

SAIMM: ESG in the Minerals Industry - Challenges And Opportunities

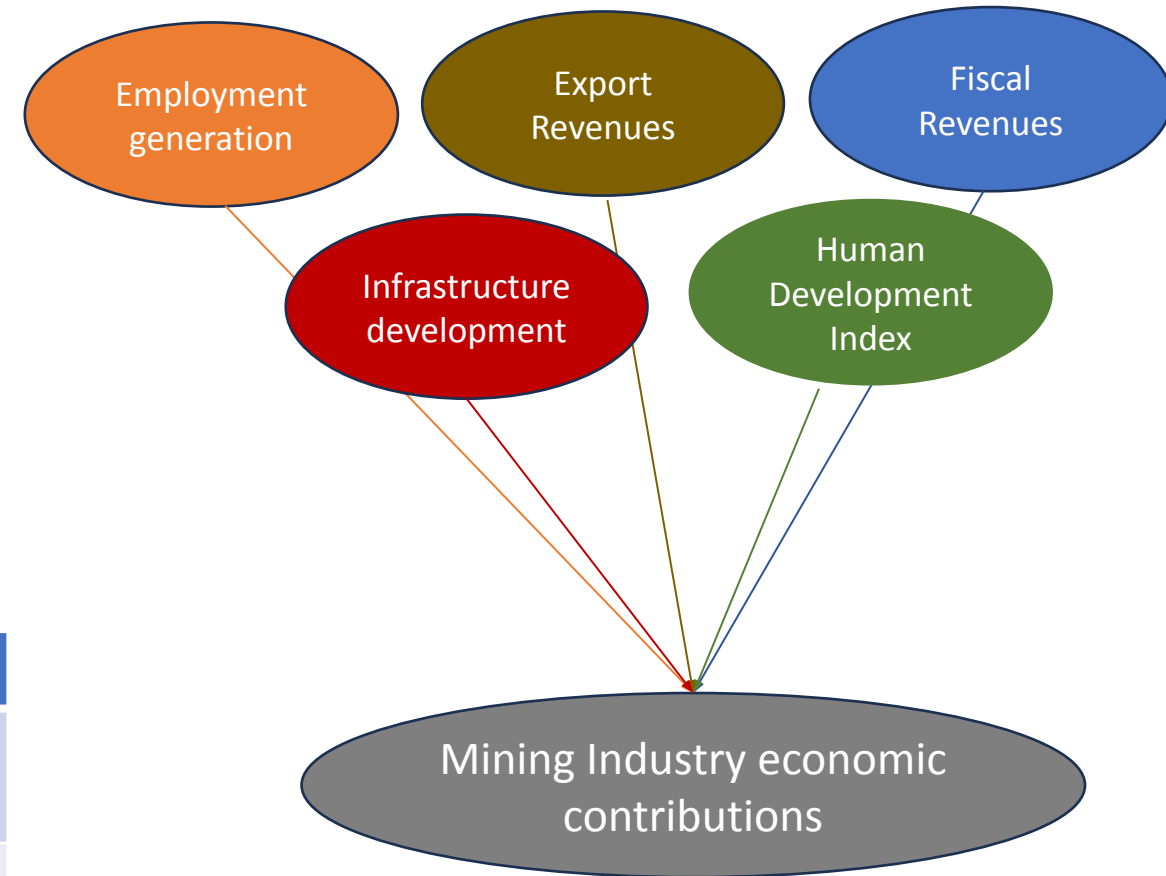
Road to Carbon Neutrality – Opportunities, Innovations, and Strategic Implications in the Mining Industry

Patronella S. Mtemeli

Introduction

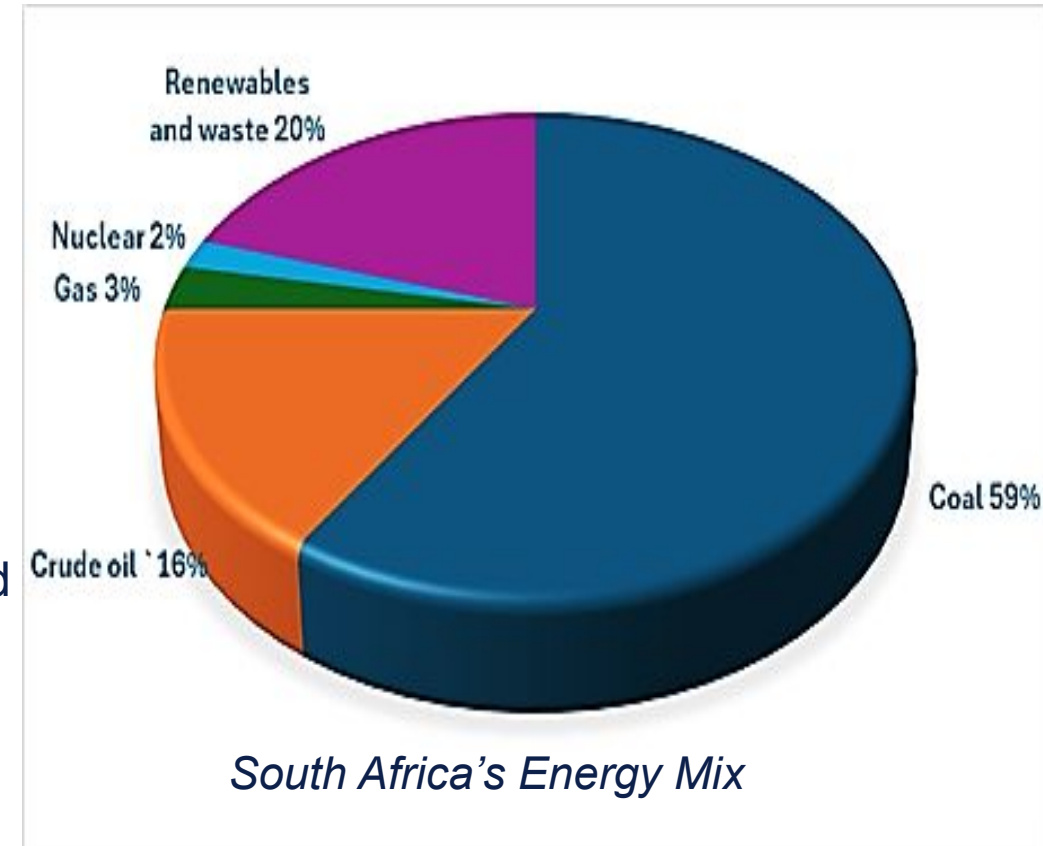
- South Africa's economy is heavily reliant on its mineral resources
- Provides substantial job opportunities
- Major source of export revenue
- Contributes significantly through taxes and royalties
- Lead to infrastructure development
- Improvement in the HDI
- Estimated contributions in 2016

GDP	About 7.1%
Employment	About 3% (about half a million people)
Economic contribution	R286 billion



Introduction

- Linkage between SA economy and its rich mineral resources, creates MEC
- MEC – framework illustrating country's mining, energy production, and industrial development interconnectedness
 - Vital for understanding South Africa's industrial growth and energy supply
 - Evolved due to abundant coal resources
- Faces challenges due to heavy reliance on coal, which is increasingly scrutinised for environmental impact and market volatility

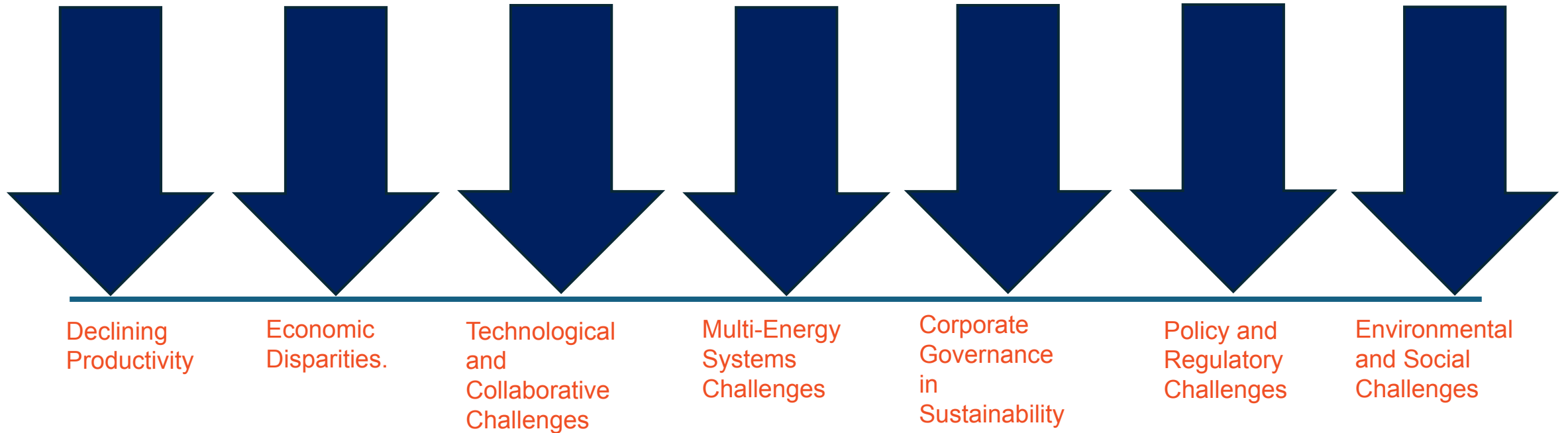


Introduction

- The mining sector plays a crucial role in global carbon emissions
- Contributes significantly to GHG emissions, with a carbon footprint exacerbating climate change
- Its major industrial processes contribute to 84.6% of its total emissions, which necessitates improvements in these processes
- Transitioning to cleaner energy sources and enhancing energy efficiency is critical for reducing emissions, with potential reductions of up to 46% from energy substitutions
- Nations striving for carbon neutrality by 2050
- Vital for mining sector to align with Paris Agreement and SDGs
- Need for sustainable practices e.g.,
 - Increased production
 - Reduction in CO₂ emissions by over 20%

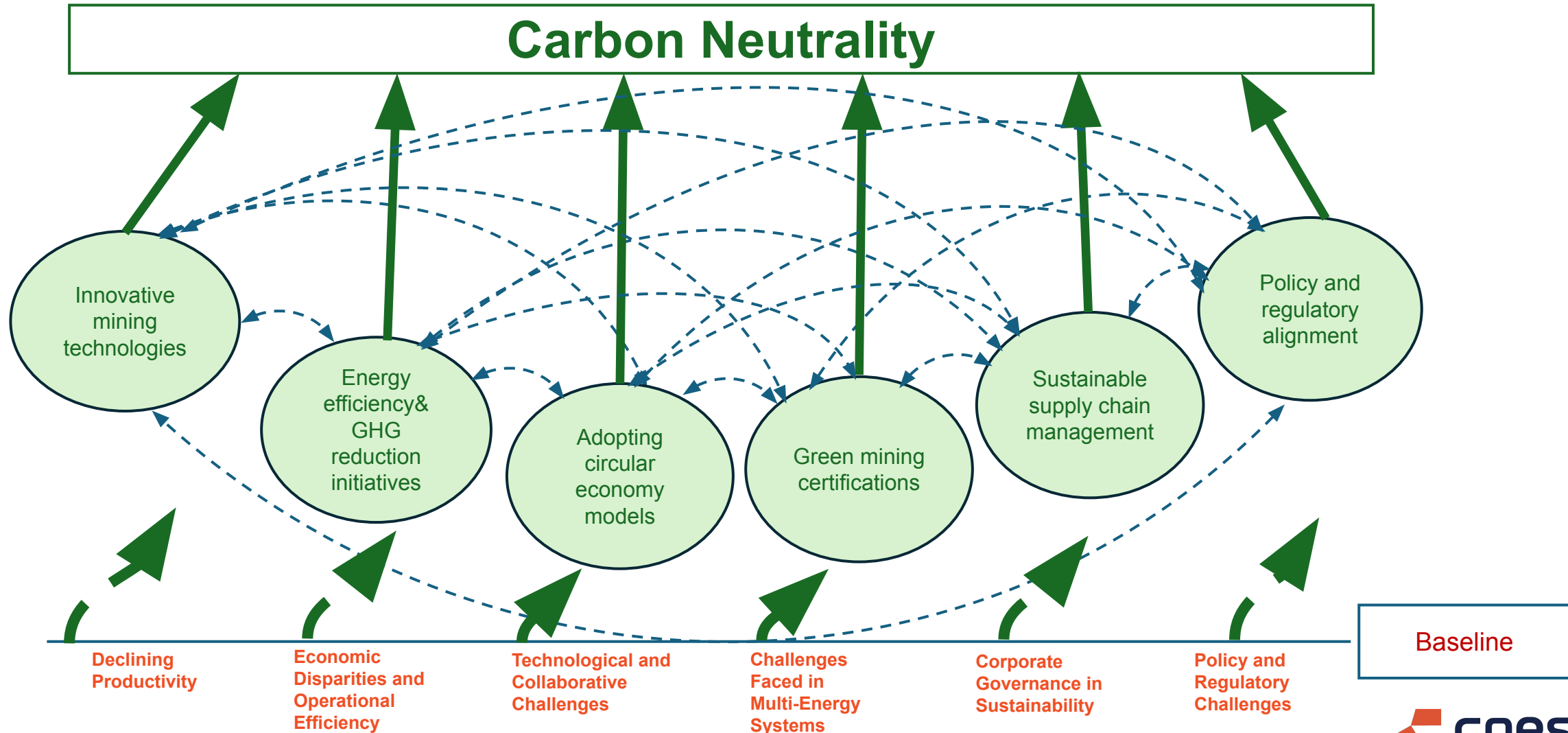
Challenges in Achieving Carbon Neutrality

What are the challenges towards carbon neutrality?



Pathways to Carbon Neutrality

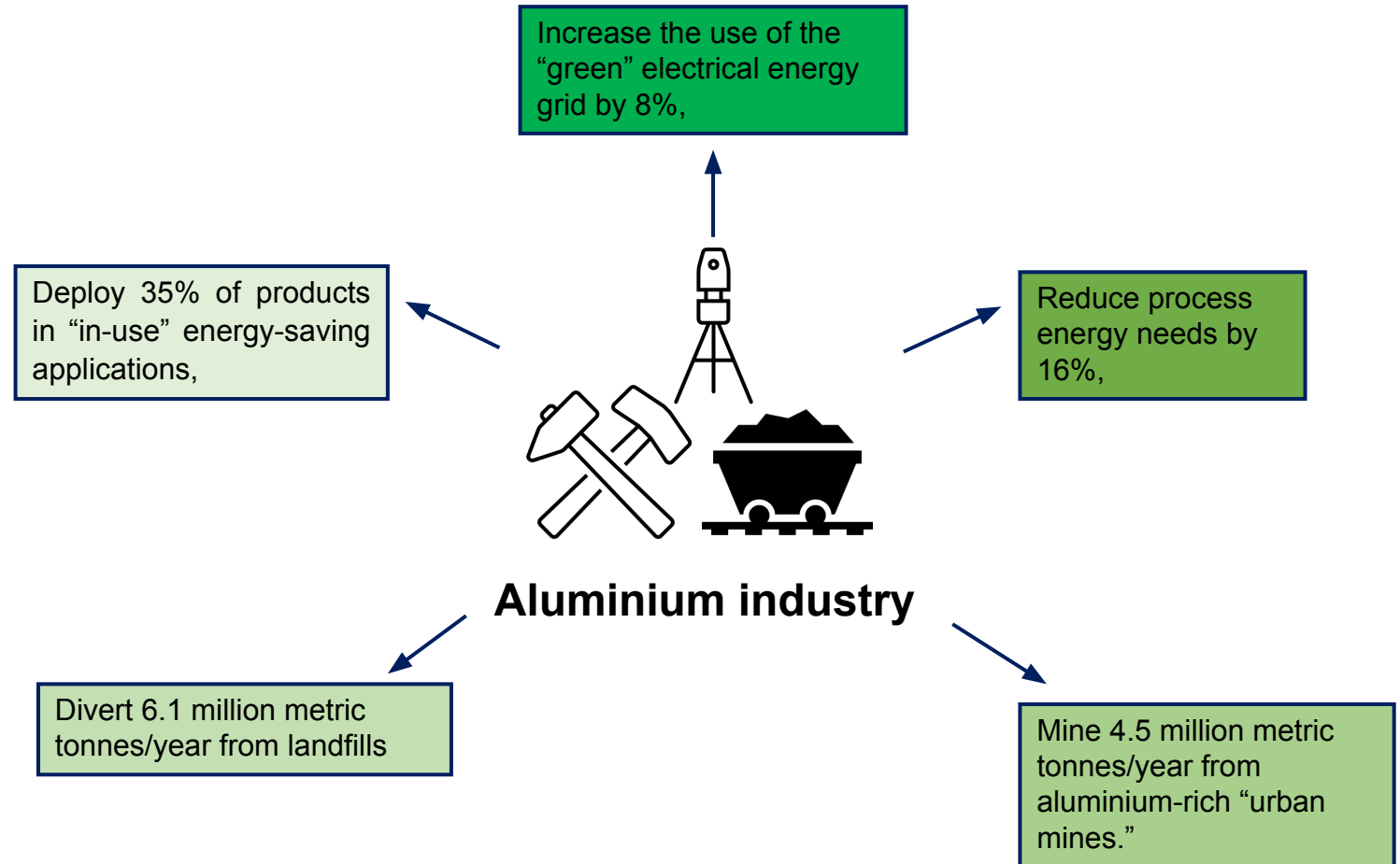
Opportunities for Carbon Neutrality in the Mining Industry: Short-term and Long-term Strategies



Pathways to Carbon Neutrality

An integrated and quantifiable plan for achieving “carbon neutrality” case study - aluminium industry

- Use of integrated energy-powered sources can drastically reduce carbon footprints
- Enhances energy security and reduces long run operational costs
- Adoption of electric trucks is a key opportunity for carbon neutrality
- Example reported by Subodh (2012), is an integrated and quantifiable plan for achieving carbon neutrality in the global aluminium industry
- Advocates for 5 actionable steps



Pathways to Carbon Neutrality

Case Studies



- *Electric Mine Consortium*, brings together various mining companies to accelerate transition to fully electrified mines, aiming for zero CO₂ emissions.



- *Anglo American* unveiled world's largest hydrogen-powered mine haul truck prototype, marking a significant step towards carbon neutrality in mining operations.



- *C-NES* is providing integrated carbon-neutrality solutions specifically tailored for the mining sector, focusing on renewable energy technologies such as biogas produced from cactus.

Strategic Implications

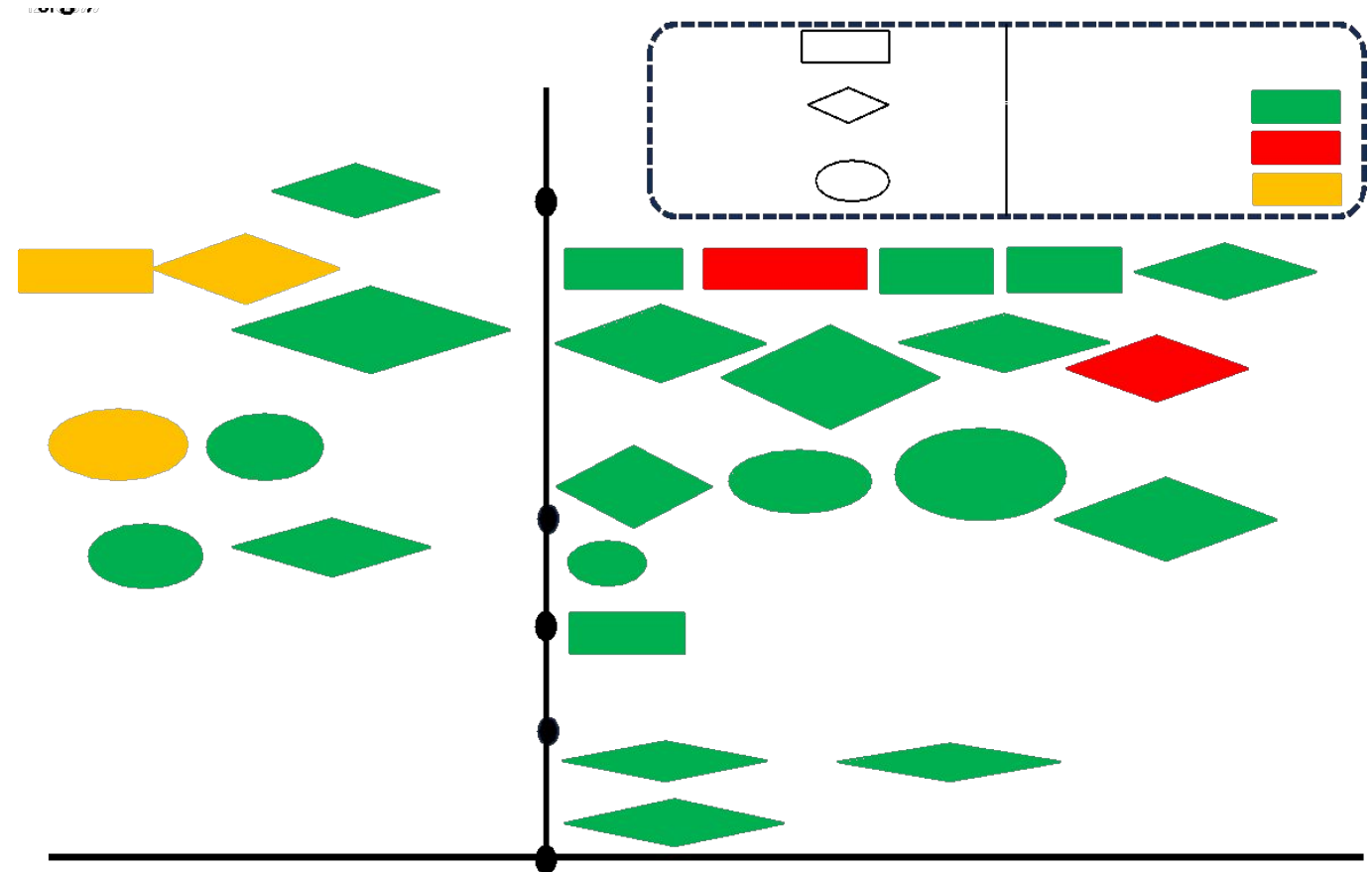
- Carbon-neutral practices present significant strategies - primarily enhancing their sustainability and competitiveness.
- As the industry faces increasing pressures from resource depletion, increased demand for critical minerals and regulatory demands for reduced GHG emissions, transitioning to low-carbon technologies is essential.
- As deposits grow more challenging and costly to reach, companies must explore innovative ways to achieve carbon neutrality while reducing operating expenses.
- Challenges remain, i.e.,
 - need for effective environmental accounting disclosures to demonstrate commitment to carbon neutrality
 - need for robust regulatory frameworks and stakeholder engagement to navigate environmental uncertainties
- The mining sector must navigate the trade-offs between economic viability and environmental responsibility.
- Transitioning to low-carbon technologies, such as the electrification of haulage systems, can substantially reduce greenhouse gas emissions, although the initial capital costs present a barrier.

Government Roles

- Achieving carbon neutrality requires collaborative efforts between government and industry, supported by robust policy frameworks.
- Governments are responsible for establishing legal frameworks and strategic plans that guide the transition to carbon neutrality.
 - will help ensure a steady transition towards carbon neutrality
- Example - carbon pricing or emissions trading systems, can drive changes in how coal-based power systems operate.

Government Roles

- The figure represents 26 regions aiming to achieve carbon neutrality through three approaches: existing laws, current policies, and proposed legislation.
 - Will help ensure a steady transition towards carbon neutrality
 - Shows strength of commitment to carbon neutral targets decreases from existing laws to current policies, with proposed legislation being the least binding.
 - Among the six regions with legally binding carbon neutrality goals, four are European Union members
 - Example - Sweden's ambitious energy policies aim for zero net emissions by 2045



Monitoring and Evaluation

- Critical and essential in the journey toward carbon neutrality as they provide frameworks for assessing progress.
- Governments and industries must establish robust monitoring systems
 - To track the effectiveness of implemented strategies
 - Ensure alignment with sustainability goals.
- Example:
 - Accurate satellite technologies and geofencing can also be employed to monitor environmental impacts and prevent the degradation of sensitive areas.

Conclusions

- Achieving carbon neutrality in the mining industry presents challenges and promising opportunities.
- The sector is confronted with declining productivity, squeezed profit margins, and increasing operational costs, all while striving to meet ambitious carbon neutrality goals.
- However, integrating long and short-term strategies, monitoring and evaluation and robust policy frameworks offers a pathway to carbon neutrality.
- By adopting these strategies, the mining sector can transform challenges into opportunities for sustainable growth and innovation towards carbon neutrality.

Thank You!