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Guidance principles for the sustainable management of secondary metals

Principes directeurs pour la gestion durable des métaux de seconde fusion

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

International Workshop Agreement IWA 19 was approved at a workshop hosted by the World Resources Forum (WRF), in association with the Swiss Association for Standardization (SNV), held in Davos, Switzerland, in October 2015.

The idea to develop guidance principles for the sustainable management of secondary metals was proposed by the Sustainable Recycling Industries (SRI) Roundtable[1)], which is an initiative of the World Resources Forum (WRF) and the Swiss Federal Laboratories for Materials Science and Technology (EMPA). The development process was assisted by the Swiss Association for Standardization (SNV) and funded by the Swiss State Secretariat for Economic Affairs (SECO). The guidance principles draw on existing key research and sustainability standards, e.g. from the Responsible Jewellery Council (RJC, 2012[41]; RJC, 2013[42]), the Aluminium Stewardship Initiative (ASI, 2014),[10] and the European Committee for Electrotechnical Standardization (via the CENELEC standards).

This document was developed between July 2015 and December 2016, and was reviewed and agreed through a public and transparent process encompassing in-country consultations, and involving the private sector, governments, inter-governmental organizations, practitioners, civil society organizations and researchers working in the field of secondary metals. The International Social and Environmental Accreditation and Labelling (ISEAL) Alliance Codes of Good Practice [28][30][31] were also used in the process of developing the guidance principles.

1) www.sustainable-recycling.org

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Introduction

0.1 Metal recycling and impacts

Recycling metals such as aluminium, copper and gold found in waste, e.g. resulting from electronic and electrical equipment, cars, ships, packaging materials or construction activities, is a rapidly growing economic activity worldwide. In Latin America alone, the amount of electronic waste generated annually is expected to grow from 2,84 million tons in 2009 to 4,79 million tons in 2018 (Magalini et al., 2015[34]).

In developing and emerging economies recycling is mainly done through the informal sector (e.g. in India this sector recycles more than 90 % of all generated e-waste), which plays a critical role in the recycling of secondary metals.

These uncontrolled metals recovery activities release pollutants into the air, soil and water, which, combined with poor working conditions and poor health and safety practices, create significant negative impacts on workers, communities and the environment (Robinson, 2009[43]; International Labour Office, 2012[24]; SRI, 2015[44]). Most critical are the impacts on vulnerable workers in the informal sector.

While formal stakeholders handle metallurgical processing more efficiently than the informal sector, the latter has proven to be more efficient at collecting and preparing waste that contain metals (e.g. through manual processing). Thus, the informal sector plays a critical role in recycling.

Furthermore, a growing number of formal recyclers want to tap into the potential of increasing secondary metals recovery, both in volume and quality. As a consequence, competition on waste streams is emerging between the informal and formal sectors. More and more waste is flowing from the informal sector to formal recyclers. However, this does not happen in a structured and organized way due to a lack of guidance and authoritative supporting frameworks.

0.2 Vision

The vision behind the guidance principles is to leverage the circular economy approach to ensure social equity, environmental justice and optimal recovery in metal recycling worldwide, for present and future generations.

Key pathways for the implementation of the guidance principles will be through:

— compliance with the guidance principles by economic operators involved in secondary metal value chains;

— integration of the guidance principles into government policy, sustainability standards systems and other organizations that would put in place supporting mechanisms.

0.3 Aims

The aim of the guidance principles is to provide a credible global framework for the sustainable management of secondary metals.

More specifically, the guidance principles aim to:

— improve practices of economic operators (see Figure 4) by complying with sustainability requirements based on principles and objectives (see Clause 6);

— ensure a credible traceability of recovered metals by complying with traceability requirements for those who wish to demonstrate so (see Clause 7);

— promote the formalization of economic operators involved in subsistence activities (SA) and unofficial business activities (UBA) by constituting themselves as legal entities or joining existing ones.

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The overarching values that inform the development and implementation of the guidance principles are shared responsibility, transparency, engagement, continuous improvement and equity.

It is envisaged that there will be a number of beneficiaries of improved practices resulting from the compliance with the principles and objectives and implementation of traceability schemes by economic operators. The guidance principles aim to primarily benefit economic operators involved in SA in developing and emerging economies, who are highly vulnerable to environmental and socio-economic impacts, including child labour and occupational hazards due to uncontrolled practices (see Annex A) and poor working conditions.

Anticipated benefits for economic operators involved in collection, manual and mechanical processing, metallurgical processing, as well as transportation/trade and storage, are:

— improved safety at work and improved health outcomes for workers and their families;

— improved access to funding and credit from financial institutions willing to mitigate risks by requiring compliance with the guidance principles;

— reduced risk of non-compliance with legal requirements; applicable laws and regulations may require that recycled metals fulfil environmental and social criteria in line with the guidance principles.

Potential benefits for economic operators involved in official business activities (OBA), such as product manufacturers and other purchasers of secondary metals, include:

— increased revenue through improved market access and securing longer-term contracts “business to business” and “business to consumer”, who may give preferential treatment to enterprises providing materials and products that are compliant with the guidance principles;

— improved and more transparent management systems;

— secured access to secondary metal resources;

— demonstrated commitment to sustainability along their value chains.

0.4 Structure

Figure 1 illustrates the structure of this document. Clause 5 describes the elements that fall within the sphere of application. Clause 6 introduces the sustainability requirements based on five principles and 17 objectives. Each objective is accompanied by a set of explanatory notes, steps and timeframe. It also has recommendations for supporting mechanisms to be adopted by governments and civil society organizations, as well as the private sector or in public-private partnerships. Clause 7 describes the traceability requirements. Clause 8 the path towards a robust assurance system. Clause 9 provides guidance for an efficient and credible implementation of the guidance principles. Annex A identifies a set of worst practices in metals recovery and good practices as options, wherever feasible. Annex B introduces an example of a monitoring and evaluation (M&E) plan.

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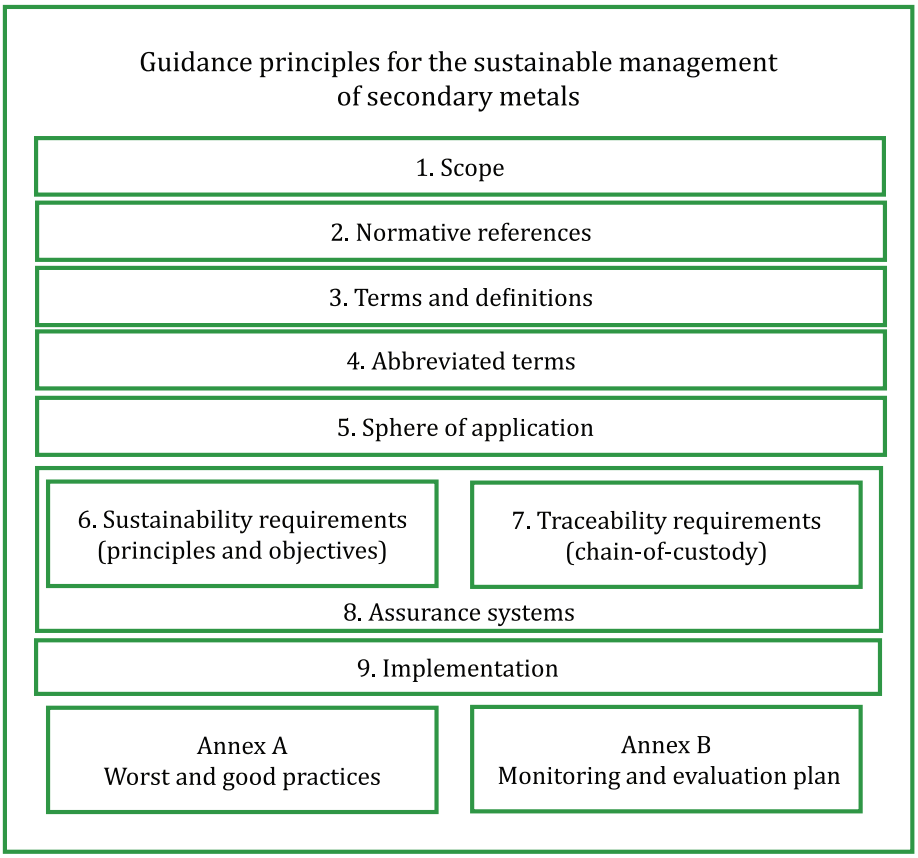

Figure 1 — Structure of this document

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation.

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Guidance principles for the sustainable management of secondary metals

1 Scope

This document provides a global framework for the sustainable management of secondary metals. The framework includes sustainability and traceability requirements for metals recovered.

This document guides economic operators of secondary metals value chains, including those engaged in the informal sector, in the efficient and credible implementation of improved recycling practices, in particular in emerging and developing economies.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
affected community
community that is directly impacted by the consequences of activities related to metal *collection* (3.6), manual and mechanical processing, *metallurgical processing* (3.24), *disposal* (3.7) and/or use of residues

Note 1 to entry: These communities are usually located near operations and may be impacted either positively (e.g. through job creation, infrastructure development and enhanced livelihoods) or negatively (e.g. through pollution, noise disturbance and human rights violations).

[SOURCE: Prospectors and Developers Association of Canada, 2009,[40] modified]

3.2
assurance system
combination of verification mechanisms used to demonstrate compliance with a set of requirements and that are based on regular and systematic monitoring of the performance of *economic operators* (3.9)

Note 1 to entry: Monitoring results can be used for external communication via *claims* (3.5).

3.3
chain-of-custody
CoC
chain of responsibility for or control of materials as they pass from one *economic operator* (3.9) to another through each step of the process or product system under assessment

[SOURCE: ISO 13065:2015, 3.7, modified]

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3.4
child labour
work that deprives children of their childhood, their potential and their dignity, and that is mentally, physically, socially or morally dangerous and harmful to children

Note 1 to entry: Child labour interferes with their schooling by:

— depriving them of the opportunity to attend school;

— obliging them to leave school prematurely; or

— requiring them to attempt to combine school attendance with excessively long hours and heavy duties.

Note 2 to entry: In its most extreme forms, child labour involves children being enslaved, separated from their families, exposed to serious hazards and illnesses and/or left to fend for themselves on the streets of large cities, often at a very early age.

Note 3 to entry: Children's participation in work that contributes to their development and the welfare of their families can be considered as positive in the context of the guidance principles if this provides them with skills and experience, helps to prepare them to be productive members of society during their adult life and does not affect their health and personal development or interfere with their schooling. These activities include helping their parents around the home, assisting in a family business or earning pocket money outside school hours and during school holidays.

[SOURCE: ILO, 2016,[25] modified]

3.5
claim
statement used for communication purposes about compliance with the sustainability and traceability requirements, and about the main characteristics of a batch of recovered materials, waste or *end-of-waste* (3.11) that contain metals

Note 1 to entry: Claims are of two types:

— On-product claims are attached to a specific batch of physical product, along with product documentation, following the successful completion of a *chain-of-custody* (3.3) assessment based on *third-party auditing* (3.38). They guarantee that a given batch of physical product is compliant.

— Off-product claims indicate that a company or a facility was verified following *second-party auditing* (3.32) and deemed compliant. Off-product claims are primarily used in general communications to the public (e.g. annual reports and marketing documents).

3.6
collection
gathering of waste, including the preliminary sorting and preliminary *storage* (3.36) of waste, for the purposes of transport to storage, manual or mechanical processing, *metallurgical processing* (3.24) or the next *economic operator* (3.9)

Note 1 to entry: Collection can be done through waste collectors involved in *subsistence activities* (3.37), curbside collection services and *recycling* (3.29) centres.

[SOURCE: CENELEC, 2014,[13] modified]

3.7
disposal
final or temporary placement of waste that is not salvaged for further metal reuse or *recovery* (3.28) purposes

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3.8
due diligence
detailed assessment conducted by an *economic operator* (3.9) to evaluate a supplier's compliance with the guidance principles

Note 1 to entry: In the context of the guidance principles, due diligence is conducted through *second-party audits* (3.32) or *third-party audits* (3.38) and, wherever feasible, regularly monitored through government inspections and oversight.

3.9
economic operator
individual, enterprise, association, cooperative or organization involved in the *collection* (3.6), manual or mechanical processing, *metallurgical processing* (3.24), transportation, trading, *storage* (3.36), consumption/manufacturing and/or *disposal* (3.7) of *waste that contains metals* (3.43) and/or of materials produced as part of *subsistence activities* (3.37), *unofficial business activities* (3.40) or *official business activities* (3.25)

3.10
ecosystem services
benefits that people derive from ecosystems such as goods (e.g. food, fresh water, wood, fibre and fuel, and other raw materials like plants, animals, fungi and micro-organisms), essential supporting services (e.g. nutrient cycling, pollination of crops, soil formation and primary production), regulating services (e.g. climatic, flood and disease regulation, water purification) and cultural services (e.g. recreational, aesthetic, spiritual, educational and a sense of place)

[SOURCE: The Millennium Ecosystem Assessment, 2003[47]]

3.11
end-of-waste
fractions or materials that have ceased to become waste, following a *recovery* (3.28) or *recycling* (3.29) operation in compliance with the criteria in Article 6 of Directive 2008/98/EC, and which are sometimes also termed secondary materials

[SOURCE: Directive 2008/98/EC[14]]

3.12
environmental and social impact assessment
ESIA
instrument whose purpose is to identify and assess the potential environmental and social impacts of a proposed project, evaluate alternatives and design appropriate mitigation/enhancement, monitoring, consultative and institutional strengthening measures

[SOURCE: African Development Bank, 2001[8]]

3.13
exporter
person under the jurisdiction of the state of export who arranges for material, products and/or waste to be exported

[SOURCE: Basel Convention,[11] modified]

3.14
extended producer responsibility programme
EPR programme
programme by which the producer's liability for a product is extended to the safe and sustainable *collection* (3.6), *storage* (3.36), *recycling* (3.29) or *disposal* (3.7) of a product

Note 1 to entry: In the context of the guidance principles, the main objective of an EPR programme is to support compliance with the sustainability requirements.

Note 2 to entry: An EPR programme is implemented through a mix of the following instruments whose implementation is regularly audited and monitored:

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— Product take-back systems. Their primary aim is to increase collection of end-of-life products and, hence, recycling that requires producers to collect the product at the post-consumer stage. This can be achieved through collection and recycling targets of the product or materials and through incentives for consumers to bring the used product back to the selling point.

— Economic and market-based instruments. They aim to provide economic incentives to producers to comply with EPR programmes. These instruments include measures such as deposit-refund schemes, advanced disposal fees (ADF), material taxes and upstream combination taxes/subsidies (UCTS).

— Regulations and performance standards. Their purpose is to establish a level playing field for producers. Regulations and performance standards include, for example, minimum recycled content in products, which can be mandatory or applied through voluntary initiatives.

— Information-based instruments. They aim to indirectly support EPR programmes by raising public awareness and include, for example, reporting requirements about the producer responsibility as well as product content and labelling.

[SOURCE: OECD, 2016,[37] modified]

3.15
extended responsible sourcing programme
ERS programme
supply chain responsibility programme through which companies commit to monitor (e.g. through audits) social and environmental impacts of suppliers in addition to the traditional aspects of cost and quality, in order to identify areas of risk and improvement

[SOURCE: ICC, 2008,[27] modified]

3.16
first-party audit
verification tool that is implemented by an *economic operator* (3.9) to assess progress of compliance with the principles and objectives, and/or *traceability schemes* (3.39) on its own practices and activities, and is conducted by an internal auditor

Note 1 to entry: First-party audits are simpler than *second-party audits* (3.32) and *third-party audits* (3.38), as the sample of interviewed people and processes tends to be smaller, which reduces the administrative burden (e.g. non-disclosure agreements, contracts, rigid audit schedule) and therefore the verification costs. First-party audits and associated compliance *claims* (3.5) are also considered less robust than third-party audits as they are not performed by independent auditors.

3.17
forced labour
work or service that is exacted from any person under the menace of any penalty and for which the said person has not offered himself/herself voluntarily

[SOURCE: ILO Convention 29, 1930[16]]

3.18
hazardous waste
waste that is potentially flammable, combustible, ignitable, corrosive, toxic, reactive or injurious to people or the environment

Note 1 to entry: Non-hazardous waste includes recovered materials consisting of only metals or alloys with non-hazardous characteristics

[SOURCE: ISO 15190:2003, 3.13, modified — Note 1 to entry has been added.]

3.19
importer
person under the jurisdiction of the state of import who arranges for material, products and/or waste to be imported

[SOURCE: Basel Convention,[11] modified]

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3.20
informal sector
sector that includes *economic operators* (3.9) involved in *unofficial business activities* (3.40) or in *subsistence activities* (3.37) that are not constituted as legal entities

3.21
independent review
review performed by individuals or organizations technically, managerially and financially independent from the *economic operators* (3.9) who are interested in assessing the level of compliance of these economic operators with the guidance principles

3.22
living wage
remuneration received for a standard work week by a *worker* (3.44) in a particular place, sufficient to afford a decent standard of living for the worker and her or his family, that includes food, water, housing, education, health care, transport, clothing and other essential needs, including provision for unexpected events

[SOURCE: ISEAL Alliance, 2013[29]]

3.23
manual and mechanical processing
process to separate and concentrate metals from waste materials into different waste and *end-of-waste* (3.11) fractions for further *metallurgical processing* (3.24)

Note 1 to entry: This includes manual processes done by skilled and adequately equipped *workers* (3.44), e.g. sorting, separating, cleaning, emptying, dismantling, depollution and segregation.

Note 2 to entry: This also includes mechanical processes that can replace or complement manual operations, such as shredding, milling and grinding, as well as segregation by, for example, eddy current or air stream classifiers.

Note 3 to entry: The equivalent term used in *primary metal* (3.26) extraction is “mineral processing” which involves sizing, separation and concentration processes to segregate commercially valuable minerals from ore.

[SOURCE: Directive 2008/98/EC,[14] modified]

3.24
metallurgical processing
processing of fractions that contain metals to obtain fractions of higher metal content and to separate and refine metals with specified properties

Note 1 to entry: This includes hydro-, pyro- and electro-metallurgical processes that involve chemical reactions, e.g. pyrolysis, smelting, chemical leaching, alloying and cementation.

Note 2 to entry: Generally, metallurgical processing follows the manual and/or mechanical processing of waste and *end-of-waste* (3.11) fractions or materials that contain metals.

Note 3 to entry: The equivalent term used in *primary metal* (3.26) extraction is “extractive metallurgy”.

3.25
official business activities
OBA
economic activities that are conducted by *economic operators* (3.9) constituted as legal entities and are therefore subject to government regulation, taxation and observation

Note 1 to entry: Such legal entities are not necessarily deemed fully legally compliant with existing national and local laws and regulations.

[SOURCE: The World Bank Group, 2013,[48] modified]

3.26
primary metal
metal extracted from minerals and free of reclaimed metal scrap

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[SOURCE: American Society for Metals International, 1992[9]]

3.27
protected area
clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated *ecosystem services* (3.10) and cultural values

[SOURCE: IUCN, 2008[33]]

3.28
recovery
operation the principal result of which is waste or *end-of-waste* (3.11) fractions serving a useful purpose by replacing other materials that would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy

[SOURCE: Directive 2008/98/EC[14]]

3.29
recycling
process by which *secondary metals* (3.33) are extracted from waste and *end-of-waste* (3.11) fractions or materials that contains metals and used in products, materials or fractions, whether for the original or other purposes

Note 1 to entry: In the context of the guidance principles, waste and end-of waste materials are those "that contain metals".

Note 2 to entry: It includes the reprocessing of organic material but does not include energy *recovery* (3.28) and the reprocessing into materials to be used as fuels or for backfilling operations.

[SOURCE: Directive 2008/98/EC,[14] modified]

3.30
restoration
process of returning an area to a state that corresponds as much as possible to its pristine condition which may include revegetation, soil enrichment, land and water depollution, and proactive conservation processes

3.31
retailer
seller of goods or services directly to consumers

[SOURCE: The Free Dictionary, 2016[46]]

3.32
second-party audit
verification tool that is implemented by an *economic operator* (3.9) seeking to assess progress of compliance by its supplier(s) with the principles and objectives, and/or *traceability schemes* (3.39) relating to *secondary metals* (3.33) resulting from the concerned *value chains* (3.41)

Note 1 to entry: Second-party audits and associated *claims* (3.5) are generally seen as less robust than *third-party audits* (3.38), due to potential conflicts of interest between an economic operator and its suppliers and/or customers.

3.33
secondary metal
metal that does not directly originate from a primary mineral but from a *recycling* (3.29) process or from the processing of waste streams from primary production

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3.34
self-assessment
evaluation conducted by an *economic operator* (3.9) over its own activities for the purpose of showing compliance with sustainability requirements

[SOURCE: ISO/IEC/TS 17027:2014, 2.73, modified]

3.35
severe degradation
severely degraded area of land and/or water that no longer provides a range of ecosystem functions and services, with a consequent loss of goods and many other potential environmental, social, economic and non-material benefits that are critical for society and development

[SOURCE: Oldeman, LR, et al., 1990[38]]

3.36
storage
depository of metals in various forms, including waste and *end-of-waste* (3.11) materials or fractions that contain metals, collected *secondary metals* (3.33) for further processing, and processed metals for further trading or processing

3.37
subsistence activities
SA
activities that can be found in both the formal and the *informal sectors* (3.20), and are conducted by *economic operators* (3.9) (mostly individuals and families) who earn a wage that is barely sufficient to support or maintain themselves and is below the minimum tax threshold required per national laws and regulations to pay taxes

Note 1 to entry: In the context of this document, the informal sector includes economic operators involved in SA that are not constituted as legal entities as long as this is required by local or national laws and regulations, and therefore they remain hidden from monitoring by local or national authorities. Economic operators involved in SA can work independently or as part of an enterprise involved in *official business activities* (3.25)/*unofficial business activities* (3.40).

3.38
third-party audit
verification tool that is implemented by an independent organization (i.e. assurance providers such as certification bodies) that assesses whether an *economic operator* (3.9) complies with the principles and objectives, and/or *traceability schemes* (3.39) it committed to comply with

Note 1 to entry: Third-party audits are generally accepted as the most robust type of *assurance system* (3.2).

3.39
traceability scheme
system of procedures and management applied to trace compliant waste, *end-of-waste* (3.11) and *secondary metals* (3.33) throughout the *value chain* (3.41)

3.40
unofficial business activities
UBA
activities that are conducted by *economic operators* (3.9) not constituted as legal entities, with income above the *living wage* (3.22) as well as the minimum tax threshold and that purposely desire to bypass national and/or local laws and regulations

Note 1 to entry: In the context of this document, unofficial business activities are part of the *informal sector* (3.20) and are not monitored by any government.

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3.41
value chain
sequence of activities and operations leading to the delivery of a valuable product

Note 1 to entry: In the context of the guidance principles, the value chain covers the circular flow which starts with the *disposal* (3.7) of *waste that contains metals* (3.43) or collection of waste and *end-of-waste* (3.11) fractions that contain metals to the purchase of products made from *secondary metals* (3.33) by final consumers.

[SOURCE: Porter, 1985,[39] modified]

3.42
vulnerable worker
worker (3.44) at risk of having workplace entitlements denied, or who lacks the capacity or means to secure them

[SOURCE: UK Health and Safety Executive, 2016[49]]

3.43
waste that contains metals
hazardous or non-hazardous material that is disposed of, intended or required to be disposed of, and that contains metals or metal compounds with the potential to be recovered

[SOURCE: Basel Convention,[11] modified]

3.44
worker
full-time, part-time or seasonal working person working in *subsistence activities* (3.37), *unofficial business activities* (3.40) and *official business activities* (3.25)

Note 1 to entry: Workers include labourers, administrators, supervisors, executives and contractor workers, as well as self-employed contractors and subcontractors

[SOURCE: ILO Convention C155, 1981,[21] modified]

3.45
worst practice
practice that is known or suspected to have severe (typically multiple) negative impacts on the environment, *workers* (3.44)/community health and safety, and the quality and quantity of recovered *secondary metals* (3.33)

4 Abbreviated terms

CoC	chain-of-custody
CSO	civil society organization
EPR	extended producer responsibility
ERS	extended responsible sourcing
ESIA	environmental and social impact assessment
M&E	monitoring and evaluation
OBA	official business activities
OHS	occupational health and safety
PPE	personal protective equipment

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PRO producer responsibility organization

SA subsistence activities

UBA unofficial business activities

5 Sphere of application

5.1 General

The guidance principles apply to the entire secondary-metals value chain. They primarily address the most critical environmental, social and economic impacts occurring over the collection and manual and mechanical processing of waste that contains metals, as well as the metallurgical processes used to extract and refine secondary metals. They also enhance the recovery potential while ensuring a safe end-of-life disposal when recycling is not possible.

5.2 Materials

The sphere of application of the guidance principles covers any hazardous or non-hazardous waste and end-of-waste that contain metals. This includes, but is not limited to, used computers, phones, electric appliances, batteries, accumulators, cars ships and packaging materials as well as waste and end-of-waste from construction activities and other industrial processes.

5.3 Processes

The processes covered by the guidance principles are illustrated in Figure 2.

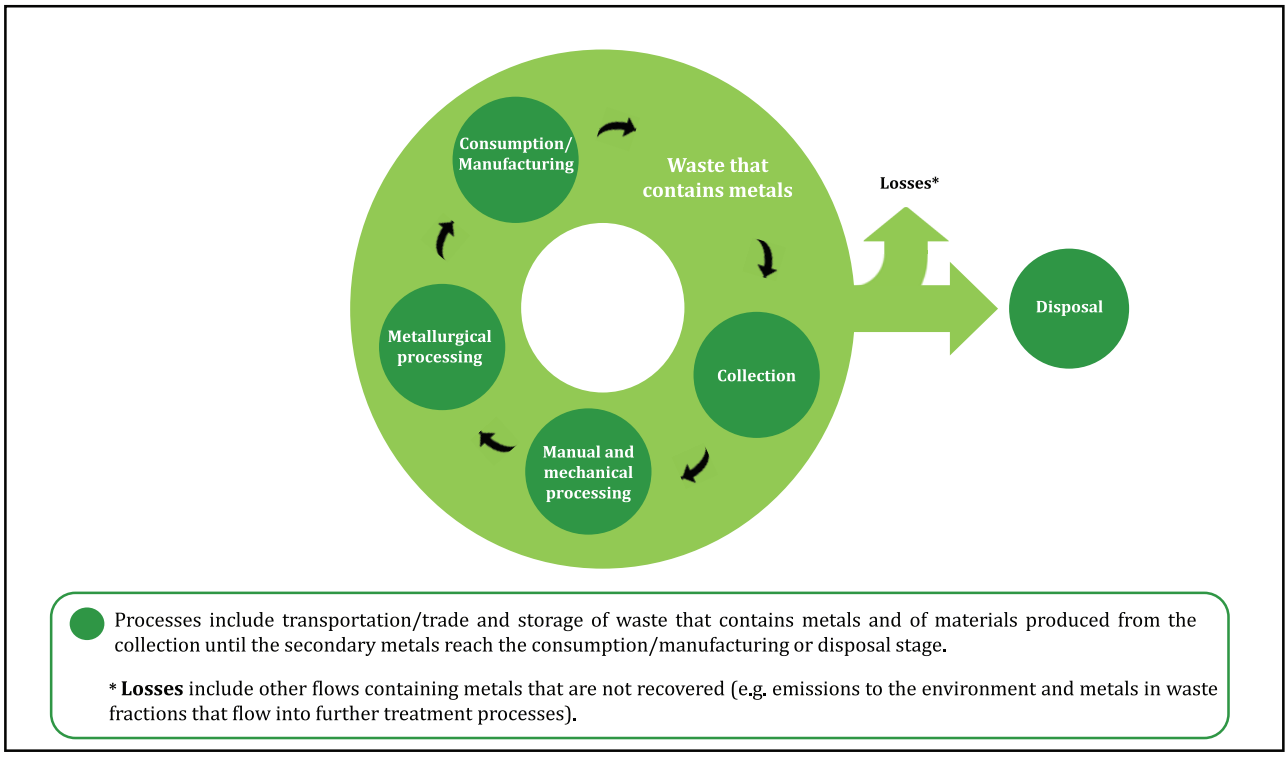

Figure 2 — Processes

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