Minerals and Metals for a Low Carbon Future: The Need for ‘Climate Smart Mining’

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World Bank
Energy and Extractives
Climate Change
Defining ‘Climate Smart Mining’
Developing a Climate Smart Approach to the Extractives Industry Value Chain

- Integration of mineral and metal development with climate responsiveness
- Mineral supply chain for broader development goals under a changing climate
1) What Do We Mean By Climate Smart?

• In extracting, processing and supplying the requisite minerals and metals for a carbon constrained future, a climate smart approach aims to mitigate rising pressures, particularly at the local level.

• From a climate perspective, climate smart mining initiatives will support more efficient mining processes with enhanced resilience:
  • GHG emissions and local air
  • Energy needs
  • Landscape Impacts
  • Adaptation (e.g. water and ecosystems)
## Squaring the Circle: Mineral-Rich Developing Countries with Robust GHG Mitigation Plans

<table>
<thead>
<tr>
<th>Country</th>
<th>Date of submission</th>
<th>PA Status</th>
<th>Mitigation target</th>
<th>Type</th>
<th>Conditional?</th>
<th>GHG covered</th>
<th>Land Use Measures</th>
<th>Adaptation in included?</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRAZIL</td>
<td>09-25-15</td>
<td>Ratified</td>
<td>37% below 2005 levels by 2025, 43% below 2005 levels by 2030</td>
<td>Absolute reductions, economy wide</td>
<td>No</td>
<td>All IPCC GHGs</td>
<td>Yes. Estimated that as much as 90% of target to be met through this category.</td>
<td>Yes</td>
</tr>
<tr>
<td>CHINA</td>
<td>03-09-16</td>
<td>Ratified</td>
<td>60% - 65% below per unit GDP 2005 levels by 2020</td>
<td>Per capita</td>
<td>No</td>
<td>All IPCC GHG</td>
<td>Increase forest stock 4.5 billion hectares from 2005 levels by 2030</td>
<td>Yes</td>
</tr>
<tr>
<td>CANADA</td>
<td>05-25-15</td>
<td>Ratified</td>
<td>30% below 2005 levels by 3030</td>
<td>Absolute reduction, economy wide</td>
<td>No</td>
<td>All IPCC GHGs</td>
<td>Net-Net Approach</td>
<td>No</td>
</tr>
<tr>
<td>CHILE</td>
<td>01-05-16</td>
<td>Signed</td>
<td>30% or 35 – 45% below 2007 levels by 2030</td>
<td>Intensity, economy wide</td>
<td>35% - 45% is conditional on external financing</td>
<td>CO₂, CH₄, N₂O, PCFs</td>
<td>100,000 hectares of forest land, equating to 600,000 CO₂ tons sequestered as of 2030</td>
<td>Yes</td>
</tr>
<tr>
<td>COLOMBIA</td>
<td>09-07-15</td>
<td>Signed</td>
<td>20% or 30% below from BAU (335 Mt) by 2030</td>
<td>Absolute growth, economy wide</td>
<td>30% below BAU conditional on external financing</td>
<td>All IPCC Gases</td>
<td>Commits to reduce deforestation but no numbers provided</td>
<td>Yes</td>
</tr>
<tr>
<td>INDONESIA</td>
<td>10-24-15</td>
<td>Signed</td>
<td>-29% or 41% reductions by 2030. - (2.881 GtCO₂)</td>
<td>Absolute growth, economy wide</td>
<td>41% conditional on external financing</td>
<td>CO₂, CH₄, N₂O</td>
<td>Vast proportion of reductions will come through forestry related projects.</td>
<td>Yes</td>
</tr>
<tr>
<td>PERU</td>
<td>09-28-15</td>
<td>Ratified</td>
<td>20% reduction from 2030 BAU 30% reduction from 2030 BAU (298 Mt including LULUCF, 139 Mt without LULUCF)</td>
<td>Absolute growth. Economy wide</td>
<td>30% reduction conditional on external financing</td>
<td>CO₂, CH₄, N₂O</td>
<td>Vast majority of mitigation activities likely to be met through land use measures.</td>
<td>Yes</td>
</tr>
<tr>
<td>SOUTH AFRICA</td>
<td>09-25-16</td>
<td>Signed</td>
<td>34% from BAU by 2020, 42% from BAU by 2025</td>
<td>Absolute growth, economy wide</td>
<td>None, outside of assumption that all nations will do their fair share</td>
<td>All IPCC Gases</td>
<td>Yes, but not a priority</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Market Pressure from Investors for Sustainable, Clean Development

- Codelco will produce ‘green copper’

- Mining Association of Canada: Towards Sustainable Mining

- Tesla is committed to ‘ethically and locally sourcing materials’
“Almost every mine I know of is looking at putting in renewable energy... It decreases your costs.”  —Ross Beaty, chair, PanAmerican Silver

Electrification via renewable energy reduces carbon emissions AND provides a competitive advantage
Game changer: Renewable energy to power mines

• Making a ‘business case’ for using renewable energy has never been easier
• It is much more than simply installing a wind turbine or solar panel
  • Solar and wind are free energy sources
  • Saves money on fuel costs compared to diesel
The Competitiveness Case For Mining in Carbon Constrained World

Grid supply with 100% cost pass-through
(carbon costs in 2013 without support measures)

- Coal-dominated grid supply
- Hydro-dominated

Carbon costs (% of EBITDA)

Australia, Canada - Quebec, Canada - BC, EU, South Africa

Scope 2
Scope 1

Source: www.icmm.com
Improving Your Data Sources and Practices

• GHG Emissions

• Geological Data

• Smart Practices
Integrated Landscape Management and Planning

- 20% of all GHG emissions come from deforestation
- Grades diminish, deforestation increases
- Footprint of associated with infrastructure
- Spatial planning/ resource corridors

Challenge: Requires a leading role from governments and intergovernmental actors
Timely Climate Change Adaptation

The Mining industry is vulnerable to climate change:
- Isolated environments
- Fixed assets
- Water and energy demands
- Local communities
- Global supply chains
# A Framework for Identifying Climate Impacts

<table>
<thead>
<tr>
<th>Impact areas</th>
<th>Impact evaluation</th>
<th>Business implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs (e.g. water, energy)</td>
<td>Description, What is the impact?</td>
<td>Financial, Higher operating expenditure or unplanned capital expenditure</td>
</tr>
<tr>
<td>Supply chains</td>
<td>Timeframe, When will the impact occur? When is action necessary?</td>
<td></td>
</tr>
<tr>
<td>Markets</td>
<td>Stakeholders, Who is impacted?</td>
<td></td>
</tr>
<tr>
<td>Exploration</td>
<td>Primary/secondary, Does the impact directly affect activities or does it trigger other impacts?</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>Likelihood, How certain is the impact? How much more often is it likely to occur?</td>
<td>Reputational, Increased risk of litigation, regulatory non-compliance, inability to operate</td>
</tr>
<tr>
<td>Closure</td>
<td></td>
<td></td>
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<tr>
<td>Post-closure</td>
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2) What Do We Mean By Climate Smart Mining?

Mining and SDGs

A Climate Smart Mining approach also means taking into account other SDG priorities, including:

- Local governance, including indigenous rights
- Sharing the wealth with local communities
- Meaningful employment and economic development opportunities
- Health and education
- Others

It will also attempt to address the trade-offs and synergies between SDGs with measures to address climate change.
Conclusion #1: Towards Climate Smart Mining

• Meeting the Paris Agreement target will require a radical restructuring of energy supply and transmission systems globally

• The clean energy shift will be significantly MORE material intensive, but with potentially strong climate and economic benefits

• Technology choices matter: need for a flexible approach

• Local implications for sustainable development needs to be factored into a ‘climate smart’ approach
Conclusion #2: Towards Climate Smart Mining

• To address growing demand, more production will have to come from mineral-rich developing countries. This will call for:
  • Robust geological data
  • Strong governance and environmental management
  • Investment in technologies and practices that minimize the carbon footprint of mining, processing and metal production
  • Landscape level planning (including infrastructure)
  • Climate resilience and adaptation

Need for a Dialogue Between Mining/Metals, Clean Energy, Climate/SD, Financing, and Investment Communities
Thank you!

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Full WB report: The Role of Minerals and Metals for a Low Carbon Future