UK-India Critical Minerals Data Quality and Standards Workshop

International Landscape of Minerals standards and standard-setting bodies

Policy initiatives and standardization work in EU

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European Project SESEI

SESEI | Seconded European Standardisation Expert in India

Enabling Europe-India Cooperation on Standards

Agenda

- About Project SESEI
- CEN-CENELEC-ETSI with BIS through SESEI
- Policy & Standardization in Europe
- Conclusion

SESEI: Local Representative of EU Standardisation Bodies in India

Launched in January 2013, currently in its sixth phase (Aug'24 to July'27)

SESEI (**S**econded **E**uropean **S**tandardization **E**xpert in **I**ndia) ***is a local face for the European standardization community in India: Dinesh Chand Sharma***

Why SESEI: India is a major trade partners for EU/EFTA, Increasing role of standards to gain market access, evolving & complex nature of regulatory and standardization landscapes, sharing best practices, and work together as partners

Priority Sectors/topics: Aligned with EU-INDIA TTC, Connectivity Partnership

- **Digitization: Strategic technologies, digital governance, and digital connectivity** - Smart Cities/Urban Development, ITS, Quantum Technologies, Smart Grid/Meter, Artificial Intelligence, 5G/6G, Open RAN, M2M/IoT (Cyber-Physical Systems), DECT, Data Privacy, Satellite Communication, Blockchain, Digital Signature, Smart Manufacturing, e-Accessibility, cybersecurity, digital skills, digital platforms including Research and Innovation etc.
- **Green & Clean technologies :** Clean Energy, Energy Efficiency (Green ICT), **Environment**, **Circular Economy including Resource Efficiency, Waste Management**, Energy storage technologies, Electric mobility, Green Hydrogen, Advanced biofuels including R&I etc.
- **Other topics** Rail, Ropeways, Machinery Safety etc. : **Open basis** mutual interests – Critical Minerals

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Introduction

- In the metals and minerals sector, standardization typically centers around the following topics:
  - ✓ **Classification and Characterisation; Chemical Analysis; Traceability and Transparency; Sustainability and ESG, Recycling criteria.**
- With time, and particularly in recent years, focus has gradually moved from **more traditional, trade-oriented classification and testing to traceability, recycling and ESG matters**.
- ISO Strategic Advisory Group on Critical Minerals (Mar'21 – Apr'23): Recommendation released mid-23
  - **New CRM Priorities and set up TCs for topics not yet covered by ISO**
    - New TCs to cover Cobalt, Chromium, Graphite and Antimony, should primarily cover material-specific chemical analysis standards but also address 'material- agnostic' issues such as terminology, packaging, labelling and – crucially - traceability. The work on traceability should be based on the methodology developed as part of ISO/TC 298 'Rare earths'.
    - Chemical Analysis Techniques: list of 10 standards to be used as 'good practice models' for the development of chemical analysis standards for new materials, to enhance comparability.
  - **Recycling, traceability and ESG standards**:
    - Recognised a gap in ISO standardisation in the downstream part of the CRM value chain, particularly regarding sustainability, traceability and recycling.
    - Regarding ESG standardisation, it noted that a significant number of ESG tools, guides and frameworks exist outside ISO. These tools are typically material-agnostic and extend across several supply chain segments, but rarely on the whole value chain. The SAG suggested that an International Workshop Agreement (IWA) bringing together stakeholders and organisations developing or applying such standards should be set up within ISO for further discussions.
- IWA 45:2024 conclusion & recommendations – Sustainable Critical Mineral Supply Chain
  - future standards should focus on the technical and environmental aspects of circularity and end-of-life management, as well as traceability.
- High-Level Forum on European Standardisation: Conclusions and recommendations of the Critical Raw Materials Workstream
  - Characterisation and chemical analysis: Implement ISO/TC 298 and ISO/TC 345 chemical analysis methods within the CEN system. Develop standards on the characterisation and performances of secondary CRMs, particularly for permanent magnets.
  - Other include on the topics of Recycling of permanent magnets, Traceability, Environmental footprint & sustainability and Circularity: ISO/PC 348 and ISO/TC82/SC7, IEC/TC 68 'Magnetic alloys and steels', CEN/TC 472 'Rare Earths'. Develop horizontal material efficiency standards for all products containing CRMs, based on Standardisation Request M/543 as well as other product-specific standards.

Policy initiatives (EU)

Policy Initiatives in Europe

European Critical Raw Materials Act (CRMA), entered into force on 23 May 2024

- Art. 28 and 29 set rules to support the uptake of permanent magnet recycling operations in the EU.
- Announced by **European Commission in March 2023** under the **Green Deal Industrial Plan**
- Forms the cornerstone of the EU's strategy to **secure, diversify, and strengthen critical raw material supply chains**
- Supports achievement of **EU 2030 climate neutrality and digital transformation objectives**
- **Key Objectives & Measures:**
  - **Strengthen domestic capacities:** Boost EU-based mining, processing, refining, and recycling
  - **Enhance supply chain resilience:** Reduce strategic dependencies and supply risks
  - **Establish International partnerships**
    - Develop **mutually beneficial partnerships** with third countries
    - Promote diversified, sustainable, and responsible sourcing
  - **Strategic Projects:** Fast-track permitting and financing for projects of strategic importance

List of Critical Minerals:

- European Commission regularly updates lists of Critical Raw Materials (CRMs), with the latest in 2023 under the Critical Raw Materials Act (CRMA), identifying 34 materials like Lithium, Cobalt, Graphite, and Rare Earth Elements crucial for green and digital transitions due to supply risks while focusing on securing EU supply chains through strategic projects and diversified sourcing

Standardization (EU)

Coherence at European level

Austria

Belgium

Bulgaria

Croatia

Cyprus

Czech Republic

Denmark

Estonia

Finland

France

Republic of North Macedonia

Germany

Greece

Hungary

Iceland

Ireland

Italy

Latvia

Lithuania

Luxembourg

Malta

Netherlands

Norway

Poland

Portugal

Romania

Serbia

Slovakia

Slovenia

Spain

Sweden

Switzerland

Turkey

United Kingdom

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European Standardization – Close Link with International Standards

A European Standard (EN) gives access to the international market and to all 34 European countries due to technical alignment.

INTERNATIONAL LEVEL

CEN: **33%** of portfolio identical to ISO

Vienna Agreement

Frankfurt Agreement

CENELEC: **72%** of portfolio identical to (+ **6%** based on) IEC standards

EUROPEAN LEVEL

Single entry point to
CEN & CENELEC and ISO & IEC

- Ò National implementation
- Ò Coherence of standards
- Ò Close access to standards

1 EN = **34** National Standards

National Standardization Organizations/ National Electrotechnical Committees

NATIONAL LEVEL

Impact on Markets

1 European Standard

34 identical national standards all conflicting standards removed

1 Global Solution

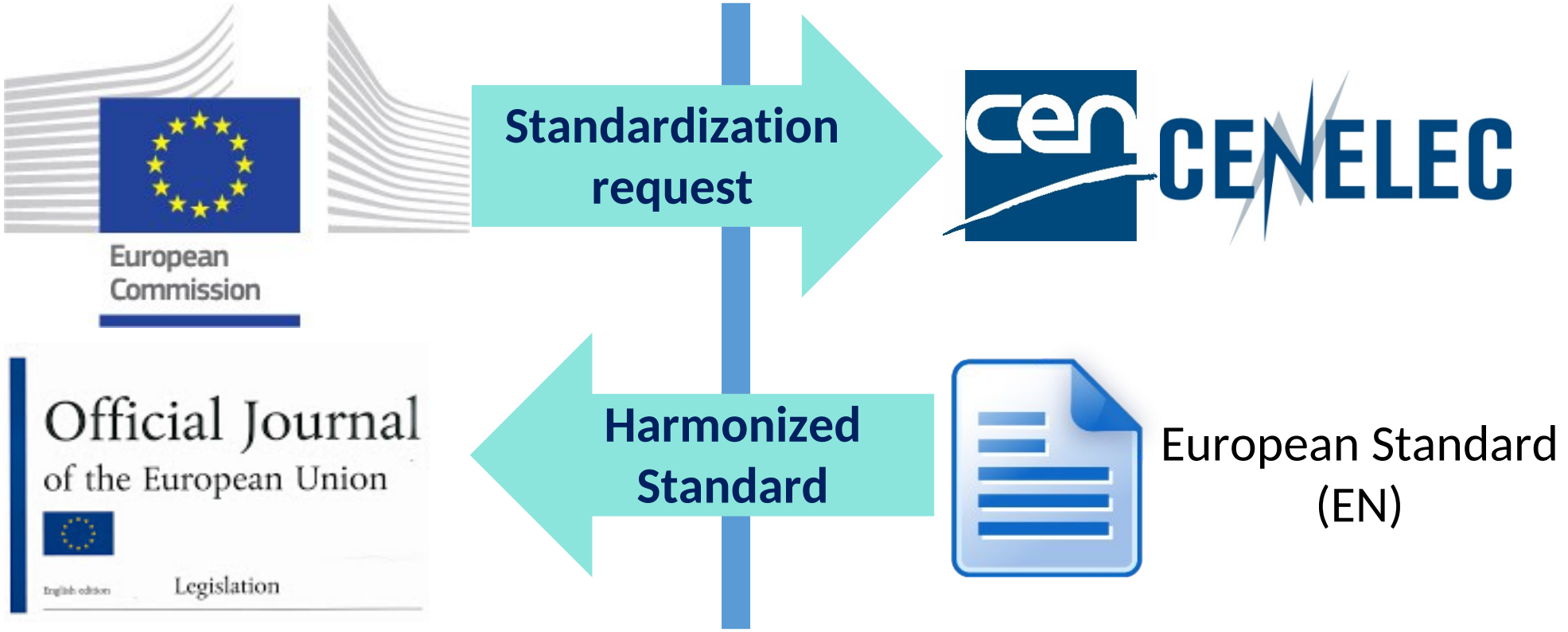
whenever possible, Europe's preference is for **International Standards**

European Standards = International Standards
whenever possible and where markets push for it

access to a market of 600 million consumers

access to a global market

The EU Smart Regulation success story
The “New Approach” & NLF – Public-Private Partnership



Presumption of conformity

Standards remain voluntary

~4.200 harmonized standards (25% only) supporting EU legislation, highly aligned with ISO/IEC

Global Standards

Objective - Avoid duplication of work and aim for a identical worldwide standards

"Vienna Agreement" with

Chemistry, Material, Energy, Environment, Transport, Construction, Services, eMobility etc

"Frankfurt Agreement" with

Electricity, Electro-technical

✔ Nearly all European countries + the European Union itself are members under the 1958 Agreement

✔ Many also participate under the 1998 Agreement

United Nations

SDGs, ECE WP.29, CRPD, UNFC etc.

Founding member of ISO and working with IEC since 1911

Bureau of Indian Standards

Member of UN ECE WP.29 "1998 Agreement (Global Technical Regulations)"

ARAI Progress through Research

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CEN-CENELEC-ETSI with BIS through SESEI

- **Presence and involvement of SESEI expert in relevant associations, working groups in India.**
  - Member of many TC's /WG's of BIS, TEC, TSDSI , Niti Aayog, Trade/Tech Associations, and active participations in various forums has led to Considerable Impact on Indian regulatory and Standardisation system.
- **Information flow (both ways)**
  - ✓ Monthly Newsletter for both EU/EFTA and Indian stakeholders
  - ✓ Industry Sector Profile Report & Presentation on "Digitization and Green & Clean Technologies: India
- **Structural cooperation**
  - ✓ MoU between BIS -CEN-CENELEC and BIS – ETSI (includes Copyright Provisions)
  - ✓ Framework Copyright Agreement between BIS-CEN-CENELEC under discussions
- **Adoption of EN's by BIS:**
  - ✓ Adoption of EN-115 standards as Indian Standard: BIS
  - ✓ Adoption of EN 301 549 (Accessibility requirements suitable for public procurement of ICT products and services): BIS
  - ✓ Adoption of E/Digital – Signatures: plans to adopt entire ETSI library, Ongoing
  - ✓ BIS Standard on Smart Infrastructure has IoT reference Architecture standards based on oneM2M Reference Architecture and Indian standard also includes ETSI NDSI-LD as well.
- **EN possible for study & adoption – linked to closure of Copyright License agreement between CEN-CENELEC-BIS**
  - ✓ Digital Signature, e-invoicing, Transportation Services, Test Methods for food products, Upgrade to EN-115, EN-81(Escalators and Moving Walks), European Sustainability Reporting Standards (ESRS), Intelligent transport systems including Road Infrastructure etc.

CRM Standardization: Europe

EU Standardization under CRM Act:

- Workstream 15 is on Critical Raw Materials
  - ✓ Develop priorities and recommendations for European and International standardization
  - ✓ Focus areas: supply chain transparency, material efficiency, sustainability, and circularity
- Within CEN, Several metal-specific TCs exist for non-critical raw materials such as **aluminium (CEN/TC 132), copper (CEN/TC 133), nickel and ferronickel (CEN/SS M14) and steel (CEN/TC 459).**
- There is one active standard explicitly referring to CRMs developed in the context of the **CEN and CENELEC JTC 10 'Energy related products and material efficiency aspects for Ecodesign'**, which defines a 'General method for declaring the use of critical raw materials in energy-related products' (EN 45558:2019).
  - ✓ EN 45558:2019 differentiates between regulated CRMs and non-regulated CRMS.
  - ✓ For regulated CRMs, the standard requires users to provide the relevant information in the material declaration format provided by EN IEC 62474:2019+A1:2021 'Material declaration for products of and for the electrotechnical industry'.
  - ✓ Same standard is also recommended for use when reporting non-regulated CRMs.

List of Metals and Minerals TCs in ISO/IEC, CEN/CLC and BIS						
Global (ISO and IEC)						
Org.	Code	Name	Scope	Secretariat	Creation year	N. active standards
CEN	TC 132	Aluminium and aluminium alloys	Classification; Chemical analysis	AFNOR (France)	1994	134
CEN	TC 133	Copper and copper alloys	Classification; Chemical analysis	DIN (Germany)	1988	97
CEN	TC 262	Metallic and other inorganic coatings, including for corrosion protection and corrosion testing of metals and alloys	Classification; Chemical analysis	BSI (UK)	1994	166
CEN	TC 459	European Committee for Iron and Steel Standardization (ECISS)	Classification; Chemical analysis	AFNOR (France)	2019	0
CEN	TC 472	Rare Earth Elements	Chemical analysis; Traceability; Sustainability; Recycling	DIN (Germany)	2023	0
CEN	TC 477	Sustainable production of raw materials from mining-related activities	Traceability; Sustainability; Recycling	SIS (Sweden)	2024	0
CLC	JTC 010	Energy-related products - Material efficiency aspects for ecodesign legislation	Classification; Traceability; Recycling	NEN (Netherlands)	2016	9
IEC	TC 068	Magnetic alloys and steels	Classification	DKE (Germany)	1968	27
ISO	PC 348	Sustainable Raw Materials	Traceability; Sustainability; Recycling	DIN (Germany)	2023	0
ISO	TC 017	Steel	Classification; Chemical analysis; Sustainability	JISC (Japan)	1947	319
ISO	TC 026	Copper and copper alloys	Classification; Chemical analysis	SAC (China)	1947	27
ISO	TC 027	Coal and coke	Classification; Chemical analysis	SABS (South-Africa)	1947	105
ISO	TC 079	Light metals and their alloys	Classification; Chemical analysis	AFNOR (France)	1953	112
ISO	TC 082	Mining	Classification; Sustainability	DIN (Germany)	1955	64
ISO	TC 102	Iron ore and direct reduced iron	Classification; Chemical analysis; Sustainability	JISC (Japan)	1961	82
ISO	TC 132	Ferroalloys	Classification; Chemical analysis	SAC (China)	1969	69
ISO	TC 155	Nickel and nickel alloys	Classification; Chemical analysis	AFNOR (France)	1973	31
ISO	TC 183	Copper, lead, zinc and nickel ores and concentrates	Chemical analysis	SA (Australia)	1983	28
ISO	TC 207	Environmental management	Classification; Traceability; Sustainability	SCC (Canada)	1993	69
ISO	TC 298	Rare Earth	Classification; Chemical analysis; Traceability; Sustainability; Recycling	SAC (China)	2015	12
ISO	TC 308	Chain of custody	Classification	NEN (Netherlands)	2016	1
ISO	TC 323	Circular economy	Classification; Traceability; Sustainability; Recycling	AFNOR (France)	2018	4
ISO	TC 333	Lithium	Classification; Chemical analysis; Traceability; Sustainability	SAC (China)	2020	0
ISO	TC 345	Specialty metals and minerals	Classification; Chemical analysis	AFNOR (France)	2023	0

BIS	MTD 5	Ferro Alloys	Various metal-specific technical committees has published over 400 Indian standards
BIS	MTD 34	Methods of Chemical Analysis of Metals	
BIS	MTD 7	Ores and Feed Stock for Aluminium Industry, its Metals/ Alloys and Products	
BIS	MTD 8	Ores and Feed Stock for Copper Industry, its Metals/ Alloys and Products	
BIS	MTD 9	Ores and Feed Stock for Non-Ferrous (Excluding Aluminium and Copper) Industry, their Metals/ Alloys and Products	
BIS	EED 9	Circular Economy	
BIS	EED 1	Environmental Management	
BIS	CHD 1	Inorganic Chemicals	

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Backup Slides on India

Policy Initiatives in India

National Critical Mineral Mission (NCMM)

- Launched by Government of India in 2025 for 7 years (FY 2024–25 to FY 2030–31) with aims to Build a self-reliant and resilient critical minerals ecosystem in India
- Budget: INR 16,300 crore (Government) & Expected Investment (≈ €1.542 billion): INR 18,000 crore from PSUs & stakeholders (≈ €1.703 billion)
- Under NCMM, Geological Survey of India (GSI) to undertake 1,200 exploration projects
  - ✓ GSI follows the United Nations Framework Classification (UNFC) classification and Minerals (Evidence of Mineral Contents) (MEMC) Rules, 2015, to carry out exploration activities for critical minerals.
- Targets **1,000 patents** by 2030, with the creation of **7 Centers of Excellence (CoE)** to drive breakthroughs in exploration and extraction.
  - **Guidelines** issued for Centre of Excellence on Critical Minerals (CECM) to align R&D with national priorities
  - 21 patents filed (May'25), 41 filed (June'25) and 10 patents granted (May'25–June'25)
- Recycling & Circular Economy
  - INR 1,500 crore Incentive Scheme approved by Union Cabinet (≈ €141.89 million)
  - Focus on recycling from e-waste & battery scrap
  - Support: 20% Capex subsidy + Opex support for 6 years (FY25–31)
  - Expected outcomes: new recycling capacity, jobs, and supply chain security

Continue…

- **Critical Minerals Identification**
  - ✓ Ministry of Mines committee (Nov 2022) identified **30 critical minerals**
  - ✓ **24 minerals included in Part D, Schedule I of MMDR Act, 1957**
  - ✓ Central Government granted **exclusive authority** to auction mining leases & composite licences
  - ✓ **List of Critical Minerals:** Lithium, Cobalt, Nickel, Copper, Graphite, REEs, PGE, Titanium, Tungsten, Vanadium, Gallium, Germanium, Indium, Niobium, Tantalum, Zirconium, Molybdenum, Potash, Phosphorus, Tin, Silicon, Selenium, Cadmium, etc.

<u>Recent Updates (Nov 2025): EoDB</u>

- Ministry of Mines has **withdrawn Quality Control Orders (QCOs) on seven key non-ferrous metals and alloys** that are classified as critical minerals:
  - ✓ Aluminium & Aluminium Alloys
  - ✓ Copper, Nickel
  - ✓ Primary Lead, Refined Zinc
  - ✓ Refined Nickel, Tin Ingot
- Removes mandatory **BIS certification** for imports, easing supply constraints

Standardization: India

Bureau of Indian Standards (BIS):

- BIS through various metal-specific technical committees has published over 400 Indian standards.
  - Significant portion of Indian standards is harmonized with ISO/IEC standards to ensure global competitiveness and quality.
- BIS through its technical committee “MSD (Management & System Department) 10 on Social Responsibility” has developed draft set of standards under Environment, Social and Governance (ESG) reporting framework “Sustainability Reporting and Disclosure Requirements (Part 1- 15)”.
  - These draft standards are largely aligned with SEBI's BRSR Core and the NGRBC principles, while also incorporating elements from the ESRS.