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Minerals and Metals Management 2020

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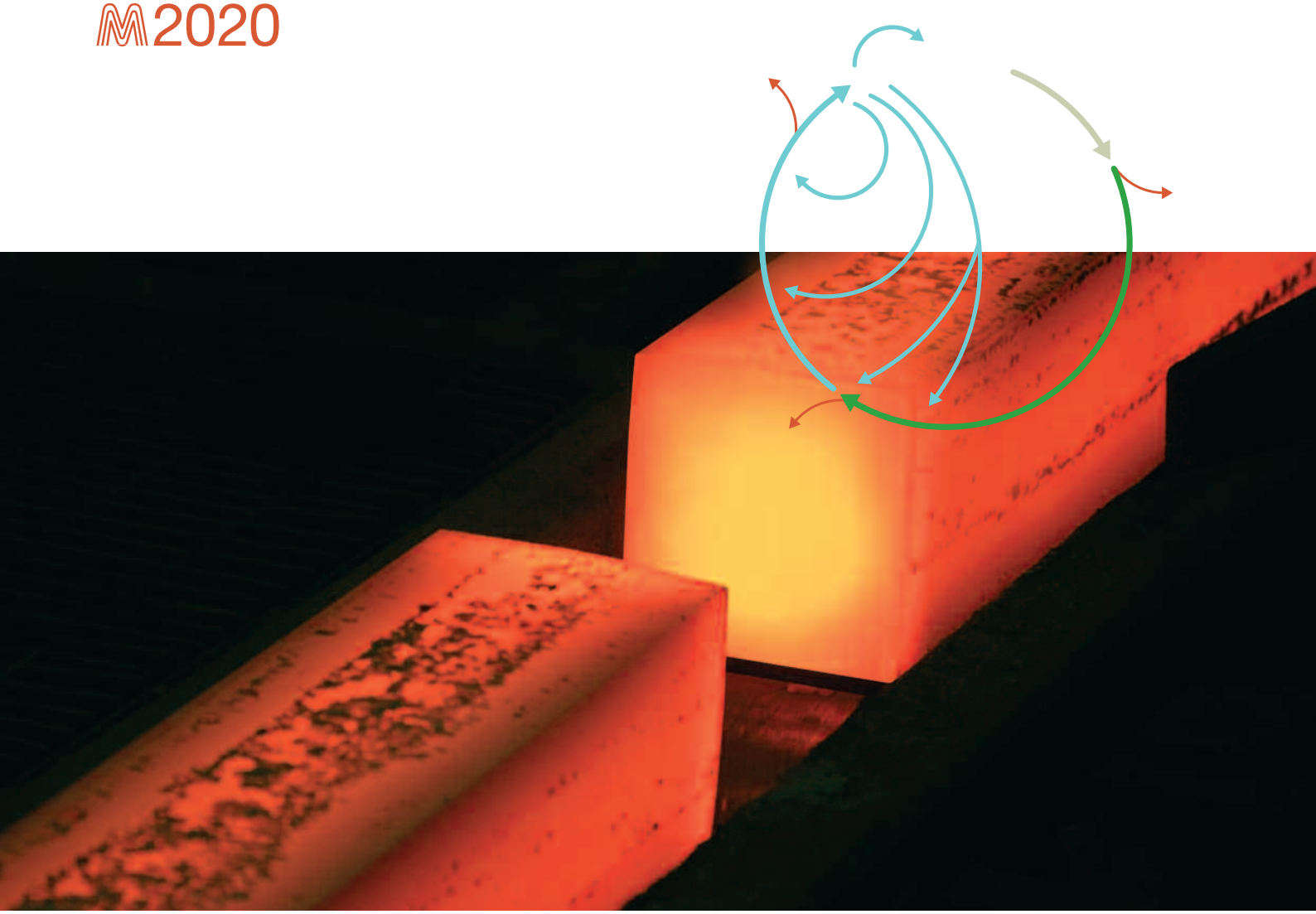
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ICMM
International Council on Mining & Metals

Minerals and Metals Management 2020

Responsible and integrative chemicals management in the mining and metals supply chain

M2020



Chemicals Management and Sustainable Development

'We all share a responsibility for the materials we use at all stages of their life cycle; it is a commitment that starts at the highest level and permeates down to individual countries and organizations, which must act together to achieve the goals of SAICM'

Anthony Hodge President, ICMM

ICMM's members, incorporating many of the world's largest mining and metals companies, are committed to maximizing their contribution to the well-being of society in a manner which ensures an equitable distribution of costs and benefits without compromising the ability for future generations to meet their own needs. Robust and integrated chemicals management policies are a vital component of this commitment to a more sustainable future.

The United Nations Strategic Approach to International Chemicals Management (SAICM) acknowledges the essential contribution made by minerals, metals and alloys to modern societies and economies while at the same time recognizing the potential threat to man and the environment if chemicals are not managed responsibly. ICMM therefore welcomes SAICM as a vehicle to promote chemical safety at the international level and hopes that SAICM will soon lead to efficient, effective and coherent chemicals management systems around the world.

The overarching goal of SAICM, which is taken from the Plan of Implementation of the 2002 World Summit on Sustainable Development, is that chemicals (including minerals and metals) are used and produced in ways that minimize significant adverse effects on human health and the environment by 2020.

ICMM members believe not only that such a global framework for chemicals is essential but that SAICM should be based on a broader life cycle approach embedded within a sustainable development context. We all share a responsibility for the materials we use at all stages of their life cycle; it is a commitment that starts at the highest level and permeates down to individual countries and organizations, which must act together to achieve the goals of SAICM. For this reason, ICMM has developed *Minerals and Metals Management 2020*, which will support the overall objective of SAICM.

This strategic action plan comprises a challenging series of commitments (see pages 8 and 9) for ICMM in relation to the role we will play in helping to achieve the SAICM 2020 goal. It links our pursuit of the SAICM objectives to the ICMM Framework for Sustainable Development and outlines the commonalities between sound international chemicals management and the application of what ICMM has described as *materials stewardship*.

The Foundation

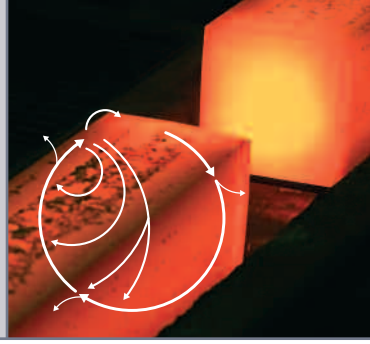


Table 1: **ICMM's Sustainable Development Principles**

10 Principles
1. Implement and maintain ethical business practices and sound systems of corporate governance.
2. Integrate sustainable development considerations within the corporate decision-making process.
3. Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities.
4. Implement risk management strategies based on valid data and sound science.
5. Seek continual improvement of our health and safety performance.
6. Seek continual improvement of our environmental performance.
7. Contribute to conservation of biodiversity and integrated approaches to land use planning.
8. Facilitate and encourage responsible product design, use, re-use, recycling and disposal of our products.
9. Contribute to the social, economic and institutional development of the communities in which we operate.
10. Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.

ICMM's Sustainable Development Framework

Sustainable Development is an increasingly important priority for government, industry and non-governmental and multi-lateral organizations around the world. Evidence is mounting that unsustainable patterns of development are undermining the environmental, social and economic foundations of modern society and it is increasingly critical that all actors in society do their part to support the shift to more sustainable consumption and production practices. ICMM has responded to this challenge through its commitment to an overarching Sustainable Development Framework. The Framework, approved by our Council composed of the CEOs of the world's leading mining and metal producing companies, is the result of extensive multi-stakeholder collaboration and comprises three elements:

(i) Ten Principles

Principles for sustainable development that company members are required to implement are based upon the issues identified in the landmark Mining, Minerals and Sustainable Development (MMSD) project. The 10 Principles are listed in Table 1 while details of the associated sub-elements can be found at www.icmm.com

(ii) Public Reporting

The ICMM Council has committed member companies to report to the highest level of public reporting: 'in accordance' with the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines and Mining and Metals Sector Supplement. The Supplement provides a practical way to measure corporate performance against key sustainable development criteria specific to mining and metals operations, and complements the main reporting guidelines. Together they provide the basis for ICMM members to report their economic, environmental, human rights and social performance against the 10 Principles.

(iii) Independent Assurance

The approval of ICMMs Assurance Procedure in 2008 marked an important stage in the evolution of the ICMM Sustainable Development Framework. The procedure outlines ICMM's members' commitment to independent external assurance of the other two elements of ICMM's Sustainable Development Framework – Principles and Reporting. This approach will give stakeholders

and other interested parties assurance over public statements describing how the ICMM Sustainable Development Framework is being implemented by member companies.

Supporting the Framework – Good Practice Guidance

ICMM has an extensive work program to help its members meet their sustainable development commitments, and drive performance improvement across the industry as a whole. This work program seeks to partner as broadly as possible to develop good practice guidance for member companies and the broader industry as a whole. The work program covers a wide range of issues across the mining and metals cycle. These range from land-use planning and community development, to on-site concerns such as health and safety and environmental protection and then through the value chain to consideration of safe management of material and product flows.

Sustainable development and chemicals management

Managing chemicals, including minerals, metals and alloys, throughout their life cycles in a responsible way is clearly one important aspect of industry's commitment to sustainable development. This is reflected both in the ICMM Sustainable Development Principles (shown in Table 1), and in ICMM's work program.

Real progress will require greater attention to the management of the materials produced from mine exploration, through production and use throughout the minerals, metals and alloys supply chain, to reuse, recovery and recycling. Implementing responsible chemicals management policies is in fact just one aspect of the wider initiative that ICMM terms *materials stewardship*. The concept is built on the premise that the industry has a shared responsibility for the performance of the whole materials cycle we are part of, well beyond our direct operations.

Characteristics of minerals, metals and their supply chain

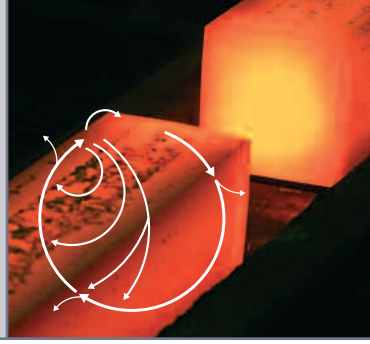
Minerals, metals and their supply chain are characterized by a series of specific properties which ICMM has recognized in its Minerals and Metals Management 2020 implementation program, see Table 2.

The characteristics described require specifically adapted: hazard and risk assessment/management; standard setting; worker support; health and education systems; socio-economic impact assessments; and, resources/materials management methods and practices that ensure relevant and effective chemicals management.

Table 2: Specific characteristics

Characteristics
1. **Minerals and metals are natural components of the earth's crust and ecosystems have evolved genetically based mechanisms to control these under natural conditions.**
2. **Whilst many minerals and metals express intrinsic toxic properties, many metals are essential for life, fulfilling important and critical functions in organisms and man.**
3. **The exposure balance of minerals and metals is diverse and covers emissions from point sources and product releases as well as often extensive natural and non intended sources.**
4. **The number of minerals, metals and metal compounds is relatively small compared to organic chemicals, however their volumes are very large resulting often in extensive and widely diverse use applications.**
5. **Metals and minerals are typically used in durable applications with lifetimes often reaching generations or even centuries.**
6. **Most non-dispersive metal and mineral uses allow complete recycling without loss of quality.**
7. **The contribution of the metals and minerals supply chain to the overall trade and social balance of countries is extensive and, for many developing countries, critical to the potential to erase poverty and illiteracy.**
8. **The minerals and mining industry often has to operate in remote locations requiring the need for local infrastructure development and skilled workers.**

Materials Stewardship



The framework for chemicals management in the mining and metals value chain

Our industry is, by its very nature, tied to value chains and life cycles that we are part of but do not always control. Materials stewardship involves caring for and managing materials production and use along the value chain to maximize net benefit, minimize losses, and conserve resources to actively contribute to sustainable development. This is an aspect of good governance, has a strong market driven component and means going beyond regulatory compliance.

The business drivers for taking such responsibility for our materials through the whole life cycle are undeniable. The sustainability performance of our materials is becoming more and more crucial and we must play our role in enhancing their value to society. Without doubt markets will favour materials and products that are sustainable – both in their application and in their wider life cycle benefits.

The scope of materials stewardship

Materials stewardship includes activities and actions to improve both the upstream processes that support the production of the material, and the downstream product(s) that it goes into. It involves caring for and managing materials use along the value chain to maximize net benefit; minimize losses and risks; promote recycling and reuse; and encourage the conservation of resources. This enables the industry to contribute actively to sustainable development by enhancing its societal value while maintaining its 'social licence' to produce and market. It requires the acceptance of complementary responsibility and the recognition of stewardship roles among all stakeholders, and provides a common interface for collective pursuance of sustainable practices in materials management. It requires the adoption of a life cycle management approach utilizing risk assessment and risk management at all points in the life cycle.

In reality, our capacity to act as stewards of the materials we produce changes between those parts of the materials life cycle over which we have direct control and those parts which we cannot manage directly. In those parts of the materials life cycle where we do not have direct control our stewardship may be exercised through partnerships, provision of information and other routes of influence and support. These two aspects of materials stewardship capacity are often referred to as process stewardship (direct control) and product stewardship (influence and support). While the nature and extent of a company's materials stewardship activity will depend on the extent of their business throughout the materials life cycle, there is general agreement that the concept of material stewardship is still evolving and will be shaped by different parties along the mining and metals supply chain. This flexible, life cycle approach goes to the heart of ICMM's publication *'Maximizing Value – Guidance on implementing materials stewardship in the minerals and metal value chain'*.

Implementation

Through the publication of *Maximizing Value*, ICMM has sought to help companies take a practical view. For ICMM members, materials stewardship is about:

Understanding the social, environmental and economic impacts of a material as it moves through its life cycle from mining to use and through to the end of its life.

Developing relationships/partnerships with other actors along the life cycle to help ensure beneficial and appropriate use of material and to minimize or eliminate risks to human health and the environment.

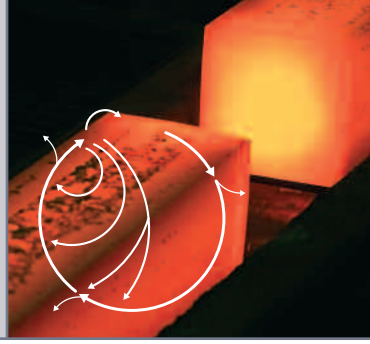
Taking action to ensure that, for the part of the life cycle they control, appropriate and effective stewardship activities are undertaken, and for the areas where they are not in direct control but have influence, they work with other actors in the life cycle to ensure they also do their part.



‘The ICMM Global Action Plan is a very significant initiative to further advance the materials stewardship concept. The Action Plan clearly demonstrates the commitment of the ICMM members to take responsibility for the safety of their products at all stages of the life cycle.’

Angel Gurría Secretary General, OECD

A Strategic Approach



Chemicals management through the framework of materials stewardship

The ICMM Sustainable Development Framework and the materials stewardship concept provide a robust policy platform that recognizes the specific properties and characteristics of minerals, metals and alloys and their supply chains for the effective advancement of chemical management practices in the sector and among stakeholders. Chemicals management is a vital component of materials stewardship and developing sound practices in this arena is a key mechanism for the industry to support sustainable development.

The concept of materials stewardship outlined here is being developed under the auspices of ICMM and supported by many metal commodities and multimetallic organizations representing the minerals and metals sector worldwide; however the principle of shared responsibility is essential for successful materials stewardship and this necessitates the extension of the concept to encompass common initiatives relevant to all stakeholders in the value chain. After all, the value of minerals and metals to society is maximized when the various stakeholders along the value chain undertake activities that enhance the durability and recyclability of minerals and metals, increase the efficiency of their production and use, and minimize associated risks.

Minerals and Metals Management 2020 encompasses many of the elements that are central to the support of ICMM and the mining and metals sector for materials stewardship and SAICM.

Hazard assessment and communication

Defining the intrinsic hazard properties of minerals and metals is a complex but key component of the Minerals and Metals Management 2020 objective. Developing and applying appropriate assessment techniques that recognize and accommodate metal specific hazard properties in a way that is scientifically sound and ecologically relevant, while adding definition to key components of hazard communication, lies at the heart of ICMM's materials stewardship policy. ICMM's policy also includes knowledge and capacity building to facilitate adoption and implementation of these hazard assessment techniques by governments and industry.

Risk characterization and management

Characterizing and managing the risks posed by the production and use of minerals, metals and alloys, and managing these adequately through the life cycle is a key aspect when considering the sustainability of our materials. Metals are natural components of the earth with specific chemical characteristics that must be taken into account to ensure that potential health and environmental risks are adequately assessed and managed. Chemicals management policies that are aligned with the principles of sustainable development and are based on sound science are essential if industry and society is to make informed, ecologically-sound decisions that can contribute to the responsible production and use of materials. ICMM's materials stewardship program encompasses several strands of work in this field that will provide an important contribution to industry's response to SAICM.

Life cycle thinking

This is a philosophy that lies at the heart of materials stewardship and putting it into practice requires that the various players in the life cycle or value chain of specific minerals and metals are able to characterize and manage products and processes in this light. A quantitative understanding of the minerals and metals life cycle can help to identify points of focus where impacts occur and improvements can be made. This means developing tools and methods not just to address products but to characterize and manage the whole life cycle. This encompasses feedstock, products, by-products, wastes and recyclables – the whole value chain.

Materials stewardship

Applying materials stewardship on a global scale and over the entire life cycle, to realize the full sustainable value of our materials for society, reflects the commitment of the mining and metals sector to sustainable production and risk based management of the supply chain. Our operations, durable products and reuse/recycling capacities contribute extensively to the sustainable development of local populations, customer groups, countries and society in general. Maximizing value creation in a balanced and sustainable way is a priority for all members of ICMM.

Global Action Plan

The need for robust and internationally relevant chemicals policies is evident not only through SAICM but also through many national and regional initiatives that have begun in recent years. International systems have already been devised covering the export and import of waste and recyclables (Basel Convention), hazard assessment and communication systems (UNGHS) and chemicals assessment (cfr. OECD test guidelines and risk assessment systems such as the HPVC program). In addition and more recently, extensive regional chemicals management initiatives are emerging,

1
Taking a System Perspective

Action
We commit to

1.
Develop and implement hazard and risk assessment tools addressing the specific properties of metals, metal compounds, alloys and other inorganic substances and any related effects on health and the environment.

2.
Encourage the development of guidance on a harmonized approach to the setting of occupational exposure limits.

3.
Establish guidance for identification, assessment and control of occupational health risks.

4.
Provide scientific input to the development of protocols for characterization of ecotoxicological and human health impacts in life cycle assessment.

5.
Promote eco-efficiency indicators to encourage efficient and effective use of materials and energy from a life cycle perspective.

6.
Develop guidance on socio-economic assessment in risk management decision making for metals.

2
Building New and Strengthening Existing Relationships

Action
We commit to

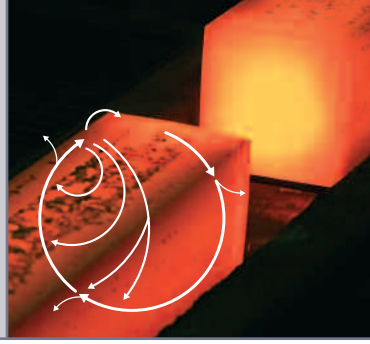
7.
Promote integration of specific assessment tools into broader risk characterization systems and government policy frameworks at the national, regional and international level.

8.
Convene workshops with commodity associations to exchange experiences and information on chemicals management.

9.
Provide guidance for member companies on terms of reference for engagement with local communities and host national governments on chemicals management particularly in developing countries.

10.
Encourage metal commodity associations to include chemicals management information and resources in their materials stewardship programs.

11.
Develop a dialogue with the World Bank Group on chemicals management and poverty alleviation.



for example the Montebello Agreement in North America, REACH in the European Union and the APEC Chemicals Dialogue in Asia. The creation of these international and regional initiatives underlines the importance of coordinated action for the global mining and metals sector.

Within the framework of materials stewardship, ICMM has identified twenty three priority actions required to respond to the challenge of SAICM and to assist in providing safe and responsible production and use of minerals and metal products to 2020 and beyond.

3
Optimizing the Production and Application of Minerals and Metals

Action We commit to
12. Develop guidance on chemicals management in the mining and metals sector.
13. Encourage prevention and minimization of hazardous waste generation within ICMM Member operations.
14. Promote and exchange information on successful experiences and projects related to environmental site management and occupational safety and health.
15. Provide guidance on implementation of the UN Globally Harmonized System of Classification and Labelling.
16. Develop and implement Mercury Stewardship activities.
17. Promote dissemination of existing guidance and address gaps relating to the safe handling of metals throughout the supply chain and specific metal containing products during recovery and recycling.

4
Contributing to a Robust, Accessible Base of Information to Support Decision-making

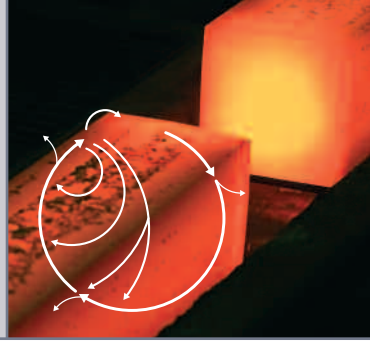
Action We commit to
18. Make available high quality hazard and risk assessment information on specific metals and metal compounds.
19. Publish and disseminate fact sheets on new and revised hazard and risk assessment tools intended to address the specific properties of metals, metal compounds, alloys and other naturally occurring inorganic substances.
20. Convene training workshops for companies and organizations within the mining sector on key chemicals management topics such as the UNGHS and risk characterization.
21. Develop a web-portal to provide common access to life cycle inventories for specific metals and metal compounds.
22. Develop a sector specific framework for monitoring and public disclosure of emission levels of specific substances to air and water from ICMM member companies operations consistent with the Global Reporting Initiative guidelines.
23. Develop and publish a database of regulatory occupational exposure limits for substances linked to the production of minerals and metals.



'Mining, minerals and metals are important to the economic and social development of many countries. Minerals are essential for modern living'

WSSD Plan of Implementation (Chapter IV)

Four Themes for Four Objectives

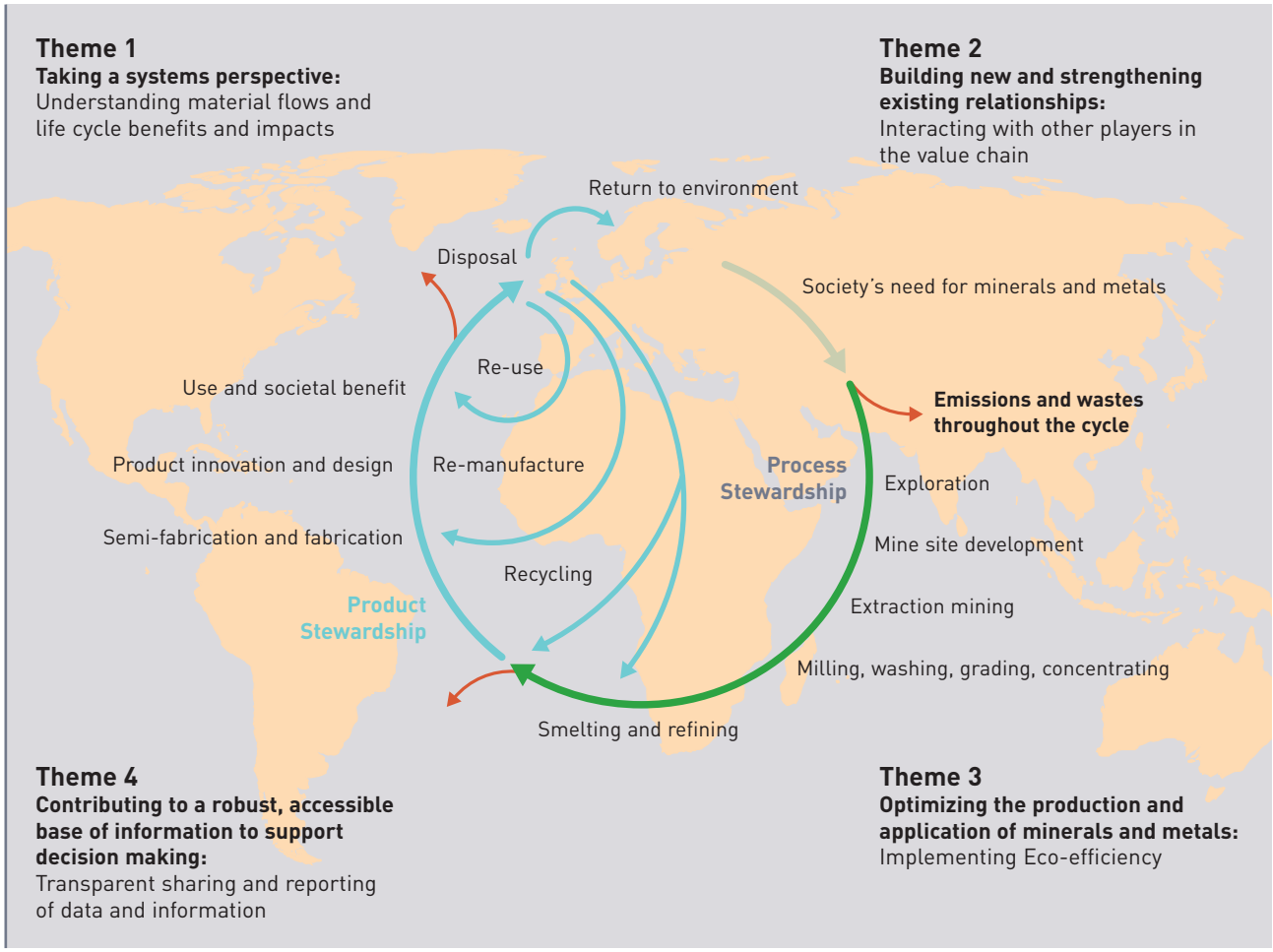


Integrating materials stewardship and SAICM

The materials stewardship guidance which ICMM has developed for the minerals and metals value chain is organized into four themes (see Figure 1), each supported by a comprehensive set of activities and illustrative examples designed to support implementation. Since materials stewardship and SAICM are based around a life cycle approach, the structure of ICMM's commitment to chemicals management reflects what we believe are the key needs for successful implementation of materials stewardship.

There is a clear synergy between the four themes of materials stewardship and four of the overarching objectives of SAICM set out in the Overarching Policy Statement: risk reduction, knowledge and information, governance, and capacity building and technical cooperation.

Figure 1: The minerals and metals life cycle and four themes of materials stewardship



Materials Stewardship Theme 1
Taking a systems perspective

The systems approach is about integrating life cycle thinking into existing management systems and therefore into business decision making. It is about looking up and downstream along the value chain – for example focusing on a particular application for the material in order to better understand potential impacts and sustainable benefits. The message for ICMM members is that it pays to participate in this type of initiative.

Purchasing, research, marketing, as well as long-range planning and capital allocation procedures, will require information on the business, social, environmental and health and safety issues and opportunities that lie beyond your own gate.
A systems perspective can help advance materials stewardship; as it requires new ways of thinking and new inputs into decision-making, leadership skills, incentives and resources are also needed.

SAICM Objective

Risk reduction

The systems approach is a natural way to begin to meet the objectives of SAICM with regard to risk reduction throughout the life cycle. This recognizes the importance of scientific understanding to systematically identify, characterize and ultimately manage potential risks to the environment and human health. The approach should be inclusive of all stakeholders and encourage transparency throughout the materials supply chain.

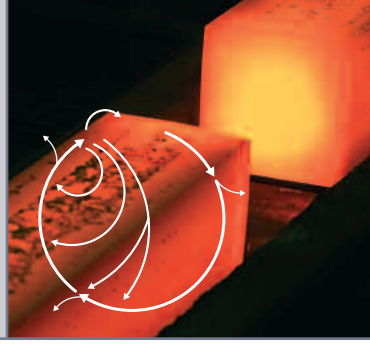
Materials Stewardship Theme 2
Building new and strengthening existing relationships

The second theme is about building relationships up and down the supply chain. This can encompass a range of stakeholders, from fellow employees to government officials, customers and consumers. This theme is consistent with the aims of SAICM, which will provide the opportunity to build a new partnership approach, among a diversity of stakeholders, to support the achievement of environmentally sound chemicals and chemical wastes management practices.

SAICM Objective

Governance

Building relationships is key to SAICM, which recognizes that governance needs to be addressed through a multi-sector and multi-stakeholder approach in pursuing the sound management of chemicals. There is therefore a need to recognize the roles that all stakeholders, from producers to consumers to the broader civil society, play in the life cycle of a material and the ways in which they can be impacted. SAICM acknowledges that there are currently gaps, overlaps and duplication in both policy and practice at many levels which, if addressed, will lead to more effective management of chemicals.



Materials Stewardship Theme 3
Optimizing the production and application of minerals and metals

The third theme of material optimization requires a company to understand the intrinsic value of a material alongside the potential environmental risks throughout its life cycle. There are incentives for improving process and production efficiencies, extending product life, enhancing recycling, and/or improving design innovation regarding materials use at different stages of the value chain.

SAICM Objective

Capacity-building and technical assistance

Optimizing the application of minerals and metals will require increased capacity to develop concepts and act, coupled with improved technical assistance to support others in the life cycle. SAICM recognizes the widening gap in such capacity between developed countries, developing countries and economies in transition. Strengthening stakeholder capacities will result in more widespread application of sound chemicals management practices.

Materials Stewardship Theme 4
Contributing to a robust, accessible base of information to support decision-making

The fourth theme covers life cycle information that can be shared to support collaborations to ensure that all concerned are better informed, better protected and ultimately more able to make their own contribution to the stewardship process. The more information that is made available, the more likely we are to achieve decision making that favours sustainability.

SAICM Objective

Knowledge and information

Contributing transparently to the global knowledge base to share information, data and tools in pursuit of a more integrated approach to chemicals management responds directly to this objective. Knowledge, information and public awareness are basic needs for decision-making, which will be enhanced with more cooperation throughout the value chain.

‘This pro-active program for chemicals management in the mining and metals sector will strongly support the overall objectives of the United Nations’ Strategic Approach to International Chemicals Management’

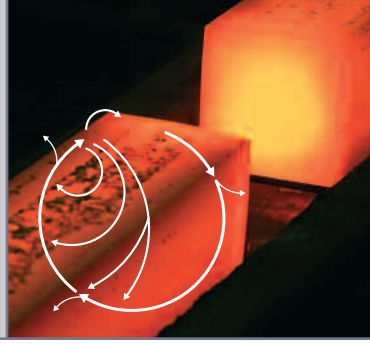
Somit Varma Director
Oil, Gas, Mining & Chemicals, World Bank



'It becomes increasingly evident that the companies that are successful in their Environment, Health and Safety strategies are in the long term also those that are economically the most successful'

Angel Gurría Secretary General, OECD

The Benefits



Chemicals management for a sustainable value chain

The benefits of implementing sound international and regional chemicals management policies are clear. The activities and concepts, including materials stewardship, outlined in this document have potentially beneficial consequences for all stakeholders in the value chain.

Value to users and consumers

A better understanding of the properties of the materials we produce and the products they go into will ensure that those using them are able to extract maximum value while responsibly managing potential risks. Effective stewardship of mining and material processing is a key aspect of mitigating and managing these impacts to meet stakeholder expectations.

Furthermore, population growth, coupled with an increasing reliance on minerals and metal products, point to a long-term outlook for these materials. However the environmental and socio-economic consequences of these trends also point to an increasing need for materials that are harvested, extracted, produced, used, recovered and reused with minimal negative impacts on the environment and society. Having robust policies in place across a global industry will help to ensure that the benefits are enjoyed wherever we operate.

'Exchanging information with actors along the value chain can help to maximize valuable benefits and manage negative impacts throughout the material's life cycle'

Value to producers

Future markets will favour materials with superior sustainability performance – stakeholders rightly have high expectations of mining and metals companies when it comes to managing impacts associated with the extraction and processing of metals. While enabling industry to comply with relevant regulation, this plan aims to go further and increase reputational capital at a time when scrutiny is increasing.

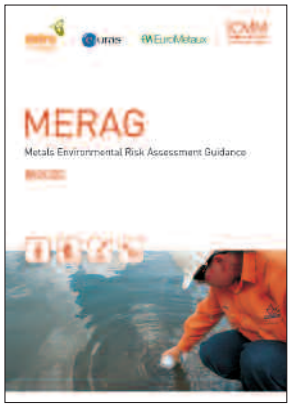
Creating a better understanding of products and processes has also been demonstrated to lead to improvements in efficiency – particularly when considered in the broader context of materials stewardship.

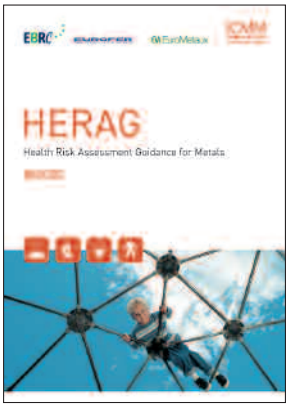
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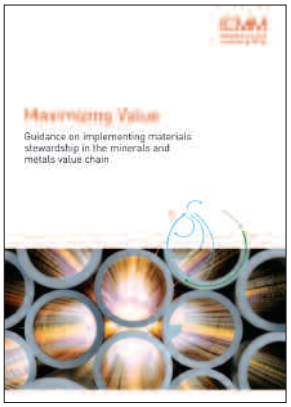
The International Council on Mining and Metals (ICMM) is a CEO-led industry group that addresses key priorities and emerging issues within the industry. It seeks to play a leading role within the industry in promoting good practice and improved performance, and encourages greater consistency of approach nationally and across different commodities through its association members and member companies.

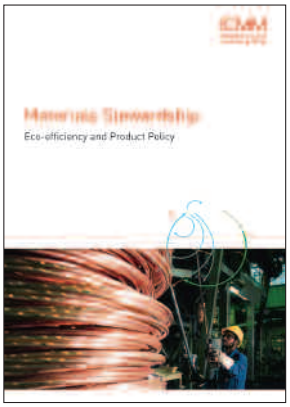
ICMM's vision is for a respected mining and metals industry that is widely recognized as essential for society and as a key contributor to sustainable development.

For further information on industry initiatives, chemicals management and materials stewardship, visit: www.icmm.com









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This logo denotes contributions to the 23 actions at the heart of Minerals and Metals Management 2020.

ICMM
35/38 Portman Square
London W1H 6LR
United Kingdom

Phone: +44 (0) 20 7467 5070
Fax: +44 (0) 20 7467 5071
Email: info@icmm.com

www.icmm.com

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