

World Resources Forum 2023: Sustainable Value Chains

Knowledge Synthesis of the

Mine Life Cycle and the Mining Value Chain to Address Climate Change

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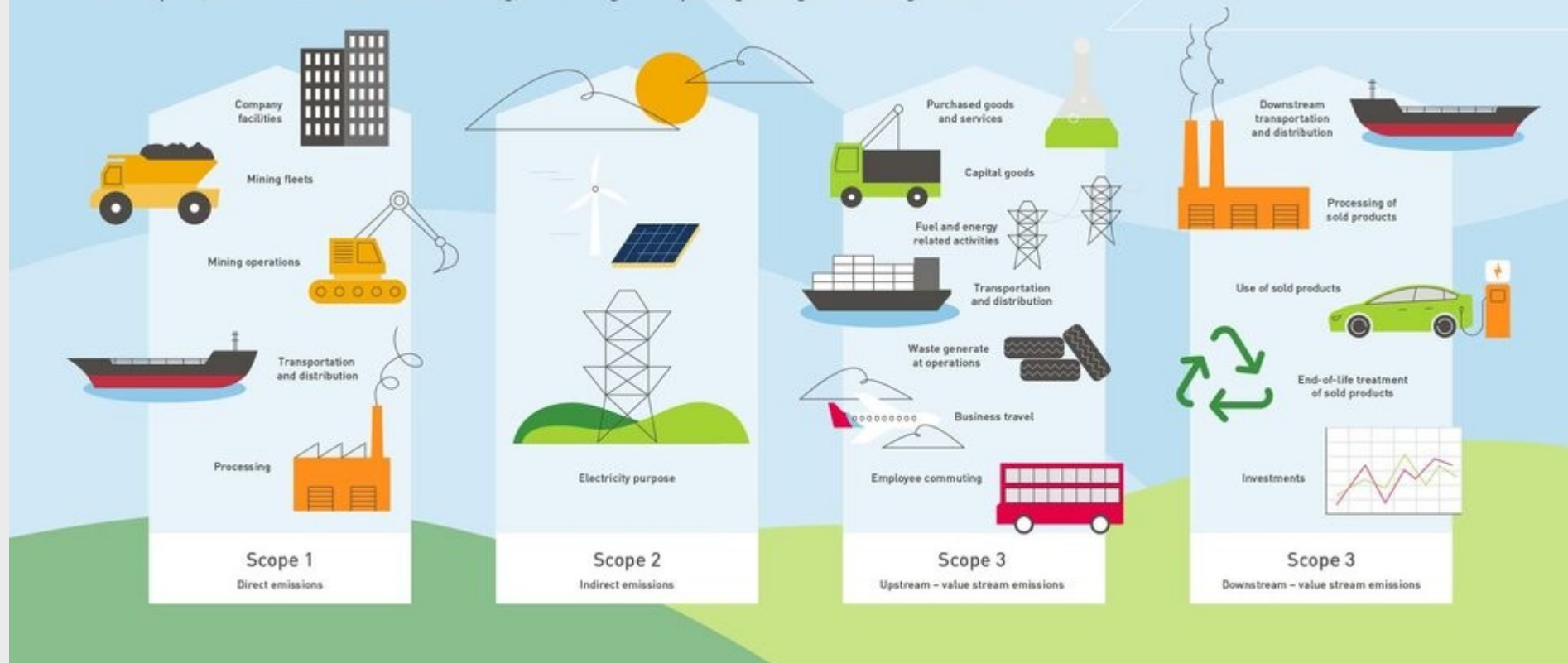
September 5, 2023



GETTING TO A HEALTHIER, MORE RESILIENT, LOW CARBON WORLD.

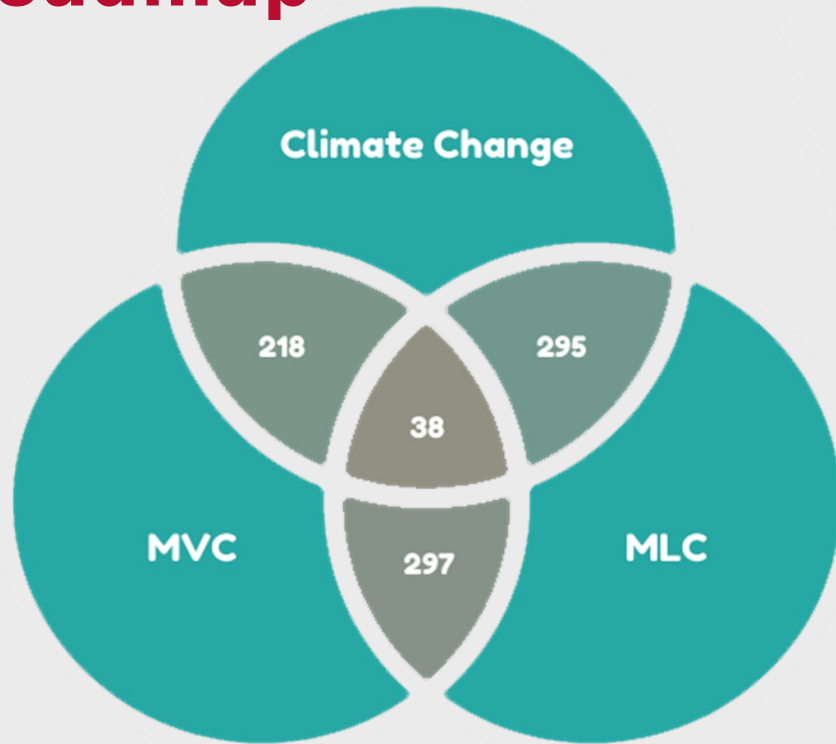
ICMM
International Council
on Mining & Metals

Businesses must reduce their environmental impact. One of the ways they can do this is by reducing their carbon footprint, and this starts with understanding, accounting and reporting their greenhouse gas emissions.



Source: [International Council on Mining and Metals \(ICMM\)](#)

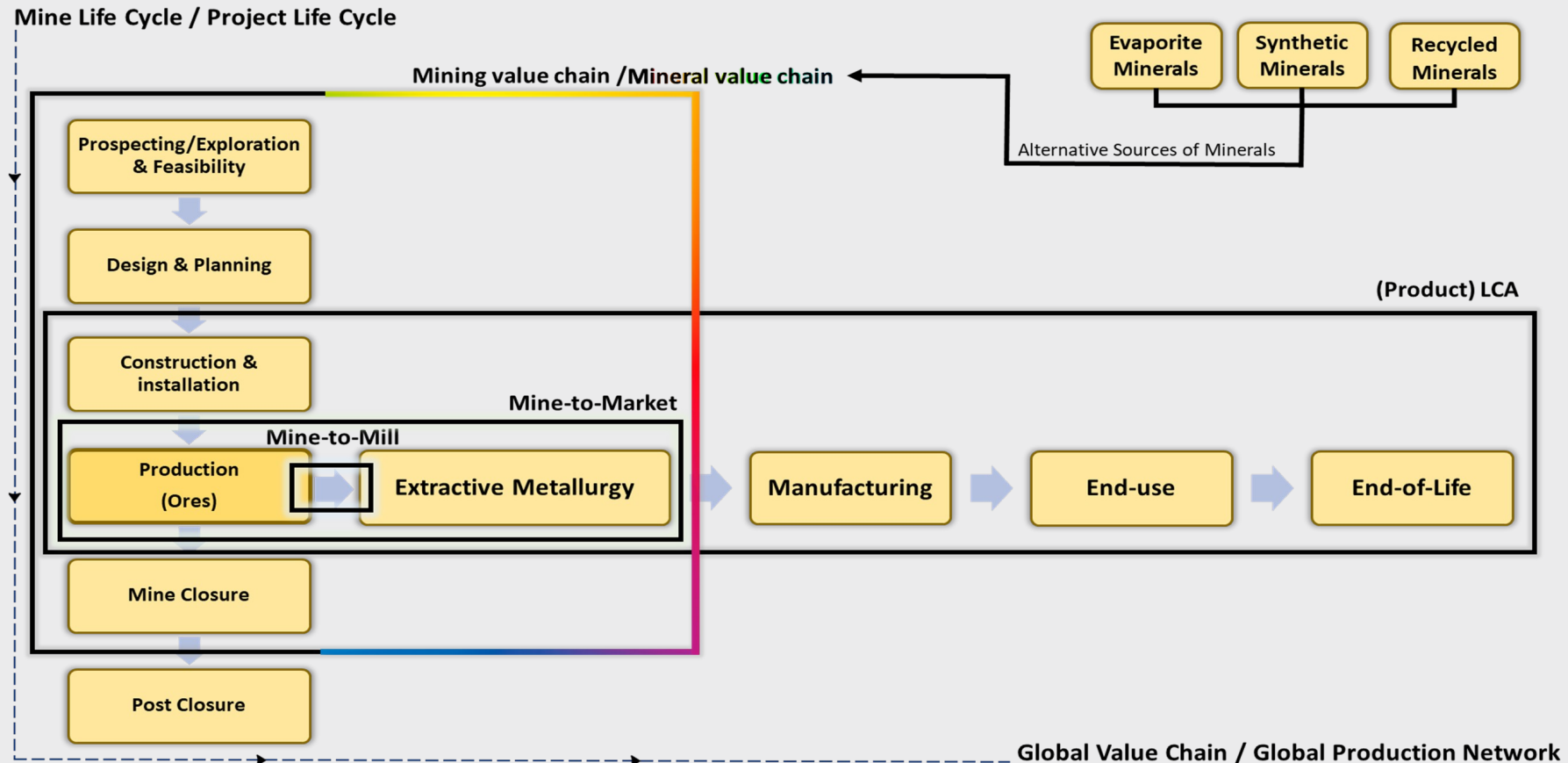
A Holistic Framework Needed to Achieve a Net-Zero Roadmap



Identified publications linking "Mine Life Cycle," "Mining Value Chain," and "Climate Change."

- How can the environmental impacts associated with each stage of the mine life cycle and the mining value chain be mitigated to promote sustainable mining practices?
- How can the mining industry reduce its carbon footprint and contribute to the transition to a low-carbon economy?

The Mine Life Cycle vs. The Mining Value Chain



Knowledge Synthesis to Address Climate Change -1

- Exploration and Feasibility
 - Conduct early evaluations and tests to identify climate change risks
 - Prioritize the exploration of minerals for the renewable energy transition
 - Adopt advanced technologies (e.g., remote sensing technologies and data processing)
- Mine Planning, Design, and Construction
 - Incorporate geometallurgical modeling and renewables in strategic planning
 - Review material handling methods to reduce carbon emissions
 - Engage local suppliers to reduce long-distance transportation emissions
 - Develop flexible operational plans for climate resilience

Knowledge Synthesis to Address Climate Change -2

- Production and Processing Operations
 - Consider “mine-to-mill” methods, renewable energy projects, and industrial symbiosis
 - Advanced mine waste management with reprocessing or carbon sequestration
 - Deploy IoT with machine learning for real-time ore monitoring and “digital twin” development
- Mine Closure and Rehabilitation
 - Design-for-closure strategies to minimize waste and effective land reclamation
 - Reduce the risk of premature mine closure
 - Incorporate climate-proofed closure designs
 - Site-specific action plans for long-term impact and risk mitigation (e.g., sensors and drones)

Call for Collaboration

- **How Can We Sustain the Mining Value Chain?**
 - Where are the opportunities for the mining value chain to mitigate GHG emissions collectively and collaboratively?
 - What should the mining sector do more to help achieve the Sustainable Development Goals (SDGs) toward the 2030 Agenda?
 - How will technological and societal transitions outside the mining industry reshape the future of mining?

