

# Optimizing Transparency and Accountability in CRM Value Chains: Applying UNRMS Principles

ESCWA Expert Group Meeting on  
CETMs – May 2025

Harikrishnan Tulsidas  
Economic Affairs Officer  
UNECE



**UNECE**

# Transparency, Trust, and Transformation

**1**

**Lifecycle coherence and traceability across the value chain.**

**2**

**Empowering data systems and institutional capacity.**

**3**

**Inclusive, future-ready planning for value and equity.**

**1**

**Lifecycle coherence and traceability across the value chain.**

# From Source to Service: A Lifecycle Vision for CRM Governance

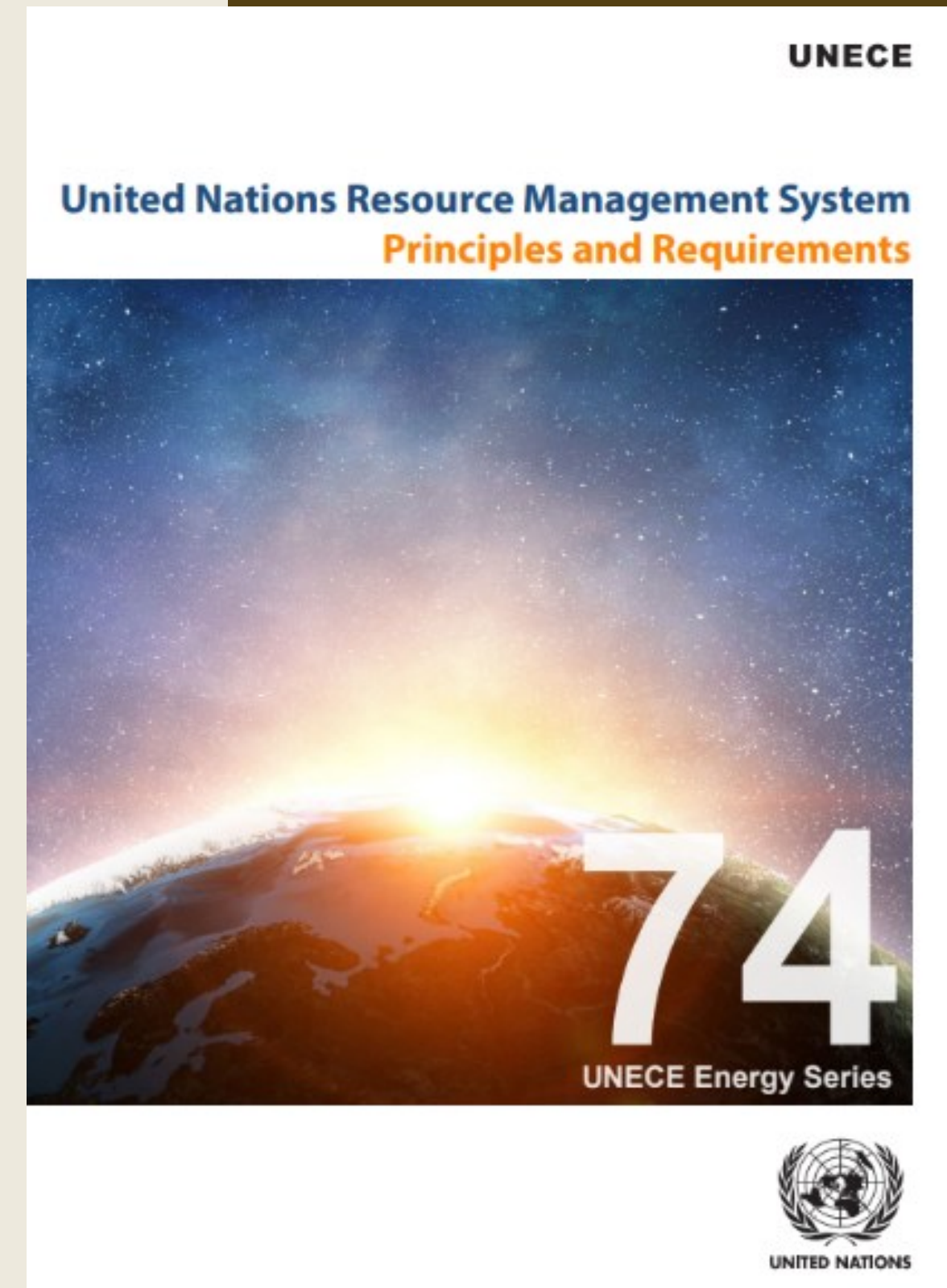
**UNRMS applies a full-lifecycle approach—from exploration to reuse and circular recovery.**

**Aligns with UNFC's E-F-G model: Viability, Feasibility, Confidence.**

**Enables coherent planning across energy, industry, geology, and trade ministries.**

**Supports all resource types—CRMs, renewables, petroleum, anthropogenic materials.**

**Used in AMREC & PARC to guide end-to-end resource governance in Africa.**



# 12 Fundamental Principles

- **State Rights and Responsibilities:** States have sovereignty and legal responsibilities over their natural resources.
- **Responsibility to the Planet:** Prioritize the well-being of the Earth and its inhabitants
- **Integrated Management of Resources:** With public, private, and civil society partnerships.
- **Social Engagement:** Ensures active social engagement with all stakeholders.
- **Service Orientation:** Resources should be used and reused as a service to society.
- **Comprehensive Resource Recovery:** Maximize value recovery at all operational stages with minimal environmental impact.
- **Value Addition:** Throughout the resource lifecycle
- **Circularity:** Responsible design, use, reuse, and waste minimization
- **Health and Safety:** Continuous health and safety performance improvement
- **Innovation:** Adoption of hybrid technologies
- **Transparency:** Public understanding of resource management and financial flows.
- **Continuous Strengthening of Core Competencies:** Enhance institutional and personnel capabilities for sustainable resource management.

# Capturing the Missing Materials: Co-products and By-products in Focus

 Up to 60% of gallium, 30% of indium, and 35% of tellurium come as by-products.

 UNRMS requires comprehensive recovery—ensuring co/by-products are evaluated and reported.

 Enables lifecycle planning for solar PV, magnets, semiconductors, and battery components.

 Prevents underestimation of strategic reserves and future supply bottlenecks.

 Applied in pilot classifications under EU FutuRAM project.

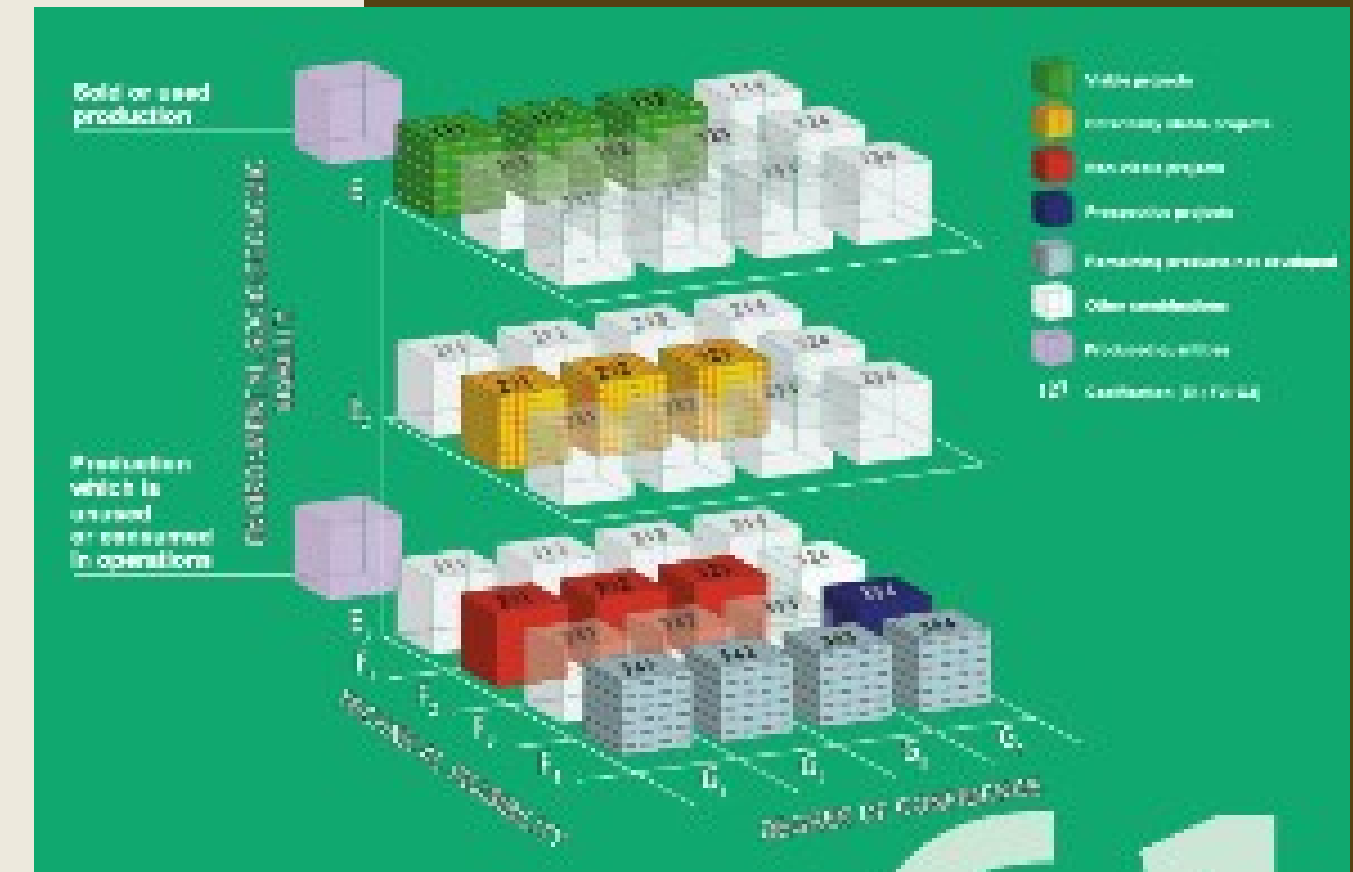
# Embedding ESG and Circularity from the Start

**UNRMS Principles 2 & 8 embed planetary responsibility and circularity by default.**

**ESG factors are hardwired into the E-axis of UNFC.**

**Projects failing to meet ESG thresholds are not classifiable as viable (E1).**

**Supports planning for reuse, recycling, and zero-waste pathways.**





# Systemic Thinking for Joined-up Institutions

**UNRMS aligns geology, energy, industry, finance, and environment under a shared resource logic.**

**Moves planning from project-by-project silos to national resource strategies.**

**Supports institutional integration.**

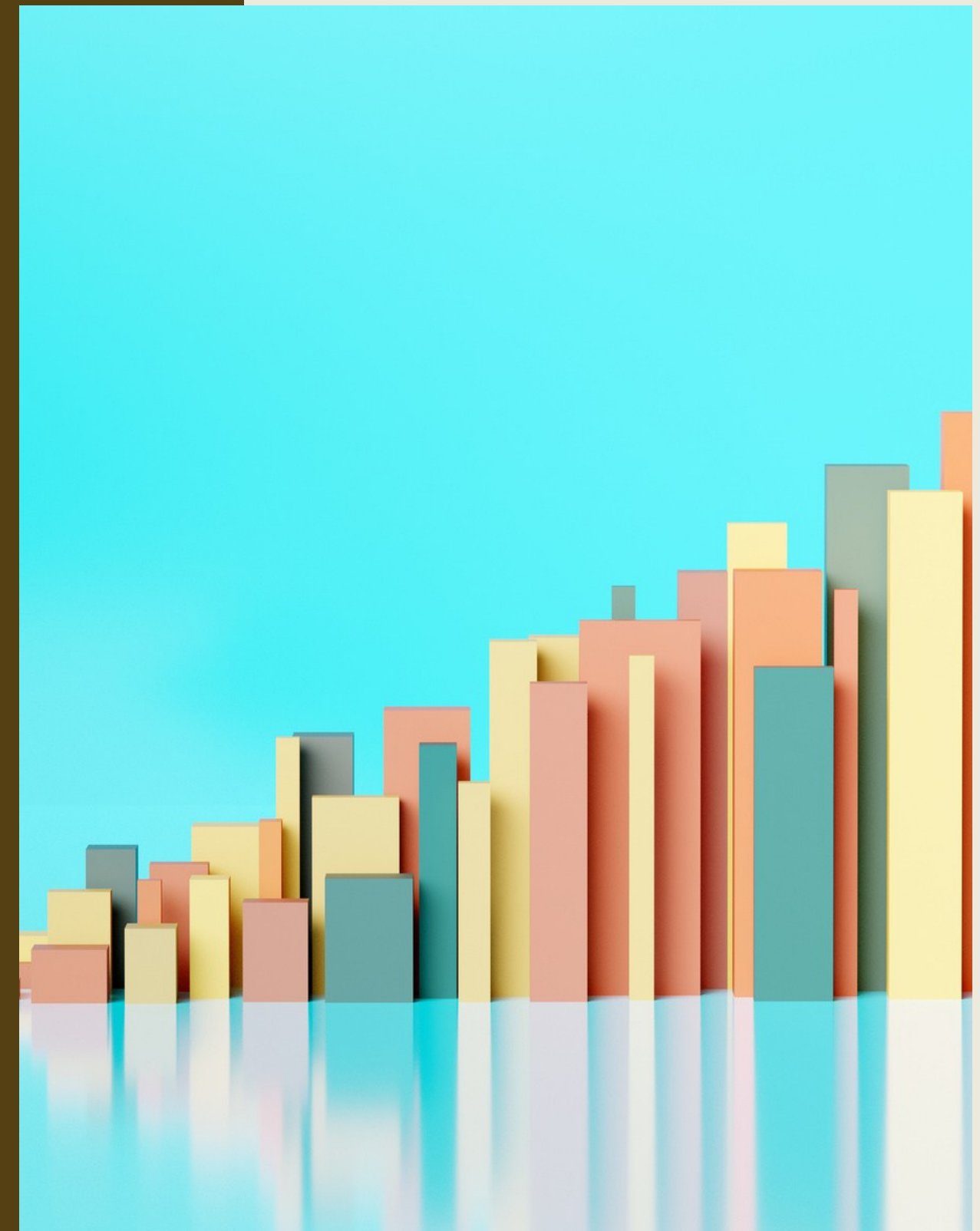
**Enables scenario modelling for domestic value chains, not just exports.**

**Forms the backbone for regional dashboards.**



# Trust through Traceability: The Case for Unified Data


- **UNRMS ensures traceable, auditable project data from mapping to recycling.**
- **Builds credibility with investors, communities, and trading partners.**
- **Facilitates ESG-aligned finance through structured disclosures.**
- **Reduces data asymmetries in price-sensitive midstream and export decisions.**
- **Forms the foundation for interoperable regional systems.**



2

**Empowering data systems and institutional capacity.**





# **Fragmented chains, Fragmented Knowledge: The Midstream Challenge**

**Refining, processing, and trading of CRMs are concentrated in few hands.**

**Midstream actors hold critical pricing, purity, and volume data—rarely shared.**

**Africa, MENA, and LLDCs lack visibility into midstream margins and losses.**

**UNRMS highlights this 'bloated middle' and enables data alignment.**

**Transparent midstream reporting is key to building regional strategies.**



# **UNRMS Principle 11: Making Transparency Actionable**

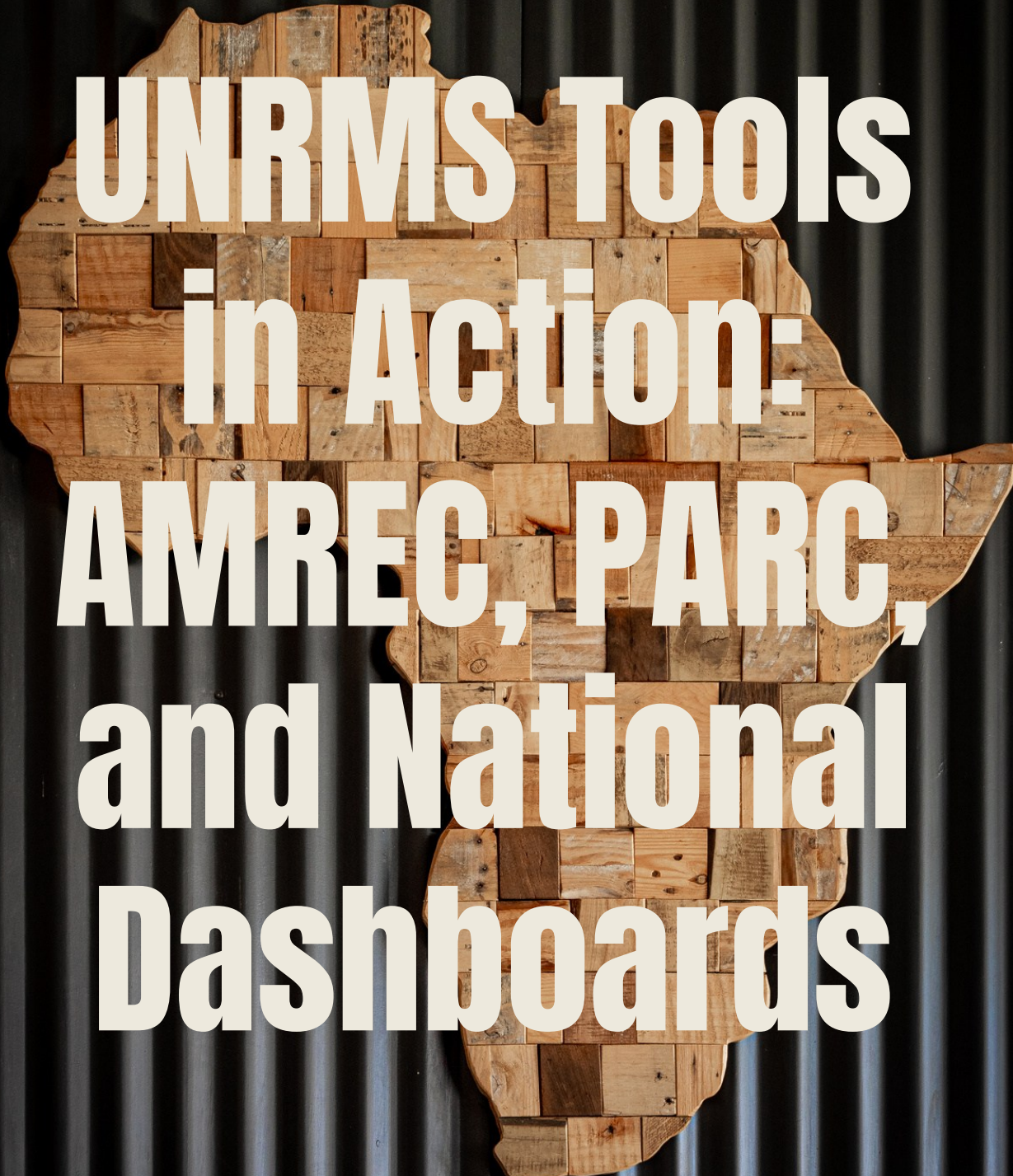
**Mandates verifiable, structured disclosure across all project stages.**

**Covers ESG, value flows, and supply chain traceability.**

**Aligns with EU CRM Act, IFC Standards, OECD Due Diligence.**

**Backbone for green finance, local trust, and contract fairness.**

**Integrated with UN Transparency Protocol.**

A map of the African continent is constructed from numerous small, rectangular pieces of light-colored wood, arranged to form the outline of the continent. The map is set against a dark, vertically-ribbed background.

# **UNRMS Tools in Action: AMREC, PARC, and National Dashboards**

**AMREC applies  
UNFC/UNRMS at  
continental level.**

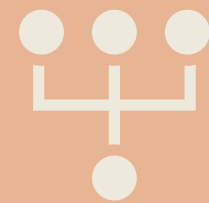
**PARC 2023 enables  
public reporting of  
ESG and project  
viability.**

**Supports multi-axis  
classification for  
holistic assessment.**

**Dashboards for  
informed decisions.**

**Covers ASM, co/by-  
products, and social  
license—beyond  
tonnage.**

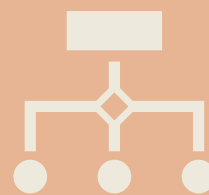
# Reducing Asymmetries: Empowering Governments and SMEs



**UNRMS builds capacity for classification, valuation, and monitoring.**



**Shifts power from external actors to local institutions.**



**Enables SMEs to access and act on classified project data.**

# Cooperation, Not Isolation: Enhancing Regional Resilience

- **UNRMS creates a common language for CRM trade and infrastructure planning.**
- **Enables cross-border benchmarking and mineral corridor coordination.**
- **Vital for LLDCs to negotiate transport, processing, and offtake.**

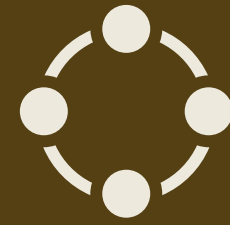




3

**Inclusive, future-ready planning for value and equity.**

# From Extraction to Transformation: Building Value at Home



**UNRMS supports domestic  
beneficiation through  
project-based classification.**



**Enables upstream planning  
for processing hubs and  
industrial parks.**



**Aligns with CETM Principle  
#4 on value addition and  
diversification.**

# **Navigating Core Chaos: How UNRMS Tames Market Volatility**

---

**CRM prices can fluctuate up to 500% in three years (e.g., cobalt, lithium).**

---

**Global shocks expose the need for strategic planning and stockpiling.**

---

**UNFC/UNRMS classifies by maturity and risk—enabling phased rollout.**

---

**Informs demand forecasting, offtake strategy, and fiscal buffers.**

---

**Supports resilience under EU CRM Act.**

# Aligning Classification with Community Needs

---

**E-axis requires evidence of social acceptance and equity.**

---

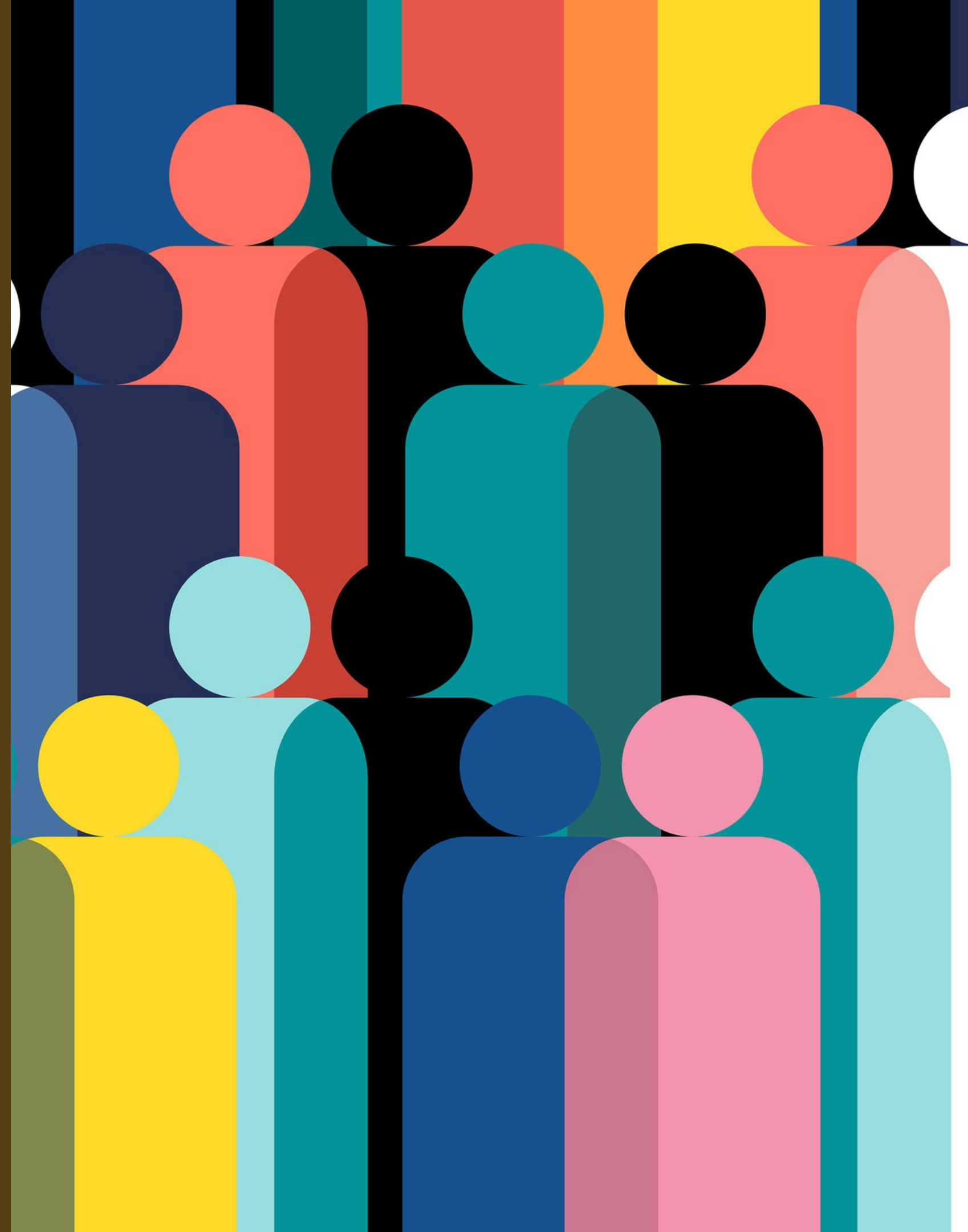
**Non-compliance pushes projects to E2–E3 (non-viable or delayed).**

---

**PARC 2023 mandates reporting on livelihoods, land, gender, and ASM.**

---

**Avoids delays and reputational damage—costing significant value.**





# Linking Global Principles to Regional Visions

**UNRMS delivers on SDGs.**

**Enables linkages to NDCs, just transition, and green industrialization.**

**Aligned to regional visions – Africa, ASEAN.**

**Acts as translator from global vision to national strategy.**

**Fosters policy coherence across ministries and partners.**



# A Platform for the Future: Institutionalizing Sustainable Resource Governance



**UNRMS is a scalable platform for real-time governance.**



**Supports NRMS, integrated data systems, and AI-based planning.**



**Anchors just transition and circularity into institutional processes.**



**Builds long-term capacity for resilient resource economies.**



# UNRMS as the Compass

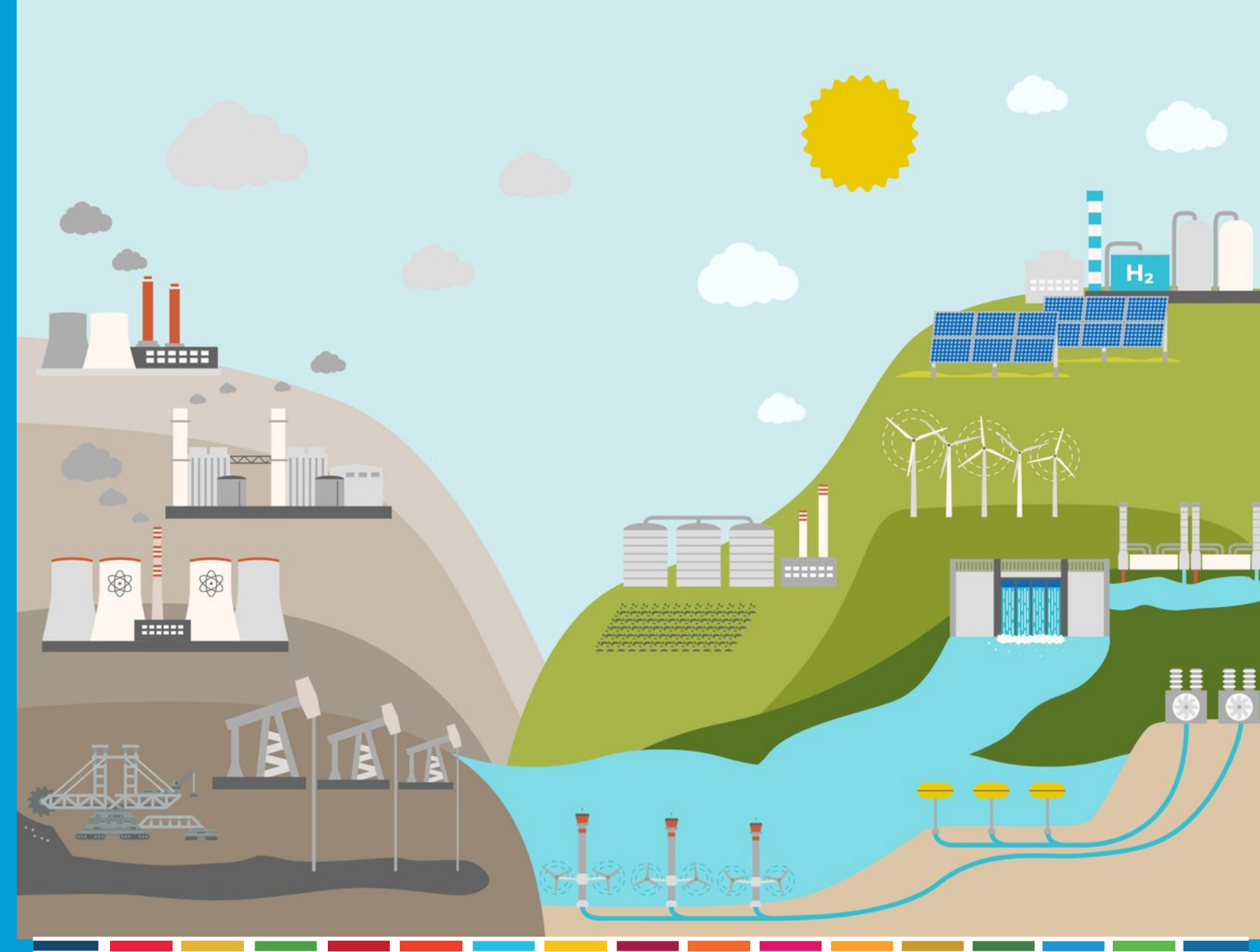


**UNRMS is a living system  
for sustainable resource  
governance.**

**Supporting building  
transparent, principle-  
aligned value chains.**



Thank you!



SUSTAINABLE RESOURCE MANAGEMENT



UNECE