuring ICT equipment can contribute to minimizing the amount of e-waste produced at the top of the waste hierarchy, preventing its adverse effects on human health and the environment in clause 8.
- Extension of a product's lifetime in clause 9.
- Increasing recyclability contributes to the circular economy in clause 10.
- A summary of recommendations grouped by broad ICT product categories in clause 11.

To facilitate the implementation of the Recommendation, The Circular and Sustainable Public Procurement Guide [b-ITU23] provides practical guidance and help to ICT procurement planners and professionals to improve the circular and sustainable outcomes of their organization's ICT buying decisions and to avoid adverse impacts on social and environmental systems. The guide was developed in parallel with this Recommendation. Three levels of circular and sustainable ICT procurement for getting started or improving the level of circular and sustainable ICT procurement are covered in the guide:

- 1) Policy and strategy, including setting the guiding principles and goals and planning for circular and sustainable ICT procurement.
- 2) Creating the conditions, covering the practical steps for capacity building, target setting and enabling circular and sustainable ICT procurement.

- 3) Procurement processes, providing methods, approaches and cases of application for circular and sustainable procurement of ICT on the ground.

While predominately aimed at national governments, the guide is equally applicable to other public buyers. The guide has been developed by the GovStack initiative in collaboration with the Circular Electronics Partnership.

Recommendation ITU-T L.1061

Circular public procurement of information and communication technologies

1 Scope

This Recommendation provides a set of principles that provides a basis for circular public procurement of ICT equipment to:

- Maximize usable life,
- Maximize the use of energy-efficient equipment,
- Minimize any resulting amount of e-waste produced, and the adverse effects of e-waste, and
- Increase recyclability, thereby contributing to circular economy realization.

This set of recommendations defines standards to help the public sector in deciding the ICT products to be procured that will not only be cost-effective but also to minimize e-waste during and after a product's end of use. It means purchase preference shall be given to those products that are environmentally sustainable and that already contain sustainability as a criterion. The decisions of the public sector shall reward the manufacturers of ICT products to move towards more environmentally sustainable ICT products in the medium to long term.

This Recommendation covers the purchase of ICT equipment and including:

- Personal computer (PC) products including desktops, laptops, servers, displays, docks and other accessories.
- Terminals, such as smartphones, tablets and video-conferencing devices.
- Network equipment and servers including network switches, routers, Wi-Fi access points and network adapters.
- Imaging equipment, such as scanners and printers.

In general, any ICT equipment acquired through public procurement is at the procurer organization's disposal for use.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

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|----------------|--|
| [ITU-T L.1000] | Recommendation ITU-T L.1000 (2019), <i>Universal power adapter and charger solution for mobile terminals and other hand-held ICT devices.</i> |
| [ITU-T L.1001] | Recommendation ITU-T L.1001 (2012), <i>External universal power adapter solutions for stationary information and communication technology devices.</i> |
| [ITU-T L.1002] | Recommendation ITU-T L.1002 (2016), <i>External universal power adapter solutions for portable information and communication technology devices.</i> |
| [ITU-T L.1005] | Recommendation ITU-T L.1005 (2014), <i>Test suites for assessment of the universal charger solution.</i> |

- [ITU-T L.1010] Recommendation ITU-T L.1010 (2014), *Green battery solutions for mobile phones and other hand-held information and communication technology devices.*
- [ITU-T L.1021] Recommendation ITU-T L.1021 (2018), *Extended producer responsibility - Guidelines for sustainable e-waste management.*
- [ITU-T L.1022] Recommendation ITU-T L.1022 (2019), *Circular economy: Definitions and concepts for material efficiency for information and communication technology.*
- [ITU-T L.1023] Recommendation ITU-T L.1023 (2020), *Assessment method for circular scoring.*
- [ITU-T L.1024] Recommendation ITU-T L.1024 (2021), *The potential impact of selling services instead of equipment on waste creation and the environment – Effects on global information and communication technology.*
- [ITU-T L.1031] Recommendation ITU-T L.1031 (2020), *Guideline for achieving the e-waste targets of the Connect 2030 Agenda.*
- [ITU-T L.1033] Recommendation ITU-T L.1033 (2021), *Guidance for institutions of higher learning to contribute in the effective life cycle management of e-equipment and e-waste.*
- [ITU-T L.1035] Recommendation ITU-T L.1035 (2022), *Sustainable management of batteries.*
- [ITU-T L.1220] Recommendation ITU-T L.1220 (2017), *Innovative energy storage technology for stationary use – Part 1: Overview of energy storage.*
- [ITU-T L.1221] Recommendation ITU-T L.1221 (2018), *Innovative energy storage technology for stationary use - Part 2: Battery.*
- [ITU-T L.1300] Recommendation ITU-T L.1300 (2014), *Best practices for green data centres.*
- [ITU-T L.1301] Recommendation ITU-T L.1301 (2015), *Minimum data set and communication interface requirements for data centre energy management.*
- [ITU-T L.1304] Recommendation ITU-T L.1304 (2020), *Procurement criteria for sustainable data centres.*
- [ITU-T L.1310] Recommendation ITU-T L.1310 (2020), *Energy efficiency metrics and measurement methods for telecommunication equipment.*
- [ITU-T L.1320] Recommendation ITU-T L.1320 (2014), *Energy efficiency metrics and measurement for power and cooling equipment for telecommunications and data centres.*
- [ITU-T L.1321] Recommendation ITU-T L.1321 (2015), *Reference operational model and interface for improving energy efficiency of ICT network hosts.*
- [ITU-T L.1330] Recommendation ITU-T L.1330 (2015), *Energy efficiency measurement and metrics for telecommunication networks.*
- [ITU-T L.1340] Recommendation ITU-T L.1340 (2014), *Informative values on the energy efficiency of telecommunication equipment.*
- [ITU-T L.1410] Recommendation ITU-T L.1410 (2014), *Methodology for environmental life cycle assessments of information and communication technology goods, networks and services.*

- [ITU-T L.1420] Recommendation ITU-T L.1420 (2012), *Methodology for energy consumption and greenhouse gas emissions impact assessment of information and communication technologies in organizations*.
- [ITU-T L.1470] Recommendation ITU-T L.1470 (2020), *Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement*.
- [IEC 62623] IEC 62623:2022 (2022), *Desktop and notebook computers – Measurement of energy consumption*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 environmental life cycle assessment [ITU-T L.1410]: An environmental life cycle assessment (LCA) is a systematic analytical method by which the potential environmental effects related to ICT goods, networks and services can be estimated. LCAs have a cradle-to-grave scope where all the life cycle stages (raw material acquisition, production, use, and end-of-life treatment) are included. Moreover, transport and energy supplies are included at each stage of the life cycle assessment.

3.1.2 green public procurement [b-EU-1]: A process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured.

3.1.3 life cycle [b-ISO 14040]: Consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal.

3.1.4 life cycle costing [b-ICLEI]: A method for assessing the total costs of the product group or service under study. It takes into account all costs related to the purchase and use of and maintenance operations for this product group or service and the disposal of any waste generated by it.

3.1.5 needs assessment [b-EC-2]: The first stage in the procurement cycle for green public procurement, prior to launching a tender, to ensure that a true demand exists for the goods, services or works being purchased, and to identify the most environmentally efficient way of meeting that need.

3.1.6 public procurement for innovation [b-OECD17]: This happens when the public sector uses its purchasing power to act as early adopter of innovative solutions which are not yet available on large scale commercial basis.

3.1.7 recyclability [ITU-T L.1022]: Ability of a product to be recycled at end-of-life.

3.1.8 refurbishing [b-IEV-904-04-09]: Functional or aesthetical maintenance or repair of an item to restore to original, upgraded, or other predetermined form and functionality.

3.1.9 remanufacturing [b-EN 4553]: Industrial process which produces a product from used products or used parts where at least one change is made which influences the safety, original performance, purpose or type of the product.

3.1.10 supply chain [b-ITU-2]: The group of planning, manufacturing and producing operations required to bring a product/service to the market. It covers activities that range from sourcing of raw materials to the delivery of a completed product.

3.1.11 supply chain due diligence [b-EC-3]: The obligations of the economic operator which places a [product] on the market, in relation to its management system, risk management, third party verifications by notified bodies and disclosure of information with a view to identifying and addressing actual and potential risks linked to the sourcing, processing and trading of the raw materials required for [product] manufacturing.

3.1.12 sustainable public procurement [b-DEFRA]: A process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole-life basis in terms of generating benefits not only to the organization, but also to society and the economy, whilst minimizing damage to the environment.

3.1.13 total cost of ownership [b-Mieritz]: A financial estimate intended to help buyers and owners determine the direct and indirect costs of a product or system. It is a management accounting concept that can be used in cost accounting, strategic planning and budgeting.

3.1.14 tracing [b-Dorp]: The ability to follow the supply chain upward and determine the source of a product.

3.1.15 tracking [b-Dorp]: The ability of keeping track of the flows of products transporting from upstream to downstream in a supply chain.

3.1.16 waste hierarchy [ITU-T L.1031]: Preference for actions in managing waste, including e-waste in five tiers of decreasing preference: waste prevention, preparation for re-use, recycling, other recovery and disposal.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 public sector: All levels of government and government-controlled or funded agencies, enterprises and other organizations that deliver public programmes, goods or services.

3.2.2 circular and sustainable procurement: The purchase of goods, services, works and utilities that meets user needs while generating positive environmental and societal impacts and stimulating the circular economy through purposeful design, production, sale, use, re-use and recycling processes throughout the lifecycle.

3.2.3 state of health: Current full charge battery capacity (in mAh) expressed as a percentage of the design capacity (rated capacity).

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AC	Award Criteria
AMC	Annual Maintenance Contract
BBP	Butyl Benzyl Phthalate
CFC	Chlorofluorocarbon
CPE	Customer Premises Equipment
CPC	Contract Performance Clause
CPU	Central Processing Unit
DBP	Dibutyl Phthalate
DEHP	Bis(2-ethylhexyl) Phthalates
DIBP	Diisobutyl Phthalate
EPD	Environmental Product Declaration
EPR	Extended Producer Responsibility
GHG	Greenhouse Gas
GPP	Green Public Procurement