

ISO Guidance Principles for the Sustainable Management of Secondary Metals

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Abstract

Recycling of waste that contains metals is a growing economic opportunity for micro, small and medium enterprises and an important income source for the informal sector in developing and emerging economies (DEE). However, mechanisms to track sustainable recovery have not been fully developed yet. The Guidance Principles for the Sustainable Management of Secondary Metals (*Guidance Principles*) are tackling this challenge by recommending five sustainability *Principles* and 17 *Objectives*, a gradual implementation approach and an assurance system and traceability mechanism (Chain of Custody) to economic operators, governments, standards initiatives, among others, willing to enforce the sustainable recovery of metals. The *Guidance Principles* are developed under an International Organization for Standardization (ISO) International Workshop Agreement (IWA) process and aim to especially benefit economic operators in DEE with weak regulations and enforcement. The paper aims to introduce the *Guidance Principles*, main issues raised along the process and future activities in selected DEE.

1 Introduction

Developing and emerging economies are a vital source of raw materials used in global value chains. While this fact has led to significant development of extractive industries in these regions, stakeholders concerned have not experienced substantive positive socio-economic changes. Furthermore, this process has brought about detrimental impact on the environment and accelerated depletion of natural reserves.

On the other hand, collection and recycling of metals (e.g. gold, copper) contained in wastes are increasing in micro, small and medium enterprises (MSMEs) as well as in the informal sector in developing and emerging economies. Recycling of waste that contains metals is emerging as an important source of materials for concerned value chains, but this is also responsible for severe impacts on the health and safety of exposed workers including working children, and on the environment and communities.

Standards and associated labels have emerged to address these concerns and improve the sustainability of extraction of raw materials (Fairtrade) and production of certain metals (Conflict Free Gold Standard [1] and Aluminium Stewardship Initiative (ASI) Performance standard [2]). Only recently standards for recycling of one type of waste (e-waste) have been issued (CENELEC 50625 on Collection, Logistics & Treat-

ment of WEEE [3]; R2 Standard [4]; EU Directive on WEEE [5]). None of them provide broader guidance for the recycling of other wastes that contain metals nor in the context of MSMEs and the informal sector in the developing economies. It is estimated that more than 50% of metal is recovered through informal or subsistence activities in these regions [6].

Gold is increasingly recovered from used Information Technology (IT) devices, as they may contain up to 30 times more gold per m³ than natural deposits. Its recovery takes place through uncontrolled chemical leaching (e.g. amalgamation) without any oversight or guidance, often creating significant negative impacts on workers, local communities and the environment [7]. On the other hand, more sustainable recycling activities of gold are emerging in Latin American MSMEs such as the Better Gold Initiative [8], but in spite of the improved practices, recovered metals still do not get access to international commodity markets, nor these efforts are recognized e.g. through better prices [9].

Table 1: Case of gold recovery

The Guidance Principles for the Sustainable Management of Secondary Metals (hereafter, *Guidance Principles*) [10] are tackling this challenge by providing guidance to economic operators (e.g. individuals, MSME, large enterprises) in addition to governments, sustainability standards initiatives, finance sector, Civ-

il Society Organizations (CSOs) and other interested parties willing to enforce the improvement of metal recovery practices.

The development of the *Guidance Principles* is supported by the Roundtable on Sustainable Recycling Industries (SRI Roundtable) and national standardization bodies through an International Organization for Standardization (ISO) International Workshop Agreement (IWA) process [11] and in line with ISEAL Standard-setting Code. The process includes four working sessions and two public reviews combined with local stakeholder consultations and web-based international public consultations. The process is expected to be completed by end of 2016. The ISO IWA secretariat is hosted by the World Resources Forum Association (WRFA) and the Swiss Association for Standardization (SNV).

The SRI Roundtable is part of the Sustainable Recycling Industries Program which is jointly implemented with the Swiss Federal Laboratories for Materials Science and Technology (Empa) and supported by the Swiss State Secretariat for Economic Affairs (SECO) [11].

The aim of this paper is to introduce the *Guidance Principles* which includes five sustainability *Principles*, and 17 associated *Objectives*, a gradual implementation towards full compliance, an assurance system and a traceability mechanism (*Chain of Custody*) to help tracking and demonstrating compliance levels.

The paper introduces the main issues identified during the ISO IWA working sessions, the public review, and the stakeholder consultations held in India, Peru, Colombia, Kenya, and Chile in 2016 and includes an outlook on next steps.

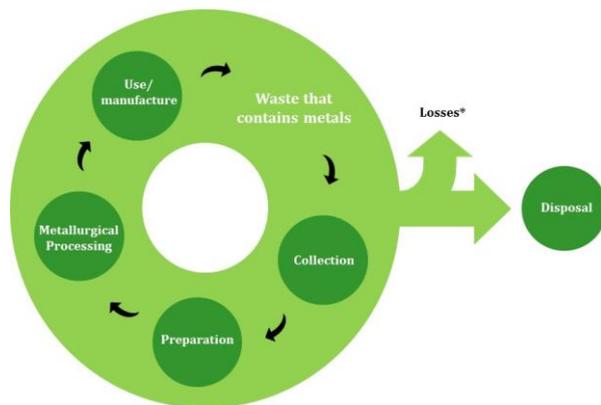


Figure 1: Processes in the scope

2 Aim of the Guidance Principles

The *Guidance Principles* aim to provide (i) a credible and practical global framework on how to deliver change towards more sustainable recycling practices

and recovery of metals; and (i) assurance and traceability mechanisms to demonstrate compliance and improvements done.

The *Guidance Principles* focus in particular on improving working and living conditions from a social and environmental perspective for the most vulnerable and disadvantaged workers and economic operators in developing and emerging economies with weak regulations and enforcement of existing mechanisms.

3 Scope and users

3.1 Scope

The *Guidance Principles* are globally applicable. Geographic and metal-specific adaptations may be considered in future versions.

The scope is defined through materials and process covered as well as economic operators concerned.

The material scope includes waste that contains metals from a wide range of sources: used mobile phones, computers, vehicles, ships, electric equipment and packaging materials as well as construction and industrial waste. Waste covers hazardous and non-hazardous defined according to the Basel Convention [12].

The process scope includes transportation/trade and storage of waste that contains metals and of materials produced from the collection until the secondary metals reach the use/manufacture stage or disposal (see Figure 1).

Economic operators (any individual, enterprise, association, cooperative or organisation) involved in any process within the scope as part of Subsistence Activities (SA)¹, Unofficial Business Activities (UBA)² or Official Business Activities (OBA)³, are required to comply with the *Principles* and *Objectives*.

¹ SA are mostly conducted by individuals and families who earn below the living wage and the minimum legal threshold for incomes to be taxed. These activities can be found in both the formal and the informal sector.

² UBA are conducted by economic operators with non-legal status whose income is above the living wage and the minimum legal threshold for incomes to be taxed. UBA purposefully desire to bypass national and local regulations and are part of the informal sector.

³ OBA are organisations with a legal status.

3.2 Users

Users of the *Guidance Principles* are four-fold:

- Economic operators that wish to demonstrate that their recovered metals, metals sourced or products manufactured with these metals comply with the *Principles* and *Objectives*.
- National, local governments, standards initiatives and inter-governmental organisations that develop laws, regulations, policies or standards basing on the *Guidance Principles*.
- Public/private organisations, financial institutions and development organisations that use the *Guidance Principles* as a framework to assess impacts and risks of metals recovery related projects.
- Civil Society Organisations that organize capacity building activities on environmental and socio-economic impacts of metal recovery activities as well as better practices on the basis of the *Guidance Principles*.

4 Principles and Objectives

Principles 1 through 4 aim to: ensure safe, healthy and equitable working conditions; strengthen local community relations and resilience; conserve and protect the environment and natural resources; and improve the recovery of secondary metals. Principle 5 focuses on establishing a robust sustainable management approach to support the application of the first four principles (see Figure 2).

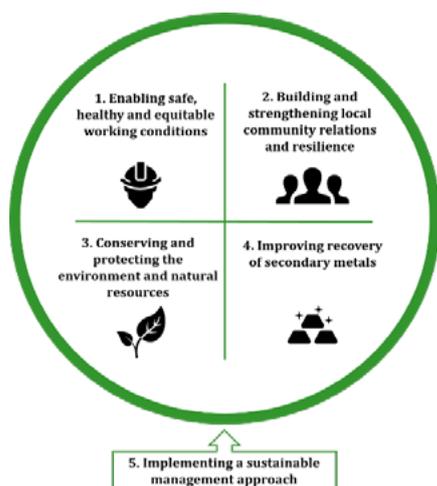


Figure 2: The five Principles for Sustainable Management of Secondary Metals

The 17 associated *Objectives* are the following.

Principle 1: Objectives

- 1.1 Enable safe and healthy work places
- 1.2 Establish working terms and conditions that are decent and equitable.
- 1.3 Eliminate child labour, forced labour, harassment and all forms of discrimination.
- 1.4 Ensure freedom of association and the right to collective bargaining.
- 1.5 Provide clear channels for communication, transparency and dialogue with workers.

Principle 2: Objectives

- 2.1 Respect and foster local communities' rights.
- 2.2 Enable the social inclusion of workers in the community.
- 2.3 Establish clear channels for communication, transparency and dialogue with local communities.

Principle 3: Objectives

- 3.1 Conserve and protect water, air and soil resources.
- 3.2 Conserve and protect biodiversity and ecosystems (services).
- 3.3 Restore severely damaged areas from metal recovery operations.

Principle 4: Objectives

- 4.1 Develop, implement and promote technologies / strategies to increase quantity and quality of secondary metals.

Principle 5: Objectives

- 5.1 Document and evaluate the baseline conditions of metal recovery in the areas addressed by the Principles.
 - 5.2 Mitigate negative impacts and strengthen positive impacts of metal recovery by developing, implementing and improving continuously a management plan.
 - 5.3 Strengthen the organisational capacity of economic operators involved in secondary metal operations.
 - 5.4 Ensure compliance with local / national laws, rules and regulations.
 - 5.5 Implement measures to eliminate bribery, money laundering and corruption.
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5 Implementation

5.1 Stepwise approach

To support the implementation, the *Guidance Principles* suggest a stepwise approach (i. e gradual implementation) and provide supporting mechanism for

each *Objective* [10].

The stepwise approach provides more flexibility and time for economic operators (OBA, UBA or SA) implementing the *Guidance Principles* towards full compliance, and is adapted to the capacity of each economic operator and their specific socio-economic context.

So, for example, it is proposed that SA take about 5 years, UBA 3 years and OBA 2 years to reach full compliance including the formalization of the legal status in case of SA and UBA.

5.2 Assurance system

The *Guidance Principles* also suggest an assurance system, traceability and monitoring mechanisms (e.g. *Chain of Custody*) in order to ensure compliance along the value chain.

The assurance system relies on a regular assessment mechanism (either third-party, second-party or first-party audits) to assess compliance of the value chain concerned. The assessment is complemented with the implementation of a *Chain of Custody* system to identify responsibilities for or control of materials as they pass from one economic operator to another through each step of the process or product system under assessment. The *Chain of Custody* provides a credible traceability system which is essential to ensure that the claim on the end-product is credible too.

also supports the verification of claims published of recovered metals.

In the short and medium term, due to the specific nature of secondary metals, value chains and the existence of economic operators without a legal status (e.g. SA) second-party audits (due diligence) and EPR (in place by producers and OBA) are recommended (see Figure 3) as they offer practical and cost-effective assessment options to demonstrate compliance. Especially in the case of SA and UBA, self-assessments and independent reviews by governments and non-governmental organisations can be also considered as assessment mechanism for the purposes of demonstrating compliance.

In the long term, the *Guidance Principles* should be implemented using a robust assurance scheme involving third-party audits covering all economic operators in the secondary metal value chain.

Mainly economic operators established as OBA are responsible for ensuring compliance with the assurance system and traceability mechanism (*Chain of Custody*).

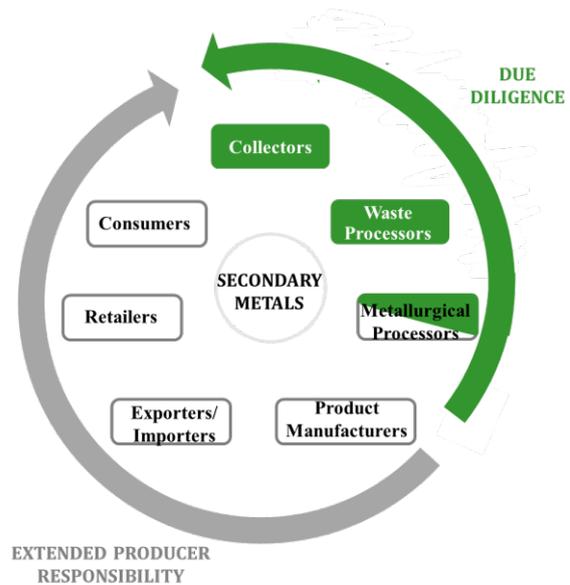


Figure 3: Assessment mechanisms to assurance

6 Issues identified

During the development process of the *Guidance Principles* two periods of public reviews and stakeholder consultations were held in emerging and developing economies (Kenia, India, Peru, Colombia, Chile). Main findings and issues raised are summarized as follows.

6.1 Subsistence activities and formalization challenges

Different socio-economic contexts and existing regulations need to be taken into account when developing a management and time plan to reach full compliance with the *Guidance Principles*. This is of special importance when aiming at formalization of the legal status for SA and UBA. The *Guidance Principles* acknowledge that SA may always exist and that the assurance system need to provide options for SA not to be excluded from the market. An alliance and partnership between SA and OBA including metallurgical processors, producers, manufactures and other organizations involved in OBA, is essential. OBA are called to take the leadership in supporting SA in their pathway towards full compliance.

6.2 Worst Practices: To be banned or improved

Worst Practices need to be stopped from the outset considering that they are evidently dangerous or damaging to health and the safety of exposed workers, the surrounding community and/or the receiving environment and typically cannot be mitigated. Examples for practices which need to be banned are open burning and amalgamation to extract gold. The *Guidance Principles* acknowledge that a subset of *Worst Prac-*

tices can be altered through certain technical, operational or housekeeping improvements to become good practices, e.g. to adapt uncontrolled dumping of residues to a controlled final disposal.

6.3 Child labour vs working children

There is the need to differentiate between “working children” and “child labour” as well as among different types of the latter. While “child labour” is to be eliminated according to the ILO Convention No. 182 [13], “working children” has a different connotation and can be even considered as positive as long as this does not affect children’s health and personal development nor interfere with their schooling. The *Guidance Principles* acknowledge the possibility of “working children” (*Objective* 1.3) under certain conditions: (a) within families and “not” under UBA based on children exploitation, (b) when practices are considered safe and “not” as *Worst Practices*. Also supporting mechanisms need to be activated to enable the development of “working children”.

6.4 Chain of Custody for global value chains: feasible?

While tracking metals recovered from global value chains might be difficult, the trend is confirming that the Chain of Custody is a feasible method, as this is being adopted by a number of emerging initiatives. Examples can be found in the context of conflict minerals and specific metals management (such as the Aluminium Stewardship Initiative (ASI) Performance standard [2]). Based on that, the *Guidance Principles* are recommending the implementation of a *Chain of Custody* which can be replaced by an alternative mechanism if the user already counts on one.

7 Outlook

Once the *Guidance Principles* have been published, the SRI programme will pilot its implementation in their partner countries, possibly in Colombia, Peru, Egypt, Ghana and India. For each of these pilots the appropriate value chain, the intended users and respective economic operators will have to be identified. The aim of these pilots will be to test the applicability of the *Principles*, *Objectives* and assurance system, and provide relevant findings for improving them especially in developing and emerging economies. The ISO IWA process offers a flexible approach where such findings can form the basis for the Revision of the *Guidance Principles* after 3 and 6 years respectively, which could eventually lead into an International ISO standard in the future.

8 Literature

- [1] World Gold Council. Conflict Free Gold Standard. 2012. Available www.gold.org/sites/default/files/documents/Conflict_Free_Gold_Standard_English.pdf
- [2] ASI. Aluminium Stewardship Initiative (ASI) – Performance and Chain of Custody Standards. 2014. Available: www.aluminium-stewardship.org/asi-standards/.
- [3] CENELEC EN 50625-1. WEEE - European Committee for Electro-technical Standardization. European Standard Collection, Logistics & Treatment requirements for WEEE - Part 1: General treatment requirements. 2014.
- [4] SERI. Responsible Recycling (R2) Standard. 2013
- [5] European Commission. Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE). 2002.
- [6] Sureda, M., Valdivia, M., Schlupe, M. Social Criteria for the Sustainable Management of Secondary Metals. 2015. Sustainable Recycling Industries. Available: www.sustainable-recycling.org/sustainable-recycling/wp-content/uploads/2015/09/Sureda_2015_SRI.pdf
- [7] Better Gold Initiative (BGI) (Iniciativa Oro Responsable). 2016. Available www.iniciativaororesponsable.org/
- [8] Baldé, C.P., Wang, F., Kuehr, R., Huisman, J. The Global E-waste Monitor. 2014. Available i.unu.edu/media/unu.edu/news/52624/UNU-1stGlobal-E-Waste-Monitor-2014-small.pdf
- [9] Valdivia et al. Contributing to the ISO Guidance Principles for Sustainable Metals Recycling in Latin America. Proceedings of the WRF Latin America and the Caribbean and the International Sustainable Building Congress 2016, Costa Rica. Available: www.wrforum.org/contributing-iso-guidance-principles-sustainable-metals-recycling-latin-america/
- [10] ISO IWA. Working Draft (2016) Guidance Principles for the Sustainable management of secondary metals Draft 2. 2016. Available: sustainable-recycling.org/sustainable-recycling/wp-content/uploads/2016/07/160701_ISOIWA19_GuidancePrinciples_DRAFT2.0_final.pdf
- [11] Sustainable Recycling Industries (SRI). [Sustainable-recycling.org](http://sustainable-recycling.org)
- [12] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. 1989.
- [13] International Labour Organization (ILO) Convention No. 182 on Worst Forms of Child Labour. 1999.