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IWA 45

Sustainable critical mineral supply chains

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Foreword

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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).

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International Workshop Agreement IWA 45 was approved at workshops hosted in Tokyo (Japan), New York (USA) and a virtual workshop held in February 2024, April 2024 and May 2024 respectively.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This corrected version of IWA 45:2024 incorporates the following corrections:

— list in Annex B has been corrected to include missing participants and the list has been moved to https://standards.iso.org/iso/iwa/45/ed-1/en/.

Introduction

Critical minerals are vital to the production of materials and equipment needed to deliver clean energy technologies. This means that we are increasingly relying on critical mineral supply chains, from mine to product, for the transition to net-zero emissions.

Simultaneously, we must ensure that hard-won environmental gains in critical mineral supply chains are not lost in the rush to deliver low, and zero, emission technologies, nor are the rights of communities and Indigenous people overlooked due to the new imperatives.

That presents the world with a challenge – to ensure a reliable supply of the materials needed to tackle climate change, while offering environmental and social protections which preserve human rights.

Sustainability frameworks, guidelines and standards are central to achieving these goals. They provide best-practice for the mining industry and corporations throughout the critical mineral supply chain as well as guidance for policy-makers seeking to ensure a responsible and reliable approach.

The ISO's International Workshop Agreement on Sustainable Critical Minerals Supply Chains (IWA 45) has been developed by a group of stakeholders from the mineral supply chain and designed for stakeholders in the critical mineral supply chains, who need such a framework to assess their operations and measure sustainability.

NOTE A list of IWA 45 participants is provided in Annex B.

This document is designed to assist those stakeholders in understanding the existing landscape of frameworks, guidelines and standards currently available and to determine which best suit their needs.

A survey was undertaken of a range of stakeholders across geographic regions to identify relevant frameworks, guidelines and standards that organizations are already using to assess and improve the sustainability of critical mineral supply chains.

This document examines governance structures, sustainability topic areas and requirements within existing frameworks. It details 30 frameworks, guidance and standards relevant to the sector. While there was no attempt to determine the effectiveness of any of these instruments in improving sustainability, this document provides an objective overview of the scope of governance, assurance processes and other factors. It also pays particular attention to provisions and recommendations held in common across the frameworks, as well as how they differ.

IWA participants identified many areas that should be considered in determining how extensively a standard covers sustainability issues, while assessing how existing frameworks approached the management of a wide variety of environmental, social, labour, human and Indigenous rights and transparency factors.

They concluded that, while standards and frameworks have a vital role to play in ensuring a sustainable critical mineral supply chain, it is important to avoid developing new ISO standards that duplicate or conflict with existing sustainability standards.

The IWA participants found no market need for another standard in the upstream or midstream segments of the minerals and metals sector. Instead, future ISO work is needed to explore the gaps that exist within the downstream standards landscape and how to best address them.

Above all, it is vital to engage with developing countries, Indigenous peoples and communities impacted by mining, to encourage more stakeholders to participate in developing international sustainability standards, to promote equal, shared governance and decision-making with rights holders and civil society organizations, while boosting training and building capacity for vulnerable populations.

Sustainable critical mineral supply chains

1 Scope

This document surveys the range of existing sustainability frameworks available for critical mineral supply chains to aid understanding and assist in improving an organization's sustainability outcomes. It includes an analysis of:

— the requirements contained in existing sustainability guides or frameworks and where these tools are similar and where they diverge;

— sustainability topic areas within existing guides and frameworks that have been accepted in different regions and jurisdictions.

This document did not assess the effectiveness of existing standards or frameworks in improving the sustainability performance of their users or how performance was assessed.

The results show that the existing sustainability frameworks are extensive and varied in the upstream supply chain. The analysis undertaken as part of this document will help inform the development of potential future ISO work programs and standards development, without duplicating or conflicting with existing frameworks.

This document can also be used by organizations outside of ISO with respect to understanding available sustainability standards or frameworks.

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 terminology databases for use in standardization at the following addresses:

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

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

3.1
air pollutant
material emitted into the atmosphere either by human activity or natural processes that adversely affects humans or the environment

[SOURCE: ISO 18158:2016, 2.1.2.1]

3.2
circular economy
economic system that uses a systemic approach to maintain a circular flow of resources, by recovering, retaining or adding to their value, while contributing to sustainable development

Note 1 to entry: Resources can be considered as concerning both stocks and flows.

Note 2 to entry: The inflow of virgin resources is kept as low as possible and the circular flow of resources is kept as closed as possible to minimize waste, losses and releases from the economic system.

[SOURCE: ISO 59004:2024, 3.1.1]

3.3
critical mineral
essential mineral or mineral-based resource necessary for a particular economic activity, the supply of which is deemed to be at risk and absence could have detrimental consequences to a commercial entity and to the economic, environmental, security and social well-being of a country, common economic region or specific region

Note 1 to entry: In this definition, 'mineral' includes metallic and non-metallic elements which in many cases are compounds or alloys.

Note 2 to entry: Frameworks, guidelines and standards referenced in this document can use different definitions of critical minerals.

3.4
financial assurance
financial instrument, required by a regulatory authority and provided by the mine owner or operator, if that company is unable or unwilling to perform required mine closure activities

Note 1 to entry: Financial instruments can include bond, levy payment or bank guarantee.

[SOURCE: ISO 20305:2020, 3.9.2]

3.5
environmental impact assessment
tool used to identify the environmental impacts of a project, asset and activity prior to decision-making

Note 1 to entry: The tool can be used to assess a project, asset and activity during its various stages, including when it is finished.

Note 2 to entry: An organization's activities or products or services can be a project, asset and activity to be considered for a request for financing.

[SOURCE: ISO 14100:2022, 3.1.6]

3.6
gender equality
equal rights, responsibilities and opportunities for women and men and girls and boys

Note 1 to entry: Gender equality does not mean that women and men, girls and boys, will become the same but that women's and men's rights, responsibilities and opportunities will not depend on whether they are born male or female.

Note 2 to entry: Gender equality implies that the interests, needs and priorities of both women and girls and men and boys, are taken into consideration, recognizing them in all their diversity.

[SOURCE: ISO 53800:2024, 3.4]

3.7
gender-based violence
sexual, physical, mental and economic harm inflicted in public or in private, this also includes threats of violence, coercion and manipulation.

Note 1 to entry: This definition is based on the description on gender-based violence provided by the United Nations High Commission on Refugees (UNHCR).[35]

3.8
hazardous material
item, element or substance with a potential for harm in terms of human injury or ill health (both short and long term), damage to property, damage to the environment, or a combination of these.

3.9
human rights
rights inherent to all human beings, whatever their nationality, place of residence, sex, national or ethnic origin, colour, religion, language or any other status.

Note 1 to entry: An authoritative list of the core internationally recognized human rights is contained in the International Bill of Human Rights (consisting of the Universal Declaration of Human Rights and the main instruments through which it has been codified: the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights), coupled with the principles concerning rights in the 10 International Labour Organization (ILO) core conventions as set out in the Declaration on Fundamental Principles and Rights at Work.[33]

[SOURCE: ISO 22300:2021, 3.1.115, modified — Note 1 to entry added.]

3.10
Indigenous rights
broad range of collective and individual rights that constitute the minimum standards to protect the rights of Indigenous peoples and to contribute to their survival, dignity and well-being

Note 1 to entry: These include rights related to:

— equality and non-discrimination;

— self-determination, self-government and recognition of treaties;

— lands, territories and resources;

— environment;

— civil and political rights;

— participation in decision-making and indigenous institutions;

— economic and social rights;

— implementation and redress;

— culture, religion and language;

— education and media.

Note 2 to entry: This definition of Indigenous rights is as affirmed and set out in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).[34]

3.11
livelihood
capabilities, assets, income and activities required to obtain the necessities of life

Note 1 to entry: People pursue a variety of livelihood outcomes (such as more income, increased well-being, reduced vulnerability, improved food security) through various livelihood strategies. Livelihood strategies aim to build or contribute to an individual's livelihood assets- comprised of human capital, natural capital, financial capital, physical capital, social capital, and political capital.

[SOURCE: ISO/TR 19915:2023, 3.18]

3.12
extraction
procedure of mining and retrieving minerals from the earth or from waste rock and tailings that have previously been mined

3.13
mitigation hierarchy
step-by-step tool used to limit the negative impacts of development which has four steps that are followed in order, avoid, then minimise, then restore impacted areas and finally offset any impacts than remain

3.14
on-site processing
processing of ore at the same location as the mine.

3.15
recycling
recovery operation by which waste materials from mining (*mine waste* (3.20)), manufacturing processes or any other supply chain activity and products at end-of-life are collected and reprocessed into products, materials or substances, whether for the original or other purposes

3.16
social impact assessment
SIA
process by which an entity identifies actual and potential social or human rights risks from a project or a planned project

Note 1 to entry: The United Nations Guiding Principles on Business and Human Rights (UNGPs) stipulate that assessments should focus on risk to people, not risk to business. The International Association of Impact Assessment (IAIA) defines SIA as the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment. [35]

3.17
supply chain
linked set of resources and processes that upon placement of a purchase order begins with the sourcing of raw material and extends through the manufacturing, processing, handling and delivery of goods and related services to the purchaser

Note 1 to entry: The supply chain may include vendors, manufacturing facilities, logistics providers, internal distribution centres, distributors, wholesalers and other entities involved in the manufacturing, processing, handling and delivery of the goods and their related services.

Note 2 to entry: The supply chain may include the recovery, processing and placing on the market of secondary materials.

[SOURCE: ISO 28001:2007, 3.24, modified — Note 2 to entry added.]

3.18
sustainability
state of the global system including environmental, social, and economic aspects, in which the needs of the present are met without compromising the ability of future generations to meet their own needs

Note 1 to entry: The environmental, social, and economic aspects interact, and are often referred to as the three dimensions of sustainability.

Note 2 to entry: Sustainability is the goal of sustainable development.

[SOURCE: ISO Guide 82:2019, 3.1]

3.19
sustainable development
development that meets the environmental, social and economic needs of the present without compromising the ability of future generations to meet their own needs.

Note 1 to entry: Derived from the Brundtland Report.[18]

[SOURCE: ISO Guide 82:2019, 3.2]

3.20
mine waste
materials derived from mining or processing activities, that are disaggregated and stored on site within a defined mine feature

Note 1 to entry: Generally, it includes all mine materials except topsoil and mine water.

3.21
waste rock
rock removed in the mining process, that does not contain ore and will not be processed

[SOURCE: ISO 20305:2020, 3.5.1.4]

4 Sustainability topic areas to consider in critical mineral supply chain standards

4.1 General

Sustainability topic areas that are important to consider in critical mineral supply chain standards include, but are not limited to, those described in 4.2 and 4.3.

4.2 Mineral exploration/extraction/mining/mineral recovery on-site processing/off-site processing and refining

4.2.1 Environment

— Biodiversity

— Climate change/greenhouse gas emissions

— Air pollutants

— Durability, reusability, repairability of products containing critical minerals

— Energy use

— Environment cost-benefit analysis

— Environmental impact assessment and permitting

— Hazardous materials

— Mine closure and reclamation, including long-term environmental monitoring and risk mitigation after closure

— Noise/vibration

— Non-greenhouse gas or climate change impacts (including loss of carbon sinks resulting from deforestation or destruction of wetlands)

— Non-tailings waste management

— Pollution management and control

— Physical hazards/mine security

— Radioactive materials

— Recycling

— Resource efficiency

— Resource use